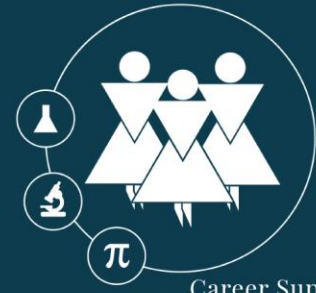


# *Part I :* An Unequal Support Conundrum



Career Support Group  
Women in Science

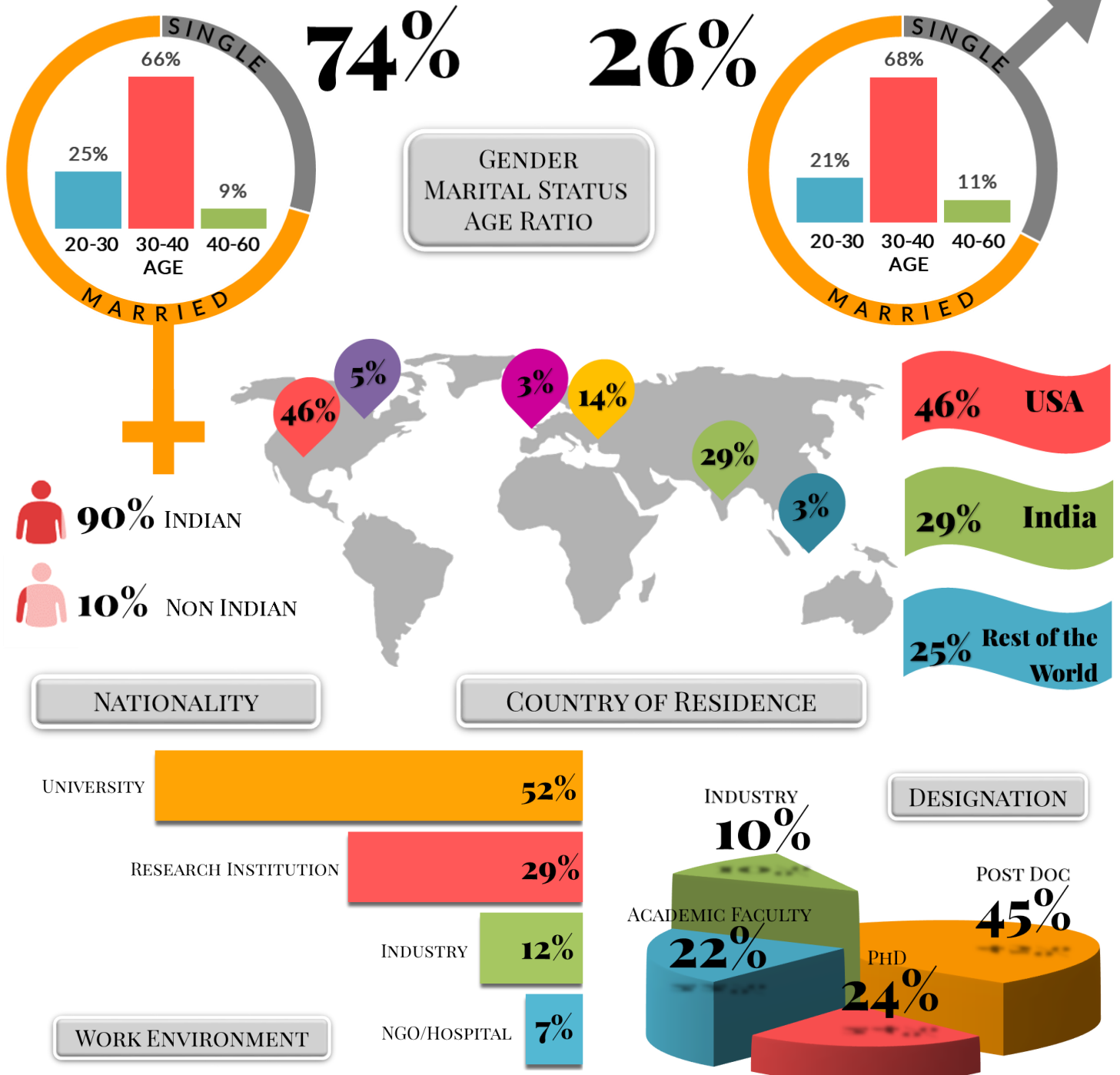
CSG-WIS Survey

2018-19



In early 2018, a [post](#) on Career Support Group (CSG) asking about the challenges faced by women in their work place/graduate school, got an overwhelming response. There were stories and struggles shared, but also support and willingness to take action. This led to the inception of Women in Science (WiS) sub-group of the PhD [Career Support Group \(CSG\)](#), a group of volunteers both women and men who care about the challenges faced by women in their lives. This survey is a part of an initiative to identify and address gaps in the support received by women researchers in a professional STEM environment and will be published as a 5-part series on [ClubSciWri](#).

The survey had 220 participants and their demographics are as follows:



# An Unequal Support Conundrum

*Shubhendu Sen Roy, PhD and Divya Swaminathan, PhD*

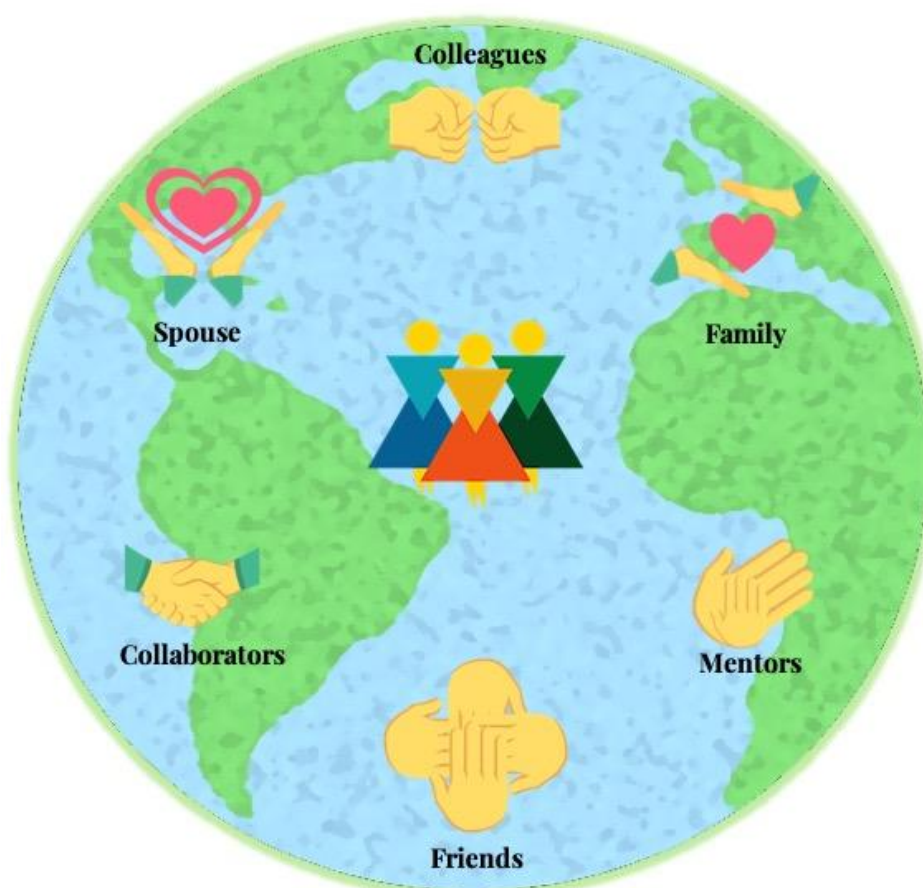
As a postdoctoral researcher, Shrini was always supported by his supervisor.

Together, as a team, Shrini and his supervisor were working toward Shrini's first funded grant. This implied navigating every highs and lows through five different grant cycles. From aiding in writing skills to strategizing the science pitch to moral support, Shrini's supervisor mentored and steered him toward his science career.

Shrini's friend, Amy, a third year PhD candidate, was experiencing a tad hostility.

She was told to not "waste time" in conferences when she could spend the same time in lab hours. She was also discouraged from applying to a mere travel grant because the advisor had sufficient funds. In retrospect, Amy regrets not being able to reap benefits of attending a conference or the fulfilment of winning a travel award.

## Support System for Women Researchers working in STEM



### Introduction

It is inevitable that the support one receives from mentors, co-workers and the workplace environment plays a major role in shaping up one's career. Surveys point to the [skewed nature of women/girl participation in STEM careers](#) - not because of a paucity of talent but several other factors including [social and cultural values](#), [lack of adequate mentoring](#) and workplace support in general. Most individual success stories, along with self initiative of course, highlight the [significance of a mentor](#). That Amy's and Shrini's careers turned out differently is no surprise.

The Career Support Group - Women in Science (CSG-WiS) survey series is an attempt to gather and understand quantitative and qualitative data about work environments as experienced by women and men with advanced degrees. The survey asked respondents about the 'level of support' they received in their respective work environments from group leaders (similar to a supervisor in some settings), colleagues, collaborators, clients and family members. 'Gender' of the mentor, colleague, collaborator or family member was a variable the respondents had to consider. In addition, they had to pick one of six options for the 'level of support' received: always, moderately, mostly, never, rarely or not available. See schematic 1.

Indicate the level of support that you have received from your MALE colleagues in the following roles?

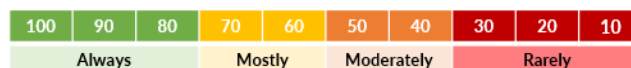
	Always	Mostly	Moderately	Rarely	Never	Not Applicable
Group leader	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Colleagues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*Schematic 1: A snapshot of the survey showing how the question was framed and how respondents had to choose the 'level of support' based on working and personal relationships.*

In this report we present and discuss the results of this survey vis-a-vis 'levels of support' experienced by the respondents.

Two caveats the reader must keep in mind. (i) Our interpretation assumes that response *Always* equals unequivocal support 80-100% of the time; *Mostly* equals support 60-80% of the time; *Moderately* equals support 40-60% and *Rarely* equals support 0-40% of the

time (see schematic 2). Of course this is arbitrary and survey respondents may have had another scale in their minds. What is *mostly* for one respondent maybe *moderately* for another, and (ii) we use the word 'support' indicating mentorship, financial help, encouragement and general help that one requires to grow to full potential working in a STEM environment. In the context of this survey it depends on the interpretation of the respondent.



*Schematic 2: Schematic showing our interpretation of 'Levels of Support'. All numbers are percentages. The reader must keep this scale in mind while referring to figures 1-6.*

Majority of our respondents were Indian nationals (90.4%) working across the world. About 32% of the Indians polled work in India, 48% in USA and 20% in other countries. Our respondents were predominantly female (73.5%) and maximum survey responses were filled in the USA (45.6%) followed by India (29.2%).

Keeping this in mind we analyzed our results by sub-setting survey responses by geographical regions. Three regions were explored - India, USA and the rest of the world (RoW). Next we categorized responses by gender and determined unique trends.

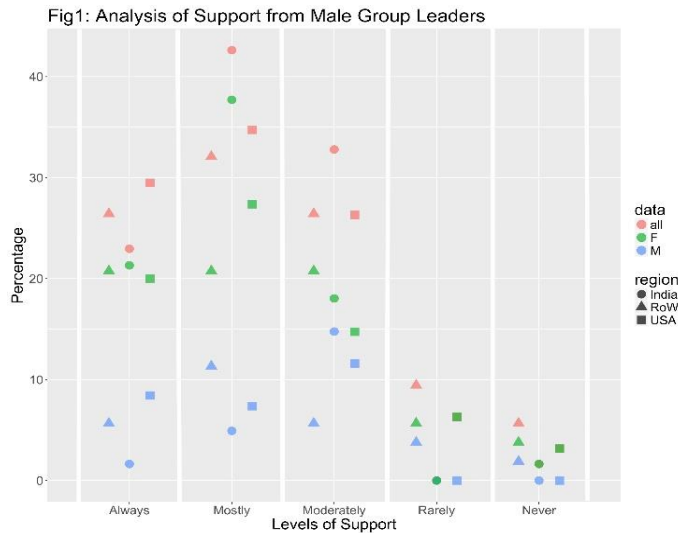
No matter how we segregated the data, a few key findings remained invariant. First, most people have worked with more male supervisors (an average of 3) compared to female supervisors (average of 1). [This points to a lack of female leadership, which is unfortunately relevant across various professional fields.](#) Second, most people reported being 'mostly' supported by their co-workers be it group leaders, colleagues or collaborators. Third, our survey shows across region and gender divide a strong family support - be it friends, parents or spouse- exists.

In the next few sections we present category wise survey results.

For analysis and presentation, the data were segregated into three groups. In Figs 1-6, Group 1 represents respondents from India (circles). Group 2 represents respondents from USA (squares) and Group 3 represents rest of the world (RoW, triangles). For each group, data was further divided by gender of respondents. Pink symbols show all pooled data by region; green symbols show responses by women and blue show responses by men.

## Support from Male Group Leaders

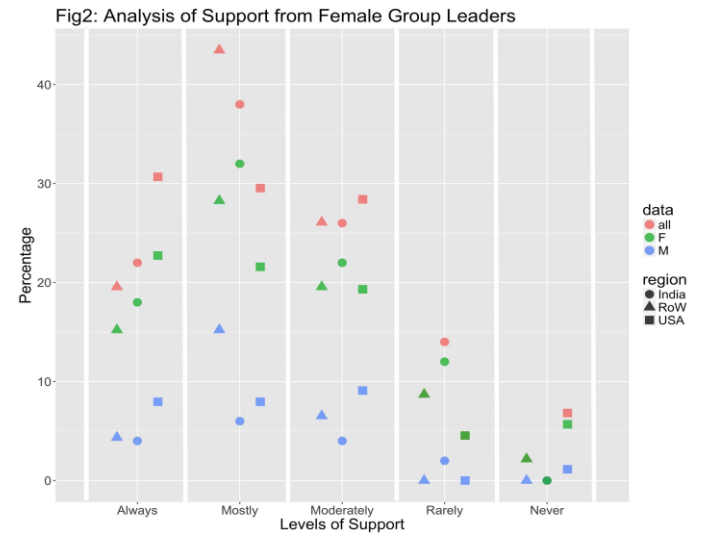
Fig.1 presents results from the survey question asking respondents to rate the level of support they received from Male group leaders.



1. In the 'always' category, male group leaders (GL) in the US were found to be more supportive of their subordinates than in India and RoW. Indian Male GLs were found to be the least supportive. When we looked at gender specific responses, across the three categories, women were better supported by male group leaders.
2. In India and US, women experienced better support from Male GLs. Maximum respondents who polled (~35%) were 'mostly' supported by male group leaders' regardless of the country they worked in. When we split responses along gender and region lines we found that in both India and USA more men feel 'moderately' supported by male GLs (compare blue circles and squares across the 'mostly' and 'moderately' categories) whereas more females polled in the 'mostly' category (compare green circles and squares across the 'mostly' and 'moderately' categories).
3. The two lack of support categories - 'rarely' and 'never'- were interesting. From India, only one person (a woman) replied never and no one replied rarely. This was not the case with data from the US or RoW. All negative responses from the US were female respondents and men seemed to not have experienced a lack of support.
4. Overall RoW fared poorly when compared to others be it men or women respondents. 10% of people reported 'rarely' being helped while ~5% reported 'never'.

## Support from Female Group Leaders

Fig.2 presents results from the survey question asking respondents to rate the level of support they received from Female group leaders.

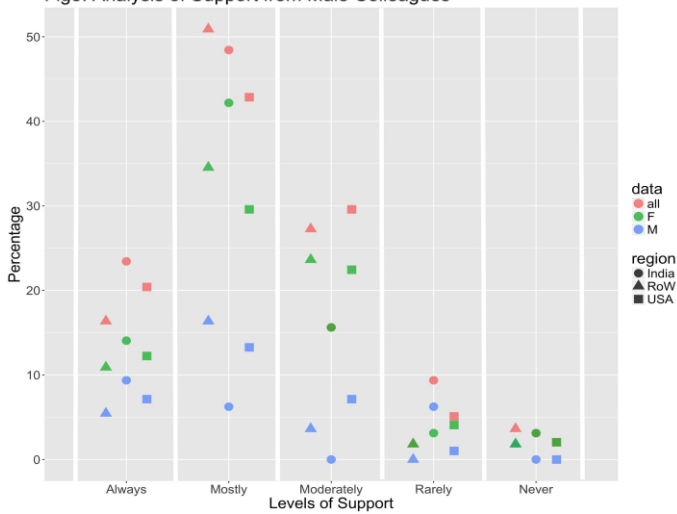


1. Female GLs from US were 'always' more helpful when compared with Female GLs from India or RoW. The majority of our respondents in India (38%) and RoW (43.4%) reported being 'mostly' supported from female group leaders. This was in sharp contrast to US where maximum people (30.6%) reported being 'always' supported by female group leaders.
2. In fact, Female Group Leaders in the US were consistently helpful - compare pink squares across 'always', 'mostly' and 'moderately' categories. Surprisingly they also lead in the 'never' category.
3. Female group Leaders from India, at ~15%, were most likely to 'rarely' support people working with them. More people reported being unsupported by female GLs than male GLs across regions.
4. Most people who reported 'never' or 'rarely' being supported were women. This begs us to ask the question if a same sex bias exists.

## Support from Male Colleagues

Fig.3 presents results from the survey question asking respondents to rate the level of support they received from Male Colleagues.

Fig3: Analysis of Support from Male Colleagues

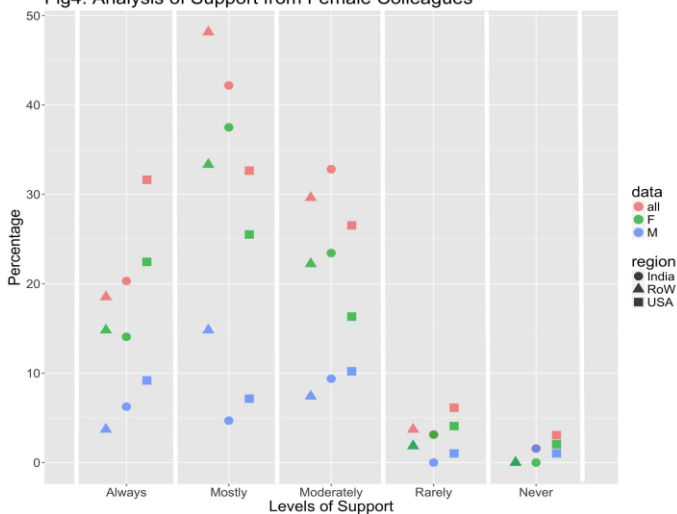


1. Across regions, the maximum number of responses (48.5% from India, 42.8% from US and 50.9% from RoW) polled in the 'mostly' category.
2. Male colleagues in India were 'always' more helpful towards their coworkers. They are also most likely to 'rarely' help when compared to counterparts from USA and RoW.
3. In categories that measured lack of support women polled higher than men.
4. Data from India showed that a larger fraction of men cannot expect help from male colleagues. This also raised the question if a same sex bias exists.

### Support from Female Colleagues

Fig.4 presents results from the survey question asking respondents to rate the level of support they received from Female Colleagues.

Fig4: Analysis of Support from Female Colleagues



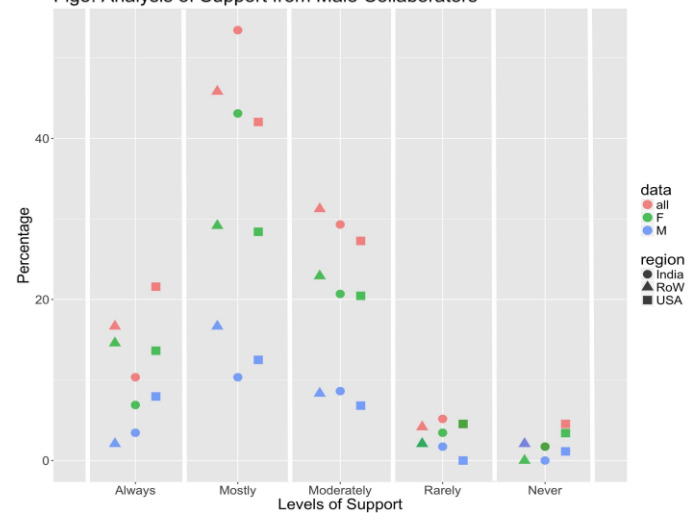
- 1) Regardless of the region, maximum number of responses polled in the 'mostly' category. Region wise breakup was: 42.1% polled from India, 32.6% from US and 48.1% from RoW.

- 2) Compared to male colleagues (~20%, see Fig 3), female colleagues in the US were remarkably 'always' more helpful towards others (31.8%, see Fig4).
- 3) Female colleagues in US were also less likely to help others when compared with their counterparts in India and RoW.
- 4) Once again women were disproportionately affected by the lack of support (see 'never' and 'rarely' categories).

### Support from Male Collaborators

Fig.5 presents results from the survey question asking respondents to rate the level of support they received from Male Collaborators.

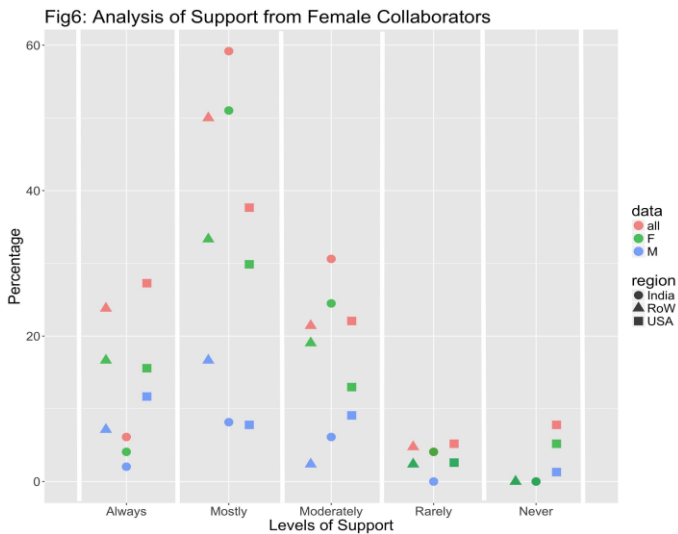
Fig5: Analysis of Support from Male Collaborators



- 1) Regardless of the region, maximum number of responses (53.45% from India, 42.04% from US and 45.8% from RoW) polled in the 'mostly' category.
- 2) Different from other groups, men in the USA were equally supported both 'always' and 'moderately'. They were also least likely to not be supported compared to men polled from India and RoW.
- 3) Regardless of region, more women were unsupported compared to men.

### Support from Female Collaborators

Fig.6 presents results from the survey question asking respondents to rate the level of support received from Female Collaborators.



clear people responding with 'not available' implied that they had no direct experience of working with a male or female co-worker hence could not respond to questions of support. We chose to interpret these NAs as a measure of 'lack of interaction' (Fig.7).

More number of people had no direct experience of working with a female group leader (~16%, 35 NA's in 219 responses) or a female collaborator (~23%, 51 NA's in 219 responses) in comparison to their male counterparts. For example, only 7 people have no direct experience of working with a male group leader (~3%) and 16 of not working with a male collaborator (7.3%).

These numbers seem to reinforce what we already know about work environments in STEM, i.e. in leadership positions men dominate and fewer women run their own labs. This also correlates with another metric in our survey data - the average number of male bosses one respondent worked with was thrice the average number of female bosses. Nearly 34% of respondents from India and 21% of respondents from the US have not worked with a female boss.

At ~23%, the lack of female collaborators is a bit alarming. If we break this down by gender we see both men and women lack female collaborators with men faring marginally (12/51 NAs or ~21%) better than women (39/51 NA responses, ~24%). When we look at the lack of male collaborators (25 NAs in data) women fare poorly when compared to men. 22 NA responses came from women respondents (~13.6% and only 3 from men respondents (~5%).

It is striking that women lag behind men in setting up work collaborations. Men fare better but in general have fewer female collaborators. The importance of collaborative work in STEM cannot be understated and if women are not succeeding in setting up collaborations their career development and progression will most likely suffer.

- 1) Regardless of the region, maximum number of responses (59.18% from India, 37.66% from US and 50% from RoW ) polled in the 'mostly' category.
- 2) In the 'always' category female collaborators from India fare poorly when compared to counterparts from US and RoW polling in close to 5%. This was lower than responses polled from US (~30%) and RoW (~25%).
- 3) Female collaborators in the US were 'always' more supportive of both male and female co-workers whereas female collaborators in India and RoW were 'mostly' supportive.
- 4) Women collaborators in the US were also marginally likely to 'never' support their co-workers.
- 5) Women collaborators, regardless of region, are 'rarely' likely to support others - particularly women.

### What does 'Not Available' data tell us?

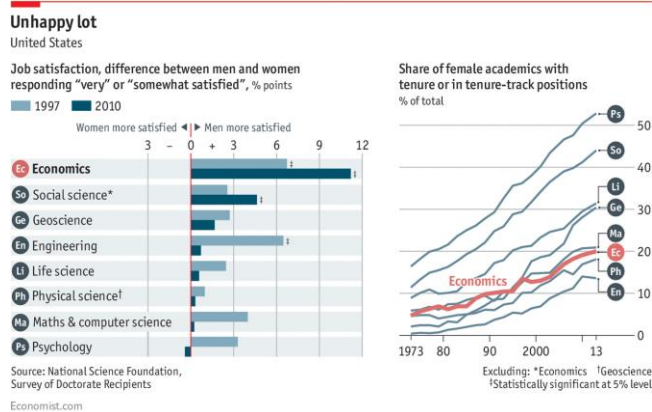
Fig.7- Graph depicts all 'not available' responses as a percentage of total number of male and female response. Higher the percentage, higher is the degree of lack of interaction. More people, be it men or women, lack female collaborators. A similar trend was observed for female group leaders.



All the percentages presented above were calculated after removing 'not available' (NA) data points. It was

## Conclusions

The first part of our analysis sheds light at some interesting trends.



Most people report being 'mostly' supported by male or female co-workers which leads one to believe that people find, on the whole, their work environments agreeable. This is counterintuitive on two accounts. Compared to women, men in general reported higher job satisfaction across different academic fields as surveys conducted by National Science Foundation (NSF) have shown multiple times (Fig.8). In fact these surveys reported a decrease in job satisfaction from 1997-2010. The NSF survey reported zero job satisfaction for women across all fields.

Postdoctoral surveys in [US](#) and [Canada](#) have highlighted the need for better support systems and mentorship for career advancement. Different from these reports most people we surveyed, a majority of whom were women, reported being 'mostly' supported at work.

## References:

### Mentorship and Women:

1. Mentors Help Create a Sustainable Pipeline for Women in STEM: This Forbes article states that Women make up about half of the workforce in America, but they only represent 24% of the workforce in STEM fields. How mentorship can change that - <https://www.forbes.com/sites/bonniemarcus/2014/03/28/mentors-help-create-a-sustainable-pipeline-for-women-in-stem/#6c7809a653d3>
2. "Million Women Mentors program", an initiative that strives to create a pathway by connecting girls/women to potential mentors. Idea is to mobilize a million men and women to sign up and pledge as mentors, to create that pool of people who can be paired up with these young girls and women. [https://www.millionwomenmentors.com/downloads/Women\\_in\\_STEM\\_-\\_Realizing\\_the\\_Potential.pdf](https://www.millionwomenmentors.com/downloads/Women_in_STEM_-_Realizing_the_Potential.pdf)
3. How can mentoring support women in a male-dominated workplace? A case study of the UK police force: <https://www.nature.com/articles/palcomms2016103>

Women also consistently polled higher than men in categories that signify lack of support. Across regions and gender of co-worker considerations this trend remains robust. Women also had fewer collaborations (Fig.7).

Our survey hints that a [same sex bias](#) possibly exists when it comes to helping coworkers as observed in other [comprehensive studies](#). Indian male colleagues are least likely to help men working with them when compared to other groups. Similarly, female group leaders, colleagues and collaborators are more likely to not offer support to a woman.

What impedes women from setting up [collaborations](#)? Could same-sex bias be a [factor](#)? An interesting [study](#) highlights the tendency of men, across various fields, to selectively collaborate with other men whereas they find women to be more egalitarian in their collaborations. Are women shy to ask for help and team up with others? If true, does this have roots in our cultural upbringing? [Or is it the lack of good mentorship for women in academia](#)? Even if the rates of attrition are similar for men and women in companies, the playing field is not similar and [women in the workplace](#) face daunting challenges specific to their gender.

The trends in this survey reveal issues around inclusion and biases that affect career goals. One thing is clear we must all set our biases aside and rally around each other for an equitable tomorrow. As Indra Nooyi said at a panel discussion during the 2016 Women in the World Summit in New York City - "Let's figure out how we can help each other way more than what we are doing today."



### Women and support at the workplace:

1. 2017 McKinsey Report on Women in the workplace: More companies are committing to gender equality. But progress will remain slow unless corporates confront blind spots on diversity—particularly regarding women of color, and employee perceptions of the status quo. <https://www.mckinsey.com/featured-insights/gender-equality/women-in-the-workplace-2017>
2. 2018 McKinsey Report on Women in the workplace: Companies say they are committed to more diversity, gender and race, at work but they must turn good intentions into concrete action. Unfortunately, progress on gender diversity at work has stalled. <https://www.mckinsey.com/featured-insights/gender-equality/women-in-the-workplace-2018>
3. PDF of 2018 Mc-Kinsey report on women: [https://www.reachire.com/wp-content/uploads/Women\\_in\\_the\\_Workplace\\_2018.pdf](https://www.reachire.com/wp-content/uploads/Women_in_the_Workplace_2018.pdf)
4. Efforts towards inclusion and diversity is on the rise. While social justice is the initial impetus behind these efforts, companies have increasingly begun to regard inclusion and diversity as a source of competitive advantage, and specifically as a key enabler of growth. Yet progress on diversification initiatives has been slow. (PDF is embedded). <https://www.mckinsey.com/business-functions/organization/our-insights/delivering-through-diversity>
5. In 2016, a study published in the *Academy of Management Journal*, found that senior-level women that try to help other women at work are likely to face more negative performance reviews than those who don't. Men, who hold majority of senior roles, are often hesitant to network with women, worried that mentorship will be mistaken for a come-on. Also, when women do have the opportunity to network, they are sometimes reluctant to do it viewing 'networking' and mentoring as inauthentic and transactional. <https://www.inc.com/magazine/201710/jessica-bennett/women-coworking-spaces.html>
6. INSEAD is a graduate business school with campuses in Europe, Asia, and the Middle East. Their report "[Social Support Sets Women Up for Success at Work](#)", on women being nearly equally represented in the labour force at large, but not so much at higher corporate hierarchy. Important as they are, non-discrimination policies alone have not levelled the playing field.
7. In addition, for those companies with the financial capability, providing on-site childcare or childcare credit can make an enormous difference in parents' lives. While the gender gap is a complex societal issue, employers can become agents of change by reviewing and amending organizational policies that may be putting women at a disadvantage in the employment setting. [Some suggestions on Organizational policies and practices.](#)
8. Health and well-being at work: The key role of supervisor support. Hämmig O. *Health SSM Popul Health*. 2017;3:393-402.
9. [Key findings on the 2018 LeanIn.org report on women in the workplace.](#) (survey conducted by LeanIn in partnership with McKinsey) - 279 companies employing more than 13 million people shared their pipeline data and completed a survey of their HR practices. In addition, more than 64,000 employees were surveyed on their workplace experiences, and we interviewed women of different races and ethnicities and LGBTQ women for additional insights.

### Further Reading:

1. Obstacles to Female Leadership: About four-in-ten believe higher standards for women and lack of readiness by companies to hire women for top positions and by voters to elect women to higher office are major reasons that there aren't more women in top leadership roles in business and politics. Other reasons, such as family responsibilities, inexperience, or women not being tough enough, are cited less frequently as significant barriers to female leadership. <http://www.pewsocialtrends.org/2015/01/14/chapter-3-obstacles-to-female-leadership/>
2. Women and leadership survey by PEW (Washington-based think-tank). This report explores public attitudes about gender and leadership with a particular focus on leadership in U.S. politics and business. - [http://www.pewresearch.org/wp-content/uploads/sites/3/2015/01/2015-01-14\\_women-and-leadership.pdf](http://www.pewresearch.org/wp-content/uploads/sites/3/2015/01/2015-01-14_women-and-leadership.pdf)

3. Female representation in the field of Economics. Academic economists are overwhelmingly male. According to information from university websites, about 20% of Europe's senior economists are women. In America, about 15% of professors are women. At Harvard, arguably the most prestigious economics department in the world, the faculty pictures that beam down from the wall feature 43 senior members of the department. Only three are women. Two have tenure. <https://www.economist.com/christmas-specials/2017/12/19/women-and-economics>
4. In countries with higher gender equality, women are less likely to get STEM degrees. Researchers analyzed data on 475,000 adolescents across 67 countries or regions. The researchers found that, throughout the world, boys' academic strengths tend to be in science or mathematics, while girls' strengths are in reading. <https://www.weforum.org/agenda/2018/02/does-gender-equality-result-in-fewer-female-stem-grads>
5. Where The Gender Pay Gap Is Widest. Organisation for Economic Co-operation and Development (OECD data) <https://www.forbes.com/sites/niallmccarthy/2018/03/08/where-the-gender-pay-gap-is-widest-infographic/#78921a1d1693>
6. Gender wage gap is among the worst in India. India had among the worst levels of gender wage disparity – men earning more than women in similar jobs – with the gap exceeding 30 per cent, the Global Wage Report 2016-17 released by the International Labour Organisation (ILO) <https://www.thehindu.com/business/Industry/Pardon-the-gender-wage-gap-is-showing/article16921327.ece>.
7. How can mentoring support women in a male-dominated workplace? A case study of the UK police force: <https://www.nature.com/articles/palcomms2016103>.
8. Mentors Help Create A Sustainable Pipeline For Women In STEM: This Forbes article states that Women make up about half of the workforce in America, but they only represent 24% of the workforce in STEM fields. How mentorship can change that - <https://www.forbes.com/sites/bonniemarcus/2014/03/28/mentors-help-create-a-sustainable-pipeline-for-women-in-stem/#6c7809a653d3>.
9. 'The Stop Street Harassment survey', meanwhile, looked not just at the prevalence of harassment and assault overall but also at different types of experiences as well as different locations, like home, work, or school. Respondents had to choose whether they identified as female or male, though they were also asked a separate question about their preferred gender identity – 13 people identified as transgender, 5 as other, and 63 did not respond to the gender identity question. <http://www.stopstreetharassment.org/wp-content/uploads/2018/01/Full-Report-2018-National-Study-on-Sexual-Harassment-and-Assault.pdf>
10. VOX article "Measuring #MeToo: more than 80 percent of women have been sexually harassed or assaulted": <https://www.vox.com/identities/2018/2/21/17036438/sexual-harassment-me-too-assault-hollywood>.
11. These are the industries with the most reported sexual harassment claims: <https://www.vox.com/identities/2017/11/21/16685942/sexual-harassment-industry-service-retail>
12. Women and STEM careers. An interesting article with data on women in STEM careers. There are two universally accepted "truths" about women and STEM careers 1) men outnumber women in in these fields, and 2) women are socialized to avoid STEM as career choices, because society considers them "unfeminine." These beliefs have spawned a national effort by NSF to attract girls and young women into STEM. The preferred strategy is to attract females by "unbrainwashing them" into accepting STEM careers as appropriate for women. On closer inspection, it turns out that these "truths" are nothing more than assumptions, and that these assumptions are inconsistent with the facts. Here are the facts:
13. <https://www.pbs.org/newshour/economy/making-sense/truth-women-stem-careers>
13. Why women are worried about #MeToo - <https://www.vox.com/2018/4/5/17157240/me-too-movement-sexual-harassment-aziz-ansari-accusation>

## ACKNOWLEDGEMENTS



[Author: Data Analysis] [Divya Swaminathan, PhD](#) is a computational scientist working at the intersection of physics and biology. Her research focused on mathematical modelling of calcium channel through signal detection in fluorescence images and understanding what single particle tracks tell us about the movement of proteins in crowded intercellular environments! At present, she is engaged in plotting her own career transition story. One of her goals is to communicate relatable, jargon-free science to engage more people in conversation. Follow her on [LinkedIn](#).



[Author: Literature Review] [Shubhendu Sen Roy, PhD](#) did his PhD from Indian Institute of Science (IISc.) followed by postdoctoral research at UCLA. His research interests include metabolic and signalling control of mammalian preimplantation development & differentiation and disease. He is passionate about science, society and politics. In his downtime, he hatches travelling/trekking plans or dabbles with a sketching and water-colouring or contemplates restarting his blogs on [science](#) and [cinema](#). Connect with him on [LinkedIn](#).



[ClubSciWri Editor] [Dolonchapa Chakraborty, PhD](#) is a Postdoctoral Fellow at NYU Langone working on Infectious disease with a focus on cell wall metabolism to identify new targets for therapeutic attacks by *Pseudomonas aeruginosa*, a common opportunistic human pathogen. She also serves as the Co-Chair of National Postdoctoral Association's Outreach Committee. She believes in the power of technical storytelling as an effective tool for scientific outreach and looks forward to practicing this art as an editor at ClubSciWri. Follow her on [Twitter](#).



[ClubSciWri Editor] [Paurvi Shinde, PhD](#) is a Post Doc Fellow at Fred Hutchinson Cancer Research Center, where she studies how certain receptors expressed on immune cells can alter their phenotype and function during HSV-2 infection. As an Assistant Chief Editor of ClubSciWri she loves editing articles to make them easy and fun to read. Apart from this, she is currently a Mentor for students at Freedom English Academy (FEA, New Delhi, India) and an active member of Women in Bio, Seattle Chapter. Follow her on [LinkedIn](#).



[ClubSciWri Illustrator] [Bhrgu Yagnik, PhD](#) is a Postdoctoral Fellow at [Emory Vaccine Centre](#), [Yerkes National Primate Research Centre](#), Emory University, Atlanta and works on the development of a HIV/AIDS vaccine. Bhrgu is passionate about communicating science creatively and work as a writer and illustrator with various scientific magazines and sci-blogs. In his free time, Bhrgu indulges himself into the spirituality where he attempts to bring amalgamation of science and spirituality. Follow him on [Twitter](#), [LinkedIn](#) and [ResearchGate](#).



[Illustrator: Demographics] [Vibhav Nadkarni, PgDipSci](#), a biotechnologist by training has gained multifaceted experience in sales, marketing, team management, market data research and entrepreneurship. He completed his post-graduation in Biosciences from University of Auckland, NZ. In his spare time, he works on building his [online travel venture](#), and explore ways to incorporate creativity into life sciences. Connect with him on [LinkedIn](#)



[CSG-WiS Survey Coordinator] [Shraddha Lad, PhD](#) completed her doctoral thesis in Epigenetics and Imprinting as a Marie Skłodowska-Curie Early Stage Researcher from Naples, Italy and is currently working as a Medical Editor at [Klick Inc.](#), Toronto, Canada. She is passionate about communicating fascinating science succinctly and encouraging women empowerment. In her free time, she enjoys reading, tasting different cuisines, music and coordinating interesting events Connect with her on [LinkedIn](#)



[CSG-WiS Administrator] [Deepa Balasubramaniam, PhD](#) is a Research Scientist at the Lilly Biotechnology Center in San Diego (Eli Lilly and Company) where she unravels protein-protein interactions. She is passionate about helping others succeed and volunteers her time as a mentor for CSG Gurukool and founded CSG-WiS to support her peers. She enjoys reading and exploring the world with her two girls. Connect with her on [LinkedIn](#).

### Survey Design

Aishwarya Swaminathan, PhD, Awanti Sambarey Pandit, PhD, Disha Chauhan, PhD, Heena Khatter, PhD, Madhurima Das, PhD, Malvika Sharan, PhD, Manasi Pethe, PhD, Pallashri Saha, PhD, Radhika Gopal, PhD, Sandhya Sekar, PhD, Shivasankari Gomathinayagam, PhD

### Survey Analysis

Aishwarya Swaminathan, PhD, Ashwani Sharma [PhD student], Divya Swaminathan, PhD, Malvika Sharan, PhD, Soudeh Yaghouti, PhD, Poorva Dharkar, PhD, Shivasankari Gomathinayagam, PhD, Shubhendu Sen Roy, PhD, Shraddha Lad, PhD, Siddarth Chandrasekaran, PhD

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