WOMEN'S HEALTH *In Focus* AT NIH

A QUARTERLY PUBLICATION OF THE NIH OFFICE OF RESEARCH ON WOMEN'S HEALTH

National Institutes of Health • Office of the Director | Volume 3, Issue 2, 2020

ORWH's Mission to Support Women in Biomedical Careers

OFFICE OF RESEARCH ON WOMEN'S HEALTH

Advancing the Health of Women Through Science

IN THIS ISSUE

Visit the subscription page to sign up to receive future issues of *Women's Health in Focus at NIH*.

TABLE OF CONTENTS

Director's Corner

Janine Austin Clayton, M.D.
Director, NIH Office of Research on Women's Health
NIH Associate Director for Research on Women's Health

Over the past several months, many of ORWH's efforts—along with those of its institutional partners within and outside NIH—have focused on supporting women and men in biomedical research careers. NIH recently announced several funding opportunities and policy changes (e.g., NOT-OD-20-011, NOT-OD-18-235, NOT-OD-20-054, and NOT-OD-20-055) designed to support junior investigators through qualifying career interruptions, such as childbirth and periods of career transition when rates of attrition are known to be high. Further, several presentations planned for the April 21 meeting of the NIH Advisory Committee on Research on Women's Health (ACRWH) will discuss issues related to women in biomedicine and the obstacles they face in scientific careers.

Accordingly, this issue of Women's Health in Focus at NIH *concentrates not only on enhancing the participation of women in biomedical careers but also on the careers of researchers who investigate topics in women's health. Our feature story describes the NIH Building Interdisciplinary Research Careers in Women's Health (BIRCWH) program as well as some important initiatives of the NIH Working Group on Women in Biomedical Careers that aim to support these professionals. Additional articles discuss current efforts to support junior investigators in postdoctoral research programs, research trends linked to the gender of investigators, a program to increase the retention of minority women in technology and computing positions, new policies and initiatives striving to address gender inequities in the medical research field, and other topics related to biomedical research professions.*

We hope you enjoy this issue of In Focus *and find it informative. Please share this publication with your colleagues and encourage them to subscribe.*

Janine Austin Clayton, M.D.
Director, NIH Office of Research on Women's Health
NIH Associate Director for Research on Women's Health

"Let's All Make It Happen"

ORWH Celebrates a Collaborative Approach to Supporting Women in Biomedical Careers and Researchers of Women's Health

A core mission of the NIH Office of Research on Women's Health (ORWH) since its establishment in 1990 has been to support women in biomedical careers by enhancing professional opportunities for women in the field, identifying barriers to women's biomedical careers, and making recommendations to overcome those barriers.[1] With the launch of the Building Interdisciplinary Research Careers in Women's Health (BIRCWH) program in 2000, ORWH's careers mission expanded to include support of new generations of researchers interested in interdisciplinary approaches to women's health and sex differences research.

One of ORWH's earliest initiatives was the Re-Entry into Biomedical Research Careers program, which awards supplemental funds to existing grants to support individuals returning to the scientific workforce after a career interruption for qualifying circumstances, such as family responsibilities. (See *In Focus*, issue 3.1 for more details on the history of ORWH.) This program and ones like it have done much to ensure the success of women throughout all stages of their biomedical careers.

Indeed, several decades' worth of data from U.S. medical schools suggest that women are experiencing greater success in entering the biomedical workforce. For approximately 15 years, men and women have applied and matriculated to medical schools in roughly equal numbers,[2] with women enrollees outnumbering men since 2017.[3] Though such statistics are encouraging, others show that women, particularly those who are racial or ethnic minorities, remain underrepresented in several scientific disciplines[4] as well as in leadership positions throughout academic medicine.[5,6] In addition, retention rates of women in biomedical fields have historically been lower than those of women in other professional areas[7] and those of men in academic medicine. Although this latter retention gap has diminished in recent years,[8] the attrition of highly trained women from biomedical research diminishes the talent pool and is cause for concern among researchers, educators, and funding organizations. Thus, ORWH's mission to support women in biomedical careers remains a priority.

Over the course of its 30-year history, ORWH has fulfilled its career development aims in partnership with other NIH Institutes, Centers, and Offices (ICOs), as well as with outside institutions. Through these collaborations, ORWH and its partner organizations have developed initiatives to begin realigning the culture of the research community. By fostering the careers of women in biomedicine and of investigators researching women's health, ORWH and its partners strive to achieve greater social equity and diversity in the scientific workforce and thereby to improve the quality of biomedical research and the health of all. Below, we discuss a few exemplar initiatives illustrating how ORWH's collaborations with ICOs and external partners have contributed to the advancement of both women in biomedical careers and women's health researchers by addressing the multiple obstacles that impede progress throughout every stage of a scientific career. (See *Changing Institutional Culture to Empower Women in Biomedical Careers*, below).

The NIH Working Group on Women in Biomedical Careers

NIH uses multiple frameworks to address issues facing women in the biomedical workforce, including the use of working groups, such as the Working Group on Women in Biomedical Careers (WgWBC) and the Advisory Committee to the Director (ACD) Working Group on Changing the Culture to End Sexual Harassment. (See *NIH Addresses Sexual Harassment,* page 5.) These groups bring together thought leaders to consider problems related to health research, policy, and clinical practice and then propose evidence-based, actionable solutions.

In 2007, NIH formed the WgWBC, assembling a diverse, multidisciplinary team with a wide range of ideas, research and policy interests, and subject matter expertise to develop strategies and interventions to promote the entry, recruitment, retention, and sustained advancement of women in biomedical and scientific research careers. Recommendations from the seminal report *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*, a publication of the National Academies of Sciences, Engineering, and Medicine (NASEM),[9] prompted the formation of the WgWBC and helped set its agenda. The WgWBC is cochaired by NIH Director Francis S. Collins, M.D., Ph.D., and ORWH Director Janine A. Clayton, M.D., and includes the directors of other ICOs, as well as scientific leaders from across NIH. Many ORWH staff members support the WgWBC and help to coordinate its activities; to solicit input from NIH staff, external scientific organizations, and the public; and to synthesize that input into strategies, solutions, publications, and other products. The WgWBC facilitates collaborations between ORWH and other ICOs where these organizations' missions and scientific disciplines intersect, while preserving each entity's intellectual and organizational autonomy.

As one of its first initiatives, the WgWBC issued a trans-NIH request for applications (RFA) titled "Research on Causal Factors and Interventions that Promote and Support the Careers of Women in Biomedical and Behavioral Science and Engineering" (CFI) to sponsor investigations of the obstacles impeding women throughout their biomedical careers and the interventions to ameliorate those barriers. CFI resulted in a wealth of pioneering research and associated publications[10] that fundamentally changed our understanding of how women in biomedical careers make career choices and how workplace environments and communities can function to impede the advancement of women. CFI recommendations informed additional interventions, policy changes, and programs and laid the

Changing Institutional Culture to Empower Women in Biomedical Careers

Reports from several research teams (e.g., references 10 and 14) have recommended steps to effect a cultural and systemic transformation of the biomedical community to mitigate the obstacles impeding women's advancement in the field, including:

- Increasing diversity in leadership roles and creating formal pathways for leadership development
- Improving mentoring, mentored career development, and sponsorship through formal mentor training programs and by enabling diverse mentoring networks
- Establishing pathways to re-enter biomedical careers (including career paths to leadership positions) after an extended leave of absence (e.g., for childbirth)
- Implementing flexible programs to facilitate work–life integration and addressing employer and employee reluctance to utilize these programs
- Adopting no-tolerance policies toward sexual harassment and considering it a form of professional misconduct (see *NIH Addresses Sexual Harassment,* page 5)
- Reducing implicit bias through evidence-based formal training, positive imaging/messaging, and other initiatives
- Achieving gender equity in compensation

NIH Addresses Sexual Harassment

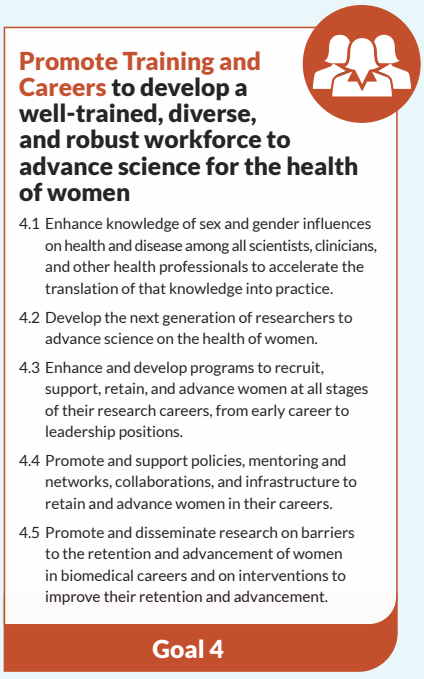
Sexual harassment remains one of the primary reasons women leave biomedical careers.[15] NIH does not tolerate sexual harassment in any form or place, especially at its facilities, on NIH-funded projects, and at awardee organizations. Only in safe and respectful work environments can individuals achieve their greatest potential and carry out the important work that supports the NIH mission. To foster a work environment free from sexual harassment, NIH is bolstering policies, guidelines, requirements, and communications to make its expectations clear to the NIH workforce and NIH-funded organizations and to take appropriate actions within its authority. Other efforts to combat sexual harassment at NIH include:

- A webpage that details relevant NIH policies and answers frequently asked questions
- An online platform and email address (GranteeHarassment@od.nih.gov) where grantees can report incidents of sexual harassment
- The NIH Workplace Climate and Harassment Survey for NIH employees and contractors
- Oversight by the U.S. Department of Health and Human Services (HHS) Office for Civil Rights (OCR)
- Formation of the Advisory Committee to the Director (ACD) Working Group on Changing the Culture to End Sexual Harassment, which recently released an extensive report of its mission and recommendations

foundation for understanding how to transform the culture of the biomedical research enterprise.

For instance, CFI research showed that family-friendly leave and flexibility policies assist women researchers in managing work–life integration. A body of research shows that work–life balance is a high priority for junior faculty and women; that women physicians with both child care and clinical responsibilities report low job satisfaction; that high-achieving women physician-scientists spend much more time parenting and doing domestic tasks than high-achieving men physician-scientists; that flexibility policies may be linked to the improved recruitment, retention, and career satisfaction of women scientists; and that family-friendly policies often are underutilized.[10,11] Based on these findings, the NIH Office of Extramural Research (OER) released the NIH Extension Policy for Eligibility Window for Pathway to Independence Awards (K99/R00) (NOT-OD-20-011) and the Update on NIH Extension Policy for Early Stage Investigator Status (NOT-OD-18-235), both of which support early-career researchers after the birth of a child. A complete list of NIH policies fostering a family-friendly environment for the NIH-supported workforce is available here. Two similar family-friendly programs are described in *Administrative Supplements for Retention of Early-Career Investigators* (page 6).

The programs described here resulting from the WgWBC's collaborations and influence represent only a sample of the working group's many accomplishments. The WgWBC has also increased recognition and support of women-of-color scientists through newsletter features, websites, nominations for a prominent lecture series, and the creation of the Women of Color Research Network (WoCRN), which provides information about the NIH grants process, advice on career development, and a forum for networking and sharing information for women-of-color scientists and their supporters. The WgWBC plays a pivotal role in coordinating trans-NIH efforts to support women in biomedical careers and represents just one aspect of NIH's multipronged approach.



The *2019–2023 Trans-NIH Strategic Plan for Women's Health Research — Strategic Goal* 4 — maps out a multipronged approach for realizing the vision of all women in science careers reaching their full potential. The goals and objectives of the plan — which also address rigorous research relevant to the health of women, study methods and data, evidence dissemination and implementation, and research evaluation — apply to the critical work being carried out in NIH Institutes, Centers, or Offices to improve the health of women. See www.nih.gov/women/strategicplan for more details.

Administrative Supplements for Retention of Early-Career Investigators

NIH recently published two notices of special interest (NOSIs) announcing administrative supplements to support and enhance retention of early-career biomedical investigators during critical life events. These pilot programs were developed in collaboration with the WgWBC and participating ICOs to complement ongoing NIH efforts and initiatives. The overarching goal of the first program, titled "Administrative Supplements to Promote Research Continuity and Retention of NIH Mentored Career Development (K) Award Recipients and Scholars" (NOT-OD-20-054), is to support the transition of investigators from individual mentored career development to research independence and to minimize departures from the biomedical research workforce at this critical juncture. This supplement program is intended to ensure continuity of research among recipients of K awards. The second program, titled "Administrative Supplements for Continuity of Biomedical and Behavioral Research Among First-Time Recipients of NIH Research Project Grant Awards" (NOT-OD-20-055), enhances the retention of investigators who are transitioning to the first renewal of their first independent Research Project Grant award or to a second NIH Research Project Grant award. Retention at the first renewal or continuous NIH Research Project Grant support is crucial for both sustaining the ongoing research in which NIH has invested and retaining diversity in the biomedical research workforce.

Building Interdisciplinary Research Careers in Women's Health (BIRCWH)

Complementing NIH's initiatives on behalf of women in biomedical careers, ORWH also supports the training and career development of early-career investigators—both men and women—with interests in interdisciplinary approaches to research on women's health and sex differences. The BIRCWH program, coordinated by ORWH and its ICO partners, is a mentored career-development program that connects junior faculty, known as BIRCWH Scholars, to senior faculty with shared research interests. BIRCWH represents the first institutional-level mechanism for funding career development with a focus on women's health and sex differences. Now celebrating its 20th year, BIRCWH demonstrates the efficacy of a collaborative approach to supporting the careers of biomedical researchers. Since its founding, BIRCWH has awarded multiple grants to over 40 institutions, supporting 94 principal investigators and more than 700 BIRCWH Scholars. Most of these scholars, upon completing the BIRCWH program, have obtained independent NIH grant funding, a fact that has attracted many women to BIRCWH, which is in line with ORWH's mission to support women's biomedical careers.

BIRCWH leverages trans-NIH partnerships. Currently, nine ICOs provide funding for the program. (A full list is available here.) Through the BIRCWH program, NIH partners with universities and research institutions across the country, where the next generation of biomedical and behavioral researchers conducts interdisciplinary research in mentored, guided, and collaborative environments and learns and develops cutting-edge interdisciplinary research techniques. These settings facilitate the career development of the BIRCWH Scholars and encourage paradigm-shifting, interdisciplinary, team-based approaches to advancing research on women's health and sex differences.

"Collaborative teamwork has certainly been the hallmark of our BIRCWH program," says Ellen B. Gold, Ph.D., Principal Investigator of the BIRCWH program at the University of California, Davis. "Our collaborations with NIH and specifically ORWH have not only facilitated the identification and inclusion of a diverse group of scholars into this mentored training program but also provided them with important opportunities."

Dr. Gold enumerates several ways the BIRCWH program fosters both team-based and interdisciplinary approaches to science and career development. "At the annual meeting, our BIRCWH Scholars interact with other investigators with both similar and differing interests, as well as with Program Officers at NIH," she says. "Our mentoring teams include both career mentors for the scholars as well as researchers from different but complementary fields. We also require our scholars to attend regular work-in-progress sessions with trainees from other programs who have differing interests. These program elements enhance interdisciplinary exposure for our scholars." Dr. Gold also reports that each cohort of three or four BIRCWH Scholars forms a cohesive unit for mutual support, information exchange, constructive criticism, intellectual and social connection, and professional networking.

The BIRCWH program's success and longevity highlight the efficacy of trans-NIH teamwork between ICOs and of collaboration between NIH and its BIRCWH partners to support the training, development, and advancement of the up-and-coming generation of researchers focusing on women's health and sex differences.

"Let's All Make It Happen"

Expert organizations—from NASEM[9] to the grassroots Research Partnership on Women in Science Careers[10]—

ORWH's Pearls of Wisdom

The ORWH Pearls of Wisdom video series features scientific dignitaries—such as National Institute on Aging (NIA) Deputy Director Marie A. Bernard, M.D., and the first full-time Director of ORWH, Vivian W. Pinn, M.D.—offering advice on education, professional development, and navigating one's way to a successful biomedical career. For instance, in her Pearls of Wisdom video, retired National Institute of Environmental Health Sciences (NIEHS) Director Linda S. Birnbaum, Ph.D., recalls the role of mentoring throughout her career. She advises that you'll have "mentors coming and going. You're doing a certain kind of experiment, and you find someone who can really help you with that. Or you're moving up in a leadership role, and you find someone who can really give you some pointers there. And at the same time, you also learn that you can be mentored by your students and your postdocs. It's not all a one-way street." The Pearls of Wisdom videos offer practical advice and inspiration to women at the beginning of their careers in the biomedical sciences as well as those in mid-career stages with aspirations of advancing to leadership.

have posited that gender equity in the biomedical research community can be realized only through a multilevel cultural and systemic transformation. ORWH, its partner ICOs and working groups, and external scientific research institutions have adopted an interorganizational approach to effect such a transformation by leveraging the diverse and multidisciplinary perspectives such collaborations afford.[12] By adopting some of the core principles of team science and collaboration,[13] ICO leadership, the WgWBC, and the directors of the individual programs and initiatives described here have taken crucial steps toward improving gender diversity and increasing opportunities for careers in women's health by incorporating multiple perspectives into a shared vision that encourages a sense of investment and ownership in all stakeholders.

The path the biomedical community must follow has been mapped. (See *Changing Institutional Culture to Empower Women in Biomedical Careers*, page 4). It is now up to scientific institutions, working both collaboratively and individually, to implement these best practices to improve the recruitment, retention, and advancement of women in biomedical careers. As Dr. Clayton wrote in a recent blog post, we know "how to address the underrepresentation of women in academic medicine … so let's all make it happen."

References

1. ORWH. 1997. *Report of the Office of Research on Women's Health: Fiscal Years 1993-1995.* Publ. No. 97-3702, Washington: HHS.
2. AAMC. 2016. *Diversity in Medical Education: Facts & Figures 2016.* www.aamcdiversityfactsandfigures2016.org.
3. AAMC. 2017. More Women Than Men Enrolled in U.S. Medical Schools in 2017. www.aamc.org/news-insights/press-releases/more-women-men-enrolled-us-medical-schools-2017.
4. Boucher et al. 2017. *Front. Psychol.* 8: 901.
5. Plank-Bazinet et al. 2017. *J. Women's Health (Larchmt.)* 26: 525–529.
6. Lautenberger et al. 2016. *AAMC Anal. Brief* 16: 1–2.
7. Glass et al. 2013. *Soc. Forces* 92: 723–756.
8. Xierali et al. 2020. *Acad. Med.* 95: 241–247.
9. NASEM. 2007. *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering* Washington: National Academies Press.
10. Carr et al. 2019. *J. Gen. Intern. Med.* 34: 356–362.
11. ORWH. 2012. *Causal Factors and Interventions Workshop Summary* Bethesda: NIH.
12. Galinsky et al. 2015. *Perspect. Psychol. Sci.* 10: 742–748.
13. Bennett and Gadlin. 2012. *J. Investig. Med.* 60: 768–775.
14. Raj et al. 2019. *Acad. Med.* 94: 1658–1664.
15. NASEM. 2018. *Sexual Harassment of Women: Climate, Culture, and Consequences in Academic Sciences, Engineering, and Medicine* Washington: National Academies Press.

Caroline Goon, M.S., M.B.A.
ORWH Career Development Program Lead

Supporting Women and Scholars Who Have Children Through the Postdoc Years: A Conversation with the Board of Directors of the National Postdoctoral Association

The National Postdoctoral Association (NPA) is a nonprofit professional association that advocates on behalf of postdoctoral scholars—individuals with doctoral degrees in a temporary training period during which they obtain additional scholarly skills and professional development necessary for a wide range of career paths. ORWH Career Development Program Lead Caroline Goon, M.S., M.B.A., recently asked NPA's Board of Directors a series of questions on the association's current and future efforts and initiatives to support postdoc women and scholars who have children.

Goon: *What initiatives has NPA spearheaded to support postdocs with children?*

NPA: The NPA's hallmark project in this area is NPA ADVANCE: From Postdoc to Faculty: Transition Issues for Women Scientists. A 3-year grant from the National Science Foundation (NSF), as part of its ADVANCE program, supported this project and enabled us to develop and disseminate the Family-Friendly Postdoc Resources webpage and two booklets: *A Postdoc's Guide to Pregnancy & Maternity Leave* and *A Postdoc's Guide to Paternity Leave*. Further, the Center for WorkLife Law, based at the University of California Hastings College of the Law, partnered with NPA to produce the report *Parents in the Pipeline: Retaining Postdoctoral Researchers with Families*. This report draws attention to the "parenthood leak" in the science, technology, engineering, medicine, and mathematics (STEMM) pipeline and provides recommendations on how institutions can support postdoc parents with pregnancy accommodations, paid and unpaid parental leave benefits, and more accepting attitudes toward family leave. These recommendations emerged, in part, from research conducted by NPA based on an online survey of postdocs distributed in March–April 2016 and from data on current policies at NPA member institutions from our 2017 Institutional Policy Report.

Goon: *How has NPA addressed the barriers and biases that hinder women's career advancement in STEMM?*

NPA: While the last several decades have seen a tremendous increase in the number of women receiving doctorates (particularly in STEMM), women continue to be underrepresented in tenured faculty and senior administrative positions in academia and the broader workforce. NPA has published two books that explain the obstacles that impede career transitions of postdoc women and suggest how to remove those barriers through institutional initiatives and individual career development. *From Ph.D. to Professoriate: The Role of the Institution in Fostering the Advancement of Postdoc Women*, developed by the NPA as part of the NSF-funded NPA ADVANCE project, provides resources to navigate the postdoc-to-faculty transition. The Elsevier *Advancing Postdoc Women Guidebook* was funded through the New Scholars grant awarded by the Elsevier Foundation and provides resources on programs available to postdoc women as they navigate their careers. NPA has also developed the Elsevier Advancing Postdoc Women Clearinghouse website to provide resources offered by professional associations and societies to postdoc women to enhance their career development.

Goon: *How will NPA continue or expand its support of postdoc women over the next few years?*

NPA: Since 2015, the NPA has offered childcare support awards for postdoctoral scholars to attend the annual conference, which speaks to our desire to foster a family-friendly conference. The NPA also will continue to advocate for institutional policies that reflect fair and equitable health care and benefits packages for postdocs. In addition, the NPA looks forward to the work of the Committee on Women in Science, Engineering, and Medicine (CWSEM) at the National Academies of Sciences, Engineering, and Medicine and values their expertise on how to advocate for women proactively as we prioritize our activities and projects moving forward.

Goon: *Over the next few years, what will NPA prioritize in supporting postdoc women?*

NPA: Future areas of prioritization for the NPA include actively engaging with developing policies to prevent sexual harassment in higher education and addressing the mental health and wellness of the postdoc population. Overall, the NPA is committed to creating an inclusive environment where all postdocs are empowered, valued, recognized, and supported in their current and future endeavors.

Gender of Investigators Linked to Trends in Preclinical Cardiovascular Research

(Original article by Labinaz et al. 2019. JACC Basic Transl. Sci. 4: 471–477.)

Cardiovascular disease was long assumed to be a disease of men, and this incorrect assumption may continue to influence research in the field. For instance, preclinical cardiovascular research often uses only male animals in studies and fails to disaggregate data by sex in published reports. In addition, women researchers remain underrepresented in cardiovascular science—a cause for concern, given numerous reports (e.g., Nielsen et al. 2017. *PNAS*. 114: 1740–1742) on how sex and gender diversity in research teams produces more robust findings.

As these trends have implications for the quality and character of cardiovascular science, researchers at the University of Ottawa analyzed 3,396 articles on preclinical studies published from 2006 to 2016 in five leading cardiovascular journals. The investigators found that women represented about a quarter (24 ± 17%) of the authors and that the percentage of women authors in cardiovascular science journals increased over the decade considered. Among studies that reported the sex of animals, female authorship was associated with a greater degree of consideration of sex as a biological variable—with women researchers more likely to study female animals, to include both male and female animals in their experimental designs, and to report sex-specific results.

The researchers also found that the gender of study authors did not correlate with other measures of methodological rigor or the number of citations over 5 years, suggesting that author gender had little connection to research quality or scientific impact. However, first and senior authors tended to be of the same gender, consistent with persistent gender segregation in mentorship relationships, a situation that may perpetuate women's underrepresentation in preclinical cardiovascular research.

Study Links Lifetime Patterns of Workforce Participation with Risk of Physical Limitations Among Women

(Original article by Palumbo et al. 2019. J. Aging Health doi: 10.1177/0898264319826797.)

A recent analysis of data from over 75,000 women ages 50–79 identified trends linking women's lifetime work patterns to physical function and limitation. Aimee J. Palumbo, Ph.D., and colleagues found that compared with women who worked continuously, women who worked intermittently had a 5% *lower* risk of physical limitations later in life, and women who left the workforce early had an 8% *higher* risk.

These findings emerged from the researchers' analysis of data from the Women's Health Initiative Observational Study of the National Heart, Lung, and Blood Institute (NHLBI), which included information such as timing of first and last pregnancies, jobs held, time off between reported jobs, and physical capability. The researchers controlled for confounding factors such as race, ethnicity, marital status, number of births, and "the healthy worker effect" (the notion that healthy people are more likely to participate in the workforce).

The analysis showed how different types of work and work patterns can have varying effects on women's health. For instance, an intermittent work pattern was associated with even less of a risk of physical limitation for women engaged in work requiring critical thinking, problem-solving, and active learning. Compared with continuous work, intermittent work was associated with a 9% lower risk of physical limitations for women engaged in complex work but only a 2% lower risk for women engaged in noncomplex work. Further, among women who self-identified as homemakers, intermittent work was associated with a 12% lower risk of physical limitations compared with continuous work. However, among women who did not self-identify as homemakers, leaving the workforce early was associated with a 21% higher risk.

The association between intermittent workforce participation and lower risk of physical limitations later in life suggests the benefit of policies and programs, such as NIH's Re-Entry Supplements, that enable women to return to work after time away for childbirth or other circumstances. Systemically preserving the option to return to work might help to support the long-term health of women.

FEATURED RESEARCH AND PERSPECTIVES

L'Oréal USA Reports on Alumnae of Its "For Women in Science" Program

(Original report by Lindquist et al. 2019. Detailed Findings from RTI's Study of L'Oréal USA's For Women in Science Program. RTI Project No. 0216985.000.001.)

L'Oréal USA, along with its partners the Heising–Simons Foundation and RTI International, recently reported on a study involving 63 of the 75 alumnae of the company's For Women in Science (FWIS) program, which has provided grants to postdoctoral women scientists in the United States over the past 15 years. Based on surveys of and extensive interviews with program alumnae, the study identified factors contributing to the retention of women in STEMM, such as obtaining independent grant funding, family-friendly policies, formal mentoring, career development training, and structured networking programs. The report also lists study findings related to the obstacles to women's success in STEMM fields, including self-doubt, gender bias, sexual harassment, and lack of equal opportunities. Finally, the report highlights the successes of the scientists who participated in the FWIS program and recommends areas for future intervention.

Study Finds Women Researchers Less Likely Than Men to Describe Work in Positive Terms

(Original article by Lerchenmueller et al. 2019. BMJ.doi: 10.1136/bmj.l6573.)

Marc J. Lerchenmueller, Dr. rer. pol., and colleagues recently analyzed the language of over 100,000 clinical research articles and 6.2 million general life science articles published from 2002 to 2017 and indexed on PubMed. The investigators identified how often study authors described their research in positive terms. They found that clinical articles with a man listed as the first and/or last author were 12.3% more likely to describe their research using at least one positive term, such as "novel" or "excellent," in the title or abstract than articles with women listed as the first and last authors. Positive terms were also associated with a greater number of later citations of the research so described. No difference was found when the same research question was analyzed for the much larger set of general life science articles. To contextualize the results of their analysis, the investigators cited past research, such as studies showing that men engage in more professional self-promotion than women and studies showing that women are more likely to underestimate their abilities. The investigators concluded with findings that have implications for equitable career progress and warrant further consideration. You can listen to the lead author talk about this research on a *BMJ Talk Medicine* podcast.

AAMC Addresses Gender Inequities in Academic Medicine

The Association of American Medical Colleges (AAMC) has launched a new initiative "to address and eliminate gender inequities" in medical schools, teaching hospitals, and academic medical societies. Responding to increasing recognition of dramatic gender differences throughout the field, the AAMC will address discriminatory practices related to four key areas: the workforce of physicians and researchers, leadership and compensation, research, and recognition. As the first step of this initiative, the AAMC released a Statement on Gender Equity, serving as a call to action for academic medical organizations to improve their equity practices; to identify, deconstruct, and eliminate exclusionary practices; and to transform the culture of academic medicine to become equitable and inclusive. The AAMC has also created a Gender Equity in Academic Medicine web page linking to resources, toolkits, and other information. These and future efforts will strive to mitigate the gender inequities in academic medical workplaces and decrease the number of women who leave medical and scientific careers.

Study Seeks Ways to Increase Retention of Minority Women in Technology and Computing

An ongoing research project, funded by the National Science Foundation (NSF) and conducted by the nonprofit organization TERC, is reviewing scientific literature published from 2000 to 2019 to identify successful practices for improving engagement and retention of minority women in professional and academic technology and computing. Led by Maria Ong, Ph.D., and Nuria Jaumot-Pascual, Ph.D., the Literature Analysis and Synthesis of Women of Color in Technology and Computing (LASOW) study will answer an important research question: "What factors affect the experiences, participation, and advancement of women of color in technology and computing from the stages of early college education through their careers?"

SCIENTIST SPOTLIGHT

Patrice A. Harris, M.D., M.A.

"It's important to see people who look like you in your chosen or desired profession—just to know what is possible."

In June 2019, Patrice A. Harris, M.D., M.A., became the first African-American woman president of the American Medical Association (AMA). Dr. Harris, a psychiatrist from Atlanta, has been a practicing physician, a public health administrator, a patient advocate, and a medical society lobbyist. Over the course of her career, Dr. Harris has been an active member of the AMA and other medical organizations, serving as the chair of the AMA Opioid Task Force since its inception in 2014, a role in which she will continue as AMA President; an active member of several AMA groups, including its Board of Trustees and its Council on Legislation; and an officer of several professional associations, including the American Psychiatric Association. She earned her B.A., M.A., and M.D. at West Virginia University and completed her psychiatry residency at the Emory University School of Medicine, where she continues to serve as an adjunct assistant professor. She is also an adjunct faculty member at the Morehouse School of Medicine.

What are your goals as AMA President?

As AMA President, I have the pleasure of serving as chief spokesperson for the AMA and for the policies of our House of Delegates. I have the opportunity and privilege of representing the AMA across the country and around the world—a tremendous platform for elevating critical issues. The first is the importance of mental health as a part of overall health. The second is health equity and the related need to improve the diversity of the physician workforce, which we know translates into better health outcomes. The third is to raise the level of awareness of the need to assess and address adverse childhood experiences.

Why do we need more diversity in STEMM leadership? How will your presidency contribute to increasing diversity in medicine and related fields?

As a country, we've been talking about health disparities for some time, and we know they exist in many areas, including maternal morbidity and mortality, diabetes, hypertension, and so many areas. We need to talk about health equity. The AMA believes in optimal health for all and is working to ensure that all people and communities reach their full potential.

Last year, the AMA made a bold recommitment to this issue, launching the AMA Center for Health Equity. Achieving our goals on health equity requires addressing the other determinants of health. The AMA will continue to highlight the need to address the social determinants of health and continue to highlight how social determinants affect health disparities—and therefore the lack of health equity.

The diversity of the physician workforce is key. Studies show that health outcomes improve when physicians look and sound like their patients. Thus, it is critical that we find support for Federal and State legislative efforts that enhance opportunities for medical students of color, issues around student debt, and issues around funding for pipeline programs. Diversity in STEMM leadership is a meaningful goal in and of itself, but the ripple effect and the opportunity to improve the health of the Nation in the process are end results that everyone would see.

What does the movement to change what a doctor looks like today mean to you?

I had so many supportive, inspirational people in my life—people who helped me get where I am and continue to help me every day. But to be perfectly honest, when I was in college, I had advisors who discouraged me from going into medicine. I persevered, but I know it's important to see people who look like you in your chosen or desired profession—just to know what is possible. I hope my example provides tangible and visual evidence demonstrating that young people of color—particularly girls—can aspire to be physicians and can aspire to leadership roles, particularly in medicine.

What are the most important traits of a leader?

The most important traits of a leader are authenticity, a willingness to listen and learn from others, and self-awareness. Ultimately, leaders are measured by their impact, and impact rests on one's ability to be true to self and mission and to do so with humility. At times, the leadership journey is lonely but so worth the trip.

What legacy would you like to leave behind?

Although I'm the first African-American female president of the AMA, it's my responsibility to ensure that I will not be the last. I hope I have paved the way for others as others have paved the way for me.

WORDS OF WISDOM

Find a Mentor Who Dreams Big with You

Melody Goodman, Ph.D., M.S.

Melody Goodman, Ph.D., M.S., is an Associate Professor of Biostatistics and the Associate Dean for Research in the School of Global Public Health at New York University. She is a biostatistician and research methodologist with a large statistical toolbox. In her work, she strives to identify the origins of health disparities and to develop evidence-based primary prevention strategies to reduce these disparities. She received her Ph.D. from the Department of Biostatistics at Harvard University, her M.S. in biostatistics from the Harvard T.H. Chan School of Public Health, and her B.S. in applied mathematics-statistics and economics from Stony Brook University. During a recent visit to NIH, Dr. Goodman met with members of the Women of Color Committee, with whom she shared professional advice, and she later delivered a lecture, titled "You Want to Quantify That?! The Science and Metrics of Partner Engagement in Research," as part of the prestigious NIH Director's Wednesday Afternoon Lecture Series.

What are the major barriers to advancement for women in STEMM?

Managing work–life balance is difficult, although this is not gender-specific. Careers in STEMM often require working more than 40 hours a week. While the glass ceiling still exists, the main limitation for many women is what they can dream for themselves. My main limitation has been what I have been able to imagine for myself. I have been lucky enough to have mentors who dream bigger for me than I do for myself.

What surprised you about mentorship?

My best mentors did not come in the package I was expecting. I was looking for a Black woman mentor, but some of my best mentors have been White men. Also, young scholars should not expect everything from one mentor. Everyone should form a mentoring committee and find multiple people to go to for advice. Some of my best lessons came from watching other people make mistakes. It is just as important to know what not to do as it is to know what to do.

What are important traits that a young person should look for in a mentor?

Look for someone who is willing to invest in you without getting anything in return—someone who will sponsor you, look for opportunities for you, and talk you up even when you aren't in the room. Try to find someone who has already walked the path you are trying to take or someone who has the career of your dreams. Of course, good mentors won't expect you to follow their paths exactly. They will travel with you on your journey as you chart your own course to your destination.

What legacy would you like to leave behind?

I hope that each time I enter a classroom, I change my students' perspective on what biostatisticians look like and the types of problems they work on. I never had a Black professor, but my students can't say that. When they think of a biostatistics professor, I hope they see a Black woman. While I don't think my work will change the world, I hope that through training and mentorship, I will touch the mind of someone who does.

Knowing what you know now, what would you say to yourself at 16 years of age?

One, it will all work out in the end; if it hasn't worked out, then it is not the end. Two, what is meant for you is meant for you, and no one can take that away.

For more information and discussion of the value of mentoring in STEMM careers, particularly for women of color, watch the Facebook Live Q&A: Mentorship and Women of Color in Science.

IN CASE YOU MISSED IT

New Law Extends Paid Parental Leave for Some Federal Workers

On December 20, 2019, a new law improved the compensation and benefits package for Federal civilian employees. It provides up to 12 weeks of paid parental leave in connection with the birth, adoption, or foster care placement of a child on or after October 1, 2020, for employees covered by Family and Medical Leave Act (FMLA) provisions. More details are available here.

GET Cities: A New Initiative Promotes Women's Participation in the Tech Workforce

Pivotal Ventures, an investment company founded by Melinda Gates, along with several partner organizations, recently initiated Gender Equality in Tech (GET) Cities, a $50 million project promoting the representation and leadership of women in technology. A pilot program creating an "inclusive tech hub" in Chicago launched in January 2020.

NLM Hosts Women-Led "Codeathon"

The National Library of Medicine (NLM) regularly hosts codeathons, where researchers and computer programmers collaborate to create software tools to solve problems for the biomedical community. On May 8–10, 2019, NLM hosted the first-ever all-women-led codeathon, involving 46 women from 11 NIH Institutes, 10 universities, and 5 companies. A schedule of upcoming codeathons and links to software tools produced by past codeathons are available here.

Documentary Honors Canada's Queen of Giraffes

The Woman Who Loves Giraffes (2018), a documentary film written and directed by Alison Reid, details the work of Canadian zoologist Anne Innis Dagg, Ph.D., the first scientist to study wild giraffes and author of *The Giraffe* (1976), a groundbreaking work on the towering animals. In spite of her many accomplishments, Dr. Dagg was denied tenure by the University of Guelph. More information on the film and Dr. Dagg is available here.

NIH Hosts Annual Meeting of the BIRCWH Program

The annual meeting of the Building Interdisciplinary Research Careers in Women's Health (BIRCWH) program was held on December 11, 2019, on the NIH main campus. The annual BIRCWH Meeting provides a forum for young investigators, their mentors, and other research scientists to share their research in podium presentations and poster sessions. This year, presentation topics included sex differences associated with asthma and testosterone, differences in body composition and cardiometabolic health between transgender and cisgender youths, and sex differences in inflammatory response to acute psychological stress and risk of major adverse cardiovascular events. Keynote speaker Judith Regensteiner, Ph.D., delivered the third Ruth L. Kirschstein Memorial Lecture, titled "Strategic Career Development: Charting the Course." The meeting also featured a panel discussion titled "Next-Generation Data and the Future of Women's Health." You can read more about the BIRCWH program here, and a video of the meeting is also available.

ORWH Releases "Progress Report" on Sex as a Biological Variable Policy

The *Journal of Women's Health* recently published "Sex as a Biological Variable: A 5-Year Progress Report and Call to Action," an article by ORWH staff commenting on the development and implementation of NIH's SABV policy, which went into effect in January 2016. This policy articulates the expectation that all applicants for NIH funding for studies in vertebrate animals and humans will factor SABV into research designs, analyses, and reporting (or provide strong scientific justification for single-sex investigations). The article describes the development and history of the SABV policy; the efforts by NIH and others to implement the policy and promote the integration of SABV into research through online educational resources, SABV-relevant funding opportunities, work of the Trans-NIH SABV Working Group, and other means; the scientific literature relevant to SABV; and the ways that SABV can serve as a guiding principle to improve all biomedical and biobehavioral disciplines. The article also discusses lessons learned to date and exhorts the scientific community and other stakeholders to integrate the consideration of SABV into all aspects of the biomedical research enterprise, from basic and preclinical research to the delivery of personalized medicine and improved health care for everyone.

NASEM Report Identifies Effective STEMM Mentoring Practices, Links Mentoring to Greater Diversity and Inclusion

The Science of Effective Mentorship in STEMM, a new report from a committee of the National Academies of Sciences, Engineering, and Medicine (NASEM), advises colleges and universities to adopt a systematic, formal, evidence-based approach to mentoring STEMM students. Numerous studies demonstrate the value of effective mentoring on academic and professional performance, retaining students in STEMM educational programs and careers, graduation rates, continuation to graduate study, and increasing diversity in scientific fields. However, according to the report, most mentoring of STEMM students occurs in an informal, ad hoc manner, and to improve the quality of STEMM mentoring, colleges and universities should adopt evidence-based best practices, such as implementing formal training of mentors, developing structured feedback mechanisms, rewarding effective mentorship, and mitigating negative mentor–mentee relationships. An interactive guide complements the published report and provides further support to institutions implementing the NASEM recommendations.

Special Issue of *Health Services Research* Describes the Health Effects of Discrimination

A special issue of the journal *Health Services Research* (vol. 54, issue S2) collects research articles detailing the health effects of discrimination in the United States. Titled "Experiences of Discrimination in America: Race, Ethnicity, Gender, and Sexuality," the special edition describes the significant and harmful effects of discrimination on physical and mental health in six underrepresented groups: Blacks, Latinos, Native Americans, Asian Americans, women, and LGBTQ+ adults. A phone survey of over 3,400 nationally representative U.S. adults provided the primary datasets for several articles in the special issue. *Health Services Research* commentators note that though civil and human rights groups have made some policy progress toward reducing discrimination against minorities in some arenas, increases in hate crimes and greater divisiveness in political discourse point toward major patterns of discrimination in the United States. The researchers demonstrate that these discriminatory patterns have direct and profound effects on human health and on minorities' interactions with health care and medical insurance systems.

Study Identifies Trends in Twitter Use for Professional Purposes Among Men and Women in Academic Medicine

(Original article by Zhu et al. 2019. JAMA Intern. Med. 179: 1726–1729.)

A recent study by Jane M. Zhu, M.D., M.S.H.P., Rachel M. Werner, M.D., Ph.D., and colleagues characterized trends and habits of Twitter use among men and women in academic biomedical careers for promoting their research, networking, and increasing their professional visibility and likelihood of advancement. Male and female health researchers used

Twitter about equally. Of 3,148 researchers studied, 53% of whom were women and 47% of whom were men, 29.5% of women and 28.9% of men used Twitter. Overall, the women studied had less social media influence than the men; the mean number of followers was 567.5 for women and 1,162.3 for men. Women were also more likely than men to follow other women and received fewer likes and retweets than men. Some observers have posited that Twitter and other social networks can provide equitable platforms for biomedical researchers and other academics and professionals to promote themselves and their work. However, the results of this study suggest that men in academic medicine have a larger audience and more influence on Twitter than women in the field.

ORWH Congratulates Former NIDCR Director Martha J. Somerman, Recognizing Her Leadership and Scientific Work

Martha J. Somerman, D.D.S., Ph.D., has retired as the Director of the National Institute of Dental and Craniofacial Research (NIDCR). She was the first woman to serve in this position, which she held for 9 years. Throughout her career, Dr. Somerman has been a leader in defining factors that modulate formation of dental, oral, and craniofacial tissues and applying that knowledge to designing evidence-based, predictable, targeted therapies to regenerate damaged or diseased tissue. In 2016, Dr. Somerman launched the NIDCR 2030 strategic vision, which envisions a future where dental, oral, and craniofacial health and disease are understood in the context of the whole body. Dr. Somerman has made it a priority to improve the oral health of the Nation through her commitment to overcoming health inequity and advancing public health initiatives. Dr. Somerman will continue working at NIH as the Chief of the Laboratory of Oral Connective Tissue Biology at the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). ORWH congratulates Dr. Somerman and thanks her for her years of leadership and many scientific contributions.

The FDA Office of Women's Health Celebrates 25 Years, Welcomes New Associate Commissioner

Two milestone events occurred late in 2019 at the Food and Drug Administration (FDA) Office of Women's Health (OWH). First, OWH celebrated its 25th year of protecting and advancing the health of women through policy, science, and outreach and advocating for the inclusion of women in clinical trials and for analyzing scientific data disaggregated by sex, gender, and subpopulation—missions that complement those of ORWH. Second, Kaveeta Vasisht, M.D., Pharm.D., officially accepted the appointment of Associate Commissioner for Women's Health at FDA, a role in which she had been serving in an acting capacity. A short bio-sketch of Dr. Vasisht appeared in issue 2.2 of *In Focus*. ORWH congratulates its sister organization OWH and Dr. Vasisht.

STAFF UPDATES

Lynn Morin, M.A., joined ORWH as a Health Scientist Administrator in September 2019. Ms. Morin received her undergraduate degree in industrial/organizational psychology from George Mason University, where she continued her education in a neuropsychology graduate program, in which she studied prenatal and perinatal cocaine exposure in an animal model of learning and brain connectivity. She began her NIH career as a Program Analyst for the National Institute of Neurological Disorders and Stroke (NINDS) and later served as the lead for the centers, training, and diversity programs of the National Institute on Alcohol Abuse and Alcoholism (NIAAA). Prior to her work at NIH, she worked, through Kelly Services and Booz Allen Hamilton, as the head of a cryogenics laboratory, a lead developer of a database for the U.S. Navy, and a project manager on many other contracts.

Ezelle Wooden III joined the ORWH team in September 2019 as a Program Specialist providing clerical, scheduling, and other assistance to the ORWH Director. Prior to joining ORWH, Mr. Wooden worked for the National Institute on Aging (NIA), where he was responsible for maintaining schedules for several branch chiefs and senior-level officials; supporting grant and project management; organizing and securing office files, materials, and records; and coordinating professional meetings, conferences, and panels. Mr. Wooden also served at the National Cancer Institute (NCI) and in offices in the private sector. He studied business management at Morgan State University.

UPCOMING EVENTS

Black Maternal Health Week 2020
April 11–17, 2020
More information is available here.

50th Meeting of the NIH Advisory Committee on Research on Women's Health (ACRWH)
April 12, 2020 | 9:00 a.m. – 5:00 p.m. (Eastern Time)
More information will be made available here.

National Women's Health Week 2020
May 10–16, 2020
More information is available here.

NICHD/ORWH Pregnancy and Maternal Conditions That Increase Risk of Morbidity and Mortality Workshop
May 19–20, 2020 | 9:00 a.m. – 5:00 p.m. (Eastern Time)
More information is available here.

For up-to-date information, visit www.nih.gov/women.

FUNDING OPPORTUNITIES

Administrative Supplements to Promote Research Continuity and Retention of NIH Mentored Career Development (K) Award Recipients and Scholars (NOT-OD-20-054). This program supports junior investigators who have received K awards as they transition from individual mentored career development to research independence. It aims to improve retention and minimize departures from the biomedical research workforce. Eligibility hinges on the Program Director/Principal Investigator (PD/PI) experiencing a critical life event such as childbirth. Due dates and additional information are available here.

Administrative Supplements for Continuity of Biomedical and Behavioral Research Among First-Time Recipients of NIH Research Project Grant Awards (NOT-OD-20-055). This program is designed to enhance the retention of investigators who are transitioning to the first renewal of their first independent Research Project Grant award or to a second NIH Research Project Grant award. Retention at the first renewal or continuous NIH Research Project Grant support is crucial for both sustaining the ongoing research NIH has made an investment in and retaining diversity in the biomedical research workforce. Eligibility hinges on the Program Director/Principal Investigator (PD/PI) experiencing a critical life event such as childbirth. Due dates and additional information are available here.

Administrative Supplements for Research on the Health of Women of Understudied, Underrepresented, and Underreported (U3) Populations (NOT-OD-20-048). This program supports biomedical research highlighting health disparities among women of U3 populations. The proposed research must address at least one objective from strategic goal 1, 2, or 3 of *The Trans-NIH Strategic Plan for Women's Health Research*. Due dates and additional information are available here.

Administrative Supplements for Research on Sex/Gender Influences (NOT-OD-20-049). This program supports research highlighting the impact of sex and gender influences in human health and illness. Having continuous interaction between sex and gender, human health is determined by both biology and expression of gender. The most robust experimental designs include consideration of both sex and gender. Therefore, applications proposing to investigate the influences of both sex and gender are highly encouraged. The proposed research must address at least one objective from the five strategic goals of *The Trans-NIH Strategic Plan for Women's Health Research*. Due dates and additional information are available here.

NIH Office of Research on Women's Health (ORWH)
6707 Democracy Boulevard, Suite 400
Bethesda, MD 20817
Phone: 301-402-1770
ORWHinfo@mail.nih.gov
Twitter: @NIH_ORWH
Facebook: /NIHORWH

To subscribe to future issues of *Women's Health in Focus at NIH*, click here or visit us on the web at nih.gov/women.
This publication was publicly funded by the NIH Office of Research on Women's Health.