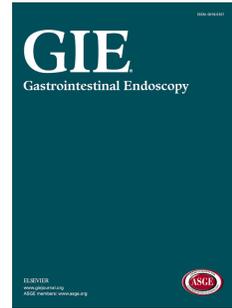


Accepted Manuscript



Gender Disparities in Gastroenterology Fellowship Director Positions in the United States

Zibing Woodward, MD, Zaida Rodriguez, MD, Janice Jou, MD, Kian Keyashian, MD, Yiyi Chen, PhD, Charles R. Thomas, Jr., MD, Grace H. Elta, MD, Sharlene L. D'Souza, MD

PII: S0016-5107(17)30060-3

DOI: [10.1016/j.gie.2017.01.019](https://doi.org/10.1016/j.gie.2017.01.019)

Reference: YMGE 10387

To appear in: *Gastrointestinal Endoscopy*

Received Date: 20 September 2016

Accepted Date: 20 January 2017

Please cite this article as: Woodward Z, Rodriguez Z, Jou J, Keyashian K, Chen Y, Thomas Jr. CR, Elta GH, D'Souza SL, Gender Disparities in Gastroenterology Fellowship Director Positions in the United States, *Gastrointestinal Endoscopy* (2017), doi: 10.1016/j.gie.2017.01.019.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Gender Disparities in Gastroenterology Fellowship Director Positions in the United States

Zibing Woodward, MD (Corresponding author)
Oregon Health & Science University, Portland, Oregon
The Oregon Clinic – GI South, Portland, Oregon
19250 SW 90th Ave, Tualatin, OR 97062
Phone: (503)692-3750
Fax: (503) 691-2324
jiang@ohsu.edu

Zaida Rodriguez, MD
Oregon Health & Science University, Portland, Oregon
Portland VA Health Care System, Portland, Oregon

Janice Jou, MD
Oregon Health & Science University, Portland, Oregon
Portland VA Health Care System, Portland, Oregon

Kian Keyashian, MD
Oregon Health & Science University, Portland, Oregon
Portland VA Health Care System, Portland, Oregon

Yiyi Chen, PhD
Oregon Health & Science University, Portland, Oregon

Charles R. Thomas, Jr., MD
Oregon Health & Science University, Portland, Oregon

Grace H. Elta MD
University of Michigan Health System, Ann Arbor, Michigan

Sharlene L. D'Souza, MD
Oregon Health & Science University, Portland, Oregon
Portland VA Health Care System, Portland, Oregon

Gender Disparities in Gastroenterology Fellowship Director Positions in the United States

Zibing Woodward, MD^{1,2}, Zaida Rodriguez, MD^{1,3}, Janice Jou, MD^{1,3}, Kian Keyashian, MD^{1,3}, Yiyi Chen, PhD¹, Charles R. Thomas, Jr., MD¹, Grace H. Elta MD⁴, Sharlene L. D'Souza, MD^{1,3}

¹Oregon Health & Science University, Portland, Oregon, ²The Oregon Clinic – GI South, Portland, Oregon, ³Portland VA Health Care System, Portland, Oregon, ⁴University of Michigan Health System, Ann Arbor, Michigan

ABSTRACT

Background and Aims:

Despite a paucity of women occupying leadership positions in academic medicine, studies have shown a higher ratio of female representation in the program director position compared with division chief in multiple specialties. This study aims to determine whether this trend exists in 3-year gastroenterology fellowships in the United States and to evaluate for any factors that may affect these differences.

Methods

In 2015, data were collected for the 163 U.S. gastroenterology fellowship programs including program director, associate program director, division chief, gender distribution, program size, academic center affiliation, and geographic region.

Results

A higher percentage of men than women held the role of program director (82% vs 18%), associate program director (72% vs 28%), and division chief (93% vs 7%). Female program leadership held lower academic rank than their male counterparts ($P < 0.0001$). The program director was more likely to be female if the division chief was also female ($P = 0.03$). Programs with a higher number of trainees tended to be led by a female program director ($P = 0.06$).

Conclusion:

A gender disparity exists in all gastroenterology leadership roles, although the magnitude is smaller for program director and associate program director than the role of division chief. Further studies are needed to investigate the impact of this disparity on promotion and academic productivity.

Introduction/Background

Traditionally, women have been under-represented in all fields of medicine, although the gender gap has been slowly decreasing over the past few decades. According to data from the Association of American Medical Colleges (AAMC) Physician Specialty Databook, in 2013 women comprised 46% of trainees across all specialties, 35% of gastroenterology trainees, and 15% of practicing gastroenterologists.¹ This is in comparison to 10 years ago, when only a quarter of first-year gastroenterology fellows were women.^{2,3} In recent years, although there is more gender parity for medical school applicants, matriculates, and residents across all specialties, the proportion of female academic faculty is only 38%.⁴ This percentage decreases

even further with higher academic rank; females account for only 21% of full professors, 16% of medical school deans, and 15% of department chairs.⁴ Among full-time faculty, the only academic rank in which women outnumbered men was the clinical instructor level—the lowest rank.⁴

This gender disparity is also seen in the field of gastroenterology. A study by Burke et al⁵ surveyed gastroenterology fellows 3 years, 5 years, and 10 years after graduation and showed there was a larger proportion of women in academic practice at all time points surveyed^{5,6}; however, even at 10 years after graduation, they had significantly lower academic rank with 30% holding the rank of associate professor as compared with 58% of their male counterparts and no woman holding the rank of full professor as compared with 10% of men.⁶ Studies across other subspecialties have shown that women are under-represented in all major department based leadership roles but are not under-represented in the residency program director role.⁷ In general surgery, women comprise 10% of residency program directors but only 3% of department chairs.⁸

It is known that women are under-represented in gastroenterology faculty positions and higher academic ranks; however, less is known about female representation in fellowship program leadership. In this study, we aim to quantify gender representation in gastroenterology fellowship program leadership and compare it to the disparity seen in the division chief role as well as find any associated factors that may contribute to the potential disparities.

Methods

This study was exempt from Institutional Review Board approval because all of the data analyzed were publicly available. A list of all 3-year allopathic gastroenterology fellowship programs in the United States was obtained from the American College of Gastroenterology (ACG) and the Association of American Medical Colleges (AAMC) websites and cross-compared for accuracy. Each program website was then accessed and the names, gender, and academic rank (professor, associated professor, assistant professor, or clinical instructor) for the program director, associate program director, and division chief for each program were recorded. Program-specific information, including program size (number of trainees and faculty), academic affiliation, and geographic region, was collected for each program. If the information was incomplete on the program website, attempts were made to obtain the missing data by using a standard internet search engine, Doximity, and LinkedIn. Departmental website photographs were used to determine the gender of the physician; if no photo was available, gender information was collected from publicly available Healthgrades websites. All data were collected over a 2-month period in the summer of 2015.

The Fisher exact test was used to evaluate the association among gender of the program director, associate program director, and division chief. Similarly, it was used to assess any relationship with their academic ranks and the geographic region of the program. Chi-square test was also used to evaluate the association between the gender of the program director and associate program director with geographic region as well as the association between the associate program director gender and program director gender. Wilcoxon rank sum test was used to determine the association between the gender of the program director, associate program

director, division chief, and the size of the program in terms of number of trainees as well as number of faculty members.

Results

A total of 163 three-year allopathic gastroenterology fellowship programs were found on the ACG and AAMC websites. All of these programs listed a fellowship program director, whereas only 107 listed an associate program director and 150 listed a division chief.

For the 163 program directors, there were fewer women holding the position of program director than men (18% vs 82%). Academic rank was found for 145 of the fellowship program directors. Female program directors held a lower academic rank when compared with their male counterparts ($P = 0.0187$) (Figure 1). Among the 27 female program directors with a listed academic rank, 52% ($n = 14$) were assistant professor, 33% ($n = 9$) were associate professors and 15% ($n = 4$) were full professors. There were 118 male program directors with a listed academic rank, 3% ($n = 3$) were clinical instructors, 26% ($n = 31$) were assistant professors, 33% ($n = 39$) were associate professors, 38% ($n = 45$) were full professors.

Only 107 fellowship programs listed an associate program director. Similar to the role of program director, there were fewer women holding this position when compared with men (28% vs 72%). Academic rank was found for 88 of the associate program directors and again, female associate program directors held a lower rank than males ($P = 0.0032$) (Figure 2). Among the 26 female associate program directors, 4% ($n = 1$) were clinical instructors, 85% ($n = 22$) were assistant professors, 12% ($n = 3$) were associate professors, and none were full professors. Of the 62 male associate program directors with a listed academic rank, 3% ($n = 2$) held the rank of clinical instructor, 55% ($n = 34$) held the rank of assistant professor, 16% ($n = 10$) held the rank of associate professor, and 26% ($n = 16$) held the rank of full professor. There was no association between the associate program director gender and the gender of the program director ($P = 0.2390$) or the gender of the division chief ($P = 1.000$).

A division chief was listed for 150 of the 163 programs. The division chief was female in only 11 programs (7%), whereas 139 programs (93%) had a male division chief. Academic rank was found for 141 of the chief positions. Females had a lower academic rank than their male counterparts: 27% of females versus 7% of males were assistant professors; 18% of females versus 14% of males were associate professors, and 55% versus 79% were full professors. This was statistically significant with a P value of 0.049 (Figure 3).

A significant association was found between the gender of the fellowship program director and the gender of the division chief ($P = 0.0327$). It was more likely that a female held the role of program director if the division chief was also female. For the 11 programs with a female division chief, 45% ($n = 5$) had a female fellowship director as compared with 54% ($n = 6$) with a male program director. Of the 139 programs with a listed division chief, 17% ($n = 23$) of these programs had female program directors and 83% ($n = 116$) male program directors (Figure 4). There was no significant association between the gender of the division chief and the gender of the associate program director ($P = 1.000$).

Training program size, as defined by the number of gastroenterology trainees was found for 113 of the 163 fellowship programs. Programs with a female program director tended to have a higher number of trainees (mean of 12 trainees, maximum 24) when compared with programs with a male program director (mean of 9 trainees, maximum 23), although this was not statistically significant ($P = 0.0604$) (Figure 5). There was no significant association between the number of trainees and the gender of the associate program director ($P = 0.1221$); there was also no association between the number of faculty and the gender of the program director ($P = 0.8870$) or the associate program director ($P = 0.1795$).

Geographic region was not found to be a significant factor for any of the leadership positions (program director, $P = 0.2770$; associate program director, $P = 0.2996$; division chief, $P = 0.4928$).

Discussion

This study demonstrates that women are significantly under-represented in the roles of gastroenterology fellowship director and associate program director. Similar to prior studies in other specialties such as surgery, obstetrics-gynecology, and pediatrics, the proportion of women in fellowship leadership roles was higher than the proportion of those in a division chief role⁷. Women across all roles held a lower academic rank than their male counterparts. The gender of the division chief had a significant impact on the gender of the fellowship program director. No other factors had a significant association with gender. One may argue that because women only made up of 15% of practicing gastroenterologists according to 2013 AAMC data, having 18% female program directors is actually an over-representation of women in a leadership role. However, studies have shown a larger percentage of women go into academics than men.^{5,6} Diamond et al⁹ found 24% of gastroenterology academic faculty to be women. This confirms that women are under-represented in leadership roles in gastroenterology.

The most surprising aspect of our results is the large degree of difference between gender representation of the fellowship directors based on whether there was a male or female division chief. This could support the idea of mentorship playing a significant role in career advancement. Women in senior leadership roles may be more likely to promote other women, or perhaps seeing a woman in senior leadership empowers junior women to seek promotion. Further review of the data show that of the 5 programs that had both a female division chief and a female program director, they were the same person 100% of the time. The other 6 female division chiefs all had male program directors. This contradicts the theory of mentorship leading to career advancement. It is unclear from our data what factors influenced and enabled this very small percentage of woman to have been able to reach the top echelon of academic leadership.

The reasons for the persistent gender disparity in gastroenterology leadership are unclear and likely multifactorial. One possibility may be decreased institutional support for career advancement of women as compared with men. For example, studies have shown that women receive less research funding, have fewer available mentors, and are paid less than men. Women also reported more difficulty in the tenure process than men and were less likely to promote themselves or ask for advancement.⁶ This trend may be changing, as seen in a recent study that found that there was a higher proportion of women who requested appointments to American Society for Gastrointestinal Endoscopy (ASGE) committees and that they were more likely to be

appointed when compared with male counterparts. Endorsement from a mentor was a strong predictor for committee assignment and more women tended to have a letter of support than men (33 vs 24%, $P = 0.06$),¹⁰ which underscores the importance of mentorship. Although this trend is promising, there still remains a lack of female representation in leadership positions within the major gastroenterology societies within the United States, with very few female presidents over the past 30 years (1 for American Gastroenterological Association [AGA], 2 for ACG, 3 for ASGE, and 3 for American Association for the Study of Liver Diseases [AASLD]).²

The gender gap may be smaller in the leadership of the fellowship programs because these roles are seen more as nurturing, more befitting that of the traditional female gender role. Prior studies have shown that women are more likely to choose education-driven career tracks than their male counterparts, such as that of a clinician-educator.^{9,11} It could be postulated that the same applies for program director because the role focuses more on education than research. This may contribute to women choosing non-traditional academic roles such as clinical-educator, clinical instructor, and program director because they do not rely as heavily on publications for promotion. The clinician-educator track, however, may not have the same opportunity to advance into a major departmental leadership role as the traditional research based track.^{7, 11-13} This could account for the larger gender disparity seen in higher department level leadership roles.

It has been hypothesized that women have more home and child care responsibilities outside of work than men and, as a result, are either not able to or choose not to devote as much time to career advancement. Hofler et al⁷ showed that there was more gender parity in subspecialties with a more controllable lifestyle such as radiology and anesthesiology. The authors hypothesize that the more predictable work hours as well as the higher-than-average compensation allow women to achieve a better work-life balance as well as potentially hire outside support in their personal life, allowing more time to dedicate to career advancement. Other studies refute this hypothesis such as the survey study by Burke et al,⁵ which found that women tended to have children later and fewer children than similar career stage men;^{5, 6} women also reported altering family planning more so than men, an indication that women are also delaying personal life advancement in favor of their careers.^{5, 6}

There are several limitations to this study. All of the information collected was from publicly accessible websites including program websites and other standard health websites. The information available on these websites may not have been complete, accurate or up to date. We did our best to verify any information we found across websites of the program itself, the AAMC website as well as the ACG websites. We were not able to ascertain age, career stage, or the length of time each person has been in their current role. It is possible that the gender disparity and trend of lower academic rank that we found is due to the shorter career duration of women in medicine overall. In fact, a recent study by Diamond et al⁹ showed women to have lower research productivity; however, this difference disappeared when taking into account career duration. We were also unable to separate the community programs from academic programs as the vast majority of the programs listed a University Affiliation on their program websites and without deeper analysis, it was difficult to tell how much academic scholarship occurs at each program. A future study may consider looking at true community practices and female leadership in the private practice setting.

Conclusions

Gender disparities exist in the field of gastroenterology though the gap is smaller in the roles of gastroenterology fellowship program leadership than in major departmental and divisional leadership roles. This difference may be related to the perception that the role of fellowship program director would be more befitting that of a traditional female gender role. Gender parity in fellowship program leadership was improved if the division chief was female; this suggested that improving female mentorship and sponsorship may decrease the gender gap for future generations of female gastroenterologists. Closer review of the data showed the female division chiefs of these programs also held the role of program director. It is unclear what factors propelled these women into the most senior leadership roles. Some gastroenterology societies have already recognized the importance of mentorship and have started programs to help promote and empower women; for example, ASGE has the Leadership Education and Development (LEAD) program and AGA has a Women's Leadership Conference. Further studies are needed to investigate trends over time with regard to institutional support, promotion, academic productivity as well as personal motivations to help elucidate and eliminate the underlying causes of the gender gap.

Table 1: Female representation in gastroenterology leadership positions

Role	# of females (%)	# of males (%)	Total
Program Director	29 (17.8%)	134 (82.2%)	163
Associate Program Direction	30 (28%)	77 (72%)	107
Division Chief	11(7.3%)	139 (92.7%)	150

Figure 1: Academic Rank of gastroenterology Fellowship Program Directors.

Figure 2: Academic rank of gastroenterology Fellowship Associate Program Directors.

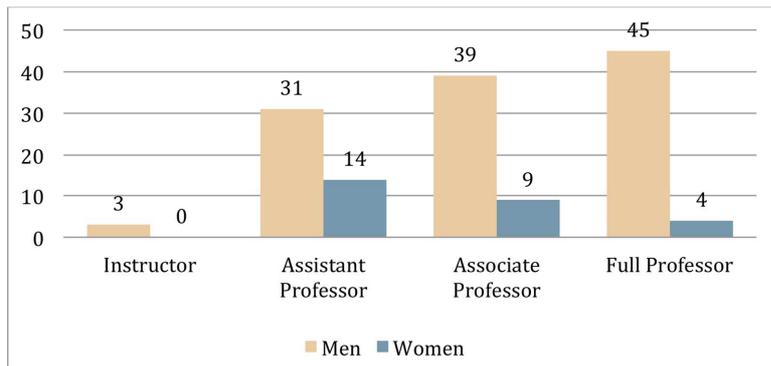
Figure 3: Academic Rank of gastroenterology Division Chiefs.

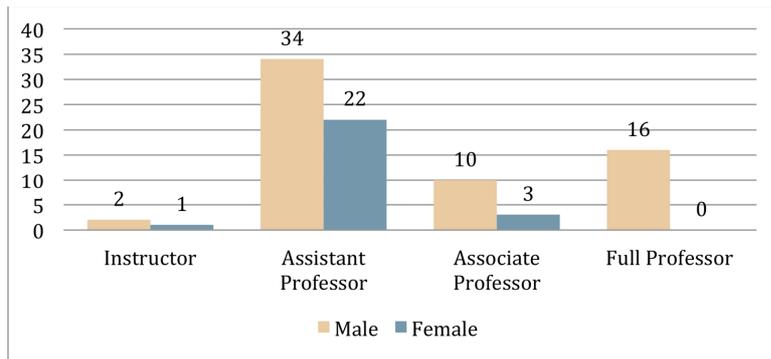
Figure 4: Fellowship program director gender broken down by the gender of their division chiefs.

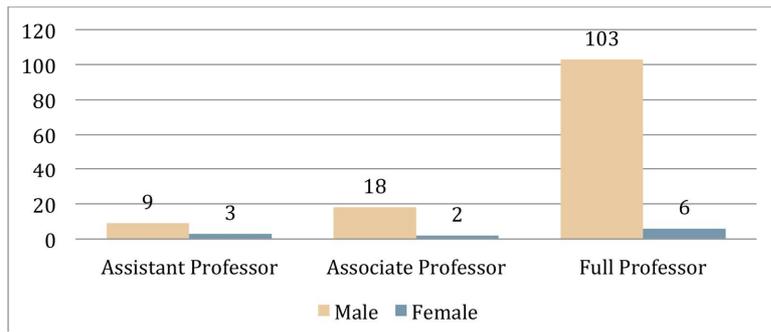
Figure 5: Program Size by gastroenterology Fellowship Director gender.

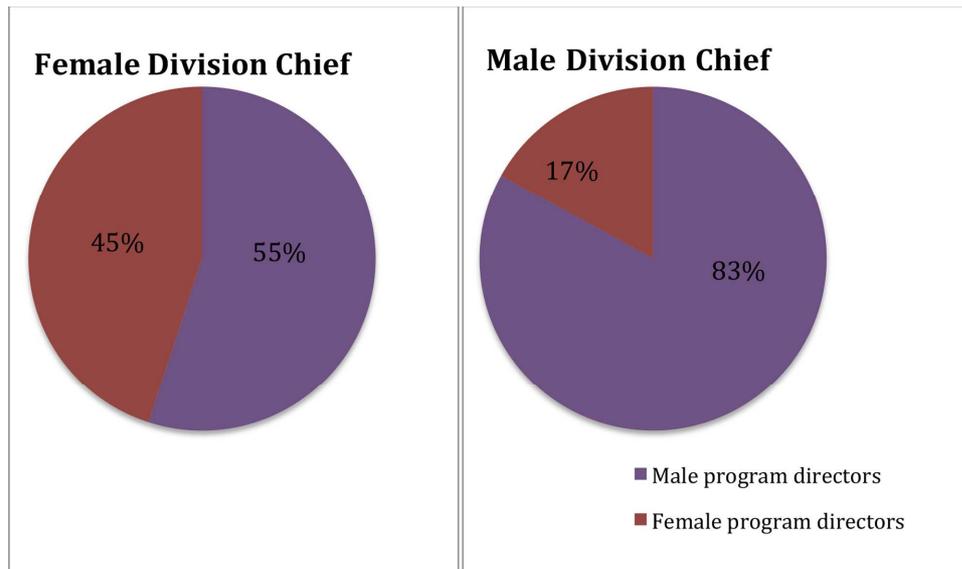
References:

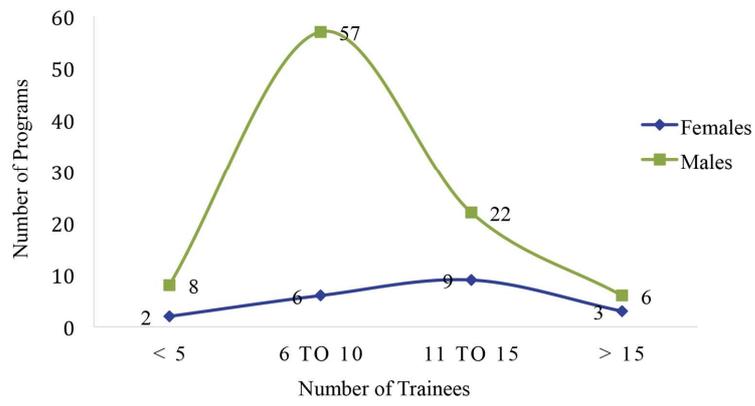
1. AAMC 2014 Physician Specialty Databook available at: <https://www.aamc.org/data/#>. Accessed April 17, 2016
2. Menees, Stacy B., and Grace H. Elta. "Is the glass ceiling in gastroenterology gone?" *Gastrointestinal Endoscopy* 83.4 (2016): 734-735
3. American Board of Internal Medicine. Resident & fellow workforce data, 2016 Available at: <http://www.abim.org/about/statistics-data/resident-fellow-workforce-data.aspx>. Accessed April 17, 2016
4. Women in Academic Medicine AAMC Available at: <https://www.aamc.org/members/gwims/statistics/>. Accessed April 17, 2016
5. Burke, Carol A., Suriya V. Sastri, Gordon Jacobsen, Freda L. Arlow, Robyn G. Karlstadt, and Patricia Raymond. "Gender Disparity in the Practice of Gastroenterology: The First 5 Years of a Career." *The American Journal of Gastroenterology Am J Gastroenterology* 100.2 (2005): 259-64.
6. Singh, Aparajita, Carol A. Burke, Brett Larive, and Suriya V. Sastri. "Do Gender Disparities Persist in Gastroenterology After 10 Years of Practice." *The American Journal of Gastroenterology* 103.7 (2008): 1589-595.
7. Hofler, Lisa G., Michele R. Hacker, Laura E. Dodge, Rose Schutzberg, and Hope A. Ricciotti. "Comparison of Women in Department Leadership in Obstetrics and Gynecology With Those in Other Specialties." *Obstetrics & Gynecology* 127.3 (2016): 442-47.
8. Weiss, Anna, Katherine C. Lee, Viridiana Tapia, David Chang, Julie Freischlag, Sarah L. Blair, and Sonia Ramamoorthy. "Equity in Surgical Leadership for Women: More Work to Do." *The American Journal of Surgery* 208.3 (2014): 494-98.
9. Diamond, Sarah J., Charles R. Thomas, Sima Desai, Emma B. Holliday, Reshma Jaggi, Colleen Schmitt, and Brintha K. Enestvedt. "Gender Differences in Publication Productivity, Academic Rank, and Career Duration Among U.S. Academic Gastroenterology Faculty." *Academic Medicine* 91.8 (2016): 1158-163.
10. Calderwood, Audrey H., Brintha K. Enestvedt, Rebecca Devivo, and Colleen M. Schmitt. "Impact of Gender on Requests for ASGE Leadership Assignments." *Gastrointestinal Endoscopy* 83.4 (2016): 730-33.
11. Mayer, Anita P., Janis E. Blair, Marcia G. Ko, Sharonne N. Hayes, Yu-Hui H. Chang, Suzanne L. Caubet, and Julia A. Files. "Gender Distribution of U.S. Medical School Faculty by Academic Track Type." *Academic Medicine* 89.2 (2014): 312-17.
12. Borges, Nicole J., Anita M. Navarro, and Amelia C. Grover. "Women Physicians: Choosing a Career in Academic Medicine." *Academic Medicine* 87.1 (2012): 105-14.
13. Jena, Anupam B., Dhruv Khullar, Oliver Ho, Andrew R. Olenski, and Daniel M. Blumenthal. "Sex Differences in Academic Rank in US Medical Schools in 2014." *Jama* 314.11 (2015): 1149.











Acronyms:

AAMC – Association of American Medical Colleges

ACG - American College of Gastroenterology

ASGE - American Society for Gastrointestinal Endoscopy

AGA - American Gastroenterological Association

AASLD - American Association for the Study of Liver Diseases

LEAD – Leadership Education and Development

ACCEPTED MANUSCRIPT