



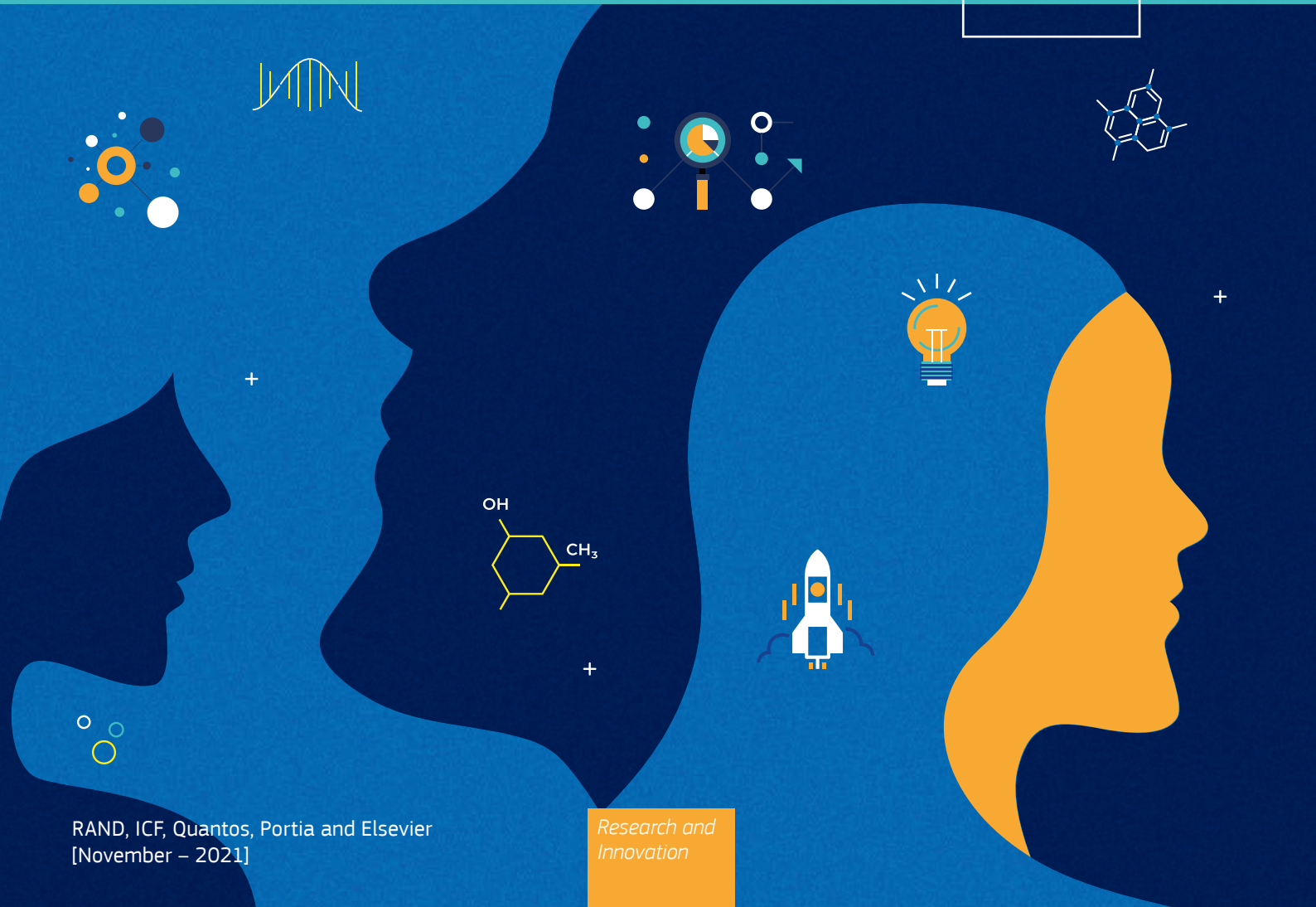
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Manuscript completed in November 2021

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PDF ISBN 978-92-76-43535-8 doi:10.2777/078011 KI-07-21-083-EN-N

Luxembourg: Publications Office of the European Union, 2021

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She Figures 2021

Policy Briefs

TABLE OF CONTENTS

POLICY BRIEF 1	Improving the presence, participation, and progression of women in science	3
POLICY BRIEF 2	Institutional culture, research excellence & institutional change (including the impact of COVID-19)	14
POLICY BRIEF 3	Policy actions to tackle gender imbalance in Europe's research leadership	23
POLICY BRIEF 4	Gender dimension in research and innovation content and training	32
POLICY BRIEF 5	Holistic view of Science Technology Engineering, and Mathematics (STEM) education at undergraduate level.	39
POLICY BRIEF 6	Promoting a gender perspective in innovation	49
POLICY BRIEF 7	Intersectionality	60

POLICY BRIEF 1

IMPROVING THE PRESENCE, PARTICIPATION, AND PROGRESSION OF WOMEN IN SCIENCE

This policy brief discusses the topic of the presence, participation, and progression of women in science. The brief presents available data at the EU-level and discusses key policy priorities at the EU, national level, and institutional levels, concluding with recommendations for different stakeholders. Good practices are presented in the policy brief to illustrate some of the approaches taken at the EU, national and institutional levels to improve the presence, participation and progression of women in science.

Summary of key issues

The Communication from the European Commission on a new European Research Area (ERA)¹ recognises that while gender balance in doctoral graduates has nearly been reached, gender inequalities persist in Europe's research and innovation (R&I) systems in terms of women's participation and progression in scientific careers. An example of an ongoing issue in this area, well supported by evidence in She Figures, is the persistently **lower level of women's participation in several academic fields** (including STEM) at **all career stages**, requiring fresh policy intervention.

The under-representation of women researchers in different career stages is increased through the **'leaky pipeline'** and **'glass ceiling'** phenomenon. The former refers to the effect of women leaving the career pipeline at different stages. As a result, an increase in the share of women among graduates (or at a later stage in the career ladder) does not automatically lead to an increase in the share of women among researchers or the share of women among Grade A (i.e. the highest position at which research is conducted) academic staff. The glass ceiling effect refers to the structural barriers such as discrimination and gender bias that impede women's access to top decision-making and managerial positions.

An additional factor partly contributing to slower career progression of women compared to men is gender differences in **access to research funding**. Research funding is essential to career progression and performance assessment of research careers. Differences in funding success rates for women and men in R&I could lead to a vicious cycle where lower funding could lead to lower patents or publications, which in turn could lead to less competitive funding applications.

An example of an emerging issue, for which reliable statistical data is less available, is the increasing **precariousness of academic careers**, such as short-term contracts, affecting women in particular. Women in the EU tend to be over-represented in precarious and part-time work, which might be linked to gender stereotypes related to family responsibilities. An urgent new issue is the impact of COVID-19 pandemic and the lockdown measures on higher education institutions including the impact on the research output of women scientists, which is discussed in detail in policy brief ².

1 European Commission (2020). Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions, A new ERA for Research and Innovations, COM(2020) 628 final. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0628&from=EN>

What do data tell us?

Key findings from She Figures indicators

The She Figures publication follows the chronological journey of women in science from participation in doctoral programmes to their presence in the labour market and among researchers to their progression to decision-making roles, while considering their research outputs. Key findings on the presence, participation, and progression of women in science that are identified in the She Figures 2021 analysis are:

- **In 2018, women represented around 48.1% of doctoral graduates at the European level** (i.e. EU-27), indicating near gender parity when all fields of study are considered.
- **Despite advancements in the pool of doctoral graduates, inequalities persist in the labour market in science and technology occupations.** For example, in 2019, women were less represented among the population of employed scientists and engineers at European level (41.3%).
- **Men continue to be over-represented in the EU's researcher population.** At the European level, women represented around one third (32.8%) of the total population of researchers. Compared to the EU-28 data from She Figures 2018, there has been a slight improvement in women's representation among researchers in the EU-28 (from 33.4% in 2015 to 33.8% in 2018).
- When data are disaggregated by the main economic sectors, the results indicate that **gender segregation in research careers persists across these sectors.** Specifically, in 2018, women researchers were more likely to be employed in the higher education sector (55.9%), while men researchers were more likely to be employed in the business enterprise sector at European level (53.3%).
- In terms of career progression among academic staff, **men were twice as likely as women to hold a grade A position at the European level** in 2018 (15.7% for men and 7.6% for women).
- **A glass ceiling** (the ratio of women in academia in grades A over women at all levels (A, B, and C)² **persists at the European level** and among EU-27 Member States and Associated Countries. At European level, the glass ceiling index was around 1.5 in 2018, compared to an index of around 1.6 in 2015, which indicates that the presence of a glass ceiling effect for women academics has reduced slightly over time.
- **There are more men than women among active authors between 2015-2019.** Among active authors, the ratio of women to men was closest to gender parity i.e. 1.0 among early-stage authors at the European level (0.8 for <5 years since first publication). On the other hand, the ratio was furthest from parity among senior authors (0.5 for > 10 years since first publication).
- **Gender differences exist in access to research funding,** where the funding success rate for men was 3.9 percentage points higher than the funding success rate for women at European level.

2 The Glass Ceiling Index (GCI), as computed in She Figures, is a relative index comparing the proportion of women in academia (Grades A, B, and C) to the proportion of women in top academic positions (Grade A positions; equivalent to full professorships in most countries), for a given year. The GCI can range from 0 to infinity. A GCI of 1 indicates that there is no difference between women and men in the chance of being promoted. A score of less than 1 means that women are over-represented at Grade A level and a GCI score of more than 1 points towards a glass ceiling effect, meaning that women are under-represented in Grade A positions. In other words, the interpretation of the GCI is that the higher the value, the stronger the glass ceiling effect and the more difficult it is for women to move into a higher position.

The glass ceiling index can also be analysed through consideration of the differential rate of career progression/promotion between women and men - often called the "male advantage index". It is considered through this ratio: (% of men in Grade A positions among male academics) / (% of women in Grade A positions among female academics): (%Grade A men among Grades A+B+C male population) / (%Grade A women among Grades A+B+C female population)

Additional sources

In this context of the under-representation of women researchers at different career stages, it is important to understand the factors contributing to these persisting inequalities.

A survey of UK researchers in 2020³ which sought views on workplace culture found that 60% of the respondents thought that their working environment was biased in favour of certain groups of people (60% of respondents were women and 37% men. 84% were white and 11% were Black, Asian and minority ethnic).

Over a third of respondents reported experiencing discrimination during their research career and 46% responded that they had witnessed discrimination. The results were higher for women than men, 44% of women reported having experienced discrimination and 51% of women reported witnessing it. When considering which aspects of bullying, harassment, or discrimination were related to (gender, race or ethnicity, age, nationality, class/socio-economic background, sexual orientation, disability, religion, gender identity), gender was by far the most common. It is also notable that women (22%) were less likely than men (30%) to believe their concerns relating to these issues would be acted on appropriately.

While attitudes towards the effectiveness of gender equality initiatives – such as Athena SWAN – were mixed, many women respondents said that these had led to more small improvements to the working environment. The environment of long hours and presenteeism is particularly problematic for individuals with care commitments. 57% of respondents agreed that there was a long working hour culture at their workplace, while 48% agreed that they had felt pressured to work long hours. Furthermore, 62% agreed that the system exploited their interest in the work, leading to a heavy workload.

What are the key policy priorities?

EU policy commitments

At the European level, **political commitments to strengthen the presence, participation and progression of women** in higher education have been made throughout the past few years. The focus on gender equality has been one of the priority topics in the framework of the European Research Area (ERA) for two decades. The 2012 ERA Communication invited Member States to “create a legal and policy environment and provide incentives to remove legal and other barriers to the recruitment, retention and career progression of women researchers”⁴ and the Council Conclusions of 1 December 2015 on Advancing gender equality in the ERA⁵ reinforced this objective, further inviting relevant authorities in Member States to set up guiding targets for gender balance in professorships and leadership and decision-making positions.

The latest ERA progress report concluded that while some progress has been achieved in gender equality and gender mainstreaming in the ERA, efforts are still needed to reduce the gender pay gap and **remove obstacles to women’s career progression** as well as better integrate the gender dimension in R&I content.⁶

3 Wellcome, 2020. *What Researchers Think of the Cultures they work in*. Available at: <https://wellcome.org/sites/default/files/what-researchers-think-about-the-culture-they-work-in.pdf>

4 European Commission, 2012. *Communication from the Commission to the European Parliament, The Council, the European Economic and Social Committee and the Committee of the regions A Reinforced European Research Area Partnership for Excellence and Growth*. Available at: https://era.gv.at/public/documents/4295/era-communication-partnership-excellence-growth_en_17072012.pdf

5 Council of the European Union Permanent Representatives Committee, 2015. *RECH 282 COMPET 531 SOC 684*. Available at: <https://data.consilium.europa.eu/doc/document/ST-14414-2015-INIT/en/pdf>

6 European Commission, 2019. *ERA Progress Report 2018*. Available at: https://ec.europa.eu/info/publications/era-progress-report-2018_en

Concrete legal changes have also been taken to promote the work-life balance through the adoption of the Directive (EU) 2019/1158⁷ on work-life balance for parents and carers. In addition, Directive 2019/1152 on Transparent and Predictable Working Conditions provides a new set of rights for all EU workers, particularly addressing insufficient protection for workers in more precarious jobs.⁸

The EU's gender equality strategy 2020-2025⁹ called for new measures to strengthen gender equality in Horizon Europe, including the requirement for institutions to have a gender equality plan in place in order to apply¹⁰, as well as a new initiative to increase the number of women-led technology start-ups.¹¹

The **policy framework for the new ERA** calls for coordinated action to promote a gender inclusive culture in research, enact sustainable change in R&I institutions and unblock the pipeline of women talent in research. This is expressed concretely through the development of inclusive gender equality plans with Member States and stakeholders in order to promote EU gender equality in R&I.¹² The Council in its Conclusions on the new ERA of 1 December 2020 also called for a renewed focus on gender equality and mainstreaming, including through the implementation of gender equality plans and the integration of the gender dimension into R&I content, also inviting Member States and Research Funding Organisations (RFOs) to advance measures to ensure that allocation of research funding is not affected by gender bias.¹³

In March 2021, the European Commission published a **proposal for binding pay transparency measures**. The initiative aims at tackling the persisting inadequate enforcement of the fundamental right to equal pay and ensuring that this right is upheld across the EU, by establishing pay transparency standards to empower workers to claim their right to equal pay.¹⁴

National policy directions

At the national level, a combination of approaches to support women's presence, participation, and progression has emerged. This includes measures for quotas and enhanced monitoring, as well as measures to support the reconciliation of care responsibilities.

Supporting equal career progression through quotas, reconciliation of work/care and enhanced monitoring

Across European higher education, there has been a significant move to introduce quotas, targets or other quantitative data for academic staff and students. Indeed, there are numerous national examples of such national-level approaches being in place over a considerable period of time:

- 7 Directive (EU) 2019/1158 of the European Parliament and of the Council of 20 June 2019 on work-life balance for parents and carers and repealing Council Directive 2010/18/EU. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1562941367621&uri=CELEX:32019L1158>
- 8 Directive (EU) 2019/1152 of the European Parliament and of the Council of 20 June 2019 on transparent and predictable working conditions in the European Union. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019L1152>
- 9 European Commission, 2020. *Communication of 5 March 2020 on A Union of Equality: Gender Equality Strategy 2020-2025*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A152%3AFIN>
- 10 European Commission, 2020. *Communication of 30 September 2020 on A new ERA for Research and Innovation*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A628%3AFIN>
- 11 Details available at: European Commission, 2021, *EU to launch new support scheme for women in deep tech and call for mentors*. Available at: https://ec.europa.eu/info/news/eu-launch-new-support-scheme-women-deep-tech-and-call-mentors-2021-mar-08_en; European Innovation Council, Women TechEU, Available at: https://eic.ec.europa.eu/eic-funding-opportunities/european-innovation-ecosystems/women-techeu_en
- 12 European Commission, 2020. *Communication of 30 September 2020 on A new ERA for Research and Innovation*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A628%3AFIN>
- 13 Council Conclusions, 2020, *RECH 483 COMPET 611*. Available at: <https://data.consilium.europa.eu/doc/document/ST-13567-2020-INIT/en/pdf>
- 14 Details available at: European Commission, 2021, *Proposal for a Directive of the European Parliament and the Council to strengthen the application of the principle of equal pay for equal work or work of equal value between men and women through pay transparency and enforcement mechanisms*. Available at: https://ec.europa.eu/info/sites/info/files/aid_development_cooperation_fundamental_rights/com-2021-93_en_0.pdf

- Since 2012, universities and research institutes in **Germany** have been obliged to implement gender quota according to the cascade model. This model determines targets for the proportion of men and women to be recruited or promoted to a certain career or hierarchical level based on the proportion of each at the level directly below. Five-year targets are published.¹⁵
- In **Norway**, the Norwegian Research Council (a government agency that funds R&I projects) has put in place the Programme on Gender Balance in Senior Positions and Research Management (BALANSE).¹⁶ Established in 2014, the programme aims to improve gender balance by facilitating the efforts of research institutions to promote gender equality in research and research management supporting structural and cultural change at these institutions. The BALANSE programme seeks to be a national learning arena and is developing a toolkit for gender equality measures in the research sector. The objective of the programme will be achieved through three main areas of activity:
 - BALANSE projects;
 - Knowledge development and new research;
 - National learning arena.
- In early 2020, the **Irish** Government gave approval for the creation of 20 women-only professorships aimed at tackling gender inequality in higher education, with a total of 45 posts to be allocated over a three-year period in areas where there is “clear evidence” of significant under-representation of women, such as physics, computer science and engineering. In April 2021, Trinity College Dublin elected its first woman provost to lead the University in its 429-year history.¹⁷
- The **Austrian** Federal Ministry of Education, Science and Research promotes more gender-appropriate research-mission statements, career models and selection procedures at the public universities that will take into account the life-phase and biographical circumstances (including the reconciliation of work/study with care responsibilities, work in the economy or in civil society organisations).¹⁸
- The **Swiss** federal government has been pursuing since 2000 a programme called Equal Opportunity at Swiss Universities. Its main aims include ensuring that 25% of all full and associate professors and 40% of all assistant professors are women.¹⁹ The programme is accompanied by the yearly monitoring exercise which reports on the progress to achieving gender equality across academic positions of regular and assistant professors in all Swiss universities and research institutes.²⁰ A benchmarking pilot project was running between 2017-2020 to use the gender data to benchmark gender performance in all main types of Swiss universities and research institutes.
- In **Sweden**, the State sets targets in relation to the hiring of full professors for the periods of three to four years. In Sweden, it is also mandatory to continuously work with active measures to prevent discrimination, as stated in the Discrimination Act. How this translates into practice is demonstrated in Lund University.²¹ At Lund University, the faculties report their progress on equality every year in the Annual Report of the University. The Faculties must document the four steps:
 - Review risks of discrimination,
 - Analyse the root/cause of the issue,
 - Attend to the issue,
 - Follow up.

The work is monitored by the Swedish Discrimination Ombudsman. The University-wide management group for gender equality and equal opportunities is a network and a strategic arena for the faculties’ representatives to share experiences and support.

15 EMBO, Bendiscioli, S., Wallon, G. and Garfnkel, M., 2015. *Exploring Quotas in Academia*, Heidelberg. Available at: https://eige.europa.eu/sites/default/files/exploring_quotas_academia.pdf & <https://eige.europa.eu/gender-mainstreaming/toolkits/gear/examples/cascade-model>

16 The Research Council of Norway, Gender balance and gender perspectives. Available at:

<https://www.forskningradet.no/en/Adviser-research-policy/Gender-balance-and-gender-perspectives/>

17 <https://www.irishtimes.com/news/education/twenty-women-only-professorships-to-be-established-this-year-1.4128975>

18 GENDERACTION, 2020, *Policy Brief “Disruptive measures for gender equality in R&I”*, Available at: https://genderaction.eu/wp-content/uploads/2021/07/GENDERACTION_Policy-Brief_14.pdf

19 SwissUniversities, *Equal Opportunities and Diversity*. Available at: [Equal Opportunities and Diversity - swissuniversities](https://www.swissuniversities.ch/en/topics/equal-opportunities/gendermonitoring)

20 SwissUniversities, *Gendermonitoring*. Available at: <https://www.swissuniversities.ch/en/topics/equal-opportunities/gendermonitoring>

21 LERU, 2018, *Implicit bias in academia: A challenge to the meritocratic principle and to women’s careers - And what to do about it*. Available at: <https://www.leru.org/publications/implicit-bias-in-academia-a-challenge-to-the-meritocratic-principle-and-to-womens-careers-and-what-to-do-about-it>

Institutional-level policy and practices

At institutional level, a variety of approaches have been implemented which includes training of equality and diversity, enhanced transparency of processes for recruitment, evaluation and progression, policies for more equal access to research funding and for support of reconciliation of work and care responsibilities.

Training on equality and diversity for academic leaders, staff and students

In a number of countries, initiatives have been taken to provide training on gender equality and more broadly diversity issues to raise awareness of the challenges amongst the senior leaders, staff members and students.²² Examples of such initiatives, mostly at the institutional level, include the following.

- In **Ireland**, Trinity College Dublin initiated a cascade of gender bias training and its dissemination, starting from the university leadership team and cascading down to the heads of departments and faculties. By 2015 all members of all promotions committees were required to attend one of two sessions. Trinity College has also developed a series of online training resources on equality matters. This includes internally and externally provided resources.²³
- In **Italy**, the University of Milan organised training courses on the effects of gender stereotypes on career paths and research, between 2012 and 2015. This was undertaken in the framework of the FP7 Project STAGES – Structural Transformation to Achieve Gender Equality in Science. The courses addressed the senior management of the entire University (Management Board, Academic Senate, Heads of Department, Heads of Administrative Office) and of selected departments. The courses focused in particular on addressing the impact of gender stereotypes in evaluation, career progression and decision-making. Institutional leadership.²⁴
- In **Sweden**, Lund University has centres for educational development that include different aspects of equality and bias in their programmes. For a lecturer to be appointed, (s)he must have completed at least five weeks of training in higher education teaching and learning including on equality and bias dimensions, or be able to demonstrate equivalent knowledge by other means.²⁵
- In the **UK**, for the University of Edinburgh, endorsement by the Principal (Vice-Chancellor) was key to getting engagement for training senior staff, exploring concepts of equality and unconscious bias. The sessions were by invitation and voluntary, but all who were invited attended at least one session. The University of Edinburgh measured the impact of training, showing major improvements in unconscious bias knowledge, and pro-equality efficacy, and a decrease in family versus career stereotyping for women. The University's online Challenging Unconscious Bias training course is compulsory for all staff involved in recruitment and promotion panels.²⁶

In addition to some of the examples outlined above, it is also evident that there is increased interest in the monitoring of gender-based targets. A EUA survey of a total of 159 higher education institutions from 36 European systems in 2019²⁷ found that a significant proportion of HEIs had in place and were working with gender-related targets. 57% of institutions had such gender-related targets for academic staff, 32% for non-academic staff and 41% for students. In contrast, only 5% of institutions reported having quantitative targets related to people with care responsibilities, which suggests that whilst there is increased interest, gender may be being examined somewhat in isolation.

A 2020 report produced by the Standing Working Group on Gender in Research and Innovation under European Research Area and Innovation Committee (ERAC SWG GRI) examined the implementation of actions and measures to support gender balance in decision-making and in Grade A positions. The report followed up on a 2018 report

22 *Ibid*

23 Details available at: Trinity College Dublin, *Online Training*. Available at: <https://www.tcd.ie/equality/training/lead-online-training/>

24 STAGES Project, 2015, *Structural Transformation to Achieve Gender Equality in Science Guidelines* Available at: https://eige.europa.eu/sites/default/files/guidelines_stages_1.pdf

25 Rönmar, M., Wickberg, K., 2018, *Good and Clear Career Paths at Lund University*. Available at: https://www.staff.lu.se/sites/staff.lu.se/files/ronmar_good_and_clear_career_paths_at_lund_university.pdf

26 Additional details available at: The University of Edinburgh, *Challenging Unconscious Bias*. Available at: <https://www.ed.ac.uk/human-resources/learning-development/courses/other-courses/elearning/challenging-unconscious-bias>

27 Claeys-Kulik, A. L., Jørgensen, T. E. & Stöber, H., 2019, *Diversity, Equity and Inclusion in European Higher Education Institutions Results from the INVITED project*. Available at: https://eua.eu/downloads/publications/web_diversity%20equity%20and%20inclusion%20in%20european%20higher%20education%20institutions.pdf

to determine the extent to which Council Conclusions from 2015 on Advancing Gender Equality in the European Research Area had been implemented by Member States and institutions. The report details progress made in the development of national and institutional policy frameworks to advance gender balance in decision-making. The report presents data for 25 countries on the extent to which they have set and implemented guiding targets and/or quotas through legislation, 14 of 25 have quotas and/or targets in place through their legislation for university bodies, such as rectorates, senates, boards, councils, etc. 11 of 25 have not implemented targets and/or quotas at the national level.²⁸

Enhancing the transparency of recruitment, evaluation and progression procedures

To promote **more gender-sensitive and unbiased recruitment**, predominantly at the institutional level, individual universities have taken steps to promote gender equality in their recruitment procedures through a combination of approaches²⁹:

- Including a gender equality expert in the selection panels (for example, in Heidelberg University³⁰, KU Leuven³¹);
- The Eindhoven University of Technology³² launched a special recruitment programme exclusively for women for a given period.
- Offering gender bias training to the selection panels and training on competency-based recruitment (University of Lund³³) and a broader programme of equality and unconscious based training to recruiters in Trinity College Dublin³⁴ and University of Edinburgh³⁵;
- Drafting the job advertisements and recruitment guidelines in a gender-sensitive way (Heidelberg University, University of Freiburg, KU Leuven implementing a more qualitative assessment of candidates, Imperial College London, University of Zurich implementing a model and a practical toolkit “Open, Transparent and Merit Based Recruitment of Researchers” (OTM-R)).³⁶

A further example of this institutional level approach is demonstrated by **Freie Universität Berlin in Germany** which has a long-standing policy to increase the number of women professors.³⁷ This includes clear and strict formal rules for the recruitment process. For example, half of the members of search committees, and at least two of them, must be women scholars (one of them a women professor). If there are no women candidates on the shortlist, the department is obliged to explain why, including providing information on attempts to obtain applications from women candidates, and to explain whether the gender equality officer had been consulted and how the department plans to increase the number of women scholars in the future. In order to achieve a higher percentage of women professors, the University is actively counselling the members of search committees and engages in active scouting for women talent. Moreover, gender equality officers are involved throughout the process. As a result, the share of women professors has risen from 24 % to 32 % between 2008 and 2017, reaching 37 % in 2019.

28 Details are available at: Council of the European Union, 2020, *WK 8491/2020 INIT*. Available at: https://era.gv.at/public/documents/4304/WK_8491_2020_INIT.pdf, p. 24

29 LERU, 2018, *Implicit bias in academia: A challenge to the meritocratic principle and to women's careers - And what to do about it*. Available at: <https://www.leru.org/publications/implicit-bias-in-academia-a-challenge-to-the-meritocratic-principle-and-to-womens-careers-and-what-to-do-about-it>

30 Heidelberg University, 2011, *Enhancing Gender Equality*, CITY-DRUCK, Heidelberg. Available at: https://www.uni-heidelberg.de/md/gsb/imagebrosch_gleichst_engl_druck_neu.pdf

31 Details available at: Bekers, T., Malfliet, K., Van Aerschot, M., 2016, *How does one find her?*, KU Leuven Diversity Office, Leuven. Available at: https://www.kuleuven.be/diversiteit/pdf/KU%20Leuven%20Genderrapport_interim_FINAL_with%20lay%20out%20edit.pdf

32 GENDERACTION, *Policy Brief "Disruptive measures for gender equality in R&I"*, Available at: <https://genderaction.eu/policy-advice/gender-equality-in-era/>

33 LERU, 2018, *Implicit bias in academia: A challenge to the meritocratic principle and to women's careers - And what to do about it*. Available at: <https://www.leru.org/publications/implicit-bias-in-academia-a-challenge-to-the-meritocratic-principle-and-to-womens-careers-and-what-to-do-about-it>

34 Trinity College Dublin, Online Training. Available at: <https://www.tcd.ie/equality/training/lead-online-training/>

35 The University of Edinburgh, *Challenging Unconscious Bias*. Available at: <https://www.ed.ac.uk/human-resources/learning-development/courses/other-courses/elearning/challenging-unconscious-bias>

36 University of Zurich, *Open, Transparent and Merit-Based Recruitment of Researchers*. Available at: https://cdn5.euraxess.org/sites/default/files/policy_library/otm-r-checklist.pdf

37 Claeyss-Kulik, A. L., Jørgensen, T. E. & Stöber, H., 2019, *Diversity, Equity and Inclusion in European Higher Education Institutions Results from the INVITED project*. Available at: https://eua.eu/downloads/publications/web_diversity%20equity%20and%20inclusion%20in%20european%20higher%20education%20institutions.pdf

The **University of Padua** in **Italy** published its first annual Gender Report in 2017 (concerning the year 2016)³⁸. Since then, it has conducted yearly monitoring of the gender relevant indicators that reveal inequalities and power imbalances in the University and in academic careers. The reports present disaggregated data about students, teaching staff, and administrative staff. It also includes surveys of the different leadership positions occupied by men and women in the institution; and features information on the gender pay gap and other relevant issues. The collected data are used to provide evidence about existing gender imbalances and to develop gender budgeting actions that address disparities.

In the area of researcher progression, evaluation and promotion throughout the academic life, there are institutional level efforts **to reform the workload allocation models, their reflection in the performance reviews and use quotas to promote more gender balanced researcher progression.**

Workload models are normally implemented at departmental/school level and vary by discipline, so that there are challenges in implementing them to correct and monitor for gender bias. At the same time, this is a crucial issue in the design of the research career model on how to evaluate the performance of scientists who have exited the system (or country) for some time or have worked part-time (e.g., women scientists due to care responsibilities)³⁹. The core of the problem is that the research career success strongly depends on the time (e.g., full-time-equivalent, FTE) spent on research.

- In **Ireland**, HEIs have been working to ensure that HEI workload allocation models are transparent and monitored for gender bias on an annual basis.⁴⁰ The extent to which this has been used, and any gender bias addressed, is taken into account in the performance development reviews of managers/supervisors responsible for setting staff workloads. Since 2016, transparent workload models are in place in all seven Irish universities. Universities are working to ensure that the principles that underpin their models and the manner in which they are implemented are not gender biased. Each university is examining how workload allocation data can be analysed and aggregated to monitor for gender bias.
- A gender-aware workload model has been developed by **Nottingham University in the UK** in consultation with staff, which acknowledges that colleagues contribute to the overall workings of the University in many different ways. The model ensures 'equity and transparency in workload allocations'.⁴¹

The **use of quota to promote** the career progression of women has also been in place in several countries at the institution level. The approach in Germany was described above (under *Supporting more equal career progression through quotas and enhanced monitoring* section), two further examples are presented below:

- In **Ireland**, the HEIs are using a flexible cascade model for promotion/recruitment, where the proportion of women and men to be promoted/recruited is based on the proportion of each gender at the grade immediately below.⁴² From 2016 four out of seven Irish universities have implemented quotas, cascade quotas or a cascade monitoring tool. One university is currently reviewing its promotion and progression schemes and is considering this recommendation in its review. The remaining two universities do not implement quotas, but review gender equality objectives in monitoring the outcomes of promotion rounds.
- In **Spain**, at **Universitat Politècnica de Catalunya**, a gender coefficient has been included in the evaluation of women candidatures for promotion to full professor category (their evaluation is marked up).⁴³

38 *Ibid*

39 Niglas, K., Niinemets, Ü., Pilt, E., Randma-Liiv, T., Roosalu, T., Soomere, T., 2018, *Sustainable Research Career Models: Applications for Estonia. Executive Summary*. Tallinn, Estonian Academy of Sciences. Available at: https://www.etag.ee/wp-content/uploads/2018/04/Sustainable-Research-Career-Models_Applications-for-Estonia.-Executive-Summary.pdf

40 Higher Education Authority, 2018, *Gender Action Plan 2018-2020*. Available at:

<https://hea.ie/assets/uploads/2018/11/Gender-Equality-Taskforce-Action-Plan-2018-2020.pdf>

41 Higher Education Authority, 2016, *HEA National Review of Gender Equality in Irish Higher Education Institutions*, Available at: <https://hea.ie/assets/uploads/2017/06/HEA-National-Review-of-Gender-Equality-in-Irish-Higher-Education-Institutions.pdf>

42 Higher Education Authority, 2018, *Gender Action Plan 2018-2020*. Available at:

<https://hea.ie/assets/uploads/2018/11/Gender-Equality-Taskforce-Action-Plan-2018-2020.pdf>

43 GENDERACTION, 2020, *Policy Brief "Disruptive measures for gender equality in R&I"*, Available at:

https://genderaction.eu/wp-content/uploads/2021/07/GENDERACTION_Policy-Brief_14.pdf

Gender equality in career progression is also supported by **networks and monitoring**. The **Dutch Network of Women Professors** (Landelijk Netwerk Vrouwelijke Hoogleraren - LNVH) is a network of over 1400 women professors and associate professors. They represent every discipline and all Dutch Universities and publish an annual monitor of institutional targets for women in academic and administrative positions. The goals of the network are to:

- strengthen the links between women professors and associate professors in the Netherlands, inter-, as well as intradisciplinary and to give support in all activities surrounding professorships and associate professorships;
- promote the rise of capable women to higher university positions, and to prevent them leaving the sector;
- cooperate with organisations with comparable goals, in the field of academic research and education;
- strive for numerically proportionate representation of women in committees and advisory boards in the field of academic research and education;
- undertake other activities that contribute to achieving the goals of the network, provided these are not contrary to Dutch Law or public order.⁴⁴

The LNVH also produce the Women Professors Monitor report.⁴⁵ The Monitor has been produced since 2015 and provides data on a range of aspects, such as different job categories, salary scales, age, Glass Ceiling Indexes, scientific fields, University Medical Centres and academic management.

Ensuring equal access of women researchers to research funding

Access to research funding is an integral part of research careers and one of the key determinants of career progression and performance assessment across Europe. Hence, it is important that initiatives are taken to improve the gender balance in the awards of research funding.⁴⁶ For instance, the Science Europe 'Practical Guide to Improving Gender Equality in Research Organisations' provides guidance on how to avoid unconscious bias in the peer review process, how to monitor gender equality, and how to improve grant management practices.⁴⁷

Policies at the national funding level are identified below in this respect.

In **Ireland**, Science Foundation Ireland (SFI) set a target to increase the number of women award-holders to 25% by 2020, from an average of 19% in the period 2008-2012. To this end, several measures and approaches were put in place. These contributed to meeting the 25% target by 2017 (and revising the target up to 30% by 2020).⁴⁸ Key measures included:

- Introduction of a supplemental discretionary allowance to enable SFI-funded research teams to provide cover for a team member who goes on maternity or adoptive leave. The SFI Advance Award Programme provided women postdoctoral researchers with an opportunity to remain in, or return to, high-quality research and in particular, to undertake further training that has substantial industry relevance on a full-time or part-time basis.
- The 'SFI Women in Science Early Career Initiative', the agency has incentivised the participation of women in the flagship SFI Starting Investigator Research Grant (SIRG) scheme. This was done by raising the maximum number of applications a research body can make from 5 to 12, on the condition that no more than 6 of the applications are from male applicants. In 2018 it was reported that the initiative had encouraged gender balance in applications with 48% of applications received from women.⁴⁹

44 Details available here: Dutch Network of Women Professors (LNVH), *LNVH*. Available at: [https://www.lnvh.nl/#:~:text=The%20Dutch%20Network%20of%20Women%20Professors%20\(Landelijk%20Netwerk%20Vrouwelijke%20Hoogleraren,female%20professors%20and%20associate%20professors](https://www.lnvh.nl/#:~:text=The%20Dutch%20Network%20of%20Women%20Professors%20(Landelijk%20Netwerk%20Vrouwelijke%20Hoogleraren,female%20professors%20and%20associate%20professors).

45 Dutch Network of Women Professors (LNVH), 2020, *Women Professors Monitor*, Available at: <https://www.lnvh.nl/monitor2020/EN.html>.

46 Higher Education Authority, 2016, *HEA National Review of Gender Equality in Irish Higher Education Institutions*, Available at <https://hea.ie/assets/uploads/2017/06/HEA-National-Review-of-Gender-Equality-in-Irish-Higher-Education-Institutions.pdf>

47 Science Europe, 2017, 'Practical Guide to Improving Gender Equality in Research Organisations': D/2017/13.324/2. Available at: https://www.scienceeurope.org/media/ubbl/odu/se_gender_practical-guide.pdf

48 Science Foundation Ireland, *Gender and Maternity*. Available at: <https://www.sfi.ie/funding/sfi-policies-and-guidance/gender/>

49 Science Foundation Ireland, 2018, *Analysis of gender success rates in the SFI review process and overview of SFI's gender redressing initiatives*. Available at: <https://www.sfi.ie/research-news/publications/SFI-Gender-Data-report-Nov-2018.pdf>

- The SFI Investigator Career Advancement (ICA) criteria aimed ‘to support researchers returning to active academic research after a prolonged absence’ by waiving the requirement for lead-authorship of ten international peer-reviewed articles for the SFI Investigators Programme 2015.

Research conducted by **the UK Research Councils** found that application processes for larger grants are biased against women, as a longer track record is required for a successful application. Acting on this, they have introduced a number of measures to improve the gender balance of awards, such as:

- valuing additional activities,
- requiring unconscious-bias training for all assessment panels,
- requiring that all universities are asked the question ‘Are the number of women applicants to this research call equivalent to the proportion of women working in this area in your institution?’.

The aim is to achieve a minimum of 30% of applications from women researchers within STEMM disciplines⁵⁰, as this is roughly comparable to the percentage of women working in STEMM.

Addressing additional challenges which can impact women’s academic careers

Women researchers face particular challenges to combine the demands of their research careers and care responsibilities, which still, despite long-standing efforts to change this, fall disproportionately on women. Efforts are underway to support a more equal distribution of care responsibilities and support women researchers in this regard.

As described above, an EUA survey of a total of 159 higher education institutions from 36 European systems in 2019⁵¹ found that around a half of HEIs offered measures for staff with caring responsibilities. National examples, at the institutional level, confirm this trend.

- In **Czechia**, the Masaryk University gives preferential treatment when selecting projects to support through the University Grant Agency to projects with researchers returning from parental leave. This is aimed at individuals who will have a key role in the project and is implemented as part of an internal competition to fund interdisciplinary projects through the University Grant Agency.⁵²
- **Swedish** universities proactively support the reintegration into the workforce of staff who avail of parental leave. For example, Uppsala University’s ‘Parental Policy’, in accordance with which staff and postgraduate students who avail of such leave are offered a planning discussion with their manager or supervisor prior to and after their leave.⁵³
- In **the UK**, the Chemistry Department at York University goes beyond the legal requirements in terms of paid family leave, paying the salary of researchers (including PhD students) on maternity leave, when this is not covered by their funding agency.⁵⁴ At Queens University Belfast, a Maternity Cover Fund is in place to provide assistance to Schools and Directorates. This ensures that work is covered when staff make maternity leave. This reduces anxiety and has ensured a 100% rate of return from maternity leave since 2011.⁵⁵

50 Standing for: Science, Technology, Engineering, Mathematics, Medicine

51 Claeys-Kulik, A. L., Jørgensen, T. E. & Stöber, H., 2019, *Diversity, Equity and Inclusion in European Higher Education Institutions Results from the INVITED project*. Available at: https://eua.eu/downloads/publications/web_diversity%20equity%20and%20inclusion%20in%20european%20higher%20education%20institutions.pdf

52 GENDERACTION, *Policy briefs*. Available at: https://genderaction.eu/wp-content/uploads/2020/11/GENDERACTION_PolicyBriefs_Brochure.pdf

53 Higher Education Authority, 2016, *HEA National Review of Gender Equality in Irish Higher Education Institutions*, Available at: <https://hea.ie/assets/uploads/2017/06/HEA-National-Review-of-Gender-Equality-in-Irish-Higher-Education-Institutions.pdf>

54 *Ibid*

55 European Institute for Gender Equality, *Maternity Cover fund*, Available at: [Maternity cover fund | European Institute for Gender Equality \(europa.eu\)](https://www.eige.europa.eu/maternal-leave)

What are the main recommendations?

Based upon the issues identified above, the existing policy framework and selected good practices, the brief presents the following list of recommendations.

- Member States should support the establishment and sustainability of a gender-equal culture within research organisations. This can be done through appropriate policy guidance and funding of gender equality at national level and within funding programmes.
- Research organisations need to ensure that unconscious bias training and training on promoting gender-inclusive work culture becomes part of the regular training and staff development programmes.
- Member States should support the development of statistical approaches to measure the advancement rate of individual researchers / academics / scientists from one career stage to the next. This will make career progress quantifiable and comparable and will help track (gender, national, or disciplinary) differences and similarities between careers at national and institutional levels.
- Research organisations should regularly monitor their organisational structures and processes to determine how they affect women researchers and put mechanisms in place to act on the evidence. This should also help to examine crucial areas of main challenges to gender-equal participation, access and progression in science and define concrete actions and measures for addressing those.
- Member States need to analyse their funding streams through a gender lens to combat gender differences in access to funding. Some research fields that are dominated by women have less access to funding.
- Similarly, RFOs need to take action to ensure more equal access to research funding. Examples of this include changes to the funding award criteria, and explicit targets for successful women candidates.
- Recruitment, selection, and career progression procedures need to be reformed by research organisations to remove any bias against women researchers. This includes paying attention to gender bias in recruitment processes and reforming the research assessment and workload models.
- Research organisations should ensure that effective policy and measures are in place to allow work-life balance (including, e.g. parental leave, dependent care).

POLICY BRIEF 2

INSTITUTIONAL CULTURE, RESEARCH EXCELLENCE & INSTITUTIONAL CHANGE (including the impact of COVID-19)

This policy brief explores persistent issues of gender inequality within research performing organisations (RPOs) and research funding organisations (RFOs). It outlines how institutional culture, research excellence and institutional change are affected by and can propagate gender inequality, concluding with recommendations for different stakeholders. Good practices are presented in the policy brief to illustrate some of the approaches taken at EU, national, and institutional levels to address some of the gender-related issues influencing institutional cultures.

Summary of key issues

Traditionally, **research excellence** is assessed through publication records in peer-reviewed journals¹ This social construction of research excellence can exclude researchers who do not fit this narrow image but do high-quality research. More equitable approaches to assessing research excellence focus on quality of work, rather than measures such as the impact factor of journals^{2,3}. Such approaches involve taking a more holistic view of researchers' contributions, including researchers' impact on wider society and other responsibilities, such as teaching and outreach, roles often disproportionately attributed to / expected of women. Revised approaches also promote actively reflecting on how biases held by individuals can hinder objective assessments of research excellence. For example, ideas held by individuals on recruitment panels about who is a 'good fit' for a role are often implicitly gendered.⁴

Aspects of **institutional culture** within RPOs and RFOs can also negatively affect the recruitment and retention of women. This includes poor work-life balance and research grant management practices that do not offer sufficient flexibility regarding maternity and parental leave. Workplace harassment, including sexual harassment, has also been noted as 'prevalent' inside higher education and research institutions.⁵ Short-term work contracts in RPOs can create relationships of dependence, within which junior team members may also be more vulnerable

- 1 Connolly, S., Fuchs, S., Herschberg, C., Schels, B., Vinkenburg, C., 2020, *Mapping career patterns in research: A sequence analysis of career histories of ERC applicants*, PLOS ONE, 15, (7), 1-19, Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0236252>
- 2 Curry, S., Hatch, S., 2020, *Research Culture: Changing how we evaluate research is difficult, but not impossible*, DORA, United States; Imperial College, United Kingdom. Available at: <https://elifesciences.org/articles/58654>
- 3 A wider discussion on the way metrics are used can be found here: Wilsdon, J., et al., 2015, *The Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management*. Available at : https://dera.ioe.ac.uk/23424/2/2015_metric_tide_Redacted.pdf
- 4 See for example: Granted, nd, *Grant Allocation Disparities*. Available at: <https://www.granted-project.eu/about/the-project>; LERU, nd, *Implicit bias in academia: A challenge to the meritocratic principle and to women's careers - And what to do about it* – Executive summary, LERU Publications. Available at: <https://www.leru.org/files/implicit-bias-in-academia-executive-summary.pdf>; Derks, B., Van Veelen, R., 2020, *Academics as Superheroes: Female academics' lack of fit with the agentic stereotype of success limits their career advancement*. PsyArXiv Preprint. Available at: <https://psyarxiv.com/c3k56/>
- 5 Bondestam, F., Lundqvist, M., 2020, *Sexual harassment in higher education – a systematic review*, European Journal of Higher Education, Available at: <https://www.tandfonline.com/doi/full/10.1080/21568235.2020.1729833>; European Research Area and Innovation Committee, 2020, *ERAC 1205/1/20 REV 1*. Available at: https://genderaction.eu/wp-content/uploads/2020/06/SWGGRI_Sexual-Harassment-in-the-Research-Higher-Ed.-National-Policies-Measures.pdf

to gender-based violence. Workplaces with an atmosphere of hyper competition can also reproduce environments in which those perceived to be of lower status are subject to greater degrees of harassment. Efforts to implement **institutional change** at national level across the EU have focused on Gender Equality Plans (GEPs) and gender mainstreaming efforts.

This policy brief also discusses these issues against a context of the **COVID-19** pandemic, during which progress towards gender equality has faced setbacks. Although the long-term implications are not yet fully known, a growing number of studies indicate that women researchers are disproportionately affected during the COVID-19 epidemic.

What do the data tell us?

Key findings from She Figures indicators

In relation to **institutional culture**, part-time and precarious work in the higher education sector (HES) is an important feature of women and men's working conditions that could shed light on underlying gender inequalities. The data from She Figures 2021 show that:

- **The proportion of women researchers who were employed part-time in the HES exceeded the equivalent proportion of men researchers** by 3.9 percentage points (11.1% for women and 7.2% for men) at the European level (i.e. EU-27). At the country level, the proportion of women researchers working part-time in the HES was larger than the proportion of men researchers in most EU-27 Member States and Associated Countries for which data were available (25 of the 31).
- **A greater proportion of women researchers also worked under precarious contracts in the HES** at the European level (9% for women compared to 7.7% for men). At the country level, the proportion of women researchers working under precarious employment was larger than the corresponding proportion for men researchers in over two-thirds of the EU-27 Member States and Associated Countries considered (22 out of 31).

To further examine the potential factors that increase precarious working conditions of women and men researchers, She Figures 2021 provides a new disaggregation, taking into account family status. The results show that:

- **Among researchers who were in a couple with children, a higher proportion of women researchers working in HES were employed under a precarious contract compared to men** at European level (7.2% women vs 4.4% men). The data suggest that gender differences in working conditions of women and men researchers might be related to unequal caring responsibilities.

Recently, Horizon Europe has reaffirmed the European Commission's efforts towards **institutional change** through a new requirement for public research organisations and higher education institutions to have in place a GEP.⁶ Within this policy context, the 2021 edition of She Figures includes an indicator presenting the current prevalence of measures and actions towards gender equality⁷. The proportion of RPOs that reported having taken such measures and actions on their website are presented in detail in chapter 5, by type of RPO - both higher education institutions (HEIs) and public research organisations (PROs).

- The data show that in line with the European Commission's approach to foster institutional change through GEPs, in the majority of EU-27 Member States and Associated Countries (19 out of 27), **more than 50% of HEIs mentioned actions and measures towards gender equality on their website**. This figure was greater than 80% in seven countries (DE, ES, AT, SE, NO, CH, TR) with more than 30 HEIs identified.
- Compared to HEIs, **a lower proportion of PROs mentioned actions or measures towards gender equality on their websites**. Among countries with more than 30 PROs identified, none had more than 80% of PROs mention actions and measures towards gender equality, with Sweden having the highest proportion at 78.1%.

6 European Commission, 2021, *General Annexes to Horizon Europe Work Programme 2021-2022*. Available at https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-13-general-annexes_horizon-2021-2022_en.pdf

7 Data were collected through web-scraping techniques.

Additional sources

Implementation of GEPs in EU Member States and Associated Countries, including obstacles and needs

In 2020, the Standing Working Group on Gender in Research and Innovation under European Research Area and Innovation Committee (ERAC SWG GRI) launched a survey to map GEP requirements at the national level and provide an overview of the obstacles for GEP implementation. The results of the survey showed that⁸:

- Six EU-27 and associated countries (DE, DK, FI, SE, IS, NO) require the adoption of GEPs in all sectors including HEIs and RPOs and 12 EU-27 and associated countries (AT, DE, DK, ES, FI, FR, IE, PT, SE, IS, NO, CH) had specific GEP requirements for HEIs at the national or regional level.
- France, Ireland, Spain, and Switzerland have the most extensive requirements for GEPs established by law or public policies on including building blocks, support structures, monitoring and evaluation mechanisms, sanctions or funding for the development of GEPs.
- In terms of the obstacles identified at the national level regarding the implementation of GEPs, the highest number of ERAC SWG GRI members pointed to resistance from R&I stakeholders followed by lack of human and financial resources.
- In terms of needs of ERAC SWG GRI members regarding the implementation of GEPs, the highest number of members responded that capacity building on GEP design, implementation, monitoring and evaluation followed by financial and human resources for GEP design, implementation and monitoring where their greatest areas of need.

Success factors and challenges for implementing strategies for equity, diversity and inclusion (EDI) in higher education institutions

A 2019 report by the European University Association, presented information on the institutional approaches, success factors and challenges HEIs face in implementing strategies for equity, diversity and inclusion. A total of 159 HEIs in Europe responded to the survey, with follow-up interviews also conducted with selected HEIs. The results from the EUA data collection on success factors and challenges for implementing EDI strategies showed that⁹:

- Support from the institution's leadership, for example from the rector or vice rector, is vital to allowing bottom-up initiatives to become policies that lead to cultural and structural changes.
- External drivers play an important role in developing strategies for equity, diversity and inclusion. For example, Advance HE members of the Athena Swan Charter in the UK and Ireland can apply for institutional and departmental Athena Swan awards recognising their gender equality efforts. According to the EUA report, the charter has been a driver for universities to expand gender equality efforts across different parts and levels of the institution and go beyond the originally narrow focus on STEM fields.
- When asked explicitly about the top three success factors for their institutional strategies and activities, the majority of respondents (76%) indicated that commitment and support of the institutional leadership was the most important followed by direct involvement of target groups (48% of respondents) and involvement of the entire university community (43%).
- When asked about the barriers to promote EDI strategies, the top two barriers identified were the lack of funding and other resources and the lack of the awareness about the issue within the university community.

8 ERAC SWG GRI, 2021, *GENDER EQUALITY PLANS AS A CATALYST FOR CHANGE. Report from the Standing Working Group on Gender in Research and Innovation*. Available at: <https://genderaction.eu/swgri-gender-equality-plans-as-a-catalyst-for-change/>

9 Claeys-Kulik, A. L., Jørgensen, T. E. & Stöber, H., 2019, *Diversity, Equity and Inclusion in European Higher Education Institutions Results from the INVITED project*. Available at: https://eua.eu/downloads/publications/web_diversity%20equity%20and%20inclusion%20in%20european%20higher%20education%20institutions.pdf

The impact of COVID-19 on women researchers.

Progress towards gender equality has faced setbacks due to the COVID-19 pandemic, although the long-term implications are not yet fully known.

A growing number of studies indicate that women scientists are disproportionately affected in their research during the COVID-19 epidemic compared to their male colleagues, which risks endangering the engagement, experience and retention of women in science, and setting back the progress that has been made over the past years.¹⁰

This can be partially attributed to women taking on a disproportionate share of child-care responsibilities. While such gendered norms have already been evident before the pandemic, a report by the Commission's Joint Research Centre notes that a change in these behavioural patterns is unlikely to occur in a short time, warning that women might feel pressured to reduce their workload or quit their job temporarily to meet growing household demands.¹¹ One survey on 4,535 principal investigators in scientific projects in Europe and the U.S. indicated that women academics, those conducting laboratory work and, especially, scientists with young children, have experienced a substantial decline in research time.¹² This impression was supported by two recent studies to estimate the gender rate of authors publishing COVID-19 related papers during the pandemic. Andersen et al (2020) found that fewer women than expected were named as first author in medical research papers published between March and April 2020, suggesting that this could also be linked to the restricted access to childcare and the traditionally greater amount of domestic responsibilities that women take on, compared to men, even in dual-career academic couples.¹³ Likewise, Pinho-Gomes et al (2020) concluded that women were under-represented as first and last authors in COVID-19 research since the beginning of the outbreak, adding that gender biases in the peer-review process or in the access to high in-demand research could be a potential reason.¹⁴ The causes of women's lower research output in these areas will need to be confirmed by further research, however there is a clear indication that the gender gap in academic productivity has widened during the lockdown.

Similarly, a study on manuscript submissions and reviews in 2347 Elsevier Journals during the pandemic assessed publication submission rates for men and women between February and May 2018 and 2020.¹⁵ The results indicated a statistically significant negative effect for women compared to men during the pandemic in three of the four research areas, i.e., health and medicine, physical sciences and engineering, and social science and economics. With the exception of the area of social science and economics, the study found a consistent negative interaction effect between gender and seniority. Publication submission rates for women at intermediate or advanced stages of their career were more significantly reduced than rates for PhD students and researchers without a PhD, the age of the latter being typically younger than the former.

- 10 Johnson, E., 2020. *The Impact of Covid-19 on Women Scientists from Developing Countries: Results from an OWSD Member Survey*, 20 June, Organization for Women in Science for the Developing World (OWSD); National Academies of Sciences, Engineering, and Medicine, 2021, *The Impact of COVID-19 on the Careers of Women in Academic Sciences, Engineering, and Medicine*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/26061>.
- 11 Blasko, Z., Papadimitriou, E. and Manca, A.R., 2020. *How will the COVID-19 crisis affect existing gender divides in Europe*, EUR 30181 EN, Publications Office of the European Union, Luxembourg, doi:10.2760/37511, JRC120525. Available at: <https://publications.jrc.ec.europa.eu/repository/handle/JRC120525>
- 12 Myers, K.R., Tham, W.Y., Yin, Y. et al., 2020, *Unequal effects of the COVID-19 pandemic on scientists*. *Nat Hum Behav* 4, p880–883. Available at: <https://doi.org/10.1038/s41562-020-0921-y>
- 13 Andersen et al., 2020, *Meta-research: COVID-19 Medical Papers Have Fewer Women First Authors Than Expected* *eLife*, doi: [10.7554/eLife.58807](https://doi.org/10.7554/eLife.58807)
- 14 Pinho-Gomes A, Peters S, Thompson K, et al., 2020, *Where are the women? Gender inequalities in COVID-19 research authorship* *BMJ Global Health*. Available at: <http://dx.doi.org/10.1136/bmjgh-2020-002922>
- 15 Squazzoni et al., 2020, *No Tickets for Women in the COVID-19 Race? A Study on Manuscript Submissions and Reviews*, 2347 Elsevier Journals during the Pandemic.

What are the key policy priorities?

EU policy commitments

Gender equality is a core policy area within the European Research Area (ERA). In September 2020, the European Commission adopted a Communication on a new European Research Area for Research and Innovation to further improve Europe's R&I landscape.¹⁶ Importantly, one of the 14 actions contained in this Communication is the development of inclusive GEPs with the EU Member States, Associated Countries and relevant stakeholders.¹⁷ One of the keys to achieving the objectives of the ERA is the current framework programme for R&I, Horizon Europe (2021-2027), where having in place a GEP will become an eligibility criterion for all research organisations, higher education institutions and public bodies wishing to participate in the programme.^{18 19} The Widening participation and strengthening the European Research Area (WIDERA) Work Programme 2021-2022 under Horizon Europe implements concrete measures to widen participation and strengthen the ERA including support to the implementation of GEPs.²⁰

Previous important steps over the past decade taken to facilitate institutional change include:

- The European Commission report Structural change in research institutions: Enhancing excellence, gender equality and efficiency in research and innovation (2011)²¹;
- Communication from The Commission to The European Parliament, The Council, The European Economic and Social Committee and The Committee of The Regions: A Reinforced European Research Area Partnership for Excellence and Growth (2012)²²;
- Advancing gender equality in the European Research Area - Council conclusions (adopted on 01/12/2015).²³

The EU's **financial support for institutional change** in previous framework programmes for R&I has been a key success factor for implementation of GEPs at the national level.

A systemic approach to tackle gender inequality through support for GEPs was first initiated under the 7th Framework Programme (FP7) and strengthened under the Horizon 2020 (2014-2020) programme for R&I. To support the implementation of GEPs, in 2016, DG RTD and the European Institute of Gender Equality (EIGE) developed the GEAR tool – a step-by-step guide with good practices to assist universities and RO's in implementing a GEP. Reference to the GEAR tool became a requirement for all GEP projects calls in the 2018-2020 Science with and for Society (SwafS).²⁴ Overall, the SwafS Work Programmes in Horizon 2020 funded a total of 21 GEP projects.²⁵

16 European Commission, 2020, *Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions, A new ERA for Research and Innovations*, COM(2020) 628 final. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0628&from=EN>

17 *Ibid*

18 European Commission, 2021, *General Annexes to Horizon Europe Work Programme 2021-2022*. Available at: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-13-general-annexes_horizon-2021-2022_en.pdf

19

20 European Commission, 2021, *Widening participation and strengthening the European Research Area - Horizon Europe Work Programme 2021-2022*. Available at: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-11-widening-participation-and-strengthening-the-european-research-area_horizon-2021-2022_en.pdf

21 Directorate-General for Research and Innovation (European Commission), 2011, *Structural change in research institutions*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/bb49c5dc-109b-483d-a47c-074f757243e3/>

22 European Commission, 2012, *Communication from the Commission to the European Parliament, The Council, the European Economic and Social Committee and the Committee of the regions A Reinforced European Research Area Partnership for Excellence and Growth*. Available at: https://era.gv.at/public/documents/4295/era-communication-partnership-excellence-growth_en_17072012.pdf

23 Council Conclusions on the new European Research Area, 2020, *RECH 483 COMPET 611*. Available at: <https://data.consilium.europa.eu/doc/document/ST-13567-2020-INIT/en/pdf>

24 *Ibid*

25 Directorate-General for Research and Innovation (European Commission), 2020, *Achievements in Horizon 2020 and recommendations on the way forward*. Available at: <https://op.europa.eu/s/ppwe>
CESAER, 2019, *EQUALITY, DIVERSITY AND INCLUSION BEST PRACTICES*; Available at: <https://www.cesaer.org/content/5-operations/2019/20190906-best-practices-equality-diversity-and-inclusion.pdf>

The EU has a range of policies in place that relate to **institutional culture** in RPOs and RFOs. The EU Gender Equality Strategy 2020-2025²⁶ includes a focus on combatting gender-based violence, including harassment in the workplace, and a range of measure to ensure a ‘gender-equal economy’, including addressing unequal caring responsibilities.²⁷ Moreover, the EU 2019 Directive on work-life balance for parents and carers introduced at least 10 working days paternity leave, at least 5 days of leave for workers providing care to a relative and the right to request flexible working arrangements.²⁸

Policy responses regarding **research excellence** are less pronounced. The international agenda is led by the San Francisco Declaration on Research Assessment (DORA) which has become a global initiative that covers all academic disciplines and a wide variety of stakeholders.²⁹ The Declaration focuses on ending reliance on Journal Impact Factors to measure research quality. In support of more equitable approaches for evaluating research excellence, expert evaluators of proposals submitted in response to Horizon 2020 calls are provided briefings and resources on implicit (or unconscious) gender biases that may influence decision-making.³⁰ For Horizon Europe, gender balance between personnel named in the proposal (responsible for the research) will be used as one of the ranking factors for equally ranked proposals.³¹

Initial EU level responses to the **COVID-19** pandemic have focused on strengthening the gender dimension in COVID-19 related research. This includes an ad hoc case study by the Gendered Innovations Expert Group on the impact of sex and gender in the COVID-19 pandemic, which examines sex-specific differences in immune responses and side effects of vaccines and therapeutics, as well as gender-specific risk factors and the socio-economic burden of public safety measures.³² In addition, the EU launched a second call for expression of interest, under which five projects have been funded to address the socio-economic and behavioural impact of the pandemic responses, where gender was considered an important cross-cutting issue.

At EU project level, RESISTIRE aims at mitigating the negative impacts of the crisis responses on women and girls and finding sustainable solutions towards an inclusive recovery.³³ Additionally, the Funding Organisations for Gender (FORGEN) community of practice of Horizon 2020 project ACT held a webinar on the importance of integrated a gender perspective on COVID-19 funded research.³⁴ Similarly, the EU-funded project Gender-SMART carried out a survey highlighting the impact of Covid-19 on income, need for child/family support and on work arrangements of researchers and staff in its partner RFOs and RPOs.³⁵ Such initiatives are essential to understand the impact of Covid-19 on women and men in R&I careers and subsequently how institutions can respond with more gender-sensitive strategies and actions.

26 European Commission, 2020. *Communication of 5 March 2020 on A Union of Equality: Gender Equality Strategy 2020-2025*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A152%3AFIN>

27 *Ibid*

28 Directive (EU) 2019/1158 of the European Parliament and of the Council of 20 June 2019 on work-life balance for parents and carers and repealing Council Directive 2010/18/EU. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1562941367621&uri=CELEX:32019L1158>

29 DORA, *San Francisco Declaration on Research Assessment*. Available at: <https://sfedora.org/read/>

30 European Commission, 2020, *Horizon 2020 Proposal Evaluation*. Available at: https://ec.europa.eu/research/participants/data/support/expert/h2020_expert-briefing_en.pdf

31 European Commission, 2021, *General Annexes to Horizon Europe Work Programme 2021-2022*. Available at https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-13-general-annexes_horizon-2021-2022_en.pdf

32 European Commission, 2020, *The impact of sex and gender in the COVID-19 pandemic*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/4f419ffb-a0ca-11ea-9d2d-01aa75ed71a1>

33 <https://cordis.europa.eu/project/id/101015990>

34 More information available at: <https://www.act-on-gender.eu/act-events/for-gen-consolidation-workshop>

35 Gender Smart, 2020, *Facing Covid-19 in Gender-Smart Partner Countries -Support to employment in Research Funding and Performing Organizations*. Available at: https://www.gendersmart.eu/documents/36447/714466/GENDER+SMART+FACING+COVID-19_INFGRAPHIC_FINAL+11-5-20.pdf/8ab8f2be-b405-f9e8-0528-ab41197cdd0a?t=1589198751223

National policy directions

Implementation of EU policy priorities by Member States and institutions in Member States varies considerably regarding institutional culture, research excellence and institutional change.

Institutional culture and change

At national level, progress regarding implementation of GEPs varies significantly, with different legal requirements and funding available to fully implement them, although all Member States have adopted gender equality approaches in their legal framework in accordance with the EU directives.³⁶ A review of GEPs in the private and public sector by the European Parliament in 2017 showed a high degree of variation in how GEPs are designed, implemented and monitored.³⁷ One of the main findings was that many GEPs lack detailed monitoring and evaluation processes, including indicators. The review also showed that only some countries have a legal requirement for GEPs (such as Sweden, Germany, Austria, France) and/or action plans to facilitate implementation. It also notes that most GEPs focus on increasing the participation of women in employment and at decreasing the gender pay gap, which, although important, is a narrow approach to understanding gender inequalities.

These findings are supported by research by the GENDERACTION project in 2020, analysing progress on Priority 4 of the European Research Area and focusing on gender equality and gender mainstreaming in research and innovation through measures including National Actions Plans (NAPs).³⁸ The report showed the diverse stages and uses of NAPs across the EU and offers the following typology of countries:

- Countries with a comprehensive and consistent NAP and corresponding implementation (Austria, Belgium, Germany, the Netherlands, Slovenia, Spain and Sweden)
- Countries with focused NAPs (Cyprus, Denmark, Finland, Ireland, Luxembourg, Malta and Portugal) which address two out of three ERA gender equality objectives
- Countries with inconsistencies within the NAP or between the NAP and its implementation (Greece, Italy and the UK)
- Countries with actionistic NAPs (the Czech Republic, Estonia, Lithuania and Poland) which do not contain a context analysis but formulate priorities and/or implement measures
- Countries with focused NAPs but without implementation (Croatia and Latvia)
- Countries without a NAP (Hungary and Slovakia) or with a NAP but without gender equality priorities (Bulgaria and Romania).

Progress regarding tackling gender-based violence in RFOs and RPOs appears limited.³⁹ The Standing Working Group on Gender in Research and Innovation notes that gender-based violence, with few exceptions, is an unrecognised issue and an underdeveloped field of knowledge at the national level in the European Research Area. They state that 'only a few countries have introduced cohesive measures and activities that may be able to achieve institutional change.'⁴⁰

Ireland has recently taken significant steps to tackling sexual harassment in Higher Education Institutions (HEI). The Minister for Higher Education announced in November 2020 that HEIs must develop institutional action plans and report statistics annually on the number of incidents of bullying, intimidation or harassment, including sexual harassment.⁴¹

36 Directorate General for Internal Policies, 2017, *Gender Equality Plans in the Private and Public sectors in the European Union*, Policy Department C, Study for the Femm Committee. Available at: [https://www.europarl.europa.eu/RegData/etudes/STUD/2017/583139/IPOL_STU\(2017\)583139_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2017/583139/IPOL_STU(2017)583139_EN.pdf) p15

37 *Ibid*

38 Wroblewski, A., 2020, *Report on Monitoring of ERA Priority 4 Implementation*, GENDERACTION. Available at: https://genderaction.eu/wp-content/uploads/2021/02/GENDERACTION_D06_Monitoring-ERA-priority-4-implementation.pdf

39 Act-On-Gender, 2020, *e-discussion Addressing Sexual Harassment in Research Organizations*. Available at: <https://act-on-gender.eu/nes/e-discussion-addressing-sexual-harassment-research-organizations>

40 European Research Area and Innovation Committee, 2020, *ERAC 1205/1/20 REV 1*. Available at: <https://data.consilium.europa.eu/doc/document/ST-1206-2020-INIT/en/pdf>, p.5

41 Department of Further and Higher Education, Research, Innovation and Science, 2020, *Minister Harris confirms survey into harassment, sexual harassment and bullying of staff and students in higher education institutions*. Available at: <https://www.gov.ie/en/press-release/61728-minister-harris-confirms-survey-into-harassment-sexual-harassment-and-bullying-of-staff-and-students-in-higher-education-institutions/>

Institutional-level policy and practices

Research Excellence

One way to implement reform in how research excellence is assessed through reducing unconscious or implicit bias. A survey by Science Europe shows that important progress is being made. 21 out of 29 Member Organisations of Science Europe (composed of major research foundations) stated that they thought unconscious bias might come into play during discussions by review panels.⁴² 20 respondents also claimed to take action to minimise potential unconscious bias. Of these 20 respondents, five provided guidelines and training for reviewers about unconscious bias and composed gender-balanced panels.

Many European institutions have sought to change how academic excellence is measured and to implement DORA.⁴³ As of December 2020, more than 16,000 individuals and 2,000 organisations have signed DORA including about 175 academic institutions.⁴⁴ In 2019, 75% of universities in Europe still used the Journal Impact Factor in making assessments.⁴⁵ Slow progress is likely because of the complexity of the task, as well the continued reliance on metrics within higher education, including by RFOs, which makes change difficult to achieve for individual organisations. Nonetheless, progress is being led by individual institutions and a focus on cross-institutional learning and developing best practices.

In 2019, the **Netherlands public knowledge institutions** and **research funders** published a position paper about modernising the national recognition and rewards system. The purpose is to move toward more holistic evaluation practices, where the focus is on academic career and research quality assessment. Implementation is decentralised and led by a handful of institutions, although it is supported by the Dutch Ministry. Members of the consortium delivering this work in the Netherlands launched a new Strategy Evaluation Protocol in March 2020 and will be implemented between 2021 and 2027.⁴⁶

Covid-19

Various institutions have also taken gender sensitive approaches which consider the impact of Covid-19 on women researchers. For example, the Global Research Council Gender Working Group issued a list of questions for organisations to consider in responding to the pandemic, including deferring application deadlines and continuing to pay stipends. An interesting approach in this regard was the **Swiss National Science Foundation (SNSF)**, which introduced flexibility regarding its research funding due to the impact of COVID-19 on work patterns.⁴⁷ It extended the application deadline for new grants and allowed existing researchers to apply for a no-cost extension and additional funding, especially for those with additional supervisory duties.

One way of mitigating the negative effects of the COVID-19 pandemic, is for research funding organisations, to adapt their granting procedures in order to allow more flexibility for grantees, including by extending submission deadlines and grants, offering student support, and adapting evaluation procedures to factor in crisis-related delays in applications.⁴⁸ Witteman *et al.* demonstrate how targeted gender policy changes put in place by the Canadian Institutes of Health Research (CIHR) in response to the COVID-19 crisis, have succeeded in supporting female scientists and improving research quality, by extending deadlines and including sex and gender analysis into COVID-19 grant requirement.⁴⁹ Following these changes, the funder received more applications from women scientists, awarded a greater proportion of grants to these women, and received more grant applications that considered sex and gender analysis in the content of COVID-19 research.

42 Science Europe, 2017, *Summary of Implemented Indicators and Measures: Survey Results and Data on Improving Gender Equality in Research Organisations*, Available at: https://www.scienceeurope.org/media/fpxksyci/se_surveyresults_gender.pdf

43 Curry, S., Hatch, A., Lakoduk, A., Proudman, V., Saenen, B., 2021, *Reimagining Academic Career Assessment: Stories of innovation and change*. Available at: https://eua.eu/downloads/publications/eua-dora-sparc_case%20study%20report.pdf

44 *Ibid*

45 *Ibid* p5

46 Dora, 2020, *The Dutch Recognition Rewards Programme*. Available at: <https://sfedora.org/case-study/the-dutch-recognition-rewards-programme/>

47 Swiss National Science Foundation, 2020, *Pandemic: SNSF provides flexible solutions for researchers*. Available at: <https://www.snf.ch/en/PpR4LwMAMfFV7pl5/news/news-200319-pandemic-flexible-solutions-for-researchers???lang=de&lang=en>

48 Global Research Council, (GRC) *Gender Working Group*. Available at: <https://www.globalresearchcouncil.org/about/gender-working-group/>

49 Witteman, H.O., Haverfield, J., and Tannenbaum, C., 2021, *COVID-19 gender policy changes support female scientists and improve research quality*, PNAS 118 (6) e2023476118. Available at: <https://doi.org/10.1073/pnas.2023476118>

What are the main recommendations?

Based upon the issues identified above, existing policy framework and selected national good practices, this section presents a list of recommendations.

- Member States should ensure the implementation of impactful and sustainable institutional change through the development of Gender Equality Plans (GEPs) at institutional level to support the presence, participation, and progression of women in scientific careers.⁵⁰ This entails the collection of information on the uptake and implementation of GEPs at national level.
- Member States should include actions to combat gender-based violence in national action plans, strategies and other policy documents relevant to gender equality in Research and Innovation, including through regular monitoring and reporting of instances of gender-based violence.
- RPOs and RFOs should ensure all staff understand how implicit bias can affect their work and decision-making, particularly concerning assessments of research excellence. Regular awareness-raising and training sessions, followed up with evaluation on the effect of this training would help towards this path. The use of gender-balanced panels is also important.
- RPOs and RFOs should consider ways to assess research excellence that do not rely on proxy factors and instead are based on direct assessments of quality. Implementation of DORA is an important first step in this regard. Additionally, it is important that RPOs and RFOs invest in this process through engaging in cross-institutional dialogue to support learning and share practical experiences to improve approaches.
- RPOs to implement support systems and formal complaint structures about gender-based violence and consider how short-term contracts and 'toxic' hypercompetitive environments might contribute to the prevalence gender-based violence.
- EU institutions, RFOs and RPOs to monitor the impact of responses to the COVID-19 pandemic on gender equality, both in the immediate term and long-term, and ensure sustainability in the post-COVID-19 recovery period.
- RPOs and RFOs to adopt policies that allow for flexible and supportive working arrangements in recognition of the often-greater caring responsibilities of women than men, especially during COVID-19. RFOs to offer flexibility regarding deadlines, particularly applications for new research grants to avoid long-term implications.
- RFOs to ensure grant qualification criteria do not directly or indirectly disadvantage those who take career breaks or have gaps in research activity during COVID-19.

⁵⁰ In line with Gender Equality Plans becoming an eligibility criterion for applicants to Horizon Europe funding, see the minimum requirements: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-13-general-annexes_horizon-2021-2022_en.pdf

POLICY BRIEF 3

POLICY ACTIONS TO TACKLE GENDER IMBALANCE IN EUROPE'S RESEARCH LEADERSHIP

This policy brief discusses the issue of gender imbalance in Europe's research leadership and presents available data. It then discusses key policy priorities at EU, national, and institutional levels before presenting recommendations for different stakeholders. Good practices are presented in the policy brief to illustrate some of the actions taken at EU, national, and institutional levels to tackle gender imbalance in Europe's research leadership.

Summary of key issues

The new European Research Area (ERA) framework¹ highlights the significant **under-representation of women in the Higher Education Sector (HES)** and in **grade A positions**, i.e. the highest level at which research is typically conducted. While the gap between the numbers of women and men in senior academic positions is reducing, there remains a rather low percentage of women in key leadership positions (She Figures, 2018 & 2021). In the context of She Figures, while equality has nearly been reached amongst doctoral graduates (48% at the European i.e. EU-27 level – though lower in many fields), only 26% of grade A staff positions (full professorships or equivalent) were occupied by women.² The rate of progress has been slow. Thus, an ongoing policy concern has been how to address the **persistent imbalance between men and women in key decision-making, governance, and leadership roles**, an important aspect being the progression of mid-career women researchers.

The gender imbalance in research leadership positions can be explained through the **'glass ceiling'** phenomenon where structural barriers such as discrimination and gender bias impede women's access to decision-making and managerial positions. The factors which contribute to and reinforce the glass ceiling effect are multiple, complex and intertwined. They include:

- lower rates of women, relative to men, achieving a full professorship, considered to be a pre-requisite for top level positions such as faculty leads, or university rectors (apart from non-executive board members who tend to be non-academics).³
- institutional cultures which can exclude women (including lack of work-life balance), societal perceptions of appropriate gender roles and unconscious gender biases which affect the assessment of women's scientific performances.

1 European Commission, 2020, *Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions, A new ERA for Research and Innovations*, COM(2020) 628 final. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0628&from=EN>

2 Based on She Figures 2021 findings

3 Rahier, M., 2017, *Supporting STEM excellence Women's Leadership in Higher Education and Research*, European University Association. Available at: <https://stemequality.com/wp-content/uploads/2017/06/Martine-Rahier-Supporting-STEM-Excellence-Women%E2%80%99s-Leadership-in-Higher-Education-and-Research.pdf>

- lower representation of women compared to men on evaluation committees where women candidates in academia are less likely to be promoted when a committee is composed exclusively of men.⁴

A lack of gender balance in leadership positions in research also entails a considerable loss and waste of talent that detrimentally affects institutional decision-making because women have fewer opportunities to shape and influence the research agenda.⁵ Inclusive and diverse leadership is essential to bring forward new ideas and innovative approaches that better serve the EU society.⁶

What do data tell us?

Key findings from She Figures indicators

Data collection for She Figures 2021 has shown that the under-representation of women in Europe's top research leadership continues to remain a significant issue:

- In 2019, **just over three in 10 board members were women and under a quarter of board leaders were women** at the European (i.e. EU-27) level.⁷ Among the EU-27 Member States and Associated Countries, only 12 out of 33 countries had more than 40% women among board members, while five had less than 20% of women among board members.
- In 2019, **only 23.6% of women were heads of higher education institutions** in the Higher Education Sector (HES) at the European level. For the majority of EU-27 Member States and Associated Countries, the proportion of women among heads of institutions was less than 30%.
- **There is significant variation between countries in the share of women in grade A positions** in the HES. In 2018, values for the proportion of women among grade A staff ranged between 13.3% in Cyprus and 50.8% in Romania.
- Furthermore, **women remained under-represented at the top level positions in academia**. While women represented an average of nearly half of grade C (46.6%) and D (47.1%) staff and 40.3% of grade B staff, they represented only around one-quarter (26.2%) of grade A staff at European level.⁸

Additional sources

Data from the European University Association (EUA)⁹ show that in 2020, only **15% of rectors in EUA member universities** in 48 countries are women. Similar to She Figures data, the EUA finds some variation between countries as the proportion of women rectors is above the average in 19 countries, and below average in eight countries.

4 De Paola, M. & Scoppa, V, 2015, Gender Discrimination and Evaluators' Gender: Evidence from Italian Academia. *Economica*, Vol. 82, Issue 325, pp. 162-188.

5 GenPORT, 2017, *Gender and Science Policy Briefs: From "Where to start" to "How to innovate"*. Available at: https://eige.europa.eu/sites/default/files/d4.8_gender_and_science_policy_briefs_genport.pdf

6 European Commission, 2020, *A Union of Equality: Gender Equality Strategy 2020-2025*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A152%3AFIN>

7 Boards include scientific boards and administrative or advisory boards of a research organisation that can be publicly or privately managed and financed

8 The academic staff grades presented in She Figures are based upon national mappings according to the following definitions: A: The single highest grade / post at which research is normally conducted within the institutional or corporate system; B: All researchers working in positions which are not as senior as the top position (A) but definitely more senior than the newly qualified PhD holders (C); i.e. below A and above C; C: The first grade/post into which a newly qualified PhD (ISCED 8) graduate would normally be recruited within the institutional or corporate system; D: Either postgraduate students not yet holding a PhD (ISCED 8) degree who are engaged as researchers (on the payroll) or researchers working in posts that do not normally require a PhD.

9 European University Association, 2020, *Male vs Female university leaders: the hard facts on International Women's Day*. Available at: <https://www.eua.eu/news/467:male-vs-female-university-leaders-the-hard-facts-on-international-women%E2%80%99s-day.html>

At the same time, the EUA reports that the share of women in high level management positions at universities has increased over time.¹⁰ Moreover, when data were disaggregated by academic departments, women were over-represented among heads or directors of international relations departments, quality assurance and communications departments (ranging from 55% to 67%) and under-represented as heads or directors of research departments (around 42%) between 2014 and 2019.

Countries promote gender balance in decision-making positions and professorships through various policy measures.¹¹ The Standing Working Group on Gender in Research and Innovation under European Research Area and Innovation Committee (ERAC SWG GRI) reported in 2020¹² that eight countries (AT, DE, DK, FR, IE, LU, NO and SE) have established quota to promote gender balance in decision-making positions and professorships, and seven countries have developed recommendations for gender balance in decision-making through their strategic documents (BA, CZ, EE, FI, LT, MT and SI). Moreover, three Member States (BE, EL, NL) promote gender balance in decision-making and professorship positions through awareness-raising actions, and five countries (DK, NL, EL, NL, SI, and TR) promote this topic through media, events and publications. This report was produced in response to the 2018 report *Guidance to facilitate the implementation of targets to promote gender equality in Research and Innovation*¹³, co-developed by the European Commission and the then Helsinki Group in Research and Innovation.

What are the key policy priorities?

EU policy commitments

Addressing the gender imbalance in research leadership has been recognised as **a policy priority at the EU level**. The European Council Conclusions of 1 December 2015 on Advancing gender equality in the ERA¹⁴ contained an explicit focus on addressing the gender imbalance in research leadership, for example it invited relevant authorities to set up guiding targets for better gender balance in decision making bodies and called on the Commission to provide support and guidance to implement the targets. At the national level, these Conclusions were an important stimulus for achieving progress towards gender balance in decision-making (discussed above based on the findings of the ERAC SWG GRI report on Gender in Research and Innovation¹⁵).

The 2020 ERA Communication on the new ERA underlines the need to deepen institutional change through the development of inclusive Gender Equality Plans (GEPs) and promoting gender balance in decision-making as one of the objectives underpinning this priority action.¹⁶ Gender balance in leadership and decision-making is one of the thematic areas that the European Commission recommends that public bodies, higher education establishments and research organisations address as part of their mandatory GEP, under the new GEP eligibility criterion under Horizon Europe.¹⁷ The 2020 Council Conclusions on the new ERA also called for a renewed focus on gender equality and mainstreaming, including through the implementation of inclusive GEPs.¹⁸

10 *Ibid*

11 ERA Portal Austria, 2020, *ERA Gender Group adopts report on implementation of gender balance in decision-making*. Available at: <https://era.gv.at/news-items/era-gender-group-adopts-report-on-implementation-of-gender-balance-in-decision-making/>

12 ERAC Standing Working Group on Gender in Research and Innovation, 2020, *Report on the Implementation of Targets: Follow-Up on the 2018 Guidance Recommendations*. Available at: [Report-on-the-Implementation-of-Targets-Follow-Up-on-the-2018-Guidance_ERAC_SWGRRI.pdf \(genderaction.eu\)](https://www.eraswgri.eu/Report-on-the-Implementation-of-Targets-Follow-Up-on-the-2018-Guidance-ERAC-SWGRRI.pdf)

13 Directorate-General for Research and Innovation (European Commission), 2018, *Guidance to facilitate the implementation of targets to promote gender equality in research and innovation*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/2aa2585b-1d03-11e8-ac73-01aa75ed71a1>

14 Council Conclusions, 2015, *RECH 295 COMPET 551 SOC 703 Advancing gender equality in the European Research Area*. Available at: <https://data.consilium.europa.eu/doc/document/ST-14846-2015-INIT/en/pdf>

15 ERAC Standing Working Group on Gender in Research and Innovation, 2020, *Report on the Implementation of Targets: Follow-Up on the 2018 Guidance Recommendations*. Available at: [Report-on-the-Implementation-of-Targets-Follow-Up-on-the-2018-Guidance_ERAC_SWGRRI.pdf \(genderaction.eu\)](https://www.eraswgri.eu/Report-on-the-Implementation-of-Targets-Follow-Up-on-the-2018-Guidance-ERAC-SWGRRI.pdf)

16 European Commission, 2020, *Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions, A new ERA for Research and Innovations*, COM(2020) 628 final. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0628&from=EN>

17 Directorate-General for Research and Innovation, 2021, *Horizon Europe Guidance on Gender Equality Plans (GEPs)*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/ffc06c3-200a-11ec-bd8e-01aa75ed71a1/language-en/format-PDF/source-232129669>

18 Council Conclusions on the new European Research Area, 2020, *RECH 483 COMPET 611*. Available at: <https://data.consilium.europa.eu/doc/document/ST-13567-2020-INIT/en/pdf>

For Horizon 2020, the **Framework Programme for R&I** (2014-2020), the European Commission set a target of 40% for the under-represented sex in expert groups, panels and committees and of 50% in advisory groups.¹⁹ The new Framework Programme for R&I, **Horizon Europe** (2021-2027), promotes further gender balance in evaluation panels and other relevant advisory bodies, such as boards and expert groups, increasing the target to 50%.²⁰ It also contains commitments to supporting and monitoring gender equality and other forms of diversity in scientific careers and in decision making, including in advisory bodies.²¹

For the private sector, a **Directive by the European Parliament and the Council** to introduce gender quota on company boards was proposed in 2012.²² In her Political Guidelines for the European Commission, President von der Leyen has committed to build a majority for the adoption of the proposed Directive – which would concern private R&I related companies as well.²³

National policy directions

At the national level, several **strands of concrete policy approaches** to improve the gender balance in research leadership have been taken in the form of **legislation (especially on gender-specific mandatory targets and quota), soft measures (voluntary targets and quota, awareness, mentoring, coaching) and providing targeted funding to encourage women research leaders**. The following intervention logic illustrates that these actions can lead to positive outcomes of improving the careers of women researchers and improving the quality and performance of the decision-making processes in research. These, in turn, are expected to lead to the broader impacts of improved quality and relevance of research to societal needs and challenges.

19 Directorate-General for Research and Innovation (European Commission), 2017, *Report of the Expert Group on the Interim Evaluation of Gender Equality as a crosscutting issue in Horizon 2020*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/91b94873-3233-11e8-b5fe-01aa75ed71a1/language-en>

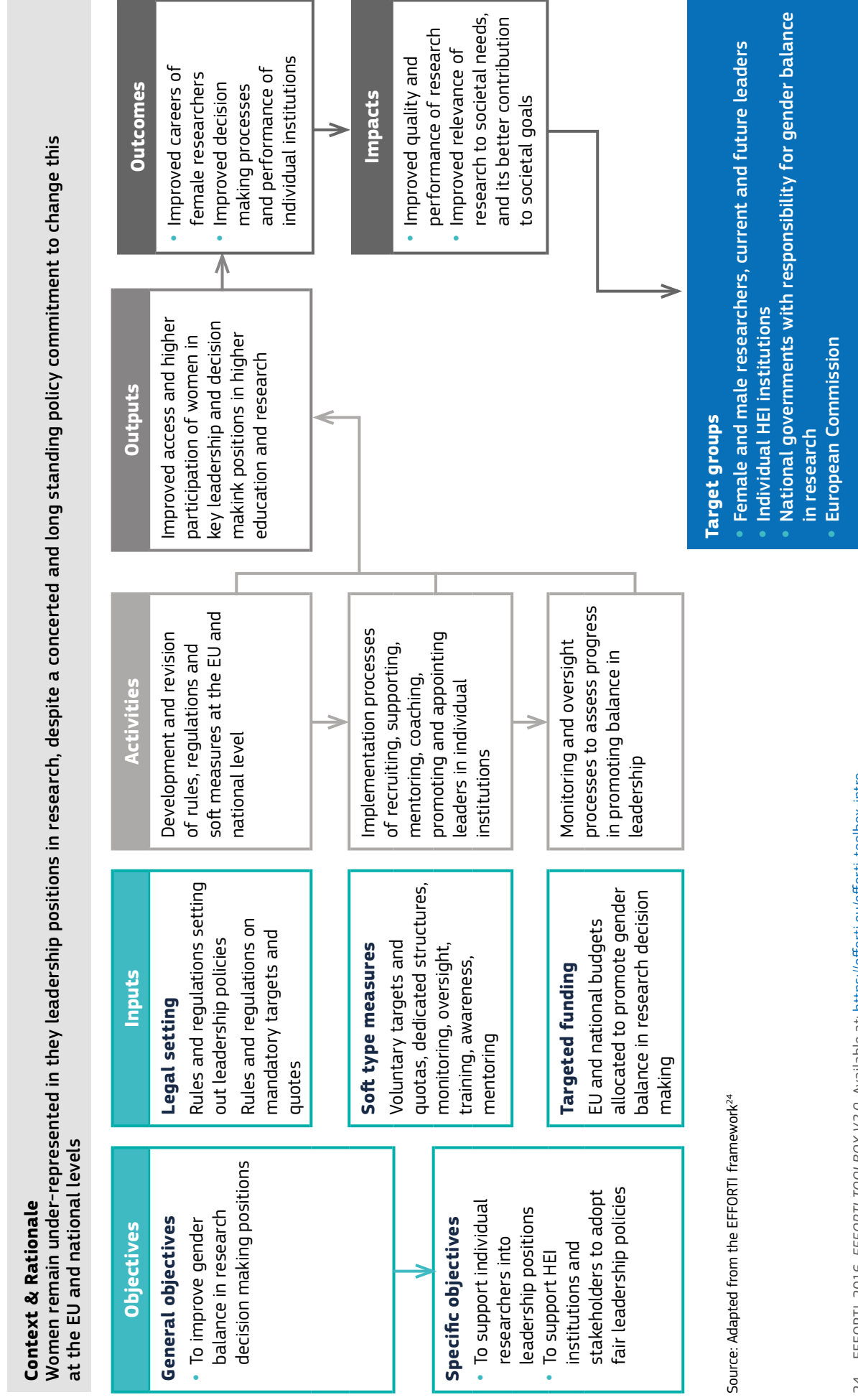
20 Council Decision (EU) 2021/764 of 10 May 2021 establishing the Specific Programme implementing Horizon Europe – the Framework Programme for Research and Innovation, and repealing Decision 2013/743/EU. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021D0764&from=EN> & Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination. Available at: <https://eur-lex.europa.eu/eli/reg/2021/695/oj>; & Repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0695&from=EN>

21 *Ibid*

22 European Commission, 2012, *Proposal for a Directive of the European Parliament and the Council on improving the gender balance among non-executive directors of companies listed on stock exchanges and related measures*, COM/2012/0614 final - 2012/0299 (COD). Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52012PC0614>

23 Ursula von der Leyen, *Political Guidelines for the next European Commission 2019-2024*. Available at: https://ec.europa.eu/info/sites/default/files/political-guidelines-next-commission_en_0.pdf

Figure 1.1 The logic for intervening to promote gender balance in research leadership roles



24 EFFORTI, 2016, EFFORTI TOOLBOX V2.0. Available at: <https://efforti.eu/efforti-toolbox-intro>

One of the most prominent **policy developments** in the recent years has been the introduction of **mandatory gender-specific targets and quota for leadership positions** in several European countries. Below are a few examples, both **specific to the research field and also from a broader public sector**. What they show is that targets are applied **both to the positions in the decision-making bodies as well as specific professor positions**. Most targets are in **the 30-40% range** for the under-represented sex.

- Examples of countries with quota, specific to higher education and research:
 - **Austria** has set up a fixed quota of 50% of the underrepresented sex of decision-making bodies in research performing organisations.²⁵
 - In **Belgium**, Gent University prescribes a gender balance of minimum one third to two-thirds to be maintained in the University's decision-making and advisory bodies.²⁶
 - In **Poland**, the Act on Higher Education 2011 stipulates that nominations for the Ministry of Science and Higher Education's advisory body (the Council of Science and Higher Education) should consider gender balance. The Ministry of Science and Higher Education must ensure that at least 30% of the members of the accreditation committees are women.²⁷
 - In **Slovenia**, the National Research Agency's rules for evaluation committees are that every such committee must include at least a third of each gender (with an exception for the technical sciences committee, which must have a fifth of representation).
 - The **Norwegian Gender Equality Act** (2018) states that higher education and public research institutions are obliged to have at least a 4:6 ratio of the sexes on boards and panels or in committees.²⁸
 - In **Ireland**, the proportion of women in grade A / professorship positions is a key metric for the Higher Education Authority's assessment of progress as part of their Strategic Dialogue Process (performance contracts) with HEIs annually. All HEIs are required to have an institutional Gender Equality Action Plan including specific targets for recruitment and goals for structural change.²⁹
 - **Germany**, with the cascade model seeks to convert the ratio of women employees from each career stage to the next career stage (please also see the Women Professors programme described at the end of this section)
- Arising from the more general public sector level regulation which also applies to research field:
 - **The Finnish Act** on Equality between Women and Men of 1995 states that all public sector bodies are to have at least 40% both women and men unless there are special reasons for the contrary. Furthermore, the Finnish Act on Equality between Women and Men of 1995 states that authorities and all parties that are requested to nominate candidates for such bodies must, wherever possible, **propose both a woman and a man for every membership position**.
 - The **French Law** "Sauvadet" of 2012 included both quota and economic sanctioning if quota are not met in high level civil servant positions. Progressive quota have been introduced for yearly appointment/ nomination of women and men (of 40% the underrepresented sexes by 2018) to high level civil servant positions. The Ministry of National Education, Higher Education and Research also committed to the target percentage for appointment / nomination of the underrepresented sex of 40%.³⁰

25 Directorate-General for Research and Innovation (European Commission), 2018, *Guidance to facilitate the implementation of targets to promote gender equality in research and innovation*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/2aa2585b-1d03-11e8-ac73-01aa75ed71a1>

26 Ghent University, 2021, *Gender Action Plan*. Available at: <https://www.ugent.be/en/ghentuniv/principles/diversity-and-gender/genderactionplaneng.htm>

27 Palmén, R., Bitusikova, A., Caprile, M., Getz, L., Hearn, J., Husu, L., Lipinsky, A., Müller, J., Arroyo, L., Pollitzer, E., Steinweg, N. and GenPORT Consortium, 2017. *Gender and Science Policy Briefs: From "Where to start" to "How to innovate"*. GenPORT. Available at: https://eige.europa.eu/sites/default/files/d4.8_gender_and_science_policy_briefs_genport.pdf

28 Gender in Norway, *The Equality and Anti-discrimination Act*. Available at: <https://gender.no/legislation/the-gender-equality-act>

29 Higher Education Authority, *Gender Action Plan 2018-2020*. Available at: <https://hea.ie/assets/uploads/2018/11/Gender-Equality-Taskforce-Action-Plan-2018-2020.pdf>

30 GenPORT, 2017, PB20 – *Gender-balance in decision-making: How to innovate?*. Available at: https://www.genderportal.eu/sites/default/files/resource_pool/pb20_decisionmaking_inno.pdf

Furthermore, some countries have undertaken measures **to ensure more gender balanced appointments** to research leadership positions. Existing measures were identified by the ERAC SWG GRI³¹, for example:

- **Austria** has developed a database for women on supervisory boards which provides information on women executives that want to assume the position of a supervisory board member. The database is supported by the Federal Ministry for Digital and Economic Affairs, the Federation of Austrian Industries, and the Austrian Economic Chamber.
- **Estonia** has developed recommendations for gender balance in decision making positions in its strategic documents and on the legislative level for the Evaluation Committee of the Estonian Research Council (RFO), which evaluates applications for research funding submitted to the Estonian Research Council. It is recommended that, when possible, gender balance is considered to form the committee, with preference being given to candidates of the under-represented gender. It is also recommended that researchers of different academic age are represented in the committee.

The evidence on the effectiveness of such mandatory quota and hard legal steps is mixed³². In the private sector, evaluations have shown that the quota on their own are not effective unless they are implemented through systems of accountability (using governance codes) backed up by sanctions.³³

Thus, what emerges clearly is that quota on their own are less effective unless accompanied by **a framework of supportive measures**, such as when they are an integral part of the broader national laws/ strategies to promote gender equality in research, and when they are backed up by institutional ownership and leadership from the existing echelons of academic leaders.³⁴ Evidence suggests that measures need to be put in place to enhance the pool of potential women candidates for leadership positions along with measures to reduce or mitigate the effect of bias on recruitment procedures. Furthermore, they need to be accompanied by an implementation of a robust monitoring and assessment system to evaluate the impact and efficiency of such measures. Finally, several countries have put in place financial incentives or sanctions when quota or targets are not met to support gender balance in research leadership. Ultimately, transparency and accountability are crucial, especially if targets are not being met and/or quota are not sanctioned.³⁵

Institutional-level policy and practices

A framework of supportive measures for gender equality in decision-making and leadership includes measures both at individual level, such as training or mentoring, and at institutional level with initiatives of dedicated structures, funding for more women leaders and governance codes, leading to a culture change enabling more diversity in the highest decision-making bodies.

At the **individual level**, core initiatives relate to the training and mentoring of potential and actual leaders, as well as decision making bodies and staff members in general. To give a few examples:

- To tackle implicit bias, **the Swedish Research Council** uses reports from the gender equality observation panels to train review panels on decision-making bodies, and research council staff. The purpose of this is to investigate whether there was further potential for improvement in terms of procedures, instructions and other aspects that promote a gender-neutral evaluation of grant applications. This is the seventh time this exercise has been conducted.³⁶

31 ERAC Standing Working Group on Gender in Research and Innovation, 2020, *Report on the Implementation of Targets: Follow-Up on the 2018 Guidance Recommendations*. Available at:

[Report-on-the-Implementation-of-Targets.-Follow-Up-on-the-2018-Guidance_ERAC_SWGRII.pdf \(genderaction.eu\)](https://www.genderaction.eu/wp-content/uploads/2020/05/ERAC_SWGRII.pdf)

32 *Idem*

33 Clayton-Hathway K., Humbert A.L., Kelan E.K., 2019, A rights-based approach to board quotas and how hard sanctions work for gender equality. *European Journal of Women's Studies*. 2019;26(4):447-468. doi:[10.1177/1350506819857125](https://doi.org/10.1177/1350506819857125)

34 Directorate-General for Research and Innovation (European Commission), 2018, *Guidance to facilitate the implementation of targets to promote gender equality in research and innovation*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/2aa2585b-1d03-11e8-ac73-01aa75ed71a1>

35 Clayton-Hathway K., Humbert A.L., Kelan E.K., 2019, A rights-based approach to board quotas and how hard sanctions work for gender equality. *European Journal of Women's Studies*. 2019;26(4):447-468. doi:[10.1177/1350506819857125](https://doi.org/10.1177/1350506819857125)

36 Swedish Research Council, 2020, *A gender-equal process*. Available at: <https://www.vr.se/english/analysis/reports/our-reports/2020-05-07-a-gender-equal-process.html>

- In the **United Kingdom** and **Ireland** more than 100 higher education institutions participate in the Aurora leadership development programme for women. The programme is delivered online and consists of learning led by leadership experts to explore four key areas associated with leadership success: Identity, Impact and Voice; Power and Politics; Core Leadership Skills; Adaptive Leadership Skills.³⁷

In relation to **institutional measures**, a number of countries have established dedicated structures to support gender equality in research leadership. For example:

- in **Austria**, the Austrian Rectors' Conference Gender and Diversity Taskforce was established in 2013 to implement gender mainstreaming and to support the increase of women's share in top-level positions at universities in addition to the legislative action (quota) by offering coaching to prospective women heads of universities.³⁸
- The creation of women support networks is also important, both at the European level, such as the European Platform of Women Scientists (EPWS) and the European Women Rectors Association (EWORA) or national level networks.

Another level of intervention relates to building gender competence / sensitivity or diversity and inclusion expertise at the decision-making level.

Finally, providing specific funding to support the recruitment of women into senior academic positions can be helpful to promote gender balance in top level positions. Examples of measures to incentivise the recruitment of women professors are outlined below:

- In **Denmark**, University departments need to reach a certain benchmark of women professors to be awarded with additional professorial chairs; also, the Danish 'Sapere Aude' programme aims to encourage more women to become research leaders.³⁹
- In **Germany**, the Federal Ministry of Education and Research has been implementing the Federal Programme for Women Professors ("Professorinnenprogramm") since 2008 and is still running in 2021.⁴⁰ Its approach is twofold: higher education institutions submit gender equality plans and if positively assessed, the institution is granted funding for up to three professorships held by women for the course of five years. The first phase of the Federal Programme for Female Professors (2008-2012) contributed to the establishment of 260 professorial appointments. The evaluation of this initiative identified its positive effects. It pointed out that the number of women professors has risen more dramatically than the total number of professorships. A particularly dynamic development can also be observed here that coincides with the launch of the women professorship programme in 2008.^{41 42}
- In **Ireland**, through the 'Senior Academic Leadership Initiative', the Higher Education Authority (HEA) approves a defined number of new and additional senior academic leadership posts to successful HEIs. It is envisaged that 45 senior academic leadership posts will be awarded to HEIs over three years to assist in accelerating gender balance at senior levels.⁴³

37 AdvanceHE, 2020, *How does Aurora work?*. Available at: <https://www.advance-he.ac.uk/programmes-events/aurora/how-does-aurora-work#Overview>

38 Lipinsky, A., Ahlzweig, G., Steinweg, N., & Getz, L., 2015, *GenPORT (D4.1) Analysis of Policy Environments Report*, p44. Available at: https://www.genderportal.eu/sites/default/files/resource_pool/GenPORT_analys%20of%20policy%20environments%28D4.1%29_Full%20Version%20Including%20Country%20Fiches.pdf; See also: Uniko, *Gender & Diversity*. Available at: https://www.uniko.ac.at/foren/gender_diversity/aktuelles/

39 Independent Research Fund Denmark, *Overview of Instruments*. Available at: <https://dff.dk/en/application/overview-of-instruments>

40 German Federal Ministry of Education and Research, 2021, *Das Professorinnenprogramm*. Available at: <https://www.bmbf.de/bmbf/de/forschung/chancengerechtigkeit-und-vielfalt-im-wissenschaftssystem/frauen-im-wissenschaftssystem/das-professorinnenprogramm.html>

41 Bühner, S., Kalpazidou Schmidt, E., Palmén, R. *et al.*, 2020, Evaluating gender equality effects in research and innovation systems. *Scientometrics* 125, 1459–1475. Available at: <https://doi.org/10.1007/s11192-020-03596-1>

42 Lothar, A., 2019, *Is It Working? An Impact Evaluation of the German "Women Professors Program"*. Available at: <https://ideas.repec.org/a/gam/jscscx/v8y2019i4p116-d221879.html> & Zippel *et al.*, 2015, 'Gender equality in German universities: vernacularising the battle for the best brains', *Gender and Education*, Vol 28, No 7. Available at: <https://www.tandfonline.com/doi/abs/10.1080/09540253.2015.1123229>

43 HEA, *Senior Academic Leadership Initiative*. Available at: <https://hea.ie/funding-calls/senior-academic-leadership-initiative/>

What are the main recommendations?

The relative under-representation of women leaders in research is a complex and structural problem where no single simple solution has achieved a significant improvement. From the policies of countries where most progress is made, a combination of policy approaches has emerged, including the explicit target and quota, backed by a range of supporting measures, including training, mentoring, networking, dedicated structures and funding for nurturing women's leadership potential. The precise policy choice will need to reflect the specific national circumstances. However, a number of common themes for action are emerging:

- Member States should further consider gender quota or hard targets supported by governance codes - for accountability at the highest leadership levels. This is a measure which has been gaining traction in the research institutions themselves, as well as the private sector. Evidence is showing its positive effects, especially when embedded within a broader institutional framework supportive of gender equality.
- Member States should consider establishing incentives and sanctions for institutions to tackle the worst instances of gender imbalance. This should also include support to help institutions establish appropriate and proportionate measures.
- Member States and national institutions should monitor and evaluate the impact of policy and practices on the gender imbalances in decision making at institutional level for all staff management positions. This should include assessing progress against targets and quota and identifying specific factors which contribute to achievement / non-achievement of targets and quota, with a view to developing policy intervention based on the findings of such work.
- Research funding organisations (RFOs) and research performing organisations (RPOs) can further promote a more gender balanced research leadership by embedding these objectives in a more structured way at the institutional and individual level.
 - Including leadership targets in the performance agreements for research organisations or the overall strategy for the specific institutions.
 - Supporting implementation through specific financial incentives such as additional funding for changing the gender balance in leadership positions.
 - At the individual level, the job requirements for senior leaders in research could include a specific commitment to gender equality to be considered for the position, or experience on gender equality.
 - Beyond individual level, institutions might consider requesting a gender-balanced pool of candidates for leadership positions.
- Research organisations should bring attention to the issue through regular publication, monitoring and discussion of the progress made through standard and publicly available sex-disaggregated statistics in leadership and decision-making positions. This should become a standard feature of national and European research policy reviews, reporting and evaluations.
- Research organisations should increase the adoption of Gender Equality Plans in decision making on strategic and operational matters at institutional level is important to help embed the necessary actions and cultural change to help address gender imbalances in decision-making. In this respect, policy makers should insist on mandatory establishment and regular progress reporting on Gender Equality Plans. Supportive mutual learning environments should also be established and maintained to enable institutions to discuss effective forms of implementation.

POLICY BRIEF 4

GENDER DIMENSION IN RESEARCH AND INNOVATION CONTENT AND TRAINING

This policy brief discusses the topic of the gender dimension in Research and Innovation (R&I) content and training. The brief first describes available data and trends in this field in Europe. The next section discusses key policy priorities at EU, national and institutional levels before presenting recommendations for relevant actors. Good practices are also presented to illustrate some of the approaches taken at EU, national, and institutional levels to support the integration of a gender dimension in R&I content.

Summary of key issues

The integration of the gender dimension into R&I content refers to the integration of gender analysis into all phases of the research process. These phases may consist of establishing research priorities and project objectives, making funding decisions, developing methodologies, gathering and analysing data, evaluating results, developing patents, transferring ideas to market and drafting policies.¹ The European Commission's report "Gendered Innovations 2: How inclusive analysis contributes to research and innovation" demonstrates through diverse case studies how the integration of gender analysis into R&I content adds value to research in terms of excellence, creativity and business opportunities. Moreover, gender analysis helps researchers and innovators to question gender norms and stereotypes, which leads to an improved understanding of women's and men's diverse needs, behaviours and attitudes.²

In relation to improving quality of R&I, instances of gender bias and gaps in knowledge exist throughout available research methods and results:

- The selection of funding priorities depends on many different academic and societal processes and biases. For example, if a funding opportunity's objective is to investigate the potential health effects of types of employment in sectors predominantly involving men workers (e.g., nuclear energy industry), the effects on women workers in the same sector may be relatively under-researched. Indeed, it is also the case that women and those that do not fit into a binary women-men classification are underrepresented in clinical trials and therefore subject to medical practices based on medical data and evidence for males.³

1 European Commission, 2020, *Gendered Innovations 2: How inclusive analysis contributes to research innovation: policy review*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/33b4c99f-2e66-11eb-b27b-01aa75ed71a1>

2 *Ibid*

3 LERU, 2015, *Advice Paper 18 Gendered research and innovation: Integrating sex and gender analysis into the research process*. Available at: <https://www.leru.org/files/Gendered-Research-and-Innovation-Full-paper.pdf> p.20

- In terms of the development of the research question, disregarding the potential effects of gender differences (for example, not undertaking gender-disaggregated data analysis when assessing the efficacy of vaccines) may reduce the quality of study outcomes. This can lead to mistakes that limit the validity of the conclusions, outcomes that may advantage one gender over the other, or miss innovation opportunities where it may be advisable to develop a product with different properties for use by women and men.⁴
- In terms of the reproducibility and efficiency of scientific research, gender-specific reporting is still limited across scientific disciplines (from biology to chemistry, human–robot interaction, medicine, physics, psychology and beyond⁵). Without these details, it is difficult to reproduce experiments in which sex and gender as variables affect experimental results. In addition, the lack of disaggregation of data by pooling the response for females and males, can mask sex differences. Accounting for sex and gender increases the possibility of detecting meaningful effects, illuminating unexplained variability, and potentially reducing the number of experiments needed to identify trends or make discoveries.⁶
- In terms of gender analysis, the failure of researchers to consider differences in the preferences and behaviours of women and men in the studied population can lead to inaccuracies, research inefficiency and difficulties in generalising results. Lack of gender analysis can lead to the perpetuation and amplification of gender bias and stereotypes. As much of science is path-dependent, and thus difficult to change when already designed, it is essential to integrate gender analysis when relevant from the beginning of the research process.⁷
- There is also evidence of the cost of the failure to incorporate a gender perspective in safety testing. In the automotive industry, there are gender differences in standards for car safety, where the human body models are primarily identified with a male body. As a result, women wearing seat belts are 73% more likely to be injured in a front-end car crash (the most common kind) than similarly belted men.⁸
- Lastly, gender bias can result in missed market opportunities. For example, in computer science, facial recognition systems perform better on men’s faces than on women’s, and on lighter skin tones than darker skin, meaning that darker-skinned women may not be recognised at all.⁹ A separate policy brief has been prepared on the issue of intersectionality as part of She Figures 2021. In relation to incorporating a gender dimension into training in the curriculum, barriers may be partly to do with complexities associated with setting up and gaining approval for formal academic courses and the costs of producing textbooks. Most training efforts to cover the gender dimension have been through dedicated workshops, on-line courses, and guidelines, or addressed in specific projects.¹⁰

4 *Ibid*

5 Baker, M., 2016, 1,500 scientists lift the lid on reproducibility. *Nature* p533, 452–454 & *American Society of Cell Biology. Member survey on reproducibility*. Available at: <http://www.ascb.org/wp-content/uploads/2015/11/final-survey-results-without-Q11.pdf>

6 Ellis, R.P., Eyssel, F., Tannenbaum, C *et al.*, 2019, Sex and gender analysis improves science and engineering. *Nature* p575, 137–146. Available at: <https://doi.org/10.1038/s41586-019-1657-6>

7 *Ibid*

8 For more details see: Ash, J., Forman, J., McMurry, T.L., Poplin G.S., Schmidt, K., C.G. Shaw, & Sunnevang, C., 2019, *Automobile injury trends in the contemporary fleet: Belted occupants in frontal collisions*, *Traffic Injury Prevention*, 20:6, 607–612, Available at: <https://www.tandfonline.com/doi/full/10.1080/15389588.2019.1630825> & for details of research to address this see: Virtual, 2018, *About*. Available at: <https://projectvirtual.eu/about/>

9 European Commission, 2020, *Gendered Innovations 2: How inclusive analysis contributes to research innovation: policy review*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/33b4c99f-2e66-11eb-b27b-01aa75ed71a1> p.30

10 See, for example: EuroGender, 2015, *2015 EUGenMed Workshops – “Sex and Gender in Medicines Regulation and Medical Education”*. Available at: <https://eurogender.eige.europa.eu/events/2015-eugenmed-workshops-%E2%80%9Csex-and-gender-medicines-regulation-and-medical-education%E2%80%9D> & Wroblewski, A., 2016, *Gender in research content: Experiences from an Austrian programme*. Available at: https://gender-summit.com/attachments/article/1346/Wroblewski_paper_GS9Eu.pdf

What do data tell us?

Key findings from She Figures indicators

The European Commission seeks to promote the integration of gender analysis into research design and process as a way of preventing bias in research. She Figures indicators related to the gender dimension in research and innovation content help assess whether the introduction of new policies has resulted in changes overtime in the research landscape within this area.

Data from the 2021 publication shows that between 2015 and 2019, **a very small proportion (just under 2%) of publications included a gender analysis at European (i.e. EU-27) level**. Since 2010, the proportion of a country's publication with a gender analysis has increased on average by just under 1%.

When data are disaggregated by field of R&D, the results show that between 2015-2019, approximately 0.8% of European publications in the Natural Sciences took into account a gender dimension in their research content. As did 0.2% of publications in Engineering & Technology did, 3.8% of publications in the Medical Sciences, 2.4% of publications in Agricultural & Veterinary Sciences, 3.0% of publications in the Social Sciences, and 2.1% of publications in the Humanities & Arts.

To assess whether the introduction of new policies has resulted in changes in the research landscape, a new indicator in She Figures 2021 reveals changes over time in how many Horizon 2020 projects are integrating gender as part of the project content. The results show that **between 2014-2020, less than 3% of Horizon 2020 projects integrated a gender dimension** across all EU-27 Member States and Associated Countries.

Additional sources

Besides the EU's multiannual Framework Programmes for R&I, national funding institutions and academic journals are essential to the process of integrating a gender dimension in research and innovation content.

Whilst there is, at present, no systemic analysis of how many funding institutions or journals require attention to gender and how they implement these requirements, a global review of sex, gender, and/or diversity analysis of research policies of major granting agencies is being undertaken. The first phase of research includes the European Commission, the Canadian Institutes for Health Research, the German Research Foundation, the Irish Research Council, the U.S. National Institutes of Health, and the National Research Foundation (Republic of Korea).¹¹

A study by Hankivsky et al (2018) analyses how gender is incorporated into health research by analysing official statements about gender inclusion in 45 national agencies that fund health research across 36 countries (covering EU-27 and associated countries, North America, and Australia¹²) and from top-ranking health journals. The results of the study show that¹³:

- **Few funding agencies considered the gender-related content of research in funding applications.** Only 15 agencies recognised the importance of gender in research content (in Austria, Canada, Germany, Ireland, the Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, and United States).
- **Some funding agencies specifically paid attention to factors of health beyond gender** in a way that would be consistent with an intersectional approach (in Canada, the Netherlands, Sweden, and the US).

11 For further details see: OSFHOME, 2021, *Global Review of Sex, Gender, and/or Diversity Analysis (SG&DA) in Research Policies of Major Public Granting Agencies*. Available at: <https://osf.io/agwy6/>

12 The study identified key funding agencies based on information gathered from the Gendered Innovations Project website, the Gender-Net EU website, two European Commission reports: "The Gender Challenge in Research Funding: Assessing the European National Scenes" and "Analysis of the state of play of the European Research Area in Member States and Associated Countries: focus on priority areas" and a Google search for national-level public funding bodies that may have been missed in the aforementioned inventories.

13 Hankivsky *et al.*, 2018, Beyond sex and gender difference in funding and reporting of health research, *Research Integrity and Peer Review* p3:6. Available at: <https://doi.org/10.1186/s41073-018-0050-6>

- Among the top five journals in the Social Science Edition Category, only the American Journal of Public Health contained a directive about using “non-discriminatory language.”
- Among the top five journals in the Science Edition Category, all journals included some direction about addressing gender in reporting except for the New England Journal of Medicine.

What are the key policy priorities?

EU policy commitments

The **European Commission’s Gender Equality Strategy 2020-2025**¹⁴ has prioritised actions for ensuring the inclusion of a gender perspective across all EU policies and processes. The strategy commits Horizon Europe funding for gender and intersectional research. The Council Conclusions on the New ERA issued on 1 December 2020¹⁵ call on the Commission and the Member States to renew focus on gender mainstreaming in R&I through the integration of gender dimension into R&I content.

Horizon Europe sets the integration of the gender dimension in R&I content as a default requirement across the whole programme, unless its non-relevance is duly justified.¹⁶ The proposal application forms for participation in Horizon Europe explicitly require applicants to describe how the gender dimension is taken into account in the content of the project or to provide justification for why the gender dimension is not relevant to the proposed project.¹⁷ The European Commission also encourages an inclusive approach to gender-based analysis which also considers intersecting social categories such as ethnicity, age or disability, as a matter of producing excellent research to the benefit of all European citizens.¹⁸ The importance of these aspects, and their potential to contribute to research quality has also been highlighted by academic journals.¹⁹

In terms of knowledge exchange between the EU-27 Member States and Associated Countries, good practice sharing is continuously implemented. Examples of such exchanges are:

- ERA-related national representatives sub-groups, such as the Standing Working Group on Gender in Research and Innovation under European Research Area and Innovation Committee (ERAC SWG GRI);
- The European Commission has supported, first through the Seventh Framework Programme (FP7) and the Horizon 2020 Framework Programme, the implementation of Gender Equality Plans (GEPs) in over 200 research performing organisations and research funding organisations.²⁰ The aim of GEPs is to achieve institutional change, with one of its building blocks to support the integration of the gender dimension in research content.

14 European Commission, 2020. *Communication of 5 March 2020 on A Union of Equality: Gender Equality Strategy 2020-2025*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A152%3AFIN>

15 European Commission, 2020, *Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions, A new ERA for Research and Innovations*, COM(2020) 628 final. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0628&from=EN>

16 European Commission Directorate-General for Research and Innovation, 2021, *Horizon Europe Strategic plan (2021-202)*, Luxembourg: Publications Office of the European Union, Available at: https://ec.europa.eu/info/sites/default/files/research_and_innovation/funding/documents/ec_rtd_horizon-europe-strategic-plan-2021-24.pdf, p25

17 European Commission, 2021, *Horizon Europe Programme Standard Application Form (HE RIA, IA)*. Available at: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/temp-form/af/af_he-ria-ia_en.pdf, p8

18 European Commission, 2020, *Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions, A new ERA for Research and Innovations*, COM(2020) 628 final. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0628&from=EN>

19 See for example: Nature, 2020, *Accounting for sex and gender makes for better science*. Available at: <https://www.nature.com/articles/d41586-020-03459-y>

20 Directorate-General for Research and Innovation (European Commission), 2020, *Gender equality Achievements in Horizon 2020 and recommendations on the way forward*, Luxembourg: Publications Office of the European Union Available at: <https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/8cf2353d-cbc9-11ea-adf7-01aa75ed71a1>

There have also been significant information and knowledge sharing activities that have brought together EU level stakeholders. For example, the GENDER-NET ERA-NET Cofund led to the creation of the 'Integrating the Gender Analysis into Research' (IGAR) tool which assisted Research Performing Organisations (RPOs), Research Funding Organisations (RFOs) and individual researchers to integrate a gender dimension into policies, programmes and projects.²¹ Mutual learning workshops facilitated through the GENDERACTION project also addressed the integration of gender dimension in R&I content.²²

In relation to training, the Horizon 2020-funded GE Academy project²³ developed a range of topic-specific training courses on integrating a sex and or gender analysis. Other initiatives have provided practical tools for technology development²⁴ and guidelines for reporting gender dimensions of medical and health studies.²⁵

National policy directions

Previous initiatives addressing the inclusion of gender aspects in research, have been adopted across the EU-27 Member States and Associated Countries with various levels of success. EU law does not require the adoption of specific policy tools to implement gender equality measures in this field. Individual Member States have adopted different levels of commitment and actions. The implementation of a monitoring and assessment framework to measure the impact of such measures is a key factor of such interventions' efficiency.²⁶

The national policy landscape is mixed regarding the inclusion of objectives for the integration of the gender dimension in research and training within National Action Plans (NAPs).

The previous ERA Council Conclusions of 1 December 2015²⁷ prioritised gender equality and gender mainstreaming in R&I within ERA Priority 4. Within their NAPs, EU Member States and Associated Countries were asked to develop policies which address gender imbalances, particularly at senior levels and in decision making, and which strengthen the gender dimension in research. The recent GENDERACTION report on Monitoring ERA Priority 4 finds that the degree of implementation varied across countries such that only ten out of 25 NAPs mention the objective to integrate the gender dimension into research content or teaching²⁸.

The ERAC SWG GRI has also provided an assessment of the implementation of the 2015 ERA Council Conclusions in 2018²⁹, noting that in some countries gender equality continues to be regarded as an issue of women's representation rather than a comprehensive mix of various objectives including the gender dimension in research and innovation. Moreover, the report also found that incentives to integrate the gender dimension in R&I content were lacking.

Institutional-level policies and practices

The GENDER-NET ERA-NET Cofund conducted in 2014-2015 a survey of initiatives undertaken by national and regional organisations to integrate gender dimension in R&I. The key findings of the survey provided a mixed picture showing that:³⁰

21 Details available at: <http://igar-tool.gender-net.eu/en/tools-for-igar>

22 See: GENDERACTION, *Trainings Past*. Available at: <https://genderaction.eu/trainings/past/>

23 GE Academy, 2019-2021, *Horizon 2021 Tag*. Available at: <https://ge-academy.eu/tag/horizon-2020/>

24 The GERD Model, *What is GERD?* Available at: [GERD | Gender Extended Research and Development Model \(gerd-model.com\)](http://gerd-model.com)

25 The European Association of Science Editors (EASE), 2021, *The SAGER guidelines*. Available at: <https://ease.org.uk/communities/gender-policy-committee/the-sager-guidelines/>

26 European Commission, 2019, *ERA Progress Report 2018*. More details available at: https://ec.europa.eu/info/publications/era-progress-report-2018_en

27 European Commission, 2015, *Council conclusions on the European Research Area Roadmap 2015-2020*. Available at: <https://data.consilium.europa.eu/doc/document/ST-9351-2015-INIT/en/pdf>

28 Wroblewski, A., 2020, *Report on Monitoring of ERA Priority 4 Implementation*, GENDERACTION. Available at: https://genderaction.eu/wp-content/uploads/2021/02/GENDERACTION_D06_Monitoring-ERA-priority-4-implementation.pdf

29 See: ERAC Standing Working Group on Gender in Research and Innovation, 2018, *Report on the implementation of Council Conclusions of 1 December 2015 on Advancing Gender Equality in the European Research Area*. Available at: <https://data.consilium.europa.eu/doc/document/ST-1213-2018-INIT/en/pdf>

30 Gender-Net Report, 2015, *Compendium of national initiatives on the integration of the gender dimension in research contents* [GENDER-NET D3-9 - Compendium of national initiatives on the integration of the gender dimension in research contents.pdf](#); & Gender-Net Report, 2016, *Comparative analysis of existing national initiatives on the integration of the gender dimension in research contents*. Available at: [GENDER-NET D3-10 - Comparative analysis of existing national initiatives on the integration of the gender dimension in research contents.pdf](#)

- Only 16 of 40 responding organisations (in Austria, France, Canada, Ireland, Netherlands, Norway, Spain, Switzerland and the USA) had a policy or strategy to integrate gender dimension in research content.
- Nine organisations (in Austria, France, Spain, Germany, Ireland and USA) provide guidelines and/or training material or workshops to assist applications in integrated gender into their designs. Of these, six organisations also have guidelines and/or training materials to assist evaluators in reviewing gender components of research proposals.

There are other examples of institutional policies and practices which include explicit recognition of the gender dimension in research content. At the research application stage, in Switzerland, the **Swiss Programme for International Research** by Scientific Investigation Teams which promotes team-oriented cross-border research includes the use of gender in R&I content as an evaluation criterion and also includes a gender expert on the panel which evaluates research proposals. Whilst not specific to a particular country, a complementary initiative to promote recognition of inclusion and diversity was launched by Cell Press in 2021 at the research dissemination stage to allow researchers to include a statement which focuses on highlighting aspects of the paper that are relevant to inclusion and diversity. This builds on existing statements which contain researcher declarations of interests, author and reviewer contributions, and data and code availability.

At RFO level, there are also good practices which include a gender dimension in training. RFOs play a particularly important role in setting the required standards and expectations in this regard.³¹

- There are some instances where institutions have made efforts to embed a gender dimension through specific modules which situate the particular aspects of gender within different subject areas.³²
- In Germany, the **Deutsche Forschungsgemeinschaft** (DFG) has produced guidelines for consideration of the gender dimension in research. This includes a checklist for applicants planning research projects. This provides researchers with starting points for determining whether it may be necessary to provide information about gender and/or diversity when planning research projects. It also provides discipline-specific guidance.³³
- In Ireland, the **Irish Research Council Gender Strategy and Actions** document recognises that the integration of a gender dimension has the potential to contribute to scientific excellence, hence it is an important aspect of the evaluation of proposals. To support this approach, the document advocates gender-blind assessment of research applications and integration of gender analysis in applications for funding.³⁴

31 For information on activities undertaken by RFOs, see: The Gender Equality in Engineering through Communication and Commitment, 2017, *Best practice examples of gender mainstreaming in Research Funding Organizations*. Available at: http://www.geecco-project.eu/fileadmin/t/geecco/geecco/GEECCO_report_best_practice.pdf

32 For example: Humboldt Universität, *Gender Studies*. Available at: <https://www.hu-berlin.de/en/studies/counselling/course-catalogue/programme-descriptions/gender>

33 Details available at: Deutsche Forschungsgemeinschaft, nd, *Sex, Gender and Diversity in the Life Sciences*. Available at: https://www.dfg.de/en/research_funding/principles_dfg_funding/diversity_dimensions/index.html

34 Details available at: Irish Research Council, *Gender Strategy and Actions*. Available at: <https://research.ie/assets/uploads/2018/08/04108-IRC-Gender-flyer-proof03-single.pdf>

What are the main recommendations?

Based upon the issues identified above, the existing policy framework including strong commitment from the Member States to integrate the gender dimension in Research and Innovation content³⁵, and selected good practices, the brief presents the following list of recommendations to relevant stakeholders regarding gender in R&I.

- Member States to ensure that the integration of the gender dimension in R&I content is taken into account where relevant when allocating funds to national granting agencies, universities and projects. Member States should develop principles for the integration and evaluation of the gender dimension in R&I content in cooperation with national RFOs.
- RFOs to adopt policies to promote the integration of the gender dimension in R&I content and ensure that funding proposals entail such a perspective where relevant. Gender experts in fields relevant to specific calls/topics should be included in evaluation panels, when possible.
- RFOs to develop training and guidelines for programme managers, external reviewers, and applicants.
- RFOs to tailor their national policies, considering the approach taken by the European Commission in the Horizon Europe programme, including the recommendations stemming from the EC Gendered Innovations 2 Report.³⁶
- RFOs to promote research and innovation projects that has successfully integrated gender perspectives.
- Universities and RPOs to provide training and tools for researchers to fully comprehend what the gender dimension in R&I entails and integrate such an analysis in their respective fields. This should also cover training to grants offices on the requirements related to integrating gender in R&I.
- Universities and RPOs should consider incentives for researchers to work on gender in R&I proposals and projects, such as recognition to foster career-development, or awards to promote the efficient integration of gender dimension in research and innovation content.
- Universities and research organisations to undertake curriculum development such as:
 - creation of cross-disciplinary short courses, connecting, for instance life sciences and nano-medicine, that include consideration of the benefits of sex and gender analysis (and weaknesses / dangers of not incorporating this perspective).
 - incorporate a gender dimension into doctoral engineering training programmes especially involving biological, environmental or ecological settings linked to people (e.g., managing waste hazards as part of circular economy).
 - incorporate a gender dimension into emerging fields: nano-medicine (e.g., toxicity of nano-particles used for drug delivery), sustainability science (e.g. who benefits from energy transition), models of intraspecies dynamics in natural ecosystem under different stresses produced by climate change (e.g. increased feminisation of sea turtle population).
 - encourage textbooks and scholarly literature that integrate gender analysis in results and methods
- Peer-reviewed journals should set editorial standards for the inclusion of information on sex and gender as variables where relevant.
- Peer-reviewed journals should provide guidelines for authors and reviewers on how to include sex and gender analysis in research and innovation content.
- Member States, RPOs, and the European Commission should include call topics specifically dedicated to support gender studies and intersectional research.

35 Council Conclusions on the new European Research Area, 2020, RECH 483 COMPET 611. Available at: <https://data.consilium.europa.eu/doc/document/ST-13567-2020-INIT/en/pdf>

36 European Commission, 2020, *Gendered Innovations 2: How inclusive analysis contributes to research innovation: policy review*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/33b4c99f-2e66-11eb-b27b-01aa75ed71a1>

expectations better than those of women.⁵ This has important implications as the choice of study subject has a significant influence on the gender pay gap at the earliest stages of a career.

Furthermore, the **gender gap in career expectations** at lower levels of schooling has the potential to influence subject choices at the undergraduate level or higher. An analysis of 2018 PISA data⁶ finds that while gender differences in mathematics and science performance are generally small at lower levels of schooling, there is still a gender gap in career expectations. Specifically, among the 15-years-old assessed in the OECD, only 1% of girls reported that they want to work in ICT-related activities compared to 8% of boys. A range of factors can influence career expectations such as encouragement from parents to work in STEM which has been found to be particularly lacking for girls compared to boys. A 2020 report commissioned by the FEMM Committee of the European Parliament notes that lower secondary education provides the best timeframe for intervention to address gender gaps in terms of stimulating interest in STEM careers and choice of STEM subjects at the undergraduate level.⁷

Closing the gender gap in STEM would help to address the labour shortages and recruitment difficulties experienced in STEM-related jobs in academia and the private sector. Additionally, it would enable more women accessing better-paid jobs, as STEM-related sectors have been growing much faster than others and have significantly higher wages.

What do data tell us?

Key findings from She Figures indicators

The horizontal segregation between women and men scientists is connected to early segregation in education pathways such as in STEM subjects. She Figures indicators provide insight into women and men's propensity to graduate from Bachelor's level studies (ISCED 6) and transition from Master's (ISCED 7) to Doctoral level studies (ISCED 8).

The number of people who graduated from bachelor level studies to the number of people who started their bachelor level studies in 2018 is used in She Figures as a proxy indicator for the graduation rate of men and women at the undergraduate level. Analysis of these data indicates that:

- **Women were more likely than men to graduate at the Bachelor's level across several broad fields** of study. However, gender differences in the ratio of bachelor graduates to entrants was largest in the field of Education (1.2 for women and 0.9 for men) and smallest in the fields of Information & Communication Technologies (0.6 for women and 0.5 for men) at European level.
- At country level, **women were particularly more likely to graduate in the fields of Arts & Humanities, Social Sciences, Journalism & Information, and Business Administration & Law**. No more than four out of 35 EU-27 Member State and Associated Countries had higher ratios of bachelor graduates to bachelor entrants for men compared to women in these respective fields. This indicator provides a proxy for the proportion of people who continue from Master level studies to doctoral level studies.

To explore women and men's propensity to transition to higher levels of study, She Figures examines the ratio of the number of people who started Doctoral level studies to people who graduated from Master level in 2018. The data show that:

5 EENEE, McNally, S., 2020, Gender Differences in Tertiary Education: What explains STEM Participation? EENEE Analytical Report No.41 Prepared for the European Commission, May 2020. Available at: https://eenee.eu/wp-content/uploads/2021/05/EENEE_AR41.pdf

6 OECD, 2018, *PISA 2018 Results*. Available at: <https://www.oecd.org/pisa/publications/pisa-2018-results.htm>

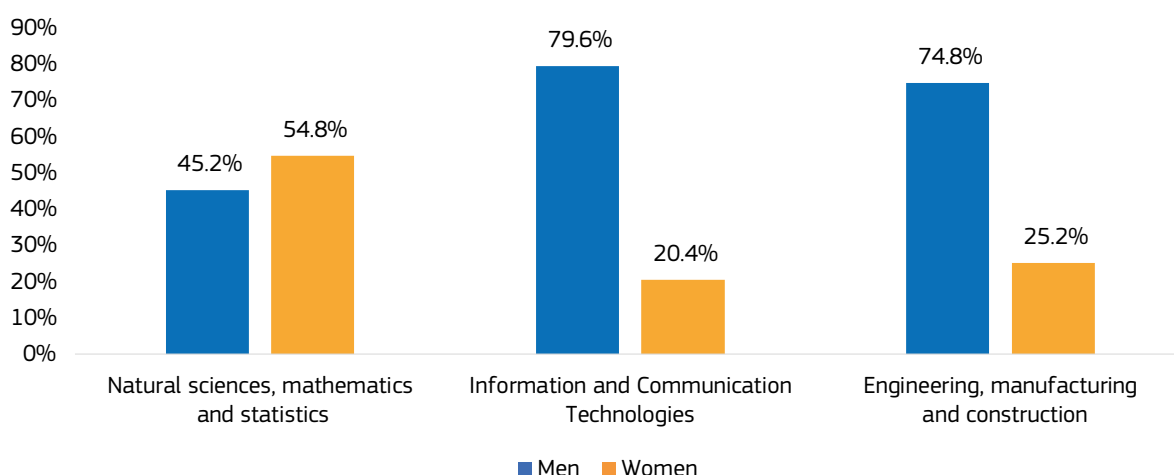
7 European Parliament, 2020, *Education and employment of women in science, technology and the digital economy, including AI and its influence on gender equality*. Available at: [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/651042/IPOL_STU\(2020\)651042_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/651042/IPOL_STU(2020)651042_EN.pdf)

- The **ratio of Doctoral entrants to Master graduates for women was either equal to or greater than the ratio for men** in almost half of the EU-27 Member States and Associated Countries in the narrow fields of ICT (CZ, DE, ES, EE, FR, HR, IE, IT, LV, LT, LU, AT, PL, SK, NO, CH, TR, IL for ICT) and Engineering & Engineering Trades (BG, CZ, DK, DE, EE, FR, HR, IT, LV, AT, PT, SI, SK, FI, SE, UK, CH, MK, RS, IL). Hence, the data suggest that countries have been making progress in improving the proportion of women who continue from Master level to Doctoral level in the fields in which women tend to be most under-represented.

Additional sources

Examining the absolute number of women and men graduates more closely shows that, in 2019, **there was considerable gender segregation among Bachelor's graduates in the STEM fields of ICT and Engineering, Manufacturing & Construction, Health & Welfare and Education.** At the European i.e. EU-27 level, women Bachelor's graduates were over-represented in the field of Health & Welfare (77.8%) and Education (83.8%) compared to men Bachelor's graduates.⁸ While the proportion of women graduates in the STEM field of Natural Sciences, Mathematics & Statistics was gender-balanced (54.8%), women Bachelor's graduates were under-represented in the fields of Information & Communication Technologies (20.4%) and Engineering, Manufacturing & Construction (25.2%).

Figure 1.1 Share of Bachelor's or equivalent level graduates by STEM field, 2019



Source: author's calculation, Eurostat, [educ_uoe_grad02].

Moreover, while She Figures data identify women's graduation rates from fields such as Education compared to STEM-related fields such as ICT, less information is available on the transition from STEM education at the undergraduate level to employment outcomes. For example, recent data from Eurostat finds that only 18.5% of women in the EU-27 were employed as ICT specialists in 2020.⁹ An EIGE study finds that for women in men dominated occupations, discrimination and institutionalised and informal barriers could influence the labour market performance of graduates in the EU-27: in STEM sectors, men graduates of tertiary STEM education had higher employment rates compared to women graduates of tertiary STEM education (by 10 percentage points) in 2014.¹⁰

8 Author's calculations based on Eurostat data [educ_uoe_grad02] on number of women and men Bachelor's or equivalent level graduates in Education (F01), and Health and Welfare (F09) in the EU-27.

9 Eurostat (isoc_sks_itsps)

10 EIGE, 2018, *Study and work in the EU: set apart by gender*. Available at: https://eige.europa.eu/sites/default/files/documents/20173992_kina26893enn_pdf.pdf

As an example of data collection on the transition from studies in various fields to employment at the Member State level, Poland's graduate tracking system collects data on the labour market situation of graduates from Polish universities.¹¹ A key finding of the Polish data collection in 2018 was that while men are still more likely than women to find a job after graduation in Poland, the differences between men and women mainly arise from the employment rates of men and women that graduate from the fields of Technology & Engineering.¹² The data also indicate that the levels of employability of both men and women are lower in technical fields such as Biotechnology and Architecture & Urban Planning where women tend to be over-represented.

Research by the European Institute of Gender Equality (EIGE) suggests that closing the gender gap in STEM would contribute to an increase in EU GDP per capita by 0.7-0.9 % in 2030. By 2050, the predicted increase is between 2.2 % and 3.0 %.¹³

What are the key policy priorities?

EU policy commitments

Pursuing a more holistic approach to the representation of women in STEM-related fields has been a consistent policy commitment at the EU level. Most recently, the **ERA Communication** has confirmed this and called for a strengthened focus of participation of women in STEM fields in particular. The European Innovation Council (EIC) is also implementing a pilot scheme to support women-led start-ups (Women TechEU), which includes coaching and mentoring to EIC-funded women entrepreneurs through the Women Leadership Programme.¹⁴

The **EU Gender Equality Strategy 2020-2025** also points out the gender gap in STEM graduates.¹⁵ It identifies the link between fewer women among STEM graduates and the potential lack of full participation in digital transitions. Specifically, women may face disadvantages in the context of rapid transformation of occupations into high-skilled jobs requiring digital skills and digitisation of the economy and the nature of the labour market. Data from the 2020 Women in Digital Scoreboard points to the potential disadvantages faced by women in jobs that require digital skills as it finds that only 30.9% of women compared to 35.8% of men had above basic digital skills in the EU.¹⁶ This gap is to be addressed in the updated Digital Education Action Plan¹⁷ and through the implementation of the Ministerial declaration of commitment on Women in Digital¹⁸. The Women in Digital (WiD) scoreboard can also be used in this context to monitor progress.

The European Parliament's Committee on Women's Rights and Gender Equality (FEMM) tabled a motion for a **resolution on promoting gender equality in STEM education and careers**.¹⁹ The report highlighted the importance of STEM-related careers for the future of the European economy, identifying that increasing the share of women in the STEM sector is critical to building a more sustainable and inclusive economy and society through scientific, digital and technological innovation. In addition, the report specifically recognises that social norms and gendered expectations about career choices, which are often reinforced through educational content and curricula, are two of the drivers of gender segregation in higher education.²⁰

11 See: ELA, *Polish Graduate Tracking System*. Available at: <https://ela.nauka.gov.pl/en>

12 ELA, *Women still a minority in technical fields*. Available at: https://ela.nauka.gov.pl/pl/labor-market/gender_employment_gap

13 EIGE, 2017, *Economic benefits of gender equality in the EU How gender equality in STEM education leads to economic growth*. Available at: <https://eige.europa.eu/publications/economic-benefits-gender-equality-eu-how-gender-equality-stem-education-leads-economic-growth>

14 European Commission, 2021, EU to launch new support scheme for women in deep tech and call for mentors. Available at: https://ec.europa.eu/info/news/eu-launch-new-support-scheme-women-deep-tech-and-call-mentors-2021-mar-08_en; European Innovation Council, Women TechEU. Available at: https://eic.ec.europa.eu/eic-funding-opportunities/european-innovation-ecosystems/women-techeu_en

15 European Commission, 2020. *Communication of 5 March 2020 on A Union of Equality: Gender Equality Strategy 2020-2025*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A152%3AFIN>

16 See: Data Visualisation Tool, *Women in Digital*. Available at: [Women in Digital \(WiD\) Indicator: 2.2 Above basic digital skills](#)

17 European Commission, 2021, *Digital Education Plan (2021-2027)*. Available at: https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_en

18 Declaration, 2018, *Commitment on women in digital*. Available at: [https://rdd.gov.hr/UserDocsImages//SDURDD-dokumentii//WIDDD3Declaration_Signedpdf%20\(3\).pdf](https://rdd.gov.hr/UserDocsImages//SDURDD-dokumentii//WIDDD3Declaration_Signedpdf%20(3).pdf)

19 European Parliament, 2019, *DRAFT REPORT on promoting gender equality in science, technology, engineering and mathematics (STEM) education and careers (2019/2164(INI))*. Available at: https://www.europarl.europa.eu/doceo/document/FEMM-PR-661980_EN.pdf; the text was adopted in June 2021: European Parliament, 2021, Texts Adopted. Available at: https://www.europarl.europa.eu/doceo/document/TA-9-2021-0296_EN.pdf

20 *Ibid*, p19.

The European Commission's EUwomen4future campaign, which ran between 2020 and 2021, featured extraordinary women in research, innovation, education, culture and sport and highlighted their achievements.²¹ At European organisation level, the FEBS | EMBO Women in Science Awards recognise outstanding women life scientists and highlight major achievements by women scientists in Europe. The award winners provide inspiration for future generations of women who may consider careers in science.²²

The following **EU funded projects** are useful illustrations of EU funded activity which aims to address gender segregation in STEM:

- The EQUALS-EU project²³ (2021-2023) aims to promote gender equality in social innovation. The project aims to establish capacity through multilateral collaborations to empower existing business networks and create new ones, and to build smart, sustainable and inclusive social innovation ecosystems in EU and non-EU local communities and cities, deploying its activities in EU Member States, associated countries and third countries.
- The shemakes.eu project²⁴ (2021-2022) aims to permanently improve the opportunity structures within the textiles and clothing sector in Europe and promote, highlight and celebrate the leading role of women in innovation.
- The Scientix projects²⁵ (2009-2022) promote and support a Europe-wide collaboration among STEM teachers, education researchers, policymakers and other STEM education professionals.
- The GEECCO project²⁶ (2017-2021) aims to establish Gender Equality Plans (GEPs) in four European Researching Performing Organisations (RPOs) in the STEM field. The project aims to enhance systemic institutional change towards gender equality in STEM through tailor-made GEPs, implementation of a gender criteria in activities of the RPOs, creation of a learning environment between RPOs and evaluation of GEP implementation.
- The EQUAL-IST project²⁷ (2016-2019), aimed to introduce structural changes to enhance gender equality within Information Systems and Technology Research Institutions. The project included actions on three main levels: HR practices and management processes, research design and delivery, student services and institutional communication.
- The Hypatia project²⁸ (2015-2018) aimed to develop, pilot and disseminate a unique modular toolkit of activities and guidelines for engaging teenagers in STEM in a gender-inclusive way. The activities focussed on gender-inclusive ways of communicating STEM, empowering teenage girls and exploring the range of skills needed for of STEM studies and careers.
- The HELENA project²⁹ (2009-2011) identified and implemented gender mainstreaming measures in various pilot institutions of engineering education and research all over Europe, including institutions for continuing education and distance learning.

At the **international level**, relevant policy commitments have also been made. For example, the annual International Girls in ICT Day encourages girls and young women to pursue studies and careers in the technology sector through awareness-raising and skills development.³⁰ Similarly, the International Awards L'Oréal-UNESCO for Women in Science awards five women in STEM every five years from five regions of the world. The researchers are chosen based on the importance of their contributions to the progress of science, either in Life sciences or in the fields of Physical sciences, Mathematics and Computer science. An award of €100,000 is given to each of the five laureates selected by a jury of internationally renowned experts.³¹

21 European Commission, 2021, #Women4Future. Available at: <https://ec.europa.eu/jrc/en/euwomen4future>

22 EMBO, nd, FEBS | EMBO Women in Science Awardees. Available at: <https://www.embo.org/the-embo-communities/febsembo-women-in-science-awardees/>

23 Europe's Regional Partnership for Gender Equality in the Digital Age. Details available at: <https://cordis.europa.eu/project/id/101006396>

24 Opportunity Ecosystems Bridging the Gender Gap. Details available at: <https://cordis.europa.eu/project/id/101006203>

25 See for example the latest Scientix 4. Details available at: <https://cordis.europa.eu/project/id/101000063>

26 Gender Equality in Engineering through Communication and Commitment. Details available at: <https://cordis.europa.eu/project/id/741128>

27 Gender Equality Plans for Information Sciences and Technology Research Institutions. Details available at: <https://cordis.europa.eu/project/id/710549>

28 Hypatia. Details available at: <https://cordis.europa.eu/project/id/665566>

29 CORDIS, 2009, Higher Education Leading to ENgineering And scientific careers. Available at: <https://cordis.europa.eu/project/id/230376>

30 ITU, 2021, Girls in ICT Days. Available at: <https://www.itu.int/women-and-girls/girls-in-ict/>

31 For Women in Science, 2021, L'Oréal-UNESCO For Women in Science. Available at: <https://www.forwomeninscience.com/>

Moreover, the GENDER STI project aims to solve complex problems associated with the integration of the gender perspective in science, technology and innovation (STI) dialogues with third countries.³² The EU also has all the responsibilities of a member of G57 and the G7 Ise-Shima Leaders' Declaration (2016) which established women's empowerment and gender equality as a priority, specifically the empowerment of women and girls to realize their full potential and the promotion of an active role of women in STEM fields and careers.³³

The Nature Research Awards for Inspiring Women in Science celebrate and support the achievements of women in science, and of all those who work to encourage girls and young women to engage with STEM subjects and who work to support women to stay in STEM careers around the world. The Awards comprise two categories- Science Outreach and Scientific Achievement.³⁴

Reflecting gender dimension in STEM content

Another policy development supporting a more holistic view of STEM education has been the move to address the gender dimension in both the approach and contents of STEM education, encouraging the use of gender-neutral terminology in STEM and promoting a more inclusive curriculum in STEM.³⁵ The EU-funded GARCIA project³⁶ developed a toolkit for integrating a gender-sensitive approach into research and teaching based on findings from test institutions in five EU and associated countries. The toolkit targets all research and teaching staff (e.g., for undergraduate courses and above) and provides recommendations and practical advice for designing a gender-sensitive curriculum. Such a development is also important at primary and secondary levels of education. Inclusive STEM curricula, such as lessons on women's trajectories in scientific fields and their contributions to science, assignments that allow personal expression and creativity and an environment that is collaborative and supportive have been shown to have an impact on young girls' perception of what it means to be a scientist and their ability to do science.³⁷

This may include examples that discuss women, but also wider considerations such as using artistic approaches to STEM involving creating thinking and applied arts (STEAM approach). This can have the effect of broadening interest and access to STEM subjects.³⁸

Some EU level examples of actions to promote a **STEAM approach** are:

- The European Committee of the Regions opinion report 'Strengthening STEAM education in the EU' identifies the value of a STEAM approach in widening access, especially among girls and women, to STEM. The paper calls on the European Commission and the Member States to support STEM-related initiatives at local and regional level.³⁹
- The IN2STEAM project which aims to enhance, encourage and foster innovative educational approach that integrates STE(A)M learning (applying art and design principles to science education) in primary education through gender-inclusive methods and resources to promote a positive change of attitudes towards non-stereotyping choices in education in order to attract more girls into STEM fields.⁴⁰

32 Gender Equality in Science, Technology and Innovation Bilateral and Multilateral Dialogues. Details available at: <https://cordis.europa.eu/project/id/872427>

33 Ministry of Foreign Affairs Japan, 2016, *G7 Guiding Principles for Capacity Building of Women and Girls*. Available at: <https://www.mofa.go.jp/files/000160274.pdf> & Directorate-General for Research and Innovation (European Commission), 2017, *Report of the Expert Group on the Interim Evaluation of Gender Equality as a crosscutting issue in Horizon 2020*. Available at: <https://link.springer.com/interim-evaluation-gender-equality-as-a-crosscutting-issue-in-horizon-2020> | GenPORT (genderportal.eu)

34 NaturePortfolio, 2021, *Nature Research Awards for Inspiring Women in Science*. Available at: <https://www.nature.com/collections/jcpghfmlz/about>

35 For a discussion of a wide range of aspects in relation to this see: Harraway, D., *A manifesto for Cyborgs: Science, technology, and socialist feminism in the 1980s, 2010*, Available at: <https://www.tandfonline.com/doi/abs/10.1080/08164649.1987.9961538> & Allegrini, A., 2014, Gender, STEM Studies and Educational Choices. Insights from Feminist Perspectives. Available at: https://link.springer.com/chapter/10.1007/978-94-007-7793-4_4

36 Trbovc, J.M., Hofman, A., 2013, *Toolkit for Integrating Gender-Sensitive Approach into Research and Teaching*, GARCIA Working Papers. Available at: https://eige.europa.eu/sites/default/files/garcia_toolkit_gender_research_teaching.pdf

37 Robinson, R, 2021, *Girls' Experiences with Gender-Inclusive Curriculum: Effects on Perception, Confidence, and Belief in Ability to Do Science* (Doctoral Thesis).

38 Rabalais, M.E., 2014, *STEAM: A national study of the integration of the arts into STEM instruction and its impact on student achievement*. University of Louisiana at Lafayette.

39 European Committee of the Regions, 2019, *Strengthening STE(A)M education in the EU*. Available at: <https://cor.europa.eu/en/our-work/Pages/OpinionTimeline.aspx?opId=CDR-6435-2018>

40 In2steam, more details available at: <https://in2steam.eu/>

National policy directions

The need for a more holistic STEM education incorporating both women and men has also been recognised at the national level. There are examples of more system level thinking⁴¹ and action to promote women in STEM, as well as individual initiatives. Policies have been taken to promote the visibility of women scientists as role models, establishing specific support structures, reflecting more holistically gender diversity in STEM careers and education to counter the existing stereotypes.

Systemic approaches to promote more holistic STEM

At the national level, there are examples of initiatives taken at a system level to promote the participation and progression of women scientists in a more holistic way which reflects the range of barriers women face in accessing and succeeding in STEM fields.

In **Austria**, the government has put in place an overarching web of initiatives to support progression women scientists, including a dedicated funding programme, institutional centres, career support, networking and exchange.⁴²

- The Talents Programme of the Austrian Ministry of Transport, Innovation and Technology, - administered by the Austrian Research Promotion Agency (FFG) is a **comprehensive programme** which encourages networking (FEMtech Network), enhances visibility of women experts (FEMtech Female Expert Database), and offers career support for women researchers (FEMtech Career Initiative) amongst other activities.
- The Austrian Science Fund's **programmes targeted at women researchers** – the Elise Richter⁴³ for senior positions and the Herta Firnberg Programme⁴⁴ for earlier stage careers, no longer include an age limit for applicants. This is aimed to alleviate some of the pressures that women with childcare duties face in the science career progressions.

In **Australia**, the Government's strategy for women in STEM is to enable STEM potential through education, supporting women in STEM careers, and making women in STEM visible. This strategy is being implemented through two guiding frameworks: the Australian Government's Advancing Women in STEM strategy and the Women in STEM Decadal Plan led by the Australian Academy of Science and the Australian Academy of Technology and Engineering.⁴⁵

In the **USA**, the **ADVANCE** programme was established by the National Science Foundation to develop systemic methods to increase the representation and advancement of women in academic STEM careers and contribute to the development of a more diverse science and engineering workforce⁴⁶. ADVANCE has established STEM education and diversity programmes, such as the Improving Undergraduate STEM Education: Education and Human Resources programme, which aims to improve the quality of undergraduate STEM education through a foundation-wide framework of investments.⁴⁷

Increasing the visibility of women scientists through awards

There are several national and European initiatives to raise visibility of women and promote women scientists as positive role models which can attract young women into STEM studies at the undergraduate level and eventually into STEM careers:

41 Systems thinking is a holistic approach to analysis that focuses on the way that a system's constituent parts interrelate and how systems work overtime and within the context of larger systems

42 GenPORT, 2017, *Gender and Science Policy Briefs: From "Where to start" to "How to innovate"*. Available at: <https://www.genderportal.eu/resources/gender-and-science-policy-briefs-where-start-how-innovate-introduction>

43 FWF, *Elise Richter Programme*. Available at: <https://www.fwf.ac.at/en/research-funding/fwf-programmes/richter-programme-incl-richter-peek>

44 FWF, *Hertha Firnberg Programme* Available at: <https://www.fwf.ac.at/en/research-funding/fwf-programmes/firnberg-programme>

45 Austrian Government Department of Industry, Science, Energy, and Resources, 2020, *2020 Action Plan*. Available at: <https://www.industry.gov.au/data-and-publications/advancing-women-in-stem-strategy/2020-action-plan>

46 National Science Foundation, nd, *ADVANCE: Organizational Change for Gender Equity in STEM Academic Professions (ADVANCE)*. Available at: https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383

47 National Science Foundation, 2021, *Improving Undergraduate STEM Education: Education and Human Resources (IUSE: EHR)*. Available at: <https://www.nsf.gov/pubs/2021/nsf21579/nsf21579.htm>

- In Czechia, The Ministry of Education, Youth and Sports, in cooperation with the National Contact Center - Gender and Science of the Institute of Sociology of the Academy of Sciences of the Czech Republic, organises annual competitions for the Milada Paulová Award for women scientists. The award aims to publicly and financially appreciate the achievements of prominent Czech women researchers, provide role models and inspire women researchers and students at the beginning of their research careers.⁴⁸
- In Germany, TU Darmstadt awards the Franziska Braun Award for outstanding women scientists.⁴⁹ Hosted in Germany, the Women's STEM Award is open to international entrants. The award gives prizes for women undergraduates in the fields of Artificial Intelligence, Cloud, Cyber Security, Internet of Things and Networks of the Future.⁵⁰
- In Poland, the annual Perspektywy Women in Tech Summit is an event for women in Tech in Europe, also promoting women role models. The initiative is supported by the government through the Ministry for development.⁵¹
- In France, the Irene Joliot-Curie Prize awards three annual prizes - the "Woman Scientist of the Year" prize, the "Young Woman Scientist" award which highlights and encourages a young woman who has distinguished herself through a career and work that make her a talented specialist in her field, and the "Woman, research and business" prize rewards a woman who has developed scientific and / or technical innovations in a research & development function.⁵²
- In Italy, the National Council of Engineers Award aims to enhance the profile of women in the technical field and intends to reward the best thesis in engineering, among all the degree courses provided for by the engineering system.⁵³

Institutional-level policy and practices

At institutional level, there are several examples of policies, projects and programmes to encourage and support young girls/women to pursue STEM subjects at the undergraduate level and higher. Furthermore, several institutions have developed specific programmes to encourage and support women to enter STEM careers.

Support for young women and girls to pursue STEM subjects

In Italy, the **National Institute for Nuclear Physics (INFN) and National Research Council (CNR)** organised a school competition on 'women in physics, stereotypes and gender bias'.⁵⁴ The competition aimed to encourage girls to choose STEM-related subjects in university, to highlight the importance of role models and stereotypes related to women in science and to understand the perception of young people about women in research. The competition involved 120 high schools where students created pictures, posters or brochures on the stereotypes related to women in physics.

In Germany, the project 'Zdi Campus - Girls try out STEM-fields'⁵⁵ provided young girls with high school diplomas the opportunity to attend university courses in STEM-related subjects for a period of six months. The project was found to be effective as several young girls/women that attended the courses chose to select a STEM field for their further study. At the undergraduate and graduate level, the UniMento project⁵⁶ at the **University of Augsburg** provides mentoring for students and women researchers to help eliminate gender-based career stereotypes in subjects where either women or men are typically under-represented. The mentoring programme includes individual career planning support and opportunities for students to reflect on their future ambitions. Furthermore, mentees are offered support through training on job applications and networking with useful contacts for their future careers.

48 Further details: Center for Gender and Science, 2021, *Milada Paulova Award*. Available at: <https://genderaveda.cz/en/milada-paulova-award/>

49 CESAER Task Force Human Resources, 2015, *Gender Equality at European Universities of Science and Technology, Results of the CESAER Gender Equality (GE) Survey 2014*. Available at: <https://www.lnvh.nl/uploads/moxiemanager/downloads/320.pdf>

50 Women-Stem-Awards, 2021. Available at: <https://www.women-stem-award.com/#award>

51 The Perspektywy Women in Tech Summit. More details available at: <https://womenintechsummit.pl>

52 Ministère de l'enseignement supérieur de la recherche et de l'innovation, 2021, *Prix Irène Joliot-Curie*. Available at: <https://www.enseignementsup-recherche.gouv.fr/pid24580/prix-irene-joliot-curie.html>

53 Ingenio al femminile, 2021, Available at: <https://bando.ingenioalfemminile.it/>

54 Eiseman, I., 2018, *Genera Toolbox, Gender Equality Network in the European Research Area performing in Physics*. Available at: https://www.genera-network.eu/_media/genera:genera_toolbox-2018_final_revision.pdf

55 *Ibid*

56 *Ibid*

Moreover, the **Karlsruhe Institute for Technology** has established a multi-level support scheme to support reconciliation of work and private life for undergraduate and graduate students. Support includes parental leave, pregnancy compensation, emergence child day care centres, childminder network, parent-child office, and elder care.⁵⁷

In **Ireland**, the STEM Passport for Inclusion (STEM Passport Inc.) takes an intersectional approach by supporting 1000 girls from working class communities to move into STEM courses and careers. It offers an accredited STEM skills programme, preparing disadvantaged girls from Munster and Leinster for STEM courses, and building an accredited pathway for them into Maynooth University and Munster Technological University.⁵⁸

In Switzerland, the **University of Geneva** organised the Athéna programme⁵⁹ to encourage students in the final years of secondary education, especially young women, to consider Physics and Mathematics as a university/career option. As part of the programme, high school students followed the semester of a first-year physics course and receives tutorial support from young researchers. Subsequently, students could take an optional exam which could be used as credit for future studies at the university. The programme was found to be very successful with around 50% participation of boys and girls.

Support for transition from undergraduate level to Master/Doctoral level

The **Norwegian University of Science and Technology** (NTNU) The Girl Project Ada works to recruit more girls to the ICT studies and prevent dropouts. The project offers a career network that provides career opportunities when students graduate. A specific aim of the project is to increase the number of girls with Master's degrees in Mathematics, Informatics, Cybernetics and Robotics, Electronic System Design and Innovation, Computer Technology and Communication Technology.⁶⁰

The **Israeli Ministry of Science and Technology** promotes scholarships for women in science and technology and for women in Engineering Masters Programmes with specific funding to facilitate women's research career in the STEM fields.⁶¹ The Swiss National Science Foundation (SNSF) has extended its measures for promoting gender equality with the introduction of PRIMA, the new scheme for excellent women researchers, in 2017.⁶² The SNSF's is also planning to introduce a PhD-funding instrument for (only) women in STEM.

Support structures for women in STEM careers

Across several countries, specific support programmes have been established targeting women in STEM fields, with means of dedicated funding, visibility, access to networking and career support. For example, this approach is implemented in the following universities:⁶³

- TU Wien: WIT Women in Technology,
- Leibniz University Hannover: Caroline Herschel Programme,
- TU Berlin: Female scientists to the top,
- TU Dresden: Eleonore-Trefftz guest professorship programme,
- TU Dresden: Marie-Reiche young female scientists programme,
- TU Munich: Liesel Beckmann Distinguished Professors,

57 *Ibid*

58 Details available at: <https://www.maynoothuniversity.ie/all-institute/all-projects/stem-passport-inclusion>

59 Eiseman, I., 2018, Genera Toolbox, *Gender Equality Network in the European Research Area performing in Physics*. Available at: https://www.genera-network.eu/_media/genera:genera_toolbox-2018_final_revision.pdf

60 NTNU, *About the Girl Project Ada*. Available at: <https://www.ntnu.edu/girls/about-ada>

61 GENDERACTION, nd, *Policy Brief "Disruptive measures for gender equality in R&I"*, Available at: <https://genderaction.eu/policy-advice/gender-equality-in-era/>

62 Swiss National Science Foundation, nd, *PRIMA*. Available at: <https://www.snf.ch/en/soMWfibVDpNMVR36/funding/careers/prima>

63 CESAER Task Force Human Resources, 2015, *Gender Equality at European Universities of Science and Technology, Results of the CESAER Gender Equality (GE) Survey 2014*. Available at: <https://www.lnvh.nl/uploads/moxiemanager/downloads/320.pdf>

- TU Delft: DEWIS Women in Science, Young Delft, DEWIS Award,
- TU Eindhoven: Talent to the Top,
- U Twente: UTWIST – tenure track positions for women only,
- TU Istanbul: Women studies Centre.

An interesting development in this context is the introduction of gender blind assessments in the awards of grants from the Irish Research Council.⁶⁴ The **Science Foundation Ireland** gender strategy includes a pillar on gender in STEM education with several practical actions.⁶⁵ This includes supporting projects that aim to increase the number of women pursuing STEM subjects; publishing evaluations of public engagement projects that address gender parity in STEM; ensuring that activities and online content represent gender parity and challenge unconscious bias; and developing a toolkit on unconscious bias for education and public engagement initiatives.

Ireland is also active in terms of providing networking opportunities for women in STEM through the STEMettes organisation, active in both the UK and Ireland. **Stemettes** is a social enterprise, the stated aim of the organisation is to inspire the next generation of women and nonbinary people into Science, Technology, Engineering and Maths (STEM) fields by showing them the diversity of people already in STEM via a series of intersectional cohort programmes, impactful events and inspirational content platforms.⁶⁶

What are the main recommendations?

- Member States to support in-depth research that focuses on so-far less explored cultural and institutional barriers of girls' aspirations and access to STEM subjects and careers.
- Member States should include gender-responsive STEM learning, including through a STEAM approach⁶⁷, in national development plans and policies for education.
- Education institutions (lower and upper secondary, tertiary) developing STEM curricula should consider how to address and remove gender stereotypes in STEM education, including in the content of teaching materials, pedagogical methods and lesson plans.
- Education institutions (lower and upper secondary, tertiary) should develop better career guidance to encourage women and girls to consider studying in STEM fields in which they are under-represented.
- Education institutions (lower and upper secondary, tertiary) should provide gender-sensitive training for teachers and career counsellors to deconstruct stereotypical beliefs about students' subject and career preferences, and avoid gender-biased visuals, language, teaching methods, and teachers' attitudes and behaviours.
- Tertiary education institutions should advance measures to address structural sources of gender inequality in access to Higher Education systems that, together with social expectations, act as barriers to inclusion of under-represented groups among the student population (considering intersections with gender and other social categories, including socio-economic status, ethnic or migrant background). Measures can include specific scholarships for under-represented groups, support networks or dedicated Equality Officers.
- Funders of STEM education and tertiary education institutions need to further raise awareness of benefits of STEM education, promote diverse women role models and create opportunities that lead to fulfilling career paths for women in STEM fields. This involves targeted and timely intervention measures (e.g. from lower secondary level to undergraduate level).

64 Higher Education Authority, 2016, *HEA National Review of Gender Equality in Irish Higher Education Institutions*, Available at: <https://hea.ie/assets/uploads/2017/06/HEA-National-Review-of-Gender-Equality-in-Irish-Higher-Education-Institutions.pdf>

65 Science Foundation Ireland, 2016, *Gender Strategy 2016-2020*. Available at: [SFI-Gender-Strategy-2016-2020.pdf](https://www.sfi.ie/sites/default/files/2016-12/SFI-Gender-Strategy-2016-2020.pdf)

66 STEMettes. More details available at: <https://stemettes.org/>

67 The use of artistic approaches to STEM involving creative thinking and applied arts (the "A" in STEAM) could prove particularly useful in this regard.

POLICY BRIEF 6

PROMOTING A GENDER PERSPECTIVE IN INNOVATION

This policy brief discusses the topic of promoting a gender perspective in innovation. The brief first describes available data, discussing European trends. The next section discusses key policy priorities at EU, national level, and institutional levels before presenting recommendations for relevant actors. Good practices are also included to illustrate some of the approaches taken at EU, national, and institutional levels to promote a gender perspective in innovation.

Summary of key issues

Innovation is a key ingredient for driving economic growth, creating good-quality jobs¹ and ensuring Europe's long-term competitiveness and sustainable development. At the same time, **women continue to be severely under-represented** across a range of **innovation-driven activities**, with large gaps, especially in the new innovation-driven economic activities, such as **digital-driven innovation**, including **Artificial Intelligence (AI)**. With the under-representation of **women-led start-ups** and on **boards of innovative companies** (also spin-offs from academia), innovation lacks a balanced gender perspective. Recent trends in the context of COVID-19 pandemic include a negative impact on women-led start-ups, as these tend to be more vulnerable to economic shocks due to lower levels of financial backing.²

Critically, the concept of “innovation”, which has traditionally been equated with technological progress, an area typically dominated by men,³ has excluded social innovation or innovation in the third and public sectors where women play a more significant role. However, research has shown the importance of the so-called soft innovation across a range of sectors.⁴ It also demonstrated how significant social innovation can be in driving change also in “hard” sectors, such as energy.⁵

- 1 Including aspects such as: a living wage, basic benefits, career-building opportunities, wealth-building opportunities, and a fair and engaging workplace (see for example, Insight at Pacific Community Ventures, 2016, *Moving Beyond Job Creation*. Available at: https://www.pacificcommunityventures.org/wp-content/uploads/sites/6/2016/04/Quality-Jobs_Moving-Beyond-Job-Creation.pdf (Page 4-5))
- 2 See for example: Le Houérou, P., 2020, *4 key trends on how COVID has impacted women in business*, World Economic Forum. Available at: <https://www.weforum.org/agenda/2020/07/how-private-companies-can-facilitate-a-gender-equal-recovery/> IMFBlog, 2020, The Covid-19 Gender Gap. Available at: <https://blogs.imf.org/2020/07/21/the-covid-19-gender-gap/>
- 3 ERAC Standing Working Group on Gender in Research and Innovation, 2019, *Innovating innovation: Policy brief on gender and innovation*. Available at: <https://data.consilium.europa.eu/doc/document/ST-1210-2019-INIT/en/pdf>
- 4 Report of the OMC Working Group of Member State Experts, 2018, *The role of public policies in developing entrepreneurial and innovation potential in the cultural and creative sectors*, Luxembourg: Publications Office of the European Union. Available at: <https://op.europa.eu/en/publication-detail/-/publication/5d33c8a7-2e56-11e8-b5fe-01aa75ed71a1/language-en/format-PDF/source-68820857>
- 5 Mikkonen, I., Gynther, L., Matschoss, K., Koukoufakis, G., Murauskaite, I. and Uihlein, A., 2020, Social innovations for the energy transition, EUR 30446 EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-76-25283-2 (online), doi:10.2760/555111 (online), JRC122289.

Furthermore, the public policy framework, research and understanding of innovators, entrepreneurs and **innovation processes rarely adopt a gender perspective** on a systematic basis. This is a waste of innovation potential as shown by a clear correlation between gender equality and innovation: countries with the most effective innovation systems are also the countries with the best gender equality systems.⁶ However, significant challenges remain in relation to ensuring the **inclusiveness of innovation** and **innovation contents** in terms of topics, approaches and products taking account of the needs of both men and women as well as the accessibility of innovation ecosystem to women, including the accessibility of innovation funding, networks and adequate training for women, financing, networking and care responsibilities.

What do data tell us?

Key findings from She Figures indicators

She Figures indicators examine the gender gap in innovation outputs in terms of patents and in terms of representation within academic-corporate collaboration teams. Furthermore, indicators measure women and men's employment in knowledge-intensive activities and self-employment among science & engineering and ICT professionals to shed light on potential differences across industries and entrepreneurship activities. The results show that:

- **Women are very under-represented among inventors.** In She Figures, inventorship is inferred based on the number of patent applications and the corresponding number of inventors (for example, a team of 10 inventors for a given patent application would each be attributed a tenth of that invention). At European (i.e. EU-27) level, for every 100 inventorships held by men, there were just 12 held by women between 2015 and 2018. The vast majority of EU-27 Member States and Associated Countries had ratios of women to men inventorship of 0.2 or less, indicating that more than five times as many inventorships were held by men compared to women in these countries.
- **Fewer women than men are authors on academic-corporate collaboration teams.** At the European level and across all EU-27 Member States and Associated Countries, the proportion of women among authors on academic-corporate collaborations was less than 0.5 between 2015 and 2019. This indicates that on average, less than half the authors on teams involved in academic-corporate collaboration were women. These results build on an indicator of the Innovation Union Scoreboard (IUS), which examines public-private co-publications as a measure of participation in Open Innovation.⁷
- **Women are more likely than men to work in knowledge-intensive activities (KIA),** both at the European and country level. The relative over-representation of women in KIA can be partly explained by the fact that public sector jobs such as healthcare, education and social work are included, and women tend to dominate these sectors.
- However, **when KIA is narrowed to business industries, men are more likely than women to work in such industries.** At the European level, the proportion of women employed in KIA was higher than that of men by 15.6 percentage points in 2019. On the other hand, when only business industries were considered (KIABI), the proportion of men employed in KIABI exceeded that of women by 0.7 percentage points at the European level in 2019. The situation was more mixed at the country level where in approximately half of the EU-27 Member States and Associated Countries examined, women were more likely than men to be working in KIABI.

A measure of women's entrepreneurship, the relative self-employment rate for women and men provides insights into the gender gap in entrepreneurship activity. A new indicator in the present edition of She Figures provides an indication on women and men's entrepreneurship activity in tech occupations where women tend to be under-represented. The data find that:

6 European Institute for Gender Equality, 2021, *Gender Equality Index*. Available at: <https://eige.europa.eu/gender-equality-index/2021/compare-countries/index/bar>

7 European Commission, 2019, 2019 *Innovation Scoreboards: The Innovation performance of the EU and its regions is increasing*. Available at https://ec.europa.eu/commission/presscorner/detail/en/QANDA_19_2998

- **Women represented less than one-quarter (24.9%) of self-employed professionals in Science & Engineering and ICT at the European level in 2018.** Hence, the gender imbalance in employment within the Science & Technology occupation widens when considering self-employment of women compared to men. A similar trend was seen at the country level where the proportion of self-employed women was below 40% in all EU-27 Member States and Associated Countries except for Croatia (43.9%).

Additional sources

Gender gap in entrepreneurship and digitalisation

Similar to the self-employment data provided in She Figures, a study from the OECD⁸ using Eurostat data shows that **there is a substantial gender gap in self-employment in the EU with less than one in ten working women self-employed in 2018.** Moreover, the self-employment rate for women in the EU has remained constant between 2002 and 2018. Furthermore, among the EU-27 Member States, the study highlights that the self-employment rates for women were highest in the Southern Member States, including Greece (22.1%) and Italy (14.9%) and lowest in Denmark (4.4%) and Sweden (5.0%).

Another measure of women's entrepreneurship is the proportion of women who are involved in starting a business. The OECD uses data from the Global Entrepreneurship Monitor (GEM) to show that, between 2014 and 2018, **women in the EU were less likely than men to be active in starting a business** (2.9% of women were trying to start a business compared to 5.3% of men). Furthermore, GEM data on new business ownership, i.e. the proportion of the population that is currently owner-manager of a new business, has shown that between 2014 and 2018, women in the EU were around two-thirds as likely as men to be an owner-manager of a new company (2.1% for women and 3.6% for men). Moreover, among the EU-27 Member States, the new business ownership rate for women was highest in the Netherlands (4.4%) and lowest in Italy and Belgium (1.3% for both).

In terms of barriers to business creation and sustainable self-employment, the OECD study reports that only **one third of women in the EU stated that they had the skills and knowledge to start a business** compared to about half of men between 2014 and 2018. Moreover, women in the EU were more likely to report that a fear of failure prevented them from started a business compared to men between 2014 and 2018 (49.3% for women and 40.6% for men).

Gender gap in innovative start-ups and venture capital investments

Access to funding is a key determinant for successful innovative start-ups. However, an OECD analysis⁹ based on Crunchbase reported a large gender gap among innovative start-ups looking for VC investments with only 11% of such start-ups founded by women. Moreover, the OECD analysis found that raising capital is more difficult for women-owned firms such that in a sample of 25,000 start-ups on Crunchbase. Start-ups with a heterogeneous team of founders in terms of gender were less likely to be funded and if they were funded, **they received 70% less compared to a team of founders composed of all men.** These results hold after controlling for factors such as the nature of the start-up and the education and professional background of the founder.

Gender gap in the field of Artificial Intelligence (AI)

The European Commission's Gender Equality Strategy recognises that AI has become an area of strategic importance and therefore, policies need to ensure that AI does not intensify gender inequalities in the labour market and in society. However, increasing evidence has shown that there are considerable gender gaps in AI research across the world and in the EU. A recent study by Nesta using a dataset from arXiv¹⁰ has shown that¹¹:

8 OECD/European Union, 2019, *The Missing Entrepreneurs 2019: Policies for Inclusive Entrepreneurship*, OECD Publishing, Paris. Available at: <https://www.oecd-ilibrary.org/docserver/3ed84801-en.pdf?expires=1614006010&id=id&accname=quest&checksum=6AC9C27E648A63640459AA81COE01305>

9 Breschi, S., J. Lassébie and C. Menon, 2018, *A portrait of innovative start-ups across countries*, OECD Science, Technology and Industry Working Papers, No. 2018/02, OECD Publishing, Paris. Available at: <https://www.oecd-ilibrary.org/docserver/f9ff02f4-en.pdf?expires=1614016916&id=id&accname=quest&checksum=1877F5DC63EC346275F471D789952579>

10 Arxiv is an online repository providing open access to more than 1.5 million research articles and widely used by the AI research community.

11 Mateos-Garcia, J., Stathoulopoulos, K., 2019, *Gender Diversity in AI Research*, Nesta. Available at: https://media.nesta.org.uk/documents/Gender_Diversity_in_AI_Research.pdf

- There are important differences in gender diversity in AI both within the EU and internationally. The analysis showed that across all countries for which data were available, **Netherlands** had the highest share of AI papers with at least one female author (around 35%). Specifically across the EU-27 Member States and Associated Countries for which data were available, seven countries (BE, DK, ES, FR, IE, PT, TR) had a share of greater than 30% and six countries (CZ, DE, EL, FI, PL, CH) had a share of less than 25%.
- The study also found that relative to the proportion of women across all papers in a country, women in AI are significantly over-represented in ten countries (BE, DK, ES, FR, IE, IT, PT, NL, NO, TR) and under-represented in six countries (CZ, DE, EL, FI, PL, CH).

The 2021 AI Index report, published by Stanford University¹², found that the share of female AI and Computer Science PhD graduates as well as tenure-track Computer Science faculty staff remains low. Female graduates of AI PhD programs and CS PhD programs accounted for 18.3% of all PhD graduates on average within the past 10 years.

The report also assessed the AI skills penetration rate, comparing it for men and women. This rate measures the extent of the prevalence of AI skills across occupations, or the intensity with which people in certain occupations use AI skills. The analysis showed that the AI skills penetration rate for women is lower than it is for men¹³ (India, USA, South Korea, Singapore, China, Canada, France, Germany, Australia, UK, South Africa, and Italy were included in the analysis).

The 2030 Digital Compass and the Women in Digital Scoreboard 2020

In March 2021, the European Commission set out the digital ambitions for the next decade, through the Communication Digital Compass: The European Way for the Digital Decade.¹⁴ Targets were proposed in relation to four points: 1) Digitally skilled citizens and highly skilled digital professionals; 2) Secure, performant and sustainable digital infrastructures; 3) Digital transformation of businesses; and, 4) Digitalisation of public services.

Introducing measures to promote a digitally skilled population and highly skilled digital professionals, the Communication highlights the gender imbalance in the digital, with only one in roughly six ICT specialists and one in three STEM graduates being women. The Communication proposes that by 2030 there should be 20 million employed ICT specialists in the EU, with convergence between women and men.¹⁵

The Women in Digital (WID) Scoreboard monitors women's participation in the digital economy and society.¹⁶ Part of the Digital Economy and Society Index (DESI), the scoreboard assesses Member States' performance in the areas of Internet use, Internet user skills as well as specialist skills and employment based on 12 indicators. The scale of the challenge identified above is underscored in the WID scoreboard which shows that women are less likely to have specialist digital skills and work in this field compared to men.¹⁷ Furthermore, the analysis shows a varied picture across Europe:

- Finland, Sweden, Denmark and the Netherlands are home to some of the most active women in the digital economy.
- Women in Bulgaria, Romania, Greece and Italy are the least likely to be taking part in the digital economy, either through employment, use of the internet, or using digital skills.

12 Stanford University, Human-Centered Artificial Intelligence, 2021, *AI Index 2021*. Available at: <https://hai.stanford.edu/research/ai-index-2021>

13 Artificial Intelligence Index Report, 2021, *Chapter 6: Diversity in AI*. Available at: stanford.edu/wp-content/uploads/2021/03/2021-AI-Index-Report-Chapter-6.pdf

14 European Commission, 2021, *Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions, 2030 Digital Compass: the European way for the Digital Decade*, COM/2021/118 final. Available at: <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52021DC0118>

15 European Commission, 2021, *Europe's Digital Decade: digital targets for 2030*. Available at: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

16 European Commission, 2020, *Women in Digital Scoreboard 2020*. Available at: <https://digital-strategy.ec.europa.eu/en/library/women-digital-scoreboard-2020>

17 As mentioned above, only 18% of ICT specialists in the EU are women.

The impact of COVID-19 pandemic and resulting lockdown measures has also been disproportionately high on women entrepreneurs and innovators. A study in the Nordic countries¹⁸ showed that women entrepreneurs are at risk of being especially affected by the economic repercussions of COVID-19. This is because the lockdown measures affected mostly industries where physical contact or physical proximity is important, such as personal services, childcare, health and social work services, or food and accommodation services. These have a significantly higher share of women entrepreneurs than industries where physical proximity is less important.

What are the key policy priorities?

Why it is important to consider gender perspective in innovation?

Gender perspective is **relevant for the design, development and implementation** of the research-driven innovation policy.¹⁹ Otherwise, innovations arising from the research processes are less useful, robust and socially responsible. Gender-sensitive innovation can also help to ensure the innovation processes are including diverse range of experiences and expertise.²⁰

In March 2021, the European Commission announced a new initiative called 'Women TechEU' to support women leading deep tech start-ups in Europe and help grow their companies into tomorrow's deep tech champions. The pilot scheme will support a first cohort of up to 50 promising deep tech start-ups from EU Member States and Associated Countries.²¹

Gender affects how innovation is perceived, designed, developed, implemented and used. However, a gender perspective is **rarely systematically adopted in innovation processes, innovation studies, its outcomes and innovation policies**. Despite EU's regulatory framework, innovation policy at EU level and in the majority of Member States and neighbours, research does not systematically address gender issues.²² Research studies and policy documents on innovation and Open Innovation can be gender blind²³ with less attention given to innovation in certain sectors (such as care industries, service sector, public sector).²⁴

The emerging gender-sensitive innovation policy matters because women innovators, research entrepreneurs and pioneers of applying research results into economy face **a range of barriers to their more widespread participation in innovation**. Literature points out a lack of motivation and women role models of innovators, weak support or the lack of network support, the missing entrepreneurial skills, and the inadequate access to financing and capital structures.^{25 26}

18 Grünfeld, L., Hernes, S.M., Karttinen, E., Menon Economics, 2020, *FEMALE ENTREPRENEURSHIP IN THE NORDICS 2020 - A comparative study*. Available at: [FULLTEXT02.pdf \(diva-portal.org\)](#)

19 ERAC Standing Working Group on Gender in Research and Innovation, 2019, *Innovating innovation: Policy brief on gender and innovation*, ERAC 1210/19. Available at : <https://data.consilium.europa.eu/doc/document/ST-1210-2019-INIT/en/pdf>

20 GenPORT, 2017, *Gender and Science Policy Briefs: From "Where to start" to "How to innovate"*. Available at: https://eige.europa.eu/sites/default/files/d4.8_gender_and_science_policy_briefs_genport.pdf

21 European Commission, 2021, *EU to launch new support scheme for women in deep tech and call for mentors*. Available at: https://ec.europa.eu/info/news/eu-launch-new-support-scheme-women-deep-tech-and-call-mentors-2021-mar-08_en; see also: https://eic.ec.europa.eu/eic-funding-opportunities/european-innovation-ecosystems/women-techeu_en

22 ERAC Standing Working Group on Gender in Research and Innovation, 2019, *Innovating innovation: Policy brief on gender and innovation*, ERAC 1210/19. Available at : <https://data.consilium.europa.eu/doc/document/ST-1210-2019-INIT/en/pdf>

23 GENDERACTION, 2019, *Report on Strategic Advice for Enhancing the Gender Dimension of Open Science and Innovation Policy*. Available at: https://genderaction.eu/wp-content/uploads/2019/04/GENDERACTION_Report-5.1_D11_OS01.pdf

24 Amble, N., Axelsen, P., & Snerthammer, L. K., 2016, *Innovation in public care*. In G. A. Alsos, U. Hytti, & E. Ljunggren (Eds.), *Research Handbook on Gender and Innovation*, p151–170, Edgar Elwar Publishing Limited.

25 OECD/European Union, 2019, *The Missing Entrepreneurs 2019: Policies for Inclusive Entrepreneurship*, OECD Publishing, Paris, Available at: <https://doi.org/10.1787/3ed84801-en>

26 Grünfeld, L., Hernes, S.M., Karttinen, E., Menon Economics, 2020, *FEMALE ENTREPRENEURSHIP IN THE NORDICS 2020 - A comparative study*. Available at: [FULLTEXT02.pdf \(diva-portal.org\)](#)

Women are also under-represented in disruptive innovation areas such as for example, employment in the **development, use and application of AI**.²⁷ Furthermore, the gender gap in AI may result in biased AI-related development (e.g., patents, start-ups). For example, only 1-2% of the start-ups funded by venture capital were managed by women founders in the last decade. Therefore, the women's voice is missing with the consequences that AI is developed reinforcing gender bias and stereotypes, not addressing the needs of all citizens and reproducing existing gender inequalities.²⁸

In this respect, it is important that the emerging European policy framework on AI acknowledges the need for gender equality as a key principle in the approach to the AI.

EU policy commitments

The European policies on research-driven innovation are becoming gender sensitive. **The new ERA Communication** recognises that the representation of women amongst its innovators remains extremely low and wants to strengthen the focus policy to address this.²⁹ This renewed focus is reiterated in the Council conclusions on the new ERA.³⁰

This is translating into targeted measures promoting the participation of women in innovation to be developed in Horizon Europe by the **European Innovation Council (EIC) phase** following the successful measure in the 2020 EIC Accelerator Pilot that increased the success of women led-companies from 8% to 29% in 2020 by prioritising 25% women CEOs at interviews.³¹ Other EIC measures include **a pilot scheme to support women-led start-ups (Women TechEU³²)**, a prize for women innovators and Women Leadership Programme to provide coaching and mentoring to EIC-funded women entrepreneurs.³³ This builds on the experience of Horizon 2020 funded projects which aimed to investigate and promote the inclusion of women in the key areas of innovation.³⁴ In addition, the **Gendered Innovations** report has developed guidelines for including a gender perspective in research and innovation (R&I) content in different scientific fields, demonstrating how this will enhance the innovation processes and outcomes.³⁵

Other concrete measures of support to women innovators (within and outside the higher education sector) include a mix of awareness raising and visibility initiatives, knowledge management, networks and support structures, such as:

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27 European Parliament, 2020, *Education and employment of women in science, technology and the digital economy, including AI and its influence on gender equality*. Available at : [https://www.europarl.europa.eu/thinktank/en/document.html?reference=IPOL_STU\(2020\)651042](https://www.europarl.europa.eu/thinktank/en/document.html?reference=IPOL_STU(2020)651042)

28 European Commission, 2020, *Communication of 5 March 2020 on A Union of Equality: Gender Equality Strategy 2020-2025*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A152%3AFIN>

29 European Commission, 2020, *Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions, A new ERA for Research and Innovation*, COM(2020) 628 final. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0628&from=EN>

30 Council Conclusions on the new European Research Area, 2020, *RECH 483 COMPET 611*. Available at: <https://data.consilium.europa.eu/doc/document/ST-13567-2020-INIT/en/pdf>
 “RECALLS with great concern that there continues to be a major gender imbalance preventing Europe from using the full potential of its R&I system aiming for excellence, and CALLS on the Commission and Member States for a renewed focus on gender equality and mainstreaming, including through the instrument of gender equality plans and the integration of the gender dimension into R&I content. INVITES Member States and research funding organisations to advance measures to ensure that allocation of research funding is not affected by gender bias.”

31 European Innovation Council, 2021, *Statement on Gender & Diversity in EIC*. Available at: https://eic.ec.europa.eu/news/statement-gender-diversity-eic-2021-06-03_en

32 European Commission, 2021, *EU to launch new support scheme for women in deep tech and call for mentors*. Available at: https://ec.europa.eu/info/news/eu-launch-new-support-scheme-women-deep-tech-and-call-mentors-2021-mar-08_en ; European Innovation Council, Women TechEU. Available at: https://eic.ec.europa.eu/eic-funding-opportunities/european-innovation-ecosystems/women-techeu_en

33 European Commission, 2020, *Communication of 5 March 2020 on A Union of Equality: Gender Equality Strategy 2020-2025*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A152%3AFIN>

34 Such as projects GENOVATE - Transforming Organisational Culture for Gender Equality in Research and Innovation; PLOTINA - Promoting gender balance and inclusion in research, innovation and training.

35 European Commission, 2020, *Gendered Innovations 2: How inclusive analysis contributes to research innovation: policy review*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/33b4c99f-2e66-11eb-b27b-01aa75ed71a1>

- **Monitoring participation of women in innovation:** the Women in Digital (WID) Scoreboard assesses the women's presence in digital jobs, careers and entrepreneurship.³⁶ The Oslo Manual 2018 (OECD 2018) which delivers guidelines on collecting, reporting and using data on innovation includes social inclusion and gender equality among the outcomes that affect the economy, society or the environment. However, the European Innovation Scoreboard does not include any gender relevant indicators.³⁷
- **Supporting networks specific for women entrepreneurs,** innovators and women-led digital businesses, such as the European Women in Digital Network, Women4Cyber Registry, the Database of European women in cybersecurity or the Enterprise Europe Network's (EEN), a dedicated women entrepreneurship group.
- **Establishing awards dedicated to women innovators and raising visibility** – such as awards for digital start-ups led by women,³⁸ the EU Prize for Women Innovators, or the EIT Awards for innovative and digital entrepreneurs, including recent graduates and women (through a specific award category EIT WOMAN for outstanding achievements of women entrepreneurs and leaders).
- **Providing specific support structures** – such as the Europe-wide online platform WEgate, to support women entrepreneurs³⁹; or setting up a European community of women business angels and women entrepreneurs⁴⁰, The European network to promote women's entrepreneurship (WES); the European Network of Female Entrepreneurship Ambassadors, the European Network of Mentors for Women Entrepreneurs, and an E-platform: One-stop-shop for women's entrepreneurship. An interesting example is a WeHubs initiative aimed at promotion and support of women's digital entrepreneurship.⁴¹
- **Integrating gender equality and gender mainstreaming into the functioning of the European Innovation Council** - measures and activities promoting gender equality under the European Innovation Council, include a target of 40% women-led companies invited to pitch their projects, a target of 50% women among members of advisory structures, a prize for women innovators and a dedicated initiative to support women-led start-ups.⁴² The importance of the gender dimension in innovation content is also identified in the EIC 2021 Work Programme.⁴³
- **Redefining the boundaries of research and development and promoting technology transfer** by including a wider range of people and in particular women in the process to discovering markets for research.⁴⁴
- The **European level funders of entrepreneurs and innovators** are also considering gender diversity in their funding programmes. For example, The EIB Strategy on Gender Equality and Women's Economic Empowerment has a specific strategic priority aimed at identifying targeted opportunities to invest in women's economic empowerment that increase women's access to employment and to credit/financial services, and that purposefully support women's entrepreneurship.⁴⁵

36 European Commission, 2019, *Women in Digital Scoreboard 2019 – Country reports*. Available at: <https://digital-strategy.ec.europa.eu/en/library/women-digital-scoreboard-2019-country-reports>

37 European Commission, 2021. European Innovation Scoreboard 2021. Available at: <https://ec.europa.eu/docsroom/documents/46013>

38 European Commission, 2018, *Digital4Her pitching event is over*. More information available at: <https://digital-strategy.ec.europa.eu/en/news/digital4her-pitching-event-over-10-startups-awarded>

39 WEgate. Available at: [Welcome to WEgate - European gateway for women's entrepreneurship](https://welcome-to-wegate.eu)

40 See for example: <https://www.euro-access.eu/calls/the-european-community-of-women-business-angels-for-women-entrepreneurs>

41 WeHubs (Women Web Entrepreneurs Hubs), nd, *Get Inspired*. Available at: <http://wehubs.eu/get-inspired>

42 European Commission, 2021, *Horizon Europe Programme Guide*, Available at: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf

43 European Innovation Council, 2021, *Work programme 2021*. Available at: <https://eic.ec.europa.eu/system/files/2021-03/EIC%20Work%20Programme%202021.pdf>

44 Schraudner M., Wehking S., 2012, *Fraunhofer's Discover Markets: Fostering Technology Transfer by Integrating the Layperson's Perspective*. In: Audretsch D., Lehmann E., Link A., Starnecker A. (eds) *Technology Transfer in a Global Economy*, International Studies in Entrepreneurship, vol 28. Springer, Boston, MA. https://doi.org/10.1007/978-1-4614-6102-9_19

45 EIB, 2016, *Protect, Impact, Invest: The EIB Strategy on Gender Equality and Women's Economic Empowerment*, Available at: https://www.eib.org/attachments/strategies/eib_group_strategy_on_gender_equality_en.pdf

National policy directions

A similar mix of innovation-support policy measures targeting women innovators, entrepreneurs and start-ups is emerging at the national level. Key aspects of national approaches include improving access to finance and funding for women.

Facilitating access to finance and specific funding to women innovators and entrepreneurs

It is typical of national innovation / entrepreneurship support bodies to offer direct financial support (e.g. business R&D and innovation grants) to promote research and innovation in key areas of industry and economy. They are often awarded through calls from such agencies to which innovators / entrepreneurs can apply, under a set of eligibility criteria, where women are often singled out as a specific target group. For example:

- The Competitive Start Funds distributed by **Enterprise Ireland** typically focus on specific sectors or target groups such as women.⁴⁶
- In the **UK**, the government's innovation support agency **Innovate UK** has implemented the Women in Innovation Awards to find and support the UK's most promising women innovators. Each year, up to 10 women innovators will secure dedicated funding of £50,000 each as well as a bespoke programme of coaching, mentoring and innovation growth support..⁴⁷

The evidence on the success of existing generic support structures for entrepreneurship in academia is mixed. Some have found that the existing incubators in the academic world do not appear to decrease the existing gender entrepreneurship gap. For example, Lindholm Dahlstrand & Politis (2013) studied the role of university incubators in nurturing women's academic entrepreneurship. They analysed over 1400 companies across 19 academic incubators in Sweden and found that only around 15 percent of these companies were founded and managed by women. The authors did not find any evidence that the Swedish incubators in the study were able to decrease the gender gap in women's academic entrepreneurship.⁴⁸

In contrast, a 2020 study found a more positive experience, reported at the institutional level, in the Imperial College London where Imperial Enterprise Lab has supported hundreds of women entrepreneurs in their goals to become entrepreneurial leaders. The institution has also introduced an entire suite of Women's Entrepreneurship (WE) events and programmes to support Imperial women..⁴⁹ Additional examples of approaches are also evident.⁵⁰

A more **targeted approach to providing dedicated funding to women innovators** and entrepreneurs is offered by examples in Austria, Iceland, Norway and Sweden.

- The Laura Bassi Centres of Expertise **in Austria** are funded by the Austrian Federal Ministry of Science, Research and Economy by the programme "w-FFORTE – economic impulses by women in research and innovation" in the scope of the Austrian Research Promotion Agency (FFG). The eight Laura Bassi Centres of Expertise conduct research in the areas of medicine, life sciences and IT⁵¹ and had an initial term of up to seven years, with a total funding budget of 15 million euros. Headed by highly qualified women experts, it is their task to undertake innovative research in the natural sciences and technology. A mid-term evaluation confirmed the success of the programme and all centres were recommended for a second funding period.

46 OECD/European Union, 2019, *The Missing Entrepreneurs 2019: Policies for Inclusive Entrepreneurship*, OECD Publishing, Paris. Available at: <https://doi.org/10.1787/3ed84801-en>.

47 GOV.UK, 2020, *Women in Innovation Awards 2021/22*. Available at: <https://apply-for-innovation-funding.service.gov.uk/competition/974/overview> <https://www.gov.uk/government/news/women-in-innovation-2020-new-funding-announced>

48 Lindholm Dahlstrand, Å. & Politis, D., 2013, Women business ventures in Swedish university incubators, *International Journal of Gender and Entrepreneurship*, 5(1), 78–96.

49 Imperial enterprise lab, 2020. Available at: <https://www.imperialenterpriselab.com/we-innovate/>

50 See for example: University of Portsmouth, *Accelerating Women's Enterprise (AWE)*. Available at: <https://www.port.ac.uk/collaborate/business/business-services/accelerating-womens-enterprise> & Oxford Brookes University, 2021, Call for Evidence: Inquiry into Equity in the STEM Workforce. Available at : <https://radar.brookes.ac.uk/radar/file/9a59b7fd-c280-4539-a26b-ec64d8ec485d/1/Call%20for%20evidence%20submitted.pdf>

51 GenPORT, 2017, Gender and Science Policy Briefs: From "Where to start" to "How to innovate". Available at: https://eige.europa.eu/sites/default/files/d4.8_gender_and_science_policy_briefs_genport.pdf

- **In Iceland**, the Ministry of Welfare awards yearly grants to women entrepreneurs from the loan guarantee fund Svanni.⁵² The aim of these grants is to encourage women to start up their own companies and to increase their access to financing. A prerequisite is that a majority of the company is owned by women. Further requirements are that the company is based on an innovation approach and that it creates jobs in the long term.
- The **Research Council of Norway** aims to promote R&I in Norway. The Research Council offers a STUD-ENT scheme that is aimed at increasing the rate of entrepreneurship among students. The programme does not have any specific requirements related to gender, but the Research Council reports that women entrepreneurs were behind almost half of the projects in 2019.⁵³

Institutional-level policy and practices

A range of initiatives have been identified at the institutional level including targeted training, coaching and mentoring of women to build innovation-related skills, networks for women innovators and gender sensitive innovation strategies and actions.

Building innovation-related skills through training, coaching and mentoring of women innovators

- In June 2020, EU-Startups.com featured examples of academies and start-ups that were focussed on addressing the issue of low levels of participation among young women. Examples were featured from Poland, the Netherlands, Spain, UK, Ireland, Romania, and France.⁵⁴
- The Copenhagen School of Entrepreneurship (CSE), the largest entrepreneurship university **in Denmark**, is a student organization at Copenhagen School of Business with an incubator and accelerator programme. They have an initiative towards women entrepreneurs called the RISE Programme, aimed at inspiring women students to build businesses. The program has 15 spots and can be viewed as an exclusive talent programme.⁵⁵
- In **Finland**, the mission of the “Women’s Enterprise Agency” is to promote women’s entrepreneurship. The Agency provides several services for women entrepreneurs, such as referrals, mentoring, training, and advisory services. It also runs “Future Female” as a platform for women entrepreneurs which offers workshops, seminars, and mentors.
- The women entrepreneurs of the future initiative run **in Germany** targets women entrepreneurs that have businesses with up to 30 employees and offers coaching to support the development and implementation of an action plan on digitalisation. It was launched in February 2018 by a combination of private and public sector actors. Participants can access 20 coaches and digital experts for six months to help them develop and implement a digital plan for their business. Among the first cohort of 18 participants, nine launched an online shop or professionalised an existing one. After one year, these 18 women entrepreneurs had created 19 new jobs. This programme illustrates that developing partnerships with private sector actors can improve the quality of support provided to women innovators.
- In **Norway**, the SHE Community is an organisation that aims at inspiring more women to become leaders and entrepreneurs.⁵⁶ The organisation is behind several initiatives such as a mentor programme for women entrepreneurs and leaders. Another initiative is SHE Invest that aims to inspire women to become investors, and to encourage investors to invest in start-ups led by women. The new evaluation of Innovation Norway’s mentoring service clearly shows that a mentoring scheme is important for company growth, and especially for women entrepreneurs.

52 More details available at: <https://atvinnumalkvenna.is/english/>

53 Grünfeld, L., Hernes, S.M., Karttinen, E., Menon Economics, 2020, *FEMALE ENTREPRENEURSHIP IN THE NORDICS 2020 - A comparative study*. Available at: <http://www.diva-portal.org/smash/get/diva2:1438362/FULLTEXT02.pdf>

54 Fresneau, V., 2020, *Women coders: Meet these 10 European coding academies improving gender equality*, EU-Startups. Available at: <https://www.eu-startups.com/2020/06/women-coders-meet-these-10-coding-startups-and-academies-improving-gender-equality/>

55 Grünfeld, L., Hernes, S.M., Karttinen, E., Menon Economics, 2020, *FEMALE ENTREPRENEURSHIP IN THE NORDICS 2020 - A comparative study*. Available at: <http://www.diva-portal.org/smash/get/diva2:1438362/FULLTEXT02.pdf>

56 SHEcommunity, *Insight Magazine*. Available at: <https://shecommunity.com/>

- The initiative “the Yes Way” is run by eight **Swedish** incubators, and sponsored by innovation-focussed government agencies such as Vinnova and Tillväxtverket.⁵⁷ The initiative focuses especially on women entrepreneurs and an equal and inclusive entrepreneurial and innovation support system, financing climate and business support. According to the initiative, to be able to increase the gender diversity in entrepreneurship, organisations that encourage entrepreneurship, such as incubators, must have a working environment that is inclusive towards women.

Strengthening innovation culture and networks for women innovators

Examples of national and regional level networks for women innovators have been identified as follows.

- The “Nordic Mentor Network for Entrepreneurship” (NOME) is a collaboration between the Nordic countries in the area of life sciences. NOME matches Nordic companies within life sciences with highly skilled professionals that volunteer as mentors. The mentors are typically Nordic business leaders, chairpersons, professors, and successful entrepreneurs.
- Another example comes from Iceland where the Association of Women Business Leaders, also called the FKA, aims to support women managing and growing their businesses in Iceland. FKA was founded in April 1999 and has as its core mission to bring businesswomen together, support women as they manage and grow their businesses and increase their visibility in the business world and society in general.
- In the UK, the Women’s Enterprise Policy Group (WEPG) has launched in 2020 a ‘Framework of Policy Actions to Build Back Better for Women’s Enterprise.’⁵⁸ It aims to address the gaps in COVID-19 enterprise support for women. The network has called for the government to address the current gaps in the enterprise support for woman-led businesses. The main form of support such woman-led businesses have been offered is through loans, but without any targeted marketing to women business owners who are typically more cautious about risking family security via business loans.

Establishing gender-sensitive innovation strategies and actions

This policy strand relates to approaches which combine several strategies of supporting women innovators and entrepreneurs in a more coherent and integrated way. For example, **Innovation Fund Denmark** (Innovationsfonden) invests in entrepreneurs, researchers and businesses. In 2018, it has launched four reinforcing initiatives with to strengthen the gender balance among the applicants of the investment fund:

- Appointing role models that will inspire women to apply, as well as providing the investment fund with input into future work ensuring increased gender balance.
- Including gender diversity in the strategy of Innovation Fund Denmark. In December 2018, the fund published a new strategy that focuses on securing that more women entrepreneurs are supported.
- Adjusting application requirements and formulations to include gender perspectives
- Focusing on gender diversity among candidates for panels and awards.

Another example of coordinated approach comes from **Sweden’s innovation agency Vinnova**. Gender diversity has been a focus point of the agency over several years. Vinnova has three focus areas for their gender equality work:

- Actively promote the number, power and influence of women in project teams.
- Integrating a sex and/or gender perspective in R&I projects.
- Ensuring 60/40 percent in all assessment groups and a gender aware assessment process.

57 Theyesway, Available at: <https://en.theyesway.se/>

58 The businessDesk, 2020, *Failure to support women’s enterprise could lead to ‘catastrophic economic impact’*. Available at [Failure to support women’s enterprise could lead to ‘catastrophic economic impact’ | TheBusinessDesk.com](https://www.thebusinessdesk.com/news/2020/09/24/failure-to-support-women-s-enterprise-could-lead-to-catastrophic-economic-impact/)

What are the main recommendations?

Based upon the issues identified above, existing policy framework and selected good practices, the brief presents the following list of recommendations.

- Innovation policy makers at the EU and Member State levels need to ensure that their innovation policy framework systematically includes a gender perspective. This would also require broadening the traditional view of “hard” innovation⁵⁹ to include a more holistic perspective, including social innovation.
- Innovation policy makers at the EU and Member State levels also need to develop a systematic ethical regulatory framework for innovation that includes appropriate consideration of the gender dimension, particularly in emerging areas of innovation such as the AI, Big Data, Green and Sustainable Technologies.
- Further efforts should be made at the EU and Member State levels to monitor and track the participation of women in innovation, particularly in decision-making and leadership positions, to better understand the need and impact of European and national policy and practices and inform future interventions aimed at supporting women innovators and women in venture capital funding.
- Innovation funders and R&I organisations at the EU and national levels need to ensure that a gender perspective is included in innovation grants and finance disbursed. Concretely, this could mean:
 - requiring that applicants and grantees address the gender dimension in their project design, development and testing, as well as considering the gender dimension in the future implementation of new models, products, processes and services (as implemented in Horizon Europe).
 - encouraging gender balance in the teams receiving funding for innovation and entrepreneurship,
 - supporting explicitly more women founders at different stages of their business development through mentorship, financial support, skills training, and enhancing their visibility.
- Research performing organisations should better support women and men researchers wanting to transfer their research outcomes as innovative products and services into the labour market through a dedicated “innovation” leave. This could be a leave of some years after which a researcher would be entitled to return to their original post.

59 E.g., STEM-based innovation

POLICY BRIEF 7

INTERSECTIONALITY

This policy brief explores the issue of intersectionality, defining and describing its relevance to She Figures. The brief identifies policies and actions related to the intersectional dimension of gender equality and outlines considerations for future actions which may help to better reflect an intersectional diversity perspective in research and innovation.

Introduction: understanding intersectionality

Intersectionality starts from the premise that people live multiple, layered identities derived from social relations, history and the operation of structures of power. Intersectional analysis aims to reveal diversity of identities, exposing the different types of discrimination and disadvantage that occur as a consequence of the intersection between sex and gender and other social characteristics.¹

It also looks at how aspects of a person's social and political identity, such as gender, age, ability, ethnicity, and sexual orientation, intersect and how these relationships can result in different forms of privilege or inequality.²

Crenshaw (1991)³ defines three levels of intersectionality, which provides an illustration of the varied nature of causes and consequences of discrimination, as well as some clues regarding the areas for policy concentration. Crenshaw outlines that intersectionality can be:

- Structural: relating to how structures combine to constrain, oppress, establish, and reinforce forms of inequality
- Political: relating to how political / organisational choices and agendas shape particular forms of prejudice
- Representational: with a focus on imagery and ways in which representations reinforce existing prejudices and inequality.

It is also important to recognise that intersectionality can be distinguished from other forms of discrimination which involve multiple aspects of identity. A report published by the Directorate-General for Justice and Consumers of the European Commission⁴ identifies intersectionality along with other forms of discrimination:

- Sequential multiple discrimination – when a person suffers discrimination on different grounds on separate occasions. For example, a woman with a disability might suffer discrimination once because of her gender and on another occasion because of her disability. This type of discrimination is the easiest to deal with, because each incident can be assessed individually, and judged accordingly.

1 For discussion of definition and application of the issue in EU policy see: European Institute for Gender Equality, nd, *Intersectionality*. Available at: <https://eige.europa.eu/thesaurus/terms/1263> and Council of Europe, nd, *Intersectionality and Multiple Discrimination*. Available at: <https://www.coe.int/en/web/gender-matters/intersectionality-and-multiple-discrimination>

2 United Nations, 2001, *Report of the Expert Group Meeting on Gender and Racial Discrimination: note / by the Secretary-General*. Available at: <https://digitallibrary.un.org/record/440520?ln=en>

3 Crenshaw, K., 1991, Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color. *Stanford Law Review*, 43(6), 1241-1299. doi:10.2307/1229039. See also: Crenshaw, K., 1989, *Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics*, University of Chicago Legal Forum: Vol. 1989, Article 8. Available at: <https://chicagounbound.uchicago.edu/uclf/vol1989/iss1/8>

4 Directorate-General for Justice and Consumers, 2016, *Intersectional discrimination in EU gender equality and non-discrimination law*, European Commission, Luxembourg. p.27-28.

- Additive multiple discrimination – when a person suffers discrimination on the same occasion but on two grounds, for example a lesbian is harassed because she is woman and gay. This type of discrimination is additive, because each of the grounds can be identified independently.
- Intersectional discrimination – when two or multiple grounds operate simultaneously and interact in an inseparable manner, producing distinct and specific forms of discrimination.

Combatting discrimination that has intersectional aspects is about recognising and acting on dynamic consequences of inequalities which can be embedded in formal and informal social, cultural, and political norms and rules that advantage certain groups over others.

Intersectionality: in the context of She Figures

This section demonstrates the relevance of an intersectional approach in She Figures context in three ways: 1) intersectionality in EU policy developments, 2) intersectionality in relation to attraction and retention of people in research, 3) intersectional analysis in research content.

Intersectionality in EU policy developments

In the European Gender Equality Strategy 2020-2025, the Commission commits to including a gender perspective in all policy areas, at all levels and at all stages of policy-making and underscores that “the strategy will be implemented using intersectionality – the combination of gender with other personal characteristics or identities – as a cross-cutting principle”⁵

The Standing Working Group on Gender in Research and Innovation under European Research Area and Innovation Committee (ERAC SWG GRI) has noted the importance of an intersectional perspective that considers age, health status, disability, occupation, socioeconomic status, migratory status, and geographic location.⁶ The Commission’s Communication on “A new ERA for Research and Innovation” includes a commitment to gender equality as a means of strengthening European research and innovation performance and specifically acknowledges the need to “address diversity by opening policy to intersections with other social categories, such as ethnicity, disability (including accessibility and inclusion) and sexual orientation.”⁷ In line with this, the Commission proposes, as of 2021, to develop inclusive gender equality plans with Member States and stakeholders.

Intersectionality as a way of understanding workforce attraction and retention

More broadly, in the context of She Figures, an intersectional perspective is important because it acknowledges that women researchers and scientists are not a homogenous group and that inequalities and discrimination can affect diverse representation in academia depending on a range of factors. A 2020 JRC report explored gender and migrant status using a range of different indicators to identify gaps in the EU labour market participation. The report undertakes quantitative analysis and concludes that ‘intersectionality is a fruitful policy approach for combatting gender stereotypes and for improving the understanding of the different and complex mechanisms that may shape labour market participation of women’⁸ For example, the report identifies education as one of the most important factors that influences the labour market participation gap between women and men, and the effect of education in reducing the gender gap is largest for natives and the smallest for migrants born outside the EU. The report also found that marital status and parenthood were important factors, with the gender gap for both natives and non-natives (EU mobile and non-EU born), the highest between married men and women with children and the smallest between men and women who are not married and have no children.

5 European Commission, 2020, *A Union of Equality: Gender Equality Strategy 2020-2025*, COM(2020) 152 final. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0152>

6 ERAC, 2020, *Standing Working Group on Gender in Research and Innovation: Position paper on the future gender equality priority in the European Research Area 2020-2030*. Available at: <https://data.consilium.europa.eu/doc/document/ST-1204-2020-INIT/en/pdf>

7 ERAC, 2020, *Standing Working Group on Gender in Research and Innovation: Position paper on the future gender equality priority in the European Research Area 2020-2030*. Available at: <https://data.consilium.europa.eu/doc/document/ST-1204-2020-INIT/en/pdf>

8 JRC, 2020, *Gaps in the EU Labour Market Participation Rates: an intersectional assessment of the role of gender and migrant status*, p32. Available at: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC121425/kcmd_gender_gaps-pdf.pdf

The Engendering Success in STEM research partnership produced an analysis to show how intersectionality can provide a useful framework to explore how different factors (or identities) combine to impact attraction and retention in STEM.⁹ In considering the workplace climate, this source described how in a study of 400+ astronomers and planetary scientists, women of colour experienced highest rates of harassment, assault, and other negative workplace experiences. It also noted that women of colour felt unsafe for different reasons – gender (40%), and age (28%). The research also provided a summary of previous work which identified a range of harmful stereotypes and barriers to leadership that negatively influence attraction and retention in STEM, for example:

- To be seen as equally competent as co-workers, women need to provide more evidence of their past work, study, and achievements than men, and after having a child, women are assumed to be not as competent or committed to their work.
- Women’s behaviour is often judged in the workplace, and considered to be overly masculine or feminine, along with an expectation of women doing more “feminine” work such as administration and mentoring.¹⁰
- Black women are perceived more negatively in leadership positions than Black men and White women, and disproportionately penalised for mistakes.¹¹

This analysis provides insights into how workplace climate and negative stereotypes interact with various factors, which further impact on attraction and retention. Analysis that only uses quantitative research approaches when seeking to understand intersectionality may underplay important circumstances of discrimination that influence outcomes.

Intersectionality as a way of improving research and innovation content

There is a growing recognition that intersectionality should also inform the selection of research and innovation methodologies and content.

The European Commission’s Gendered Innovations 2 report provides guidance on designing and implementing intersectional approaches in research. It identifies specific factors to consider in an intersectional analysis, such as: gender, disabilities, ethnicity, race, age, geographic location, socioeconomic status, nationality, sexual orientation, LGBTI+ identity, religion, educational background, lifestyle, language, family configuration, environment, genetics, sex hormones, reproductive status, body composition comorbidities, body size.¹²

The report provides guidance on how an intersectional approach can be embedded at different stages of research, such as problem identification and scoping; research design; data collection; data analysis; reporting and dissemination of results.

A report by the Human Sciences Research Council in Africa¹³ considered approaches to intersectionality in research, this report includes a useful categorisation (drawing on the previous work conducted by the International Development Research Centre in Canada¹⁴) of the extent to which intersectionality is included in research design and content, this is illustrated below in Figure 1.2. The approach rejects gender-blind research as a form of preservation for gender inequality and forms of bias, highlighting that gender transformative approaches are most desirable as they enable research approaches and techniques that fully engage with intersectionality. Understanding intersectionality in research in this way provides a framework for researchers and those commissioning research to think about research content.

9 Engendering Success in STEM, 2019, *Intersectionality in STEM*. Available at: <https://successinstem.ca/wp-content/uploads/2019/10/Intersectionality-in-STEM-Final.pdf>

10 Williams, J., Phillips, K. W., & Hall, E. V., 2014, *Double jeopardy? Gender bias against women of colour in science*. Unpublished. Available at: <https://doi.org/10.13140/2.1.1763.8723>

11 Livingston, R.W., Rosette, A.S., & Washington, E.F., 2012, Can an agentic black woman get ahead? The impact of race and interpersonal dominance on perceptions of female leaders. *Psychological Science*, 23(4), 354-358. Available at: <https://doi.org/10.1177/0956797611428079>

12 European Commission, 2020, *Gendered Innovations 2: How inclusive analysis contributes to research and innovation*. p.184. Available at: <https://op.europa.eu/en/publication-detail/-/publication/33b4c99f-2e66-11eb-b27b-01aa75ed71a1>

13 Lynch, I., Isaacs, N., Fluks, L., Friese, S., Essop, R., & van Rooyen, H., 2020, *Intersectionality in African research: Findings from a systematic literature review*. Cape Town: HSRC

14 IDRC (2019) Transforming gender relations: Insights from IDRC research https://issuu.com/idrc_crdi/docs/wd_13_000_gender_e-file_en?e=34655515/70235030

Figure 1.1 Intersectional gender analysis in research

Gender – aware	Gender – sensitive	Gender – responsive	Gender – transformative
<ul style="list-style-type: none"> • Gender is considered in rationale • Not yet operative in methodology 	<ul style="list-style-type: none"> • Gender is considered in rationale and is operative in methodology • Example, gender-differentiated barriers, roles, impacts • Not yet rigorous analysis 	<ul style="list-style-type: none"> • Gender is considered in rationale and is operative in methodology • Rigorous analysis of relations and how gender intersects with other relevant aspects of identities • Not yet root causes or process 	<ul style="list-style-type: none"> • Gender is considered in rationale, operative in methodology, rigorous analysis of intersecting identities • Explicit analysis of root causes, aim for structural changes in power relations, norms & policies

Source: [International Development Research Center](#) (IDRC)

A briefing by the UK's Equality Challenge Unit demonstrates that research design and effective execution of research methods which allow precision and nuance in analysis is important to reflect intersectionality issues for target groups. This is the case in both qualitative and quantitative research. Indeed, the authors note that in quantitative analysis there is an opportunity to use regression analysis to explore the interaction of different factors and understand the impact of various types of intersectionality.¹⁵

Intersectionality data analysis in She Figures

In the context of She Figures, there are no indicators which fully address the concept of intersectionality. The reason for this is that while there is a general consensus that the factors discussed above are important and inter-related, these descriptions do not provide the precise definitions needed for operationalisation as search queries.

For the 2021 edition of She Figures, it was decided to undertake indicator development work so that the concept of intersectionality could begin to be addressed. An exploratory indicator has been developed to measure the *integration of intersectional aspects in Horizon 2020 projects*. This indicator analyses the text fields used for the indicator on gender dimension in R&I content in Horizon 2020 projects and combines the results retrieved from this indicator with search queries on intersectional aspects on research.

To prepare the search queries on intersectional research, a shortlist of keywords was obtained from the Gendered Innovations 2 report. The keywords used for the queries were: “intersectional*”, “disabilit*”, “ethnic”, “LGBT*”, “race” OR “racis*”, “socio-economic”, “religion”, “belief”, “class”, “social origin”, “sexual orientation”, “vulnerable group” OR “vulnerable population”. What has been produced for She Figures 2021 is an exploratory draft, which aims to give a starting point for discussions and further analysis in the future.

The results of the exploratory analysis show that **at European level, only 0.19% of Horizon 2020 projects integrated an intersectional approach** as defined by the search query for this indicator. In the majority of EU-27 Member States and Associated Countries, the results indicate that no Horizon 2020 projects integrated an intersectional approach. However, it is important to note that these values are based on a very low numbers of projects that were identified using the search query developed. Specifically, in total, the exploratory analysis identified only 58 projects out of 30,084 projects including intersectional aspects. Ultimately, this exploratory indicator provides a starting point from which further development work is required so that intersectionality analysis can be included prominently in future She Figures publications.

15 Equality Challenge Unit, 2017, *Intersectional approaches to equality research and data*. Available at: http://www.ecu.ac.uk/wp-content/uploads/2017/04/Research_and_data_briefing_2_Intersectional_approaches_to_equality_research_and_data.pdf

Data availability for intersectionality analysis

Analysis undertaken in 2017 to examine and compare equality data collection practices among Member States demonstrates shortcomings among national data collection methods. The effect of this is that the data do not provide a full picture of the population whose situation they seek to measure.¹⁶ The analysis concludes that work is needed at national and regional levels to establish effective guidance and promote methodological harmonisation.

This report further notes, that the European Commission can play a role in this work through working with Eurostat in the framework of the European Statistical System Committee to ensure that opportunities are taken to include relevant indicators in European surveys. It is also important that access in disaggregated forms is enabled to facilitate relevant analysis.

EU level policy commitments

This section describes relevant EU policy initiatives and strategies which incorporate aspects of intersectionality, and specific funding mechanisms that support policies and practices to encourage intersectionality measures at Member State level.

Relevant EU strategies, policies, and guidelines:

- Gender Equality Strategy 2020-2025¹⁷
- EU Anti-Racism Action Plan 2020-2025¹⁸
- Strategy for the Rights of Persons with Disabilities 2021-2030¹⁹
- EU Roma Strategic Framework for Equality, Inclusion and Participation 2020-2030²⁰
- LGBTIQ Equality Strategy 2020-2025²¹
- Mutual Learning Programme in gender equality²²
- The EU Platform of Diversity Charters²³
- European Commission (2019) The regional gender equality monitor²⁴

16 Farkas L., 2017, Analysis and comparative review of equality and data collection practices in the European Union. Data collection in the field of ethnicity, Directorate-General for Justice and Consumers. Available at: https://ec.europa.eu/newsroom/just/document.cfm?action=display&doc_id=45791

17 European Commission, 2020, Communication from the Commission to the European Parliament, The Council, the European Economic and Social Committee and the Committee of the regions A Union of Equality: Gender Equality Strategy 2020-2025, COM/2020/152 final. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0152>

18 European Commission, 2020, EU Anti-racism Action Plan 2020-2025. Available at: https://ec.europa.eu/info/policies/justice-and-fundamental-rights/combating-discrimination/racism-and-xenophobia/eu-anti-racism-action-plan-2020-2025_en

19 European Commission, 2021, Union of equality: Strategy for the rights of persons with disabilities 2021-2030. Available at: <https://op.europa.eu/en/publication-detail/-/publication/3e1e2228-7c97-11eb-9ac9-01aa75ed71a1>

20 European Commission, 2020, Commission launches new 10-year plan to support Roma in the EU. Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1813

21 European Commission, 2020, Speech by Commissioner Dalli: Union of Equality: LGBTIQ Equality Strategy 2020-2025. Available at: https://ec.europa.eu/commission/presscorner/detail/en/speech_20_2126

22 European Commission, 2020, The EU Mutual Learning Programme in Gender Equality Gender Mainstreaming & Gender Budgeting in the ESIF and National Budgets - Slovakia - 4-5 February 2020. Available at: https://ec.europa.eu/info/publications/eu-mutual-learning-programme-gender-equality-gender-mainstreaming-gender-budgeting-esif-and-national-budgets-slovakia-4-5-february-2020_en

23 European Commission, 2020, The EU Platform of Diversity Charters turns 10!. Available at: https://ec.europa.eu/info/policies/justice-and-fundamental-rights/combating-discrimination/tackling-discrimination/diversity-management/eu-platform-diversity-charters-turns-10_en

24 Norlen, H., Papadimitriou, E. and Dijkstra, L., 2019, The regional gender equality monitor, EUR 29679 EN, Publications Office of the European Union, Luxembourg. Available at: <https://ec.europa.eu/jrc/en/publication/regional-gender-equality-monitor>

Funding

Under Horizon Europe, the integration of the gender dimension into research and innovation content (i.e., sex and gender analysis) becomes a requirement by default across the whole programme, and a new eligibility criterion is introduced for public bodies, research organisations and higher education establishments, which will be required, starting in 2022, to have a Gender Equality Plan (GEP) in place. Moreover, specific funding will be allocated for gender studies and intersectional research, and specific funding will be made available for actions supporting the development of inclusive GEPs, opening to intersectionality, in R&I organisations, in support to the new ERA framework.

Good practices and innovative approaches

A position paper published by the League of European Research Universities²⁵ in 2019 examined the issue of equality, diversity and inclusion at universities. The paper outlined how equality, diversity and inclusion can be addressed through an approach including measures to address inclusion and enhanced representation of all under-represented groups, to aim at the entire academic community of staff and students together, and to make the content of both the research and the research-led curriculum more inclusive.

Intersectionality is identified as a framework which can be used to understand how bias, and discrimination can overlap / combine to disadvantage marginalised groups. The paper identifies the “core value” discussion at Lund University, a project which includes an anti-discrimination workshop (discussing the intertwining of different forms of discrimination) using inclusive educational methods and a norm-critical approach.

A 2019 report from the European University Association²⁶ investigated intersectionality approaches at institutional level. The vast majority of respondents to the survey of EUA Member institutions included in the report indicated that institution-wide policies and strategies developed at central level are most important for addressing issues related to intersectionality. Concerning effective strategy, when asked about the top three success factors for their institutional strategies and activities, a clear majority of 76% of respondents indicated leadership commitment as being one of those (next most popular answer was involvement of target groups in strategy development, 46%). These findings highlight the importance of institutional leadership in the development of effective approaches.

The identified good practices below concentrate on institution level good practices and innovative initiatives which demonstrate how intersectional approaches have been promoted. The common devices comprise mainly of good practice guidance and data toolkits which can be used at institutional level.

- **Germany** (with partners in The Science Granting Councils Initiative in Sub-Saharan Africa (SGCI), the Organization of Women in Science for the Developing World - OWSD - South African National Chapter)²⁷ launched a project in 2019 to help provide a greater understanding of intersectionality in the context of research funding. Specifically the project will develop a research paper contextualising this topic of intersectionality to research funding with a focus on: Deepening its understanding; Documenting examples of intersectional research being undertaken in SGCI participating countries and beyond; Sharing practices by public funding agencies on considering intersectionality in executing their mandate of funding research; and Providing recommendations as guidelines to public funding agencies.
- **Ireland:** The National Athena SWAN Ireland Intersectionality Working Group was established in 2019 by the National Committee for Athena SWAN in Ireland with an initial goal to develop a cross-sectoral approach to collecting data on staff and student ethnicity in the Irish higher education sector. The Working Group has produced guidance to provide staff in HEIs with information on the rationale for collecting ethnicity data and the complexities of categorisation.²⁸

25 Buitendijk, S., Curry, S., Maes, S., 2019, *Equality, diversity and inclusion at universities: the power of a systemic approach*, LERU. Available at: <https://www.leru.org/publications/equality-diversity-and-inclusion-at-universities>

26 European University Association, 2019, *Diversity, Equity and Inclusion in European Higher Education Institutions*. Available at: https://eua.eu/downloads/publications/web_diversity%20equity%20and%20inclusion%20in%20european%20higher%20education%20institutions.pdf

27 Details here: DFG, 2019, *Considering Intersectionality in Research: Perspectives of Public Funding Agencies*. Available at: https://genderaction.eu/wp-content/uploads/2019/10/Intersectionality-in-Research_-_Author-Terms-of-Reference.pdf

28 Higher Education Authority Ireland, *Athena Swan Charter*, Available at: <https://hea.ie/policy/gender/athena-swan/>

- **Norway:** Committee for Gender Balance and Diversity in Research (the KIF Committee) provides support and recommendations on measures contributing to gender balance and cultural / ethnic diversity in the Norwegian research sector. One of the committees aims is to contribute to working with diversity perspectives, among these gender perspectives, in research.²⁹
- **Southern Europe:** (International Organization for Migration) Towards Empowered Migrant Youth in Southern Europe. Focusses on integration of local and migrant youth currently enrolled, or interested in enrolling, in higher education institutions.³⁰
- **The Netherlands:** The Dashboard Barometer Culturele Diversiteit is a pilot initiative being administered by Statistics Netherlands on behalf of the Minister of Social Affairs and Employment. It is available in the Netherlands for employers who want to monitor cultural diversity (i.e. migrant background) while taking into account privacy and data protection concerns.³¹
- **UK:** Athena SWAN charter and the Race Equality charter. Athena Swan is a framework which is used across the globe to support and transform gender equality within higher education. One of the Athena Swan principles is that institutions must commit to considering the intersection of gender and other factors wherever possible.³² Advance HE guidance for institutions to support the inclusion of staff and students of different faiths and beliefs including those with no religious beliefs.³³
- The **UK** Higher Education Information Database for Institutions allows comparison between people of different groups across more than one “protected characteristic” for time series analysis of students, staff, finances, graduates.³⁴
- **Canada:** Gender-based analysis plus (GBA+): a tool which proposes a series of questions to ask before undertaking any research or activity in order to challenge the researcher or the analyst’s beliefs or biases.³⁵

29 KIFinfo, 2018, *The KIF Committee- Committee for Gender Balance and Diversity in Research (KIF) 2018-2021C*. Available here: <http://kifinfo.no/en/content/committee-gender-balance-and-diversity-research-kif-0>

30 Stoeber, H., 2019, *Higher Education for third country national and refugee integration in Southern Europe*, International Organization for Migration. (IOM) Available at: <https://eua.eu/downloads/publications/higher%20education%20for%20third%20country%20national%20and%20refugee%20integration%20in%20southern%20europe%20v2.pdf>

31 Barometer Culturele Diversiteit, nd, Home page. Available at: <https://dashboards.cbs.nl/v2/barometerculturelediversiteit/>

32 AdvanceHE, *Athena Swan Charter*. Available at: <https://www.advance-he.ac.uk/equality-charters/athena-swan-charter>

33 AdvanceHE, 2018, *Guidance note - Religion and belief: supporting inclusion of staff and students in higher education and colleges*. Available at: <https://www.advance-he.ac.uk/knowledge-hub/religion-and-belief-supporting-inclusion-staff-and-students-higher-education-and>

34 HESA, *Heidi Plus: Higher education business intelligence*. Available at: <https://www.hesa.ac.uk/services/heidi-plus>

35 Government of Canada, *Gender-based Analysis Plus (GBA+)*. Available at: <https://cfc-swc.gc.ca/gba-acis/index-en.html>

What are the main recommendations?

- Based upon the issues identified above, existing policy framework and selected good practices, the following recommendations are presented. Recommendations are targeted at different impact levels, with recommendations for future She Figures also presented.
- Recommendations for R&I policy makers and institutions
- In line with the EU Gender Equality Strategy 2020-2025, foster an intersectional approach among all DGs and European Agencies involved in R&I policy and funding. Leadership in R&I should be fully committed to promoting intersectionality.
- Evidence-based policy (including impact assessment analysis and evaluation) should consider intersections between gender and a wide range of factors, such as disability, age, racial or ethnic origin, migration status, socioeconomic status, and geography.
- It is important that relevant data are collected at Member State level which adequately reflect various characteristics of the population whose situation policy makers seek to measure / understand. Effective analysis also requires researchers and policy makers can access and interpret such data.
- Support data collection and analysis from a diverse range of sources (governments, practitioners, civil society, universities) to capture a wide range of themes relevant for an intersectional approach. Support innovative approaches to analysis that model different aspects of discrimination, especially when there is a lack of available data.
- Move beyond binary sex and / or gender disaggregated data to account for intersex and non-binary persons.
- It is important to promote an understanding among staff of the benefits of an intersectional perspective, which can highlight areas that need improvement and offer strategies to build capacity and foster inclusive working environments where all persons, regardless of their backgrounds, can thrive.

Recommendations for future She Figures editions

- The rationale for using an intersectional approach to the analysis of the gender dimension in research and innovation content is well accepted in scientific literature which explores sex and gender issues. Future editions of She Figures should therefore continue to develop ways to expand bibliometric analyses to include intersections between gender and other diversity characteristics.
- To ensure required data are available for the next edition of She Figures, the European Commission should continue cooperation with Member State statistical correspondents to explore what data could be possible to collect and which forms of analysis the statistical correspondents consider most meaningful and salient in their particular context. This can include discussions of GDPR restrictions to ensure compliance.
- Quantitative analysis should be used to explore ways in which various factors combined with gender influence R&I labour market outcomes. This could follow the approach taken by the JRC³⁶ using EU micro-data (such as that available through the EU-Labour Force Survey and EU-Statistics on Income and Living Conditions).

36 JRC, 2020, 'Gaps in the EU Labour Market Participation Rates: an intersectional assessment of the role of gender and migrant status' p.32. Available at: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC121425/kcmd_gender_gaps-pdf.pdf

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The 2021 She Figures edition is accompanied by seven policy briefs on emerging and ongoing policy priorities in the area of gender equality in R&I to further contextualise data trends observed in the main study.

The policy briefs cover topics related to women's presence, participation and progression in science, institutional culture and institutional change, gender imbalance in Europe's research leadership, gender dimension in research and innovation content and training, holistic view of STEM education at undergraduate level, promoting a gender perspective in innovation, and intersectionality.

Studies and reports

