Diversity in the European Innovation Industry and IP Profession

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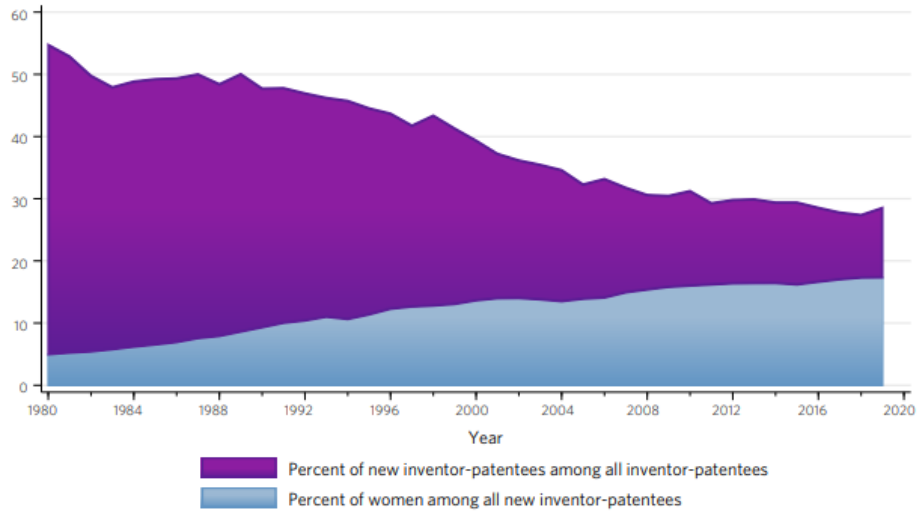
Introduction

The premise of this whitepaper is to review diversity metrics in the Intellectual Property ("IP") space in Europe with the hopes of empowering all members of the population to contribute successfully to the innovation and IP industries. We believe diversity results in greater innovation, economic growth, and improved resiliency and stability across the population as whole. This whitepaper focuses on gender and ethnic minority representation in the EU and UK, and it includes looking at law firms, corporations, and government agencies such as WIPO, EPO and UKIPO. The demographics in the innovation industry were compared to the demographics represented amongst inventors named in European patents and patent applications. The overview began by looking at the US innovation space as a benchmark.

Part 1 – Approach

In 2019 the USPTO issued a report on US women inventor-patentees called "Progress and Potential: A profile of women inventors on US patents"[1]. An update was issued in 2020, using three years of new data collected between 2017 and 2019. The data gathered in this report showed that more women are entering and staying active in the US patent system than ever before. The number of patents with at least one woman inventor increased from 20.7% in 2016 to 21.9% by the end of 2019. It was also reported that women are making up an increasing share of all new entrants to the US patent system, rising from about 5% of new inventor-patentees in 1980 to 17.3% by 2019.

New US inventor-patentees as a percentage of all inventor-patentees, and corresponding women's percentage, 1980-2019



Source: Analysis by the authors of the 2020 update of Progress and Potential (USPTO) of PatentsView data, 1976 – 2019

[1] https://www.uspto.gov/sites/default/files/documents/Progress-and-Potential-2019.pdf

The Inventor Diversity for Economic Advancement Act (IDEA Act)[2] goes further than the consideration of gender diversity and is a proposed bipartisan act of Congress that directs the USPTO to collect, on a voluntary self-reporting basis, information about inventors. It grants the ability to provide the following information regarding inventors: gender, ethnicity, national origin, sexual identity, veteran status, disability, and education and income levels.[3]

There is also increased interest in the USA about eligibility for admission to the Patent Bar. Mary Hannon published an article in the Fall of 2020, which focused on whether expanding eligibility requirements would foster greater inclusion and innovation in the US patent system. The USPTO issued a response to questions by Senators Tillis, Coons, and Hirono in January 2021, where they set out the data they had available regarding gender of applicants for the Patent Bar. In September 2021, the USPTO reported that they had expanded the degree categories that would automatically entitle the holder to apply for the Patent Bar, for example to include aerospace engineering, biological sciences and electronics engineering.

This increased interest in diversity in the USA led to questions about the situation in the UK and Europe. A few of the questions asked were:

- Is there data available on innovation in the UK and Europe? If so, what does it show?
- Is there data available on practitioners working in Intellectual Property in the UK and Europe? If so, what does it show?

The answer to these questions is not simple, and is further complicated by the fact that there are both national Intellectual Property Offices, and pan-European institutions such as the European Patent Office (which serves countries of the European Union and beyond) and EUIPO (European Union Intellectual Property Office, which is responsible for managing EU trademarks and registered Community designs).

Starting with the UK, there are a number a studies and surveys available that give information relating to the make-up of people working at the UKIPO[4] and in the UK Patent and Trademark professions. The UKIPO also issued a report[5] in 2019 on gender profiles in worldwide patenting.

With regard to the EPO, this is by its very nature home to a diverse workforce, with almost 7000 staff from 35 countries. Data detailing the breakdown of EPO staff by a variety of metrics is available in the EPO's Social Reports[6]. However, it has not been possible to find specific data relating to the diversity, gender or otherwise, of inventors filing at the EPO.

Information regarding the make-up of the staff working at the EUIPO is available in an HR Annual Report for 2020. However, again, no information was found relating to the diversity, gender or otherwise, of applicants.

In contrast to the EPO and EUIPO, WIPO does maintain and report data on the share of international patent applications with at least one woman inventor. This was reported[7] in 2018 by region, including Europe. Our preliminary review of other national offices did not disclose any further metrics as it appears collecting such data may violate local or national privacy laws. The fact that it has been difficult, if not impossible, to find data relating to anything more than gender diversity for inventors, and the fact that it has not been possible to source data about the diversity of IP professionals for more than a small number of countries, gives an indication that there is still work to be done in this area.

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[2] https://www.govinfo.gov/app/details/BILLS-117s632is/summary
[3] https://www.congress.gov/bill/116th-congress/house-bill/4075
[4] https://www.gov.uk/government/publications/inclusion-and-diversity-report-for-2020-2021
[5] https://www.gov.uk/government/publications/gender-profiles-in-worldwide-patenting-an-analysis-of-female-inventorship-2019-edition
[6] https://www.epo.org/about-us/annual-reports-statistics/social-reports.html
[7] https://www.wipo.int/wipo_magazine/en/2018/02/article_0008.html and https://www.wipo.int/edocs/pubdocs/en/wipo_pub_941_2020.pdf (e.g. pages 21 and 44)

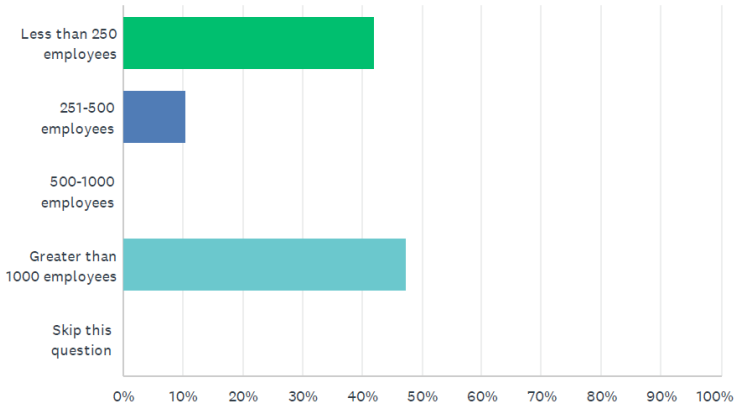
It is acknowledged that the data that has been found is likely to be inherently flawed. For example, the data maintained by WIPO is collected using a worldwide gender-name dictionary. Although this includes 6.2 million names for 182 different countries, it is unlikely to capture all the correct data. The UKIPO study also used forenames to inform gender of inventors, so will be subject to the same or similar errors.

Survey data, such as that referenced in this paper for the UK, is likely to be skewed since it will inherently reflect those willing and engaged enough to respond. This means that this survey data tends to over-represent women and minorities, as these groups tend to be more inclined to participate in surveys on the topic of diversity. What is clear from the data we have been able to source is that it appears that there is a lack of diversity in both innovators and individuals practicing in the area of Intellectual Property. More data in this area, which could be gathered by the Intellectual Property offices and registration bodies, at both the national and European levels, would be useful in determining initiatives to address the apparent lack of diversity.

A survey was conducted within IPO to try to gather some preliminary information from IPO stakeholders and members on the make-up of their IP teams in Europe, including the UK. In particular, the survey was circulated to the IPO Board of Directors, and the European Practice, Women in IP, and Diversity and Inclusion Committees. There were 19 responses to the survey. Of the respondents, there was a good range from smaller to larger organizations, as indicated by the data provided with the responses to the first two questions on these matters shown below.

Q1 What is the size of your firm or organization?

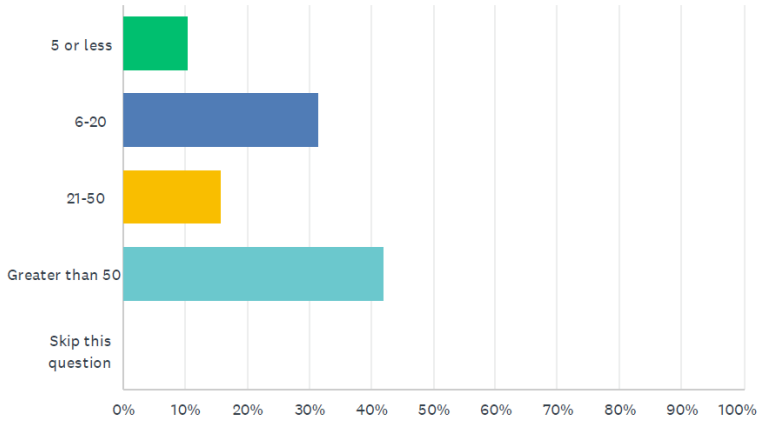
Answered: 19 Skipped: 0



ANSWER CHOICES	RESPONSES	
Less than 250 employees	42.11%	8
251-500 employees	10.53%	2
500-1000 employees	0.00%	0
Greater than 1000 employees	47.37%	9
Skip this question	0.00%	0
TOTAL		19

Q2 What is the size of your intellectual property team engaged in patents and trademarks in Europe, including the UK?

Answered: 19 Skipped: 0



ANSWER CHOICES	RESPONSES	
5 or less	10.53%	2
6-20	31.58%	6
21-50	15.79%	3
Greater than 50	42.11%	8
Skip this question	0.00%	0
TOTAL		19

Part 2 – Findings

GENDER

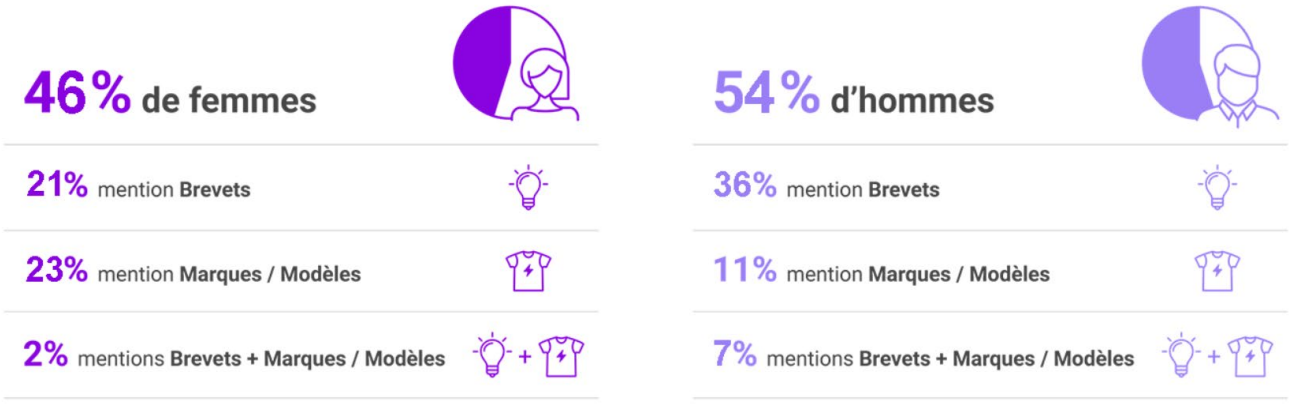
In 2019, IP Inclusive (a UK based organization focused on inclusion and diversity within the IP profession) ran a bench-marking survey soliciting feedback from IP professionals in the UK on a broad range of diversity criteria. They received 1,085 responses, the great majority (80.2%) of which were from private practice. Only 16.2% of respondents were from industry (so-called "in house" professionals) and 12.0% from government organizations (such as the UK Intellectual Property Office). Respondents included patent attorneys (42.8%), solicitors (11.0%), paralegals, IP administrators, and formalities officers (10.6%), Intellectual Property Office employees (10.5%), and trademark attorneys (9.1%), amongst others. Approximately half (52.0%) considered themselves in junior or middle tier positions, with the other half (46.7%) positioning themselves in senior or very senior roles.

On gender, 58.1% of respondents identified as female (compared to 51% in the general UK population[8]), and 39.7% identified as male (compared to 49% in the general population). At first glance, this suggests over-representation of women in the IP profession in the UK. However, there is evidence that women tend to participate more frequently/actively in diversity initiatives and surveys of this type, having a greater vested interest in driving forward change and addressing discrimination than men do[9]. As such, the apparent higher percentage of female representation suggested by this survey may not, in fact, be reflective of genuine parity within the industry.

This is borne out by other sources of data. Indeed, while 48.1% of respondents to the survey identified as female patent attorneys, only **28% of patent attorneys registered with the UK Chartered Institute of Patent Attorneys** identify as **female**. A similar pattern can be seen when comparing the proportion of trademark attorneys identifying as female participating in the survey (67.0%) with the proportion of female trademark attorneys registered with the Chartered

[8] https://www.ethnicity-facts-figures.service.gov.uk/uk-population-by-ethnicity/demographics/male-and-female-populations/latest
[9] https://www.campaignlive.co.uk/article/men-passing-responsibility-gender-diversity-initiatives-women/1676179

Institute of Trademark Attorneys in the UK (53.3%). Another survey, this time performed in 2021 by **IPReg** (the regulatory body for UK Patent and Trademark Attorney) [10] confirms this bias. In their case, of the 1180 participants, 41.79% identified as female and 55.13% identified as male. Similar figures can also be found amongst French IP Professionals, especially as it regards the patent profession.

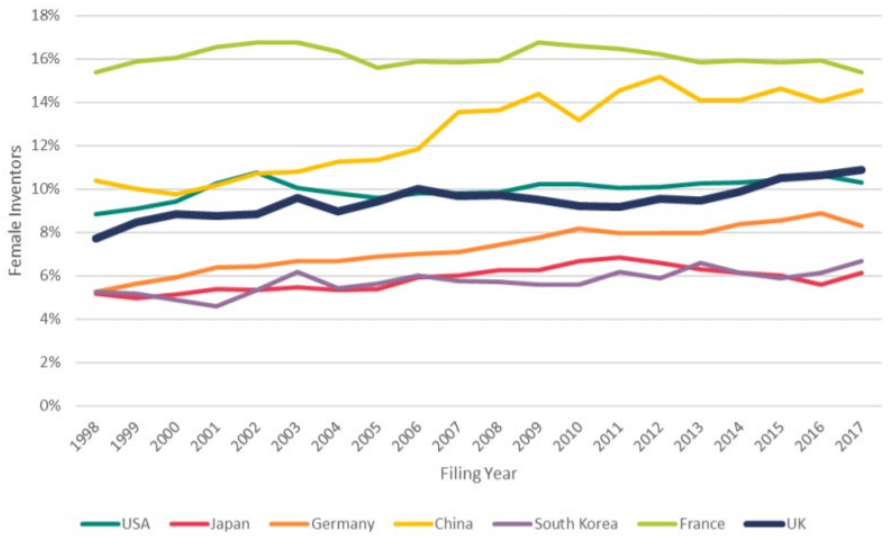


Proportion of Male and Female "Conseil en Propriété Industrielle"
(the French equivalent to registered patent and trademark attorneys)[11]

The IP Inclusive survey may therefore be more indicative of male under-participation in the survey than it is of female (over-) representation in the profession. Relative to the general population, women appear in fact to be underrepresented in the IP profession in the UK and elsewhere.

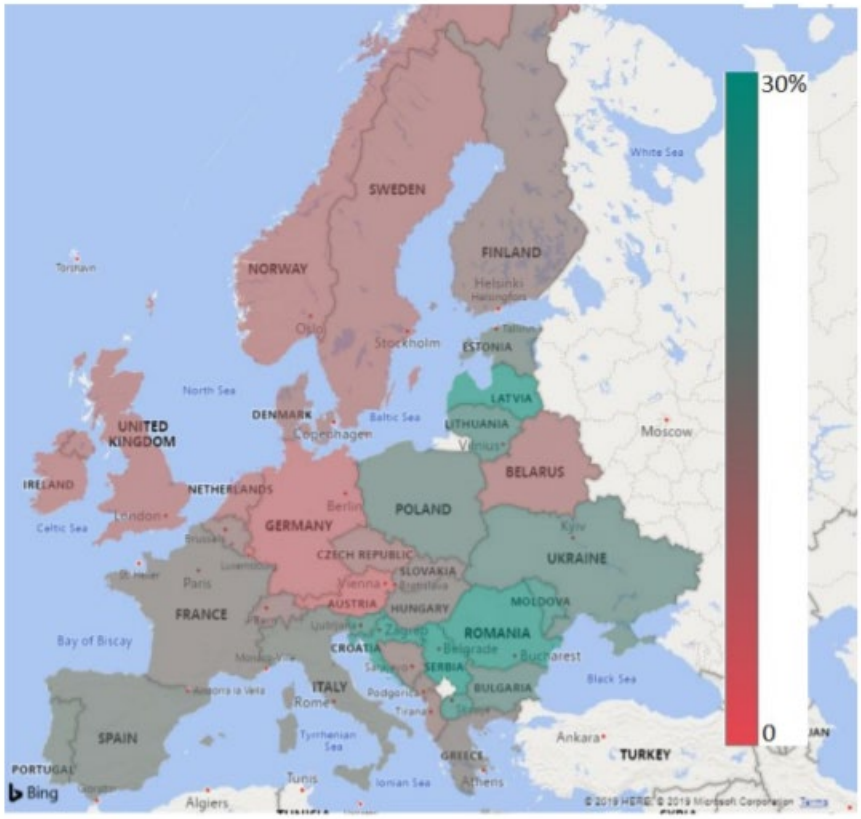
Data on female inventorship in Europe tells a similar story[12]. While Eastern European countries tend to have a higher proportion of female inventors compared to other European countries, even there, the countries with strongest female representation (Latvia, Croatia, Romania and Serbia) still only reach approximately 30% representation. Western European countries, including Scandinavia, fare worse. France has about 16% of female inventors, the UK about 11%; and Germany about 6%. What's more, it is rare for female inventors to be the sole inventors on a patent application, members of women-only teams, or even members of an inventor team with multiple women[13]. Most often, if represented at all, female inventors are the lone woman on an inventor team comprising multiple men.

[10] https://ipreg.org.uk/about-us/equality-diversity-and-inclusion/ipreg-diversity-survey-2021
[11] https://www.cncpi.fr/les_cpi/chiffres-cles/
[12] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/846363/Gender-profiles-in-worldwide-patenting-2019.pdf
[13] Inventor team composition: Germany – about 10% mixed team with a single female inventor, about 4% mixed team with multiple female inventors, and fewer than 2% individual female inventors. France – 20% mixed one female; 1% female only team; 6% mixed team multiple female inventors, and 3% individual female inventors; UK – 15% mixed team with one female inventor; 5% mixed team multiple female, and 2% individual female.



Annual Trends in the Proportion of Female Inventors by Residence Country, 1998-2017

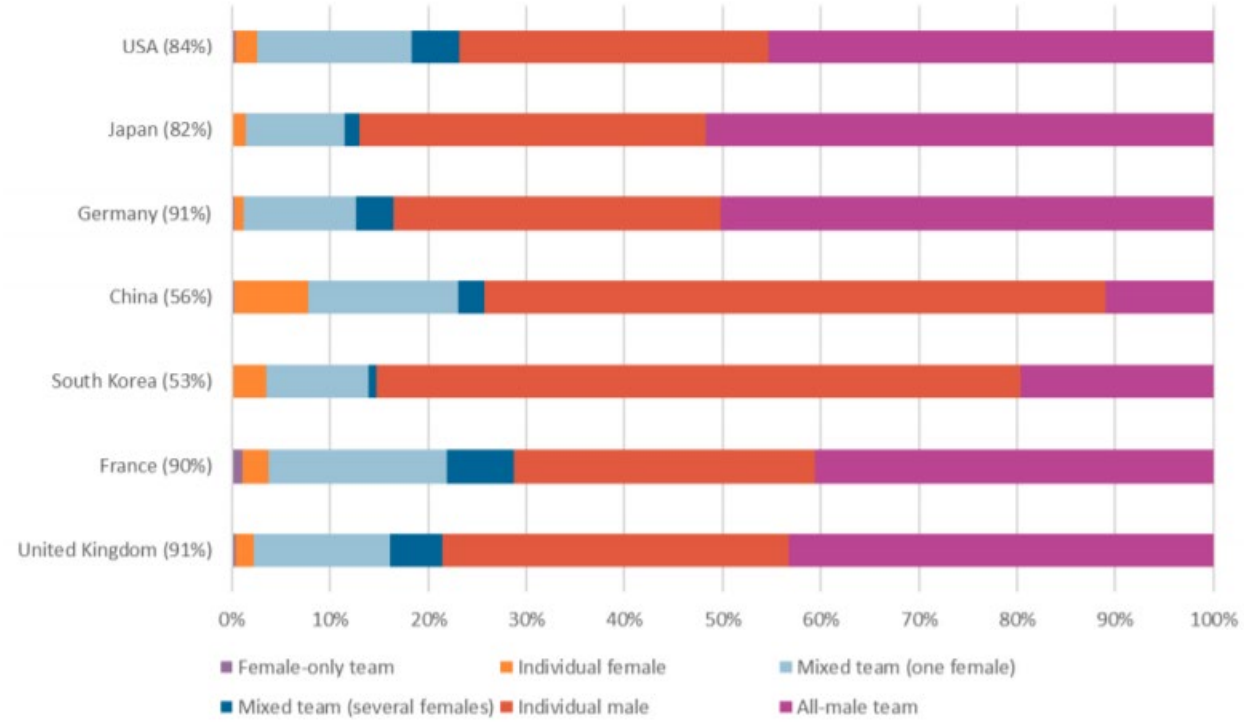
Source: Gender Profiles in Worldwide Patenting - An Analysis of Female Inventorship (2019) [14]



Proportion of Female Inventors for Each Country in Europe (1998-2017)

Source: Gender Profiles in Worldwide Patenting - An Analysis of Female Inventorship (2019)

[14] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/846363/Gender-profiles-in-worldwide-patenting-2019.pdf

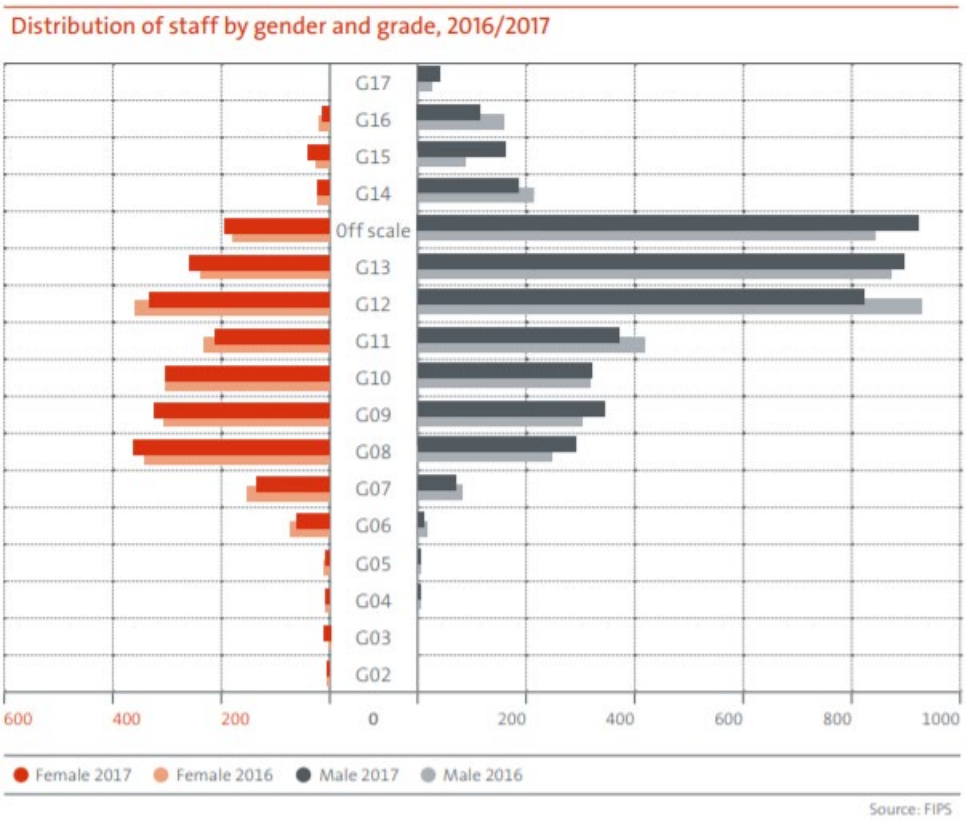


Inventor Team Constituency of Patent Application by Residence Country (team constituency inference rates given alongside each country) – Source: Gender Profiles in Worldwide Patenting - An Analysis of Female Inventorship (2019)

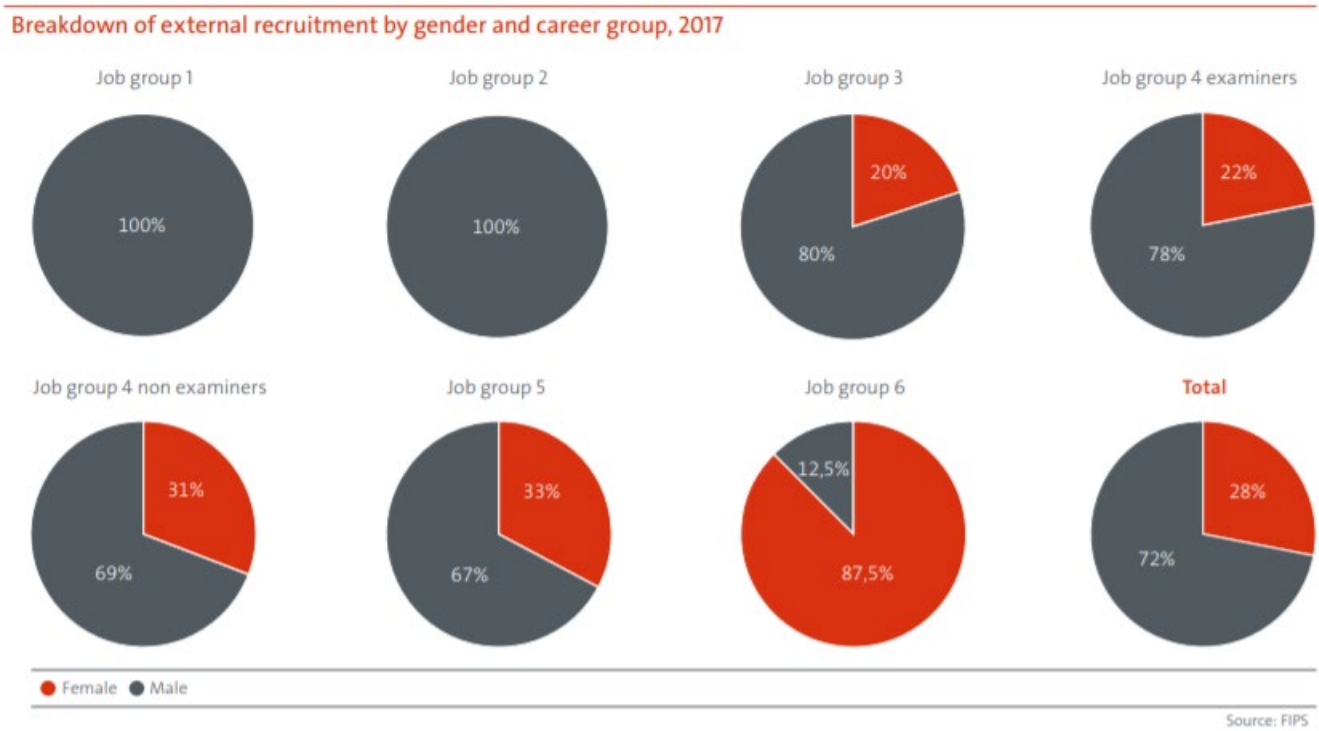
Even when the numbers do suggest strong female representation, they do not necessarily reflect equality of opportunity. Indeed, within the IP profession, the proportion of women in senior private sector roles, among IP barristers and patent attorneys, is significantly lower than among trademark attorneys and in so-called "supporting" roles such as IP paralegals, secretaries and business support professionals. In fact, despite being demonstrably over-represented in the IP Inclusive survey, a smaller proportion of women qualified their roles as "senior" or "very senior" compared to men. And while the overall number of private practice respondents holding very senior roles with business ownership was 15.5%, it was only 7.9% for women.

At the UK Intellectual Property Office[15], while 45.15% of staff members are female, women only represent 21% of patent examiners (which requires a STEM background). At the European Patent Office, only 33% of staff are female (including both permanent and contract staff, both of which have very similar ratios)[16]. This disparity is even more pronounced in more senior EPO roles, as shown in the graph below. For example, there are approximately 900 men at Grade 13 (Director) compared to fewer than 300 women. By contrast, administrative roles (Grades 6 and 7 for instance) tend to be filled by women rather than men. Only 22% of EPO managers are female. This is unlikely to change significantly in the near future based on current recruitment trends: the most recent data (from 2017) shows that almost three times as many men as women were being recruited by the EPO, with 100% of most senior roles and 78% of Examiner roles (but only 12.5% of admin roles) being filled by men.

[15] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/911668/diversity-and-inclusion.pdf
[16] http://documents.epo.org/projects/babylon/eponet.nsf/0/34397A294BF3CEF2C12582BB004636EA/$File/social_report_2017_en.pdf



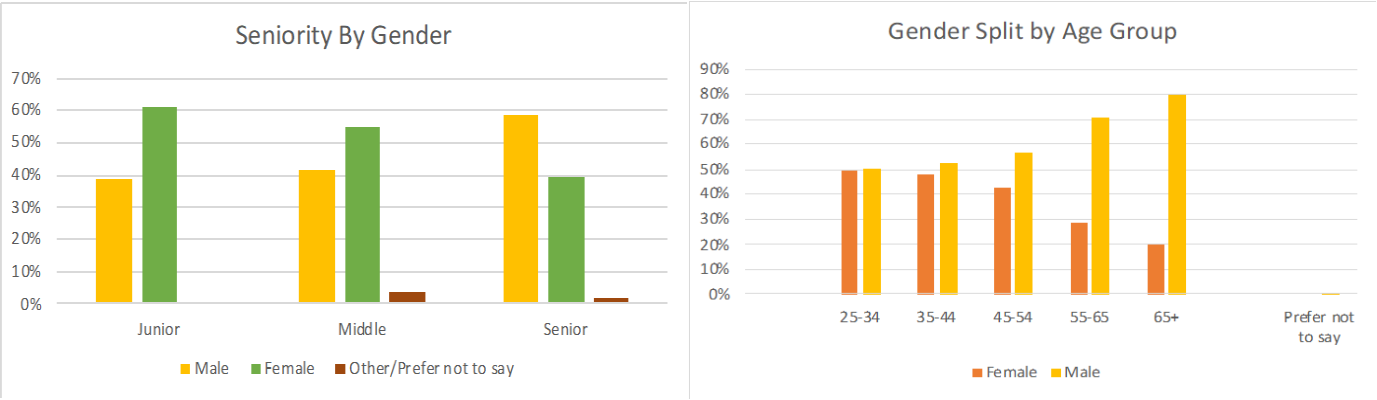
Breakdown of EPO Staff by Grade (where G17 is the most senior and G02 is the most junior grade)



Breakdown of External Recruitment by Gender (Source: EPO Social Report 2017[17])

[17] http://documents.epo.org/projects/babylon/eponet.nsf/0/34397A294BF3CEF2C12582BB004636EA/$File/social_report_2017_en.pdf

Amongst inventors, women are better represented in academia (at about 17%) than in more lucrative industry positions (at about 7%), though both have seen some progress over the last 20 years.

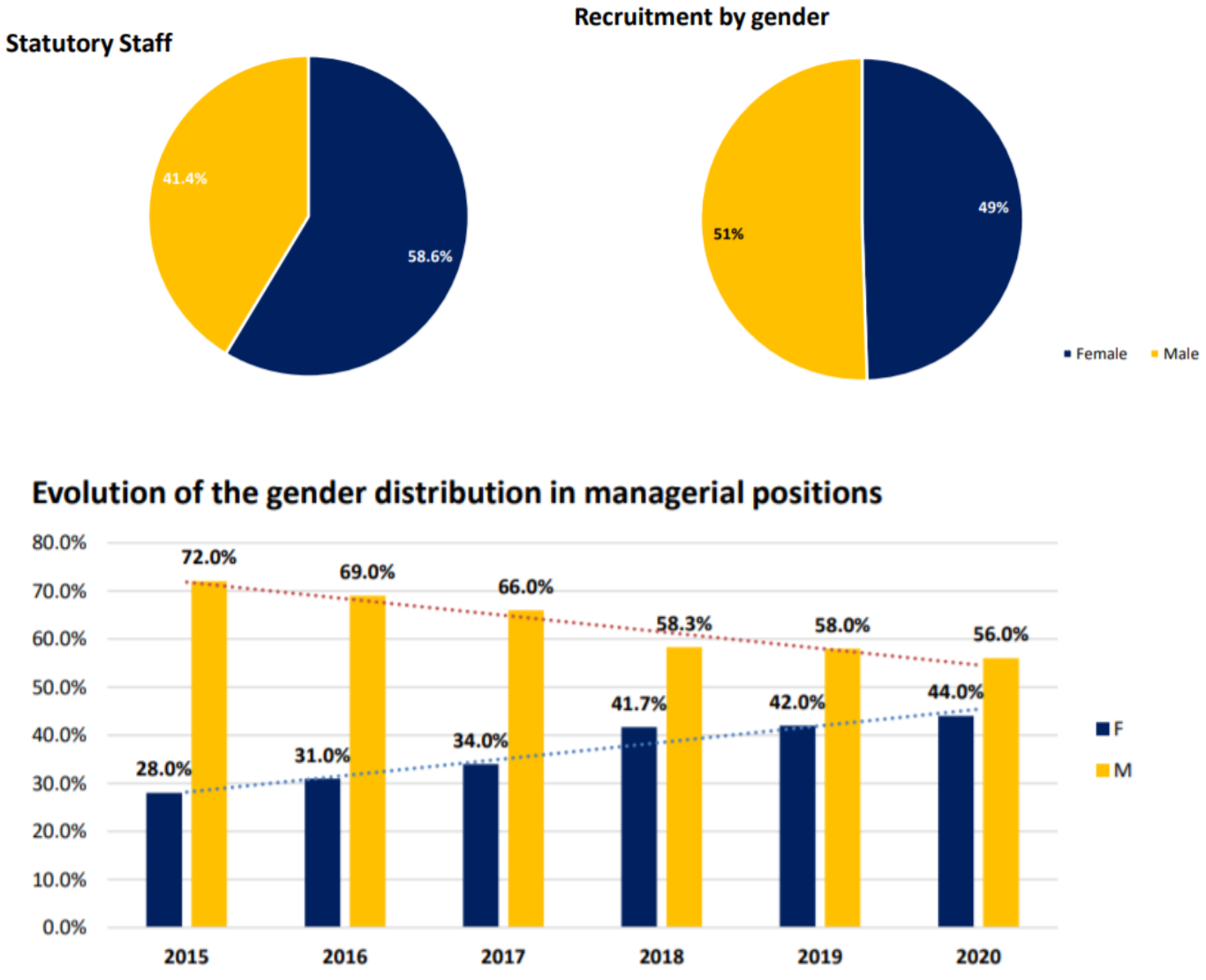


Source: IPReg Diversity Survey 2021[18]

A similar pattern can be seen in the IPReg survey data (see graphs above) which shows stronger female representation in junior and middle seniority roles, but significantly more men in senior roles. If we look at gender splits by age, we can see that while men and women are equally present in the lowest age group (25-34 years old), that shifts to a very unbalanced 80:20 male:female ratio in the highest age group (65+). Looking at the age data and seniority data together, at least two conclusions are possible: i) more men than women joined the profession in the past (and men have therefore had more time to reach senior roles) but the disparity in seniority will start to shift as women now join the profession in equal numbers, or ii) both men and women join the profession in equal numbers, but men tend to stay in the profession for longer than women. This could be motivated by (or indeed result in) men being able to reach more senior positions. In this scenario, we cannot expect the disparity in seniority to significantly change. Perhaps the truth is a combination of both of these scenarios, with fewer (but increasing numbers of) women entering the profession and greater retention of (and recognition and rewards for) men. Worryingly though, it is unlikely that equal representation will be achieved in the short term: of CIPA (Chartered Institute of Patent Attorneys) members, only 28% of patent attorneys, and only 27% of students, are female.

Nevertheless, there is some cause for optimism: UK IPO recruitment data shows that a greater proportion of female applicants are successful in obtaining a job offer (51.9%) than apply for positions (46.1%) and positive trends can be seen amongst inventors too. The number of female inventors in most countries is increasing[19] : it has grown from 8% to 11% in the UK; and from approximately 4% to 6% in Germany and, worldwide, one in five patents now have at least one female inventor. Finally, the EUIPO has proved that greater parity is possible, with women representing 58.6% of statutory staff and 49% of new recruits. The EUIPO is also successfully addressing the disparity in gender distribution in managerial positions, having gone from only 28% of women in senior roles in 2015 to 44% in 2020. Understanding how the EUIPO has achieved this significant shift over a relatively short period of time could provide some interesting learnings for other organizations wanting to invest in progress.

[18] https://ipreg.org.uk/about-us/equality-diversity-and-inclusion/ipreg-diversity-survey-2021
[19] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/846363/Gender-profiles-in-worldwide-patenting-2019.pdf



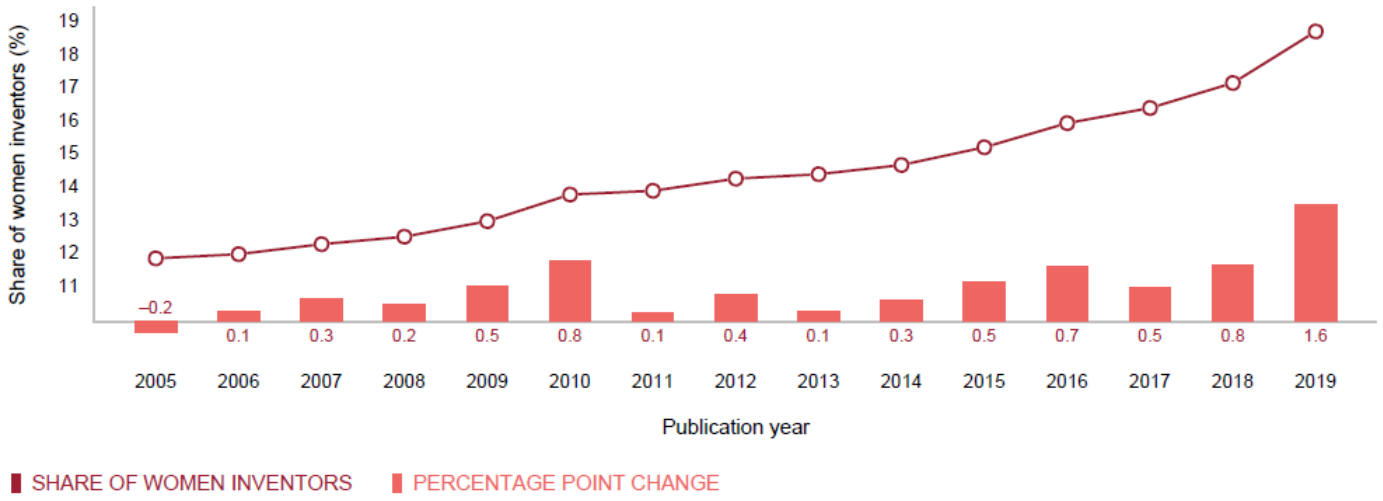
Source: EUIPO Human Resources Annual Report 2020

Each year, the World Intellectual Property Organization (WIPO) releases statistics on participation of female inventors in Patent Cooperation Treaty (PCT) applications. These statistics are based on the growing and improving, yet imperfect, worldwide gender-name dictionary. The findings are similar to the data presented above. In the figures below, it can be seen that the yearly data has shown a steady increase in total female inventorship from 14.6% in 2014 to 18.7% in 2019 and an increase in share of female inventorship (applications naming at least one female inventor) from 22.6% in 2005 to 34.9% in 2019[20].

[20] WIPO Statistics Database: https://www.wipo.int/ipstats/en/ (March 2020)

In 2019, 18.7% of all inventors listed in PCT applications were women; this is 1.6 percentage points higher than for 2018 (17.1%).

A22. Share of women among listed inventors in PCT applications, 2005–2019

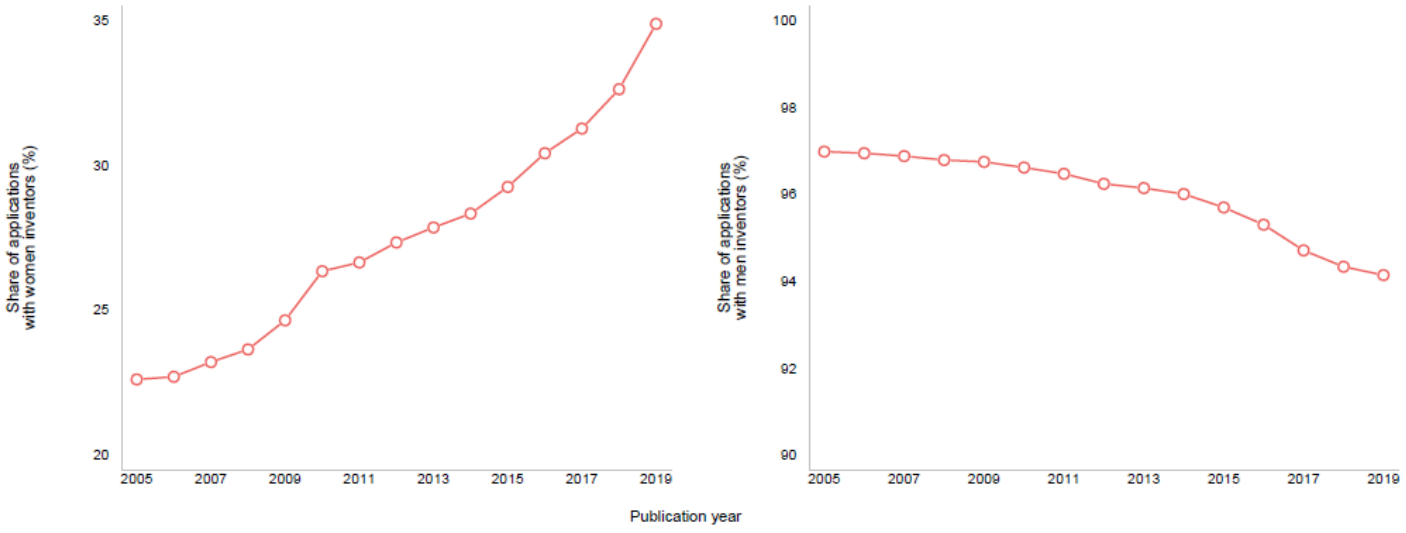


Note: For further details on methodology, refer to Martínez, G.L., Raffo, J. and Saito, K. (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*.

Source: WIPO Statistics Database, March 2020.

In 2019, about 94% of PCT applications listed at least one man as inventor and 35% of all PCT applications listed at least one woman as inventor.

A23. Share of PCT applications with at least one woman as inventor and with at least one man as inventor, 2005–2019



Note: For further details on methodology, refer to Martínez, G.L., Raffo, J. and Saito, K. (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*.

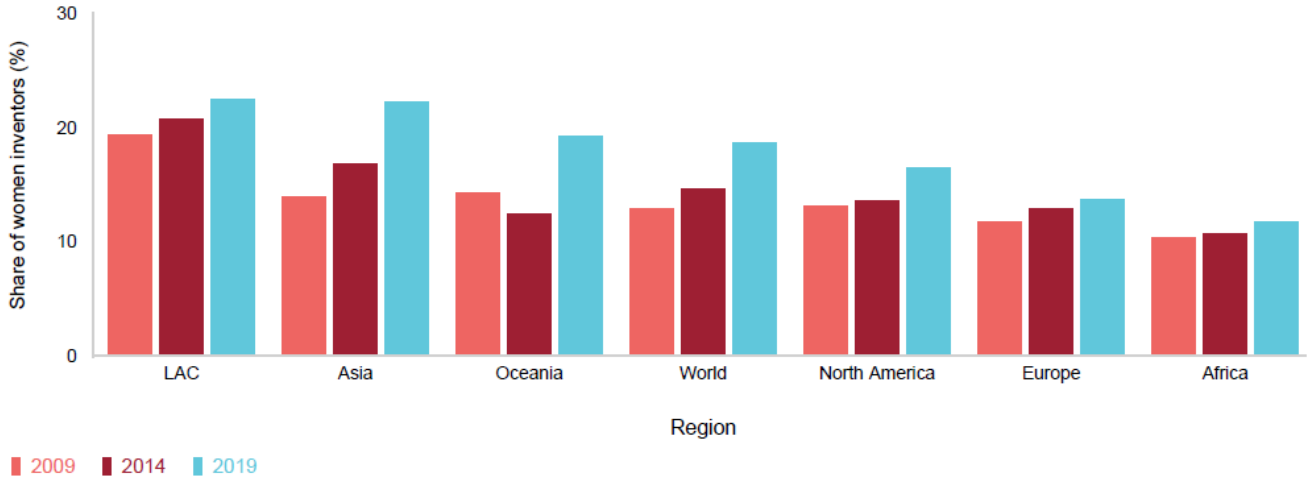
Source: WIPO Statistics Database, March 2020.

Despite there being an increase in female inventorship, the data shows there is still a long way to go to reach parity, especially considering the findings that the gender gap is much more pronounced with respect to particular geographic regions and technology fields. The figures below show that although the women inventorship share has increased in all geographic regions, certain geographic regions have fared much better than others. In China, the total percentage of

female inventors in 2019 was nearly one-third of all inventors, which is more than three times as many as in Japan and Germany.

The proportion of PCT applications with women as inventors rose in each of the world's geographical regions between 2014 and 2019.

A24. Share of women among listed inventors in PCT applications by geographical region, 2009, 2014 and 2019

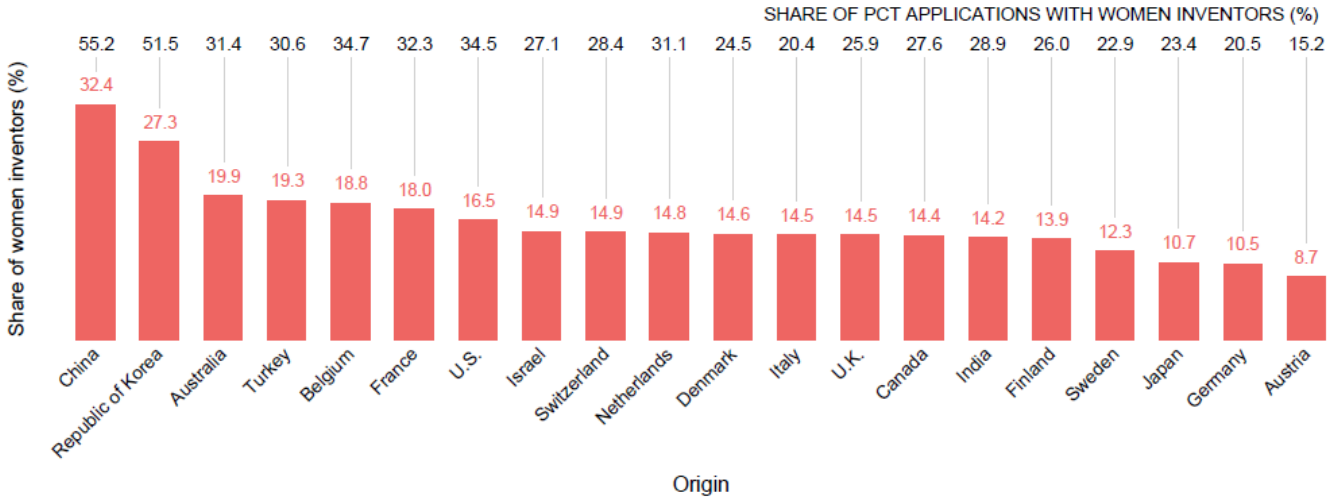


Note: LAC is Latin America and the Caribbean. For further details on methodology, refer to Martínez, G.L., Raffo, J. and Saito, K. (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*.

Source: WIPO Statistics Database, March 2020.

Women accounted for over 27% of inventors listed in PCT applications in China and the Republic of Korea.

A25. Share of women among listed inventors and share of PCT applications with at least one woman as inventor for the top 20 origins, 2019



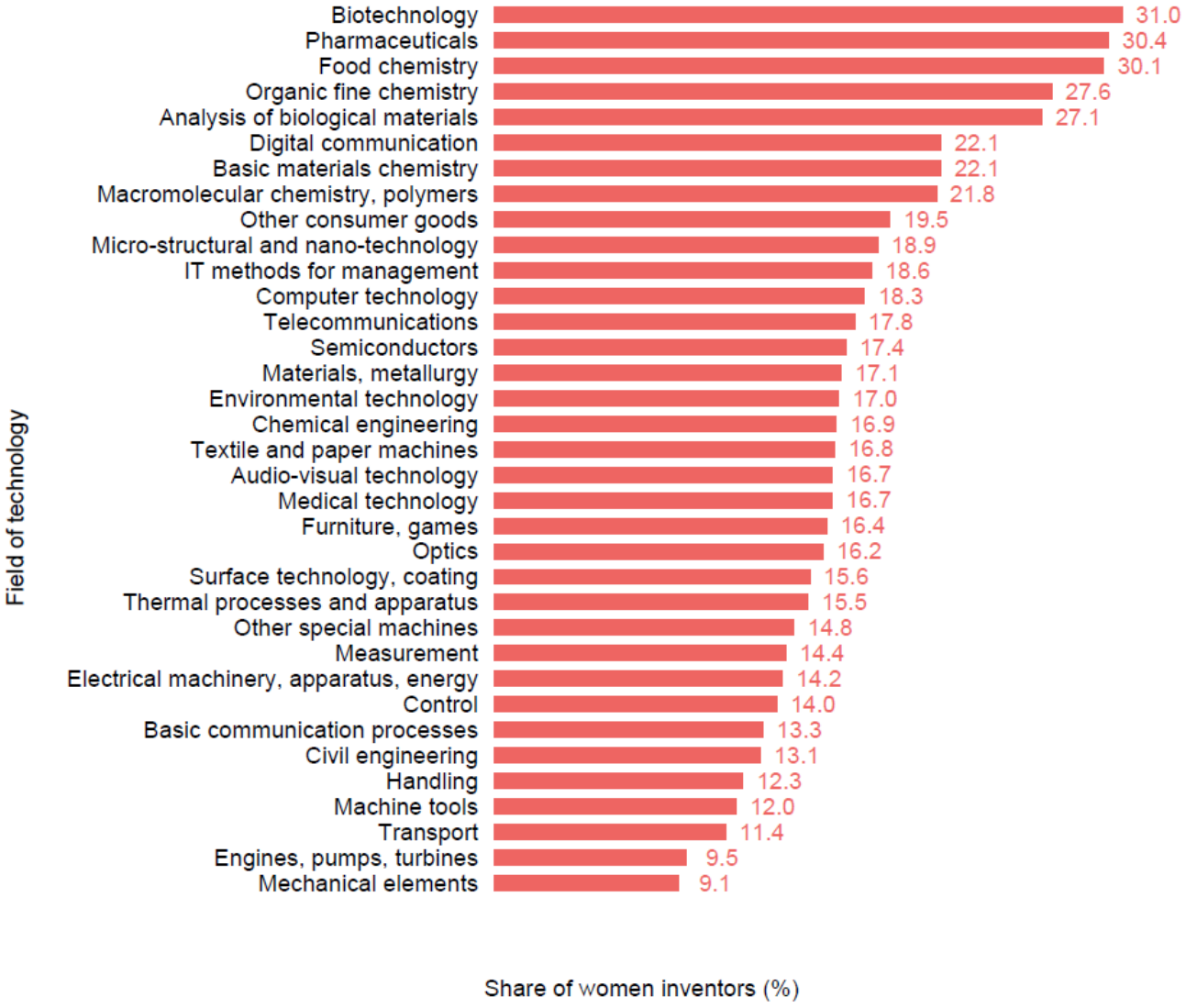
Note: For further details on methodology, refer to Martínez, G.L., Raffo, J. and Saito, K. (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*.

Source: WIPO Statistics Database, March 2020.

The WIPO data further shows that the gender gap varies widely depending on the technology field. The figure below shows that share of women inventors is much higher in the life science and chemistry fields in comparison to the mechanical fields.

Women inventors represented a comparatively large proportion of inventors in biotechnology, food chemistry and pharmaceuticals.

A26. Share of women among listed inventors in PCT applications by field of technology, 2019



Note: For further details on methodology, refer to Martínez, G.L., Raffo, J. and Saito, K. (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*. WIPO's IPC technology concordance table (available at: *www.wipo.int/ipstats*) was used to convert IPC symbols into 35 corresponding fields of technology.

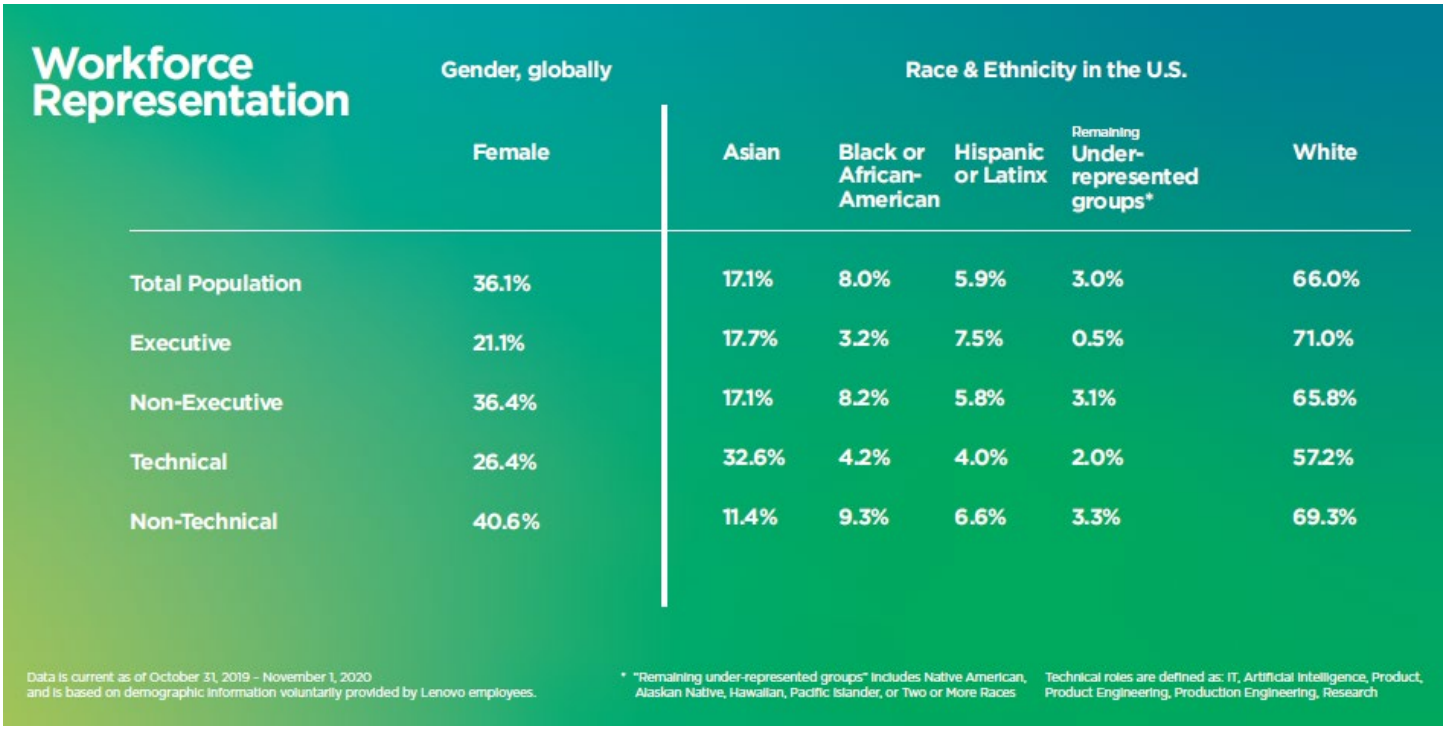
Source: WIPO Statistics Database, March 2020.

The percentage of female inventors in biotechnology, pharmaceuticals and food chemistry is more closely approaching the overall percentage of female graduates in STEM fields (~31%). However, the data is not correlated to female graduates with degrees in the particular fields of technology listed above and is significantly lower in the other fields of technology. Therefore, it is likely that females are still significantly underrepresented as inventors even in the life science and chemistry areas compared to females having advanced degrees in these areas.

Another finding by WIPO was that most female inventors file from within public research organizations or academia (47% of all female inventors), rather than for businesses in the private sector (16% of all female inventors), despite the fact the most patent applicants are businesses. Some of these disparities could likely be in part a result of the STEM leaky pipeline problem, but further data on females in technical roles in businesses could help to shed some further light on this.

WIPO recently reported that they have closed the gender gap in the representation of their WIPO Academy, which provides education, training and skills-building for WIPO member states, going from just 30% in 1998 to 54% in 2020. WIPO also offers training and mentoring programs for women, along with information sessions on closing the gender gap in IP that are open to the general public.

Recently, companies such as Lenovo, have taken the revolutionary step of collecting and publishing their diversity and inclusion information, showing that this type of data might be more readily available in the future. The snapshot below from Lenovo's report shows not only the percentage share of females in executive and technical roles, but also representation by race and ethnicity.



Workforce Representation

	Gender, globally	Race & Ethnicity in the U.S.				
	Female	Asian	Black or African-American	Hispanic or Latinx	Remaining Under-represented groups*	White
Total Population	36.1%	17.1%	8.0%	5.9%	3.0%	66.0%
Executive	21.1%	17.7%	3.2%	7.5%	0.5%	71.0%
Non-Executive	36.4%	17.1%	8.2%	5.8%	3.1%	65.8%
Technical	26.4%	32.6%	4.2%	4.0%	2.0%	57.2%
Non-Technical	40.6%	11.4%	9.3%	6.6%	3.3%	69.3%

Data is current as of October 31, 2019 – November 1, 2020 and is based on demographic information voluntarily provided by Lenovo employees.

* "Remaining under-represented groups" includes Native American, Alaskan Native, Hawaiian, Pacific Islander, or Two or More Races

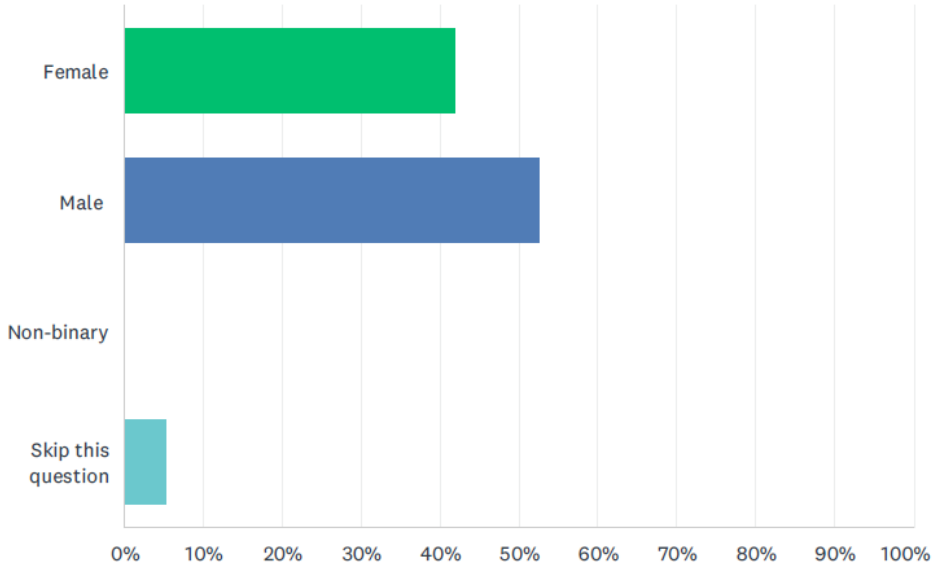
Technical roles are defined as: IT, Artificial Intelligence, Product, Product Engineering, Production Engineering, Research

Source: 2019/2020 Diversity & Inclusion Report, Lenovo Group Limited

The survey conducted within IPO asked the respondents what their own gender was, giving the following results:

Q9 What is your gender?

Answered: 19 Skipped: 0



ANSWER CHOICES	RESPONSES	
Female	42.11%	8
Male	52.63%	10
Non-binary	0.00%	0
Skip this question	5.26%	1
TOTAL		19

The survey conducted within IPO included a question asking for “the proportion of men to women amongst the lawyers/IP practitioners in your firm or law team in Europe, including the UK.” Eighteen of the respondents answered this question, giving an average of 56.7% men and 43.3% women. The answers together with the corresponding size of the IP team are as follows:

Size of IP team in Europe, including the UK	% Men	% Women
Greater than 50	40	60
Greater than 50	64	36
6-20	40	60
Greater than 50	60	40
6-20	85	15
6-20	60	40
5 or less	100	0
6-20	30	70
Greater than 50	50	50
21-50	33	67
Greater than 50	49.7	50.3
Greater than 50	50.5	49.5
21-50	38	62
Greater than 50	80	20
21-50	56	44
6-20	80	20
Greater than 50	55	45
6-20	50	50

The survey conducted within IPO also asked this same question with respect to the proportion of men to women that practice in particular in the patent field. Sixteen of the respondents answered this question, giving an average of 63.9% men and 36.1% women, showing a greater discrepancy in patents. The answers together with the corresponding size of the IP team are as follows:

Size of IP team in Europe, including the UK	% Men	% Women
Greater than 50	64	36
Greater than 50	60	40
6-20	85	15
6-20	100	0
5 or less	100	0
6-20	50	50
Greater than 50	50	50
21-50	39	61
Greater than 50	58	42
Greater than 50	63.6	36.4
21-50	38	62
Greater than 50	80	20
21-50	50	50
6-20	80	20
Greater than 50	55	45
6-20	50	50

ETHNICITY

The availability of data on the ethnicity of IP professionals and inventors is extremely limited, with several counties (including France) outlawing its collection. The data that is available suggests a clear (and damning) picture of the state of ethnic diversity within the European IP profession. And while it is dangerous to extrapolate too broadly, the limited data that is available suggests that diversity amongst inventors is not much better.

Starting with respondents to the IP Inclusive survey, 87.4% identified as White, compared to 3.0% who identified as Asian, and 1.8% who identified as Black, African or Caribbean. Amongst respondents to the IPReg survey, 8% identified as Asian (compared to 2% in 2017) but only 1% identified as Black (compared to 0% in 2017). These numbers drop further when filtering for seniority. Of respondents to the IP Inclusive survey in senior or very senior roles, only 1.0% identified as Asian, and 1.2% as Black, African or Caribbean.

	Gender	Ethnic Group					Disability
	Female	Total	Asian	Black	Multiple/Mixed	Other	
2021 Respondents	42%	10%	8%	1%	1%	0%	4%
2021 LSB Benchmark	47%	12%	5%	3%	4%	0%	15%
2017 IPReg survey	33%	11%	2%	0%	1%	6%	1%

Evolution of Diversity within the UK IP Profession (2017-2021) - Source: IPReg Diversity Survey 2021[21]
(N.B. LSB = Legal Services Board)

If we apply a similar logic here as we did for gender (i.e. that those most concerned by diversity issues are more likely to participate in diversity-focused surveys) [22], we can assume that these numbers are actually an over-representation of the proportion of ethnic minority professionals working in the industry and that the real numbers are in fact even lower.

According to the latest census data[23], amongst the 56 million residents in England and Wales, 86% were White, 8% were Asian/Asian British and 3% were Black/African/Caribbean/Black British. Thus, even if the survey data is accurate, minority ethnic populations, and especially those identifying as Black, are underrepresented in the IP profession in the UK. This is also reflected amongst UK IPO staff which includes only 4.97% of employees who identify as BAME (Black, Asian or other Minority Ethnicity). This underrepresentation is even more marked in senior roles where 91.2% of respondents identified as White, compared to only 1.0% as Asian and 1.2% as Black, African or Caribbean.

Unfortunately, available recruitment data does not suggest this gap will soon be filled. While 19.8% of applicants for positions at the UK IPO are BAME, only 6.6% were offered a position. The survey conducted within IPO asked the respondents what their own ethnicity was, giving the following results.

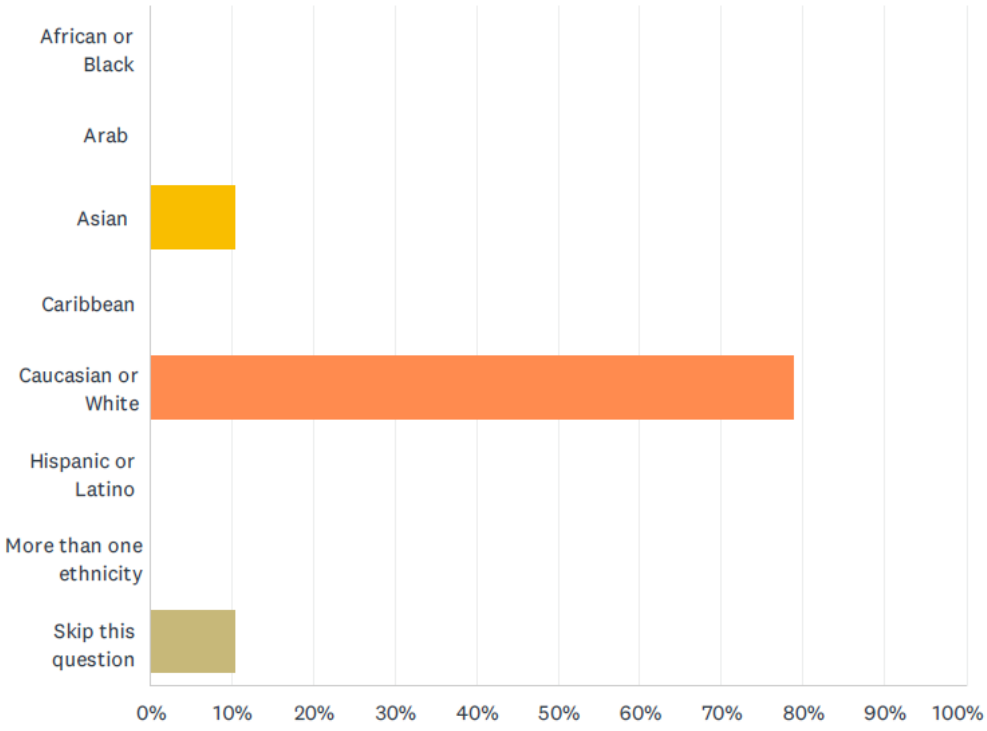
[21] https://ipreg.org.uk/about-us/equality-diversity-and-inclusion/ipreg-diversity-survey-2021

[22] Indeed, IP Inclusive concluded that "[the] relative response levels for female and male IP professionals (gender balance being a criterion for which there is already some publicly available data) suggest that people from so-called "minority" groups (for example women, BAME and/or LGBT+ professionals) were more likely to have responded to the survey than their counterparts in "majority" groups; this could have distorted the results somewhat."

[23]https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/articles/2011censusanalysisethnicityandreligionofthenonukbornpopulationinenglandandwales/2015-06-18

Q8 What is your ethnicity?

Answered: 19 Skipped: 0



ANSWER CHOICES	RESPONSES	
African or Black	0.00%	0
Arab	0.00%	0
Asian	10.53%	2
Caribbean	0.00%	0
Caucasian or White	78.95%	15
Hispanic or Latino	0.00%	0
More than one ethnicity	0.00%	0
Skip this question	10.53%	2
TOTAL		19

The survey conducted within IPO included a question asking for "the total proportion of the lawyers/IP practitioners in your firm or law team in Europe, including the UK, that do not identify as White." Fourteen of the respondents answered this question, giving an average of 4%. The answers together with the corresponding size of the IP team are as follows:

Size of IP team in Europe, including the UK	% that do not identify as White
Greater than 50	7.9
Greater than 50	4
6-20	0

Greater than 50	0
6-20	30
5 or less	0
6-20	0
Greater than 50	0
21-50	0
21-50	3
Greater than 50	0
21-50	11
21-50	0
6-20	0

Part 3 – Analysis

The data collected for this paper provide important insights into the innovation and IP industries in Europe and allows us to more clearly identify critical issues relating to diversity, equity and inclusion. These are outlined below. Women and minorities tend to be significantly underrepresented amongst IP professionals, and the underrepresentation is greatest at the highest levels of seniority. On a positive note, the data from the EUIPO shows that positive action by organizations can reverse the trend. For example, the EUIPO's efforts have helped to address the disparity even in managerial positions where female representation has doubled in just 5 years.

On the patents side, the relatively low uptake of degrees in STEM subjects by women and ethnic minorities may aggravate the disparity. This is reflected by the number of members who identify as female in the UK Chartered Institute of Patent Attorneys (28%) compared to the number of members who identify as female in the UK Chartered Institute of Trademark Attorneys (53.3%). Diversity data[24] from general law firms show that 49% of lawyers are female and 21% are BAME[25]. Accordingly, where STEM is not a pre-requisite, disparities in terms of gender and ethnicity appear to be reduced.

That said, it is not clear that the lower uptake of STEM is the sole reason for the disparity. The data on women in STEM statistics for science professionals[26] shows an increase of women in science from 41% in 2016 to 46% in 2019. The number of women graduating with physical science-related degrees is also increasing from 40% of graduates in 2015/16 to 43% in 2018/2019. These increases do not appear to be reflected in the membership of the UK Chartered Institute of Patent Attorneys, where there is no significant difference between the proportion of women among the students (i.e. more recent members) and attorneys (i.e. more longstanding members) of the Institute. Similarly, the EPO's most recent recruitment data show that almost three times as many men as women were being recruited by the EPO, with 78% of Examiner roles being filled by men. On balance, there seems to be merit in taking more positive action to address these imbalances. While external factors like the number of female STEM graduates may have a strong influence at intake level, the patent profession must take responsibility (at least) for the increasing imbalances we continue to see at higher levels of seniority.

While organizations like the EUIPO, EPO, UKIPO and IP Inclusive have taken steps to monitor and improve imbalances in gender, ethnicity does not appear to be as high on the agenda. When compiling the data for this paper, data on ethnicity within IP was considerably more difficult to find. The survey data from IP Inclusive nevertheless provides us with some insight even if the data are likely to over-represent the proportion of ethnic minority professionals working in the industry[27]. At first sight, the data relating to Asian representation in 2021 may appear to match the UK's census data and exceed the LSB's benchmark. However, the numbers should also be considered in the light of the proportion of

[24] diversity data compiled by the Solicitors Regulation Authority of England and Wales
[25] https://www.sra.org.uk/sra/equality-diversity/key-findings/diverse-legal-profession/
[26] https://www.stemwomen.co.uk/blog/2021/01/women-in-stem-percentages-of-women-in-stem-statistics
[27] See Footnote 21

students of Asian background who graduate in STEM subjects, as well as the proportion of STEM academics at UK Higher Education Institutions who are Asian[28] (higher at 13.2%).

Even more concerning was that the data for those identifying as Black, African or Caribbean; only 1% of respondents to the survey came from this group (c.f. 3% census and 5% LSB Benchmark). As with gender, the imbalances grew with seniority. Again, while the causes for these disparities extend well beyond the world of IP, the IP profession can play a positive role in addressing these imbalances both at the intake level and at all levels of seniority.

The picture for inventorship is also complex. There is a general trend of female inventorship increasing year on year. However, it is rare for female inventors to be the sole inventors on a patent application, members of women-only teams or even members of an inventor team with multiple women. Most often, if represented at all, female inventors are the lone woman on a mostly male team. Cultural, political and societal differences between countries also have a significant impact. The proportion of female inventors from countries such as the UK, Germany, Norway, Sweden and Denmark are low compared to the proportion of female inventors in e.g. Romania, Croatia and Serbia. On a positive note, the upward trend of female inventorship is breaking national boundaries, and most countries covered by the studies mentioned above have seen an increase in female representation across the last 20 years.

Part 4 – Causes and Possible Solutions

The causes of the disparities observed in the innovation and IP industries in Europe, as in other areas, are likely complex and deep-rooted. As a result, there is not, unfortunately, one single, simple solution. However, trying to understand the origin of the problem and identifying practical steps anyone can take to affect progress can only help. Underrepresentation in the innovation industry may be difficult to solve since its roots are deeply engrained and structurally embedded in our society. Causes can be traced back to reduced access to education and to discrimination and bias across our educational systems resulting in fewer women/minorities completing their studies in the STEM subjects[29]. This initial imbalance gives rise to smaller numbers being recruited into innovation/IP careers. This initial imbalance is then exacerbated by the experiences of women/minorities as they continue with their careers, as reflected in the data above. The data are consistent with fewer professional opportunities for women/minorities in the sciences and IP/Law and greater obstacles for recognition whether in the form of publication or promotions leading to discouragement and the voices of women/minorities not being heard. All of this creates a vicious cycle in which a lack of representation breeds a lack of engagement.

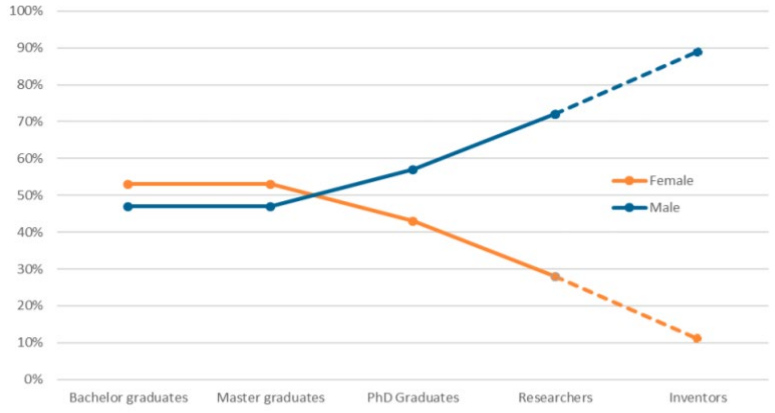


Figure 1: The 'leaky pipeline' - the proportion of females and males reaching each stage of higher education, further research and inventorship

[28] https://royalsociety.org/news/2021/03/stem-ethnicity-report/

[29] WISE: UK Statistics (https://www.wisecampaign.org.uk/statistics/) and IET, Women in STEM: Statistics and facts (https://communities.theiet.org/files/7976#.VbTQ7fkbJ_8)

Source: Gender Profiles in Worldwide Patenting - An Analysis of Female Inventorship (2019) [30]

However, just because the problem of underrepresentation may be difficult to solve does not mean that we should not try. In fact, those of us who are privileged enough to already be part of the innovation and IP industries and to have a platform to be heard MUST try. Understanding the problem is only the start.

Our profession may have "inherited" some of the imbalances of society at large. However, while we have seen how some sectors of the IP profession (e.g. EUIPO) have taken positive steps to drive change, the prospect of change seems more remote where positive action is not taken.

As acknowledged by WIPO in its report on possible approaches to close the IP gender gap, where a social problem arises as a result of multiple factors, finding a solution to the problem can be more challenging than a problem caused by a single, obvious challenge[31]. As professionals, we may wish to consider what steps we and our organisations can take to improve representation of women and minorities across all levels. Examples of some steps that organisations can take include:

- Taking responsibility to get even more women and minorities into STEM education, e.g. by engaging with and getting involved with organisations that promote women and minorities participation and engagement with STEM education. This could increase the pool of potential candidates for entry into the profession.

- Working with universities and other organisations to promote awareness of the IP field as a career option. This could increase the pool of potential candidates for entry into the profession.

- Looking at the way we interact e.g. with our recruitment agencies and requesting diversity in the pool of candidates considered.

- Looking at internal policies within our own organisations to identify practices that may be discriminatory or unhelpful, e.g. uptake of part-time or flexible working and parental leave, and seeking to remove or reduce gender-specific policies to encourage equal participation so that choices can be made within families, without the onus being on women to be the primary caregivers.

- Reconsidering recognition and promotion criteria – is there an unconscious bias towards over-valuing certain traits over others when there is no business justification for doing so?

- Encouraging targeted training on the issues – are individuals within your organisation aware of unconscious bias, and do they understand the business benefits of diversity within an organisation?

- Investing in networking, mentoring and sponsorship opportunities for women and minorities in our organisations

These are just some simple steps that everyone can take. Many more suggestions can be readily found in the literature, and we encourage everyone to invest time into exploring these issues and their possible solutions further.

[30] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/846363/Gender-profiles-in-worldwide-patenting-2019.pdf

[31] WIPO Policy Approaches to Close the Intellectual Property Gender Gap - Practices to Support Access to the Intellectual Property System for Female Innovators, Creators and Entrepreneurs, prepared by Jennifer Brant, Kaveri Marathe, Jaci McDole, Mark Schultz (2019), available at https://www.wipo.int/ip-development/en/agenda/pdf/policy_approaches_close_the_ip_gender_gap.pdf

Conclusion

In summary, there remains considerable underrepresentation of women and minorities across the innovation and IP industries, some of which cannot be properly understood and therefore addressed without better data. Other areas for data collection and analysis would include looking at or collecting statistics for LGBTQ+ law professionals and law professionals with disabilities in the IP profession and innovation space in Europe. Getting consistent and complete data is particularly difficult in Europe (partly because of the number of countries involved, partly because some countries have made it illegal to collect the data in the first place, and partly because different countries have different definitions of ethnic minorities). Even with good data, the issue remains a complex one with multiple possible causes and no single simple solution. Nevertheless, practical steps can be taken to improve diversity through targeted recruitment, retention and development initiatives. Over the coming months and years, we must continue to drive conversations on this topic forward to ensure it is top of mind and being addressed by those in positions of influence. Raising awareness of the problem is an important first step in solving it.