

Gender Differences in Academic Publications

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BACKGROUND

- Participation of females in medicine has increased over time, yet previous data has demonstrated disparities in author gender of original research in the medical literature.
- Previous studies found female authors comprise a minority of original research articles in major medical journals.
- Limited data are available on more recent author gender trends in academic publications from the 21st century.

OBJECTIVES

- To determine:
 - Gender trends in first and last authorship of select original research articles published between 2000 – 2018.
 - Gender trends in author team compositions in original research articles published between 2000 – 2018.

METHODS

- The following article types were included in the study:
 - Original research articles
 - Publication years: 2000, 2003, 2006, 2009, 2012, 2015, and 2018
 - Written in English
 - Either first or last author from the United States
- The following journals were included in the study: New England Journal of Medicine, Journal of the American Medical Association, Annals of Internal Medicine, Annals of Surgery, Obstetrics and Gynecology, and Pediatrics.
- First and last author gender was determined as follows:
 - Author gender was estimated utilizing data for common first names from the Social Security Administration registry of annual baby names.
 - Utilizing a standardized abstraction process, trained abstractors reviewed the author names for each article and determined gender.
 - Gender was identified as male, female, or unknown
- Data on publications was obtained from PubMed and imported into Research Electronic Data Capture (REDCap).
- Cochran-Armitage trend test was performed to test for an increasing trend in the proportion of female first and last authors.
- Poisson regression was used to test the trend of author team composition, evaluating the significance of the interaction of author composition and time.

Figure 1:
Overall Proportion of Authors by Gender and Author Type

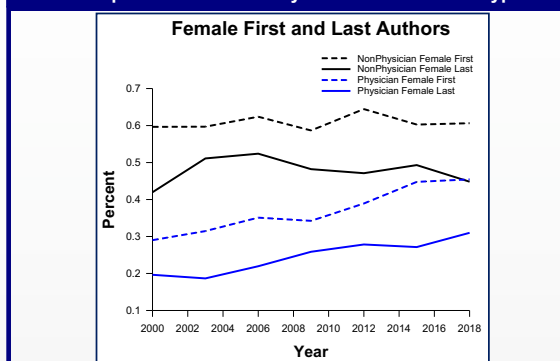
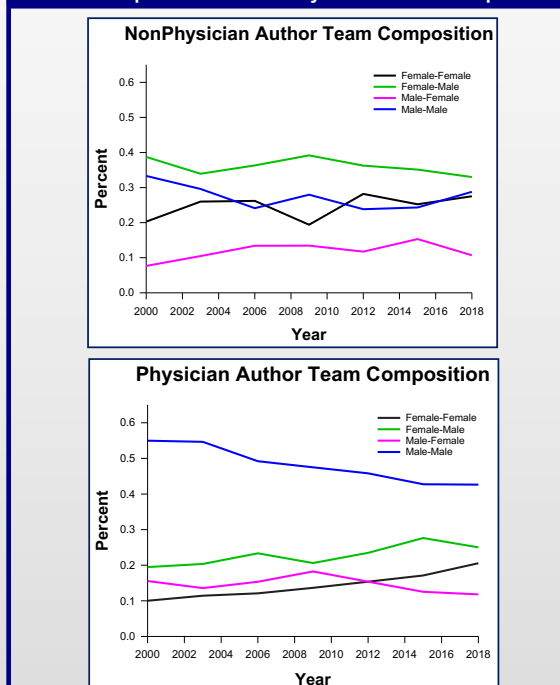


Figure 2:
Observed Proportion of Articles by Author Team Compositions



RESULTS

- Results of first and last author gender in original research publications evaluated are outlined in **Table 1**.

	Percent in 2000	Percent in 2018	p-value
Female First Author			
Physician	29	45	<0.001
Nonphysician	60	61	0.952
All	36	50	<0.001
Female Last Author			
Physician	20	31	<0.001
Nonphysician	42	45	<0.001
All	26	34	<0.001

- The proportions of male first and last authors exceeded female authors across the study time period ($p < 0.001$)
- Results of the evaluation of author team composition are outlined in **Table 2**.

Team Composition	Percent in 2000	Percent in 2018	p-value
Physician Authors			
Female first, Female last	10	21	<0.001
Female first, Male last	20	25	0.003
Male first, Male last	56	43	<0.001
Male first, Female last	15	12	0.255
Nonphysician Authors			
Female first, Female last	20	28	0.256
Female first, Male last	39	33	0.226
Male first, Male last	33	29	0.296
Male first, Female last	8	11	0.313

LIMITATIONS

- Gender is a social construct, in comparison to anatomic or physiologic differences associated with biological sex, and authors were not contacted to verify their gender.
- The study only measured gender in terms of the traditional binary of male versus female.

CONCLUSIONS

- Over the study period and among original research publications:
 - The proportion of female first/last authors increased, but female authors remained the minority.
 - Among non-physician authors, there were no statistically significant changes in team compositions and among physician authors, no significant change in MF team composition.