



Progress Toward Gender Equality in Research & Innovation – 2024 Review

An in-depth analysis of research participation, career progression and research contributions across the globe
- Focus on Japan -

This document is an adaptation of the full report.

This page is intentionally blank

Executive summary

The global research and innovation community is making progress towards full and equal participation of women.¹ Twenty years ago, women comprised only 29% of researchers, but this has increased to 41% in 2022, despite ongoing challenges. In Japan, however, the proportion remains low at 22%, reflecting a generally low level of women in the workforce. The Japan Center for Economic Research notes that the overall female workforce participation rate is improving, suggesting a resolution of the 'work or family' dilemma and a narrowing gender gap. Nevertheless, the permanent employment rate for women is significantly lower than for men, impacting women's career development and overall workforce participation. This indicates that women's representation is a societal issue.

Increasingly, researchers are addressing critical global challenges like the climate crisis and sustainable development, highlighting the importance of embracing diverse perspectives and utilizing the entire talent pool. In this context, we have undertaken a data-driven analysis of gender diversity in research, building on our prior reporting and analysis, such as the landmark 2020 report *The Researcher Journey Through a Gender Lens*. We broaden our analytical scope to investigate gender together with field of study, engagement in Sustainable Development Goals (SDGs) research and career stage. Japan, an advanced industrial economy, currently the fourth largest economy in the world, has since our first global report in 2017 been an important comparator.

Our current analysis draws on authorship within publication data from Scopus stretching back over more than two decades. Eighteen countries were selected for inclusion, analyzed individually along with the 27 countries of the European Union (EU-27) and the World as a whole. The current summary report is an abbreviated version of the full report with a specific focus on Japan, as well as with some further data from our external dashboard included.

Report objectives

1. **Assess Representation:** Evaluate the representation of women in research and innovation over time, across disciplines and career stages globally and in 18 analyzed countries.
2. **Expand Insights:** Using the Academic Evaluation Framework² developed by Elsevier, provide new insights into gender roles in areas such as grant applications, open access publication, research interdisciplinarity, SDG research, societal impact, and innovation (measured by patent filings).
3. **Inform Policy:** Offer rich data and insights to governments, funders, universities, policymakers, media, and researchers to advance gender equality in research and innovation through evidence-based policy.

Key findings

Representation: Women now represent 41% of active researchers as of 2022, but their participation is much lower in many STEM³ fields. For Japan, the corresponding number is 22 %

Grant Funding: Women's share of grant awards increased from 29% in 2009 to 37% in 2022. Japan has seen a slight increase, from 12% in 2009 to 15% in 2022.

Research Culture: Women show slightly higher representation in multidisciplinary research, though they publish fewer papers and file fewer patents than men.

SDGs Contributions: Women lead in research on several UN Sustainable Development Goals and their work is often cited in policy documents.

Despite progress, achieving parity in participation does not equate to equality in opportunities, such as funding and senior positions. The data highlight systemic hurdles and the need for policies to retain and support women in research. While this trend is observed globally, the particularly low initial representation of women in Japan's research workforce necessitates specific attention.

¹ Gender is inferred for authors using NamSor, which treats gender as a binary. This presents a limitation as we cannot infer, for example, 'non-binary'.

² Details about Elsevier's Academic Evaluation Framework: [The Future of Evaluation: Emerging Consensus on a More Holistic System](#).

³ In this report, STEM covers Biochemistry, Genetics and Molecular Biology, Chemical Engineering, Chemistry, Computer Science, Earth and Planetary Sciences, Engineering, Mathematics and Physics and Astronomy.

An online dashboard, accessible at [Elsevier Insights] (<https://www.elsevier.com/insights/gender-and-diversity-in-research>), accompanies the report. It allows for interactive exploration of data, enabling deeper analyses across various dimensions, geographies, and disciplines, and includes the detailed methodology used in the report. Japan is included in the dashboard.

Methodological guidance

This section outlines the key methodological aspects of the study related to gender inference and inclusion of authors, grant awardees, and patent inventors. For detailed methodology, refer to the [Dashboard](#).

Gender Inference: NamSor was used to infer gender as "woman" or "man" for authors, grant awardees, and inventors, focusing on those with identifiable first names and a gender prediction probability above 0.85.

Active Authors Identification: Active authors are defined as those publishing at least two peer-reviewed articles within a five-year period, ensuring consistent activity. Data are based on 5-year moving windows.

Gender Attribution: "Women's research" or "men's research" includes all research by women or men authors, including collaborative work. Full counting is used, except in specific sections where fractional counting is applied.

Country Selection: Countries with at least 4,000 active authors per period were included for bibliometric analysis. For grants analysis, countries with at least 1,000 awardees from 2018-2022 were included. Countries for patent analysis are the same as those for bibliometric analysis.

Chapter 1

Research and grant participation

1.1 Research participation

Women's participation in research has increased over the past two decades, reaching 41% of active researchers in 2022, entering the parity zone (40-60%) for the first time. However, disparities persist in STEM fields, advanced-career cohorts, and across various geographies. Among comparators, Japan remains the lowest at 22%.

Importance: Women's participation is crucial for equity, diverse perspectives, balanced findings, innovation, and addressing societal needs.

Measurement: Women's involvement was assessed by analyzing active researchers, defined as those publishing at least twice in a five-year period.

Findings: While overall representation has reached parity, only 27% of advanced-career researchers (21+ years) were women in 2018-2022. Most recent gains are due to early-career women entering the research ecosystem.

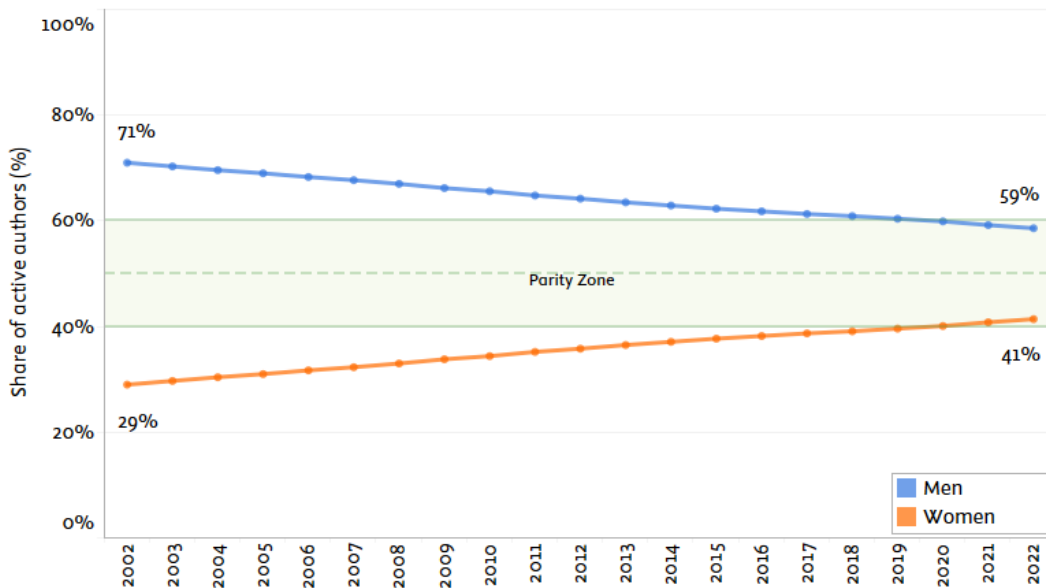


FIGURE 1-1

Trend in the share of women and men active researchers across all countries included in the analysis.

Source: Scopus and NamSor data

Women in research face barriers such as work-life balance challenges, gender bias, and institutional and funding disparities. To improve gender diversity, policies should focus on retaining early-career women in research.

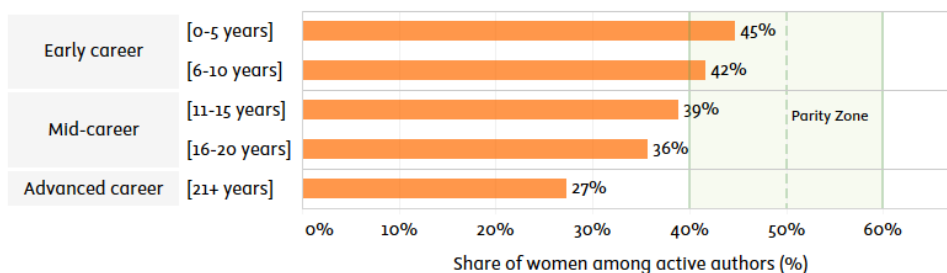


FIGURE 1-2

Proportion of women researchers by career cohort in 2018-2022.

Source: Scopus and NamSor data

Representation of women in research varies by career stage and discipline. Women are well represented in Health Sciences (e.g., Nursing, Psychology, Immunology, and Microbiology) but remain underrepresented in many STEM fields³, as shown in FIGURE 1-3 based on Scopus All-Science Journal Classification (ASJC) categories.

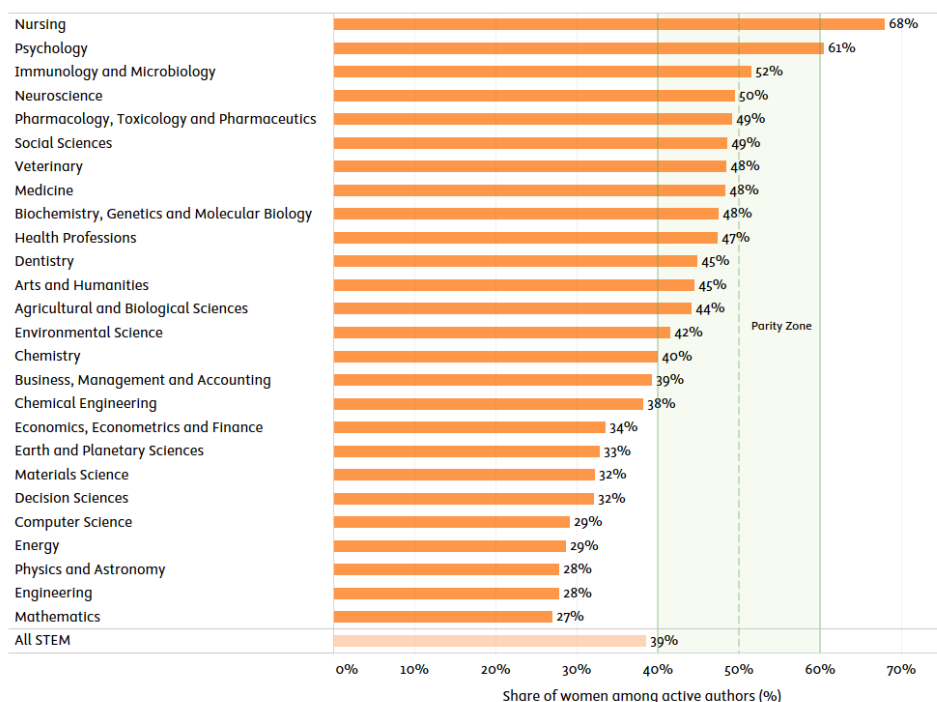


FIGURE 1-3
Proportion of women researchers by ASJC category in 2018–2022.
Source: Scopus and NamSor data

Geography significantly impacts women's representation in research due to cultural norms and national policies. In 2018–2022, Hispanic and Latin countries led in women's representation in academic research, while Japan, Egypt, and India had less than a quarter of active women researchers. Despite these disparities, all selected countries are progressing towards parity, as shown by their Compound Annual Growth Rate (CAGR). (FIGURE 1-4)

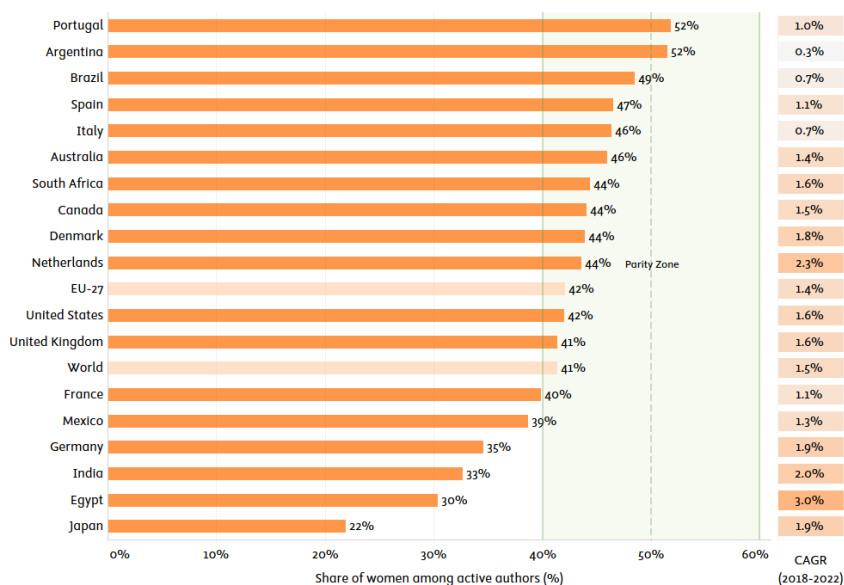


FIGURE 1-4
Proportion of women researchers by country and region in 2018–2022 and compound Annual Growth Rate of women's participation during the same period.
Source: Scopus and NamSor data

In Japan, according to the Ministry of Internal Affairs and Communications' "Report on the survey of research and development 2023", the number of female researchers (actual number) is the highest ever at 183,300 (up 4.5% on the previous year), and their share of the total number of researchers is 18.3%, also the highest.

*** Here, we will explain the differences in the analysis methodology. The Ministry of Internal Affairs and Communications defines "researchers" as those who have completed a university course and are conducting research on a specific theme, and uses this definition to calculate the number of female researchers. Elsevier, on the other hand, identifies and calculates female researchers based on authors who have a Scopus ID and whose first names can be identified. This methodological difference results in discrepancies in the figures.

In addition, the Science, Technology and Innovation Basic Plan, which is revised every five years by the Cabinet Office, sets various numerical targets to increase the proportion of female researchers in Japan. However, it was revealed at the 2023 by the Council for Gender Equality Promotion that the same target figures for "new recruitment of female researchers" were set four times in three fields-science (20%), engineering (15%), and agriculture (30%)-from the 3rd phase (2006) to the 6th phase (2021). Furthermore, the Science Council of Japan (SCJ) conducted a survey in response to more than a decade of stagnation in achieving gender equality in the academic world. Following the results of the SCJ survey, a report has been produced with various recommendations, such as promoting diversity among female researchers in university institutions, addressing harassment, fostering the next generation of female researchers, etc.

1.2 Grant participation

From 2009 to 2022, the average share of women among grant awardees increased from 29% to 37%, with the largest gains in the Netherlands, the UK, France, Canada, and Portugal. For Japan grant participation, albeit increasing remains at 15% (2022) a slight increase of 3% from its value of 12% in 2009, here one should remember the women active researcher share of 22 % at present.

Importance: Access to grants is crucial for research, publishing, and securing tenure. Gender bias in grant awards can significantly impact career trajectories and may deter individuals from research.

Measurement: Grant participation was assessed using Elsevier's funding database, attributing awards based on their start year. Only countries with robust funding data were included in the analysis.

Women have made significant gains in grant funding in many countries, with Portugal achieving parity among grant awardees. However, India and Japan showed minimal or no progress since 2009, resulting in larger disparities compared to other countries by 2022. Note that the share of women awardees will likely correlate with the share of women researchers, where Japan as seen earlier has the lowest representation. (FIGURE 1-5)

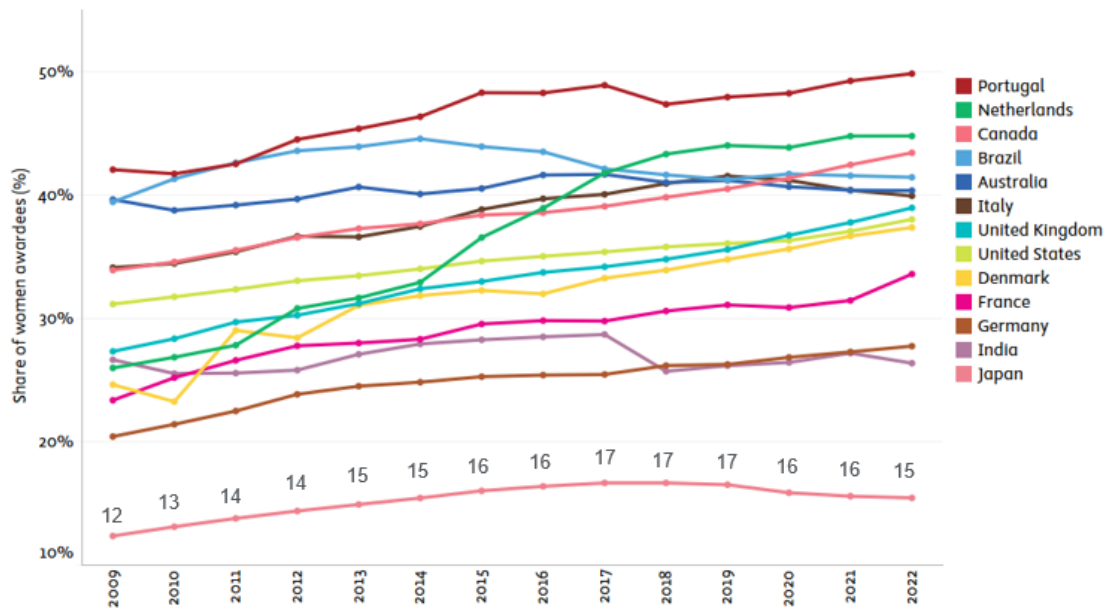


FIGURE 1-5
Trends in shares of women grant awardees, per country (2009–2022).
Source: Scopus and NamSor data

Although grant funding for women has increased, it hasn't necessarily improved their odds of being funded. The proportion of active women researchers also rose, but in most countries, the gains in grant awards haven't kept pace with this increase.

There are numerous grants for female researchers in Japan, with the Japan Science and Technology Agency (JST), the Japan Society for the Promotion of Science (JSPS) and various foundations providing support. Nevertheless, the challenge of the lowest grant participation among comparators should be taken seriously, and improvements should be encouraged.

Chapter 2

Research culture

2.1 Multidisciplinary and interdisciplinary research

Women engage slightly more in multidisciplinary research than men, particularly in Health Sciences, Physical Sciences, and Social Sciences, except in Life Sciences where men lead.

Importance: Multidisciplinary research is crucial for addressing global challenges and tends to have a higher citation impact, attracting interest from research funders.

Measurement: Multidisciplinary scores quantify collaboration among diverse disciplines, while interdisciplinarity scores measure the diversity of knowledge in research references. This section examines the share of highly multi- and interdisciplinary publications by authors.

In recent decades, women's research has become slightly more multidisciplinary than men's and has reached equilibrium in interdisciplinarity. This is based on the average shares of highly multi- and interdisciplinary publications in Scopus, using full counting where each author receives credit for one publication. (FIGURE 2-1)

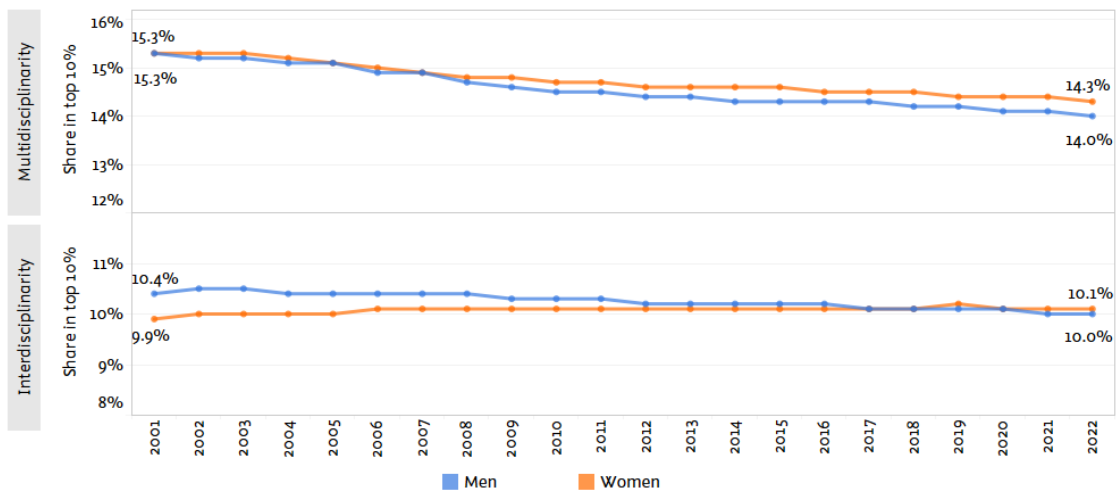


FIGURE 2-1

Trendline of average authors' share of highly multi- and interdisciplinary publications (top 10%) by gender. Note that to emphasize the difference between women and men, the data were adjusted to control for the generally increasing trend in multidisciplinary and interdisciplinarity over time.

Source: Scopus and NamSor data

Note that while the gap is small, the consistent trendline over time and across vast amounts of data suggests inherent differences in how men and women approach multi- and interdisciplinarity collaborations.

2.2 Open access publication

In 2022, 45% of content published by women authors was Gold open access, compared to 40% for men. This gender gap is consistent across career cohorts, countries, and most disciplines. For Japan the corresponding number is 49% for women and 45% for men, Japan showing a higher degree of open access publishing than the world overall.

Importance: Open access is increasingly mandated by institutional and governmental policies and is becoming a requirement for research funders in some countries.

Measurement: The analysis uses Unpaywall data, focusing on Gold open access (including Gold OA articles in Hybrid journals), where publishers provide unrestricted access to articles upon publication, often supported by article publication charges.

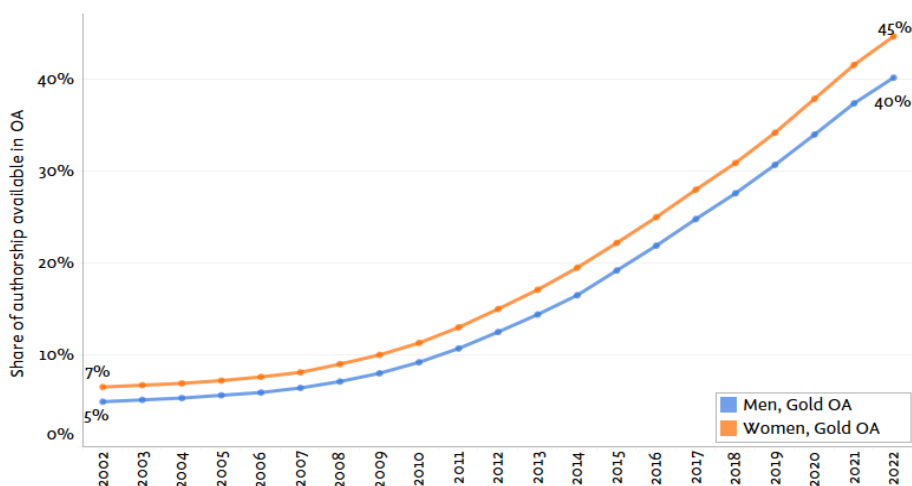


FIGURE 2-2

Average Gold open access publication rate of women and men active researchers (2002-2022).

Source: Scopus, NamSor and Unpaywall data

※The average share of open access in this report may differ from other sources because it is based on individual authors' shares (those with inferred gender) using full counting. This method, where each author gets full credit for a publication, results in a slightly higher share than a simple proportion of all Scopus publications.

Women have higher Gold open access publication rates than men in all 18 analyzed countries, the EU-27, and globally. Europe leads in open access policies, while the United States, Australia, and Canada lag behind. In the EU-27, open access rates are 54% for women and 46% for men, whereas in the United States, they are 37% for women and 35% for men. For Japan the numbers are 49% and 42% (FIGURE 2-3). The upcoming White House memo for open access in 2026 may boost U.S. rates, similarly for Japan, the Immediate Open Access mandate for research funded from Japanese fiscal year 2025, now under detailed discussion may lead to an increase boost in Japan as well.

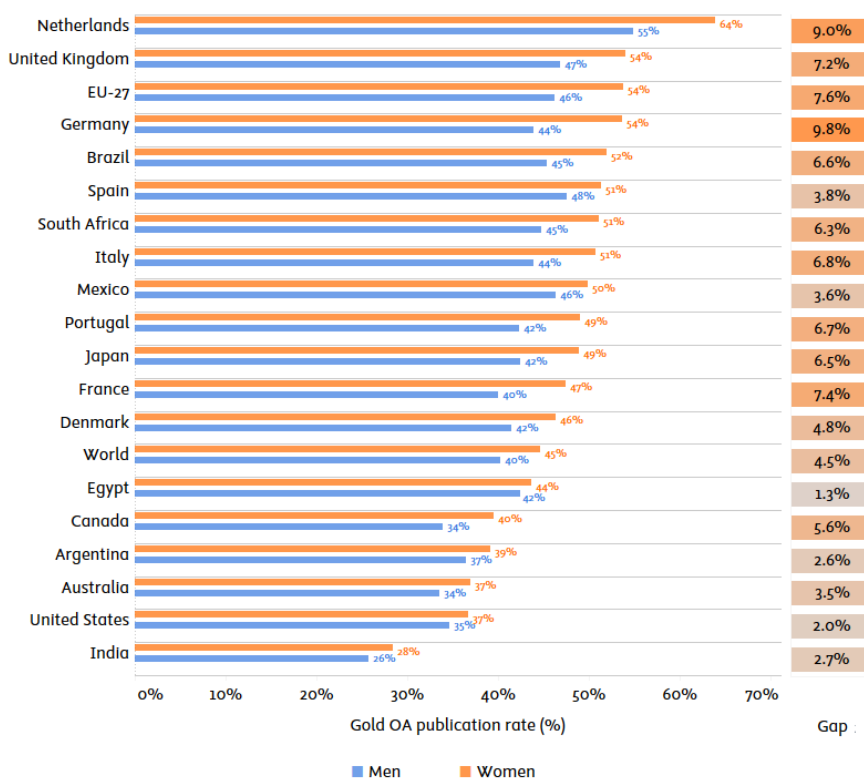


FIGURE 2-3

Average Gold open access publication rate of women and men active researchers, per country (2018-2022).

Source: Scopus, NamSor and Unpaywall data

Chapter 3

Research output

3.1 Research authorship

As of 2022, women are authors on 35% of scientific publications in Scopus, a share that has been steadily growing. However, a gap remains between the share of women active researchers at 41% and their authorship, indicating systemic issues. For Japan, with 22% women share of active researchers, the authorship share is 16%, a gap that has slightly increased over years.

Importance: Publications are crucial for disseminating research findings and understanding women's contributions to scientific literature, which impacts their career progression.

Measurement: Authorship is measured using fractional counting, where each author receives a fraction of the publication credit based on the total number of authors.

Understanding men's and women's contributions to global authorship is key to assessing gender parity. In 2022, women were authors on approximately 35% of all publications with inferred gender, a 50% increase since 2002.

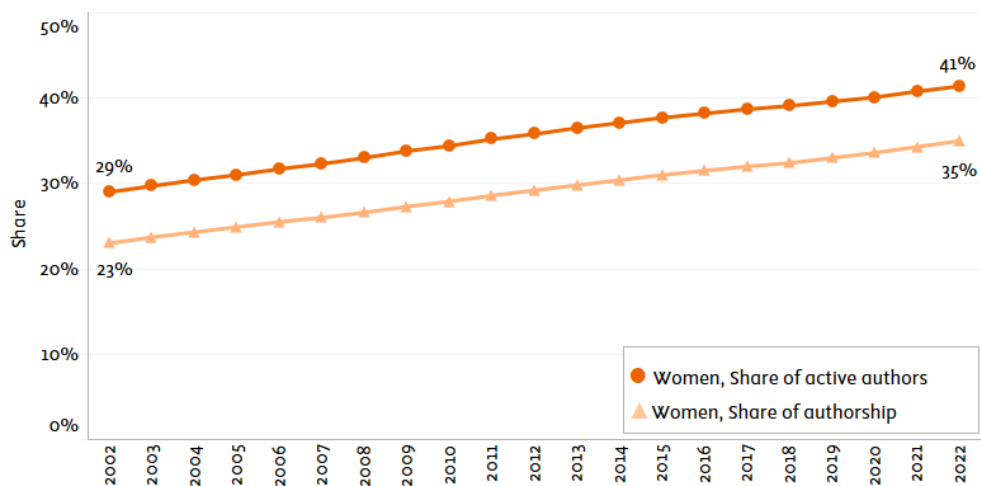


FIGURE 3-1

Trend in the share of authorship by women and share of women active authors

Source: Scopus and NamSor data

Women's authorship in research has continuously increased, aligning with the rise in active women researchers and moving towards greater parity. However, the share of authorship by women remains consistently lower than their participation rate, with a stable gap of 6-7 percentage points over the past two decades. This persistent gap impacts women researchers across all career stages, indicating that the research ecosystem is not fully leveraging the growing pool of women to advance knowledge with diverse perspectives.

In the case of Japan, despite the continuous increase in active women authors, the share of authorship (16% in 2022) has not increased significantly, resulting in a widening gap (from 4% to 6%). The underlying reason for this gap increase in the case of Japan deserves further investigation (FIGURE 3-2).

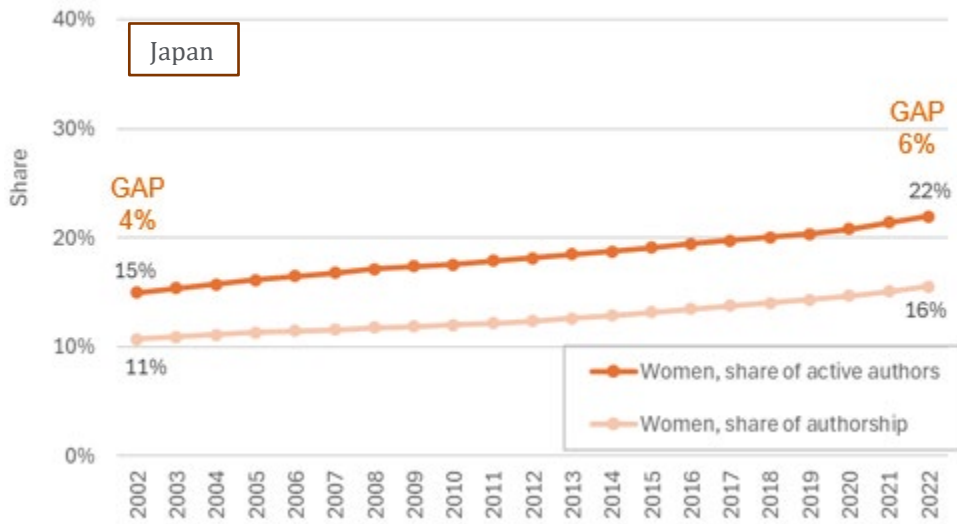


FIGURE 3-2
Trend in the share of authorship by women and share of women active authors in Japan
Source: Scopus and NamSor data

Authorship shares for women vary across countries (Figure 3-3), but the gap between participation and authorship persists everywhere. Latin and Hispanic countries lead in women's authorship shares, while Japan, Egypt, Germany, India, and France rank at the bottom, mirroring their positions in women's research participation.

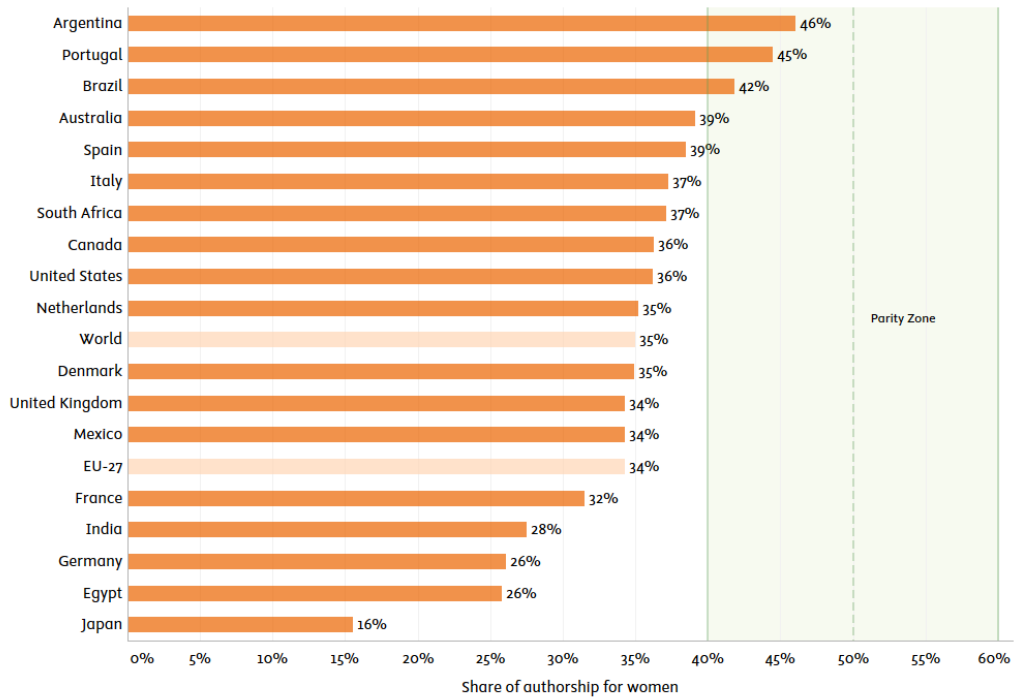


FIGURE 3-3
Shares of authorship for women across countries and regions (2018–2022).
Source: Scopus and NamSor data

3.2 Academic impact

Publications by men are generally more cited than those by women, but this gap lessens with career advancement. In 2018–2022, research by advanced-career women was slightly more cited than men's. For this section, we do not have Japan specific data in this report.

Importance: Understanding citation differences helps identify disparities in academic recognition, visibility, opportunities, and resources.

Measurement: Citation impact is measured using the field-weighted citation impact (FWCI) score, with an FWCI of 1.0 indicating the world average.

Historically, men's publications receive more citations on average than women's (Figure 3-4), with a stable citation gap of around 0.05. This persistent gap suggests systemic issues. From 2018 to 2022, the gap remained across all broad subject categories, but advanced-career women's publications received slightly more citations than those of advanced-career men (Figure 3-5).

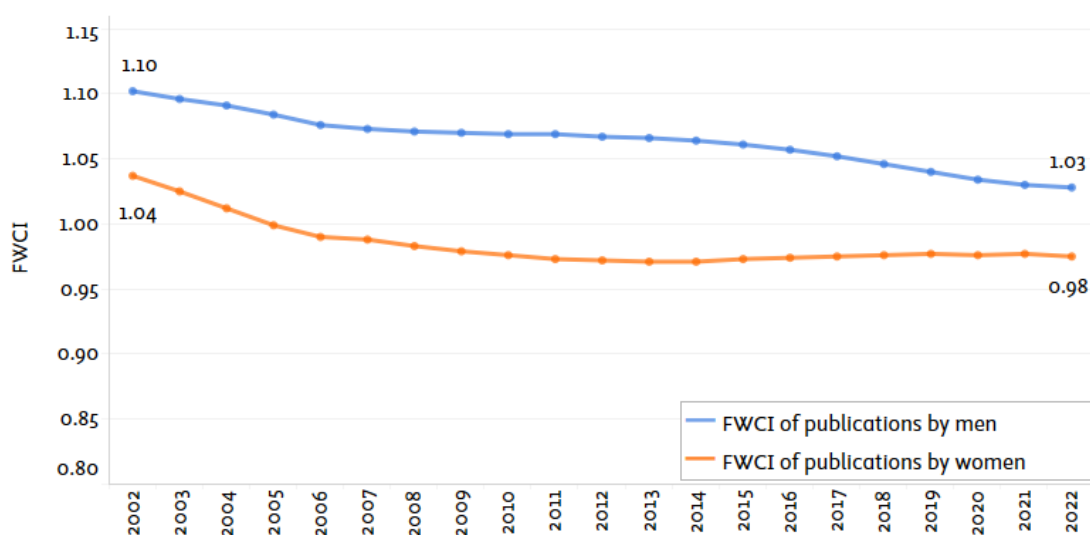


FIGURE 3-4
Citation impact (FWCI) of publications by women and men.
Source: Scopus and NamSor data

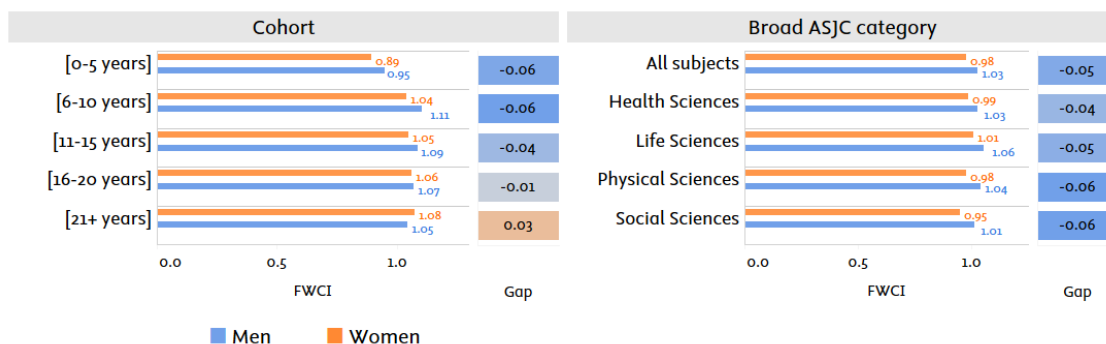


FIGURE 3-5
Citation impact (FWCI) of publications, per cohort (Left) and per broad ASJC discipline (Right). 2018–2022.
Source: Scopus and NamSor data

3.3 Research innovation and patent output

Women file significantly fewer patent applications than men, indicating that the growing share of women in research has not translated into equal participation in innovation. In below we will investigate some further depth for the case of Japan.

Importance: Patent output reflects the practical application of scientific research, serving as a proxy for contributions to innovation, technological advancement, and economic impact.

Measurement: Patent output is measured using data from the United States, Europe, and WIPO, based on patent applications filed at their respective authorities.

Women are significantly underrepresented in patent filings globally. In 2022, women were filers on only 26% of all patent applications, while men appeared on 97%, highlighting that nearly all innovations involve at least one man. Despite a slight increase in women's participation over time, they remain a substantial minority in patent activity (Figure 3-6).

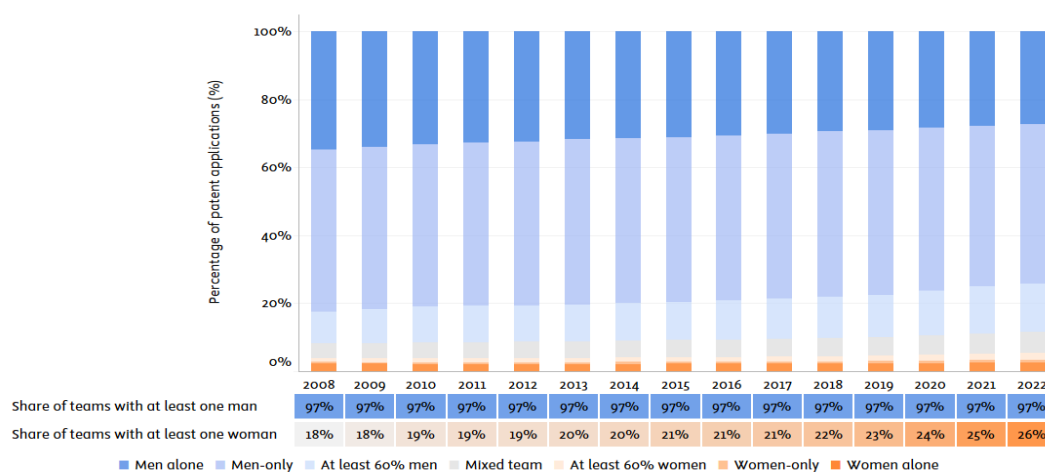


FIGURE 3-6

Trend in team composition on patent applications (2008–2022).

Source: LexisNexis patent data from the USPTO, EPO and WIPO authorities

At the current growth rate (4.2% CAGR in 2018-2022), it would take nearly 25 years for women to be filers on 50% of all patent applications. However, even then, men would still vastly outnumber women in overall patent filings. This pattern is consistent across countries, with few exceptions (Figure 3-7). Higher shares of women in patent innovation are seen in Portugal, Spain, Mexico, Brazil, and France. In contrast, Japan, South Africa, Egypt, Germany, and Italy have the lowest shares.

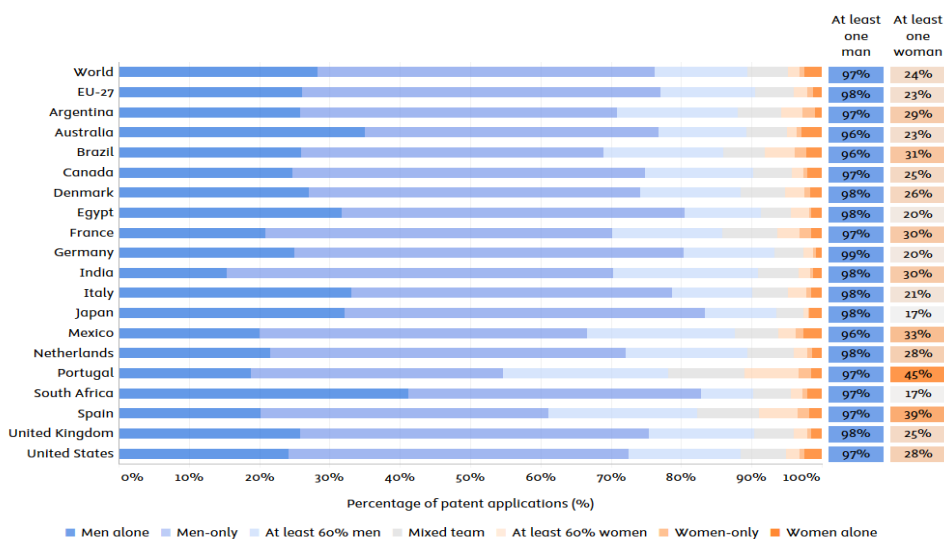


FIGURE 3-7

Team composition on patent applications, per country (2018–2022).

Source: LexisNexis patent data from the USPTO, EPO and WIPO authorities

Let's shift the focus to the share of publications cited by patents by extracting data from our gender report dashboard. In Japan, the share of publications cited by patents for female researchers is higher than the world average and is also higher than that of male researchers in certain fields (e.g. STEM, Agriculture & Biological Sciences, Materials science, etc.) (FIGURE 3-8). Despite the high share of publications cited by patents involving Japanese female researchers, their participation in patent applications remains significantly limited. 'Patent' here includes all citations at the time of initial filing, examination by the patent office, at the time of opposition after grant, and at various stages throughout the whole cycle of the patent. It may be hypothesized as women researchers see a higher patent citation rate, if their participation in patenting activities can increase, it would have a positive impact overall on knowledge transfer and economic impact. In 2016, a study submitted to the Development Bank of Japan found that the economic value of patents involving both male and female inventors was higher than patents with only male inventors in almost all industries³.

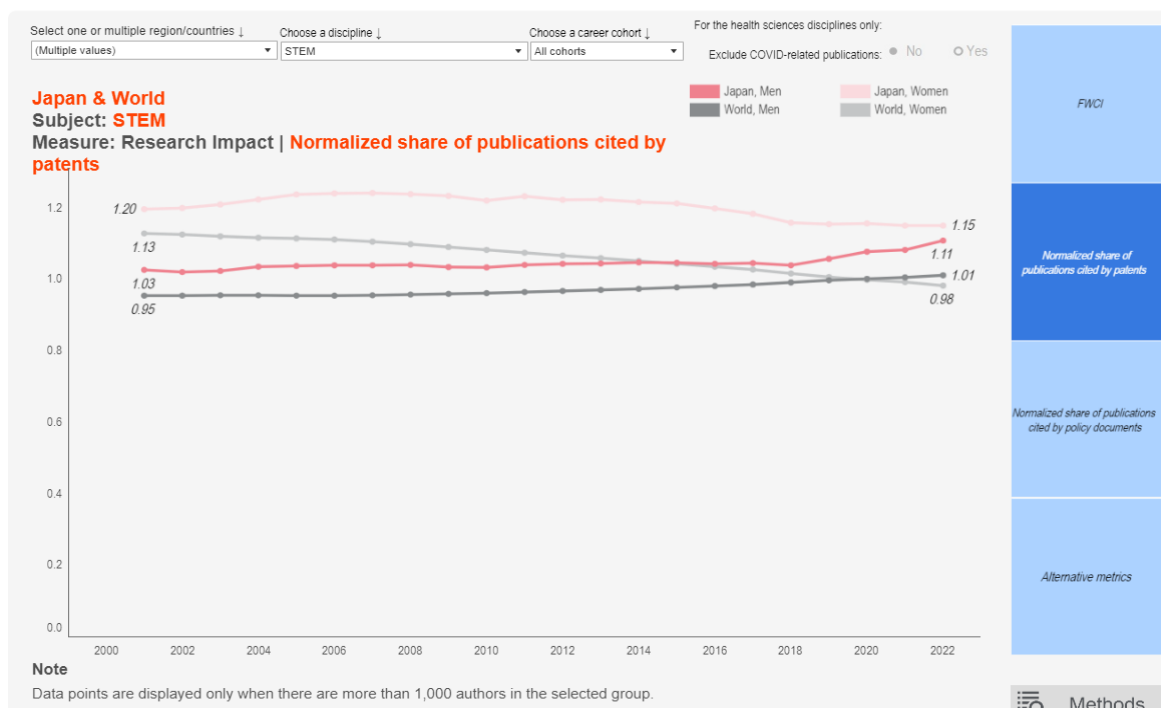


FIGURE 3-8
 Normalized share of publications cited by patents in STEM, Women and Men in Japan & World
 Source: LexisNexis patent data from the USPTO, EPO and WIPO authorities

³ Reference: Yukari Mochi / [No.257 女性の活躍は企業パフォーマンスを向上させる～特許からみたダイバーシティの経済価値への貢献度～](#) / Development Bank of Japan

Chapter 4

Research outcomes and impact

4.1 SDGs Research

Importance: Research on Sustainable Development Goals (SDGs) is crucial for meeting current needs without compromising future generations. SDGs address global challenges like poverty, inequality, climate change, and justice. For this section, we do not have specific data for Japan, but find it important to include as it relates to key societal challenges.

Measurement: This section examines women's participation in SDG-related research using Elsevier's SDG mapping, indicating alignment with key societal challenges.

Findings

- Women's representation in SDG research has significantly increased, particularly in education (SDG 4), gender equality (SDG 5), reduced inequalities (SDG 10), and peace and justice (SDG 16). (FIGURE 4-1)
- Early-career women researchers have comparable representation to men across 13 SDGs, but senior women are underrepresented in critical areas like clean energy (SDG 7), innovation (SDG 9), sustainable cities (SDG 11), and climate action (SDG 13).
- Senior women researchers are under 30% in 11 SDGs, highlighting the need for policies to retain early-career women to achieve future parity.

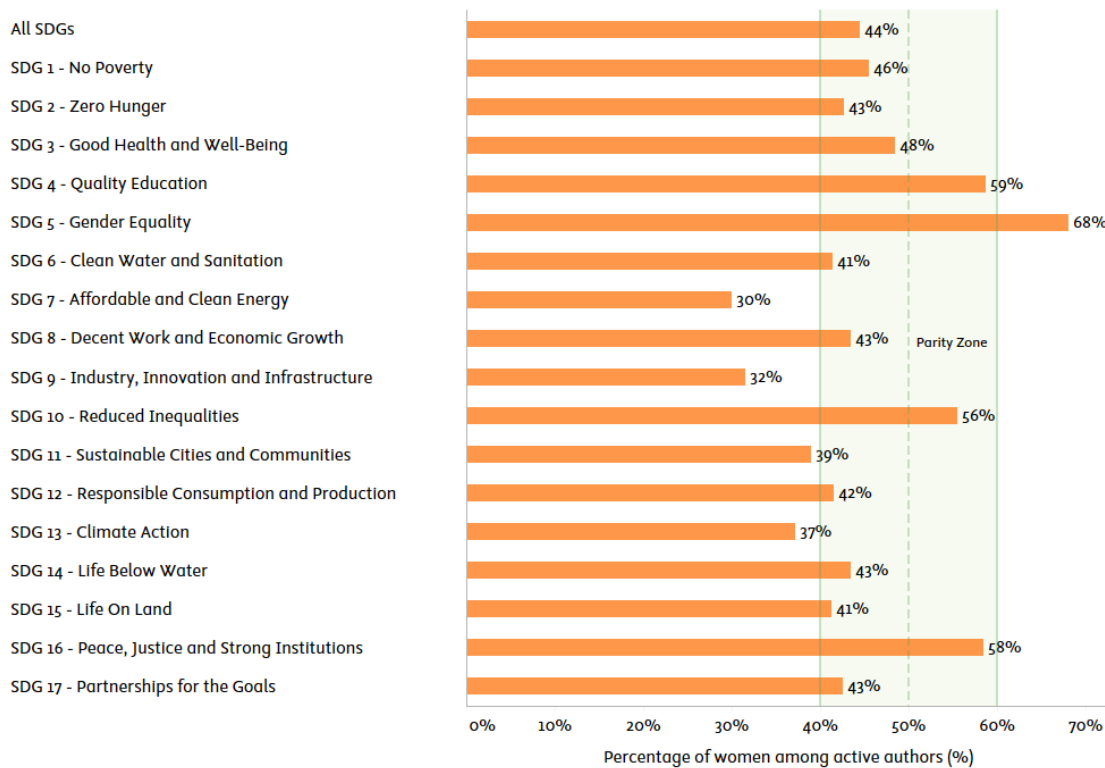


FIGURE 4-1
Share of women active researchers across UN SDGs in 2018–2022.
Source: Scopus and NamSor data

4.2 Societal impact and alternative metrics

Women's research receives more policy citations⁴, news, and blog mentions, while men's research is more often cited in Wikipedia and patents. This trend spans all career stages and subject fields. For this section, we do not have Japan specific data, but find it of importance to include as it represents impact outside academia.

Importance: Traditional bibliometric indicators don't fully capture the breadth of researchers' contributions. Alternative metrics help to measure these broader impacts.

Measurement: Societal impact is assessed using alternative metrics, including mentions on Wikipedia, news sources, blogs, and citations in patent and policy documents.

Alternative metrics reveal distinct patterns across career cohorts (FIGURE 4-2):

- **Patent Citations:** Women are less frequently cited in patents across all career stages, likely due to their underrepresentation among patent inventors.
- **Wikipedia Mentions:** Men receive more mentions, reflecting gender biases in Wikipedia contributions and content.
- **News, Blogs, and Policy Citations:** Research involving women scores higher in these metrics across all career stages.

Discipline-Specific Gaps: Women have fewer publications cited in patents but score higher in policy citations within Health and Physical Sciences, and similarly to men in Life and Social Sciences.

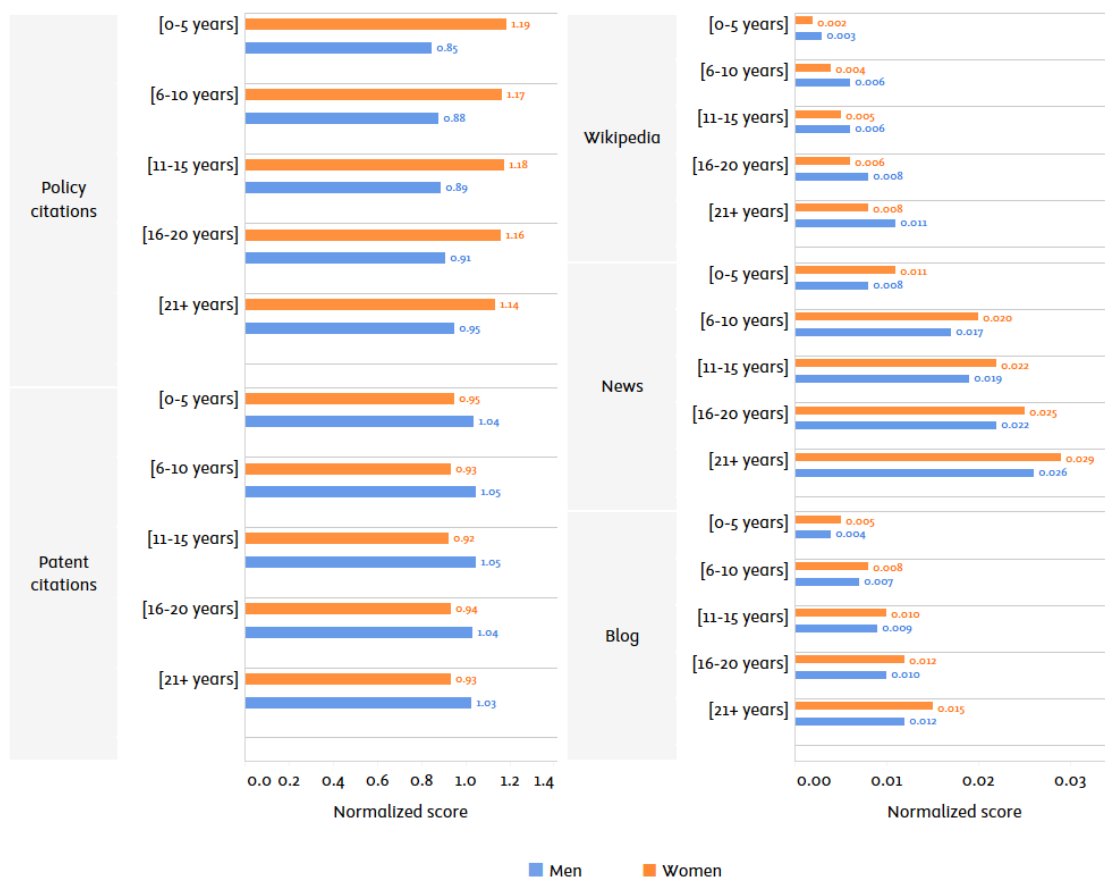


FIGURE 4-2

Comparison of women and men as authors across multiple alternative citation metrics, per career stage (2018–2022).

Source: Scopus, NamSor and Overton data

⁴ The share of publications cited in policy documents decreases closer to the present time because policy citations can take a long time to accrue. Therefore, policy citation scores are normalized annually to account for this effect.

Advancing gender diversity in research: A conversation with Dr Miyoko O Watanabe

“Japan research leader calls for greater diversity in research and policymaking and an evolution of academic evaluation metrics.”



Miyoko O Watanabe, PhD, Trustee of Nihon University / Member of Elsevier’s I&D Advisory Board

[Progress Toward Gender Equality in Research & Innovation](#) is Elsevier’s latest and most comprehensive analytics report mapping the advances and persistent challenges experienced by women researchers across two decades and 20 countries and regions. It aims to provide academic leaders, funders and policymakers with significant new data on the progress and ongoing disparities in the research ecosystem and inform evidence-based actions that will support continued progress toward gender equity. The report and accompanying Gender Dashboard offer valuable intersectional insights into women’s contributions to the global research ecosystem, reveal the pressing need for the evolution of traditional academic evaluation metrics, and emphasize the continuing imperative for greater inclusiveness in the research workforce.

Academic leaders like Dr Miyoko O Watanabe ask pivotal questions about how research institutions can better facilitate constructive dialogue and progress in gender diversity and equality. As a member of Elsevier’s I&D Advisory Board, the standing Trustee of Nihon University, the CEO of NPO Wood Deck and the former Executive Director of the [Japan Science and Technology Agency \(JST\)](#) and Chair of the 2017 [Gender Summit 10 Asia-Pacific](#), Dr Watanabe offers a unique perspective on the conversation surrounding gender parity in research. Her insights on the latest Elsevier report are both enlightening and thought-provoking.

A shifting focus for science

Dr Watanabe noted that “society is changing rapidly across the world, and science will need to grasp these changes to make contributions through evidence-based policy.” She said it’s critical that women, and especially young people, are represented, with greater diversity not only within the scientific workforce but also among policymakers.

“In the past, science contributed to industrialization, mainly by men, with primarily economic benefits,” she said. “Now, science that contributes to society as a whole is needed.”

The report’s finding that women are largely driving research related to the UN Sustainable Development Goal (SDGs) was particularly notable. She suggested that progress on the SDGs and the contribution of women to SDG-related research will need to be analysed carefully as future goals are set.

Working together regardless of gender parity

Dr Watanabe found that the report shows greater progress toward gender parity in Western countries than in Japan and Korea. While research is needed to understand the reasons for these trends, she maintained that “diversity and collaboration among men and women are as important as attaining a 50:50 gender ratio” in research.

Dr Watanabe expanded on the importance of diversity in mentorship in academia. “Individuals who are pursuing a career in science rely on their direct personal experiences with peers and mentors,” she explained. Separate analysis discussed with Dr Watanabe, not included in the report suggested that women tend to seek out other women mentors, however, Dr Watanabe encouraged young researchers to seek guidance from a diverse range of individuals, not necessarily just those who represent their future selves.

Innovation through diversity

Dr Watanabe pointed to the report’s finding of a gender gap in patent filings as another area of improvement, where diverse teams would not only address equality but also spur innovation: “Rather than gathering like-minded people into teams, researchers and decision-makers should strive to form and work in mixed-gender groups,” this as a way to broaden the pool of inputs and ideas, which are a source of innovation. Furthermore, rather than look at gender alone, age and even geographic region should be considered when building diverse teams,” Dr Watanabe added.

Re-evaluating the evaluation criteria

As science shifts its focus to address broad societal challenges, Dr Watanabe explained, it will be important to reconsider the criteria used to evaluate the research being conducted. She appreciated the analysis of both traditional and new measures of research impact in the report:

Academia must move beyond the current evaluation criteria to new perspectives being created — to incorporate more complex elements that reflect the diversity of society and its challenges. The axis of evaluation should be shifted to include multidisciplinary and interdisciplinary research, for example.

Again, she noted, an emphasis on diverse teams where inclusion is valued may be as important a goal as gender parity.

Learning from global partners

Finally, Dr Watanabe noted the value of the report as a resource for understanding and learning from different academic systems worldwide, particularly in the Global South, which has seen success in achieving gender parity in various areas.

“Within the Global South, it’s not only the developed countries — South Africa, India and Egypt — that are leading the world, but also smaller countries,” she pointed out. “In a real sense, it shows that we need to think more deeply about where we should look for new ideas.”

Dr Watanabe said she looks forward to learning more about the strategies and policies that have been put in place that have enabled these countries to do things a little bit differently to advance gender equality.

Conclusion

In conclusion, Dr Watanabe underscored the importance of advancing gender equity, diversity and inclusion in scientific research to address a shifting landscape of global societal challenges. She called for greater diversity in both scientific teams and among policymakers, and a shift in the evaluation criteria used in academia to better reflect the complexity of research questions. Her comments provide valuable guidance for policymakers, universities and research institutions seeking to advance gender equality in research and drive innovation.

<https://www.elsevier.com/connect/advancing-gender-diversity-in-research-a-conversation-with-dr-miyoko-o-watanabe>

Conclusion

Our analysis shows significant progress towards gender equality in research, but challenges persist in STEM participation, funding, authorship, citations, and patent output. These disparities require ongoing attention and action.

Progress: Notable increase in women's participation in the global research workforce. Japan also show progress, but at a slow pace where parity threshold of 40% cannot be expected to be reached in near or mid-term.

Challenges: Persistent gender gaps in STEM fields, senior positions, publication authorship, and patent filings, with regional variations highlighting systemic hurdles and biases.

Impacts: Women significantly contribute to societal issues, Sustainable Development Goals, Health Sciences, multidisciplinary research, open access publishing, and policy influence.

Conclusion: The report, and the accompanying dashboard emphasizes progress towards gender equality, acknowledges ongoing challenges, and calls for continued efforts and policy interventions.

Our work and collaboration with stakeholders, globally and in Japan, aims to be a valuable resource for policymakers, funders, institutions, and researchers, providing a data-driven foundation to advance gender equality in the global research landscape.

Key recommendations

- 1. Accelerate Gender Equality Actions:** Progress is too slow; we must urgently build and sustain diverse research teams.
- 2. Retain Early-Career Women:** Address unconscious bias, provide mentoring, support women through life changes, and aid access to research funding to help early-career women progress.
- 3. Incentivize Women in Innovation:** Implement financial incentives, preferential funding, and targeted training to boost women's participation in STEM.
- 4. Broaden Evaluation Metrics:** Use qualitative and quantitative indicators, including societal and policy impact, to evaluate research effectiveness beyond traditional bibliometrics.
- 5. Increased diversity in patent application teams:** Include women who are authors of papers cited in patents in the patent application team to aim for higher patent registration rates.
- 6. Monitor and Report Diversity Data:** Continuously collect and report inclusion and diversity data to identify gaps, evaluate policies, and ensure accountability.

Authors and Contributors

Adaptation

Miwa Sasaki

Academic Relations Manager, APAC

Review, Comments

Dr Anders Karlsson

Vice President, Global Strategic Networks, Asia Pacific

Katsuhiko Hori

Manager, Regional Marketing

Subject Matter Expert

Dr Miyoko O Watanabe

Trustee of Nihon University

Member of Elsevier's I&D Advisory Board

Paola Barr

Global Strategic Networks Analyst



ELSEVIER