RESEARCH LETTER

blood advances

TO THE EDITOR:

Gender equity analysis of nontrainee hemostasis and thrombosis recognition award recipients

Jeremy W. Jacobs,[1] Brian D. Adkins,[2] Allison P. Wheeler,[3,4] Jennifer C. Yui,[5] and Garrett S. Booth[3]

[1]Department of Laboratory Medicine, Yale School of Medicine, New Haven, CT; [2]Division of Transfusion Medicine and Hemostasis, Department of Pathology, University of Texas Southwestern, Dallas, TX; [3]Department of Pathology, Microbiology & Immunology, Vanderbilt University Medical Center, Nashville, TN; [4]Department of Pediatrics, Vanderbilt University Medical Center, Nashville, TN; and [5]Division of Hematology, Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD

Recognition award conferral advances academic careers[1-4] by influencing research funding, prestige, notoriety, academic promotion, connections, and financial compensation. Unfortunately, women continue to be underrepresented among award recipients,[4-8] including in hematology and oncology,[7] and blood banking and transfusion medicine.[8] Although informative for the respective specialties, prior studies assessing inequities in hematology and transfusion medicine did not specifically address awards dedicated to hemostasis and thrombosis, which cross numerous medical fields, including hematology and oncology, blood banking and transfusion medicine, cardiology, cardiovascular surgery, and anesthesiology, as well as basic sciences such as physiology and pharmacology. Therefore, we sought to evaluate whether gender inequities exist among hemostasis and thrombosis recognition awards and whether there has been any change over time.

We examined recipients of 22 hemostasis and thrombosis awards (Table 1) from 4 societies (1972-2021): (1) ISTH, (2) HTRS, (3) American Heart Association's Council on ATVB, and (4) THSNA. Detailed membership data (eg, sex, gender, race, ethnicity, sexual orientation, terminal/professional degree, etc) were unavailable.

We stratified awards by their availability to trainees, and excluded awards for trainees because: (1) trainee gender is often unable to be determined owing to the lack of available online biographies or faculty profiles, resulting in a significant amount of missing data, and (2) to reduce confounding and biasing of the data by the identity of the trainee's mentor(s) and/or recommender(s). All awards from THSNA were available to trainees and therefore excluded from the analysis. We excluded awards given for best papers, as contributions from the award recipient and coauthors could not be assessed. Award recipient's gender was determined independently by 2 authors using previously described methods,[1,4-7,9,10] via online review of pronouns in 3 categories (he/she/they). If unavailable, an individual's photograph and name (17 individuals) or a web-based gender identification application[11] were utilized (4 individuals).

The perceived gender of award recipients overall and predefined subgroup analyses for physician (ie, MD/DO/MBBS degree) award recipients and award categories (achievement, research/innovation, leadership, service, named lectureship) were performed. Temporal analysis of award conferral rates was performed (1972-1989; 1990-1999; 2000-2009; 2010-2021). Notably, the award year for 25 individuals who received an ISTH award was unavailable. Descriptive statistical analyses were conducted using GraphPad PRISM version 9.2.0 (GraphPad Software, LLC San Diego, CA, USA). 95% confidence intervals (CI) were calculated for all analyses. A P value $<.05$ was considered significant.

Twenty-two recognition awards have been presented 565 times to 398 unique individuals since 1972 (Table 2). Of these, 17 are exclusive to nontrainees.

Submitted 15 July 2022; accepted 21 September 2022; prepublished online on *Blood Advances* First Edition 5 October 2022; final version published online 10 May 2023. https://doi.org/10.1182/bloodadvances.2022008576.

Data are available on request from the corresponding author, Jeremy W. Jacobs (jeremy.jacobs@yale.edu).

Table 1. List of hemostasis and thrombosis recognition awards

Award	Description*	Dates awarded	Award category
Robert P. Grant Medal (ISTH)	Presented to individuals in honor of research achievements, organizational activities, support of research activities, facilitation of institutional cooperation and communication, unusual teaching or educational initiatives, and/or the development of concepts that result in a clearer understanding of research data.	1981-present	Research/innovation
Harold R. Roberts Medal (ISTH)	Presented to individuals who have used their time and talents to support the mission of the Society's Scientific and Standardization Committee. It honors meritorious service that goes beyond what is expected and that takes place over a significant period of time.	2006-present	Service
Esteemed Career Awards (ISTH)	Presented to individuals who, in the opinion of their peers, have made significant contributions to the understanding, treatment and diagnosis, research, and education in the thrombosis and haemostasis field.	2019-2021	Achievement
ISTH Honorary Membership	Recognizes members for their dedication and leadership within the society.	Unknown	Leadership
Biennial Awards for Contributions to Hemostasis (ISTH)	Presented to individuals who, in the opinion of their peers, have made significant contributions to research and education in blood coagulation.	1983-2017	Achievement and research/innovation
Marion I. Barnhart Memorial Lecture (ISTH)	Recognition criteria not available.	1987-2017	Named lectureship
Kenneth M. Brinkhous Memorial Lecture (ISTH)	Recognition criteria not available.	2007-2017	Named lectureship
Pia Glas-Greenwalt Memorial Lecture (ISTH)	Recognition criteria not available.	1999-2014	Named lectureship
Shirley Johnson Memorial Lecture (ISTH)	Recognition criteria not available.	1972-2014	Named lectureship
Oscar D. Ratnoff Memorial Lecture (ISTH)	Recognition criteria not available.	2009-2017	Named lectureship
Sol Sherry Memorial Lecture (ISTH)	Recognition criteria not available.	1993-2017	Named lectureship
Wright-Schulte Memorial Lecture (ISTH)	Recognition criteria not available.	1975-2011	Named lectureship
Life Sciences Research Partners Lecture Award (ISTH)	Recognition criteria not available.	2001-2012	Named lectureship
HTRS Lifetime Achievement Award (HTRS)	Honors a member of our community who has made a lasting and extraordinary contribution to research, education, mentorship, or clinical care in hemostasis or thrombosis.	2006-2017	Achievement
Dr. Joan Cox Gill Award for Outstanding Service to HTRS (HTRS)	Honors one of our members who has made a lasting and extraordinary contribution to the society and its members.	2013-2017	Service
HTRS Mid-Career Research Award (HTRS)	The HTRS Mid-Career Research Award program provides financial support for midcareer investigators pursuing clinical, translational, or basic science research projects in hemostasis and/or thrombosis. Applicants must be working in the United States or Canada for the duration of the proposed project.	2017-present	Research/innovation
MRA (HTRS)	The HTRS MRA program provides grants for qualified fellows or junior attending/junior faculty (MDs, DOs, MBBSs or the equivalent) pursuing clinical, translational, or basic science research projects in hemostasis and/or thrombosis under the guidance of an experienced mentor.	2007-present	Research/innovation (available to trainees)
HTRS/ATHN DREAM Award (HTRS)	The DREAM Award is designed to advance the care of patients with bleeding and clotting disorders by funding research in the field of hemostasis and/or thrombosis and address the shortage of skilled academic physician researchers in nonmalignant hematology in the United States by providing funding, mentorship, and career development support to early-stage physician scientists pursuing academic research careers in nonmalignant hematology.	2015-present	Research/innovation (available to trainees)

ATVB, Arteriosclerosis, Thrombosis and Vascular Biology; ATHN, American Thrombosis and Hemostasis Network; CSA, Clinical Scholar Award; DREAM, Dataset Research Engagement and ATHN Mentorship; HTRS, Hemostasis and Thrombosis Research Society; ISTH, International Society of Thrombosis and Haemostasis; MRA, Mentored Research Award; RBD, rare bleeding disorder; THSNA, Thrombosis and Hemostasis Societies of North America.

*Additional award eligibility criteria, if available, can be found on the society websites.

Table 1 (continued)

Award	Description*	Dates awarded	Award category
HTRS/Novo Nordisk CSA in Hemophilia and Rare Bleeding Disorders (HTRS)	During the clinical scholar year, the 2022 CSA recipient is mentored by an experienced MD, MD/PhD, or DO working in hemophilia or RBDs at an established United States–based hemostasis treatment center, hospital, or university. Applicants must present an education plan for the CSA year to obtain expertise in the clinical care of patients with bleeding disorders. It is strongly encouraged to include a scholarly activity as part of the CSA plan.	2013-present	Research/innovation (available to trainees)
ATVB Special Recognition Awards (ATVB)	Recognizes council members who have made significant contributions to the council as well as the fields of ATVB (only included awards for thrombosis and vascular biology).	1991-present	Achievement
THSNA Travel-To-A-Mentor Award (THSNA)	Provides financial support for one mentee to train for 1 week with a preselected research mentor at their facility anywhere in the United States, Canada, or Mexico. Applicant merit will be judged from the 2-page applicant essay, the mentor's letter of commitment, and the applicant's promise via his or her previous work and 1 or 2 letters of reference.	2017-2018	Research/innovation (available to trainees)
THSNA MRA (THSNA)	The THSNA MRA provides 2 years of financial support for a clinical or basic science research project in hemostasis and/or thrombosis under the guidance of an experienced mentor.	2013-2015	Research/innovation (available to trainees)

ATVB, Arteriosclerosis, Thrombosis and Vascular Biology; ATHN, American Thrombosis and Hemostasis Network; CSA, Clinical Scholar Award; DREAM, Dataset Research Engagement and ATHN Mentorship; HTRS, Hemostasis and Thrombosis Research Society; ISTH, International Society of Thrombosis and Haemostasis; MRA, Mentored Research Award; RBD, rare bleeding disorder; THSNA, Thrombosis and Hemostasis Societies of North America.

*Additional award eligibility criteria, if available, can be found on the society websites.

A total of 460 awards have been presented to 302 nontrainees (physicians and nonphysicians combined). Of these, significantly more have been conferred to men compared with women (391/460, 85.0%; 95% CI, 81.4-88.0 vs 69/460, 15.0%; 95% CI, 12.0-18.6; $P < .001$). Among the 302 unique award recipients, significantly more men received an award compared with women (249/302, 82.5%; 95% CI, 77.7-86.3 vs 53/302, 17.5%; 95% CI, 13.7-22.3; $P < .001$). A total of 89 unique individuals have received more than 1 award, 88.8% (79/89; 95% CI, 80.4-94.0) of whom have been men, significantly more than multiple award-winning women (10/89, 11.2%; 95% CI, 6.0-19.6; $P < .001$). Among awards conferred to physicians, a greater proportion of men (160/188, 85.1%; 95% CI, 79.3-89.5) received awards compared with women (28/188, 14.9%; 95% CI, 10.5-20.7; $P < .001$). Similarly, among awards conferred to nonphysicians, a greater proportion of men (89/114, 78.1%; 95% CI, 69.6-84.7) received awards compared with women (25/114, 21.9%; 95% CI, 15.3-30.4; $P < .001$).

Among all award recipients, significantly more men have received awards for achievement (172/210, 81.9%; 95% CI, 76.1-86.6 vs 38/210, 18.1%; 95% CI, 13.5-23.9; $P < .001$), research/innovation (113/126, 89.7%; 95% CI, 83.0-94.0 vs 13/126, 10.3%; 95% CI, 6.0-17.0; $P < .001$), leadership (20/25, 80.0%; 95% CI, 60.4-91.6 vs 5/25, 20.0%; 95% CI, 8.4-39.6; $P = .005$), and named lectureships (79/88, 89.8%; 95% CI, 81.5-94.7 vs 9/88, 10.2%; 95% CI, 5.3-18.5; $P < .001$), whereas a similar proportion of men and women have received awards for service (7/11, 63.6%; 95% CI, 35.2-85.0 vs 4/11, 36.3%; 95% CI, 15.0-64.8; $P = .545$) (Table 2).

Among all award recipients, significantly more men than women have received awards from the ISTH (316/357, 88.5%; 95% CI, 84.8-91.5 vs 41/357, 11.5%; 95% CI, 8.6-15.2; $P < .001$) and the ATVB (60/81, 74.1%; 95% CI, 63.5-82.4 vs 21/81, 25.9%; 95% CI, 17.6-36.5; $P < .001$), whereas there was no significant difference in HTRS (15/22, 68.2%; 95% CI, 47.2-83.8 vs 7/22, 31.8%; 95% CI, 16.2-52.9; $P = .088$) award recipients' gender (Table 2). All analyzed awards from THSNA were available to trainees.

The most recent decade of awards (2011-2021) saw a significant increase in the proportion of women award recipients compared with the 4 previous decades (29/131, 22.1%; 95% CI, 15.8-30.0 vs 33/304, 10.9%; 95% CI, 7.8-14.9; $P = .001$), and the proportion of women award recipients has steadily increased since the 1970s (Table 1). However, despite this increase, women remain significantly underrepresented among award recipients, even in the most recent decade. Notably, the award year for 25 award recipients from the ISTH (20 men, 5 women) was not available.

Women have been underrepresented among hemostasis and thrombosis recognition award recipients, receiving only 15% of the 460 nontrainee awards since 1972. Although a lack of candidates has been suggested to contribute to gender discrepancies within awards, one-third of US hematology providers are women,[12] and over 60% of Canadian hematologists are women.[13] Moreover, since 2010, over 50% of all life science doctoral degrees[14] and slightly more than one-third of all National Institutes of Health (NIH) grants have been awarded to women.[15] These data suggest that low numbers of awardees within hemostasis and thrombosis likely stand in contrast to the increasing number of women within the academic pipeline, as women have comprised only 22% of recognition award recipients in the last decade, despite the

Table 2. Hemostasis and thrombosis award and recipient details

	Total, N	Women, n (%)	Men, n (%)	*P* value
Award information	**N = 460**	**N = 69 (15.0)**	**N = 391 (85.0)**	**<.001**
Award category				
Achievement	210	38 (18.1)	172 (81.9)	**<.001**
Research/innovation	126	13 (10.3)	113 (89.7)	**<.001**
Leadership	25	5 (20.0)	20 (80.0)	**.005**
Service	11	4 (36.3)	7 (63.6)	.545
Named lectureship	88	9 (10.2)	79 (89.8)	**<.001**
Society				
ISTH	357	41 (11.5)	316 (88.5)	**<.001**
ATVB	81	21 (25.9)	60 (74.1)	**<.001**
HTRS	22	7 (31.8)	15 (68.2)	.088
Recipient information	**N = 302**	**N = 53 (17.5)**	**N = 249 (82.5)**	**<.001**
Physicians	188	28 (14.9)	160 (85.1)	**<.001**
Nonphysicians	114	25 (21.9)	89 (78.1)	**<.001**
Number of awards				
1	215	43 (20.0)	172 (80.0)	**<.001**
>1	89	10 (11.2)	79 (88.8)	**<.001**
Award year	**N = 435***	**N = 64 (14.7)***	**N = 371 (85.3)***	**<.001**
1972-1989	68	3 (4.4)	65 (95.6)	**<.001**
1990-1999	94	8 (8.5)	86 (91.5)	**<.001**
2000-2009	137	24 (17.5)	113 (82.5)	**<.001**
2010-2021	136	29 (21.3)	107 (78.7)	**<.001**

Bold values represent the comparisons in which there is a statistically significant difference between the number of awards conferred to men vs women. Statistical significance was considered at $P<.05$.

*The award year for 25 recipients (20 men and 5 women) was not available.

increasing prominence of diversity, equity, and inclusion research publications and initiatives to promote women in hemostasis and thrombosis.[16-19]

Women were underrepresented among research/innovation and named lectureship awards but not among service awards. These findings are consistent with the literature demonstrating that women are often excluded from research awards and instead are more likely to receive service or humanistic awards.[2,7,8] Furthermore, of the 11 eponymous awards analyzed in this study, 7 are named after men, with no research or achievement award named after a woman. These results recapitulate recent study findings demonstrating women are more likely to win awards not named after men.[20] Nevertheless, given recent diversity, equity, and inclusion advocacy efforts,[16-19] we are encouraged by our findings that, although still underrepresented, the proportion of women recognition award recipients increased significantly over the last decade compared with the previous 4 decades.

This study is not designed to assess all variables that may influence award recipient choice or determine causality. Instead, we simply highlight gender disparities among recognition award recipients in broad fields of study encompassing multiple basic science and medical subspecialties.

To elucidate the underlying contributors to these disparities and advance equity, we suggest the award nomination process must be transparent. Specifically, we propose that the criteria for both recognition award recipients and selection committee members be publicly available. As the demographics of the nomination and selection committees are currently unavailable, our ability to ensure these committees themselves are diverse, equitable, and representative of the individuals in the field is inhibited.

We acknowledge limitations to this study, particularly regarding the lack of availability of both society membership data and award nomination data, which precludes evaluation as to whether women are being nominated at equitable rates and how this might influence the number and proportion of women award recipients. If women are not nominated for these awards, then they will be underrepresented among award recipients. Therefore, we believe that anonymized membership and nomination demographics should be made public to ensure organizations are both nominating and selecting individuals at equitable rates. We also acknowledge that we assessed award recipients' perceived gender, which may not necessarily correlate with an individual's true gender identity. Furthermore, we recognize that gender is a spectrum and is one of many social categories that contribute to diversity. Finally, additional study limitations include the frequent absence of award recognition criteria, exclusion of trainee awards and the finding that not all years of awards were available for analysis.

This study illustrates the presence of gender inequities among hemostasis and thrombosis award recipients. Although improvements have occurred in the last decade, further work is required to address this issue. We call on researchers and professional societies to engage in discussions and work to ensure equity among individuals based on, but not limited to, gender, race, ethnicity, and sexual orientation.

Acknowledgment: No funding was received for this research.

Contribution: J.W.J. designed the manuscript, analyzed the data, performed statistical analysis, drafted the manuscript, and approved the final version; B.D.A. drafted the manuscript, interpreted the data, revised the manuscript, and approved the final version; A.P.W. interpreted the data, revised the manuscript, and approved the final version; J.C.Y. interpreted the data, revised the manuscript, and approved the final version; and G.S.B. analyzed the data, revised the manuscript, supervised the project, and approved the final version for submission.

Conflict-of-interest disclosure: The authors declare no competing financial interests.

ORCID profiles: J.W.J., 0000-0002-5719-9685; B.D.A., 0000-0002-9480-2762; A.P.W., 0000-0003-3967-4873; G.S.B., 0000-0002-8422-9480.

Correspondence: Jeremy W. Jacobs, 55 Park St, New Haven, CT 06511; email: Jeremy.jacobs@yale.edu.

References

1. Calderwood AH, Roberts JA, Silver JK, Schmitt CM, Enestvedt BK. Representation by gender of recognition award recipients from gastroenterology and hepatology professional societies. *J Womens Health (Larchmt)*. 2021;30(10):1508-1518.

2. Ma Y, Oliveira DFM, Woodruff TK, Uzzi B. Women who win prizes get less money and prestige. *Nature*. 2019;565(7739):287-288.
3. Newman C, Templeton K, Chin EL. Inequity and women physicians: time to change millennia of societal beliefs. *Perm J*. 2020;24:1-6.
4. Silver JK, Blauwet CA, Bhatnagar S, et al. Women physicians are underrepresented in recognition awards from the Association of Academic Physiatrists. *Am J Phys Med Rehabil*. 2018;97(1):34-40.
5. Silver JK, Slocum CS, Bank AM, et al. Where are the women? The underrepresentation of women physicians among recognition award recipients from medical specialty societies. *PM R*. 2017;9(8):804-815.
6. Silver JK, Bank AM, Slocum CS, et al. Women physicians underrepresented in American Academy of Neurology recognition awards. *Neurology*. 2018;91(7):e603-e614.
7. Patel SR, St Pierre F, Velazquez AI, et al. The Matilda effect: underrecognition of women in hematology and oncology awards. *Oncologist*. 2021;26(9):779-786.
8. Jacobs JW, Adkins BD, Stephens LD, Woo JS, Booth GS. Gender inequities in transfusion medicine society recognition awards. *Transfus Med Rev*. 2022;36(2):82-86.
9. Silver JK, Poorman JA, Reilly JM, Spector ND, Goldstein R, Zafonte RD. Assessment of women physicians among authors of perspective-type articles published in high-impact pediatric journals. *JAMA Netw Open*. 2018;1(3):e180802.
10. Silver JK, Ghalib R, Poorman JA, et al. Analysis of gender equity in leadership of physician-focused medical specialty societies, 2008-2017. *JAMA Intern Med*. 2019;179(3):433-435.
11. Gender API. Gender API. Accessed 26 May 2022. https://gender-api.com
12. AAMC. Active physicians by sex and specialty. 2019. Accessed 30 May 2022. https://www.aamc.org/data-reports/workforce/interactive-data/active-physicians-sex-and-specialty-2019
13. Canadian Medical Association. Hematology profile. Updated December 2019. Accessed 3 June 2022. https://www.cma.ca/sites/default/files/2019-01/hematology-e.pdf
14. Kang JF. National Science Foundation. Data tables. Accessed 30 May 2022. https://ncses.nsf.gov/pubs/nsf21308/data-tables
15. NIH. Research grants: awards by gender and percentage to women. Updated February 2022. Accessed 3 June 2022. https://report.nih.gov/nihdatabook/report/171
16. Cushman M. Diversity and inclusion in a new medical journal: advancing science in the 21st century. *Res Pract Thromb Haemost*. 2018;2(4):620-621.
17. Cushman M. #WomenInMedicine: progress in gender equity at research and practice in thrombosis and haemostasis. *Res Pract Thromb Haemost*. 2019;3(4):560-562.
18. Pendlebury EC, Cushman M. Diversity, equity, and inclusion in publishing: calling thrombosis and hemostasis journals to action in support of women. *Res Pract Thromb Haemost*. 2020;4(7):1076-1079.
19. Cushman M. Women authorship in cardiovascular science: a call to track and report to achieve equity. *J Am Heart Assoc*. 2022;11(5):e025456.
20. Gibney E. Women more likely to win awards that are not named after men. *Nature*. Published online 1 June 2022. https://doi.org/10.1038/d41586-022-01506-4