

# Gender Differences in Academic Publications

Carlos M. Jaquez<sup>1</sup>; Alison Abele<sup>1</sup>, Marjorie L. Bowden, MSW<sup>3</sup>, Randy Burnham, MS<sup>4</sup>, Jody A. Vogel, MD, MS<sup>1,2</sup>  
<sup>1</sup>University of Colorado School of Medicine, Aurora, CO, <sup>2</sup>Denver Health Residency in Emergency Medicine, Denver, CO,  
<sup>3</sup>University of Michigan, Ann Arbor, MI, <sup>4</sup>Rocky Mountain Poison and Drug Safety, Denver, CO

## 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 21<sup>st</sup> century.

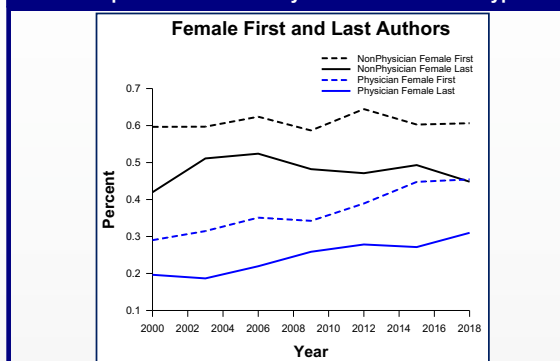
## OBJECTIVES

- 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.

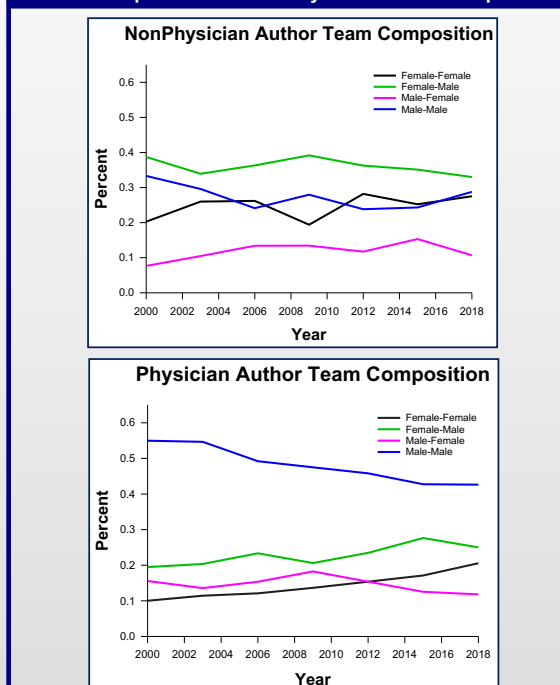
## METHODS

- 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
<b>Female First Author</b>			
Physician	29	45	<0.001
Nonphysician	60	61	0.952
All	36	50	<0.001
<b>Female Last Author</b>			
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
<b>Physician Authors</b>			
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
<b>Nonphysician Authors</b>			
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.