

ASSESSING THE GAP IN FEMALE AUTHORSHIP IN RADIOLOGY: Trends over the Past Two Decades

Teresa Liang MD BSc

Cathy Zhang MDCM

Rohan M. Khara

Alison C. Harris MBChB, FRCR, FRCPC

CAR Poster Presentation

Palais des Congrès, Montreal, QC

May 28-30, 2015



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA



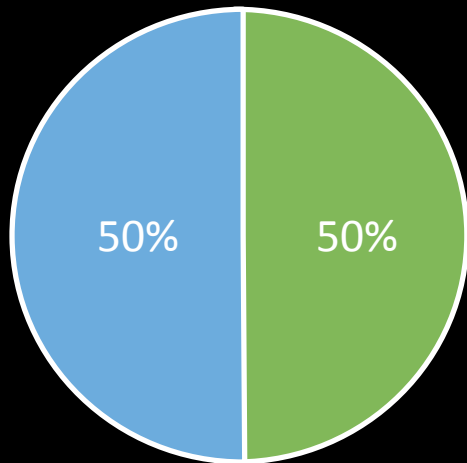
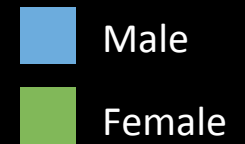
DISCLOSURE

We have nothing to disclose.

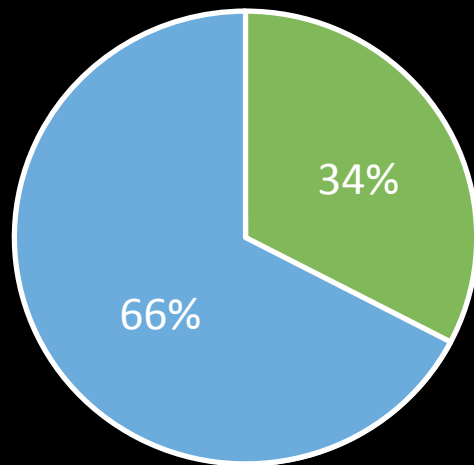
INTRODUCTION

- In the past 20 years, the number of women entering and working in the medical profession has been increasing.
 - In 2012, women made up 50% of medical school applicants, but only 34% of practicing physicians.
- However, has this growth been reflected in representation of female radiologists?
 - Criticism has recognized that females only account for roughly 22% of practicing radiologists.

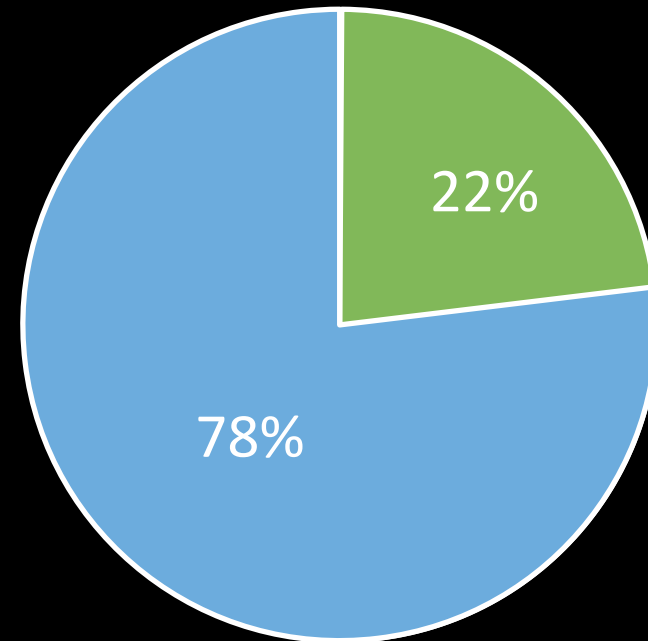
Gender Trends (2012)



Medical Students

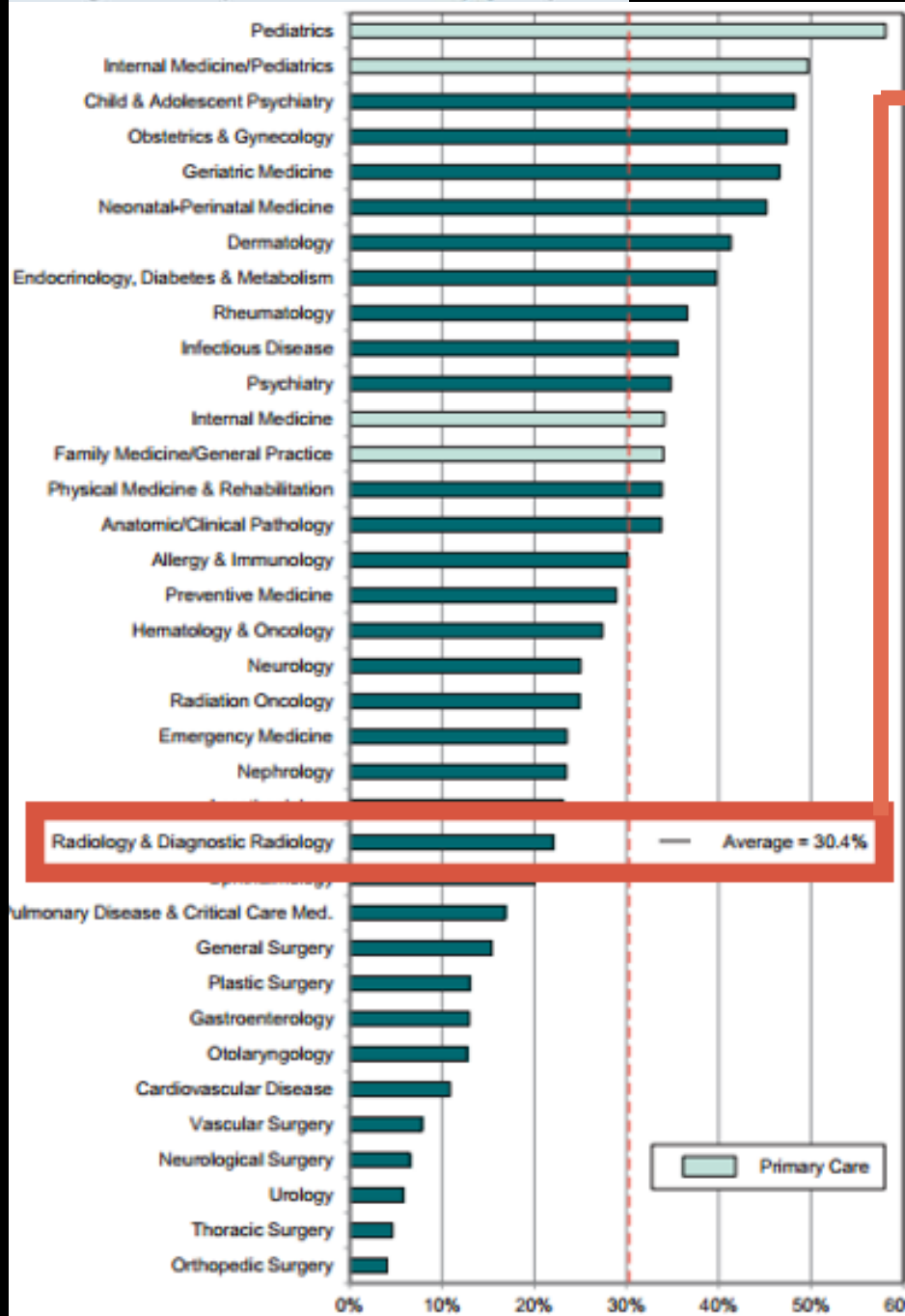


Practicing Physicians



Practicing Radiologists

Percentage of Active Physicians Who are Female by Specialty, 2010



Women Physicians (2010)

Radiology: 22%
All specialties: 30.4%

AAMC 2012 Physician Specialty Data Book.

Women in Academia (2013)

Radiology: 26.9%
All specialties: 32.8%

AAMC 2013, Distribution of U.S. Medical School Faculty by Sex, Rank, and Department.

PURPOSE

- Quantify the presence of female authorship within prominent radiology literature to determine if proportions of female authorship have changed over the past two decades.

MATERIALS & METHODS

- Conducted comprehensive online search of all articles in 1993, 2003, and 2013 from the highest Impact Factors general radiology journals (Radiology, AJR, European Radiology and Investigative Radiology)
 - Research studies, case reports, review articles and pictorial essays
- Gender of first and last authors and continent where papers were written were collected
- Exclusion criteria:
 - Uncertain genders after internet search
- Statistics analysis: chi squared test and $p < 0.05$ significant

RESULTS

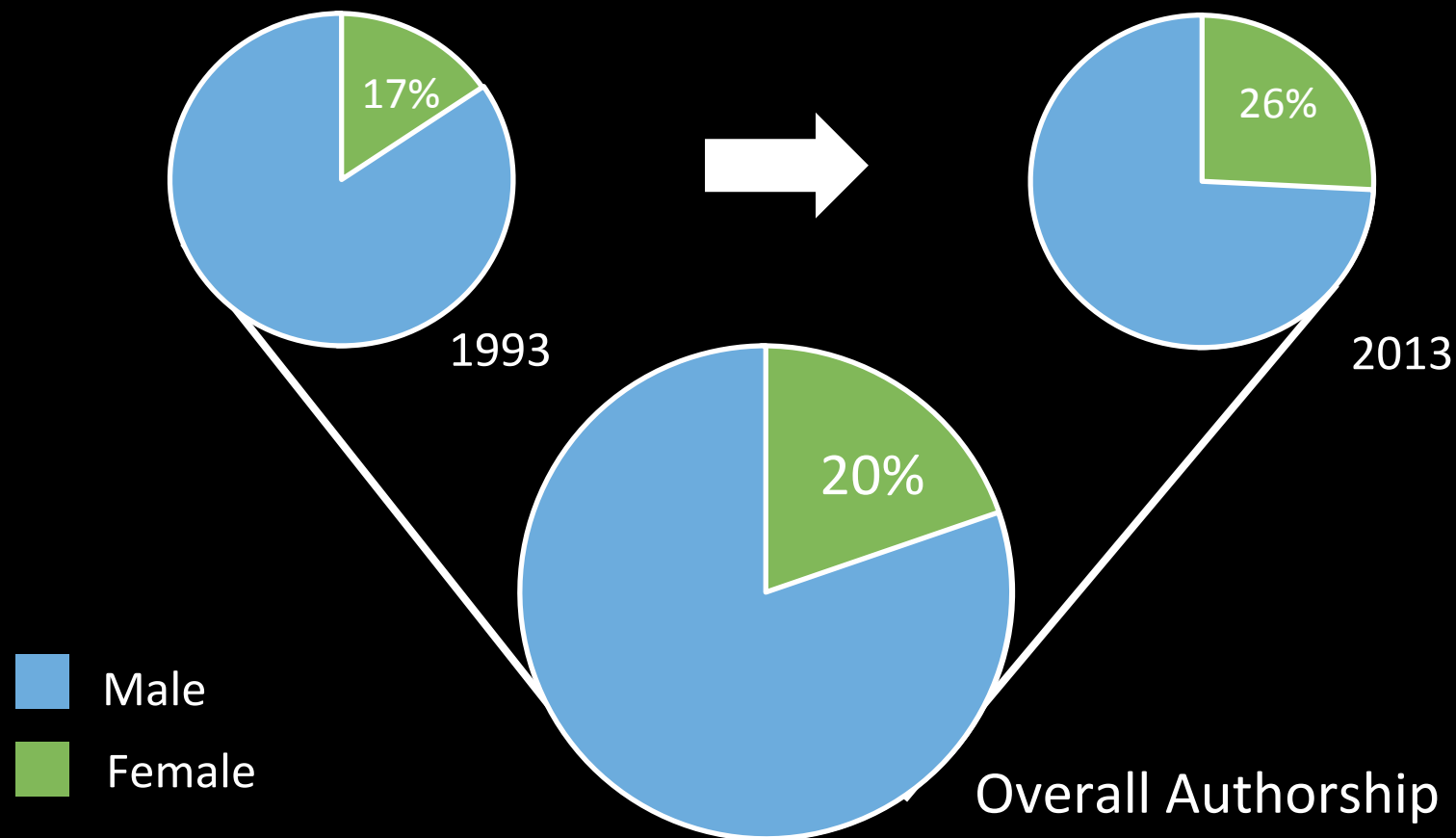
- 3786 articles reviewed:

	1993 (%)	2003 (%)	2013 (%)	P value (1993 vs 2013)	P value (2003 vs 2013)
Radiology: First Author	16.5	24.4	30.4	<0.0001	0.0930
Radiology: Last Author	12.1	17.1	19.2	0.0040	0.4887
AJR: First Author	20.7	25.9	34.8	<0.0001	0.0104
AJR: Last Author	17.5	14.1	23.2	0.0510	0.0016
Euro Radiology: First Author	29.1	15.9	31.6	0.7237	<0.0001
Euro Radiology: Last Author	4.3	5.7	15.5	0.0430	0.0001
Invest Rad: First Author	21.2	12.0	29.1	0.1739	0.0330
Invest Rad: Last Author	11.7	3.2	15.6	0.4369	0.0037
Indeterminate Authors (excluded)	10.6	16.1	12.1	N/A	N/A

RESULTS

1. Women constituted **20%** of the overall authorship:

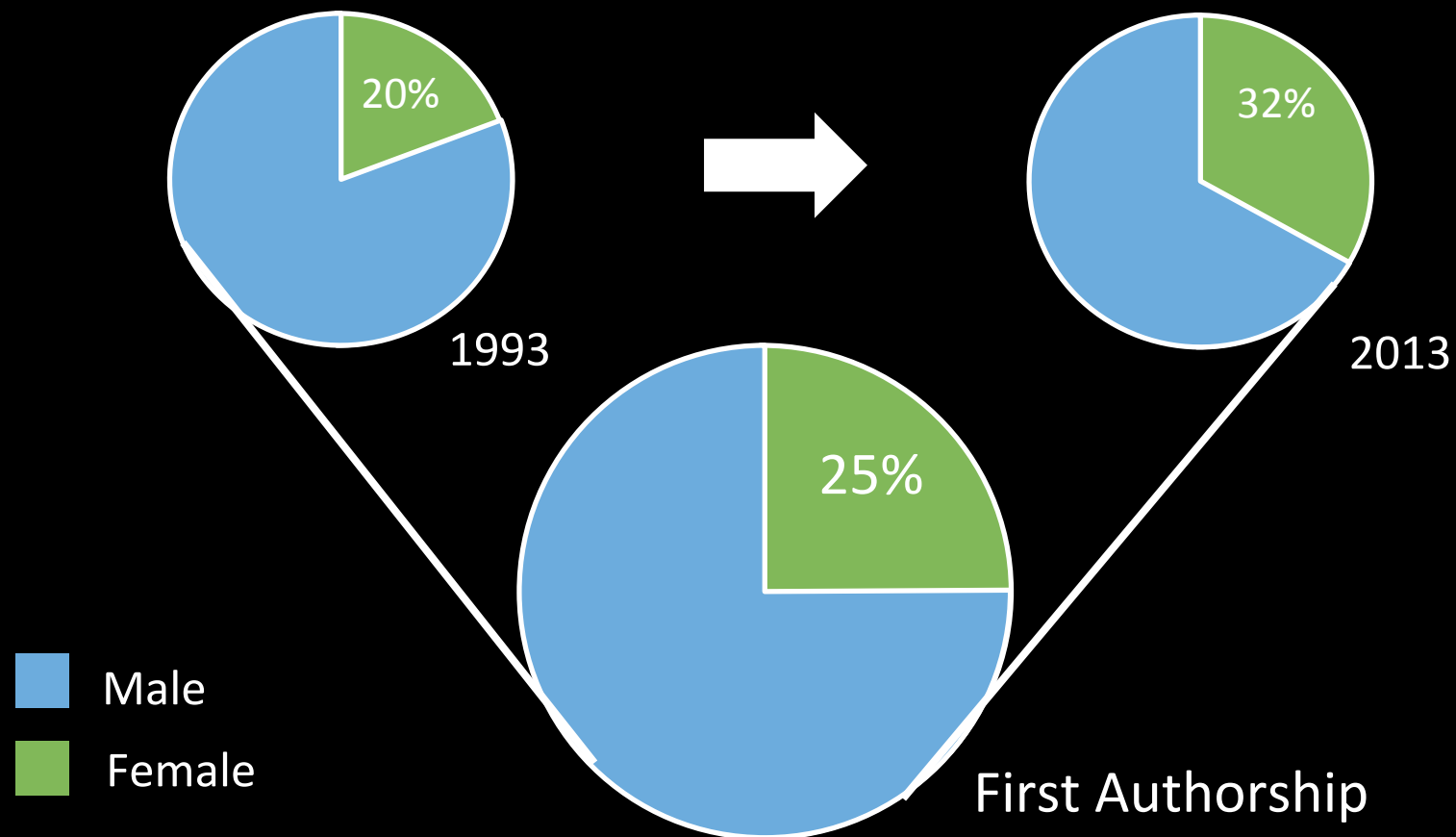
- 17% (1993) → 26% (2013)



RESULTS

2. Women constituted **25%** of first authorship:

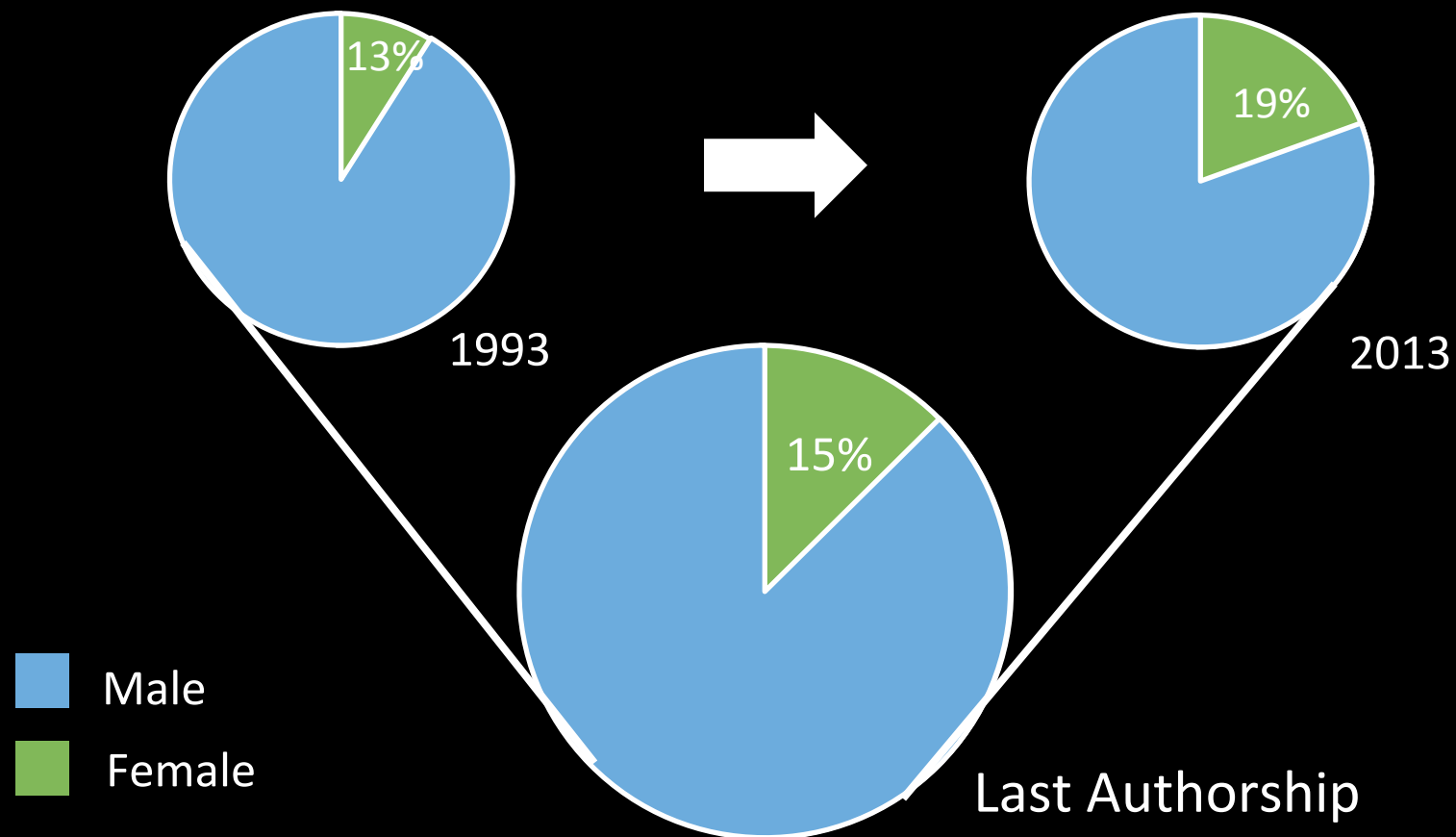
- 20% (1993) → 32% (2013)



RESULTS

3. Women constituted **15%** of last authorship:

- 13% (1993) → 19% (2013)



DISCUSSION

1. Overall, female authorship grew proportionally with practicing female radiologists in past two decades.
 - Relative to overall % of practicing female radiologists,
 - % female first authors were consistently greater.
 - % female senior authors were consistently less.
 - Maintained growth of female academic radiologists, but potential lag in research supervision by lower % in senior authorship.

DISCUSSION

2. Similar studies in other medical disciplines have demonstrated comparable increases in authorship:

Specialty	Percentages (%)	Years
ENT – first author	13 → 21	1998 to 2008
Dermatology – first author	12 → 48	1976 to 2006
Dermatology – senior author	6 → 31	
Ophthalmology – first author	21 → 24	2000 to 2009
Ophthalmology – senior author	19 → 21	

- Similar to other non-female dominated specialties, female authorship, in particular senior authorship, continues to remain a minority.

DISCUSSION

- Limitations of study
 - Four highest Impact Factor general Radiology journals based mostly in North America, thus, may not reflect global trends
 - High (Up to 16%) of indeterminate authors (especially in Asian backgrounds)
 - Only analyzed literature in 10 year increments from 1993 to 2013
 - No further analysis of radiology subspecialties
 - Positions of authors not further analyzed (e.g. academic radiologist, clinician, basic scientist..)

DISCUSSION

- Potential barriers to increase female authorship:
 1. Escalation of women to senior faculty (common trend in academic medicine)
 2. Stagnant growth of % female radiology residents
 - Lack of female Radiology mentors
 - Lack of Radiology undergraduate medical education:
 - Later exposure to specialty
 - Perpetuation of various misconceptions
 - Lifelong radiation exposure
 - No patient contact
 - Heavy focus on physics

Gender Trends in Radiology Residency



Males & females in Radiology Residency have equalized since ~1994!

CONCLUSION

- Women's growth in overall authorship in radiology literature is proportional to their growth in the specialty, however they continue to remain a minority in senior authorship, similar to other specialties.

CONCLUSION

- Potential solutions
 - Redefining senior academic positions in radiology so that our specialty can be a leader in improving gender gap in medicine
 - Increasing medical education to ensure continuous presence of female radiologists
- Further possible research directions
 - Expand literature search to include globally based journals
 - Expand literature search further back for better assessment of longer-term trends
 - Include subspecialty analysis
 - Division of authors into clinicians or basic scientists or into levels of training

REFERENCES

- Association of American Medical Colleges. 2012 Physician Specialty Data Book. <https://www.aamc.org/download/313228/data/2012physicianspecialtydatabook.pdf>. Published November 2012. Accessed October 8, 2014.
- Association of American Medical Colleges (AAMC). Table 13. Distribution of U.S. Medical School Faculty by Sex, Rank, and Department. <https://www.aamc.org/download/367160/data/13table13.pdf>. Published December 2013. Accessed October 8, 2014.
- Feramisco JD, Leitenberger JJ, Redfern SI, Bian A, Xie X, Resneck Jr JS. A gender gap in the dermatology literature? cross-sectional analysis of manuscript authorship trends in dermatology journals during 3 decades. *J Am Acad Dermatol*. 2009;60(1):63-69.
- Bergeron JL, Wilken R, Miller ME, Shapiro NL, Bhattacharyya N. Measurable progress in female authorship in otolaryngology. *Otolaryngol Head Neck Surg*. 2012;147(1):40-43. doi: 10.1177/0194599812438171 [doi].
- Shah DN, Huang J, Ying G, Pietrobon R, O'Brien JM. Trends in female representation in published ophthalmology literature, 2000–2009. *Digital Journal of Ophthalmology: DJO*. 2013;19(4):50.
- Magrane D, Lang J, Alexander H. *An overview of women in US academic medicine, 2005–06*. Association of American Medical Colleges; 2007.
- Howell W. Women in Radiology: How the Specialty Can Bridge the Gap. *Diagnostic Imaging* 2014.