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SHE FIGURES

2024

Gender in Research and Innovation: Statistics and Indicators

Research and Innovation

She Figures 2024

European Commission
Directorate-General for Research and Innovation
Directorate D — People: Health & Society
Unit D4 — Democracy, Equality & Culture

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She Figures 2024

Gender in Research and Innovation: Statistics and Indicators

Directorate-General for Research and Innovation
Horizon Europe

2025

EN

FOREWORD

As the European Commissioner for Startups, Research and Innovation, I am delighted to present the latest edition of She Figures, a flagship publication that has been a driving force behind the EU's commitment to advance gender equality.

For nearly two decades, the She Figures series has been instrumental in tracking progress towards gender equality in R&I by providing a unique and reliable source of gender disaggregated data and analysis. With a comprehensive dataset drawn from the EU, countries associated with Horizon Europe and G20, this publication has established itself as an essential resource for policymakers, stakeholders and researchers seeking to advance gender equality and promote inclusive innovation.

This edition introduces an important novelty: the pilot She Figures Index. This index provides a holistic measure of Member States' progress towards gender equality in R&I. Four policy articles on emerging and ongoing policy priorities in the field accompany the report, providing context to the observed trends.

However, this publication also acts as a stark reminder of the work still to be done. Despite steady progress, women remain underrepresented in STEM-related fields, accounting for only 21.4% among the total number of Doctoral graduates in Information and Communication Technologies. The glass ceiling persists, with women holding less than one-third of higher academic positions and a mere 26% in decision-making as heads of institutions.

As the European Union, we are committed to creating a more inclusive and innovative European Research Area where all talents can thrive and contribute to solving global challenges. To achieve this, She Figures 2024 will be a compass guiding the effort to push forward gender equality in all areas, as outlined in President von der Leyen's Political Guidelines for the 2024-2029 mandate.

Looking ahead, I am strongly committed to sustaining this momentum and harnessing the full potential of Europe's research and innovation talent. The She Figures serve as a call for action, inspiring all of us to work together towards a more equal and prosperous future. Together, we can build a stronger, more resilient, and more competitive Europe.

Ekaterina ZAHARIEVA
European Commissioner for Startups, Research and Innovation

Ekaterina Zaharieva

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DISCLAIMERS

The information and views set out in this study are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this study. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use which may be made of the information contained therein.

CONTENTS

ABBREVIATIONS

Abbreviation	Definition
BES	Business Economic Sector
CAGR	Compound Annual Growth Rate
DEAP	Digital Education Action Plan
DI	Dissimilarity Index
EIC	European Innovation Council
EIF	European Investment Fund
EISMEA	European Innovation Council and SMEs Executive Agency
EIT	European Institute for Innovation and Technology
EPO	European Patent Office
ERA	European Research Area
EU	European Union
EU-LFS	EU Labour Force Survey
FTE	Full-Time Equivalent
FWCI	Field-Weighted Citation Impact
GALI	Global Activity Limitation Indicator
GCI	Glass Ceiling Index
GDRIC	Gender Dimension in Research and Innovation Content
GEAR	Gender Equality in Academia and Research
GEP	Gender Equality Plan
GOEG	Gender Overall Earning Gap
GOV	Government Sector
GPG	Gender Pay Gap
HEI	Higher Education Institutions
HES	Higher Education Sector
HRST	Human Resources in Science and Technology
ICT	Information and Communication Technologies

IPC	International Patent Classification
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
KIA	Knowledge-Intensive Activities
KIABI	Knowledge-Intensive Activities in Business Industries
OECD	Organisation for Economic Co-operation and Development
PATSTAT	Worldwide Patent Statistical Database
PNP	Private Non-Profit sector
PPS	Purchasing Power Standards
PRO	Public Research Organisation
R&D	Research and Development
R&I	Research and Innovation
RFO	Research Funding Organisation
RO	Research Organisation
S&E	Scientists and Engineers
SDG	Sustainable Development Goal
SME	Small and Medium-sized Enterprise
STEM	Science, Technology, Engineering and Mathematics
TFEU	Treaty on the Functioning of the European Union
UN	United Nations
WiS	Women in Science

EXECUTIVE SUMMARY

The EU has a long-standing commitment to advancing gender equality across all sectors, including research and innovation (R&I). This commitment is reflected within the EU Gender Equality Strategy 2020-2025, the European Research Area (ERA), and the requirements of the Horizon Europe funding programme (2021-2027).

Since 2003, *She Figures* provides the most recent data and analysis on indicators of gender equality in R&I and gender equality objectives in R&I policy, exploring progress within the EU, countries associated to the EU Framework Programmes for R&I and, since 2021, in G20 countries where data are available. Released every three years, *She Figures* provides, therefore, policymakers and stakeholders with empirical evidence and insights to support the development of targeted strategies to foster the advancement of gender equality in R&I.

Chapter 1 – Introduction

Chapter 1 provides a comprehensive overview of the current policy landscape of gender equality in R&I in the EU. This is followed by a short introduction to She Figures 2024 and an overview of the pilot She Figures Index. The Index is a significant new addition to She Figures, which has been developed alongside this edition of the study. It aims to provide an overview of each Member State's progress towards gender equality in R&I. The chapter closes with a note on data sources and coverage, and an outline of the structure of the current edition.

Chapter 2 – The pool of graduate talent

Chapter 2 focuses on women's and men's participation at different levels of higher education, spanning Bachelor's, Master's, and Doctoral studies across different fields. This provides insights into gender differences among graduates entering the labour market, which can help to explain gender gaps within R&I careers (as explored in later chapters). The data show that women are more likely than men to complete Bachelor-level studies, including in science, technology, engineering and mathematics (STEM) fields, where women are often underrepresented. However, women are less likely to pursue Doctoral-level studies (8 %, compared to 11 % for men), including in STEM fields.

At the EU level, gender balance (where women and men each comprise between 40 % and 60 %) is achieved among the overall pool of Doctoral graduates (48 % women). However, representation varies by field of study. Women represent the majority of Doctoral graduates in Education (over 60 %), and remain underrepresented in Information and Communications Technology (ICT) and in Engineering, Manufacturing and Construction (less than 40%). Women's representation among Doctoral graduates also decreased in the STEM fields of Physical Sciences and Mathematics and Statistics since 2018, where women are already underrepresented, suggesting a move away from gender balance in these fields. This trend extends previous findings from She Figures 2021, which reported little progress in these fields between 2015 and 2018.

Chapter 3 – Participation in science and technology occupations

Chapter 3 delves into the participation of women and men in science and technology occupations, with a focus on women's presence in STEM-related careers, such as roles as

scientists and engineers, positions within research and development (R&D) and involvement in 'knowledge-intensive activities', i.e., activities in which over 33% of employees hold tertiary qualifications.

Despite women comprising 46% of the overall employed population, their presence in STEM professions and sectors remains limited. For example, women are less represented than men as scientists and engineers (although the overall employed population is gender balanced with 41 % women) and comprise only 25 % of self-employed professionals in science and engineering and ICT. Comparison with the previous edition of She Figures suggests little change in women's representation among science and technology occupations.

Within the R&D workforce, women are less likely to occupy researcher positions, with 61% of women in R&D serving as researchers compared to 66% of men. In contrast, women are more likely than men to work in knowledge-intensive activities (KIA), comprising 46% of this workforce, while men account for 30%. However, when looking specifically at KIA in business industries, there is little difference in their representation (14 % women compared to 15 % men).

Women's participation in the digital economy is a key aspect of the EU Gender Equality Strategy 2020-2025. It is also addressed explicitly in the European Commission's Digital Education Action Plan 2021-2027 under Action 13, 'Women's participation in STEM studies and careers' and within the New European Innovation Agenda, adopted in 2022, which includes measures to support women-led technology startups. However, further actions are needed to ensure that women have equal opportunities to succeed in these fields traditionally dominated by men.

Chapter 4 – Labour market participation as researchers

Chapter 4 examines women's and men's participation as researchers, exploring employment patterns across key economic sectors. Women comprise only 34 % of researchers in the EU, and women researchers represent a lower proportion of the economically active population than men. However, women's representation has been growing at a faster rate annually since 2013 (4.2 % for women, compared to 3.3 % for men), showing that the gender gap is closing slightly.

Data by economic sector show that women are well-represented as researchers in the higher education sector (HES) (44 %) and government sector (GOV) (45 %), while they are underrepresented in the business enterprise sector (BES) (22 %). However, the number of women researchers has grown in every sector at EU level over the past decade, with higher growth rates in BES.

Data by field of study indicate that gender balance is achieved in Social Sciences and Humanities in both HES (55% for Social Sciences and 49% for Humanities) and GOV (41% for Social Sciences and 55% for Humanities). However, women remain underrepresented in the fields of Natural Sciences (32% in HES and 36% in GOV) and in Engineering and Technology (25% in HES and 24% in GOV). Overall, the distribution of women and men across broad fields of study is slightly more balanced in HES compared to GOV. Gender segregation remains a challenge in the labour market. However, there is a gradual trend towards reversing this, indicating slow but steady progress towards gender equality.

Chapter 5 – Working conditions of researchers

Chapter 5 presents results on the working conditions of women and men researchers. Improving the working conditions of researchers in R&I is a key policy commitment within the EU, as demonstrated in the European Commission's actions within the ERA and the strengthened provisions regarding gender equality in Horizon Europe, the EU's current Framework Programme for Research and Innovation (2021-2027).

Working hours and contracts are one facet of working conditions. Within HES, both women and men researchers experience similar levels of precarious employment (19%), defined here as fixed-term contracts of up to three years. However, women are more likely to work part-time (20 % vs. 15 % men).

In terms of international mobility, an important factor in career advancement, there is little difference between women and men PhD students, with less than a 1 percentage point difference in most countries (noting that Covid-19 restrictions may have influenced the most recent data). However, career bibliometric data suggest that women researchers are approximately half as likely as men to be internationally mobile throughout their careers.

The working conditions of researchers can also be influenced by R&D expenditure at national level. Similar to the previous editions of She Figures, the latest data show that there is an inverse correlation between the proportion of women researchers and national R&D expenditure per researcher. This means that in countries with higher R&D spending, there tends to be a lower proportion of women researchers.

Another critical indicator is the gender overall earnings gap (GOEG), which measures income disparities between women and men. In scientific R&D fields, the GOEG stands at 20%, slightly lower than the 23% observed for total economic activities. While significant variation exists between countries, this finding suggests slightly greater pay equality in science compared to the overall economy. However, a persistent gap still favours men in scientific R&D activities, and it is widening with age.

She Figures 2024 shows that among the 36 countries included in the web-scraping analysis, 13 countries had 50% or more of their research organisations actively implementing actions or measures to promote gender equality. Additionally, in most countries, over 50% of HEIs mention their actions and measures towards gender equality on their websites, demonstrating institutional commitment to gender equality.

Chapter 6 – Career advancement and participation in decision-making

Chapter 6 compares the proportions of women and men at different stages of academic careers and examines women's participation in decision-making and leadership positions. Increasing women's representation in such positions in the EU supports innovation and improves the quality and relevance of knowledge, stimulating growth within the ERA ([1]). The underrepresentation of women among the highest-level positions in HES is recognised as an area for further improvement under the new ERA ([2]). The EU has implemented measures to

([1]) European Commission, 2012, 'Structural change in research institutions: Enhancing excellence, gender equality and efficiency in research and innovation', https://eige.europa.eu/sites/default/files/structural-changes-final-report_en_0.pdf

([2]) European Commission, 2020, 'A new ERA for Research and Innovation' COM(2020) 628 final, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A628%3AFIN

support women's career progression and inclusion among leadership roles, such as the 2022 'Directive on improving the gender balance among directors of listed companies and related measures', and the 2023 'Council Recommendation on a European framework to attract and retain research, innovation, and entrepreneurial talent in Europe'.

Gender balance is achieved among Bachelor-, Master- and Doctoral-level students, grade C staff (entry-level postdoctoral positions e.g. researcher) and grade B staff (mid-senior level positions e.g. associate professor). However, women hold only 30% of top academic positions (grade A), even in fields where they are typically well-represented. For instance, women comprise just 34% of grade A staff in Humanities, Arts, and Social Sciences.

Compared to 2019, there have been modest improvements of 1-2 percentage points in women's representation across all grades and positions, indicating a slow but steady upward trend.

The data show that most grade A post holders are in the 55+ age group. However, women constitute only 27 % of the grade A staff within this age group, highlighting a pronounced underrepresentation of women in the highest academic positions. Among heads of institutions, women represent just 26 %, with gender balance almost achieved among board members (39 %) and board leaders (39 %) at EU level.

Chapter 7 – R&I output

Chapter 7 examines gender differences in research authorship, publication frequency, funding success rates, and representation within authorship teams and patent outputs. It also explores the integration of a gender dimension in R&I content.

Data at the EU level reveal that women are significantly underrepresented as authors compared to men, with this gender gap widening as authors progress in their careers.

Although the presence of women in authorship teams has increased over time - reaching an average proportion that suggests gender balance across most R&D fields - a new indicator on authorship team composition shows that only 16% of authorship teams are truly gender-balanced. Teams comprised predominantly of men are the most common, making up 31% of all teams during the period from 2018 to 2022.

In terms of patent applications, women comprise only 9% of applicants, with no noticeable increase in the proportion over the last decade. Further, most patent applications are submitted by men-only teams.

When examining funding success rates across all fields, women experience slightly lower rates (28 % for women, compared to 32 % for men). However, women have higher funding success rates in Engineering and Technology, Humanities and the Arts, and in multi-disciplinary research.

At the EU level, only 2.0 % of publications incorporate a gender dimension in their R&I content, i.e., sex and/or gender analysis. The proportion of a country's publications with a gender dimension varies across fields of research, with the highest proportion in the field of Medical and Health Sciences (4.0 %) and the lowest in Engineering and Technology (0.3 %).

CHAPTER 1 – INTRODUCTION

Since 2003, She Figures presents gender statistics in research and innovation (R&I) every three years. Each new edition provides an opportunity to show progress towards gender equality in R&I within the European Union (EU) and Associated Countries, and to explore new emerging issues.

Gender equality is a priority for the EU in all areas of life, as well as specifically within R&I, as reflected in the Gender Equality Strategy 2020-2025, the European Research Area (ERA), and the EU's current Framework Programme for R&I (2021-2027), Horizon Europe.

The **Gender Equality Strategy 2020-2025** set out the Commission's policy commitments and objectives to achieve significant progress towards a gender-equal Europe 'where women and men, girls and boys, in all their diversity, are free to pursue their chosen path in life, have equal opportunities to thrive, and can equally participate in and lead our European society' ([3]). The Strategy highlighted the underrepresentation of women in higher paid professions, due to gender imbalances in Science, Technology, Engineering and Mathematics (STEM), beginning with underrepresentation in STEM higher education ([4]) and contrasts the importance of the digital transition for the economy with the low representation of women in ICT studies and careers. It notes the lack of women in decision-making positions across all sectors, illustrating the associated negative consequences for innovative ideas and effective policy-making to meet the complex challenges of today. It also emphasises the overarching problem of gender stereotypes and biases, which continue to hinder women's aspirations, choices and freedom, and remain a root cause of gender inequality, including within the R&I landscape ([5]).The Strategy pursues a two-pronged approach, combining gender mainstreaming with targeted actions to achieve key objectives, including: ending gender-based violence; challenging gender stereotypes; closing gender gaps in the labour market; achieving equal participation across different sectors of the economy; addressing the gender pay and pension gaps; closing the gender care gap; and achieving gender balance in decision-making and in politics.

Gender equality and gender mainstreaming in research is a focus within the **ERA** since 2012. This is reflected in a European Commission Communication highlighting the 'inefficient use of highly skilled women' in research and including gender equality and gender mainstreaming in research as a priority area ([6]). The Communication set out three objectives: to achieve institutional change in gender equality in careers at all levels, gender balance in decision-making, and the integration of a gender dimension in R&I content, laying the groundwork for integrating gender equality into R&I policies and practices across Europe ([7]).

Despite these efforts, gender inequalities persist in the R&I system across Europe, with a notable gap between the adoption of policies and strategies at EU and national level, and

([3]) European Commission, Gender Equality Strategy 2020-2025, n.d., https://commission.europa.eu/strategy-and-policy/policies/justice-and-fundamental-rights/gender-equality/gender-equality-strategy_en

([4]) Ibid., pp. 9-10.

([5]) Ibid., p. 5.

([6]) 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, COM(2012) 0392 final, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012DC0392

([7]) Tornasi, Z. & Delaney, N., *Gender Equality: Achievements in Horizon 2020 and recommendations on the way forward*, Publications Office of the European Union, Luxembourg, https://apre.it/wp-content/uploads/2021/05/KI0220258ENN.en_.pdf

their implementation at the institutional level ([8]). At the Competitiveness Council meeting of November 2021, the Council of the EU adopted Conclusions on the **governance of the European Research Area (ERA)** ([9]), along with a **Pact for research and innovation (R&I) in Europe**, setting out priorities and a streamlined governance framework for the ERA, including an ERA policy agenda for 2022-2024. In these documents, gender equality and inclusiveness were reaffirmed as core values and principles for the European R&I. The ERA policy agenda for 2022-2024 ([10]) outlines specific ERA actions to be implemented on a voluntary basis by the EU Member States, the European Commission and in cooperation with countries associated to the 'Horizon Europe' programme.

One action (Action 5) specifically aims to promote gender equality and foster inclusiveness, taking note of the Ljubljana declaration on Gender Equality in Research and Innovation which set out objectives to tackle gender inequalities in research careers, decision-making and incorporating a gender dimension in R&I content ([11]). Action 5 will deliver on four outcomes: (1) developing a policy coordination mechanism to support all aspects of gender equality through inclusive GEPs and policies, and establishing a dedicated EU network for their implementation; (2) devising a strategy to counteract gender-based violence in the European R&I system; (3) developing a policy approach to inclusive gender equality that addresses gender mainstreaming and opening to intersectionality with other diversity dimensions; and (4) formulating principles for the integration and evaluation of the gender dimension in R&I content ([12]). It is deployed in synergy with other actions of the New ERA Framework (2022-2024). This includes Action 3, which focuses on the reform of the assessment system for research and researchers, and Action 4, which aims to strengthen the attractiveness of research careers and support the mobility of researchers across the ERA, including through developing a European framework for research careers. ([13]).

Horizon Europe (2021-2027) introduced a mandatory gender equality plan (GEP) requirement for calls with deadlines from 2022 onwards. This requires all Horizon Europe applicants (public bodies, research organisations, higher education institutions (HEIs) from Member States and Associated Countries) to have a GEP or equivalent strategy in place to be eligible for accessing EU funding. That GEP must align with four mandatory process-related requirements (so-called building blocks) ([14]).

Complementing the overarching policy framework of the ERA, the EU introduced policies targeting specific parts of the R&I landscape. For example, the European Strategy for

([8]) European Commission, 2020, 'A new ERA for Research and Innovation' COM(2020) 628 final, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A628%3AFIN

([9]) European Council, Council of the European Union, 'New Pact and governance structure for the European Research Area (ERA)' Press release, 2021, https://www.consilium.europa.eu/en/press/press-releases/2021/11/26/new-pact-and-governance-structure-for-the-european-research-area-era/

([10]) 18 Member States, two Associated Countries and several stakeholder organisations committed to this action.

([11]) Council of the European Union, Ljubljana Declaration Gender Equality in Research and Innovation, 2021, https://data.consilium.europa.eu/doc/document/ST-12044-2021-INIT/en/pdf

([12]) European Commission, Directorate-General for Research and Innovation, (2022). European Research Area policy agenda – Overview of actions for the period 2022-2024. Publications Office of the European Union. Available at: https://data.europa.eu/doi/10.2777/52110 .

([13]) European Commission, Directorate-General for Research and Innovation, *European Research Area Policy Agenda: Overview of actions for the period 2022-2024*, Publications Office of the European Union, Luxembourg, 2021, https://commission.europa.eu/system/files/2021-11/ec_rtd_era-policy-agenda-2021.pdf

([14]) European Commission, Directorate-General for Research and Innovation, *Horizon Europe guidance on gender equality plans*, Publications Office of the European Union, Luxembourg, 2021, https://op.europa.eu/en/publication-detail/-/publication/ffcb06c3-200a-11ec-bd8e-01aa75ed71a1

Universities (2022) aims to strengthen the role of universities as drivers of innovation in research, emphasising the importance of gender equality in academia and R&I. It encourages universities to adopt GEPs, promote the participation of women in research and leadership positions, and foster a culture of diversity and inclusivity ([15]).

She Figures is a flagship publication for monitoring progress towards the objectives outlined in these strategies and policies. By providing empirical evidence and insights to assess the current state of gender equality in R&I and tracking this progress over time, it helps to identify gaps, disparities, and areas where women remain underrepresented. This evidence base is crucial for policy-makers and stakeholders to understand the extent of gender inequality in R&I and to develop targeted strategies and initiatives to advance equality between women and men.

She Figures 2024 edition

The 2024 edition of She Figures presents indicators that explore gender equality within R&I. Where possible, indicators are maintained across editions to allow progress to be tracked. These include: the presence of women among higher education graduates by subject area, particularly at Doctoral level; horizontal segregation by gender across different occupations in science & technology; gender (im)balance among researchers across different sectors of the economy; relative working conditions of women and men researchers, with consideration of measures for institutional change; vertical segregation by gender in academia, i.e. the (under)representation of women in the highest grades/positions of research and as heads of academic institutions; women and men's relative R&I outputs, including their success in gaining funding; and the gender dimension in research content.

New indicators are incorporated in each edition to respond to new and emerging policy priorities in R&I, and to respond to relevant developments in data availability. For this edition, this included intersectionality and inclusiveness, research contributions to Sustainable Development Goals, entrepreneurship and the gender pay gap.

She Figures 2024 includes a new indicator on research outputs that contribute to SDG 5 (which concerns gender equality); an indicator on gender equality in research dynamics, which explores the composition of authorship teams, complementing existing indicators on women's average representation within teams; additional disaggregations of two existing indicators to facilitate an intersectional approach, exploring intersections between gender and disability, and gender and migration status; the inclusion of indicators that focus on international mobility of PhD graduates and authors of publications, and part-time and temporary employment in the Higher Education Sector to replace those based on the now-discontinued MORE Survey ([16]); and the reintroduction of indicators on the gender pay gap (not included in She Figures 2021 due to data availability issues), with the additional development of using the gender overall earnings gap (GOEG) in place of the previously

([15]) Council of the European Union (2022) Council conclusions on a European strategy empowering higher education institutions for the future of Europe 2022/C 167/03, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AJOC_2022_167_R_0003.

([16]) The MORE Survey (specifically, the EU HEI survey) were produced as part of the Mobility and Career Paths of Researchers in Europe (MORE) Project (funded by the European Commission). See: MORE 4, European Commission, n.d., https://www.more-4.eu/. The MORE Survey was used in previous editions of She Figures for indicators on the working conditions of researchers, and specifically to explore international mobility, part-time employment and precarious employment.

used gender pay gap (GPG). The GOEG recognises additional differences in women's and men's employment compared to the GPG, including differences in employment rates and in hours worked and therefore aims to capture a more comprehensive picture of gender differences in earnings.

She Figures Index

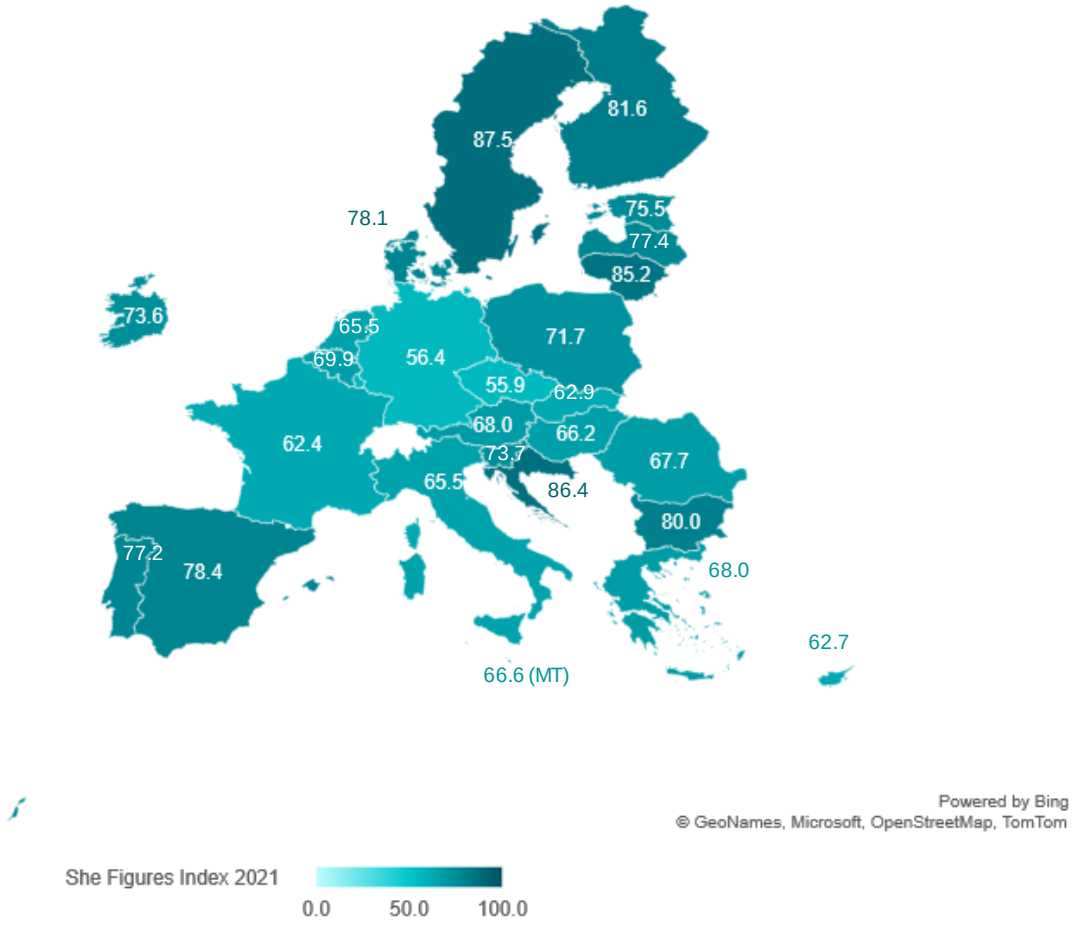
She Figures 2024 is accompanied by a pilot She Figures Index. This is a composite indicator built from a carefully selected set of indicators from the study. The Index aims to serve as a tool to measure Member States' progress towards gender equality in R&I, and, where possible, to explore progress over time. Full details of the methodology are provided in the She Figures 2024 Handbook.

Gender inequalities in R&I can be examined in six key dimensions: segregation in the talent pipeline; research careers and sectors; career progression; representation in decision-making positions; research participation; and the gender dimension in R&I content (GDRIC). These six dimensions form the conceptual framework for the She Figures Index.

The She Figures Index 2024 is calculated based on data presented in She Figures 2024. The Index has also been calculated for 2021, based on data presented in She Figures 2021, allowing for comparison over time ([17]). For each of the six dimensions, and for the overall score, the possible scores are between 0 and 100, where a score of 100 indicates that gender equality is fully achieved. The She Figures Index 2021 ranges between scores of 56 to 88 (see Figure 1.1). By 2024 (see Figure 1.2), this range has narrowed slightly, with scores between 60 to 88.

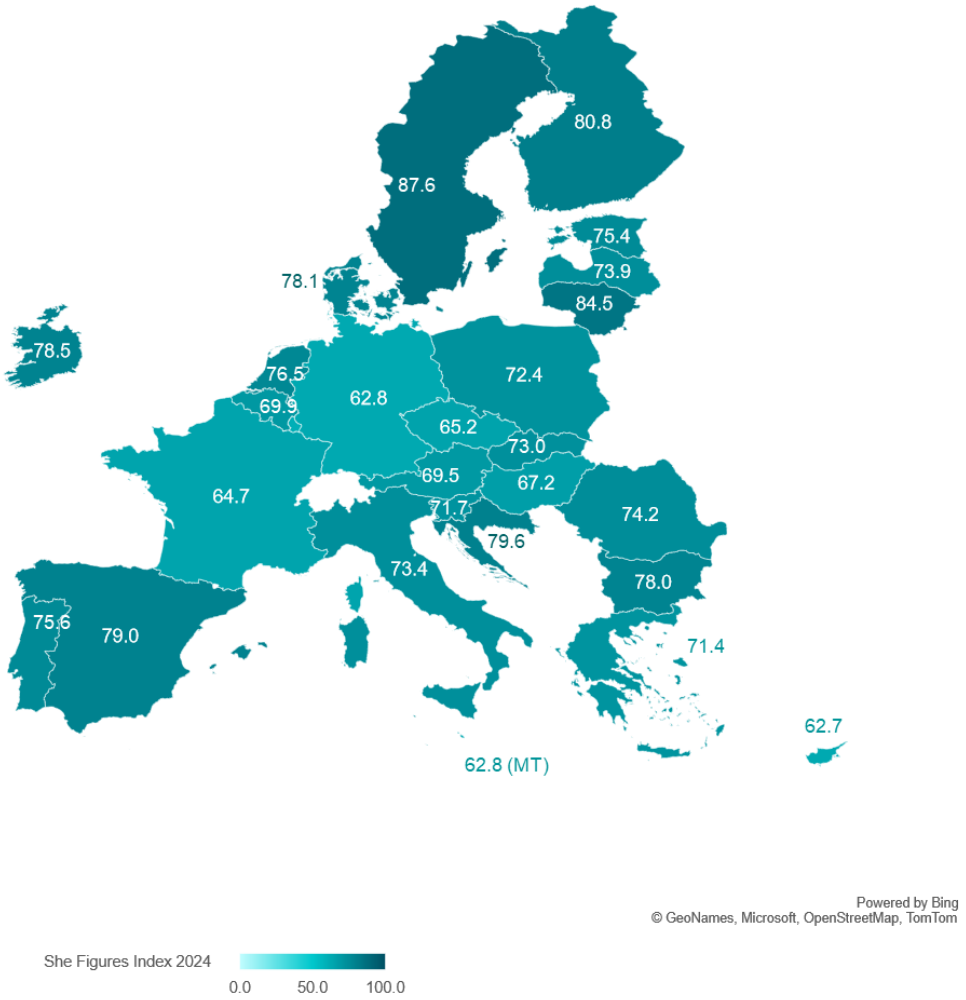
([17]) Full details of the methodology can be found in the She Figures 2024 Handbook.

Figure 1.1 She Figures Index Scores 2021



Source: Calculated using data from indicators prepared for She Figures 2021

Figure 1.2 She Figures Index Scores 2024



Source: Calculated using data from indicators prepared for She Figures 2024

Progress has been achieved by the majority of Member States between 2021 and 2024 (17 out of 27), particularly among those with lower scores. Progress is most marked in Slovakia and the Netherlands, each with increases of 10 points or more. Table 1.1 presents the results across dimensions, for 2021 and 2024:

- Within '**Segregation in the pipeline**', Index scores for 2024 range from 43 (Malta) to 96 (Romania). For 2021, the scores ranged from 26 (Malta) to 97 (Romania). Most countries (17 of 27) saw increases or decreases of up to 5 points, with an approximately equal division between increases and decreases. Six countries have larger increases of between 12 points and 17 points (the Netherlands, Czechia, Slovakia, Greece, Luxembourg, Malta) and four countries show larger decreases of between 6.6 points and 20 points (Belgium, Latvia, Spain, Slovenia).
- '**Research sectors**' has high scores overall. For the She Figures Index 2024, ranges are from 79 (Czechia) to 97 (Bulgaria). For 2021, the scores ranged from 77 (Czechia) to 98 (Latvia). Overall, scores have changed little between editions, increasing or decreasing by no more than 4 points in all Member States except the Netherlands (+5.8 points) and Malta (+9.9 points).
- **'Career progression'** has high Index scores overall, ranging from 66 in Cyprus to just under 100 in Latvia for 2024. For 2021, the scores ranged from 66 (Cyprus) to 99 (Latvia). Small improvements are evident in most countries, of up to approximately 5 points. Larger increases were observed in Austria (6.1 points), Ireland (6.2 points), Germany (6.5 points) Slovakia (8.7 points), the Netherlands (8.9 points) and Czechia (15 points). In several countries there was no change (Luxembourg), a small decrease of up to 1 point (Spain, Romania) or a slightly larger decrease (3.4 points in Malta).
- On the dimension '**Decision-making**', Index 2024 scores range from 38 in Cyprus to 99 in Latvia. For 2021, the scores ranged from 37 (Cyprus) to 99 (Sweden). While the range of scores is very similar between editions, the representation of women in decision-making positions has improved significantly in a number of Member States, with increases of more than 20 points in Belgium (24 points), Germany (26 points), Italy (28 points), Czechia (29 points), Estonia (30 points), Romania (31 points), Slovakia (40 points) and the Netherlands (43 points). Conversely, decreases of more than 5 points are observed in Sweden (7 points) and Lithuania (8 points), and a large decrease in Croatia (33 points).
- For '**Research participation**', Index scores for 2024 range from 50, in Cyprus, to 83, in Romania. For 2021, the scores ranged from 47 (Cyprus) to 82 (Portugal). Most countries' scores for 2024 remain within 5 points of their 2021 scores (17 of 27 Member States). Five countries show larger increases: France (6.2 points), Romania (8.2 points), Luxembourg (8.4 points), Malta (10 points) and Italy (14 points), and five have larger decreases: Estonia (6.4 points), Croatia (6.5 points), Poland (6.5 points), Portugal (9.3 points), and Latvia (13 points).
- **GDRIC** scores range between 0 and 100 for each year, as this dimension is based on the Min-Max. Most countries (16 of 27) experience a decrease in their score since 2021. In three cases, that decrease is more than 10 points. This is the case in Bulgaria (12 points), Estonia (23 points) and Malta (54 points). Four countries see increases of more than 5 points: Ireland (6.1 points), Lithuania (6.1 points), Hungary (6.3 points) and Spain (16 points).

Table 1.1 She Figures Index 2021 and 2024 scores by dimension and overall score

Country	Segregation in the pipeline		Research sectors		Career progression		Decision-making		Research participation		Gender dimension in research and innovation content		She Figures Index – overall score	
	2021	2024	2021	2024	2021	2024	2021	2024	2021	2024	2021	2024	2021	2024
BE	66.0	59.4	90.7	90.2	75.4	80.4	72.5	96.8	68.6	68.9	29.5	23.9	67.1	69.9
BG	93.0	90.6	96.5	96.9	97.7	99.4	90.8	88.8	71.2	73.6	30.7	18.8	80.0	78.0
CZ	53.4	65.6	76.8	78.9	81.7	96.6	37.5	66.7	56.5	56.0	29.3	27.2	55.9	65.2
DK	75.3	77.1	92.9	91.6	80.0	83.1	93.6	93.5	64.5	68.3	61.9	55.3	78.0	78.1
DE	57.6	60.1	79.3	81.4	71.9	78.4	60.2	85.8	55.2	56.6	14.3	14.4	56.4	62.8
EE	79.6	80.0	90.0	87.5	96.9	97.7	48.1	77.9	76.0	69.5	62.5	39.9	75.5	75.4
IE	81.9	84.2	91.1	91.3	85.4	91.6	82.7	96.1	64.5	65.7	36.0	42.1	73.6	78.5
EL	75.7	90.3	92.0	92.4	78.5	81.5	52.5	58.0	65.6	69.7	43.6	36.5	68.0	71.4
ES	83.4	74.5	94.4	94.4	85.7	85.5	80.6	82.4	76.5	71.5	49.5	65.7	78.4	79.0
FR	82.8	78.9	85.4	87.5	89.2	91.7	44.9	52.4	65.6	71.7	6.5	6.1	62.4	64.7
HR	78.2	82.1	97.0	94.2	98.9	99.4	71.9	39.1	80.5	74.0	91.6	89.0	86.4	79.6
IT	82.2	80.2	88.1	90.4	83.5	88.3	59.3	87.4	64.7	78.4	15.4	15.9	65.5	73.4
CY	72.1	67.6	92.0	93.0	65.9	66.3	36.9	38.0	46.5	50.3	63.7	61.1	62.8	62.7
LV	91.1	82.5	98.4	95.3	99.4	99.7	95.6	99.0	79.4	66.9	0.8	0.0	77.4	73.9
LT	82.6	79.9	94.6	94.0	97.7	98.2	97.7	89.5	75.1	75.7	63.4	69.6	85.2	84.5
LU	48.1	64.2	80.0	78.9	74.1	74.1	65.2	65.2	55.5	63.9	21.3	14.3	57.4	60.1
HU	66.0	71.1	84.2	83.9	78.1	78.8	71.0	66.7	62.1	60.5	35.9	42.2	66.2	67.2
MT	25.9	42.8	78.1	88.0	99.2	95.8	58.9	56.3	49.3	59.0	88.4	34.9	66.6	62.8
NL	66.2	78.1	84.8	90.6	76.2	85.1	54.9	98.0	65.7	66.0	45.6	41.2	65.5	76.5
AT	71.1	69.4	83.8	85.6	77.6	83.7	89.0	87.7	52.3	55.7	34.5	35.1	68.0	69.5
PL	70.5	67.0	91.0	90.5	85.4	89.4	66.7	73.9	74.0	67.5	42.3	46.0	71.7	72.4
PT	85.9	81.3	92.2	93.2	88.1	89.4	78.1	82.3	81.5	72.2	37.5	35.0	77.2	75.6
RO	97.0	96.1	97.3	95.9	98.3	97.3	38.4	69.0	75.0	83.2	0.0	3.9	67.7	74.2
SI	69.9	50.1	89.0	91.0	92.5	95.1	94.2	91.7	69.0	71.1	27.7	30.8	73.7	71.7
SK	58.3	72.5	84.3	84.9	88.1	96.8	45.9	86.1	62.5	64.8	38.4	33.0	62.9	73.0
FI	77.6	75.9	85.2	86.1	92.3	93.4	87.3	91.5	70.2	67.1	77.0	71.0	81.6	80.8
SE	79.4	80.5	89.0	91.7	90.3	92.7	98.8	91.7	67.6	68.9	100.0	100.0	87.5	87.6
MIN	25.9	42.8	76.8	78.9	65.9	66.3	36.9	38.0	46.5	50.3	0.0	0.0	55.9	60.1
MAX	97.0	96.1	98.4	96.9	99.4	99.7	98.8	99.0	81.5	83.2	100.0	100.0	87.5	87.6

Source: Calculated using data from indicators prepared for She Figures 2021 and 2024 (respectively)

Data sources and coverage

As in She Figures 2021, most of the data for this edition of She Figures are extracted from Eurostat statistics on education, research and development (R&D), professional earnings, and human resources in science and technology. Data on education, research, and the labour market for countries outside the EU are primarily drawn from Organisation for Economic Co-operation and Development (OECD) data.

In addition to Eurostat and OECD data, She Figures 2024 uses the following sources:

- **Women in Science (WiS) database**, which compiles data collected by Statistical Correspondents ([18]), using the Women in Science (WiS) questionnaire.
- **Scopus database**, produced by Elsevier, for data on scientific publications.
- **European Patent Office (EPO) Worldwide Patent Statistical Database (PATSTAT),** for data on patent applications.

Unless otherwise specified, the data collection for She Figures 2024 covers 44 countries, namely the 27 European Member States (EU-27), the United Kingdom (UK) and the countries associated to Horizon Europe (Iceland, Norway, Bosnia and Herzegovina, Montenegro, Moldova, North Macedonia, Albania, Serbia, Türkiye, Ukraine, Kosovo ([19]), Georgia, Armenia, Faroe Islands, Israel and Tunisia). Where readily available, data are also compiled for the G20 region (Argentina, Australia, Brazil, Canada, China except Hong Kong ([20]), Hong Kong, India, Japan, Mexico, Russia, South Africa, South Korea and the United States (US)). The indicators present the latest data available for a given data source during the production of this report, which is 2021 or 2022 for most indicators (with the specific reference year(s) provided in the title of each indicator).

Structure of She Figures 2024

Similar to previous editions, the structure of She Figures 2024 follows the chronological journey of researchers from higher education into the labour market and on to decision-making and leadership positions. It also explores gender equality in research outputs, including the gender dimension in R&I content of publications and Horizon projects.

- Chapter 2 presents indicators on women and men within higher education, with a focus on Doctoral-level studies (ISCED 8).
- Chapter 3 discusses women's and men's participation in science and technology and considers the extent to which human resources are utilised in STEM occupations.
- Chapter 4 examines women's and men's participation as researchers in the labour market and the extent to which their patterns of employment across key sectors of the economy have evolved over time.

([18]) Statistical Correspondents are national representatives (from both EU and associated countries) who supported the She Figures study. Each Statistical Correspondent collected data for their country to support the She Figures study, while also providing guidance on the study's direction.

([19]) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the International Court of Justice (ICJ) Opinion on the Kosovo Declaration of Independence

([20]) Official United Nations Educational, Scientific and Cultural Organization (UNESCO) statistics for China do not include Hong Kong, which is why the data are presented separately for China except Hong Kong, and Hong Kong alone.

- Chapter 5 discusses the comparative working conditions of women and men researchers, including the extent to which HEIs and research organisations (ROs) take action to promoting gender equality (based on information displayed on their websites).
- Chapter 6 compares the proportions of women and men in different grades of academic careers, and analyses women's participation in decision-making and leadership positions in R&D.
- Chapter 7 presents indicators on women's and men's R&I outputs, gender differences in funding success rates, and the integration of the gender dimension in R&I content (GDRIC).

This edition is accompanied by four policy articles on emerging and ongoing policy priorities in gender equality in R&I to complement and further contextualise the trends observed. The policy articles explore the progress achieved by gender equality plans in research organisations and higher education organisations, challenges of collecting and analysing intersectional data for structural change in the context of inclusive gender equality plans, academic spin-offs and inclusive gendered innovation and women's participation in research teams and uptake of discoveries in innovation and policy. Country fiches summarise key findings for each Member State. An updated version of the She Figures Handbook is also available, which provides the latest methodological guidance on data collection and calculation of indicators.

Box 1: Key definitions used within this study

Gender refers to 'social attributes and opportunities associated with being female and male and to the relationships between women and men, and girls and boys, as well as to the relations between women and those between men' ([21]).

Sex refers to 'the biological characteristics which define humans as female or male' ([22]).

The data included within She Figures only considers binary sex-disaggregated data (reflecting limitations in the data sources used to compute She Figures indicators).

- **Intersex** is an umbrella term for individuals who are born with sex characteristics, including chromosomal, hormonal and/or anatomical characteristics, that do not fit the typical definition of female or male.
- **Non-binary** is an umbrella term for gender identities that fall outside the gender binary categories of women and men. This includes individuals whose gender identity is neither exclusively woman or man, a combination of woman and man or between or beyond genders.

It is important to consider a non-binary approach data collection in future publications, where possible, utilising available guidance. A review on measuring gender identity was conducted by the United Nations Economics Commission for Europe (UNECE) in 2019, which explored different approaches that could be taken and various issues that need to be considered ([23]). Since then, further efforts have been made at EU level and at national level to support the collection of data about sex and/or gender identity. This includes guidance prepared by the Subgroup on Equality Data for the collection and use of data for LGBTIQ equality in 2023, which discusses possible challenges and ethical considerations before setting out guiding principles for the collection and use of equality data and guidance related to sexual

([21]) EIGE, Gender Equality Glossary & Thesaurus, n.d., https://eige.europa.eu/gender-mainstreaming/glossary
([22]) EIGE, Gender Equality Glossary & Thesaurus, n.d., https://eige.europa.eu/gender-mainstreaming/glossary
([23]) UNECE, In-depth review of measuring gender identity, 2019, https://unece.org/DAM/stats/documents/ece/ces/2019/ECE_CES_2019_19-G1910227E.pdf

orientation, gender identity, gender expression, and sex characteristics (SOGIESC) ([24]). These principles are: assessing the needs of (potential) users, mapping existing data sources, aligning definitions, mainstreaming information on SOGIESC, mainstreaming an intersectional approach, ensuring sufficient budget and facilitating the effective use of such data. The UK Office for Statistics Regulation also produced guidance in 2024 on collecting and reporting data about sex and gender identity. This similarly highlights the importance of considering the needs of users and seeking alignment across related statistics and data where possible. It also emphasises that producers of statistics should have a strong understanding of their datasets and the importance of clear communication about what is being collected and why to respondents and data users ([25]).

Horizontal segregation relates to the concentration of women and men in different sectors (sectoral segregation) and occupations (occupational segregation). It can occur within education (e.g. over/underrepresentation of one sex in particular subjects) and employment (e.g. over/underrepresentation of one sex in particular professions or industries). Unlike vertical segregation, these occupations and sectors are not ordered by a particular criterion ([26]). However, the issue of horizontal segregation may lead to greater vertical segregation. For example, the undervaluing of competencies associated with 'women's work' may limit women's prospects for career advancement.

Vertical segregation refers to the concentration of either women or men in 'top' posts, based on 'desirable' attributes (income, prestige, job stability, etc.) ([27]). In the context of R&I, the overrepresentation of men among heads of universities is an example of such segregation.

Sustainable Development Goals (SDGs) were adopted by all United Nations Member States in 2015. The goals have various objectives, as they encourage work towards ending poverty and deprivation while improving health and education, reducing inequality, increasing economic growth and tackling climate change ([28]).

Member States refers to the EU-27 Member States

Associated Countries refers to the countries associated to Horizon Europe

Terms used in the data analysis:

- **Gender parity** refers to a 50:50 balance in the number or proportion of women and men.
- **Gender balance** refers to a presence of women and men that ranges between 40 % and 60 % of the total population.
- **Underrepresentation** and **overrepresentation** refer to where the representation of women or men is below 40 % or above 60 %, respectively.
- **Gender gaps** describe differences between the proportion of women and the proportion of men in a given population.

([24]) Subgroup on Equality Data of the High-Level Group on Non-Discrimination, Equality and Diversity, Guidance note on the collection and use of data for LGBTIQ equality, 2023, https://commission.europa.eu/document/download/66adbc7e-99cb-4d88-a653-d7fbfba9d7e8_en?filename=Guidance%20note%20on%20the%20collection%20and%20use%20of%20data%20for%20LGBTIQ%20equality_FINAL.pdf

([25]) Office for Statistics Regulation, Collecting and reporting data about sex and gender identity in official statistics: A guide for official statistics producers https://osr.statisticsauthority.gov.uk/publication/collecting-and-reporting-data-about-sex-and-gender-identity-in-official-statistics-a-guide-for-official-statistics-producers/pages/1/

([26]) EIGE, Gender Equality Glossary & Thesaurus, n.d., https://eige.europa.eu/publications-resources/thesaurus/terms/1225

([27]) EIGE, Gender Equality Glossary & Thesaurus, n.d., https://eige.europa.eu/publications-resources/thesaurus/terms/1243

([28]) United Nations, Department of Economic and Social Affairs, Sustainable Development: The 17 Goals, n.d., https://sdgs.un.org/goals

CHAPTER 2 – THE POOL OF GRADUATE TALENT

Key takeaways

At EU level, women are more likely than men to complete their Bachelor-level studies across all fields of study, including several narrow fields of STEM ([29]), and are also more likely to undertake Master-level studies. However, a slightly lower proportion of women Master's graduates continue on to Doctoral-level studies compared to men (8 % and 11 %, respectively). Horizontal gender segregation persists, with women Doctoral graduates still underrepresented in the broad fields of Information and Communication Technologies (ICT), and Engineering, Manufacturing and Construction, and overrepresented in the field of Education. More specifically:

- **Women are more likely to complete their Bachelor-level studies than men** (see Table 2.1) (82 % of women completed their Bachelor studies (ISCED 6) ([30]), compared to 70 % of men). This was also the case for the narrow fields of STEM, where women are typically underrepresented.
- **Women exhibited a lower likelihood of pursuing Doctoral-level (ISCED 8) studies compared to men overall** and in most narrow fields of STEM (see Table 2.2 and Table 2.3).
- Data show that **women continue to comprise around half (48 %) of Doctoral graduates in the EU, and gender balance is observed in most countries** (see Figure 2.1).
- There has been **little change in the proportion of women among Doctoral entrants and Doctoral graduates over the last decade** (ranging from 48 % to 49 % women Doctoral entrants during this period ([31]) and between 47 % and 48 % for Doctoral graduates (see Figure 2.2 and Table 2.4)).
- Despite maintaining a gender balance in the overall pool of Doctoral graduates, gender **gaps persist in specific broad fields of study** (see Table 2.5). Women represent the majority of Doctoral graduates (over 60 %) in the field of Education across most countries, but remain underrepresented (less than 40 %) in the fields of ICT and Engineering, Manufacturing and Construction.
- **Women's representation at Doctoral level has decreased in half of all narrow STEM fields since 2018 and women continue to be underrepresented in half of all narrow STEM fields,** including Physical Sciences, Mathematics and Statistics, and Engineering and Engineering Trades (see Table 2.7).

([29]) This report analyses broad fields of study and, for STEM, narrow fields of study. Historically, gender stereotypes have largely shaped the fields that women and men choose, and understanding how their representation is changing across fields is important for understanding changes in gender dynamics in education and beyond. The broad fields included are: Education; Arts and Humanities; Social Sciences, Journalism and Information; Business, Administration and Law; Natural Sciences, Mathematics and Statistics; Information and Communication Technologies (ICT); Engineering, Manufacturing and Construction; Agriculture, Forestry, Fisheries and Veterinary; Health and Welfare; and Services. The narrow fields in STEM are: Biological and Related Sciences; Environment; Physical Sciences; Mathematics and Statistics; ICT; Engineering and Engineering Trades; Manufacturing and Processing; Architecture and Construction.

([30]) ISCED is the International Standard Classification of Education, a classification system for categorising education programmes and qualifications (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_Standard_Classification_of_Education_(ISCED)).

([31]) Eurostat data: educ_uoe_ent03.

Introduction

Chapter 2 presents indicators on women and men in higher education, with a focus on Doctoral-level studies (ISCED 8). It begins with an overview of EU- and national-level actions to support gender balance among graduates, particularly in the STEM fields. It then explores women's and men's participation at different levels of higher education, from Bachelor (ISCED 6), to Master (ISCED 7), to Doctoral (ISCED 8) levels, considering all fields of study.

- **Section 2.1 presents indicators on women's and men's likelihood to graduate from Bachelor's studies and move to higher-level studies**. These indicators are derived by comparing graduates and entrants in a given year rather than tracking individuals over time. They therefore serve as a proxy for examining the likelihood of women and men completing different stages of higher education and moving to the next. The results should be interpreted with caution due to the fact that different cohorts are compared, meaning that values may be explained by changes in the overall size of the student population. In addition, values in 2020 and 2021 may have been affected by the COVID-19 pandemic.
- **Section 2.2 presents indicators on women's overall representation among Doctoral graduates** for the most recent year for which data are available (2021) and over time (since 2013).
- **Section 2.3 examines differences in women's and men's representation among Doctoral graduates when disaggregating the data by 'broad field' of study** ([32]). These indicators show the gender distribution in different fields of study at Doctoral level in order to reveal the disparities between women and men in their choice of academic fields.
- **Section 2.4 examines differences in women's and men's representation among Doctoral graduates in STEM fields** by disaggregating the data within the 'broad fields' that relate to STEM. Educational choices have a large impact on career pathways, thus discriminatory social biases and stereotypes about women's and men's skills impact women's ability to fully participate in these fields. By examining women's representation in STEM fields and the rate at which this is changing at Doctoral level, these indicators show the extent to which the gender gap is closing in these fields, and thus whether women are gaining more access to the labour market.

([32]) Broad fields of study include: Education; Arts and Humanities; Social Sciences, Journalism and Information; Business, Administration and Law; Natural Sciences, Mathematics and Statistics; ICT; Engineering, Manufacturing and Construction; Agriculture, Forestry, Fisheries and Veterinary; Health and Welfare; and Services.

Background

At **EU level**, there is a longstanding focus on increasing the participation of women at all levels of R&D. Various strategies and action plans have been introduced to support women's participation across fields of study, often focused on STEM, where women are considerably less represented.

A key objective of the EU Gender Equality Strategy 2020-2025 is to address persistent gender stereotypes in European societies ([33]). The European Commission has launched several initiatives and campaigns to address such stereotypes. In 2023, a campaign was launched on International Women's Day ([34]) to highlight the impact of gender stereotypes in multiple contexts, including how they can 'limit our ability and our aspirations to choose a field of study or training' ([35]). Gender stereotypes are a key obstacle to expanding the female graduate pool, particularly within STEM studies.

Addressing gender inequalities in R&I is a core focus point of the European Strategy for Universities. The Strategy positions universities as 'lighthouses of our European way of life' and aims to support them to foster diversity, inclusiveness, and gender equality ([36]). More specifically, the European Commission is committed to:

- Developing a European framework for diversity and inclusion ([37]), which will tackle gender gaps and aim to understand the challenges faced by universities and possible solutions.
- Creating a roadmap to address the underrepresentation of women in STEM fields, through adopting a STE(A)M approach ([38]) for gender-inclusive education and careers, based on the principles of equality, inclusion, and intersectionality, to achieve holistic institutional change ([39]). For example, a Horizon Europe-funded project implementing this approach to bridge the gender gaps in STEM is STREAM IT, which fosters collaboration between STEM-oriented businesses, educational institutions, and related stakeholders ([40]).
- Designing guiding principles for universities to support the inclusion of researchers at risk of dropping out.

Within the Strategy, the Commission calls on Member States to implement measures for institutional change through inclusive GEPs and implementing voluntary, quantified targets

([33]) European Commission, Gender Equality Strategy 2020-2025, n.d., https://commission.europa.eu/strategy-and-policy/policies/justice-and-fundamental-rights/gender-equality/gender-equality-strategy_en

([34]) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a Union of Equality: Gender Equality Strategy 2020-2025, 2020, https://commission.europa.eu/document/download/500cf92d-792b-4055-b951-dd111419818e_en

([35]) European Commission, #EndGenderStereotypes campaign, 2023, https://end-gender-stereotypes.campaign.europa.eu/index_en .

([36]) Council of the European Union (2022) Council conclusions on a European strategy empowering higher education institutions for the future of Europe 2022/C 167/03, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AJOC_2022_167_R_0003.

([37]) European Commission, *Communication from the Commission on a European Strategy for Universities*, Publications Office of the European Union, Luxembourg, 2022, https://education.ec.europa.eu/sites/default/files/2022-01/communication-european-strategy-for-universities-graphic-version.pdf

([38]) The STE(A)M approach refers to the inclusion of arts, social sciences and the humanities in STEM education, as a transdisciplinary, inclusive, future-oriented approach to learning.

([39]) European Commission, Directorate-General for Research and Innovation, *EU support to strengthen gender equality in STEM*, Publications Office of the European Union, 2023, https://data.europa.eu/doi/10.2777/719121

([40]) European Commission, ST(R)E(A)M IT/STREAMING GIRLS AND WOMEN INTO STREAM EDUCATION, INNOVATION AND RESEARCH, Cordis, 2023, https://cordis.europa.eu/project/id/101131843

for the inclusion of people from vulnerable, disadvantaged, and underrepresented groups. Similarly, the new ERA Policy Agenda 2022-2024 includes a commitment to supporting Member States to develop inclusive GEPs, continuing its longstanding priority to uphold gender equality and equal opportunities as core values in the ERA ([41]).

The Digital Education Action Plan (DEAP) 2021-2027 focuses on promoting STEM education to equip learners with the skills needed for the digital age ([42]). In more detail, it encompasses a dedicated online learning programme, learning events, and new higher education programmes that take an interdisciplinary STE(A)M approach to increase the inclusion of women in STEM careers, including as entrepreneurs. The action aims to engage 40 000 young women students in training on the circular economy and digital skills by the end of 2027.

In line with EU-level actions, **Member States** have adopted regulations and policies to support gender equality in education and improve the participation of women in STEM education. Initiatives to enhance women's representation include:

- Requirements set in **national (gender) equality laws**. This includes requirements for educational institutions to support equal access to education, actively promote gender equality, address stereotypes and discrimination, and incorporate a gender perspective in teaching.
- Gender equality requirements set in **national higher education laws**. The Higher Education Authority (HEA) Act 2022 in Ireland, for example, requires each HEI to produce an equality statement setting out its policy on gender equality to ensure that its policies and practices do not discriminate on the basis of gender[43].
- Actions to encourage women and girls to participate in STEM education within **national action plans** for gender equality, or national action plans focused on women and girls. This includes actions to improve the gender sensitivity of the education system, promote STEM education and careers within the education system and the general public (e.g. in media), and provide scholarships to support women's participation in STEM higher education.
- Actions to encourage women and girls to participate in STEM education within **national higher education or R&I policies**. This includes encouraging universities to implement gender equality measures, monitoring women's participation as researchers and students in STEM, and addressing gender stereotypes in higher education choices.

The indicators presented in this chapter span 2013 to 2021. Several notable laws and policies were introduced during this period (see Box 2). These encourage or require HEIs to implement measures to support gender equality among the student population and in their research and teaching activities.

([41]) European Commission, Directorate-General for Research and Innovation, *European Research Area Policy Agenda: Overview of actions for the period 2022-2024*, Publications Office of the European Union, 2021, https://commission.europa.eu/system/files/2021-11/ec_rtd_era-policy-agenda-2021.pdf

([42]) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Digital Education Action Plan 2021-2027, 2020, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52020DC0624

([43]) Government of Ireland, Higher Education Authority Act 2022, Number 31 of 2022, https://www.irishstatutebook.ie/eli/2022/act/31/enacted/en/print.html

Box 2: Laws and policies implemented at Member State level to support gender equality in higher education between 2013 and 2021

In **France**, the Charter for Gender Equality in Higher Education was introduced in 2013. It encouraged universities and other research organisations to take action to support gender equality across various dimensions, including in relation to students and teaching ([44]).

The Gender Equality Act in **Croatia** (consolidated in 2008 and revised in 2017) obliges education institutions to implement measures to ensure equal access to education (Article 14(1)) and to support equal participation of women and men in the population of students (Article 14(4)) ([45]).

The National Strategy for Women and Girls 2017-2020 in **Ireland** includes commitments to improve access to training opportunities for women and address the gender imbalance in STEM education and careers through funding local courses, a National STEM Education Policy, research into barriers faced by women and girls in STEM, and guidelines to promote STEM careers to young people. The STEM Education Policy Statement 2017-2026 and Implementation Plan 2017-2019 were published in 2017 and include a target to reach 40 % women in STEM subjects by 2026 ([46]) (see Box 15 in Chapter 3 and Box 49 in Chapter 7).

Other relevant policy developments at national level since 2021 include:

- Ireland introduced a revised Higher Education Authority Act in 2022, replacing the original 1971 Act, which requires the Higher Education Authority to promote equality of opportunity. The revised Act also emphasises support for equality, diversity, and inclusion in higher education by obliging HEIs to prepare an equality statement setting out their policy in relation to gender equality ([47]).
- Building on developments from 2013-2021, Croatia's national GEP until 2027 and Action Plan for implementation of the national GEP until 2024 includes the objective to 'Increase gender sensitivity of education system (at early, preschool, elementary and high school level) and non-stereotypical education choices at all levels' ([48]). It envisages gender equality training sessions for teachers, as well as actions to promote women in the digital economy.
- Hungary's national action plan, 'Empowering women in family and society (2021-2030)' ([49]), includes actions to promote STEM careers for girls and young women, including

([44]) Ministère de l'Enseignement supérieur et de la Recherche, Ministère des Droits des Femmes, *Egalité entres les femmes et les hommes. Charte pour l'égalité*, 2013, https://franceuniversites.fr/wp-content/uploads/2013/01/chartes_dossier_couv_239902.pdf

([45]) Consolidated text of the law NN 82/08, 69/17, Zakon o ravnopravosti spolova, 2017, https://www.zakon.hr/z/388/Zakon-o-ravnopravnosti-spolova

([46]) Department of Justice and Equality, *National Strategy for Women and Girls 2017-2020: creating a better society for all*, Progress Report, May 2017-July 2018, 2018, https://www.gov.ie/pdf/?file=https://assets.gov.ie/134920/fec2beb0-8450-446d-ae03-ef270b5d8f3f.pdf#page=null

([47]) Government of Ireland, Higher Education Authority Act 2022, Number 31 of 2022, https://hea.ie/assets/uploads/2017/04/HEA-Act-2022.pdf

([48]) Government of the Republic of Croatia, *National Gender Equality Plan for the period until 2027 and Action Plan for implementation of the National Gender Equality Plan until 2024*, https://ravnopravnost.gov.hr/UserDocsImages//dokumenti/NPRS%202027%20APRS%202024//Nacionalni%20plan%20za%20ravnopravnost%20spolova,%20za%20razdoblje%20do%202027..pdf

([49]) The Government of Hungary, *Empowering women in family and society (2021-2030),* https://kormany.hu/publicapi/document-library/a-nok-szerepenek-erositese-a-csaladban-es-a-tarsadalomban-20212030-1/download

through career guidance (to encourage girls to pursue STEM careers and to reduce drop-out rates among women in STEM higher education), awareness-raising measures, and scholarships for higher education.

- The Statement, Perspective and Action Plan for Gender Equality 2023 in Denmark includes actions to investigate sexual harassment and working conditions for Doctoral students, as well as research into gender differences in education choices and on the labour market ([50]).
- In Malta, the national Research and Innovation Strategic Plan 2023-2027 includes actions to identify and address barriers to girls and women participating in STEM education ([51]) (see also Box 19 in Chapter 4).

In addition to regulations and national policies, Member States have implemented national and local initiatives to support gender balance among graduates, largely focusing on STEM fields, where women tend to be underrepresented. This includes initiatives to encourage girls to pursue STEM subjects, efforts to monitor and research gender differences among students and graduates, and support for women STEM students (see Box 3).

Box 3: Member State initiatives to support gender balance among graduates

- Many **initiatives focus on girls of school age**, promoting an interest in STEM subjects from early on by addressing stereotypes associated with scientific and technical professions and encouraging girls to consider a career in STEM:
  - 'Girls' Day', which is celebrated in multiple countries, including **Germany, Hungary, the Netherlands and Austria** ([52])
  - 'She.Can.STEM' internship programme ([53]) in **Bulgaria**
  - 'Become IT girl' event ([54]), Girls' Olympiad in Informatics event ([55]), summer robotics camp for girls, and GirlsCodeCamp in **Croatia** Ambassadors' Network ([56]), the Smartíz programme ([57]), StemPower ([58]) and the She's Skool organisation ([59]) in Hungary (see Box 4).

([50]) Digitaliserings og ligestillingsministeriet, Redegørelse/Perspektiv- og handlingsplan for ligestilling 2023, 2023, https://digmin.dk/ligestilling/publikationer/2023/redegoerelseperspektiv-og-handlingsplan-for-ligestilling-2023

([51]) Government of Malta, Ministry for Education, Sport, Youth, Research and Innovation, Parliamentary Secretariat for Youth, Research and Innovation, Malta's National Research and Innovation Strategic Plan 2023-2027, Document for Public Consultation, 2023, https://mcst.gov.mt/wp-content/uploads/2023/01/%E2%80%A2RI-Report-Final.pdf

([52]) Girls' Day websites: Girls' Day/ Mädchen-Zukunftstag, https://www.girls-day.de/; NaTE, Lányok Napja, https://nokatud.hu/lanyok-napja/; VHTO, Tijdens Girls' Day, https://www.vhto.nl/aanbod/girls-day/ , https://www.bundeskanzleramt.gv.at/en/agenda/women-and-equality/gender_equality_in_the_labour_market/girls_day.html

([53]) Deloitte, *She.Can.STEM Programme: Developing the Future Generations of leaders in STEM*, Deloitte Cyprus, 2023, https://www2.deloitte.com/content/dam/Deloitte/cy/Documents/careers/She.Can.STEM%20Program%202023.pdf.

([54]) Croatian Central State Office for Digital Society Development, *Marking of girls' and women's day in the field of Information and Communication Technologies (ICT),* 2021, https://rdd.gov.hr/vijesti/obiljezavanje-dana-djevojaka-i-zena-u-podrucju-informacijskih-i-komunikacijskih-tehnologija-ikt/1801?lang=en

([55]) Croatian Central State Office for Digital Society Development, *Croatian Girls' Olympiad in Informatics*, 2023, https://hsin.hr/hiod2023/

([56]) Association of Hungarian Women in Science (NaTE), Ambassador Network Overview, n.d., https://nokatud.hu/nagykoveti-halozat/

([57]) Association of Hungarian Women in Science (NaTE), Smartiz Network, n.d., https://nokatud.hu/smartiz/

([58]) Association of Hungarian Women in Science (NaTE), STEM-powered talent programme, n.d., https://nokatud.hu/STEMpower-felhivas/

([59]) Skool, The Coding Journey, 2014), https://skool.org.hu/eng/

- Non-governmental organisation (NGO) HK Unicorn Squad in **Estonia** (see Box 4)

- **Resources to support gender equality in R&I**, including research projects that highlight specific challenges and investigate solutions**,** are also used to support gender balance at graduate level. In **Denmark**, the Danish Agency for Higher Education and Science publishes the Talent Barometer analysis ([60]), which maps out gender divides in Danish research. Other resources include research work, such as Aalborg University's recent report on the Recruitment and Retention of Women in STEM ([61]) and Copenhagen University's research project, Gender Aware Teaching for Equity in Science and Engineering ([62]), which encourages high school girls to choose a STEM career. Other efforts focus on promoting more gender-sensitive university teaching (see Box 5).
- **Measures to support women studying STEM subjects** within higher education include mentorship programmes and scholarships (see Box 5). Scholarships for women studying STEM subjects are in place in several Member States, including **Bulgaria, Cyprus, Czechia, Greece, and Finland**.

2.1 Women's and men's likelihood of graduating from Bachelor-level studies and moving to higher-level studies

This section explores gender differences in the likelihood of students completing Bachelor-level studies (ISCED 6), then progressing to and completing Master-level studies (ISCED 7). It looks first at the overall propensity of women and men students to move on to higher level studies, then examines variations across fields of studies, including within STEM fields.

Across all countries and fields of study examined, women are more likely than men to complete their Bachelor-level studies

Women comprised more than half of Bachelor's (ISCED 6) entrants and graduates at EU level in 2021, reflecting a consistent trend over time ([63]). Table 2.1 shows the ratio of the number of Bachelor's (ISCED 6) graduates to the number of Bachelor's entrants in the same year, disaggregated by sex. A value of 1 indicates that the number of students entering Bachelor level studies in that year is equal to the number of students who graduated from Bachelor level studies that same year. This ratio is a proxy for the graduation rate. However, as it compares two different cohorts of students, the ratio is affected by changes in the size of the student population over time.

The size of student populations at national level may have been affected by the COVID-19 pandemic. Eurostat data indicate smaller growth in the number of Bachelor entrants compared to previous years (1 % growth in 2020 and 3 % growth in 2021, compared to 8 %

([60]) Danish Ministry of Higher Education and Science, *Talent Barometer 2022*, 2023, https://ufm.dk/publikationer/2023/filer/maend-og-kvinder-pa-de-danske-universiteter-danmarks-talentbarometer-2022.pdf

([61]) Faber, S. T., Nissen, A. and Orvik, A-E., *Rekruttering og fastholdelse af kvinder inden for STEM: Indsatser og erfaringer på universiteterne*, Aalborg University, 2020, https://vbn.aau.dk/ws/portalfiles/portal/348911657/Rapport_Villumfonden_Kvinder_i_STEM_FINAL_Juni_2020_med_logo.pdf

([62]) Institut for Naturfagenes Didaktik, GATE - Gender Aware Teaching for Equity in Science and Engineering, n.d., https://www.ind.ku.dk/projekter/gate/

([63]) Between 2016 (earliest available data point) and 2021 (latest available data point), women accounted for approx. 54-55 % of Bachelor entrants, and 58-59 % of Bachelor graduates (Eurostat data: educ_uoe_ent03 and educ_uoe_grad03).

growth in 2019) ([64]) and a decrease of approximately 2 % for women and 1 % for men Bachelor graduates in 2021 at EU level compared to 2020 (in the two preceding years, the overall number of graduates grew by approximately 6 % each year) ([65]). While research on this topic is relatively limited, a UK survey in 2020 found that more than one in 10 students (13 %) were considering dropping out, with higher rates among certain populations (including students with disabilities and students from state schools) ([66]).

At EU level, the ratio of women Bachelor's graduates to entrants is 0.82, compared to a ratio of 0.70 for men, indicating that women are more likely to complete their Bachelor level studies than men. When examined across all She Figures countries, the number of Bachelor's graduates compared to the number of Bachelor's entrants across all fields of study is higher for women than men in all countries except Ireland, Luxembourg, Iceland, Norway, Switzerland, the UK, Australia, Canada and Mexico. For women, the average value is 0.68 and ranges from 0.54 (MX) to 1.65 (PL), while for men the average value is 0.67 and ranges from 0.33 (SI) to 1.13 (HU). This suggests that, in 2021, women were slightly more likely than men to complete their Bachelor level studies. It should also be noted that values in 2020 and 2021 may have been affected by the COVID-19 pandemic.

Women are more likely than men to complete a Bachelor's degree across all broad fields of study. However, this is true of STEM fields in fewer countries compared to She Figures 2021

Disaggregated by broad field of study, women are more likely than men to complete their Bachelor level studies in the majority of countries ([67]). This holds for all broad fields of study in five countries (HR, PT, RO, SK, SE).

The largest variance in ratios for both women and men are observed in the field of Education. In most countries, there is a higher ratio of women graduates to entrants compared to men. However, in the countries with the biggest differences between women and men (IT, LT, HU, MT), men are more likely than women to graduate.

In the field of Natural Sciences, Mathematics and Statistics, the ratio of women Bachelor's graduates to Bachelor's entrants is lower compared to the equivalent ratio for men in 17 countries ([68]). Similarly, in the field of Engineering, Manufacturing and Construction, women are less likely than men to graduate at Bachelor level in 18 countries ([69]). Thus, while more women than men complete their Bachelor-level studies across all fields, in traditionally male-dominated fields, there are still a considerable number of countries where women are less likely than men to complete Bachelor-level studies.

([64]) Eurostat data: educ_uoe_ent02.

([65]) Eurostat data: educ_uoe_grad02.

([66]) Farnell, T., Skledar Matijević, A. and Šćukanec Schmidt, N. *The impact of COVID-19 on higher education: a review of emerging evidence*, NESET report, Publications Office of the European Union, Luxembourg, 2021, doi: 10.2766/069216.

([67]) 21 out of 38 countries in Agriculture, Forestry, Fisheries and Veterinary; 34 out of 39 countries in Arts and Humanities; 34 out of 39 countries in Business, Administration and Law; 26 out of 39 countries in Education; 21 out of 39 countries in Engineering, Manufacturing and Construction; 22 out of 33 countries in Health and Welfare; 23 out of 38 countries in ICT; 23 out of 39 countries in Natural Sciences, Mathematics and Statistics; 27 out of 36 countries in Services; and 27 out of 39 countries in Social Sciences, Journalism and Information.

([68]) DK, DE, IE, IT, LU, HU, MT, NL, AT, FI, IS, NO, CH, UK, AU, CA, JP.

([69]) BE, DK, DE, IE, EL, CY, HU, MT, NL, AT, CH, MK, TR, IL, AU, CA, JP, MX.

Box 4: Member State initiatives to encourage girls and women into STEM higher education

In **Hungary**, the Association of Hungarian Women in Science (NaTE) runs programmes to promote STEM subjects among 14-18-year-old girls in high school. For example, the SMARTIZ programme aims to encourage girls in grade 10 to learn mathematics and IT, while the StemPower programme offers free weekly STEM-focused sessions to girls in grade 11 to demonstrate how science and technology can make everyday life easier and to provide guidance on educational choices. The Ambassadors Network is a network of girls and young women in high school and university who have an interest in science and support each other in their education ([70]).

In **Estonia,** the HK Unicorn Squad ([71]) aims to foster an interest in engineering, robotics and natural sciences among girls aged 8 to 14. The organisation provides extra-curricular education, reaching more than 3 000 girls in Estonia since its launch in 2018. In 2022, the organisation also launched a pilot project to provide classes within schools. Based on the success of this pilot, one school is now offering HK Unicorn Squad technology classes within its curriculum. The organisation aims to extend its offer to girls of secondary school age.

In **Cyprus**, several scholarships are available for girls and women in STEM:

- As part of a wider campaign addressing the underrepresentation of women in Engineering, Science and Technology, a scholarship programme has been established for girls who choose to study engineering and technology at Bachelor level at Frederick University. For the academic year 2023/2024, the scholarship covers half of tuition fees for the student's first year of study ([72]).
- An annual scholarship has been established by the Gender Equality Commissioner, in collaboration with the Cyprus State Scholarships Foundation. The scholarship is awarded to 10 women, aged 30 and above, who are interested in pursuing academic programmes in the fields of innovation and technology.
- At the University of Nicosia, the Zonta D14 STEM Award (EUR 2 000) is granted to women pursuing a degree in STEM ([73]).

In **Austria**, several universities have implemented plans to support their women students. This includes TU Wien, which implemented a Career Advancement Plan for Women in 2015, and the University of Graz, which implemented a plan in 2017. One of the commitments under these plans is to take measures to increase the proportion of women students where women entrants or graduates comprise less than 50 % ([74]) ([75]).

([70]) Association of Hungarian Women in Science (NaTE), Ambassador Network Overview, n.d., https://nokatud.hu/nagykoveti-halozat/

([71]) HK Unicorn Squad, https://unicornsquad.ee/

([72]) Frederick University, Campaign to address the underrepresentation of women in engineering and technology, 2022, https://www.frederick.ac.cy/en/latest-news/110-campaign-to-address-the-underrepresentation-of-women-in-engineering-and-technology

([73]) University of Nicosia, Zonta D14 STEM Award 2022 Application, 2022, https://www.unic.ac.cy/zonta-d14-stem-award-2022-application/

([74]) TU Wien, Career Advancement Plan for Women at TU Wien, 2015, https://www.tuwien.at/fileadmin/Assets/dienstleister/abteilung_genderkompetenz/gender_ressourcen/Frauenfoerderungsplan/Career_Advancement_Plan_for_Women_at_TU_Wien.pdf

([75]) University of Graz, Career Advancement Plan for Women 2017, 2017, https://static.uni-graz.at/fileadmin/Akgl/2_Rechtsgrundlagen/Satzungsteil_Frauenfoerderungsplan_12_2017_EN_KORR.pdf

Table 2.1 Ratio of Bachelor's graduates to Bachelor's entrants, by sex and broad field of study, 2021

Country	Agriculture, forestry, fisheries and veterinary		Arts and humanities		Business, administration and law		Education		Engineering, manufacturing and construction		Health and welfare		Information and Communication Technologies		Natural sciences, mathematics and statistics		Services		Social sciences, journalism, and information		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**0.76**	**0.77**	**0.64**	**0.56**	**0.87**	**0.78**	**1.14**	**0.92**	**0.77**	**0.71**	**0.90**	**0.87**	**0.77**	**0.66**	**0.55**	**0.48**	**0.89**	**0.76**	**0.77**	**0.71**	**0.82**	**0.70**
BE	0.64	0.64	0.79	0.71	0.77	0.68	1.18	0.73	0.70	0.73	0.84	0.69	0.63	0.56	0.65	0.58	0.89	0.64	0.75	0.65	0.82	0.68
BG	0.63	0.46	0.50	0.42	1.09	0.82	0.57	0.43	0.64	0.50	0.79	0.68	0.78	0.51	0.61	0.46	0.67	0.56	0.96	0.79	0.70	0.53
CZ	0.42	0.41	0.57	0.45	0.62	0.52	0.70	0.42	0.73	0.48	0.59	0.63	0.42	0.41	0.45	0.39	0.59	0.48	0.89	0.67	0.62	0.48
DK	0.88	1.02	0.94	0.88	0.96	0.88	1.13	0.87	0.74	0.80	0.94	0.89	0.77	0.80	0.70	0.74	1.10	1.04	0.97	0.98	0.92	0.84
DE	0.86	0.91	0.74	0.68	0.84	0.79	0.77	0.68	0.78	0.80	0.73	0.74	0.59	0.59	0.57	0.59	0.89	0.86	0.76	0.75	0.78	0.75
EE	0.32	0.37	0.76	0.78	1.33	0.95	1.32	0.52 (13/25)	0.89	0.76	1.06	1.12	0.89	0.70	0.58	0.43	0.85	0.92	1.09	1.00	0.98	0.78
IE	0.74	1.27	0.81	0.75	1.42	1.35	1.02	0.94	0.79	1.01	1.14	1.25	1.88	1.15	0.87	1.03	1.33	1.05	0.98	0.99	1.07	1.08
EL	0.40	0.55	0.75	0.57	0.70	0.53	0.88	0.58	0.60	0.63	0.78	0.74	0.59	0.44	0.64	0.55	0.81	0.83	0.87	0.83	0.73	0.61
ES	0.74	0.65	0.75	0.79	0.78	0.75	1.25	1.11	0.76	0.72	0.94	0.98	0.48	0.57	0.75	0.71	0.96	0.95	0.70	0.73	0.86	0.77
FR	1.15	1.11	0.43	0.35	0.74	0.71	1.00	1.29	0.58	0.56	0.60	0.44	1.12	1.02	0.43	0.29	0.80	0.62	0.58	0.47	0.59	0.52
HR	0.64	0.46	0.64	0.60	0.71	0.53	0.69	0.78	0.64	0.52	0.81	0.69	0.59	0.43	0.67	0.63	0.85	0.61	0.82	0.81	0.72	0.55
IT	0.75	0.67	0.75	0.65	1.08	0.90	1.68	4.61	0.71	0.63	1.22	1.24	0.54	0.44	0.45	0.48	0.92	0.76	0.85	0.81	0.87	0.73
CY	1.1 (11/10)	0.90 (18/20)	0.69	0.48	0.56	0.42	0.95	0.55	0.41	0.72	1.61	0.61	0.41	0.72	0.82	0.70	0.68	0.90	0.64	0.53	0.67	0.52
LV	0.60	0.34	0.54	0.42	0.55	0.36	1.29	0.83	0.45	0.32	0.67	0.40	0.24	0.25	0.45	0.33	0.58	0.45	0.68	0.47	0.61	0.35
LT	0.69	1.04	0.72	0.51	0.85	0.57	1.07	2.00	1.32	0.96	0.78	0.52	0.55	0.56	0.57	0.55	0.89	1.17	0.72	0.51	0.81	0.69
LU	-	-	0.79	0.58	0.69	0.97	0.76	0.69	0.50 (8/16)	0.36	-	-	0.27 (4/15)	0.51	0.30	0.71	-	-	0.54	0.59	0.58	0.59
HU	1.77	1.55	1.01	0.81	1.47	1.16	2.91	4.25	1.30	1.38	0.81	0.71	0.90	0.71	1.08	0.96	1.24	1.01	1.10	0.94	1.49	1.13
MT	1.00 (11/11)	0.22 (2/9)	1.71	1.02	1.05	0.99	4.44	7.10 (71/10)	0.86	0.98	1.00	0.97	0.78	0.88	0.67	0.86	1.15	0.80	1.10	0.98	1.37	0.98
NL	0.76	0.89	0.91	0.89	0.71	0.67	0.76	0.72	0.67	0.70	0.75	0.68	0.54	0.59	0.67	0.73	0.87	0.81	0.70	0.70	0.74	0.70
AT	0.51	0.91	0.54	0.50	0.79	0.76	0.88	0.78	0.69	0.75	0.95	1.03	0.58	0.56	0.46	0.51	1.17	1.08	0.82	0.71	0.74	0.69
PL	1.44	1.72	0.93	0.74	1.93	1.53	5.56	1.68	1.11	0.78	2.74	4.33	2.22	1.20	0.96	0.72	1.04	1.01	1.24	0.95	1.65	1.12
PT	0.90	0.59	0.72	0.64	0.73	0.58	0.55	0.32	1.56	0.86	0.98	0.94	0.85	0.54	0.79	0.68	0.78	0.65	0.77	0.60	0.83	0.69
RO	0.63	0.59	0.60	0.45	0.64	0.57	0.71	0.44	0.74	0.56	0.71	0.63	0.82	0.70	0.63	0.46	0.67	0.65	0.61	0.46	0.66	0.57
SI	0.58	0.33	0.59	0.48	0.58	0.45	0.75	0.48	0.56	0.52	0.65	0.50	0.38	0.46	0.57	0.50	0.70	0.50	0.78	0.69	0.64	0.50

Country	Agriculture, forestry, fisheries and veterinary		Arts and humanities		Business, administration and law		Education		Engineering, manufacturing and construction		Health and welfare		Information and Communication Technologies		Natural sciences, mathematics and statistics		Services		Social sciences, journalism, and information		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
SK	0.71	0.52	0.64	0.46	0.63	0.45	0.68	0.54	0.62	0.54	0.62	0.51	0.49	0.39	0.58	0.44	0.66	0.48	0.65	0.49	0.64	0.48
FI	0.82	0.68	0.88	0.88	0.98	0.78	0.99	1.18	0.70	0.67	1.03	0.84	0.76	0.63	0.79	0.82	0.97	0.93	0.97	0.97	0.94	0.74
SE	0.61	0.39	0.23	0.22	0.60	0.59	1.03	1.02	0.68	0.60	1.18	1.07	1.10	0.80	0.36	0.33	0.60	0.46	0.70	0.68	0.71	0.57
IS	0.66	0.83 (15/18)	0.77	0.59	0.85	0.66	1.11	0.58	0.78	0.67	0.82	0.71	1.74	0.79	0.44	0.44	1.60	1.21 (29/24)	1.08	0.89	0.90	0.69
NO	0.71	0.79	0.51	0.53	0.67	0.58	1.42	1.65	0.94	0.93	1.04	1.11	0.70	0.79	0.59	0.65	0.81	0.83	0.50	0.49	0.81	0.73
UK	0.84	0.97	0.86	0.83	0.74	0.68	0.77	0.78	0.75	0.74	0.87	0.95	0.62	0.58	0.72	0.74	-	-	0.74	0.76	0.78	0.74
MK	0.61	0.42	1.29	0.71	0.94	0.60	0.63	0.51	0.64	0.68	0.48	0.44	0.39	0.34	1.17	1.16	1.10	0.61	0.67	0.66	0.74	0.56
RS	0.54	0.52	0.59	0.47	0.73	0.76	0.73	0.73	0.59	0.50	0.79	0.69	0.49	0.44	0.65	0.46	0.74	0.54	0.39	0.39	0.63	0.53
TR	0.81	0.70	0.74	0.57	0.87	1.03	1.05	1.08	0.87	0.97	0.31	0.45	0.21	0.29	0.77	0.63	0.40	0.42	0.78	0.70	0.67	0.75
IL	0.58	0.54	0.65	0.58	0.75	0.78	1.33	0.99	0.63	0.71	-	-	0.59	0.63	0.29	0.20	-	-	0.63	0.49	0.77	0.61
AU	0.57	0.71	0.67	0.59	0.98	0.96	0.53	0.53	0.71	0.72	-	-	0.69	0.68	0.66	0.68	0.45	0.55	0.55	0.56	0.69	0.72
CA	0.69	0.71	0.94	0.90	1.12	0.94	1.63	1.42	0.81	0.88	-	-	0.82	0.82	0.55	0.55	0.79	0.73	1.14	1.19	0.98	0.87
JP	0.99	0.93	0.94	0.84	0.99	0.92	0.95	0.90	0.96	0.96	-	-	-	-	0.96	0.96	0.99	0.70	0.97	0.87	0.95	0.90
MX	0.54	0.55	0.58	0.52	0.51	0.44	0.65	0.52	0.64	0.64	-	-	0.62	0.52	0.54	0.46	0.62	0.57	1.43	1.60	0.68	0.61

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02; educ_uoe_ent02); OECD (Graduates by field; New entrants by field).

Notes: Definition differs, see metadata for: IE, PL, UK; Data estimated for: BG; Break in time series: PL; Includes data from another category: JP (all fields except Health and Welfare, ICT, Total, Sex: Women, Men); Data included in another category: JP (ICT, Sex: Women, Men), MX (Natural Sciences, Mathematics and Statistics, Engineering, Manufacturing and Construction, ICT, Sex: Women, Men); Missing value: US (all fields except Health and Welfare, Sex: Women, Men). Other: For proportions based on fewer than 30 graduates, the numerator and denominator are displayed in brackets.

There are more women than men among Master's graduates but women are marginally less likely to progress from Master's to Doctoral-level studies

Table 2.2 presents the ratio of the number of people who started Doctoral level (ISCED 8) studies to the number of people who graduated from Master's level (ISCED 7) studies in 2021. These results illustrate the likelihood of women and men transitioning to higher levels of education. However, this indicator is affected by the size of the student population over time and is therefore a proxy for the proportion of women and men who continue from Master's to Doctoral-level studies.

Eurostat data show that women are more likely than men, overall, to begin and graduate from Master's level studies. At EU level, women comprise nearly 60 % of Master's entrants and graduates (57-58 % of entrants and 58-59 % of graduates between 2016 and 2021) ([76]).

Only a small proportion of both women and men continue to Doctoral-level studies from Master's level (ranging between a ratio of 0 and 0.3 ([77]) for both women and men ([78])). At EU level, the ratio of women Doctoral entrants to Master's graduates is 0.08, while the ratio for men is 0.11. This indicates that, proportionally, fewer women than men progress to Doctoral-level studies. Across all fields, the ratio for women is equal to or smaller than the ratio for men, suggesting that women are less likely to pursue Doctoral-level studies.

The field with the highest ratio of women Doctoral entrants to Master's graduates is Natural Sciences, Mathematics and Statistics (0.21). However, in the 21 countries ([79]) where women and men are most likely to progress from Master's to Doctoral-level studies in this field, the difference in ratios shows that women are still less likely than men to continue to study at Doctoral level for each of these countries (except Spain).

The fields with the highest proportion of countries where women are most likely to progress from Master's to Doctoral-level studies are Engineering, Manufacturing and Construction (13 countries ([80])) and ICT (14 countries ([81])). However, while this trend is encouraging for women's representation, the proportion and distribution of women in these fields suggests that the pace of change is insufficient to establish gender balance in the near future (see Table 2.3 and Table 2.4).

In Engineering, Manufacturing and Construction, the largest difference in the ratio of women Doctoral entrants to Master's graduates compared to the ratio of men is in Ireland (0.53 for women and 0.80 for men). However, the difference between the ratio of women and men in ICT is relatively close (0.13 for women and 0.21 for men), while in Natural Sciences, Mathematics and Statistics, it is the same (0.19 for both women and men).

([76]) Eurostat data: educ_uoe_grad03.

([77]) A value of 1 indicates that, for each student graduating from Master's level studies in that year, one student started Doctoral-level studies. A value of less than 1 indicates there were fewer Doctoral entrants than Master's graduates, while a value of more than 1 indicates more Doctoral entrants than Master's graduates.

([78]) Ratio is calculated using two different student populations and is, therefore, a proxy for the proportion of women and men who progress from Master's to Doctoral level studies.

([79]) BG, CZ, EE, ES, FR, HR, IT, CY, LV, LT, HU, AT, PL, SK, UK, MK, RS, IL, AU, CA, MX.

([80]) DE, EE, ES, CY, LU, PL, SI, SK, FI, SE, NO, TR, IL.

([81]) EE, ES, IT, CY, LV, NL, AT, RO, SI, SK, SE, IS, NO, MK.

Poland has the largest differences in ratios in favour of men in ICT (0.31 for women and 0.49 for men). Although the difference in ratios between women and men is considerable in Natural Sciences, Mathematics and Statistics (0.35 for women and 0.53 for men), for Engineering, Manufacturing and Construction, the difference is marginal (0.19 for women and 0.18 for men). Bulgaria has the largest difference in ratios in favour of men in Natural Sciences, Mathematics and Statistics (0.56 for women and 0.92 for men) ([82]), but with minimal differences in Engineering, Manufacturing and Construction and ICT (0.18 for women and 0.23 for men; 0.14 for women and 0.15 for men, respectively).

Introducing measures that encourage and support women to progress from Bachelor level to Master's and Doctoral level studies is paramount for ensuring gender equality in R&D. For example, in Romania, the National Strategy on promoting equal opportunities and treatment between women and men and for preventing and combating violence against women (2022-2027) contains plans for a qualitative study to investigate why the share of women who continue their Master's and Doctoral-level studies is declining. ([83]).

([82]) Except LT; however, this is based on low absolute values and may not be statistically significant.

([83]) Guvernul României, National Strategy on promoting equal opportunities and treatment between women and men and for preventing and combating violence against women 2022-2027, Monitorul Oficial al României, Partea I, Nr. 1239, 2022, https://anes.gov.ro/wp-content/uploads/2023/01/Monitorul-Oficial-Partea-I-nr.-1239Bis.pdf

Table 2.2 Ratio of Doctoral entrants to Master's graduates, by sex and broad field of study, 2021

Country	Agriculture, forestry, fisheries and veterinary		Arts and humanities		Business, administration and law		Education		Engineering, manufacturing and construction		Health and welfare		Information and Communication Technologies		Natural sciences, mathematics and statistics		Services		Social sciences, journalism and information		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**0.13**	**0.16**	**0.09**	**0.16**	**0.02**	**0.04**	**0.02**	**0.03**	**0.10**	**0.11**	**0.10**	**0.14**	**0.10**	**0.10**	**0.21**	**0.30**	**0.04**	**0.05**	**0.07**	**0.11**	**0.08**	**0.11**
BE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.05
BG	0.08	0.07	0.15	0.38	0.03	0.07	0.03	0.05	0.10	0.12	0.09	0.10	0.08	0.11	0.24	0.43	0.03	0.04	0.14	0.25	0.07	0.11
CZ	0.16	0.30	0.20	0.35	0.05	0.12	0.03	0.07	0.18	0.23	0.11	0.21	0.14	0.15	0.56	0.92	0.08	0.11	0.08	0.14	0.12	0.21
DK	0.13	0.16	0.05	0.09	-	-	-	-	0.22	0.27	0.33	0.41	-	-	0.13	0.23	0.00	-	0.04	0.07	0.09	0.12
DE	0.20	0.22	0.05	0.11	0.05	0.07	0.03	0.05	0.09	0.11	0.49	0.63	0.12	0.12	0.26	0.38	0.05	0.05	0.08	0.13	0.14	0.18
EE	0.15	0.44 (8/18)	0.10	0.15	0.03	0.04	0.02	0.10	0.15	0.11	0.07	0.10	0.12	0.17	0.32	0.62	0.04	0.02	0.06	0.14	0.08	0.13
IE	0.40	0.49	0.22	0.16	0.02	0.02	0.02	0.02	0.17	0.15	0.07	0.13	0.06	0.04	0.36	0.30	0.05	0.08	0.13	0.11	0.08	0.08
EL	0.32	0.34	0.31	0.44	0.04	0.08	0.13	0.25	0.53	0.80	0.23	0.42	0.13	0.21	0.19	0.19	0.06	0.17	0.04	0.10	0.14	0.27
ES	0.15	0.24	0.27	0.37	0.04	0.07	0.02	0.03	0.14	0.19	0.09	0.14	0.16	0.16	0.51	0.49	0.04	0.05	0.16	0.30	0.10	0.15
FR	0.05	0.08	0.13	0.21	0.01	0.02	0.01	0.02	0.07	0.05	0.04	0.04	0.07	0.06	0.13	0.21	0.03	0.04	0.05	0.08	0.04	0.06
HR	0.09	0.22	0.08	0.17	0.01	0.02	0.04	0.06	0.12	0.12	0.10	0.21	0.01	0.02	0.23	0.35	0.02	0.04	0.11	0.22	0.07	0.11
IT	0.14	0.12	0.04	0.07	0.03	0.03	0.01	0.06	0.09	0.10	0.05	0.06	0.12	0.13	0.17	0.26	0.01	0.01	0.03	0.04	0.05	0.08
CY	-	-	0.05	0.10	0.03	0.03	0.01	0.04	0.21	0.44	0.06	0.08	0.26	0.18	0.27	0.70	0.14	0.11 (2/18)	0.05	0.09	0.04	0.08
LV	0.10	0.45 (5/11)	0.16	0.27	0.09	0.16	0.09	0.29 (6/21)	0.25	0.21	0.04	0.05	0.15	0.13	0.34	0.67	0.02	0.07	0.13	0.17	0.10	0.17
LT	0.04	0.09	0.14	0.16	0.02	0.03	0.07	0.13	0.09	0.10	0.03	0.05	0.33 (9/27)	0.13	0.42	0.55	0.00 (0/17)	-	0.07	0.11	0.07	0.10
LU	-	-	0.23 (3/13)	0.1 (2/20)	0.01	0.02	0.07	-	0.13 (2/16)	0.31	-	-	0.41 (7/17)	1.61 (29/18)	0.76 (19/25)	1.27 (19/15)	0.00 (0/8)	-	0.26	0.91 (10/11)	0.10	0.16
HU	0.32	0.33	0.30	0.38	0.02	0.03	0.03	0.04	0.13	0.12	0.14	0.20	0.19	0.21	0.66	0.85	0.13	0.23	0.18	0.36	0.12	0.18
MT	-	-	-	-	0.01	0.01	-	-	-	-	0.01	-	-	-	-	-	-	-	0.06	0.34	0.01	0.03
NL	0.18	0.25	0.02	0.03	0.01	0.01	0.01	0.01	0.09	0.11	0.10	0.16	0.02	0.05	0.07	0.11	0.00	-	0.03	0.02	0.05	0.07
AT	0.22	0.29	0.18	0.29	0.07	0.07	0.02	0.02	0.17	0.17	0.12	0.20	0.23	0.20	0.26	0.34	0.04	0.11	0.12	0.16	0.11	0.16

Country	Agriculture, forestry, fisheries and veterinary		Arts and humanities		Business, administration and law		Education		Engineering, manufacturing and construction		Health and welfare		Information and Communication Technologies		Natural sciences, mathematics and statistics		Services		Social sciences, journalism and information		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
PL	0.05	0.04	0.05	0.09	0.00	0.01	0.01	0.02	0.04	0.07	0.02	0.04	0.08	0.03	0.14	0.32	0.00	0.00	0.02	0.05	0.02	0.05
PT	0.17	0.21	0.36	0.56	0.06	0.16	0.16	0.19	0.19	0.18	0.12	0.18	0.31	0.49	0.35	0.53	0.31	0.27	0.24	0.60	0.18	0.27
RO	0.15	0.14	0.23	0.31	0.04	0.06	0.02	0.04	0.12	0.18	0.09	0.12	0.06	0.07	0.14	0.18	0.08	0.06	0.07	0.15	0.08	0.13
SI	0.01	0.13	0.15	0.14	0.07	0.11	0.06	0.09	0.16	0.18	0.22	0.49	0.26 (7/27)	0.20	0.37	0.46	0.13	0.13	0.22	0.73	0.14	0.23
SK	0.11	0.16	0.13	0.24	0.05	0.11	0.03	0.06	0.16	0.12	0.05	0.11	0.18	0.09	0.31	0.44	0.07	0.06	0.07	0.12	0.07	0.12
FI	0.15	0.12	0.08	0.14	0.03	0.04	0.07	0.13	0.10	0.08	0.14	0.32	0.14	0.12	0.22	0.32	0.02	0.06	0.11	0.23	0.09	0.13
SE	0.09	0.52	0.10	0.13	0.01	0.02	0.03	0.03	0.08	0.07	0.13	0.30	0.17	0.28	0.26	0.43	0.06	0.05	0.06	0.09	0.08	0.12
IS	-	-	0.18	0.13	-	0.01	0.01	-	0.17	0.07	0.13	0.21	6.00 (6/1)	0.21 (3/14)	0.40	0.72 (21/29)	0.13 (2/15)	-	0.11	0.20	0.07	0.11
NO	0.10	0.20	0.14	0.13	0.03	0.03	0.04	0.04	0.06	0.09	0.20	0.51	0.15	0.11	0.34	0.48	0.04	0.03	0.08	0.05	0.11	0.12
UK	0.17	0.19	0.15	0.24	0.03	0.04	0.04	0.05	0.18	0.23	0.16	0.27	0.18	0.21	0.32	0.56	-	-	0.07	0.11	0.10	0.17
MK	0.54 (7/13)	0.65 (11/17)	0.29	0.24	0.12	0.17	0.50 (13/26)	0.43 (3/7)	0.11	0.15	0.45	0.69	0.30	0.35	0.61	1.42 (17/12)	0.39	0.12	0.15	0.25	0.22	0.25
RS	0.36	0.40	0.28	0.28	0.08	0.11	0.07	0.15	0.18	0.18	0.18	0.28	0.16	0.17	0.42	0.53	0.06	0.11	0.24	0.52	0.18	0.23
TR	0.16	0.13	0.47	0.60	0.11	0.11	0.24	0.30	0.48	0.51	0.09	0.06	0.18	0.14	0.51	0.57	0.07	0.05	0.20	0.28	0.20	0.21
IL	0.20	0.32	0.12	0.19	0.01	0.01	0.04	0.04	0.22	0.23	-	-	0.38	0.35	0.48	0.54	-	-	0.09	0.07	0.07	0.11
AU	0.36	0.48	0.14	0.26	0.01	0.02	0.04	0.05	0.14	0.14	-	-	0.04	0.04	0.60	0.60	0.04	0.04	0.16	0.17	0.08	0.09
CA	0.18	0.28	0.22	0.29	0.03	0.03	0.08	0.10	0.20	0.19	-	-	0.12	0.15	0.36	0.48	0.20	0.23	0.25	0.28	0.13	0.16
JP	0.09	0.14	0.15	0.24	0.05	0.07	0.12	0.10	0.11	0.08	-	-	-	-	0.12	0.18	0.12	0.28	0.10	0.14	0.13	0.15
MX	0.26	0.35	0.21	0.25	0.06	0.09	0.13	0.20	0.16	0.17	-	-	0.06	0.06	0.37	0.43	0.09	0.12	0.07	0.07	0.10	0.13

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02; educ_uoe_ent02); OECD (Graduates by field; New entrants by field).

Notes: Definition differs, see metadata for: EU-27 (Field of study: Natural Sciences, Mathematics and Statistics, Engineering, Manufacturing and Construction, ICT, Sex: Females, Males); Data estimated for: NL; Break in time series: PL; Missing value: US (all fields except Health and Welfare, Sex: Females, Males); Includes data from another category: JP (all fields except Health and Welfare, Total, Sex: Females, Males); Data included in another category: JP (ICT, Sex: Females, Males), MX (Natural Sciences, Mathematics and Statistics, Engineering, Manufacturing and Construction, Sex: Females, Males); Reference year differs: UK: 2019, CA: 2020; Data not available: BE, ME, AL, BR, US: Doctoral entrants (2021), BA: Master graduates (2021). For proportions based on fewer than 30 graduates, the numerator and denominator are displayed in brackets.

To explore the trend of the progression of women and men from Master's to Doctoral-level studies within the narrow fields of STEM, Table 2.3 presents the same ratio for Natural Sciences, ICT and Engineering. As with other indicators in this section, this is a proxy indicator for the progression from Master's level to Doctoral level and compares two different populations (Master's graduates and Doctoral entrants within the same year).

Within the narrow fields of STEM, women tend to be less likely than men to continue to Doctoral-level studies

At EU level, the ratio of women and men who began Doctoral-level studies compared to Master's level graduates in the same narrow field in 2021 ranges from 0.08 (for women in Manufacturing and Processing, and Architecture and Construction) to 0.41 (for men in Physical Sciences). The gender gap is greatest in the narrow fields of Physical Sciences and Mathematics and Statistics, reflected in ratios of 0.33 and 0.10 for women in these fields compared to 0.41 and 0.20 for men, respectively. These values suggest that men are twice as likely to continue on to Doctoral-level studies in Mathematics and Statistics.

In fewer than 10 countries ([84]), women are equally or more likely than men to go on to Doctoral-level studies in most narrow fields (Biological and Related Sciences, Environment, Physical Sciences, Mathematics and Statistics, Manufacturing and Processing, and Architecture and Construction).

By contrast, there is little difference in the likelihood of women and men continuing to Doctoral-level studies in the fields of ICT and Engineering and Engineering Trades. This is reflected in ratios of 0.11 and 0.10 for women, respectively, and 0.10 for men in both fields. However, the population of men is approximately three times as large as the population of women in both fields. Therefore, while there may be similar rates of continuation, women will continue to be underrepresented in the overall population of Doctoral-level students in these fields.

Reflecting EU level trends, the ratio of Doctoral entrants to Master's graduates for women is equal to or higher than the ratio for men in about half of Member States, Associated Countries and G20 countries (suggesting equal or greater likelihood of continuing to Doctoral-level studies) in the narrow fields of ICT and Engineering and Engineering Trades. In three countries (EE, AT, MK), women are approximately twice as likely as men to continue on to Doctoral-level studies in Engineering and Engineering Trades. Similar to EU level, however, the pool of Master's graduates is smaller for women than men in these countries, so this may still not be sufficient to address underrepresentation.

([84]) Biological and Related Sciences: IE, LT, LU, IS, MK; Environment: CZ, EL, CY, LT, HU, RO, SI; Physical Sciences: IE, IT, LV, AT, PT, IL, AU; Mathematics and Statistics: IE, ES, SI, RS; Manufacturing and Processing: HR, IT, SK, FI, TR; Architecture and Construction: IE, FR, IT, SK, SE, RS, TR, IL.

Table 2.3 Ratio of Doctoral entrants to Master's graduates, by sex and narrow field of study in Natural Sciences, ICT and Engineering, 2021

Country	Biological and related sciences		Environment		Physical sciences		Mathematics and statistics		Information and Communication Technologies		Engineering and engineering trades		Manufacturing and processing		Architecture and construction	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**0.18**	**0.23**	**0.14**	**0.16**	**0.33**	**0.41**	**0.10**	**0.20**	**0.10**	**0.10**	**0.11**	**0.10**	**0.08**	**0.11**	**0.08**	**0.10**
BG	0.31	0.69 (20/29)	0.05	0.25 (6/24)	0.22	0.34	0.50 (13/26)	0.90 (9/10)	0.08	0.11	0.13	0.13	0.08	0.11	0.07	0.11
CZ	0.51	1.03	0.82	0.68	0.67	1.09	0.26	0.35	0.16	0.17	0.29	0.26	0.20	0.49	0.07	0.14
DK	-	-	-	-	-	-	-	-	-	-	0.42	0.43	-	-	-	-
DE	0.34	0.47	-	-	0.37	0.48	0.05	0.14	0.18	0.17	0.10	0.11	0.15	0.17	0.06	0.09
EE	0.66 (19/29)	1.78 (16/9)	0.09	0.14 (1/7)	0.34	0.55	-	0.20 (2/10)	0.15	0.21	0.38	0.16	-	-	0.03	0.08
IE	0.41	0.37	0.17	0.17	0.57	0.54	0.26	0.19	0.06	0.04	0.25	0.21	0.11	0.12	0.07	0.05
EL	0.26	0.30	0.95 (18/19)	0.65 (17/26)	0.27	0.28	0.15	0.29	0.14	0.22	0.39	0.56	0.39	0.59	0.73	1.87
ES	0.66	0.73	0.30	0.38	0.49	0.58	0.50	0.48	0.16	0.16	0.20	0.21	0.20	0.29	0.08	0.13
FR	0.07	0.09	-	-	0.31	0.43	0.16	0.19	0.07	0.06	0.05	0.04	-	-	0.17	0.10
HR	0.23	0.33	-	-	0.34	0.48	0.13	0.16	0.02	0.03	0.16	0.12	0.11	0.10	0.07	0.10
IT	0.11	0.15	0.02	0.02	0.40	0.40	0.12	0.24	0.12	0.13	0.09	0.10	0.10	0.05	0.09	0.09
CY	0.17	0.41 (7/17)	2.50 (5/2)	2.00 (6/3)	0.43 (3/7)	0.71 (5/7)	-	0.80 (8/10)	0.26	0.18	0.22 (5/23)	0.58	-	-	0.21	0.32
LV	0.32	0.71 (10/14)	0.07	0.78 (7/9)	0.67	0.64	0.20 (1/5)	0.50 (2/4)	0.15	0.13	0.34	0.20	0.67 (8/12)	1.00 (2/2)	0.09	0.22
LT	0.37	0.33	1.82 (20/11)	1.00 (7/7)	0.54	0.86	0.07	0.35 (7/20)	0.33 (9/27)	0.13	0.13	0.10	0.10	0.74 (14/19)	0.04	0.04
LU	0.92 (11/12)	0.25 (1/4)	-	-	0.70 (7/10)	1.86 (13/7)	-	1.25 (5/4)	0.41 (7/17)	1.61 (29/18)	-	-	-	-	-	-
HU	0.40	0.77	1.94	1.86 (54/29)	0.70	0.82	0.57	0.58	0.19	0.21	0.07	0.07	0.48	1.41	0.07	0.11
AT	0.24	0.36	0.08	0.11	0.40	0.37	0.40	0.49	0.07	0.04	0.46	0.26	0.03	0.06	0.10	0.13
PL	0.09	0.21	-	-	0.10	0.25	0.02	0.07	0.14	0.04	0.02	0.02	0.00	0.00	0.01	0.01
PT	0.26	0.40	0.59	0.72	0.63	0.61	0.13	0.57	0.31	0.49	0.18	0.16	0.21	0.38	0.21	0.26

Country	Biological and related sciences		Environment		Physical sciences		Mathematics and statistics		Information and Communication Technologies		Engineering and engineering trades		Manufacturing and processing		Architecture and construction	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
RO	0.13	0.18	0.06	0.04	0.17	0.23	0.14	0.36	0.06	0.07	0.14	0.18	0.08	0.18	0.11	0.22
SI	0.02	0.03	0.56 (10/18)	0.43 (3/7)	0.50	0.70	0.39 (7/18)	0.17 (4/24)	0.43 (6/14)	0.23	0.22	0.19	0.16	0.16 (4/25)	0.07	0.13
SK	0.30	0.47	0.36	0.39 (9/23)	0.34	0.41	0.23	0.52	0.18	0.09	0.18	0.12	0.19	0.11	0.12	0.11
FI	0.25	0.26	0.19	0.39 (11/28)	0.26	0.40	0.05	0.20	0.14	0.12	0.11	0.08	0.22 (5/23)	0.20	0.04	0.05
SE	0.16	0.26	0.18	0.25	0.67	0.76	0.20	0.39	0.17	0.28	0.09	0.08	0.25	0.29	0.04	0.04
IS	0.86 (6/7)	0.75 (3/4)	0.25 (7/28)	0.45 (5/11)	0.45 (5/11)	0.90 (9/10)	0.50 (1/2)	1 .00 (4/4)	6.00 (6/1)	0.21 (3/14)	0.1 0 (1/10)	-	-	-	0.29 (2/7)	-
NO	0.08	0.13	0.08	0.22 (5/23)	0.02	0.05	0.24 (5/21)	0.31	0.15	0.11	0.13	0.13	-	-	0.01	0.01
UK	0.26	0.39	-	-	0.60	1.00	0.25	0.40	0.18	0.21	0.41	0.36	0.26	0.32	0.08	0.09
MK	0.63 (5/8)	0.33 (1/3)	-	-	1.33 (12/9)	2.60 (13/5)	0.18 (2/11)	0.50 (2/4)	0.30	0.35	0.40	0.13	0.06 (1/16)	-	0.02	0.10
RS	0.38	0.64	-	-	0.57	0.85	0.50	0.40	0.16	0.17	0.18	0.19	0.19	0.36	0.16	0.10
TR	0.60	0.80	0.44	0.67 (14/21)	0.53	0.55	0.30	0.34	0.30	0.19	0.49	0.54	0.39	0.36	0.52	0.45
IL	0.54	0.74	0.25	0.25	0.61	0.57	0.13	0.34	0.38	0.35	0.21	0.23	0.37 (7/19)	0.60 (6/10)	0.21	0.11
AU	1.28	1.55	0.19	0.21	1.54	1.41	0.12	0.19	0.04	0.04	0.24	0.17	0.17	0.26	0.10	0.15
MX	-	-	-	-	-	-	-	-	0.04	0.05	-	-	-	-	-	-

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02; educ_uoe_ent02); OECD (Graduates by field; New entrants by field).

Notes: Definition differs, see metadata for: EU-27, IE, PL; Data estimated for: PL; Break in time series: PL; Data included in another category (OECD): JP, RU (Biological and Related Sciences and Sex: Females, Environment and Sex: Males, Architecture and Construction and Sex: Males); Reference year differs: UK: 2019; MX: 2019; Data not available: BE, MT, NL, BA, ME, AL, BR, CA, JP, US. For proportions based on fewer than 30 graduates, the numerator and denominator are displayed in brackets.

2.2 Women's overall representation among Doctoral graduates

She Figures 2021 found that, in 2018, 48 % of Doctoral graduates were women, meaning that gender balance has been reached. Challenges remain, however. The European Strategy for Universities highlights persistent gender stratification in higher education, particularly within STEM fields, despite increasing access to tertiary education for women. This section presents indicators on women and men graduating from Doctoral-level studies (ISCED 8), including the scale of progress in the last decade and the extent to which it varies in different countries.

Women continue to comprise around half of Doctoral graduates (ISCED 8) in the EU, and gender balance is observed in most countries examined in She Figures

As shown in Figure 2.1, women represent approximately half (48 %) of Doctoral (ISCED 8) graduates at EU level. Gender balance (where women comprise between 40 % and 60 % of the population) has been achieved among Doctoral graduates in all Member States except Cyprus, where women make up the majority (66 %) ([85]) and Austria, where women remain the minority (just under 40 %) ([86]).

Gender balance has also been achieved in Associated Countries, with the exception of Bosnia and Herzegovina (where women are slightly underrepresented), and Montenegro and Albania (where women represent over 60 %, albeit based on small values for Montenegro ([87])).

([85]) Total number of Doctoral graduates in Cyprus is relatively small (n=141).

([86]) AT: exact representation of women is 39.96 %, meaning women are only very marginally underrepresented.

([87]) Total number of Doctoral graduates, n=14.

Figure 2.1 Proportion (%) of women among Doctoral graduates, 2021

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02); OECD (Graduates by field).

Notes: Definition differs, see metadata for: IE (Field of study:Total, Sex:Women,Total); Reference year differs: UK: 2019, BA: 2020. Blue fill indicates gender balance. For proportions based on fewer than 30 graduates, the numerator and denominator are displayed in brackets.

Notes: Definition differs, see metadata for: IE (Field of study:Total, Sex:Women,Total); Reference year differs: UK: 2019, BA: 2020. Blue fill indicates gender balance. For proportions based on fewer than 30 graduates, the numerator and denominator are displayed in brackets.

The proportion of women among Doctoral graduates has remained largely consistent over the last 10 years (changes of less than 5 percentage points (pp) for the majority of countries). Women comprised an equal proportion of Doctoral graduates at EU level in 2013 (47 %) and 2021 (48 %) (see Table 2.4).

Almost all of Member States, Associated Countries, and G20 countries achieved gender balance among Doctoral graduates in both 2013 and in 2021, with little change in the proportion of women Doctoral graduates during this period. Several exceptions are evident, however:

- Lithuania and Estonia both saw decreases of around 9 pp in the proportion of women among Doctoral graduates (from approximately 60 % to approximately 50 %), but nevertheless maintained their gender balance.
- Malta, Cyprus and Serbia recorded increases of more than 5 pp (Malta: from 50 % in 2013 to 59.2 % in 2021; Cyprus: 50 % in 2013 to 66 % in 2021; Serbia: 48 % in 2013 to 55.5 % in 2021). Cyprus shows an increase of 16 pp during the period, although this result is based on a small sample size ([88]).
- In Montenegro, 19 of the 28 Doctoral graduates in 2016 were women ([89]), compared to 9 out of 14 in 2021.
- Bosnia and Herzegovina achieved gender balance in 2019 (42 %), but the proportion of women Doctoral graduates declined to 39 % in 2020 ([90]).
- In Japan, women continue to be underrepresented among Doctoral graduates (32 % in 2021, up slightly from 30 % in 2013).

There has been a small overall decline in the number of women and men Doctoral graduates between 2013 and 2021, with a slightly larger decline for women (reflected in compound annual growth rate (CAGR) values of -2 % and -1 %, respectively).

Among Member States, this ranges from -12 % for both women and men (SI) to 26 % for women, and 20 % for men (MT). Changes of between -3 % and 3 % are observed for both women and men in more than half of Member States ([91]).

([88]) Doctoral graduates: 2013, n=52; 2021, n=141.

([89]) 2016 value is presented, as 2013 data are unavailable.

([90]) Most recent data point available.

([91]) BE, BG, CZ, DK, DE, EE, IE, ES, FR, HR, NL, AT, PT, FI, SE.

Table 2.4 Proportion (%) of women among Doctoral graduates, 2013 and 2021

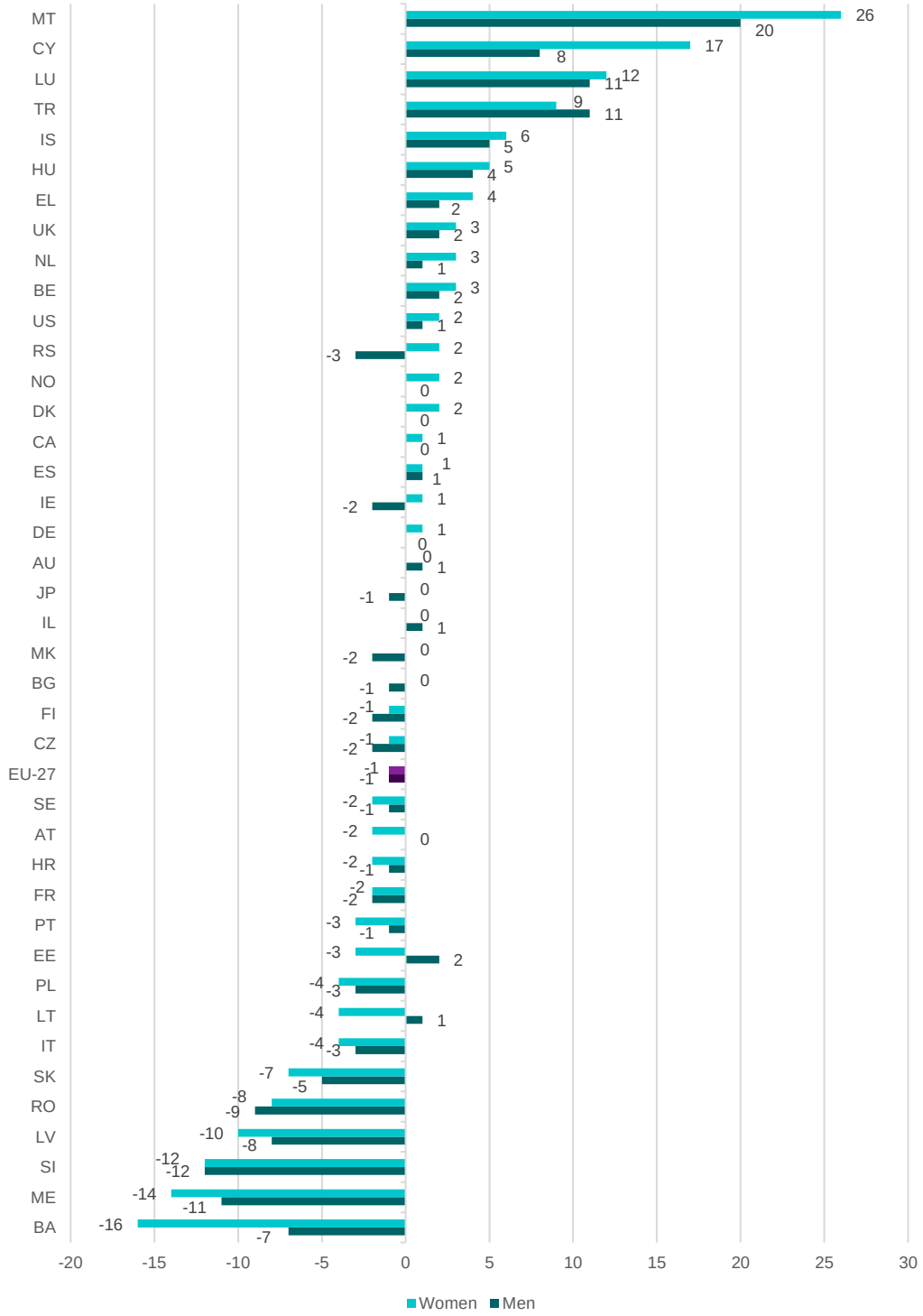
Country	2013	2021
EU-27	**47.5**	**47.6**
BE	42.8	45.4
BG	51.2	54.7
CZ	42.7	43.5
DK	45.1	49.3
DE	44.2	45.9
EE	59.7	50.9
IE	48.8	54.8
EL	45.3	49.8
ES	49.9	49.0
FR	43.8	44.0
HR	54.7	54.1
IT	52.0	48.9
CY	50.0	66.0
LV	57.5	54.4
LT	59.0	50.1
LU	39.1	41.7
HU	46.3	47.4
MT	50.0 (12/24)	59.2
NL	46.2	50.1
AT	43.7	40.0
PL	55.1	53.4
PT	55	50.9
RO	52.3	54.5
SI	53.7	53.6
SK	51.5	49.0
FI	50.6	52.3
SE	46.1	44.2
IS	47.3	49.4
NO	47.8	51.0
UK	46.5	48.0
BA	41.6	39.2
ME	67.9 (19/28)	64.3 (9/14)

Country	2013	2021
EU-27	**47.5**	**47.6**
MK	54.3	57.2
AL	66.4	66.4
RS	48.0	55.5
TR	47.7	44.3
IL	52.2	50.5
AU	49.9	49.0
BR	54.4	55.6
CA	45.1	48.1
JP	30.1	31.6
MX	48.1	52.1
US	49.4	52.0

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02); OECD (Graduates by field).

Notes: Definition differs, see metadata for: IE (Women, Total, Year: 2021); Reference year differs (2013): BA: 2019, ME: 2016, AL: 2021, RS: 2014, TR: 2014, BR: 2014; Reference year differs (2021): UK: 2019, BA: 2020. For proportions based on fewer than 30 graduates, the numerator and denominator are displayed in brackets.

Figure 2.2 CAGR of Doctoral graduates, by sex, 2013-2021



Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02); OECD (Graduates by field).

Notes: Definition differs, see metadata for: IE (Women, Men, Year:2021); Reference year differs (2013): BA: 2019, ME: 2016, AL: 2021, RS: 2014, TR: 2014, BR: 2014; Reference year differs (2021): 2019: UK, 2020: BA; Data not available: RU (Women, Men, Year: 2013).

2.3 Gender gap among Doctoral graduates across broad fields of study

This section examines the distribution of women and men among Doctoral graduates (ISCED 8), by broad field of study, which groups Doctoral level studies into the following fields: Education; Arts and the Humanities; Social Sciences, Journalism and Information; Business, Administration and Law; Natural Sciences, Mathematics and Statistics; ICT; Engineering, Manufacturing and Construction; Agriculture, Forestry, Fisheries and Veterinary; Health and Welfare; Services.

Among Doctoral graduates, women continue to be underrepresented in ICT and Engineering, Manufacturing and Construction, and overrepresented in Education, with little change since She Figures 2021

While most countries have achieved gender balance among Doctoral graduates (ISCED 8) across fields, gender disparities persist when data are broken down by broad field of study.

Most countries have achieved gender balance in the following fields:

- **Arts and Humanities** (20 Member States, four Associated Countries, six G20 countries ([92])).
- **Business, Administration and Law** (19 Member States, six Associated Countries, five G20 countries ([93])).
- **Natural Sciences, Mathematics and Statistics** (19 Member States, four Associated Countries, five G20 countries ([94])).
- **Agriculture, Forestry, Fisheries and Veterinary** (17 Member States, five Associated Countries, five G20 countries ([95])).

In **Health and Welfare studies**, women are not underrepresented in any Member States or Associated Countries, but are overrepresented in 14 Member States and six Associated Countries ([96]).

Women are particularly overrepresented in Education and underrepresented in ICT, and in Engineering, Manufacturing and Construction. In Education, women are overrepresented in all Member States, Associated Countries and G20 countries for which data are available, except Türkiye and Japan, where the proportion of Doctoral graduates is gender-balanced, at 48 % and 44 %, respectively.

In ICT, women are underrepresented in all but four countries (RO, BA, MK, AL), and are severely underrepresented in 12 countries (11 Member States and one G20 country ([97])), comprising less than 20 % of Doctoral graduates. In Engineering, Manufacturing and Construction, women are underrepresented in all but six countries (PL, IS, BA, AL, RS, BR).

([92]) BE, BG, CZ, DK, DE, IE, ES, FR, HR, IT, LT, LU, HU, NL, AT, PL, PT, RO, SK, SE, IS, UK, TR, IL, AU, BR, CA, JP, MX, US.

([93]) BE, BG, CZ, EE, IE, EL, ES, FR, HR, IT, LV, HU, NL, AT, PL, PT, RO, SK, SE, NO, UK, MK, RS, TR, IL, AU, BR, CA, MX, US.

([94]) CZ, DK, DE, EE, IE, EL, ES, HR, IT, LV, LT, LU, HU, PL, PT, SI, SK, FI, SE, IS, UK, TR, IL, AU, BR, CA, MX, US.

([95]) BE, BG, CZ, DK, EL, ES, FR, HR, IT, LT, HU, NL, AT, RO, SI, SK, FI, NO, UK, AL, RS, IL, AU, BR, CA, MX, US,

([96]) DK, EE, IE, HR, IT, CY, LV, NL, PL, PT, RO, SI, SK, FI, NO, BA, ME, AL, RS, TR.

([97]) BE (n=15), CZ, DE, LT (n=6), HU, AT, PL, PT, SI (n=20), SK, FI, BR.

This is comparable to She Figures 2021, where women were significantly underrepresented in both fields ([98]), indicating little progress on improving women's representation in these broad fields of study.

Box 5: Initiatives to encourage women to complete Doctoral-level studies in STEM

In **Finland**, the Finnish Concordia Fund, established in 1920, now grants more than 140 scholarships annually to Finnish women in higher education. In 2023, a total of nearly EUR 240 000 was granted. The recipients included 18 Doctoral students who received grants to support their dissertations, and 39 Doctoral students who received grants to travel to conferences.

In **Hungary**, academic grants from the Hungarian Academy of Sciences provide financial support for mothers and single fathers with young children to obtain a Doctorate. The total allocated grant budget was approximately EUR 166 000 in 2023, when 43 winners were granted individual scholarships ([99]) to the value of HUF 1.2-2.4 million (approx. EUR 3 000 to EUR 6 000) depending on the support category (support for writing doctoral thesis or publication of scientific results).

In **Greece**, the Bayer Hellas-Greek Women in STEM partnership grants scholarships to scientists in their early career stages and working on their PhD thesis for specific topics, such as cancer or aquaculture. In 2022, two EUR 3 500 grants were available to Doctoral students and their stories were published on the Greek Women in STEM website to inspire other women.

([98]) In 2018, in ICT, 12 countries had less than 20 % of women Doctoral graduates, while in Engineering, Manufacturing and Construction, the proportion of women Doctoral graduates ranged from 20-40 % in most Member States and Associated Countries.

([99]) Elte Institute of Research on Adult Education and Knowledge Management, Scholarship of Hungarian Academy of Science for Kinga Káplár-Kodácsy, 2023.

Table 2.5 Proportion (%) of women Doctoral graduates, by broad field of study, 2021

Country	Education	Arts and humanities	Social sciences, journalism and information	Business, administration and law	Natural sciences, mathematics and statistics	Information and Communication Technologies	Engineering, manufacturing and construction	Agriculture, forestry, fisheries and veterinary	Health and welfare	Services	Total
EU-27	**67.5**	**53.4**	**54.8**	**46.4**	**44.0**	**21.4**	**29.4**	**58.0**	**59.5**	**39.9**	**47.6**
BE	81.3	46	62.9	45.7	39.4	13.3 (2/15)	30.6	52.8	54.8	50.0 (5/10)	45.4
BG	69.9	51.9	63.2	53.7	64.9	25.0 (6/24)	34.4	55.2 (16/29)	57.5	29.8	54.7
CZ	71.4	50.4	58.3	41.7	48.6	14.0	23.2	51.1	57.6	35.4	43.5
DK	-	55.3	58.2	-	40.8	-	32.2	54.8	62.0	-	49.3
DE	65.4	56.1	55.8	40.0	40.8	17.7	19.9	64.9	58.8	52.8	45.9
EE	75.0 (6/8)	66.7	29.4 (5/17)	53.3 (8/15)	55.2	21.7 (5/23)	35.0	66.7 (10/15)	81.3 (13/16)	-	50.9
IE	70.8	49.4	66.7	58.3	52.3	33.8	34.8	69.2 (18/26)	64.7	50.0 (3/6)	54.8
EL	71.1	69.2	44.3	48.9	47.5	36.8	35.5	52.7	50.6	54.9	49.8
ES	61.8	49.7	51.0	42.9	50.3	21.3	31.2	54.0	59.6	34.9	49.0
FR	62.0	56.0	47.7	49.6	39.1	23.3	31.2	55.7	57.7	47.3	44.0
HR	65.1	51.1	66.2	53.8 (14/26)	58.5	28.6	34.2	44.4	62.7	14.3 (2/14)	54.1
IT	77.6	54.0	56.2	49.3	48.8	26.5	35.5	58.4	62.5	31.3 (5/16)	48.9
CY	61.9 (13/21)	68.8 (11/16)	77.3 (17/22)	64.7 (11/17)	94.4 (17/18)	33.3 (1/3)	34.6 (9/26)	71.4 (5/7)	80.0 (8/10)	100.0 (1/1)	66.0
LV	-	88.9 (8/9)	35.0 (7/20)	58.3 (14/24)	54.3	-	33.3 (9/27)	71.4 (5/7)	78.3 (18/23)	50.0 (1/2)	54.4
LT	83.3 (10/12)	52.2	60.0	62.1 (18/29)	55.6	16.7 (1/6)	22.8	52.9 (9/17)	60.0	-	50.1

Country	Education	Arts and humanities	Social sciences, journalism and information	Business, administration and law	Natural sciences, mathematics and statistics	Information and Communication Technologies	Engineering, manufacturing and construction	Agriculture, forestry, fisheries and veterinary	Health and welfare	Services	Total
LU	77.8 (7/9)	50.0 (5/10)	63.2 (12/19)	64.7 (11/17)	41.5	21.1	17.6 (3/17)	-	-	-	41.7
HU	85.0	53.3	50.2	50.0	43.4	17.9	30.1	47.5	57.6	19.4	47.4
MT	75.9 (22/29)	33.3 (2/6)	64.7	63.3	25.0 (1/4)	-	25.0 (2/8)	-	53.3 (8/15)	100.0 (1/1)	59.2
NL	72.3	42.4	60.5	50.8	39.4	22.4	30.5	53.5	60.1	-	50.0
AT	73.8	51.6	48.5	45.6	34.3	15.1	29.1	55.1	50.7	16.7 (1/6)	40.0
PL	78.0	50.7	57.2	47.8	52.9	6.5	42.4	65.6	71.0	41.4	53.4
PT	63.2	48.0	55.8	41.9	52.6	19.2	39.7	71.4 (20/28)	67.9	43.2	50.9
RO	71.7	54.9	62.2	59.9	64.8	48.1	38.6	54.5	68.4	28.3	54.5
SI	80.0 (8/10)	61.5	46.2 (6/13)	61.0	51.5	5.0 (1/20)	35.8	50.0 (1/2)	69.6	60.0 (9/15)	53.6
SK	67.9	53.9	61.7	45.7	59.4	14.3	28.3	54.5	60.1	29.9	49.0
FI	80.2	60.1	66.5	62.1	44.5	15.7	28.3	58.1	65.5	44.4 (4/9)	52.3
SE	64.9	51.0	46.2	51.1	40.5	26.7	28.6	60.6	57.6	50.0 (4/8)	44.2
IS	100 (6/6)	55.6 (5/9)	33.3 (2/6)	66.7 (2/3)	42.4	-	50.0 (5/10)	-	50.0 (7/14)	-	49.4
NO	74.2	64.2	56.8	52.4	39.5	23.8 (5/21)	24.0	60.0 (15/25)	63.1	50.0	51.0
UK	69.8	53.7	53.8	46.2	48.3	25.7	28.3	56.6	59.0	-	48.0
BA	36.4 (4/11)	77.8 (7/9)	26.1	20.0 (4/20)	36.4 (4/11)	50.0 (3/6)	41.2 (7/17)	83.3 (5/6)	73.3 (11/15)	14.3 (1/7)	39.2
ME	-	100.0 (3/3)	75.0 (3/4)	-	100.0 (1/1)	-	-	-	100.0 (1/1)	33.3 (1/3)	64.3 (9/14)

Country	Education	Arts and humanities	Social sciences, journalism and information	Business, administration and law	Natural sciences, mathematics and statistics	Information and Communication Technologies	Engineering, manufacturing and construction	Agriculture, forestry, fisheries and veterinary	Health and welfare	Services	Total
MK	71.4 (5/7)	65.2 (15/23)	62.9	53.1	80.0 (4/5)	76.9 (10/13)	33.3 (6/18)	25.0 (1/4)	53.2	58.8 (10/17)	57.2
AL	66.7 (2/3)	62.7	69.0	72.2	68.2 (15/22)	100.0 (4/4)	54.2 (13/24)	40.0 (4/10)	68.0	-	66.4
RS	76.9 (10/13)	62.8	64.8	47.5	68.2	21.4 (6/28)	41.3	50	60.5	42.9 (12/28)	55.5
TR	47.8	41.5	42	42.1	50.6	39	33.7	36.2	68	38.4	44.3
IL	84	48	61.5	50.6	43.5	27.1	33	58.3 (14/24)	-	-	50.5
AU	65.6	55.2	61.7	49	47.1	33.2	30.6	54.8	-	66.7 (10/15)	49
BR	68	53.6	55	44.6	51.5	18	46	55.8	-	56.3	55.6
CA	69.7	48.5	66.2	53.6	44.5	27.9	25.1	54.2	-	55	48.1
JP	44	49.9	43	30.1	22	-	18.9	37.9	-	81.8	31.6
MX	62.1	46.9	47.7	44.9	43.5	21.4	34.9	45.6	-	40.3	52.1
US	70.1	46.1	62.9	50.5	43.9	25.6	26.8	50	-	56.7	52

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02); OECD (Graduates by field).

Notes: Definition differs, see metadata for: IE (Women, Men, Year: 2021); Data included in another category: DK (Field of study: Education, Business, Administration and Law, Information and Communication Technology, Services), JP (Field of study: ICT, Women, Total, Year:2020)); Includes data from another category: DK (Field of study: Social Sciences, Journalism and Information, Engineering, Manufacturing and Construction), JP (Field of study: Education, Arts and the Humanities, Social Sciences, Journalism and Information, Business, Administration and Law, Natural Sciences, Mathematics and Statistics, Engineering, Manufacturing and Construction, Agriculture, Forestry, Fisheries and Veterinary, Services, Women, Total, Year: 2020); Data not available: JP (Field of study: ICT, Women, Total, Year: 2020), IL, AU, BR, CA, JP, MX, RU, US (Field of study: Health and Welfare, Women, Total). For proportions based on fewer than 30 graduates, the numerator and denominator are displayed in brackets.

The distribution of women and men at Doctoral level indicates persistent disparities, with lower representations of women in Natural Sciences, Mathematics and Statistics, ICT, and Engineering, Manufacturing and Construction

When data are broken down by women's and men's distribution across fields of study (see Table 2.6), it is evident that women and men continue to be represented differently at Doctoral level. At EU level, the highest percentage of women Doctoral graduates complete their studies in Health and Welfare (28 % of women graduates), while for men Doctoral graduates the highest percentage is in Natural Sciences, Mathematics and Statistics (26 % of men graduates).

When comparing the distributions of women and men Doctoral graduates, women participate less than men in Natural Sciences, Mathematics and Statistics (23 % of women vs 26 % of men), ICT (1.5 % of women vs 4.9 % of men), and Engineering, Manufacturing and Construction (10 % of women vs 22 % of men). By contrast, the percentage of women Doctoral graduates is higher in Education (3.8 % of women vs 1.6 % of men), Arts and the Humanities (12 % of women vs 10 % of men), and Social Sciences, Journalism and Information (10 % of women vs 8 % of men). There has been a change (3 pp) between 2018 and 2021 (latest data available) in the proportion of women and men Doctoral graduates across all broad fields of study at EU level, indicating a persistent gender gap.

The exceptions to this trend were Iceland and Bosnia and Herzegovina, where women Doctoral graduates comprise a higher proportion in Engineering, Manufacturing and Construction, and in Bosnia and Herzegovina and North Macedonia for ICT. Box 6 presents some examples of actions taken in these countries to increase women's representation in these fields.

Box 6: Actions to improve women's representation in ICT and Engineering in Associated Countries

In **Bosnia and Herzegovina**, the Bosnian Women Scientists' Research Opus Conference highlights the contribution of women to the development of science and their current position in academia and society. The conference centres on advocating for more to be done to attract, promote, and retain women within all scientific fields. Following the 2018 conference, 51 papers were published as part of the proceedings ([100]).

Also in Bosnia and Herzegovina, the IT Girls initiative, implemented by the United Nations (UN), has supported more than 2 000 girls and women in IT. An event in April 2023 to raised awareness of the initiative, celebrated girls in IT, and highlighted good practices and remaining challenges ([101]).

In **North Macedonia**, the Global Engineer Girls (GEG) North Macedonia programme ([102]) supports women students in engineering at six universities. It provides scholarships,

([100]) University of Sarajevo, Women in Science Discussion and Conference on Bosnian Women Scientists and Their Research Opus, Conference proceedings, 2018, https://unsa.ba/en/novosti/women-science-discussion-and-conference-bosnian-women-scientists-and-their-research-opus

([101]) United Nations Children's Fund (UNICEF), Marking the International Day of Girls in ICT: 'Who run BiH? IT girls!', 2023, https://www.unicef.org/bih/en/press-releases/marking-international-day-girls-ict-who-run-bih-it-girls#:~:text=%22The%20IT%20industry%20in%20Bosnia,this%20needs%20to%20be%20changed

([102]) Government of the Republic of North Macedonia, Macedonia 2025, STEM education and career - a challenge for girls and young women (WomenInStem), 2021, https://macedonia2025.com/project/stem-education-and-career-a-challenge-for-girls-and-young-women-womeninstem/

mentorship, and online training programmes for developing soft skills and internship opportunities. Another initiative is the STEM education and career – a challenge for girls and young women (WomenInStem) project, which promotes STEM careers by successful women in this field. The project conducted research on the main barriers to career development in STEM faced by women and provided recommendations based on its findings.

Comparing data from 2018 and 2021 at country level provides a more detailed picture of how the distribution of Doctoral graduates is changing in particular fields. For example, in 2018, men Doctoral graduates most frequently completed their studies in the field of Natural Sciences, Mathematics and Statistics (19 Member States and Associated Countries), while in 2021, men Doctoral graduates were most represented in this field in 10 countries ([103]). While this may suggest that men are less likely to choose a field in STEM, a closer look at the data indicates that there has been a move to other STEM fields. For example, Engineering, Manufacturing and Construction had the largest proportion of men Doctoral graduates in 2018 in 12 Member States and Associated Countries, increasing to 19 countries in 2021 ([104]).

([103]) 2018: 19 Member States and Associated Countries (BE, BG, CZ, DK, EL, HR, IT, CY, LV, LT, AT, PT, RO, SI, SK, FI, SE, RS, TR); 2021: 10 Member States and Associated Countries (DE, EE, IE, ES, FR, HU, IS, NO, UK, IL).

([104]) 2018: 12 Member States and Associated Countries (DE, EE, IE, ES, FR, LU, HU, UK, IS, NO, CH, IL); 2021: 19 Member States and Associated Countries (BE, CZ, DK, EE, EL, IT, CY, LV, LT, AT, PT, RO, SI, SK, FI, SE, ME, RS, TR).

Table 2.6 Distribution of Doctoral graduates across broad fields of study, by sex, 2021

Country	Education		Arts and humanities		Social sciences, journalism and information		Business, administration and law		Natural sciences, mathematics and statistics		Information and Communication Technologies		Engineering, manufacturing and construction		Agriculture, forestry, fisheries and veterinary		Health and welfare		Services	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**3.8**	**1.6**	**12.4**	**9.6**	**10.3**	**7.5**	**7.8**	**8**	**23.1**	**26.1**	**1.5**	**4.9**	**10.4**	**22.2**	**4.1**	**2.6**	**29.5**	**17.8**	**1.0**	**1.3**
BE	2.0	0.4	9.0	8.8	14.9	7.3	5.6	5.6	19.2	24.5	0.2	0.8	15.5	29.2	5.0	3.7	28.3	19.4	0.4	0.3
BG	9.2	4.8	15.0	16.7	22.1	15.5	12.7	13.2	13.9	9.0	1.0	3.5	6.7	15.4	2.5	2.5	14.6	13.1	2.2	6.3
CZ	6.5	2.0	12.7	9.6	9.5	5.3	6.8	7.3	27.3	22.2	0.9	4.1	12.8	32.6	5.2	3.8	15.2	8.6	3.1	4.4
DK	-	-	10.4	8.2	11.3	7.9	-	-	13.6	19.2	-	-	16.9	34.7	6.8	5.5	40.9	24.4	-	-
DE	2.3	1.0	7.9	5.2	6.4	4.3	7.2	9.2	23.8	29.3	1.2	4.9	5.6	19.3	3.9	1.8	41.0	24.4	0.7	0.5
EE	5.3	1.8	17.7	9.2	4.4	11.0	7.1	6.4	28.3	23.9	4.4	16.5	12.4	23.9	8.8	4.6	11.5	2.8	-	-
IE	6.1	3.0	9.9	12.2	17.6	10.7	8.0	6.9	20.7	22.9	2.7	6.5	9.2	20.7	2.1	1.2	23.3	15.4	0.4	0.4
EL	9.9	4.0	17.0	7.5	6.4	8.0	4.7	4.8	13.7	15.0	2.2	3.7	15.5	28.0	3.0	2.7	24.7	23.9	2.9	2.4
ES	6.9	4.1	13.7	13.3	13.1	12.1	5.1	6.6	23.5	22.3	1.0	3.6	8.4	17.7	3.4	2.8	23.8	15.5	1.1	2.0
FR	1.4	0.7	17.5	10.8	11.2	9.6	8.1	6.4	29.8	36.4	2.9	7.5	9.9	17.1	2.0	1.2	16.3	9.4	1.0	0.9
HR	7.0	4.4	11.5	13.0	12.3	7.4	3.5	3.6	17.3	14.5	0.5	1.5	10.0	22.8	4.0	5.9	33.3	23.4	0.5	3.6
IT	1.5	0.4	11.3	9.2	8.3	6.2	9.2	9.1	29.2	29.3	1.0	2.7	16.9	29.4	5.7	3.9	16.7	9.6	0.1	0.3
CY	14.0	16.7	11.8	10.4	18.3	10.4	11.8	12.5	18.3	2.1	1.1	4.2	9.7	35.4	5.4	4.2	8.6	4.2	1.1	-
LV	-	-	9.9	1.5	8.6	19.1	17.3	14.7	23.5	23.5	-	2.9	11.1	26.5	6.2	2.9	22.2	7.4	1.2	1.5
LT	5.3	1.1	12.6	11.6	14.2	9.5	9.5	5.8	26.3	21.2	0.5	2.6	9.5	32.3	4.7	4.2	17.4	11.6	-	-
LU	11.1	2.3	7.9	5.7	19.0	8.0	17.5	6.8	27.0	27.3	12.7	34.1	4.8	15.9	-	-	-	-	-	-

Country	Education		Arts and humanities		Social sciences, journalism and information		Business, administration and law		Natural sciences, mathematics and statistics		Information and Communication Technologies		Engineering, manufacturing and construction		Agriculture, forestry, fisheries and veterinary		Health and welfare		Services	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
HU	5.0	0.8	16.3	12.9	14.7	13.1	5.1	4.6	18.1	21.3	1.7	7.2	6.9	14.3	4.1	4.1	27.1	18	1.0	3.8
MT	28.6	13.2	2.6	7.5	28.6	22.6	24.7	20.8	1.3	5.7	-	5.7	2.6	11.3	-	-	10.4	13.2	1.3	-
NL	1.8	0.7	5.7	7.8	10.5	6.9	8.2	7.9	13.3	20.6	1.1	3.7	7.2	16.4	6.4	5.6	45.8	30.4	-	-
AT	3.8	0.9	13.7	8.4	6.2	4.3	14.1	11.0	17.3	21.8	2.2	8.1	19.3	30.9	5.3	2.8	18	11.4	0.1	0.4
PL	3.0	1.0	21.1	23.5	11.4	9.8	7.2	9.0	20.9	21.3	0.1	2.2	12.4	19.4	4.1	2.5	17.8	8.3	1.9	3.1
PT	10.9	6.6	12.7	14.3	15.0	12.3	7.6	10.9	17.2	16.1	0.9	4.1	13.8	21.7	1.9	0.8	16.1	7.9	3.9	5.3
RO	2.4	1.1	22.0	21.6	9.3	6.8	13.9	11.1	8.3	5.4	2.7	3.5	15.1	28.8	5.2	5.2	19.3	10.7	1.9	5.7
SI	3.7	1.1	18.4	13.3	2.8	3.7	11.5	8.5	15.7	17.0	0.5	10.1	13.4	27.7	0.5	0.5	29.5	14.9	4.1	3.2
SK	5.7	2.6	15.3	12.6	7.9	4.7	13.6	15.5	24.5	16.1	0.9	5.5	9.5	23.1	3.8	3.0	15.5	9.9	3.2	7.1
FI	8.0	2.2	14.9	10.8	12.9	7.1	7.5	5.0	12.2	16.7	2.1	12.4	9.3	25.9	2.1	1.7	30.5	17.6	0.5	0.6
SE	4.7	2.0	5.7	4.3	7.1	6.4	3.6	2.7	18.1	20.9	2.7	5.8	17.7	34.6	1.6	0.8	38.5	22.2	0.3	0.2
IS	14.6	-	12.2	9.5	4.9	9.5	4.9	2.4	34.1	45.2	-	4.8	12.2	11.9	-	-	17.1	16.7	-	-
NO	5.4	1.9	10.3	6.0	13.7	10.8	3.9	3.6	20.2	32.2	0.6	1.9	5.4	17.7	1.8	1.2	36.7	22.4	2.1	2.2
UK	5.6	2.2	15.8	12.6	9.4	7.5	6.4	6.9	30.8	30.4	2.2	5.9	9.0	21	1.3	0.9	19.5	12.6	-	-
BA	6.9	7.8	12.1	2.2	20.7	37.8	6.9	17.8	6.9	7.8	5.2	3.3	12.1	11.1	8.6	1.1	19.0	4.4	1.7	6.7
ME	-	-	33.3 (3/9)	-	33.3 (3/9)	20 (1/5)	-	-	11.1 (1/9)	-	-	-	-	40 (2/5)	-	-	11.1 (1/9)	-	11.1 (1/9)	40 (2/5)
MK	4.3	2.3	13.0	9.3	19.1	15.1	14.8	17.4	3.5	1.2	8.7	3.5	5.2	14	0.9	3.5	21.7	25.6	8.7	8.1
AL	0.8	0.8	16.1	18.9	15.3	13.6	10.0	7.6	5.7	5.3	1.5	-	5.0	8.3	1.5	4.5	44.1	40.9	-	-

Country	Education		Arts and humanities		Social sciences, journalism and information		Business, administration and law		Natural sciences, mathematics and statistics		Information and Communication Technologies		Engineering, manufacturing and construction		Agriculture, forestry, fisheries and veterinary		Health and welfare		Services	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
RS	2.5	0.9	25.8	19.1	8.8	5.9	4.8	6.6	22.1	12.8	1.5	6.9	16	28.4	4.0	5.0	11.5	9.4	3.0	5.0
TR	9.8	8.5	14.9	16.7	10.8	11.8	13.7	15	14.2	11.0	0.6	0.7	14.4	22.5	3.5	5.0	15.8	5.9	2.3	2.9
IL	9.5	1.6	15.9	15.7	20.4	11.6	5.9	5.2	33.6	39.8	2.4	5.9	10.2	18.9	2.1	1.4	-	-	-	-
AU	7.8	3.6	14.4	10.2	15.1	8.2	10.5	9.6	28.3	27.9	4.0	7.0	14.9	29.7	4.8	3.5	-	-	0.3	0.1
BR	13.1	6.9	15.7	15.1	9.6	8.7	6.3	8.7	16.1	16.9	0.7	3.4	15.3	20	13.1	11.6	-	-	10.1	8.7
CA	8.3	3.1	9.5	8.6	27.3	11.9	6.0	4.4	28.4	30.1	2.4	5.3	12.9	32.9	3.2	2.3	-	-	2.2	1.5
JP	7.5	4.0	25	10.6	8.9	5.0	6.4	6.3	14.9	22.3	-	-	23.8	43.1	12.5	8.7	-	-	1.0	0.1
MX	51.0	33.5	3.6	4.4	18.4	21.8	10.6	14	9.4	13.1	0.3	1.3	4.0	8.1	1.7	2.2	-	-	0.9	1.4
US	28.6	11.7	8.9	10	19	10.8	6.9	6.5	22.7	27.9	2.1	5.8	9.6	25.3	1.7	1.6	-	-	0.6	0.4

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02); OECD (Graduates by field).

Notes: Definition differs, see metadata for: IE (Women, Total, Year: 2021); Data included in another category: DK (Field of study: Education, Business, Administration and Law, Information and Communication Technology, Services), JP (Field of study: ICT; Women, Total, Year: 2020); Includes data from another category: DK (Field of study: Social Sciences, Journalism and Information, Engineering, Manufacturing and Construction), JP (Field of study: Education, Arts and the Humanities, Social Sciences, Journalism and Information, Business, Administration and Law, Natural Sciences, Mathematics and Statistics, Engineering, Manufacturing and Construction, Agriculture, Forestry, Fisheries and Veterinary, Services; Women, Total, Year: 2020); Reference year differs: UK: 2019, BA: 2020, 0: 2020; Data not available: JP (Field of study: ICT; Women, Total, Year: 2020), IL, AU, BR, CA, JP, MX, RU, US (Field of study: Health and Welfare; Women, Total). For proportions based on fewer than 30 graduates, the numerator and denominator are displayed in brackets.

2.4 Gender gap among Doctoral graduates in the narrow fields of STEM

The EU Gender Equality Strategy 2020-2025 highlights the importance of tackling the gender gap among STEM graduates within the context of the rapid development of the digital economy. As women's and men's careers are impacted by the different education pathways they pursue, assessing the variation in women's and men's representation in STEM education is of central importance. This section examines indicators that show women's representation among Doctoral graduates in narrow fields of STEM and assesses how far women's representation among Doctoral graduates in STEM fields has progressed over time.

Women's representation in STEM fields at Doctoral level has improved since 2018, but women continue to be underrepresented in half of all narrow STEM fields

At EU level, the latest data (from 2021) show that gender balance is achieved in the narrow field of Environment (52 %) and Biological and Related Sciences (60 %) and only just reached in Manufacturing and Processing (41 %) and Architecture and Construction (41 %). The data also show that women's representation among Doctoral graduates is close to achieving gender balance in the field of Physical Sciences (37 %), while women remain underrepresented in the narrow fields of Mathematics and Statistics (29 %), Engineering and Engineering Trades (27 %) and ICT (21 %). This means that women remain underrepresented in more than half (five out of eight) of all STEM fields.

Compared to 2018, of those narrow fields where the proportion of women Doctoral graduates (ISCED 8) has increased at EU level (Biological and Related Sciences, ICT, Engineering and Engineering Trades, and Manufacturing and Processing), showing growth of up to 2 pp (see Table 2.7). The difference is also marginal for those narrow STEM fields where the proportion of women graduates has decreased, such as Environment (3 pp), Physical Sciences (1 pp), and Mathematics and Statistics (3 pp). A similar but slightly more positive trend is evident across G20 countries, where the proportion of women Doctoral graduates has grown by almost 4 pp, on average, in all fields except Architecture and Construction.

Five countries (IE, SK, UK, AU, US) have improved in women's representation in six of the eight narrow STEM fields since 2018, ranging from 1 pp to 17 pp. Across all fields, Australia has the largest increase in the proportion of women Doctoral graduates in STEM fields since 2018, with an average increase of 7 pp. Nevertheless, gender balance is only achieved in Biological and Related Sciences (54 %), Environment (52 %), and Mathematics and Statistics (41 %).

An improvement in women's representation in ICT and Engineering and Engineering Trades is noted in almost half of all Member States, Associated Countries and G20 countries. In ICT, Czechia has the largest increase in the proportion of women Doctoral graduates (about 18 pp), while Bulgaria has the largest increase in Engineering and Engineering Trades (about 11 pp). Despite this improvement, data from 2021 show that Romania alone has achieved gender balance in ICT, while only three countries (PT, IS, AL) have achieved gender balance in Engineering and Engineering Trades (data for Iceland and Albania are based on a small sample size.) This demonstrates that the improvements in women's representation have not been significant enough to alter the gender imbalance in these fields.

Table 2.7 Proportion (%) of women Doctoral graduates, by narrow field of study, Natural Sciences, ICT, and Engineering, 2018 and 2021

Country	Natural sciences, mathematics and statistics (EF05)								Information and Communication Technologies (EF06)		Engineering, manufacturing and construction (EF07)					
	Biological and related sciences (EF051)		Environment (EF052)		Physical sciences (EF053)		Mathematics and statistics (EF054)		Information and Communication Technologies (EF061)		Engineering and engineering trades (EF071)		Manufacturing and processing (EF072)		Architecture and construction (EF073)	
	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021
EU-27	**59.6**	**60.4**	**55.0**	**52.3**	**38.2**	**36.8**	**32.6**	**29.4**	**20.3**	**21.4**	**27.1**	**27.3**	**39.6**	**41.1**	43.7	**40.9**
BE	50.0	46.4	100.0 (6/6)	20.0 (1/5)	29.2	29.2	39.2	40.8	37.5 (6/16)	13.3 (2/15)	27.9	38.3	50.0 (5/10)	35.0 (7/20)	26.5	39.2
BG	75.4	66.7	80.0 (4/5)	70.0 (7/10)	60.7	58.7	47.6 (10/21)	72.2 (13/18)	33.3 (9/27)	25.0 (6/24)	19.8	31.2	57.1 (12/21)	60.0 (9/15)	43.8 (7/16)	33.3 (3/9)
CZ	60.3	60.3	38.5	45.8	36.4	36.7	33.3	37.0 (10/27)	3.5	21.6	22.8	19.6	55.3	47.2	28.7	28.4
DK	-	-	-	-	-	-	-	-	-	-	30.3	32.2	-	-	-	-
DE	58.7	59.0	-	-	31.6	31.5	29.4	24.9	14.6	17.0	17.9	18.6	31.4	26.8	37.0	34.5
EE	58.1	50.0 (10/20)	60.0 (3/5)	42.9 (3/7)	41.7 (10/24)	60.7 (17/28)	-	66.7 (2/3)	13.8 (4/29)	21.7 (5/23)	42.9	35.7 (10/28)	-	-	55.6 (5/9)	33.3 (4/12)
IE	56.3	57.7	51.9 (14/27)	63.0 (17/27)	44.6	44.9	19.2 (5/26)	36.0 (9/25)	34.4	33.8	22.4	31.3	70.6 (12/17)	87.5 (14/16)	23.8 (5/21)	14.3 (1/7)
EL	63.4	64.0	50.0 (2/4)	40.0 (2/5)	49.2	47.4	31.4	37.9	31.1	34.1	33.7	28.7	40.0 (8/20)	52.4 (11/21)	45.9	40.2
ES	60.8	60.2	-	49.5	48.1	42.2	38.6	34.5	-	21.3	-	26.4	-	51.5	39.1	36.6
FR	57.7	58.2	-	-	35.6	36.9	28.8	23.0	25.4	23.3	30.2	29.1	-	-	36.7	41.1
HR	75.7	69.8	-	-	50.0	52.5	54.5 (6/11)	50.0 (7/14)	20.0 (3/15)	28.6 (2/7)	16.7	25.3	75.0 (6/8)	73.3 (11/15)	-	54.5 (6/11)
IT	65.9	66.7	55.8	56.9	41.8	41.2	34.9	29.5	20.4	26.5	27.3	25.7	39.5	48.4	-	54.0
CY	75.0 (3/4)	100.0 (8/8)	-	100 .0 (3/3)	50.0 (1/2)	85.7 (6/7)	66.7 (2/3)	-	-	33.3 (1/3)	14.3 (2/14)	18.8 (3/16)	-	-	37.5 (3/8)	60 .0 (6/10)
LV	60.0 (6/10)	55.6 (5/9)	50.0 (2/4)	57.1 (4/7)	55.6 (10/18)	50.0 (9/18)	100.0 (1/1)	100.0 (1/1)	25.0 (1/4)	-	33.3 (6/18)	27.3 (6/22)	66.7 (2/3)	100.0 (1/1)	-	50.0 (2/4)

Country	Natural sciences, mathematics and statistics (EF05)								Information and Communication Technologies (EF06)		Engineering, manufacturing and construction (EF07)					
	Biological and related sciences (EF051)		Environment (EF052)		Physical sciences (EF053)		Mathematics and statistics (EF054)		Information and Communication Technologies (EF061)		Engineering and engineering trades (EF071)		Manufacturing and processing (EF072)		Architecture and construction (EF073)	
	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021
LT	60.0	75.7	85.7 (12/14)	41.7 (5/12)	46.9	44.4	57.1 (4/7)	20.0 (1/5)	16.7 (1/6)	16.7 (1/6)	20.5	15.0	14.3 (2/14)	35.0 (7/20)	54.5 (6/11)	26.3 (5/19)
LU	44.4 (8/18)	47.4 (9/19)	-	-	33.3 (7/21)	47.1 (8/17)	14.3 (1/7)	-	8.3 (2/24)	21.1	-	-	-	-	-	-
HU	57.5	61.7	55.8	38.2	40.2	30.8	20.0 (4/20)	46.4 (13/28)	10.6	17.9	20.7	26.6	60.0 (12/20)	44.0 (11/25)	28.2	31.8 (7/22)
MT	100.0 (3/3)	100.0 (1/1)	-	-	50.0 (2/4)	-	-	-	-	-	-	16.7 (1/6)	-	-	-	100.0 (1/1)
AT	50.9	50.0	37.5 (9/24)	60.0 (3/5)	33.5	27.3	27.0	30.3	-	8.7 (2/23)	27.3	27.6	22.2 (2/9)	41.2 (7/17)	24.0	36.6
PL	72.0	70.2	62.5	40.0 (2/5)	56.5	51.1	29.0	22.4	10.2	6.5	38.8	38.4	70.3	57.4	47.3	37.5
PT	68.3	66.2	61.1 (11/18)	64.5	56.9	40.7	48.6	25.8	26.3	19.2	34.5	41.5	47.2	43.9	39.3	36.1
RO	75.0 (21/28)	68.4	33.3 (2/6)	71.4 (5/7)	58.1	60.8	43.8 (7/16)	72.2 (13/18)	52.8	50.0	33.3	36.7	39.5	44.3	45.3	41.6
SI	60.0 (15/25)	-	75.0 (3/4)	100.0 (1/1)	50.0 (4/8)	50.0	50.0 (3/6)	100.0 (4/4)	17.9 (5/28)	5.3 (1/19)	40.4	17.9	-	-	42.9 (3/7)	46.7 (7/15)
SK	77.2	71.2	44.8 (13/29)	60.0 (15/25)	41.5	49.5	41.2 (7/17)	20.0 (2/10)	12.1	14.3	17.9	21.0	34.8 (8/23)	46.4 (13/28)	35.9	37.8
FI	54.6	61.3	62.5	45.8 (11/24)	43.4	33.3	16.1	31.3 (5/16)	26.2	15.7	27.8	28.0	56.7	19.4	43.3	40.7 (11/27)
SE	48.0	47.9	66.0	58.5	35.5	36.7	22.5	32.5	25.7	26.7	31.3	28.4	30.9	23.4	34.6	34.0
IS	40.0 (2/5)	71.4 (5/7)	66.7 (2/3)	30.0 (3/10)	11.1 (1/9)	37.5 (6/16)	-	-	-	-	-	50.0 (3/6)	100.0 (1/1)	-	100.0 (1/1)	50.0 (1/2)
NO	58.8	61.5	25.0 (1/4)	45.5 (5/11)	32.8	26.4	30.8 (4/13)	28.6 (4/14)	20.8 (5/24)	23.8 (5/21)	20.5	19.7	-	-	45.5 (10/22)	35.7 (10/28)

Country	Natural sciences, mathematics and statistics (EF05)								Information and Communication Technologies (EF06)		Engineering, manufacturing and construction (EF07)					
	Biological and related sciences (EF051)		Environment (EF052)		Physical sciences (EF053)		Mathematics and statistics (EF054)		Information and Communication Technologies (EF061)		Engineering and engineering trades (EF071)		Manufacturing and processing (EF072)		Architecture and construction (EF073)	
	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021
UK	60.1	61.4	-	-	36.5	37.3	31.3	27.4	24.0	25.7	21.4	24.9	25.9	31.5	37.1	38.1
ME	-	100.0 (1/1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MK	100.0 (3/3)	100.0 (1/1)	-	-	100.0 (4/4)	100.0 (2/2)	33.3 (1/3)	50.0 (1/2)	60.0 (6/10)	76.9 (10/13)	28.6 (4/14)	35.7 (5/14)	100.0 (2/2)	50.0 (1/2)	-	-
AL	-	55.6 (5/9)	-	100.0 (1/1)	-	60.0 (3/5)	-	85.7 (6/7)	-	100.0 (4/4)	-	56.3 (9/16)	-	80.0 (4/5)	-	-
RS	67.0	78.6	76.2 (16/21)	71.4 (5/7)	69.2	61.7	57.7 (15/26)	65.0 (13/20)	34.8 (8/23)	21.4 (6/28)	45.3	33.6	69.0 (20/29)	73.1 (19/26)	55.6	42.1 (8/19)
TR	60.3	56.1	45.5 (5/11)	35.7 (5/14)	49.8	43.1	52.0	55.7	48.7	38.3	22.6	22.6	65.9	57.4	50.2	45.8
IL	63.7	54.5	47.5	44.4	37.7	37.1	38.9	14.9	26.4	27.1	24.8	31.1	83.3 (10/12)	58.3 (7/12)	14.3 (1/7)	36.4 (4/11)
AU	54.2	53.7	47.9	52.0	38.4	36.9	28.8	40.9	27.4	33.2	26.2	27.7	31.0	32.9	33.8	35.5
BR	61.6	62.9	-	-	40.8	40.6	27.7	21.6	18.9	18.0	36.6	35.4	64.2	66.7	60.7	63.2
CA	51.5	53.9	58.3	52.3	32.5	36.5	29.3	29.2	23.2	27.4	22.7	23.5	50.0	57.1	-	27.3
MX	56.1	-	-	-	39.3	-	38.3	-	27.6	28.4	25.7	-	55.4	-	40.7	-
US	53.3	53.1	50.9	52.3	34.1	35.8	27.9	27.9	21.5	25.7	23.6	25.0	26.1	30.0	32.3	34.9

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02); OECD (Graduates by field).

Notes: Definition differs, see metadata for: EU-27 (2018, 2021), IE (2018, 2021), FR (2018), NL (2021), ME (2018); Data included in another category: JP (2018, 2021), BR (2018), CA (2018), MX (2021); Not applicable: IT(2018); Reference year differs: IT: 2019, BR: 2019, CA: 2019; Data not available: DK (all fields but Engineering and Engineering Trades), NL, BA, JP (Year: 2021, Sex: Women, Total), NL, BA, ME, JP, AL (Year: 2018, Sex :Women, Total), RU (Year: 2018, Sex: Women). For proportions based on fewer than 30 graduates, the numerator and denominator are displayed in brackets.

While the number of women Doctoral graduates is growing at a faster rate than the number of men in ICT, it is declining more quickly in Physical Sciences and Mathematics and Statistics, demonstrating little progress in closing the gender gap in fields where women are most underrepresented

Table 2.8 shows the rate at which the number of women and men Doctoral graduates is changing in the narrow fields of STEM. The number of women and men Doctoral graduates has decreased in Biological and Related Sciences, Physical Sciences, and Mathematics and Statistics, while increasing in all other narrow fields of STEM ([105]) ([106]).

Within the five fields with a positive CAGR for both women and men (indicating growth), the rate is higher for women in three of these fields: 9 % for women and 7 % for men in ICT, 18 % for women and 10 % for men in Manufacturing and Processing, and 10 % for women and 4 % for men in Architecture and Construction. This finding is especially important in light of the underrepresentation of women in ICT (see Table 2.7).

By contrast, of the three fields with a negative CAGR for both women and men (indicating a decrease), the rate is lower for women in Physical Sciences (-3 % for women and -2 % for men) and Mathematics and Statistics (-7 % for women and -2 % for men). This indicates that the number of women is not only declining, but is falling at a rate faster than men in fields where women are already underrepresented, exacerbating the gender gap at EU level.

At country level, the CAGR is higher for women than men in most countries in ICT ([107]) and Engineering and Engineering Trades ([108]). However, in the remaining six narrow STEM fields, the number of women Doctoral graduates has grown at a slower rate relative to the growth rate of men in most Member States, Associated Countries, and G20 countries for which data were available.

Greece and Romania are notable examples. In Greece, the CAGR for women is positive in all but two STEM fields (Environment; Engineering and Engineering Trades) and the number of women has grown at a faster rate than men in four fields (Biological and Related Sciences; Mathematics and Statistics; ICT; Manufacturing and Processing). In Romania, the CAGR is positive for women in all but one STEM field (Physical Sciences) and the number of women has increased per year at a faster rate, on average, than for men in four STEM fields (Environment; Mathematics and Statistics; Engineering and Engineering Trades; Manufacturing and Processing).

([105]) Environment, ICT, Engineering and Engineering Trades, Manufacturing and Processing, Architecture and Construction.

([106]) Biological and Related Sciences, Physical Sciences, Mathematics and Statistics.

([107]) CZ, DE, EE, EL, HR, IT, LU, HU, SK, SE, NO, CH, UK, MK, IL, AU, CA.

([108]) BE, BG, DK, DE, IE, HR, CY, HU, AT, PT, RO, SK, CH, UK, MK, IL, AU, CA.

Table 2.8 CAGR (%), by sex and narrow field of study, Natural Sciences, ICT, and Engineering, 2018-2021

Country	Natural sciences, mathematics and statistics (EF05)								Information and Communication Technologies (EF06)		Engineering, manufacturing and construction (EF07)					
	Biological and related sciences (EF051)		Environment (EF052)		Physical sciences (EF053)		Mathematics and statistics (EF054)		Information and Communication Technologies (EF061)		Engineering and engineering trades (EF071)		Manufacturing and processing (EF072)		Architecture and construction (EF073)	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**-2**	**-3**	**20**	**25**	**-3**	**-2**	**-7**	**-2**	**9**	**7**	**12**	**12**	**18**	**15**	**10**	**4**
BE	-14	-10	-45	-	0	0	15	13	-31	9	-13	-25	12	38	20	-1
BG	-5	10	21	44	-19	-17	9	-23	-13	0	8	-12	-9	-13	-25	-13
CZ	0	0	14	3	-6	-6	-8	-13	59	-19	-10	-4	-7	4	-5	-5
DK	-	-	-	-	-	-	-	-	-	-	1	-2	-	-	-	-
DE	-2	-3	-	-	-2	-2	-10	-3	7	1	1	0	-4	4	-3	1
EE	-18	-8	0	26	19	-8	-	-21	8	-10	-18	-9	-	-	-7	26
IE	-2	-4	7	-8	-1	-2	22	-9	3	4	23	6	5	-26	-42	-28
EL	7	6	0	14	6	9	31	20	2	-2	-6	1	11	-6	65	78
ES	-18	-17	-	-	-29	-23	-42	-39	-	-	-	-	-	-	-21	-18
FR	-6	-6	-	-	-4	-5	-9	1	-4	-1	-4	-3	-	-	-5	-10
HR	2	13	-	-	2	-1	5	12	-13	-25	24	4	22	26	-23	-6
IT	0	-2	10	8	6	7	-8	5	17	-1	2	7	0	-17	8	-1
CY	39	-	-	-	82	0	-	-	-	-37	14	3	-	-	26	-7
LV	-6	0	26	14	-3	4	0	-	-	-13	0	10	-21	-	-	0
LT	16	-9	-25	52	2	6	-37	10	0	0	-9	3	52	3	-6	41
LU	4	0	-	-	5	-14	-	-6	59	11	-	-	-	-	-	-
HU	8	2	-18	3	-4	10	48	-2	34	9	34	20	-3	21	-14	-19
MT	-31	-	-	-	-	14	-	-	-	14	-	71	-	0	-	-
AT	-14	-13	-31	-49	-9	0	6	0	-	14	2	1	52	13	17	-4

Country	Natural sciences, mathematics and statistics (EF05)								Information and Communication Technologies (EF06)		Engineering, manufacturing and construction (EF07)					
	Biological and related sciences (EF051)		Environment (EF052)		Physical sciences (EF053)		Mathematics and statistics (EF054)		Information and Communication Technologies (EF061)		Engineering and engineering trades (EF071)		Manufacturing and processing (EF072)		Architecture and construction (EF073)	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
PL	-13	-11	-54	-37	-10	-3	-15	-5	-31	-18	-6	-5	6	28	-18	-7
PT	-8	-5	22	16	-12	9	-24	7	-21	-9	2	-8	2	7	-11	-7
RO	23	37	36	-21	-1	-5	23	-18	20	25	24	18	27	19	10	16
SI	-	-	-31	-	71	71	10	-	-42	-8	-28	5	-	-	33	26
SK	-4	7	5	-15	10	-1	-34	-7	14	7	-3	-9	18	0	0	-3
FI	-6	-14	-18	3	-11	2	0	-25	-22	-3	-9	-9	-29	24	-5	-2
SE	-1	-1	-4	7	-2	-4	14	-3	-7	-9	3	8	-19	-8	-3	-2
IS	36	-13	14	91	82	8	-	-	-	0	-	-	-	-	0	-
NO	6	2	71	26	-11	-2	0	4	0	-6	6	8	-	-	0	14
UK	7	2	-	-	2	-1	-10	8	7	-2	24	2	31	-1	0	-4
MK	-31	-	-	-	-21	-	0	-21	19	-9	8	-3	-21	-	-	-
RS	-18	-32	-32	-26	-16	-6	-5	-14	-9	14	-16	-1	-2	-8	-26	-12
TR	-5	0	0	14	-9	0	-4	-9	-2	13	4	5	1	13	3	9
IL	-7	6	-6	-2	-1	0	-21	22	-6	-7	13	2	-11	36	59	5
AU	-4	-3	18	12	-6	-4	2	-15	9	-1	2	-1	-1	-4	7	1
BR	-11	-14	-	-	-11	-11	-14	1	-9	-7	-9	-7	-7	-12	-11	-16
CA	-5	-10	-9	2	1	-8	-6	-6	0	-10	1	-2	7	-7	2	-1

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02); OECD (Graduates by field).

Notes: Definition differs, see metadata for: EU-27 (2018 and 2021, Sex: Women, Men), IE (2018, 2021, Sex: Women, Men), FR (2018, Sex: Women, Men), NL (2021, Sex: Women, Men), ME (2018, Sex: Women, Men); Data included in another category: JP (2018); Reference year differs: IT: 2019, BR: 2019, CA: 2019; Data not available: DK (all fields except Engineering and Engineering Trades), NL, BA, JP (Year: 2021, Sex: Women, Men), NL, BA, ME, JP, AL, RU (Year: 2018, Sex: Women, Men).

Annex indicators

Annex 2.1 Number of Doctoral (ISCED 8) graduates, by sex, 2013-2021

Country	2013		2014		2015		2016		2017		2018		2019		2020		2021	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**49135**	**54357**	**49417**	**53789**	**50303**	**55314**	**50452**	**53453**	**52104**	**56792**	**48328**	**52443**	**46065**	**50617**	**41933**	**46507**	**45641**	**50315**
BE	1054	1410	1137	1444	1214	1586	1353	1537	1284	1634	1338	1713	1303	1711	1278	1579	1332	1602
BG	616	586	719	644	719	723	773	691	760	663	725	640	721	564	598	499	628	521
CZ	1040	1393	1062	1422	1070	1370	1015	1364	985	1450	1053	1356	1018	1328	847	1043	923	1198
DK	852	1036	1002	1124	1054	1122	1065	1133	1081	1151	1025	1069	1028	1067	939	950	1009	1036
DE	12256	15451	12798	15349	13052	16166	13248	16055	12713	15691	12577	15261	13038	15652	11825	14395	12927	15226
EE	139	94	113	100	107	101	130	109	146	107	118	126	126	109	128	93	113	109
IE	747	785	862	876	683	746	807	761	741	704	747	719	811	744	742	675	840	694
EL	691	836	784	817	852	950	986	1017	843	1034	739	819	881	893	822	775	966	973
ES	5237	5267	5361	5528	5667	5649	7463	7231	10104	9945	9093	8193	4732	4608	4545	4808	5457	5679
FR	6088	7802	6003	7362	6028	7759	5797	7219	6145	7438	6026	7703	5916	7489	5176	6634	5388	6859
HR	454	376	450	405	497	381	355	291	397	319	349	298	377	303	354	261	399	338
IT	5557	5130	5588	5090	5409	5076	5077	4726	4832	4567	4028	3946	4080	3911	3811	3880	3970	4152
CY	26	26	33	27	42	35	61	38	46	46	59	61	72	56	81	71	93	48
LV	181	134	159	105	141	114	114	83	93	58	67	56	71	63	66	54	81	68
LT	260	181	243	168	248	169	187	137	190	139	202	147	192	133	186	159	190	189
LU	25	39	31	51	48	59	43	64	71	81	48	87	44	64	47	84	63	88
HU	495	574	553	601	559	647	589	666	551	626	595	692	592	679	604	617	716	793
MT	12	12	6	16	16	14	15	22	28	26	27	26	18	22	36	30	77	53
NL	1997	2324	2142	2386	2290	2373	-	-	2274	2473	2300	2481	2350	2606	2218	2242	2612	2607
AT	974	1254	924	1283	954	1236	947	1292	1191	1438	1223	1557	934	1282	902	1277	846	1271
PL	2051	1668	1798	1578	2078	1709	2030	1734	1767	1429	2057	1600	2262	1777	1313	1126	1537	1342
PT	1355	1108	1347	1156	1259	1092	1289	1055	1167	968	1199	1067	1145	958	1019	922	1059	1021
RO	2808	2562	1932	1845	2082	1910	1238	1022	1027	861	980	863	967	953	1073	996	1398	1166
SI	626	540	562	441	568	432	2308	1455	246	268	249	212	259	218	221	210	217	188
SK	1091	1028	1082	1100	953	961	928	843	820	840	692	716	691	741	662	639	632	659

Country	2013		2014		2015		2016		2017		2018		2019		2020		2021	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
FI	961	938	1061	952	1052	948	1036	973	982	871	969	896	940	854	1010	891	859	784
SE	1542	1803	1665	1919	1661	1986	1598	1935	1621	1965	1537	1675	1497	1832	1431	1597	1309	1651
IS	26	29	53	35	35	32	46	26	43	21	36	25	52	44	46	29	41	42
NO	741	808	712	730	731	676	686	682	739	750	756	744	787	808	753	785	855	823
CH	1589	2042	1664	2183	1727	2127	1743	2192	1859	2291	1864	2299	1970	2333	2067	2350	2128	2396
UK	12033	13863	11757	13263	12507	14129	12647	14719	13187	14956	13744	15725	14095	15245	-	-	-	-
BA	-	-	-	-	-	-	-	-	-	-	-	-	69	97	58	90	-	-
ME	-	-	-	-	-	-	19	9	8	10	14	12	8	12	13	10	9	5
MK	119	100	106	100	143	103	111	86	123	86	141	102	122	82	99	75	115	86
AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	261	132
RS	-	-	356	385	574	515	585	481	883	656	567	385	420	403	448	344	399	320
TR	-	-	2155	2361	2394	2798	2803	3249	2960	3085	3435	3897	3751	4318	3434	4164	3921	4936
IL	804	737	769	777	804	813	768	802	859	759	829	741	806	836	915	896	829	811
AU	4045	4056	4205	4195	4282	4345	4501	4588	4613	4629	4292	4485	4740	4749	4376	4489	4155	4319
BR	-	-	9104	7641	10141	8484	11190	9415	11754	9855	12414	10513	13419	11013	10870	9205	11499	9184
CA	3186	3873	3250	3940	3416	4130	3613	4155	3767	4236	3923	4325	3660	4203	3678	4224	3552	3834
JP	4953	11518	4953	11518	4747	10967	4904	10900	4781	10893	4805	10885	4927	10672	4803	10742	5057	10948
MX	2409	2604	2758	3024	2930	3120	4670	4598	4751	4559	5453	5033	5935	5476	6362	6229	7607	6980
US	32115	32905	33592	33846	34415	34508	34724	34801	35675	35367	36575	36156	37393	36530	37562	35943	37656	34762

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02); OECD (Graduates by field).

Notes: Definition differs, see metadata for: IT (Year: 2017), FR (Year: 2018), IE (Year: 2018, 2019, 2020, 2021), EU-27 (Year: 2016, 2018); Provisional: IT; (Year: 2020); Missing value: BR (Year: 2013); Data not available: UK (Year: 2020, 2021), BA (Year: 2013, 2014, 2015 2016, 2017, 2018, 2021), AL (Year: 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020), IL, AU, CA, JP, MX (Year: 2021), RU (Year: 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2021), ME (Year: 2013, 2014, 2015), RS (Year: 2013), TR (Year: 2013), BR (Year: 2013, 2021), US (Year: 2013 (Men), 2021).

Annex 2.2 Number of Doctoral (ISCED 8) graduates, by sex and broad field of study, 2021

Country	Education		Arts and humanities		Social sciences, journalism and information		Business, administration and law		Natural sciences, mathematics and statistics		Information and Communication Technologies		Engineering, manufacturing and construction		Agriculture, forestry, fisheries and veterinary		Health and welfare		Services		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**1656**	**796**	**5436**	**4736**	**4507**	**3712**	**3415**	**3947**	**10124**	**12900**	**660**	**2425**	**4586**	**10988**	**1781**	**1290**	**12964**	**8806**	**428**	**645**	**45641**	**50315**
BE	26	6	120	141	198	117	75	89	256	393	2	13	206	467	67	60	377	311	5	5	1332	1602
BG	58	25	94	87	139	81	80	69	87	47	6	18	42	80	16	13	92	68	14	33	628	521
CZ	60	24	117	115	88	63	63	88	252	266	8	49	118	391	48	46	140	103	29	53	923	1198
DK	0	0	105	85	114	82	0	0	137	199	0	0	171	360	69	57	413	253	0	0	1009	1036
DE	291	154	1020	798	823	651	937	1408	3077	4461	161	749	729	2943	510	276	5294	3708	85	76	12927	15226
EE	6	2	20	10	5	12	8	7	32	26	5	18	14	26	10	5	13	3	0	0	113	109
IE	51	21	83	85	148	74	67	48	174	159	23	45	77	144	18	8	196	107	3	3	840	694
EL	96	39	164	73	62	78	45	47	132	146	21	36	150	272	29	26	239	233	28	23	966	973
ES	374	231	746	755	716	689	280	373	1281	1264	56	207	458	1008	187	159	1299	881	60	112	5457	5679
FR	75	46	944	741	604	661	435	442	1606	2497	157	516	531	1170	107	85	876	642	53	59	5388	6859
HR	28	15	46	44	49	25	14	12	69	49	2	5	40	77	16	20	133	79	2	12	399	338
IT	59	17	449	382	329	256	367	377	1158	1216	41	114	672	1220	227	162	663	397	5	11	3970	4152
CY	13	8	11	5	17	5	11	6	17	1	1	2	9	17	5	2	8	2	1	0	93	48
LV	0	0	8	1	7	13	14	10	19	16	0	2	9	18	5	2	18	5	1	1	81	68
LT	10	2	24	22	27	18	18	11	50	40	1	5	18	61	9	8	33	22	0	0	190	189
LU	7	2	5	5	12	7	11	6	17	24	8	30	3	14	0	0	0	0	0	0	63	88
HU	34	6	112	98	101	100	35	35	124	162	12	55	47	109	28	31	186	137	7	29	716	793

Country	Education		Arts and humanities		Social sciences, journalism and information		Business, administration and law		Natural sciences, mathematics and statistics		Information and Communication Technologies		Engineering, manufacturing and construction		Agriculture, forestry, fisheries and veterinary		Health and welfare		Services		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
MT	22	7	2	4	22	12	19	11	1	3	0	3	2	6	0	0	8	7	1	0	77	53
NL	47	18	150	204	274	179	214	207	348	536	28	97	188	428	168	146	1195	792	0	0	2612	2607
AT	31	11	111	104	50	53	115	137	141	270	18	101	157	383	43	35	146	142	1	5	846	1271
PL	46	13	325	316	175	131	111	121	321	286	2	29	191	260	63	33	274	112	29	41	1537	1342
PT	115	67	135	146	159	126	80	111	182	164	10	42	146	222	20	8	171	81	41	54	1059	1021
RO	33	13	307	252	130	79	194	130	116	63	38	41	211	336	73	61	270	125	26	66	1398	1166
SI	8	2	40	25	6	7	25	16	34	32	1	19	29	52	1	1	64	28	9	6	217	188
SK	36	17	97	83	50	31	86	102	155	106	6	36	60	152	24	20	98	65	20	47	632	659
FI	69	17	128	85	111	56	64	39	105	131	18	97	80	203	18	13	262	138	4	5	859	784
SE	61	33	73	70	91	106	47	45	233	343	35	96	228	569	20	13	496	365	4	4	1309	1651
IS	6	0	5	4	2	4	2	1	14	19	0	2	5	5	0	0	7	7	0	0	41	42
NO	46	16	88	49	117	89	33	30	173	265	5	16	46	146	15	10	314	184	18	18	855	823
CH	49	17	134	144	177	117	127	217	539	774	34	92	198	443	99	26	768	563	0	0	2128	2396
UK	782	338	2227	1918	1323	1136	906	1056	4342	4639	313	904	1262	3202	180	138	2754	1914	0	0	14095	15245
BA	4	7	7	2	12	34	4	16	4	7	3	3	7	10	5	1	11	4	1	6	58	90
ME	0	0	3	0	3	1	0	0	1	0	0	0	0	2	0	0	1	0	1	2	9	5
MK	5	2	15	8	22	13	17	15	4	1	10	3	6	12	1	3	25	22	10	7	115	86
AL	2	1	42	25	40	18	26	10	15	7	4	0	13	11	4	6	115	54	0	0	261	132

Country	Education		ırts and humanitie		Social sciences, journalism and information		Business, administration and law		Natural sciences, mathematics and statistics		Information and Communication Technologies		Engineering, manufacturing and construction		Agriculture, forestry, fisheries and veterinary		Health and welfare		Services		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
RS	10	3	103	61	35	19	19	21	88	41	6	22	64	91	16	16	46	30	12	16	399	320
TR	385	420	584	823	422	583	537	740	557	543	23	36	566	1112	139	245	619	291	89	143	3921	4936
IL	63	12	106	115	136	85	39	38	224	291	16	43	68	138	14	10	-	-	0	0	829	811
AU	258	135	475	385	499	310	348	362	936	1050	131	263	492	1118	159	131	-	-	10	5	4155	4319
BR	1162	546	1386	1202	851	695	555	690	1426	1344	60	273	1357	1590	1164	923	-	-	894	695	11499	9184
CA	249	108	285	303	822	420	180	156	855	1065	72	186	390	1161	96	81	-	-	66	54	3552	3834
JP	198	252	664	667	236	313	169	393	394	1399	-	-	631	2705	332	544	-	-	27	6	5057	10948
MX	3653	2227	258	292	1320	1450	760	933	673	873	24	88	287	535	124	148	-	-	64	95	7607	6980
US	8969	3829	2787	3265	5980	3531	2167	2121	7132	9118	648	1885	3018	8257	523	523	-	-	178	136	37656	34762

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02); OECD (Graduates by field).

Notes: Definition differs, see metadata for: IE; Data included in another category: (OECD): JP (Field of study: ICT, Sex: Women, Total, Year: 2020); Includes data from another category: JP (Field of study: Education, Arts and Humanities, Social Sciences, Journalism and Information, Business, Administration and Law, Natural Sciences, Mathematics and Statistics, Engineering, Manufacturing and Construction, Agriculture, Forestry, Fisheries and Veterinary, Services, Sex: Women, Total, Year: 2020); Reference year differs: UK: 2019, BA: 2020; Data not available: JP (Field of study: ICT, Health and Welfare, Sex: Women, Men, Year: 2020), IL, AU, BR, CA, JP, MX, RU, US (Field of study: Health and Welfare, Sex: Women, Men).

Annex 2.3 Number of Doctoral (ISCED 8) graduates, by sex and narrow field of study, Natural Sciences and Engineering (fields EF4, EF5 and EF6), 2021

Country	Natural sciences, mathematics and statistics (EF05)								Information and Communication Technologies (EF06)		Engineering, manufacturing and construction (EF07)					
	Biological and related sciences		Environment		Physical sciences		Mathematics and statistics		Information and Communication Technologies		Engineering and engineering trades		Manufacturing and processing		Architecture and construction	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**4183**	**2741**	**299**	**273**	**4249**	**7288**	**653**	**1567**	**583**	**2143**	**2365**	**6294**	**389**	**557**	**1058**	**1529**
BE	71	82	1	4	31	75	75	109	2	13	70	113	7	13	31	48
BG	40	20	7	3	27	19	13	5	6	18	29	64	9	6	3	6
CZ	143	94	22	26	72	124	10	17	8	29	52	213	17	19	23	58
DK	0	0	0	0	0	0	0	0	0	0	171	360	0	0	0	0
DE	1476	1026	0	0	1349	2932	139	420	139	680	252	1106	62	169	187	355
EE	10	10	3	4	17	11	2	1	5	18	10	18	0	0	4	8
IE	97	71	17	10	48	59	9	16	23	45	62	136	14	2	1	6
EL	32	18	2	3	73	81	25	41	15	29	54	134	11	10	76	113
ES	686	453	105	107	425	583	50	95	56	207	269	749	85	80	98	170
FR	463	332	0	0	1013	1730	130	435	157	516	292	712	0	0	92	132
HR	30	13	0	0	32	29	7	7	2	5	23	68	11	4	6	5
IT	540	270	29	22	501	714	88	210	41	114	315	910	30	32	327	278
CY	8	0	3	0	6	1	0	0	1	2	3	13	0	0	6	4
LV	5	4	4	3	9	9	1	0	0	2	6	16	1	0	2	2
LT	28	9	5	7	16	20	1	4	1	5	6	34	7	13	5	14
LU	9	10	0	0	8	9	0	5	8	30	0	0	0	0	0	0
HU	58	36	13	21	40	90	13	15	12	55	29	80	11	14	7	15
MT	1	0	0	0	0	3	0	0	0	3	1	5	0	1	1	0

Country	Natural sciences, mathematics and statistics (EF05)								Information and Communication Technologies (EF06)		Engineering, manufacturing and construction (EF07)					
	Biological and related sciences		Environment		Physical sciences		Mathematics and statistics		Information and Communication Technologies		Engineering and engineering trades		Manufacturing and processing		Architecture and construction	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AT	52	52	3	2	59	157	20	46	2	21	109	286	7	10	37	64
PL	106	45	2	3	183	175	11	38	2	29	107	172	31	23	24	40
PT	98	50	20	11	55	80	8	23	10	42	97	137	18	23	30	53
RO	39	18	5	2	59	38	13	5	33	33	137	236	31	39	32	45
SI	0	0	1	0	20	20	4	0	1	18	7	32	0	0	7	8
SK	84	34	15	10	52	53	2	8	6	36	25	94	13	15	14	23
FI	49	31	11	13	37	74	5	11	18	97	63	162	6	25	11	16
SE	58	63	31	22	117	202	27	56	35	96	176	444	18	59	34	66
IS	5	2	3	7	6	10	0	0	0	2	3	3	0	0	1	1
NO	24	15	5	6	14	39	4	10	5	16	31	126	0	0	10	18
UK	2740	1726	0	0	1376	2316	226	598	313	904	776	2337	132	287	330	536
BA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ME	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
MK	1	0	0	0	2	0	1	1	10	3	5	9	1	1	0	2
AL	5	4	1	0	3	2	6	1	4	0	9	7	4	1	0	3
RS	33	9	5	2	37	23	13	7	6	22	37	73	19	7	8	11
TR	272	213	5	9	175	231	102	81	18	29	219	751	116	86	135	160
IL	128	107	16	20	73	124	7	40	16	43	57	126	7	5	4	7
AU	457	394	92	85	212	363	36	52	131	263	260	680	51	104	172	312

Country	Natural sciences, mathematics and statistics (EF05)								Information and Communication Technologies (EF06)		Engineering, manufacturing and construction (EF07)					
	Biological and related sciences		Environment		Physical sciences		Mathematics and statistics		Information and Communication Technologies		Engineering and engineering trades		Manufacturing and processing		Architecture and construction	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
BR	993	585	0	0	375	549	58	210	60	273	680	1240	531	265	146	85
CA	375	321	69	63	276	480	63	153	69	183	285	927	24	18	81	216
JP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MX	0	0	0	0	0	0	0	0	29	73	0	0	0	0	0	0
US	3971	3504	249	227	2134	3824	546	1412	642	1860	2153	6455	399	932	466	870

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02); OECD (Graduates by field).

Notes: Definition differs, see metadata for: EU-27 (2021), IE (2021), NL (2021); Data included in another category: JP, MX; Reference year differs: UK: 2019, MX: 2019; Data not available: DK (all fields except Engineering and Engineering Trades), NL, BA, JP (Year: 2021, Sex: Women, Men).

Annex 2.4 Ratio of Doctoral graduates to Doctoral entrants, by sex and broad field of study, 2021

Country	Agriculture, forestry, fisheries and veterinary		Arts and humanities		Business, administration and law		Education		Engineering, manufacturing and construction		Health and welfare		Information and Communication Technologies		Natural sciences, mathematics and statistics		Services		Social sciences, journalism and information		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**0.87**	**0.80**	**0.64**	**0.71**	**0.63**	**0.64**	**0.62**	**0.62**	**0.63**	**0.70**	**0.81**	**0.86**	**0.49**	**0.61**	**0.80**	**0.86**	**0.58**	**0.65**	**0.63**	**0.66**	**0.68**	**0.72**
BE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.87	1.86
BG	0.94 (16/17)	0.87 (13/15)	0.91	0.78	0.52	0.49	0.62	0.96 (25/26)	0.55	0.43	0.56	0.60	0.29 (6/21)	0.40	0.96	0.75	0.93 (14/15)	1.14 (33/29)	0.79	0.68	0.69	0.62
CZ	0.46	0.43	0.48	0.57	0.37	0.36	0.55	0.50	0.44	0.60	0.52	0.49	0.19	0.30	0.48	0.56	0.44	0.46	0.52	0.38	0.47	0.50
DK	1.92	3.35 (57/17)	1.21	1.01	-	-	-	-	0.67	0.68	0.71	0.76	-	-	0.73	0.75	-	-	0.94	0.80	0.79	0.78
DE	1.31	1.08	0.74	0.76	0.71	0.83	0.73	0.84	0.74	0.92	0.87	0.96	0.50	0.69	0.88	1.00	0.98	1.19	0.77	0.89	0.74	0.84
EE	1.00 (10/10)	0.63 (5/8)	0.69 (20/29)	0.48 (10/21)	0.50 (8/16)	0.58 (7/12)	0.75 (6/8)	0.5 (2/4)	0.54 (14/26)	0.67	0.54 (13/24)	0.38 (3/8)	0.26 (5/19)	0.43	0.86	0.63	-	-	0.36 (5/14)	0.92 (12/13)	0.61	0.58
IE	0.50	0.35 (8/23)	0.31	0.73	0.78	0.62	0.84	1.17 (21/18)	0.66	0.70	0.70	0.72	0.38	0.51	0.66	0.67	0.50 (3/6)	0.25 (3/12)	0.81	0.87	0.62	0.68
EL	0.35	0.38	0.57	0.32	0.29	0.26	0.77	0.61	0.37	0.34	0.46	0.63	0.34	0.25	0.57	0.61	1.17 (28/24)	0.64	0.48	0.68	0.48	0.43
ES	0.77	0.79	0.54	0.63	0.43	0.40	0.61	0.62	0.57	0.55	0.60	0.64	0.49	0.57	0.75	0.71	0.37	0.53	0.50	0.58	0.59	0.60
FR	0.89	0.87	0.62	0.64	0.53	0.57	0.52	0.42	0.53	0.68	0.78	0.81	0.69	0.70	0.82	0.83	0.80	0.78	0.62	0.77	0.68	0.74
HR	0.43	0.47	0.67	0.54	0.39	0.52 (12/23)	0.48	0.88 (15/17)	0.37	0.38	0.91	0.83	1.00 (2/2)	0.45 (5/11)	0.50	0.48	0.15 (2/13)	0.57 (12/21)	0.45	0.34	0.56	0.50
IT	0.76	0.73	0.67	0.74	0.65	0.72	0.54	0.35	0.70	0.62	0.73	0.58	0.69	0.54	0.78	0.77	0.63 (5/8)	0.65 (11/17)	0.72	0.59	0.72	0.67
CY	5.00 (5/1)	1.00 (2/2)	0.48 (11/23)	0.45 (5/11)	0.22	0.17	0.37	0.47 (8/17)	0.56 (9/16)	0.47	0.4 (8/20)	0.17 (2/12)	0.10 (1/10)	0.11 (2/19)	1.21 (17/14)	0.04 (1/26)	0.17 (1/6)	-	0.61 (17/28)	0.45 (5/11)	0.46	0.28
LV	1.00 (5/5)	0.40 (2/5)	0.21	0.06 (1/16)	0.21	0.13	-	-	0.23	0.28	0.64 (18/28)	0.33 (5/15)	-	0.12 (2/17)	0.51	0.38	0.50 (1/2)	0.13 (1/8)	0.18	0.93 (13/14)	0.29	0.26

Country	Agriculture, forestry, fisheries and veterinary		Arts and humanities		Business, administration and law		Education		Engineering, manufacturing and construction		Health and welfare		Information and Communication Technologies		Natural sciences, mathematics and statistics		Services		Social sciences, journalism and information		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
LT	1.13 (9/8)	1.14 (8/7)	0.47	0.92 (22/24)	0.58	0.65 (11/17)	0.77 (10/13)	0.50 (2/4)	0.53	0.92	0.87	0.96 (22/23)	0.11 (1/9)	0.33 (5/15)	0.54	0.65	-	-	0.69	1.00 (18/18)	0.60	0.80
LU	-	-	1.67 (5/3)	2.50 (5/2)	2.75 (11/4)	1.00 (6/6)	2.33 (7/3)	-	1.50 (3/2)	1.17 (14/12)	-	-	1.14 (8/7)	1.03 (30/29)	0.89 (17/19)	1.26 (24/19)	-	-	1.09 (12/11)	0.70 (7/10)	1.29	1.13
HU	0.21	0.26	0.38	0.44	0.47	0.42	0.49	0.16	0.39	0.50	0.73	0.69	0.50 (12/24)	0.53	0.54	0.54	0.29 (7/24)	0.50	0.35	0.33	0.47	0.48
MT	-	-	-	-	9.50 (19/2)	1.83 (11/6)	-	-	-	-	8.00 (8/1)	-	-	-	-	-	-	-	3.14 (22/7)	0.71 (12/17)	7.70 (77/10)	2.30 (53/23)
NL	1.93	2.06	2.14	3.24	3.24	2.72	2.14 (47/22)	4.50 (18/4)	1.39	1.18	2.96	3.38	2.80 (28/10)	1.52	1.92	1.55	-	-	1.62	2.56	1.64	1.56
AT	1.00	0.97	0.45	0.47	0.39	0.49	0.48	0.55 (11/20)	0.74	0.83	0.53	0.57	0.33	0.56	0.59	0.80	0.25 (1/4)	0.31 (5/16)	0.22	0.37	0.49	0.64
PL	0.77	0.87	1.00	1.19	1.22	1.48	0.58	0.34	0.64	0.39	0.82	0.62	0.03	0.35	0.66	0.63	2.07 (29/14)	3.42 (41/12)	0.85	0.69	0.74	0.62
PT	0.29	0.18	0.32	0.38	0.37	0.32	0.45	0.57	0.31	0.30	0.40	0.40	0.21	0.29	0.45	0.43	0.34	0.36	0.26	0.25	0.35	0.34
RO	0.43	0.40	0.55	0.58	0.64	0.60	0.48	0.46 (13/28)	0.46	0.40	0.43	0.35	0.66	0.43	0.48	0.49	0.45	0.69	0.55	0.57	0.50	0.47
SI	1.00 (1/1)	0.20 (1/5)	1.54 (40/26)	1.79 (25/14)	0.51	0.33	0.21	0.18 (2/11)	0.69	0.52	0.51	0.35	0.14 (1/7)	1.06 (19/18)	0.44	0.51	0.75 (9/12)	1.00 (6/6)	0.07	0.09	0.47	0.44
SK	0.75	0.69 (20/29)	0.90	0.90	0.74	0.65	0.62	0.49	0.67	0.76	0.68	0.61	0.38 (6/16)	0.71	0.86	0.85	0.59	0.96	0.56	0.49	0.73	0.73
FI	0.55	0.93 (13/14)	0.84	0.89	0.85	0.60	0.59	0.49	0.95	1.19	0.83	0.68	0.32	0.78	0.77	0.84	0.67 (4/6)	0.33 (5/15)	0.60	0.47	0.74	0.79
SE	1.18 (20/17)	0.52 (13/25)	0.89	1.13	1.24	1.13	0.52	1.00	1.01	1.45	0.79	0.86	0.69	0.70	0.97	1.17	0.44 (4/9)	0.50 (4/8)	0.68	0.97	0.85	1.08
IS	-	-	0.50 (5/10)	0.67 (4/6)	-	0.50 (1/2)	1.50 (6/4)	-	0.71 (5/7)	1.00 (5/5)	0.29 (7/24)	0.78 (7/9)	-	0.67 (2/3)	0.74 (14/19)	0.90 (19/21)	-	-	0.14 (2/14)	0.40 (4/10)	0.48	0.75
NO	1.07 (15/14)	0.83 (10/12)	0.79	0.64	0.58	0.73	0.69	0.70 (16/23)	0.73	0.97	0.77	0.84	0.19 (5/27)	0.21	0.79	0.93	2.00 (18/9)	1.64 (18/11)	0.79	1.13	0.76	0.85

Country	Agriculture, forestry, fisheries and veterinary		Arts and humanities		Business, administration and law		Education		Engineering, manufacturing and construction		Health and welfare		Information and Communication Technologies		Natural sciences, mathematics and statistics		Services		Social sciences, journalism and information		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
UK	0.80	0.91	0.80	0.82	0.66	0.69	0.70	0.60	0.84	0.86	0.82	0.90	0.70	0.70	0.81	0.85	-	-	0.79	0.83	0.79	0.82
MK	0.14 (1/7)	0.27 (3/11)	0.35	0.40 (8/20)	0.36	0.32	0.38 (5/13)	0.67 (2/3)	0.3 (6/20)	0.75 (12/16)	0.47	0.81 (22/27)	1.00 (10/10)	0.14 (3/21)	0.21 (4/19)	0.06 (1/17)	0.67 (10/15)	0.64 (7/11)	0.56	0.32	0.43	0.40
RS	0.44	0.33	0.40	0.64	0.21	0.30	0.14	0.12 (3/25)	0.44	0.44	0.15	0.16	0.13	0.39	0.44	0.36	0.75 (12/16)	0.47	0.29	0.19	0.31	0.34
TR	0.54	0.75	0.37	0.48	0.44	0.52	0.40	0.68	0.35	0.43	0.47	0.48	0.39	0.36	0.48	0.55	0.46	0.52	0.45	0.64	0.42	0.52
IL	1.08 (14/13)	0.59 (10/17)	0.76	0.75	0.78	0.69	0.48	0.48 (12/25)	0.91	0.73	-	-	0.62 (16/26)	0.40	0.79	0.91	-	-	0.72	0.79	0.74	0.77
AU	1.12	1.14	0.89	0.95	1.05	0.97	0.79	1.02	0.84	0.87	-	-	0.67	0.68	0.84	1.01	0.67 (10/15)	0.38 (5/13)	0.77	0.88	0.80	0.89
CA	0.83	1.11	0.70	0.83	0.54	0.61	0.73	0.91	0.63	0.92	-	-	0.66	0.81	0.86	0.96	0.73	0.57	0.70	0.77	0.73	0.87
JP	1.78	1.32	0.92	1.07	0.98	0.97	0.85	1.05	1.37	1.24	-	-	-	-	1.43	1.21	0.77	0.35 (6/17)	1.57	1.43	1.08	1.09
MX	0.88	0.81	0.73	0.77	0.59	0.55	1.11	1.07	0.95	0.92	-	-	0.39	0.58	1.01	0.99	0.93	0.72	1.41	2.04	0.98	0.96

Source: Eurostat – Education Statistics (online data code: educ_uoe_grad02; educ_uoe_ent02); OECD (Graduates by field; New entrants by field).

Notes: Definition differs, see metadata for: EU-27 (Field of study: Natural Sciences, Mathematics and Statistics, Engineering, Manufacturing and Construction, ICT); Data estimated for: NL; Break in time series: PL; Missing value: US (all fields except Health and Welfare); Includes data from another category: DK, JP (all fields except Health and Welfare, Total); Data included in another category: DK, JP (ICT), MX (Natural Sciences, Mathematics and Statistics, Engineering, Manufacturing and Construction), RU (all fields except Health and Welfare); Reference year differs: UK: 2019, CA: 2020. For proportions based on fewer than 30 graduates, the numerator and denominator are displayed in brackets.

CHAPTER 3 – PARTICIPATION IN SCIENCE AND TECHNOLOGY OCCUPATIONS

Key takeaways

Despite the overall gender balance in total employment (with women comprising 46 % in 2021), women remain underrepresented in different STEM-related professions and sectors. Compared to men, women are underrepresented as scientists and engineers (S&Es) and as researchers in the higher education sector (HES), the government sector (GOV), and the business enterprise sector (BES). In more detail:

- **Women with tertiary education are slightly more likely to be employed as professionals or technicians (human resources in science and technology – core, HRSTC) than men** (54 % compared to 46 %) (see Figure 3.1).
- **Women are generally less likely than men to work as S&Es** (41 % compared to 59 % (see Figure 3.1)). The proportion of women working as S&Es has remained at around 41 % since 2017.
- **Around 60 % of tertiary-educated women and 60 % of tertiary-educated men work as technicians and professionals at European level** (see Figure 3.2). However, at Member State level, this varies considerably, from 38 % to 73 % for women in 2021.
- **The proportion of women in the labour force working as S&Es is small (3.4 %)** compared to the proportion of men (5.0 % in 2021 (see Figure 3.3)).
- **Women are more likely than men to work in knowledge-intensive activities (KIA)** (46 % and 30 %, respectively (see Figure 3.5))**, but similar proportions of women and men work in KIA in business industries (KIABI)** (14 % for women compared to 15 % for men (see Figure 3.6)).
- **There is a clear gender gap between women and men among self-employed S&Es and in ICT**. The proportion of women among self-employed professionals in S&E and ICT hovered around 25 % in 2021 at EU level, with gender balance evident only in Cyprus, where women represented 42 % (see Figure 3.7).
- **There is little difference between the unemployment rate of tertiary-educated women and men at EU level** (3.7 % compared to 3.1 % in 2021 (see Figure 3.8)). However, a gender gap in unemployment rates is evident in more than half of the countries examined, despite Member States' action plans and strategies to address the barriers to work faced by women working in science and technology (particularly in relation to family and care responsibilities).
- **Within the R&D workforce, women are less likely than men to work as researchers (61 % and 66 %, respectively) and more likely to work as 'technicians and other supporting staff' (39 % compared to 34 %)** (see Figure 3.9) ([109]).
- **Women R&D personnel are more likely to work as researchers in HES (69 %) than in BES or GOV (54 % in both)** (see Figures 3.10, 3.11, and 3.12). This suggests that further efforts are needed to ensure equal opportunities across sectors.

([109]) This chapter disaggregates women's representation in the R&D workforce by sector and occupation (specifically considering the representation of women researchers, technicians and other supporting staff). For more information on researchers across sectors specifically, see Chapter 4.

Introduction

Chapter 3 discusses women's and men's participation in science and technology occupations and examines women's presence in STEM-related careers. It also looks at differences of men's and women's participation across sectors of economy.

- **Section 3.1 analyses the participation of women as S&Es and the tertiary-educated population employed as professionals and technicians (HRSTC)**. It discusses recent changes in the proportions of women and men in these roles (including country comparisons) and notes efforts to increase the representation of women in these occupations.
- **Section 3.2 considers women's participation in** KIA, and within KIA in business industries (KIABI), exploring progress in recent years.
- **Section 3.3 analyses the gender gap in self-employment activities in technology-oriented occupations** by considering the representation of women among self-employed S&E and IT professionals. It compares the proportion of self-employed women and men working in these occupations and notes changes over time.
- **Section 3.4 explores unemployment levels among tertiary-educated women and men**. This provides an indication of the utilisation of women and men with a high level of education in the labour market.
- **Section 3.5 analyses the participation of women in different categories of R&D personnel** (researchers, technicians, and other supporting staff ([110])), including comparisons across countries and years.

([110]) 'Other supporting staff' includes skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with such projects (OECD, *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities*, OECD Publishing, Paris, 2015, §5.43, https://doi.org/10.1787/9789264239012-en).

Background

The EU is making significant progress in promoting gender equality across various sectors of economy, with a special emphasis on science and technology careers.

The EU Gender Equality Strategy 2020-2025 ([111]) highlights this commitment, presenting for instance the importance of digital skills in addressing gender disparities within the economy. Linked to digital skills, the Digital Education Action Plan 2021-2027 (DEAP) ([112]) includes a specific action, Action 13, 'Women's participation in STEM studies and careers' ([113]). This action aims to support the inclusion of women in the digital economy, primarily through additional training and education opportunities.

Although not specific to R&I, the EU has issued the Work-Life Balance Directive ([114]), which is expected to increase the participation of women in the labour market. This Directive promotes more flexible working arrangements, which are anticipated to have a positive impact on R&I as well.

The gender equality provisions for Horizon Europe ([115]) aim to strengthen women's participation in science and technology with concrete actions. The introduction of a new eligibility criterion requires applicant organisations to have a GEP in place in order to be eligible for funding. In addition to four mandatory requirements ([116]), there are five recommended thematic areas that organisations should consider in their GEP. One is 'gender equality in recruitment and career progression' ([117]), which suggests that GEPs should consider reviewing selection processes and working procedures to address any biases women may be facing in accessing or progressing in research and academic careers. The process-related requirements for the Horizon Europe GEP eligibility criterion along with the recommended thematic areas encourage organisations across Member States and associated countries to address structural challenges faced by women and promote the inclusion of women in science and technology occupations, thereby reducing existing gender equality discrepancies between countries.

A number of initiatives at EU level aim to support women entrepreneurs and women's careers in technological professions:

- The New Europe Innovation Agenda (2022) broadly intends to 'position Europe at the forefront of the new wave of deep tech innovation and start-ups' ([118]). One of the five

([111]) European Commission, EU Gender Equality Strategy 2020-2025, 2020, https://commission.europa.eu/strategy-and-policy/policies/justice-and-fundamental-rights/gender-equality/gender-equality-strategy_en

([112]) European Commission, Digital Education Action Plan 2021-2027, n.d., https://education.ec.europa.eu/focus-topics/digital-education/action-plan

([113]) European Commission, Digital Education Action Plan 2021-2027, Action 13, n.d., https://education.ec.europa.eu/focus-topics/digital-education/action-plan/action-13?

([114]) European Commission, Work-life balance, 2021, https://ec.europa.eu/social/main.jsp?catId=1311&langId=en

([115]) European Commission, Horizon Europe guidance on Gender Equality Plans, 2021, https://op.europa.eu/en/publication-detail/-/publication/ffcb06c3-200a-11ec-bd8e-01aa75ed71a1

([116]) These requirements are: the GEP must be a public document, have dedicated resources and expertise in gender equality to implement the plan, include data collection and monitoring arrangements, and include awareness-raising and training actions on gender equality. European Commission, Gender Equality Plans as an eligibility criterion in Horizon Europe, n.d., https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/democracy-and-rights/gender-equality-research-and-innovation_en

([117]) European Commission, Horizon Europe guidance on Gender Equality Plans, 2021, https://op.europa.eu/en/publication-detail/-/publication/ffcb06c3-200a-11ec-bd8e-01aa75ed71a1

([118]) European Commission, The New European Innovation Agenda, 2023, https://research-and-innovation.ec.europa.eu/strategy/support-policy-making/shaping-eu-research-and-innovation-policy/new-european-innovation-agenda_en#flagships

flagships of the Agenda includes 'fostering, attracting and retaining talent' through various initiatives, including an innovation intern scheme for startups and scale-ups and an entrepreneurship and leadership scheme ([119]).

- The European Innovation Council (EIC), in partnership with the EIT, implements the EIC Women Leadership Programme ([120]). The Programme provides training and networking opportunities for women researchers and entrepreneurs from the EIC and EIT communities to assist them in advancing their careers. More specifically, it features personal mentoring and business coaching, matching each researcher with an experienced expert based on individual career challenges and goals.
- Similarly, the EU's Women TechEU ([121]) initiative (launched in 2021 and funded under the European Innovation Ecosystems work programme of Horizon Europe) offers coaching and mentoring to women business founders (provided by the EIC Business Acceleration Services) as part of the Women Leadership Programme. It also provides an individual grant of EUR 75 000 to support women-led innovation and business growth.
- The European Investment Fund (EIF) produced a working paper to understand access to finance for women entrepreneurs and women-led enterprises (focusing on credit and venture capital). Based on findings from literature, the paper recommends steps that could be taken to ensure that women have access to finance as required ([122]).

Member States have adopted different regulations and policies to increase women's participation in science and technology occupations. In some cases, measures include regulations or policies specific to gender equality in R&I, while others refer to women's representation in STEM within broader regulations or policies focusing on gender equality or higher education (see Chapter 2). Member States have introduced:

- Actions within **government gender equality strategies**, which include broader actions focusing on reducing segregation in the labour market and stereotypes that perpetuate gender inequalities.
- **Gender equality action plans,** which include steps to strengthen women's digital and technological skills and improve access to STEM careers.
- Plans to promote careers in science and technology within **government R&I strategies**, with specific focus on addressing obstacles that hinder young women from taking up STEM careers and prevent women with children from re-entering the workforce.

The indicators here span 2017-2022. Box 7 presents some examples of notable laws and policies introduced by Member States during this period.

Box 7: Laws and policies implemented at Member State level to support gender equality in science and technology occupations between 2017 and 2022

Romania's National Strategy on Inclusion 2022-2027 promotes equal opportunities and treatment between women and men, in addition to prevention strategies for combating violence against women ([123]). It includes specific actions to address gender balance in science and technology, such as a qualitative study to understand barriers faced by

([119]) Ibid.

([120]) EIC, Women Leadership Programme, 2023, https://eic.ec.europa.eu/eic-funding-opportunities/business-acceleration-services/eic-women-leadership-programme_en

([121]) European Commission, Women TechEU: Supporting deep-tech start-ups led by women, 2023, https://eismea.ec.europa.eu/programmes/european-innovation-ecosystems/women-techeu_en

([122]) EIF, *Female access to finance: a survey of literature*, EIF Working Paper 2023/87, 2023, https://www.eif.org/news_centre/publications/EIF_Working_Paper_2023_87.htm

([123]) National Agency for Equal Opportunities for Women and Men, National Strategy on Inclusion 2022-2027, 2022, https://anes.gov.ro/wp-content/uploads/2023/01/Monitorul-Oficial-Partea-I-nr.-1239Bis.pdf

girls/young women when pursuing careers in STEM and a counselling programme to encourage more balanced participation in the sector.

In **Cyprus**, the National Action Plan for Equality between Men and Women 2019-2023 seeks to understand the technological learning needs of women in science and technology through research. It also provides access to free computer courses ([124]).

Slovakia's National Action Plan for Women's Employment 2022-2023 highlights the need to strengthen women's digital skills to ensure equal access to careers in STEM, while also improving access to quality, affordable childcare ([125]).

National and local initiatives have also been implemented in Member States to encourage women to participate in STEM careers. These include initiatives that provide funding (such as grants and awards), occasions to promote women in STEM (such as networking events and campaigns), and measures providing direct support to women (including mentoring opportunities and training).

Initiatives target women at **different ages and at different points in their careers**, as illustrated in the examples presented in Box 8.

Box 8: Member State initiatives to support women at specific ages and points in their careers

Some initiatives focus on providing support to **young professionals with the potential to progress into successful STEM careers**. This includes the Women in Technology Hungary Association (WiTH), established in 2021, which provides mentorship opportunities and networking events to encourage young women to consider a career in STEM. Another example is the Engineers for One Day Programme in Portugal (from 2017 onwards), where girls under 18 years old are given access to lab practices, mentorships, field visits, and workshops in engineering and technology to attract them towards STEM careers (see also Box 39 in Chapter 6).

Some measures focus on women **already considering a career in STEM** or **in the early stages of their STEM careers.** For example, in 2023, Greece provided six-month Mentoring Scholarships ([126]) where young women graduates from science fields can network with other women currently working in STEM. Another measure is Czechia's 2023 Brunch for International Women in Czech Science ([127]), where attendees heard from successful women with international STEM careers.

Other initiatives focus on **supporting women already working within science and technology**:

- A 2023 Slovakian Grant Scheme facilitates the reintegration of parents into scientific work after family leave by providing funding for their scientific projects ([128]).

([124]) Ministry of Justice and Public Order, National Action Plan for the Equality between Men and Women 2019-2023, 2019, https://www.mjpo.gov.cy/mjpo/mjpo.nsf/sectorgend02_el/sectorgend02_el?OpenDocument

([125]) Slovak Government, National Action Plan for Women's Employment 2022-2023, 2022, https://www.employment.gov.sk/files/sk/ministerstvo/spolocny-sekretariat-vyborov/vybor-rodovu-rovnost/dokumenty-udalosti/nap_zamestnanosti_zien_22-30.pdf

([126]) Women On Top, 10 six-month mentoring scholarships from Women On Top and Hellenic Cables, 2023, https://womenontop.gr/10-examines-ypotrofies-mentoring-apo-to-women-on-top-kai-tin-hellenic-cables/

([127]) National Contact Centre for Gender and Science, Brunch for International Women in Czech Science, 2023, https://genderaveda.cz/en/brunch-for-international-women-in-science-with-mgr-mariya-shamzhy-ph-d/

([128]) Science Within Research, SAS grant scheme will make it easier for new parents to return to scientific life, 2023, https://vedanadosah.cvtisr.sk/ine/grantova-schema-sav-ulahci-cerstvym-rodicom-navrat-do-vedeckeho-zivota/

- Networking opportunities in other Member States have provided women in STEM with opportunities to receive peer support, including the Polish Network of Women Scientists (2023) ([129]). Similarly, Soapbox Science has organised free public events to showcase the scientific work of women and non-binary scientists in 24 countries (including six Member States ([130])), allowing them to present and discuss their work with the public and providing opportunities for scientists to meet ([131]).
- Women working in science and technology are celebrated through awards such as the SHE STEMs ([132]) Research Award in Greece in 2022, which specifically emphasises the potential of young scientists within STEM.

Some measures implemented by Member States do not provide direct support to women working, or aspiring to work, in STEM, but, rather, **highlight challenges and raise awareness** of the barriers faced by women in the sector. The 2021 Gender Equality in Estonian Research report ([133]), for example, highlights gender (in)equality in the Estonian research sector and provides recommendations to increase women's representation in science. Two reports have also been published in Poland (see Box 8).

3.1 Women's participation as S&Es and among the tertiary-educated and employed as HRSTC

This section presents indicators on the proportions of women in total employment, tertiary-educated women employed as HRSTC, and women working as S&Es. It considers women's participation in these categories, highlighting the roles in science and technology that women are most likely to occupy and exploring gender differences. It uses definitions of science and technology occupations from the EU Labour Force Survey (EU-LFS) (see below).

([129]) Kobiety Nauki, Polish Network of Women Scientists, 2023, https://kobietynauki.org/

([130]) BE, DE, ES, IE, PT, SE.

([131]) Soapbox Science, Soapbox Science, 2024, http://soapboxscience.org/

([132]) Greek Women in STEM, She STEMs Awards 2022, 2022, https://greekwomeninstem.com/gr/symposium-2022/awards/

([133]) Urmann, H., Lees, K., Remmik, M., Tubelt, E., Roos, L., Vilson, M., Puur, S. M., Aksen, M. snd Espenberg, S., *Gender equality in Estonian research - current state and ways of improving*, Tartu: Centre for Applied Social Sciences (CASS), 2021, https://etag.ee/wp-content/uploads/2022/08/Gender-equality-in-Estonian-research-1.pdf

Box 9: Definitions used in EU-LFS

Under the EU-LFS ([134]), **science and technology occupations** are all occupations classified into major group 2, 'Professionals', or 3, 'Technicians and Associate Professionals', of the ISCO-08 International Standard Classification of Occupations.

The EU-LFS survey defines 'professionals' and 'technicians' as follows:
ISCO Major Group 2 **(Professionals)** – Occupations whose main tasks usually include:

- Conducting analysis and research and developing concepts, theories and operational methods
- Advising on or applying existing knowledge related to physical sciences, mathematics, engineering and technology, life sciences, medical and health services, social sciences and humanities
- Teaching the theory and practice of one or more disciplines at different educational levels
- Teaching and educating persons with learning difficulties or special needs
- Providing various business, legal and social services
- Creating and performing works of art; providing spiritual guidance
- Preparing scientific papers and reports.

ISCO Major Group 3 **(Technicians and Associate Professionals)** – Occupations whose main tasks usually include:

- Undertaking and carrying out technical work connected with research and the application of concepts and operational methods in the fields of physical sciences including engineering and technology, life sciences including the medical profession, and social sciences and humanities
- Initiating and carrying out various technical services related to trade, finance and administration, including administration of government laws and regulations and to social work
- Providing technical support for the arts and entertainment
- Participating in sporting activities
- Executing some religious tasks

The EU-LFS also considers **S&E** to include people who conduct research, improve or develop concepts, theories and operational methods and/or apply scientific knowledge relating to the fields covered by one of the following occupations defined in the ISCO-08:

- Science and engineering professionals (ISCO-08 code: 21)
- Health professionals (ISCO-08 code: 22)
- ICT professionals (ISCO-08 code: 25)

Human resources in science and technology (HRST) related abbreviations and definitions

- *HRSTE*: human resources in science and technology by level of education. Those people who have successfully completed a tertiary level education (until 2013, ISCED97 - levels 5A, 5B, 6; starting with 2014, ISCED2011 - levels 5 to 8)[135];
- *HRSTC*: human resources in science and technology - core. Those people who have successfully completed a tertiary level education **AND** are employed in a S&T occupation[136];

The populations of HRSTCs and S&Es continue to be gender balanced, with women accounting for 54% and 41% of the populations respectively

The latest data show that the proportion of women in total employment at EU level has stayed consistent in recent years (see Figure 3.1) and the population of people in total employment continues to be gender balanced, with women accounting for 46 % of total employment in 2021. Gender balance is evident in the proportion of women and men employed as HRSTCs in the EU, with women making up 54 % of this population. There are fewer women among S&Es at EU level, although this also continues to be gender balanced (41 % women) compared to 2019.

Recent data from 2021 indicate little change in the proportion of women working as HRSTCs and S&Es at EU level. The proportion of women among HRSTCs increased by less than 1 pp since 2019, while the proportion of women among S&Es decreased by less than 1 pp during the same period.

The changes in women's total employment from 2017 to 2021, as shown in Figure 3.1, equates to a similar growth rate per year (as shown by the CAGR) compared to men (4.8 % compared to 4.6 %). However, a different trend emerges when examining sector-specific employment data: both the number of women HRSTC and S&E have increased at a faster rate than their male counterparts ([137]). These findings may be linked to higher overall employment rates of tertiary-educated women at EU level; between 2017 and 2021, the percentage of tertiary-educated women in employment increased by 0.9 pp overall, compared to 0.3 pp for men ([138]).

Box 10 presents some of the initiatives introduced in Member States to increase the number of women in STEM.

Box 10: Member State initiatives to increase the numbers of women in STEM

In **Cyprus**, the She.Can.STEM Internship Programme was introduced in 2023 by a professional services network, Deloitte ([139]). It offers students opportunities to learn about STEM careers and receive mentoring.

Some Member States have used measures to not only encourage women to pursue STEM careers, but also to highlight barriers faced by women:

- In recent years, **Luxembourg** has pursued efforts to encourage women to engage in research and science, for example through the Women and Girls in Research Campaign in 2022 and 2023 ([140]). The Campaign breaks down gender stereotypes in scientific and

([134]) Eurostat, Labour Force Survey, n.d., https://ec.europa.eu/eurostat/web/lfs/database

[135] Glossary:Human resources in science and technology (HRST) - Statistics Explained (europa.eu)

[136] Ibid.

([137]) Between 2017 and 2021, the CAGR of tertiary-educated people who are employed as HRSTCs in the EU-27 was 3.7 % for women, compared to 2.8 % for men, while the CAGR of scientists and engineers in the EU-27 was 0.5 % for women, compared to 0.1 % for men.

([138]) Eurostat, Employment rates by sex, age and education attainment level (%), 2024, https://ec.europa.eu/eurostat/databrowser/view/lfsa_ergaed__custom_10472543/default/table?lang=en

([139]) Deloitte Cyprus, She.Can.STEM Programme, 2023, https://www2.deloitte.com/content/dam/Deloitte/cy/Documents/careers/She.Can.STEM%20Program%202023.pdf

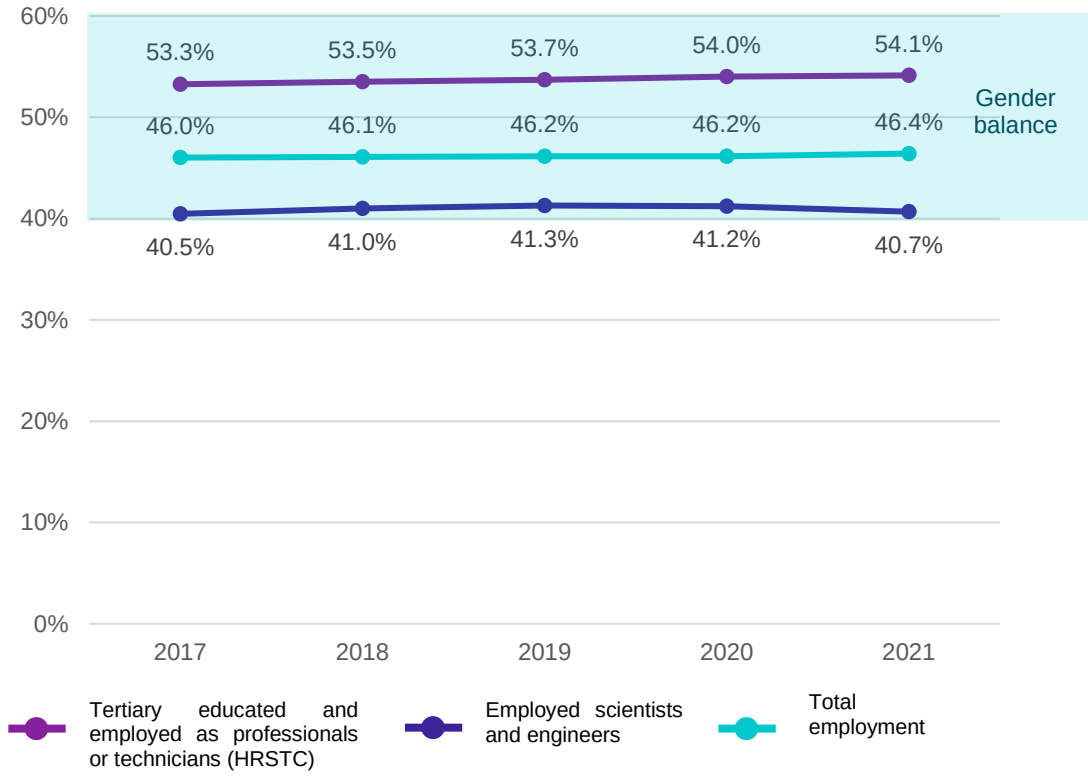
([140]) Ministry of Gender Equality and Diversity, Women and Girls in Science: An Interactive Tribute to the Great Ladies of Science, 2022, https://mega.gouvernement.lu/fr/actualites.gouvernement%2Bfr%2Bactualites%2Btoutes_actualites%2Bcommuniques%2B2022%2B02-fevrier%2B14-bofferding-science.html; Research Luxembourg, Women [& Girls] in Science 2023, 2023, https://www.researchluxembourg.org/en/women-science-2023/

technical professions through a series of testimonial videos encouraging women to get involved in research and science.

- In **Poland**, the Academy of Young Scholars (AMU) ([141]) has organised free annual 'Become a Researcher' meetings for high school students and first-year university students since 2019. These meetings encourage young women to pursue a career in STEM after their studies, with experienced women scientists discussing their careers and highlighting the challenges they faced.

([141]) Academy of Young Scholars, Become a Researcher, 2023, https://amu.pan.pl/badaczka/

Figure 3.1 Proportion (%) of women in the EU among total employment, population of tertiary-educated HRSTCs, and population of S&Es, 2017-2021



Source: Eurostat – EU-LFS (online data code: lfsa_egan) & Human Resources in science and technology (online data code: hrst_st_ncat).

Notes: Age group: 25-64 (for all indicators). Blue shading indicates gender balance (i.e. where women comprise between 40 % and 60 % of a given population).

Approximately 60 % of tertiary-educated women and men worked as HRSTCs in 2021

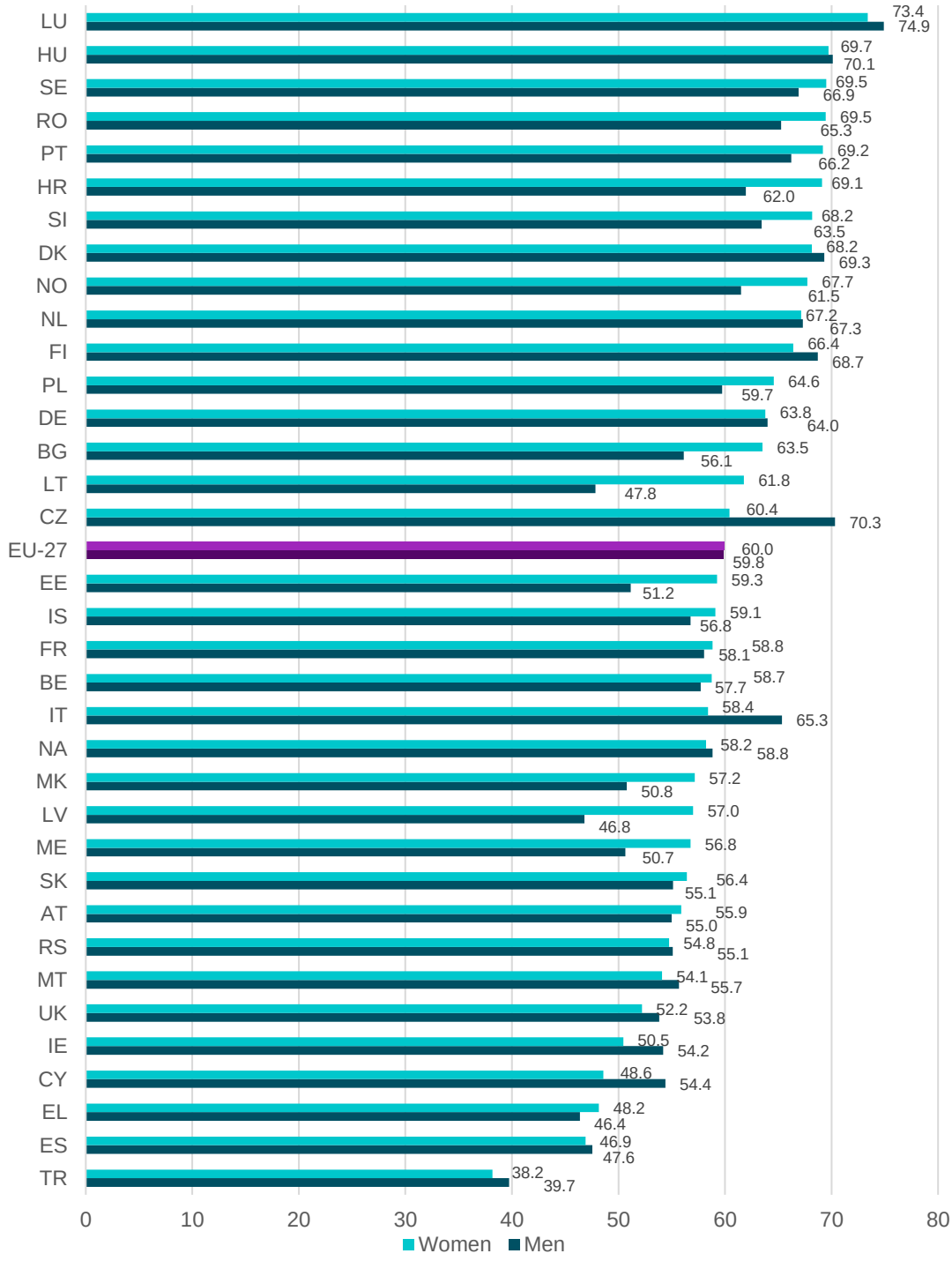
According to the latest data, in 2021, 60 % of both women and men with tertiary education in the EU were employed as HRSTCs (see Figure 3.2). This represents a marginal increase from 2019 and She Figures 2021, when the proportion stood at 59 % for both women and men. At country level, the proportions of women and men are consistent across the majority of countries. However, large differences are evident in Latvia and Lithuania, where women exceeded men by over 10 pp, and in Czechia, where men exceeded women by almost 10 pp.

Similar to She Figures 2021, Luxembourg has the highest proportions of women and men employed as HRSTCs of all countries (73 % for women and 75 % for men), while Türkiye has the lowest (38 % for women and 40 % for men).

Overall, the proportion of women employed as HRSTCs varied by 35 pp ([142]) across the countries examined by She Figures. These figures are broadly similar to She Figures 2021, with the largest change observed in Hungary, where the proportion of women employed as HRSTCs increased from 62 % in 2019 to 70 % in 2021, while the equivalent proportion of men stayed consistent at 70 %.

([142]) This is the difference between the proportion of tertiary-educated women working as HRSTCs in Luxembourg compared to Türkiye.

Figure 3.2 Proportion (%) of tertiary-educated and those employed as HRSTCs among tertiary- educated (HRSTE), by sex, 2021



Source: Eurostat – Human resources in science and technology (online data code: hrst_st_ncat).

Notes: Definition differs, see metadata: ES, FR; Break in time series: EU-27, BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, RS, NA; Reference year differs: ME: 2020, MK: 2020, TR: 2020, UK: 2019.

Tertiary-educated women who were born in their country of residence (73 %) are more likely to be employed as HRSTCs compared to women born in another Member State (63 %) or outside the EU (58 %)

When considering the migration status of HRSTC women across the EU in 2022, the data indicate that 'native-born' ([143]) women (73 %) are considerably more likely to be employed than women born in another Member State (63 %) or those born outside the EU (58 %) (see Table 3.1).

Despite Figure 3.2 showing a similar proportion of women and men (60 %) employed as HRSTCs at EU level, the differences between women and men are more pronounced when considering migration status. Women who are native-born and tertiary educated are more likely to be employed in their fields than their men counterparts (73 % compared to 68 %). The proportions of women and men born in another Member State who are tertiary educated and working as HRSTCs are similar (63 % compared to 62 %), as are the proportions of HRSTC women and men born outside the EU (58 % compared to 59 %).

At country level, tertiary-educated women who are native-born are employed more often as HRSTCs than tertiary-educated women born in another Member State or outside of the EU, in nearly all countries for which data are available. However, this is not the case for four countries (ES, FR, HU, MT), where tertiary-educated women born in another Member State are more employed in professional and technician positions than native-born tertiary-educated women ([144]).

Proportions of native-born tertiary educated women differ considerably at country level from women born in other countries (by over 10 pp). This was the case for:

- Native-born women compared to women born in another Member State, in nine countries (including seven Member States and two Associated Countries) ([145]).
- Native-born women compared to women born outside the EU, in 23 countries (including 20 Member States and three Associated Countries) ([146]). The largest differences are in Malta (51 pp), Czechia (39 pp) and Italy (36 pp).

Among tertiary-educated women born in a country other than that in which they work, those born within the EU are considerably more likely to be employed than women born outside the EU. This trend is evident in all but four countries (DK, DE, IE, ES) with data available ([147]). In seven Member States and one Associated Country, there is a difference of over 10 pp ([148]).

([143]) Refers to women who were born in the Member State in which they are working.

([144]) The differences between these populations were only 1 pp for FR and MT. For HU, the difference was 4 pp, and for RS the difference was 7 pp.

([145]) Data available for 23 countries.

([146]) Data available for 27 countries.

([147]) Data available for 23 countries.

([148]) BE, CZ, EL, IT, HU, MT, SI, IS.

Table 3.1 Proportion (%) of tertiary-educated and those employed as HRSTCs among tertiary-educated (HRSTE), by sex and migration status, 2022

Country	Women			Men		
	Born in another EU MS	Born outside of the EU	Native-born	Born in another EU MS	Born outside of the EU	Native-born
EU-27	**63.0**	**57.8**	**72.8**	**61.8**	**59.4**	**67.8**
BE	65.8	52.1	71.1	66.4	54.3	65.2
BG	-	-	71.3	-	-	60.8
CZ	77.5	38.8	78.3	75.8	47.3	74.7
DK	69.7	71.2	81.0	72.1	70.3	80.5
DE	62.8	64.2	77.5	60.7	65.4	71.8
EE	-	51.4	72.8	-	42.8	56.6
IE	51.8	63.3	63.4	54.1	63.3	57.4
EL	67.7	40.4	68.7	-	48.4	59.5
ES	38.2	40.6	61.2	40.9	44.1	57.5
FR	72.3	63.6	71.1	-	60.6	66.5
HR	70.8	68.6	80.5	67.9	67.8	71.0
IT	54.4	38.9	75.0	59.0	41.3	76.6
CY	50.0	46.2	65.6	56.4	55.2	61.8
LV	-	50.3	68.1	-	-	58.1
LT	-	61.4	69.8	-	54.2	52.6
LU	88.9	83.9	93.7	84.4	82.5	87.7
HU	79.5	54.8	75.8	74.5	80.5	73.7
MT	72.0	21.0	71.4	46.6	29.4	67.8
NL	72.1	66.8	80.4	69.0	68.4	74.9
AT	57.2	51.0	71.7	60.8	46.0	62.7
PL	-	56.0	73.1	-	44.9	62.3
PT	68.6	59.0	77.0	71.5	66.5	72.9
RO	-	-	76.7	-	-	71.0
SI	74.4	63.4	77.1	-	58.8	71.6
SK	-	-	65.7	-	-	63.3
FI	70.5	66.7	78.7	75.2	69.9	80.5

Country	Women			Men		
	Born in another EU MS	Born outside of the EU	Native-born	Born in another EU MS	Born outside of the EU	Native-born
SE	78.9	70.4	81.6	69.3	67.7	77.2
IS	60.2	47.2	72.2	35.8	58.2	65.2
NO	65.1	61.1	80.5	49.5	59.1	72.2
RS	74.4	67.9	67.7	63.4	64.5	64.2

Source: Custom extraction from EU-LFS data.

Notes: Low reliability: Women (Born in another EU Member State: HR. Born outside the EU :LV, MT.), Men (Born in another EU Member State: EL, HR. Born outside the EU: HR, MT); Values are not publishable because of very low reliability: Women (Born in another EU Member State: EE, LV, LT. Born outside the EU: BG), Men (Born in another EU Member State: BG, EE, LV, LT. Born outside the EU: BG, LV); Definition differs, see metadata: Women and Men: ES, FR (Born in another EU Member State, Born outside the EU); Data not available: Women (Born in another EU Member State: BG, EE, LV, LT, PL, RO, UK, TR, ME, MK. Born outside the EU: BG, RO, UK, TR, ME, MK. Native-born: UK,TR, ME, MK.), Men (Born in another EU Member State: BG, EE, LV, LT, PL, RO, UK, TR, ME, MK. Born outside the EU: BG, LV, RO, UK, TR, ME, MK. Native-born: UK, TR, ME, MK).

Tertiary-educated women with disabilities are more likely to be employed as HRSTCs compared to men with disabilities with the same level of education

This indicator breaks down the population of tertiary-educated women and men working as HRSTCs by disability status, using the Global Activity Limitation Indicator (GALI).

Box 11: The Global Activity Limited Indicator (GALI)

The **Global Activity Limited Indicator (GALI)** is collected by the Minimum European Heath Module (MEHM) and is used in the EU-LFS.

The GALI aims to measure the presence of 'long-standing limitations'. The EU-LFS indicator using this data can be used to gauge disability status and related inequalities.

Respondents are required to answer the following question, providing a self-assessment based on the perception of their health relative to their own impressions or feelings:

'For at least the past six months, to what extent have you been limited because of a health problem in activities people usually do? Would you say you have been… severely limited / limited but not severely or / not limited at all?'

Respondents must provide one of three responses ([149]):

- 'Severely limited' means that performing or accomplishing an activity cannot be done or only done with extreme difficulty, and that this situation has been ongoing for at least the past six months. Persons in this category usually cannot do the activity alone and would need further help from other people.
- 'Limited but not severely' means that performing or accomplishing a usual activity can be done but only with some difficulties, and that this situation has been ongoing for at least the past six months. Persons in this category usually do not need help from other persons. When help is provided, it is usually less often than daily.
- 'Not limited at all' means that performing or accomplishing usual activities can be done without any difficulties, or that any possible activity limitation has NOT been going on for at least the past six months (i.e. it is not a long-standing limitation) ([150]).

This indicator provides a breakdown of the proportion of women and men within each of these self-reported categories who are tertiary educated and employed as HRSTCs.

At EU level, in 2022, tertiary-educated women who report they are limited but not severely (74 %) and tertiary-educated women who report being severely limited (67 %) are more likely to be employed as HRSTCs than the equivalent populations of men (65 % and 63 %, respectively) (see Table 3.2).

Tertiary-educated women and men who report being severely limited are least likely to be employed overall (67 % for women and 63 % for men). The highest proportion of tertiary-educated women is observed among those who are limited but not severely (74 %), while for men, it is among those without limitations (67 %). However, only a small number of countries have data on women and men reporting being severely limited (seven countries with data on women, compared to four countries with data on men), which may impact EU level averages.

([149]) European Commission (2021) EU Labour Force Survey: Explanatory Notes. Available at: https://ec.europa.eu/eurostat/documents/1978984/6037342/EU-LFS+Explanatory+notes+from+Q1+2021+onwards.pdf

([150]) The wording used to discuss this new indicator aligns with responses self-reported by respondents.

At country level, while correlations between disability and gender can be observed, the differences between the proportions of responses (i.e. severely limited, limited but not severely, and not limited at all) are quite small. Tertiary-educated women who are limited but not severely are more likely to work as HRSTCs than those who are not limited at all (in 11 Member States and one Associated Country), but there is often variance of less than 5 pp between the values (17 of the 22 countries for which there are data) ([151]). A different trend is observed for tertiary-educated men, with those reporting not being limited at all more likely to work as HRSTCs compared to those who are limited but not severely ([152]). Similar to women, these proportions vary by less than 5 pp in most (15 of 20) countries.

([151]) The difference between the proportion of tertiary-educated women who are limited but not severely and the proportion of tertiary-educated women who are not limited at all varied by over 5 pp in BE and DK (where there are more women who are not limited at all), and LT, PT and IS (where there are more women who are limited but not severely).

([152]) Data available in 20 countries.

Table 3.2 Proportion (%) of tertiary-educated and those employed as HRSTCs among tertiary-educated (HRSTE), by sex and disability status, 2022

Country	Women			Men		
	Severely limited	Limited but not severely	Not limited at all	Severely limited	Limited but not severely	Not limited at all
EU-27	**67.4**	**73.9**	**71.1**	**63.2**	**64.8**	**66.9**
BE	67.0	62.8	69.4	-	68.0	64.1
BG	-	-	71.5	-	-	60.8
CZ	68.0	77.6	76.8	60.5	77.9	73.9
DK	-	75.6	81.1	-	76.3	80.0
DE	-	76.4	75.5	-	67.4	71.5
EE	-	64.5	71.9	-	59.4	54.5
IE	-	60.0	62.7	-	43.8	59.2
EL	-	-	67.9	-	-	59.2
ES	49.5	60.2	58.5	29.3	51.3	56.1
FR	66.7	73.2	71.0	-	62.7	66.6
HR	-	84.2	79.3	-	62.8	70.8
IT	78.1	72.7	72.4	71.3	71.0	74.4
CY	-	43.9	61.7	-	-	60.6
LV	-	-	66.0	-	-	57.8
LT	-	75.5	69.4	-	49.8	52.6
LU	-	-	90.4	-	82.5	85.9
HU	-	-	75.6	-	-	74.1
MT	-	-	60.0	-	-	56.0
NL	75.5	79.3	78.9	63.7	72.9	74.5
AT	-	63.8	67.6	-	51.7	61.3
PL	-	71.2	72.9	-	62.0	62.1
PT	-	82.2	74.2	-	73.5	72.4
RO	-	-	76.6	-	-	70.8
SI	-	73.6	76.9	-	62.4	71.7
SK	-	67.0	65.8	-	-	63.1
FI	68.0	77.5	78.3	-	80.3	79.8
SE	-	80.5	79.9	-	74.9	75.0
IS	-	76.5	70.2	-	-	60.8
NO	-	74.8	77.1	-	74.1	68.8
RS	-	-	67.9	-	-	64.2

Source: Eurostat - Custom extraction from EU-LFS data.
Notes: Low reliability: Women (Severely limited: EE, HR, HU, RO, IS. Limited but not severely: BE, DE, IE, EL, IT, CY, LV, HU, PL, RO, SK, IS, NO, ME. Not limited at all: IT, NL, PT, SK), Men (Severely limited: BG, EE, HR, HU, IS. Limited but not severely: BE, DE, IE, EL, IT, CY, LV, HU, AT, PL, RO, SK, SI, IS, NO). Not limited at all: ES, IT, NL, PT, SK); Values not publishable because of very low reliability: Women (Severely limited: CZ, IE, EL, ES, IT, LV, LT, LU, MT, NL, PL, PT, SI, SK, FI, ME. Limited but not severely: CZ, ES, NL), Men (Severely limited: CZ, DE, IE, EL, ES, IT, LV, LT, LU, MT, NL, PL, PT, RO, SI, SK, FI, NO, UK, ME. Limited but not severely: CZ, ES, NL, LT, MT, ME); Definition differs, see metadata: FR, HR. Data not available: Women (Severely limited: BG, EE, IE, EL, HR, CY, LV, LT, LU, HU, MT, AT, PL, RO, SI, SK, RS. Limited but not severely: BG, EL, MT), Men (Severely limited: BG, EE, IE, EL, HR, CY, LV, LT, LU, HU, MT, AT, PL, PT, RO, SI, SK, RS, IS, NO. Limited but not severely: BG, CY, EL, LV, HU, MT, RS).

The proportion of women among the labour force working as S&Es is small (3.4 %) compared to the relative proportion of men (5.0 %)

Among the labour force in 2021, there was a slightly smaller proportion of women S&Es compared to men S&Es at EU level (3.4 % compared to 5.0 %) (see Figure 3.3). While the proportion of women in the population of S&Es has increased at a faster rate (see discussion on Figure 3.1), when considering the total labour force population, the proportions of both women and men S&Es have stayed consistent (with proportions increasing by only 0.1 pp for women and 0.2 pp for men since 2019, reported in She Figures 2021).

Of the 27 Member States and seven Associated Countries for which there are data for 2021, women represent a higher proportion of S&Es in the total labour force than men in seven countries (BG, DK, ES, LT, PT, IS, NO). However, when compared to data available for 2019 (as presented in She Figures 2021), this number has nearly doubled (in 2019 there were only four countries: DK, LT, LV, NO). Generally, there are no substantial differences between the proportions of women and men in a given country: less than 5 pp for all countries for which data are available. The largest gender gap is evident in Finland, where the proportion of women is 4.5 pp less than that of men. Similarly, previous She Figures editions illustrate that the differences in proportions of S&Es among the total labour force have stayed consistent for both women and men since 2013 ([153]) at country level. These proportions have seldom experienced fluctuations of more than 2 pp across all Member States and Associated Countries with available data.

Denmark has taken initiatives to support gender equality in science and research through grant schemes (see Box 12).

([153]) Based on data presented in She Figures 2015, 2018, and 2021.

Box 12: Gender equality promotion through grant programmes in Denmark

In 2019, the Danish government created a talent programme to promote gender equality in Danish research ([154]). The programme is named after the renowned Danish woman seismologist and geophysicist, Inge Lehmann (1888-1993), and is focused on talented applicants in the early stages of their research careers. Although the programme is open to all genders, women applicants are prioritised where their qualifications are equal ([155]).

In 2023, the 27 researchers who received a grant from the Inge Lehmann programme were all women ([156]). A total of DKK 81.8 million (approx. EUR 10.9 million was allocated to the programme (including overheads), which amounted to a budget framework of up to DKK 2.2 million (approx. EUR 295 000) per grant (excluding overheads).

Since 2020, the Velux Foundations have provided the annual Villum International Postdoc grants to talented women transitioning from their PhD studies to post-doctoral positions ([157]), with the aim of reducing the number of women scientists leaving science and technology at that career stage.

During 2023, DKK 15 million (approx. EUR 2 million) was allocated to the programme, with successful applicants receiving a grant in the range of DKK 1-2.5 million (approx. EUR 134 000-335 000 ([158])), including up to 15 % for indirect project costs. Women who receive the grants are expected to pursue an independent research career for three years, which must include a research stay abroad, followed by returning to work in a Danish research institution. The programme also offers additional funding for family support if required.

([154]) Danish Ministry of Higher Education and Science, Inge Lehmann Programme, 2019, https://ufm.dk/aktuelt/pressemeddelelser/2019/nyt-talentprogram-skal-fa-flere-kvinder-ind-i-forskning

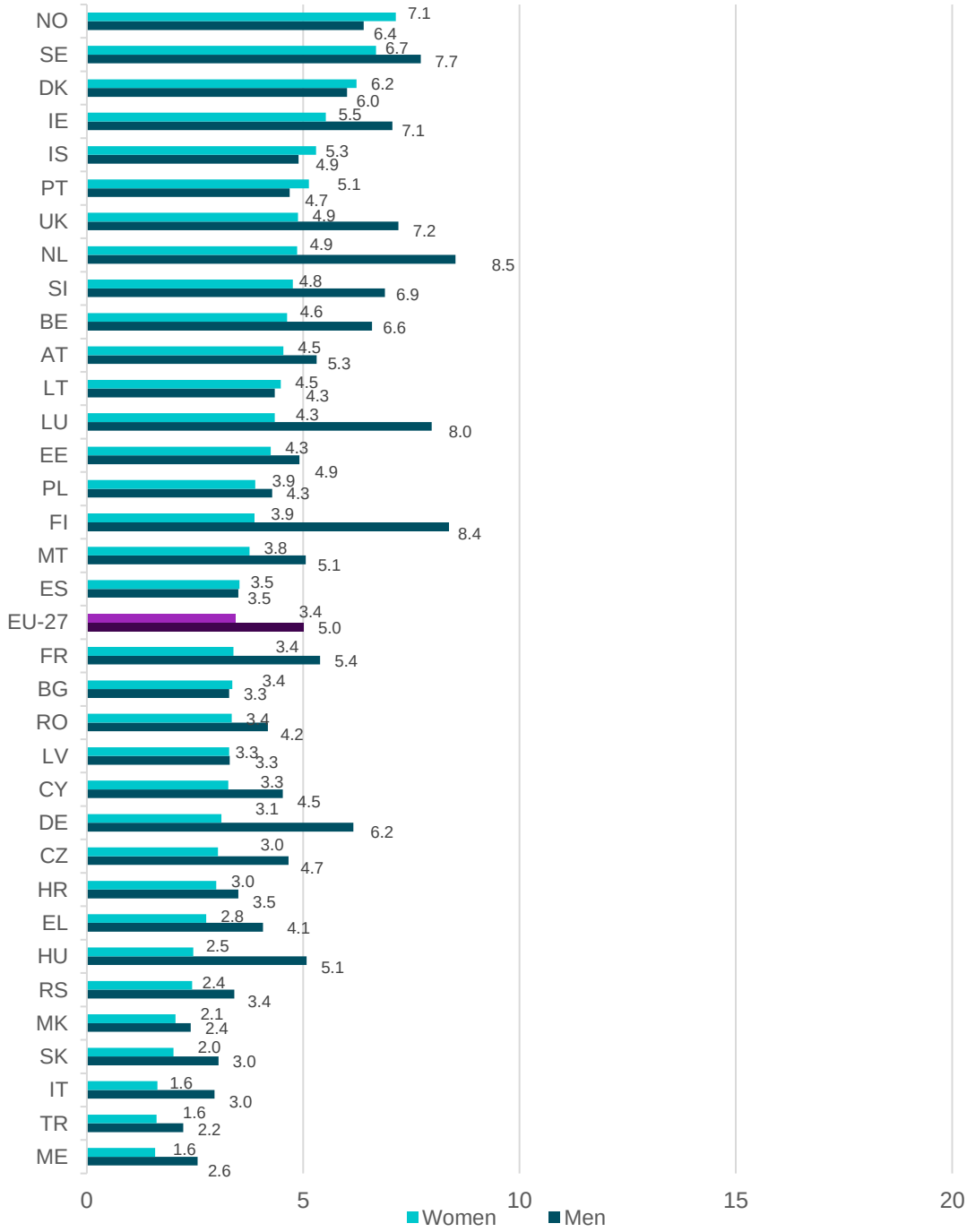
([155]) Independent Research Fund Denmark, Inge Lehmann Programme, 2023, https://dff.dk/en/apply/application/funding-instruments/2023/opslag_inge_lehmann_2023_uk.pdf

([156]) Independent Research Fund Denmark, Funding for research, 2023, https://dff.dk/en/current-news-and-events/funding-for-research-27-researchers-receive-almost-dkk-80-million-under-the-inge-lehmann-programme

([157]) Velux Foundations, Villum International Postdoc, 2023, https://veluxfoundations.dk/en/villum-international-postdoc

([158]) Figures in EUR based on conversion rate in January 2024.

Figure 3.3 Proportion (%) of scientists and engineers (S&Es) among total labour force, by sex, 2021



Source: Eurostat – Human resources in science and technology (online data code: hrst_st_ncat) and Eurostat – EU-LFS – Active population by sex, age and citizenship (online data code: lfsa_agan).

Notes: Definition differs, see metadata: ES, FR; Break in time series: EU-27, BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, RS, NA; Reference year is different: NO: 2021, ME: 2020, MK: 2020, TR: 2020, UK: 2019.

Women born outside the EU are less likely to be employed as scientists and engineers (36 %) compared to women born in another EU Member State (43 %) and native-born women (42 %)

Figure 3.4 displays the proportion of women among scientists and engineers (S&Es) in the EU by migration status, with migration status broken down into three categories: born in another EU Member State, born outside the EU and native-born. These figures are calculated as the number of women, and men, out of the total number of scientists and engineers in each of the three respective migration status categories.

At EU level, women born in a Member State other than where they work (43 %) are almost as likely to work as scientists and engineers as native-born women (42 %) (see Figure 3.4). However, less data is available on the proportion of women born in another Member State working as S&Es (18 countries) compared to native-born women in similar positions (30 countries), which may affect the reliability of the former values. The picture is slightly different at country level, with more native-born women working as S&Es compared to women born in another Member State in 10 of the 18 countries where data are available (eight Member States and two Associated Countries).

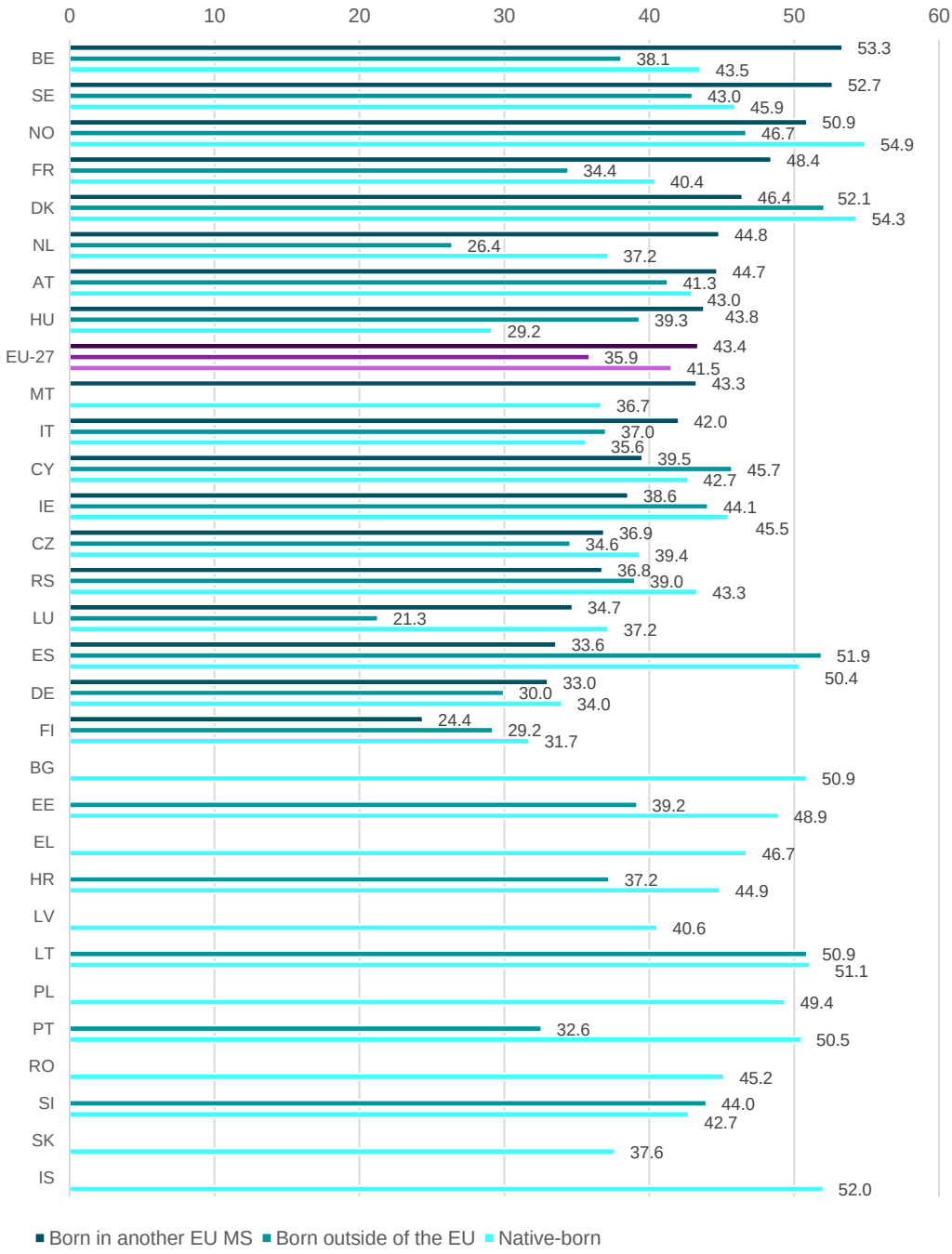
Compared to women born in the EU (in the Member State in which they work or another Member State), women born outside the EU are employed less often as S&Es at EU level (36 %).

- In 12 countries (11 Member States and one Associated Country), the proportion of women working in S&E is lower for those born outside the EU than those born in a Member State other than where they work ([159]).
- Women born outside the EU are underrepresented in the labour market as S&Es compared to native-born women in 18 countries (16 Member States and two Associated Countries) ([160]). The lowest proportions of women born outside the EU working in S&E are in Luxembourg (21 %) and the Netherlands (26 %).

([159]) Data available for 18 countries.

([160]) Data available for 22 countries.

Figure 3.4 Proportion (%) of women among S&Es in the EU, by migration status, 2022



Source: Eurostat - Custom extraction from EU-LFS data.

Notes: Low reliability: Women (Born in another EU Member State: CZ, EL, FR, HU, MT, FI, RS. Born outside the EU: CZ, EE, HR, LT, HU, AT, SI); Values not publishable because of very low reliability: Women (Born in another EU Member State: HR, LV, LT, PL, PT, SI. Born outside the EU: EL, LV, MT, PL, RO, SK, IS); Definition differs, see metadata: Women and Men: ES, FR (Born in another EU Member State, Born outside the EU); Data not available: Women (Born in another EU Member State: BG, EE, HR, LV, LT, PL, PT, RO, SI, SK, UK, TR, ME, MK. Born outside the EU: BG, EL, LV, MT, PL, RO, SK, IS, UK, TR, ME, MK. Native-born: UK, TR, ME, MK).

3.2 Gender gap in knowledge-intensive activities (KIA)

This section first compares women's and men's participation in KIA, before focusing on a subsection of KIA referred to as knowledge-intensive activities – business industries (KIABI) to explore women's participation in business industries.

Box 13: Key definitions related to knowledge-intensive activities (KIA)

- KIA: Activities are considered 'knowledge-intensive' if tertiary-educated people represent 33 % or more of total employment in the activity. The definition is based on the average number of employed persons aged 25-64 at aggregated EU level.
- KIABI: KIABI is similar to KIA but is restricted to business industries, i.e. it excludes KIA in public sector roles such as education, human health activities, libraries, archives, museums, cultural activities, activities of membership organisations, and activities of extraterritorial organisations and bodies.

The overall proportion of people employed in KIA is calculated as the total number of people employed in KIA out of the total number of people employed in all sectors of the economy. The proportions of women and men employed in KIA are calculated as the total numbers of women and men employed in KIA out of all women in employment and all men in employment respectively.

Women are more likely than men to work in KIA in nearly all countries

In 2021, the overall proportion of the employed population working in KIA at EU level was 37 %, up by 2 pp since 2019, as reported in She Figures 2021. More women were employed in KIA than men in 2021, at 46 % and 30 %, respectively (see Figure 3.5. There have been small increases in these figures since 2019, when they were 44 % and 28 % for women and men, respectively.

At country level, more women than men are employed in KIA across all 27 Member States and all seven Associated Countries for which 2021 data are available. The differences between the proportion of women and men are significant in most countries, with women's representation surpassing men's by at least 10 pp in all but two countries (LU, NL) ([161]). In seven Member States and one Associated Country ([162]), the difference between the proportion of women and men is over 20 pp, with the highest being 23 pp in Iceland.

Generally, the proportion of women in KIA has been stable in recent years, with proportions increasing by more than 5 pp in only three countries (IE, PT, SI).

Some Member States have made efforts to support women's participation in KIA (Box 14).

([161]) LU: 3 pp difference between women and men; NL: 6 pp difference.

([162]) EE, HR, LV, LT, PL, SI, SK, IS.

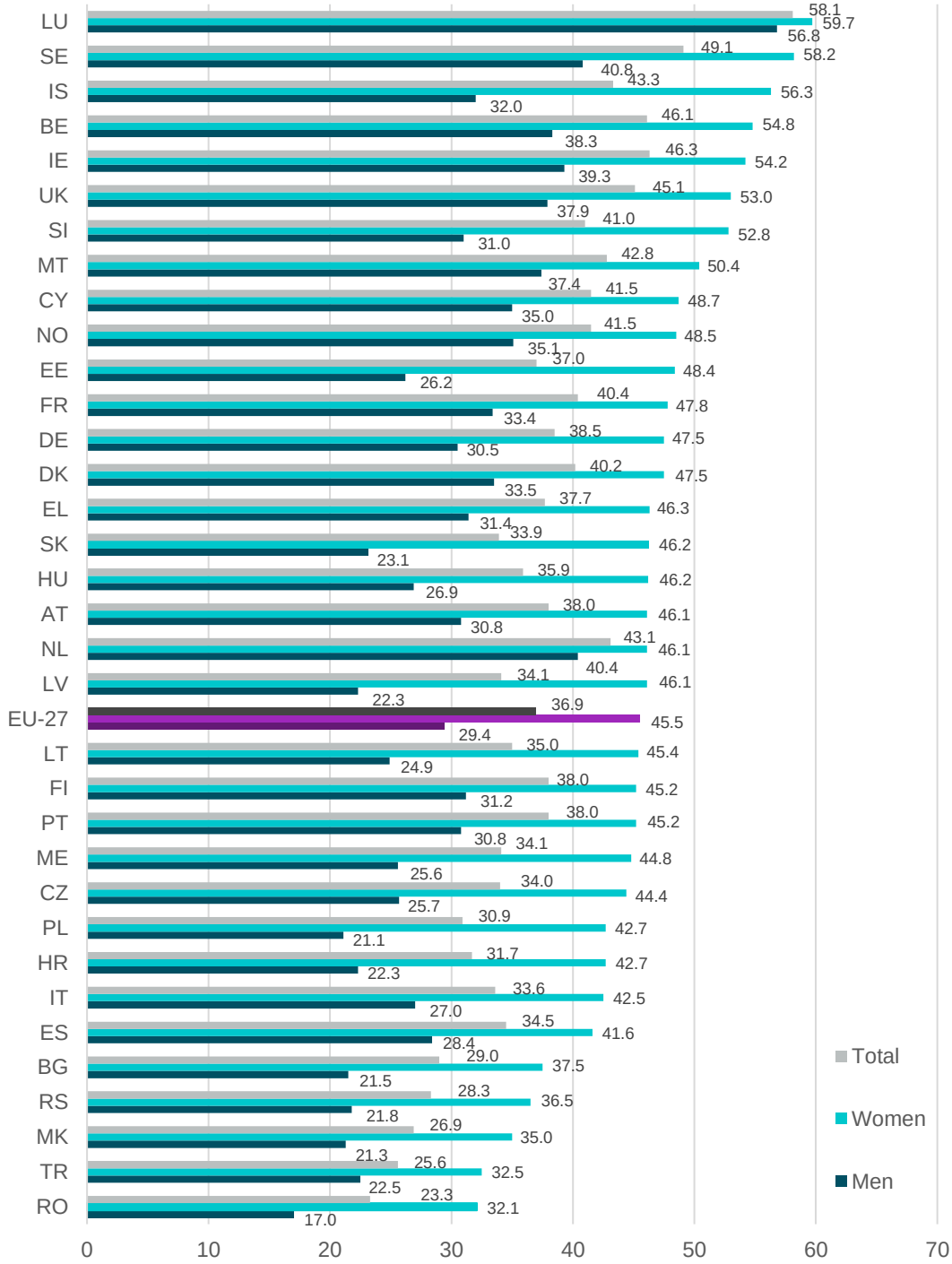
Box 14: Initiatives to support women's inclusion in KIA

In **Slovenia**, each year since 2018, Siemens (in collaboration with several private and public institutions) invites 10 'interesting women engineers' to showcase their work and highlight the progress women are making in S&E ([163]). One of these engineers then receives the Woman Engineer of the Year award to increase the visibility of women in the sector and inspire more women to pursue STEM careers.

In **Luxembourg**, Goodyear launched the Wingfoot Women Programme in 2023, a mentoring and development programme to support women leaders to enter the technology sector ([164]). The programme entails personal branding training for women Goodyear associates, who then go on to mentor young women aspiring to work in technology. The programme is expected to assist women to expand their skillsets and provide opportunities for young women to learn more about working in technology.

([163]) Inženirka leta, Engineer of the Year: About the project, n.d., https://www.inzenirka-leta.si/o-projektu/
([164]) Goodyear, 'Goodyear celebrates women by launching bespoke mentoring and development programme', 2023, https://news.goodyear.eu/goodyear-celebrates-women-by-launching-bespoke-mentoring-and-development-program/

Figure 3.5 Proportion (%) of employed population in KIA among total employment, by sex, 2021



Source: Eurostat – Human resources in science and technology (online data code: hrst_st_ncat) and Eurostat – EU-LFS – Active population by sex, age and citizenship (online data code: lfsa_agan).

Notes: Definition differs, see metadata: ES, FR; Break in time series: EU-27, BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, RS; Reference year differs: ME: 2020, MK: 2020, TR: 2020, UK: 2019.

While considerably more women work in KIA at EU level (46 %, compared to 30 % for men), there is little difference between women and men's representation in KIABI (14 % compared to 15 %)

Although more women work in KIA across all Member States and Associated Countries for which data are available, the proportion of women in KIABI (14 %) is similar to that of men (15 %) (Figure 3.6) at EU level. The proportions of women and men working in KIABI have increased only very slightly between 2013 and 2021 (less than 1 pp each over the period).

Nevertheless, the proportion of women working in KIABI exceeds that of men in 12 Member States and four Associated Countries (data available for 34 countries), although the differences were small ([165]). The proportions of women and men employed in KIABI has stayed relatively consistent since 2019, varying by less than 3 pp for all countries. Box 15 presents some plans and programmes to support women employed in KIABI.

Box 15: Member States' policies and actions to improve digital skills and support women's access to KIABI

In **Cyprus,** the National Action Plan for the Equality of Men and Women 2019-2023 targeted the education and training of women in ICT ([166]). These efforts will be strengthened under the new strategy for Gender Equality 2024-2026.

Similarly, **Slovakia's** National Action Plan for Employment of Women 2022-2030 ([167]) aims to strengthen women's digital skills, ensuring equal access to quality and inclusive education and increasing their participation in technical education-focused fields.

Ireland's most recent National Strategy for Women and Girls ([168]) aims to enhance the use of technology to promote women's empowerment. The National STEM Education Policy Statement 2017-2026 ([169]) promotes greater uptake of STEM subjects by girls and aims to improve women's and girls' participation in apprenticeships.

In **Romania,** the recent Digital Women 2023 programme ([170]) provides a free internationally recognised Google certification to women to develop their digital and employability skills, and consequently access opportunities in the IT field.

In **Portugal**, INCoDe.2030 was launched in December 2023, including two free online courses to develop digital skills on Gender Equality in ICT (Gender-Inclusive Approaches in Technology; Digitalisation and Gender Equality: How to Promote the Participation of Girls and Women in ICT). These programmes aim to present the advantages of women's participation in technology development and promote gender-inclusive approaches in digital development, inclusion, education and qualification of the population ([171]).

([165]) The largest difference between women and men is in ME (6 pp difference), followed by MK (4 pp difference).

([166]) Ministry of Justice and Public Order, National Action Plan for the Equality between Men and Women 2019-2023, 2019, http://www.mjpo.gov.cy/mjpo/mjpo.nsf/sectorgend02_el/sectorgend02_el?OpenDocument

([167]) Government of Slovakia, National Action Plan for Women's Employment 2022-2023, https://www.employment.gov.sk/files/sk/ministerstvo/spolocny-sekretariat-vyborov/vybor-rodovu-rovnost/dokumenty-udalosti/nap_zamestnanosti_zien_22-30.pdf

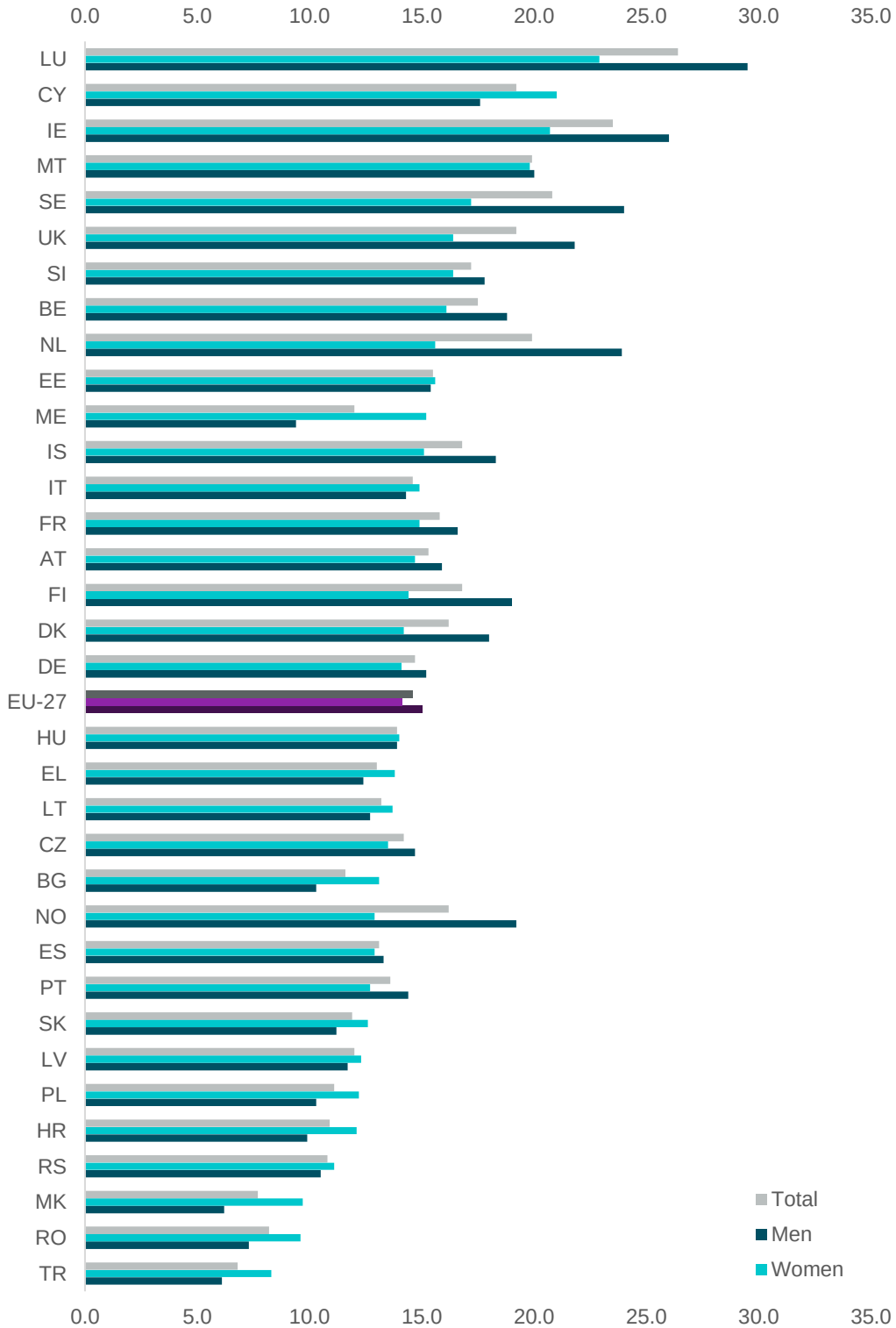
([168]) Department of Justice and Equality, Under the National Strategy for Women and Girls 2017-2020: creating a better society for all, 2017, https://www.gov.ie/pdf/?file=https://assets.gov.ie/6427/88cc57e206a34e94aeff2310f2b100d5.pdf#page=null

([169]) Government of Ireland, STEM Education Policy Statement 2017-2026, n.d., https://www.gov.ie/pdf/?file=https://assets.gov.ie/43627/06a5face02ae4ecd921334833a4687ac.pdf#page=null

([170]) Government of Romania, Digital Women 2023: About the project, 2023, https://digitalwomen.eu/despre-proiect

([171]) Government of Portugal, InCoDe.2030, n.d., https://www.incode2030.gov.pt/en/2023/12/14/incode-2030-launches-two-courses-to-promote-gender-equality-in-ict/

Figure 3.6 Proportion (%) of employed in KIABI among total employment, by sex, 2021



Source: Eurostat – Human resources in science and technology (online data code: htec_kia_emp2).

Notes: Definition differs, see metadata: ES, FR; Break in time series: EU-27, BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, RS; Reference year differs: ME: 2020, MK: 2020, TR: 2020, UK: 2019.

3.3 Gender gap in self-employment activities in technology-oriented occupations

This section explores women's representation as self-employed professionals in S&E and ICT in recent years.

Gender balance has not been achieved among self-employed professionals in S&E and ICT in nearly all countries, with little change over time

The latest data show a considerable underrepresentation of women among self-employed S&E and ICT professionals at EU level, with women comprising 25 % of the population (with no change observed since She Figures 2021) (see Figure 3.7). Among countries with available data, gender balance is observed in one out of 22 Member States (CY, 42 %) and one out of seven Associated Countries (NO, 43 %). Differences in the representation of women among self-employed professionals in S&E and ICT vary by 27 pp between countries ([172]).

At the national level, the proportion of women among self-employed S&E and ICT professionals has changed little in many countries ([173]), with 16 countries varying by less than 5 pp since 2018, a slight decrease observed in nine countries ([174]), and an increase in seven countries ([175]). There are some exceptions: in three countries (CY, HU, PT), the proportion of women among self-employed S&E and ICT professionals has increased by over 10 pp (16 pp, 11 pp and 11 pp, respectively), while in Lithuania, the proportion of women has decreased by over 10 pp (from 37 % in 2018 to 24 % in 2021).

Few Member States have undertaken initiatives focusing specifically on increasing self-employment among women in S&E and ICT. One example from Poland is outlined in Box 16.

Box 16: Girls Go Start-up! Academy, as part of Perspektywy Women in Tech Programme in Poland

Perspektywy Women in Tech Programme aims to support women to build careers in the technological industry through various activities ([176]). One of these activities is the Girls Go Start-up! Academy, which aims to provide STEM students with the skills to create and progress with a start-up ([177]). The Academy provides mentorships from women working in science, technology, and start-ups, alongside training on business models, business branding, networking, startup financing, effective communication, and pitching.

([172]) Of all 26 countries (including Member States and Associated Countries) for which there are data, the UK has the lowest proportion of women among self-employed science and engineering and ICT professionals, at 16 %, although the latest data are from 2019. The next lowest is Poland, where 17 % of self-employed professionals in science and engineering and ICT are women.

([173]) For eight countries (BG, LV, LU, MT, RO, IS, ME, MK), recent data are unavailable, while for a further three countries (EE, NO, RS) data are unavailable around 2019, making comparisons impossible.

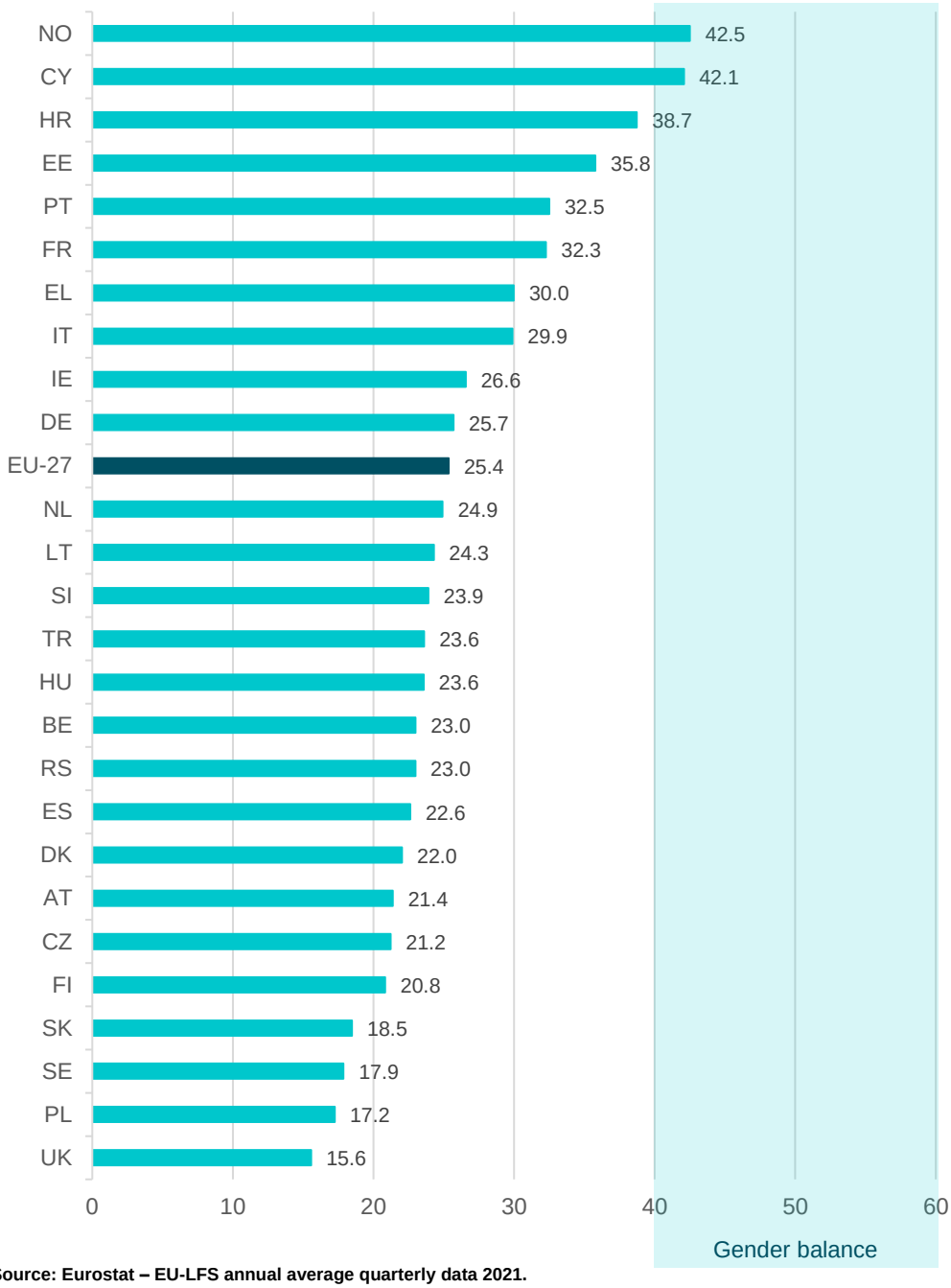
([174]) ES, FR, IT, AT, PL, SK, FI, SI, UK.

([175]) BE, CZ, DK, DE, IE, NL, TR.

([176]) Perspektywy Education Foundation, Perspektywy: Women in Tech, n.d., https://womenintech.perspektywy.org/en/about-us/

([177]) Girls Go Start-up! Academy, n.d., http://girls-startup.pl/

Figure 3.7 Proportion (%) of women among self-employed S&E and ICT professionals, 2021



Source: Eurostat – EU-LFS annual average quarterly data 2021.

Notes: Definition differs, see metadata: ES, FR (Women and Total); Break in time series: EU-27, BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, HR, IT, CY, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, FI, SE, IS, RS (Women and Total); Reference year differs: EE: 2020, IE: 2019, HR: 2019, LV: 2017, SK: 2020, NO: 2016, TR: 2020, UK: 2019; Data not available: BG, LU, MT, RO, IS, ME, MK.

3.4 Gender differences in unemployment among the tertiary-educated labour force

This section considers the unemployment of tertiary-educated women. It highlights the differences in unemployment between tertiary-educated women and men, noting actions by Member States to tackle this issue.

The proportion of unemployed tertiary-educated women is similar to men at EU level (3.7 % for women compared to 3.1 % for men)

Similar to She Figures 2021, latest data indicate similar unemployment rates for tertiary-educated women and men, at 3.7 % for women and 3.1 % for men (see Figure 3.8), with the overall unemployment rate for tertiary-educated women and men standing at 3.4 %. This mirrors the overall unemployment rates of women and men at EU level in 2021, where the disparity between women and men is minimal (7.4 % for women, compared to 6.8 % for men) ([178]).

At country level, the unemployment rate of tertiary-educated women exceeds that of men in 29 of the 44 countries for which data are available, including 18 Member States, nine Associated Countries, and two G20 countries. Gender gaps are small for most Member States and only exceed 2 pp in two cases, with women surpassing men in both instances: Greece, where the difference is 4.9 pp (12.4 % for women, compared to 7.5 % for men), and Spain, where the difference is 2.6 pp (9.7 % for women, compared to 7.1 % for men). The disparities in unemployment rates between tertiary-educated women and men in Greece and Spain reflect wider trends in unemployment rates in these countries. Unemployment rates overall are generally higher than in other Member States (at 10.0 % and 8.5 %, respectively), and larger than average gender gaps in unemployment rates are also observed (a 7.5 pp difference between the proportions of women and men in Greece and 3.5 pp in Spain, compared to EU level gender gap of 0.6 pp) ([179]).

While the data show no significant differences in the unemployment rates of women and men, there are certain barriers to employment that disproportionately affect women, such as difficulties balancing work and caring responsibilities. Various Member States have taken steps to decrease unemployment in the tertiary-educated labour force, particularly by addressing family responsibilities that may hinder women's participation in science and technology. These efforts include strategies and action plans (see Box 7), as well as initiatives such as reports or scholarships (see Box 17).

([178]) Eurostat, Unemployment rate by sex, 2024, https://ec.europa.eu/eurostat/databrowser/view/tesem120__custom_10600553/default/table?lang=en

([179]) Ibid.

Box 17: Member State initiatives to reduce women's unemployment in STEM

The **Netherlands** Research Report on Women's Attrition in Science ([180]) in 2022 documented the attrition of women in science, specifically relating to pregnancy and discrimination.

In **Poland**, two reports ([181]) were produced to outline the disparities in certain areas between women and men researchers (specifically in relation to women's family responsibilities) and how these can impact the pursuit of research funding and projects. The Career Monitoring report (2018) highlights statistical imbalances between women and men researchers who received grants from specific programmes funded by the Foundation for Polish Science. The Functioning of Women and Men in Science survey findings (2021) illustrate areas where action is needed to support women researchers to continue their careers in science (such as lack of systematic support, discrimination, and low confidence in relation to securing funding or assessing own scientific achievements).

Since 2016, the Martina Roeselová Grant in **Czechia**, currently run by the IOCB Tech Endowment Fund and funded by the Martina Roesel Foundation, has awarded postgraduate students and postdoctoral researchers pursuing science careers with funding to care for a preschool child. Successful applicants receive a grant of CZK 150 000 (approx. EUR 6 000 ([182])) for one calendar year. The grant is specifically open to those in 'a difficult life situation' ([183]) and working in natural sciences at university or non-university scientific workplaces in Czechia. The award provides financial support to ensure that scientists can cover the necessary childcare costs and continue or return to their research or studies.

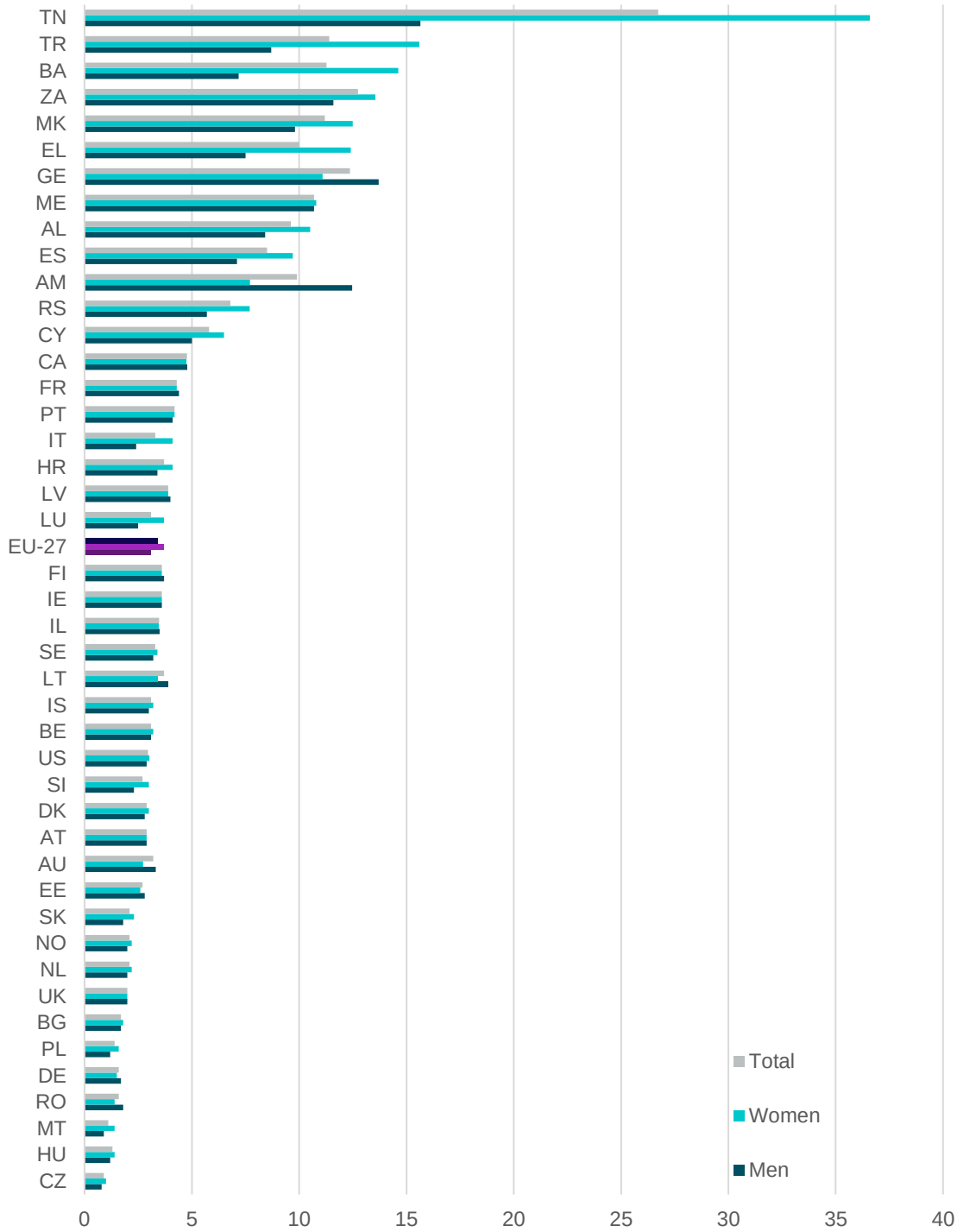
([180]) Government of the Netherlands, *Research into the dropout rate of women in science*, Final report, 2022, https://www.rijksoverheid.nl/documenten/rapporten/2022/09/15/eindrapportage-onderzoek-naar-de-uitval-van-vrouwen-in-de-wetenschap

([181]) Foundation for Polish Science, *Career Monitoring report*, 2018, https://www.fnp.org.pl/assets/monitoring-karier.pdf; National Science Centre (NCN), *Functioning of women and men in science*, 2021, https://www.ncn.gov.pl/sites/default/files/pliki/funkcjonowanie_kobiet_i_mezczyzn_w_nauce_wyniki_sondazu_NCN.pdf

([182]) EUR figure based on conversion rate on 22 January 2024.

([183]) IOCB Tech Endowment Fund, About Martina and the history of the grant, 2023, https://nf-iocbtech.cz/pgmr/

Figure 3.8 Unemployment rate (%) of tertiary-educated people, 2021



Source: Eurostat – Human resources in science and technology (online data codes: hrst_st_nunesex - custom extraction) and International Labour Organization (ILO) - Database of labour statistics (online data: Unemployment by sex, age and education, Labour force by sex, age and education).

Notes: Low reliability: MT (Women and Men), SK (Men); Break in time series: EU-27, BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, HR, IT, CY, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, FI, SE, IS, NO, BA, RS, GE; Unreliable: BA (Women), AM, GE, AL (Women); Definition differs, see metadata: ES, FR; Reference year differs: ME: 2020, MK: 2020, TR: 2020, GE: 2020, UK: 2019, AL: 2019.

3.5 Women and men's participation in the higher education, government, and business enterprise sectors

This section presents indicators on women's participation in different categories of personnel working in R&D, as researchers, technicians, and other supporting staff, overall and by sector. It then focuses on women's participation as researchers in the business enterprise sector (BES), where women are historically underrepresented.

Box 18: Key definitions related to economic sectors

The Frascati Manual (OECD, 2015) ([184]) identifies and defines four main sectors of the economy: the higher education sector (HES), the government sector (GOV), the business enterprise sector (BES), and the private non-profit sector (PNP). The definitions for the first three of these (included in this indicator) are:

HES: 'It comprises all universities, colleges of technology and other institutions providing formal tertiary education programmes, whatever their source of finance or legal status, and all research institutes, centres, experimental stations and clinics that have their R&D activities under the direct control of, or **administered by, tertiary education institutions'.**

GOV: 'The Government sector consists of the following groups of resident institutional units: all units of central (federal), regional (state) or local (municipal) government, including social security funds, except those units that provide higher education services or fit the description of higher education institutions provided in this manual. It consists also of all non-market non-profit institutes (NPIs) that are controlled by government units that are not part of the higher education sector'.

BES: 'The Business enterprise sector comprises all resident corporations, including not only legally incorporated enterprises, regardless of the residence of their shareholders. This group also includes all other types of quasi-corporations, i.e. units capable of generating a profit or other financial gain for their owners that are recognised by law as separate legal entities from their owners and set up for purposes of engaging in market production at prices that are economically significant. It comprises also the unincorporated branches of non-resident enterprises that are deemed to be resident because they are engaged in production on the economic territory on a long-term basis and all resident NPIs that are market producers of goods or services or serve business'.

Within the R&D workforce, women are less likely to work as researchers (61 %, compared to 66 % for men) and more likely to work as 'technicians and other supporting staff' than men (39 % compared to 34 %)

When looking across all sectors, 61 % of women R&D personnel held roles as researchers, compared to 66 % of men in 2021 (Figure 3.9). There has been little change in these rates

([184]) OECD, *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities*, OECD Publishing, Paris, 2015, https://doi.org/10.1787/9789264239012-en

since 2018 (as shown in She Figures 2021), when 60 % of women R&D personnel were researchers, compared to 66 % for men ([185]).

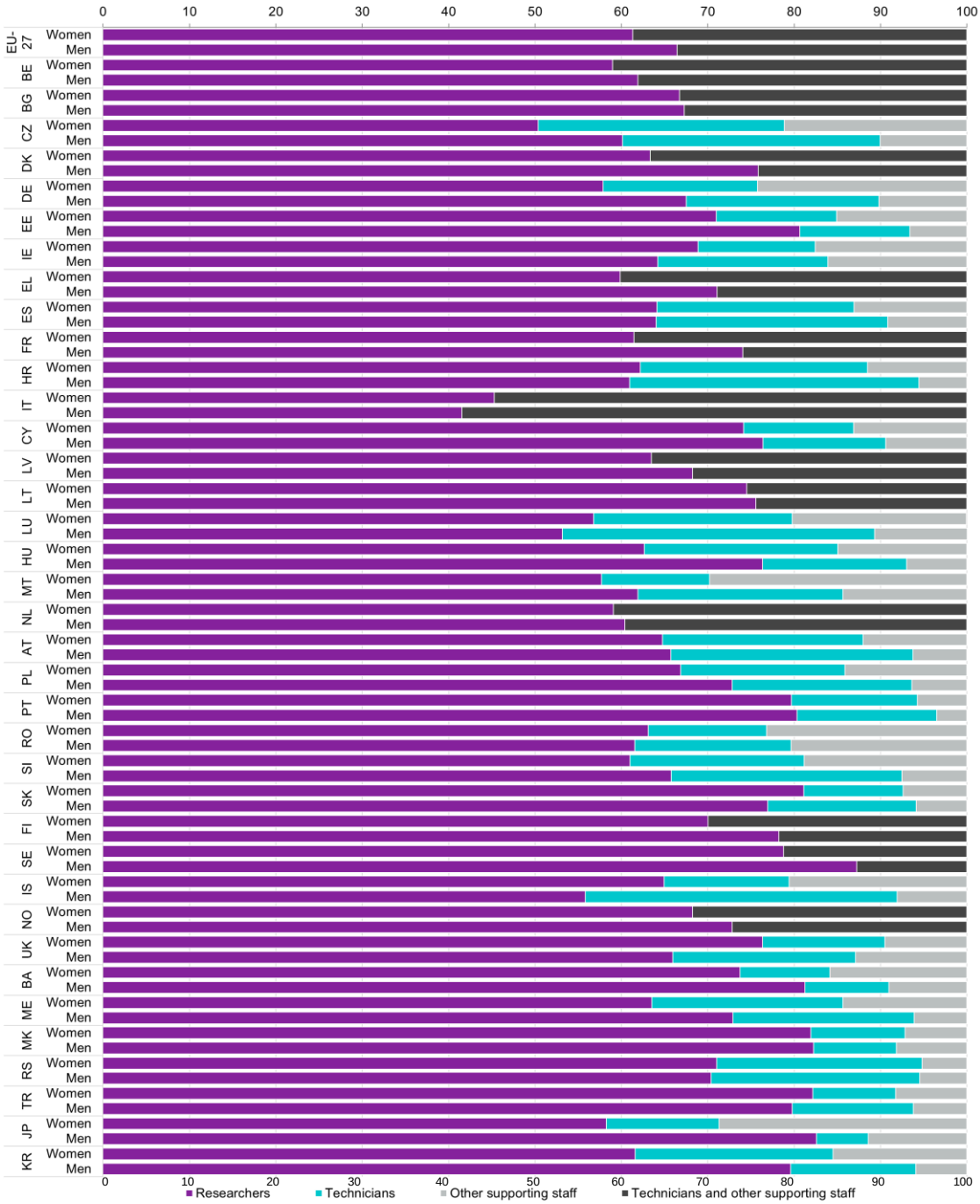
This trend of underrepresentation of women as researchers and consequent overrepresentation of women as technicians and other supporting staff is mirrored in all but seven Member States (IE, ES, HR, IT, LU, RO, SK). The gap between women and men in Member States ranges from nearly 14 pp in favour of men in Hungary (where 63 % of women R&D personnel are researchers, compared to 76 % of men ([186])) to approx. 5 pp in favour of women in Ireland (where researchers account for 69 % of women R&D personnel and 64 % of men). Across Member States, between 45 % (IT) and 81 % (SK) of women among R&D personnel are researchers, compared to between 42 % (IT) and 87 % (SE) for men.

Similar trends are seen among Associated Countries and G20 countries, with the proportion of researchers among men in the R&D workforce higher than the respective proportion for women in six out of 10 countries for which data are available (NO, BA, ME, MK, JP, KR). For the two G20 countries with available data (JP, KR), very pronounced gaps are identified: approximately 58 % of women R&D personnel in Japan are researchers, compared to 83 % for men (a gap of approx. 24 pp), while in South Korea, the equivalent proportions are 62 % for women and 80 % for men (a gap of approx. 18 pp).

([185]) European Commission, She Figures 2021, 2021, https://op.europa.eu/en/publication-detail/-/publication/67d5a207-4da1-11ec-91ac-01aa75ed71a1

([186]) The proportion of women is 62.64 %, compared to 76.35 % for men.

Figure 3.9 Distribution (%) of R&D personnel across occupations, all sectors (BES, GOV, HES), by sex, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD –R&D personnel by sector and function.

Notes: Definition differs, see metadata: FI (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Break in time series: BE, SE (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Estimated: EU-27 (2021 - All professional positions - Women, Total), UK (2018 - All professional positions - Women, Total); Provisional: DK (2019 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Difference in methodology: JP (2021 - All professional positions - Women, Total); Reference year differs: DK: 2019, UK: 2018, ME: 2019, MK: 2020, RU: 2020; Data not available EU-27, BE, DK, EL, FR, LV, LT, NL, FI, SE, NO, RU (Technicians, 'Other supporting staff' - Women, Men, Total), US, IL (All professional positions - Women, Men, Total).

Women R&D personnel are more likely to be researchers in HES (69 %) than in BES and GOV (at 54 % for both)

At EU level, in 2021, of all women R&D personnel employed in HES, 69 % were researchers, compared to 54 % for both GOV and BES. In comparison, 83 % of men R&D personnel in HES were researchers, with 63 % in GOV and 60 % in BES.

Within HES, women and men R&D personnel are more likely to be researchers than technicians or 'other supporting staff' combined in all Member States, Associated Countries and G20 countries (with the exception of South Korea, where – in total – a greater proportion of women are technicians or 'other supporting staff', although still more likely to be researchers than either of these categories separately). This may suggest that there are fewer technician and supporting staff roles available within HES compared to other sectors.

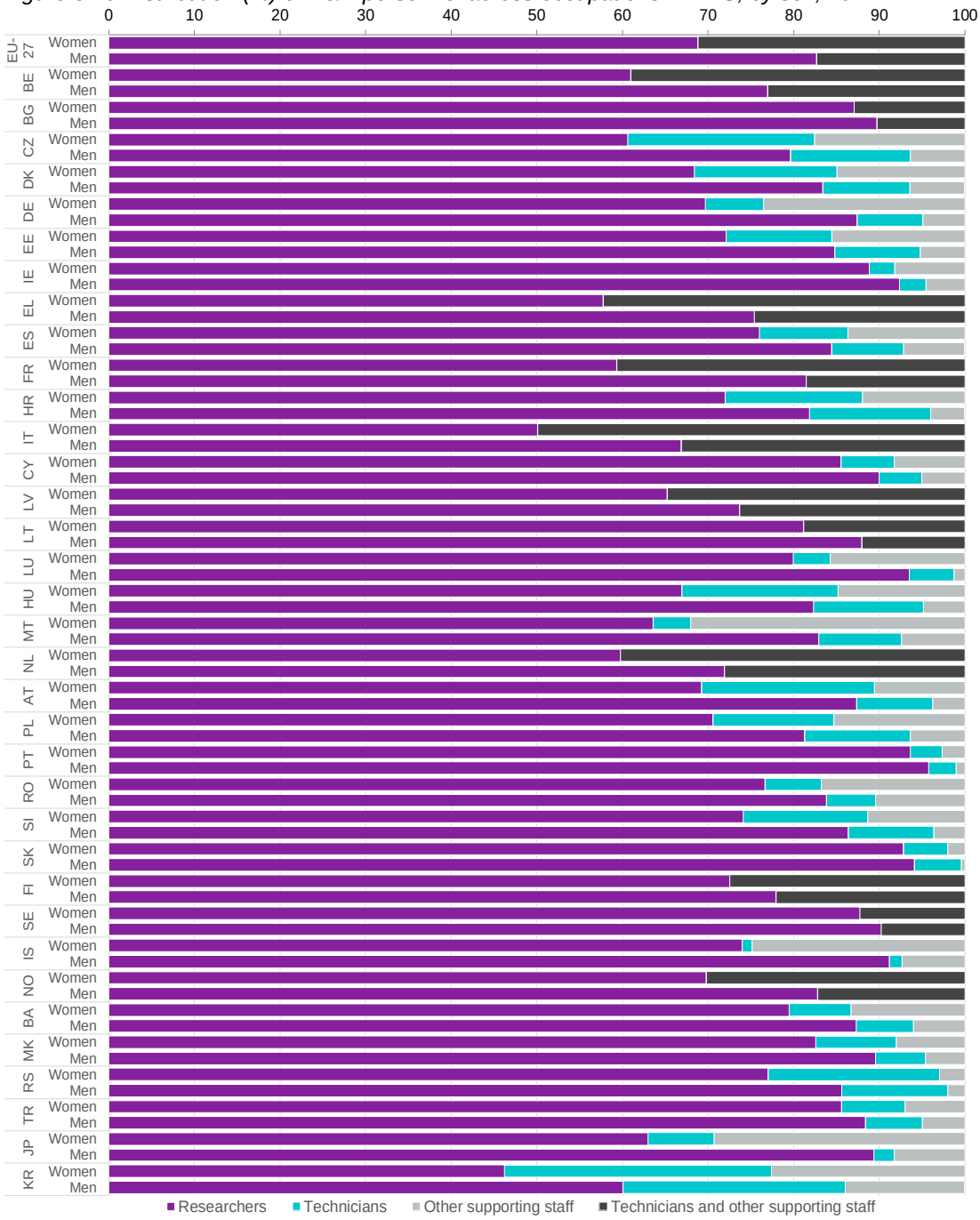
Among women R&D personnel in HES within Member States, the proportion of researchers is highest in Portugal (94 %), Slovakia (93 %), Ireland (89 %), and Sweden (88 %). However, the share of women researchers does not exceed that of men in any of the countries examined (see Figure 3.10).

When considering the lower proportion of researchers among women R&D personnel compared to men, the opposite pattern is observed for 'technicians and other supporting staff'. Where data are available ([187]), at EU level, the proportion of women R&D personnel in this employment category in HES is nearly double that of men (31 % and 17 %, respectively). Women R&D personnel are overrepresented in roles recorded as 'other supporting staff' across all countries where data are available. Similarly, the proportion of women R&D personnel working as technicians exceeds that of men in all but six countries (DE, IE, LU, MT, SK, IS). These findings are similar to observations in previous editions of She Figures ([188]).

([187]) Data for the category of 'technicians and other supporting staff' available for BE, BG, EL, FR, LV, LT, NL, FI, SE.

([188]) European Commission, She Figures 2021, 2021, https://op.europa.eu/en/publication-detail/-/publication/67d5a207-4da1-11ec-91ac-01aa75ed71a1

Figure 3.10 Distribution (%) of R&D personnel across occupations in HES, by sex, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

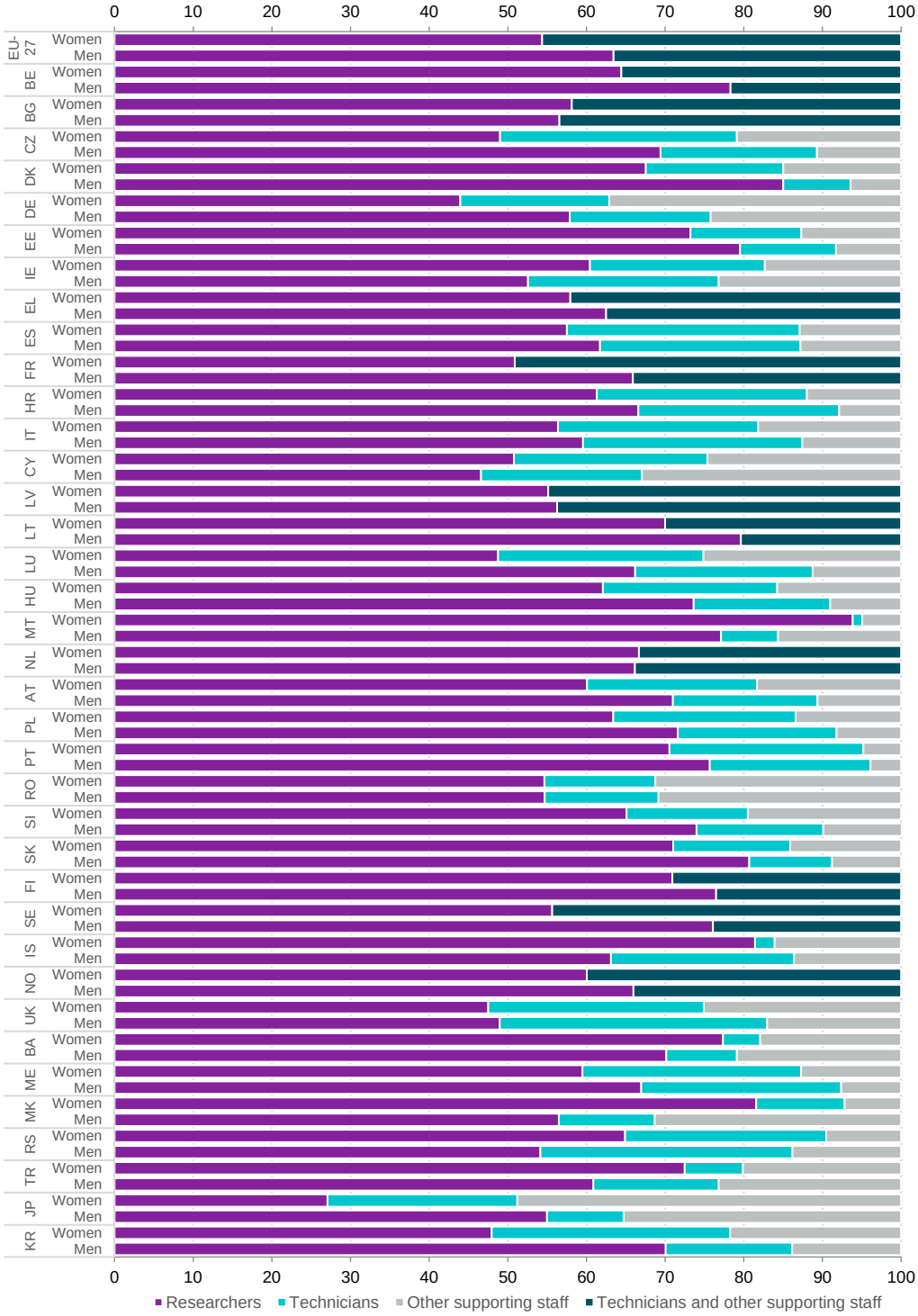
Notes: Definition differs, see metadata: DE (2021 - Researchers, 'Other supporting staff', 'Technicians and other supporting staff', Total - Women, Total), FI (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Break in time series: SE (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Estimated: EU-27 (2021 - Researchers, Total - Women, Total), IE (2021 - All professional positions - Women, Total), IT (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Provisional: DK (2019 - All professional positions - Women, Total); Difference in methodology: JP (2021 - All professional positions - Women, Total); Reference year differs: DK: 2019, MK: 2020, RU: 2020; Data not available: EU-27, BE, BG, EL, FR, IT, LV, LT, NL, FI, SE, NO, RU (Technicians, 'Other supporting staff' - Women, Men, Total), ME, UK, US, IL (All professional positions - Women, Men, Total).

As in HES, women R&D personnel working in GOV are more likely to be researchers than technicians or 'other supporting staff' (see Figure 3.11). This holds for all but three Member States (CZ, DE, LU), one Associated Country (UK), and both G20 countries for which data are available (JP, KR). A similar pattern is observed for men employed in GOV, with men R&D personnel more likely to be researchers than technicians or 'other supporting staff' in all She Figures countries, apart from one Member State (CY), and one Associated Country (UK) ([189]).

Among women R&D personnel in GOV in Member States, the proportion of researchers ranges from 44 % (DE) to 94 % (MT). The data suggest that the proportion of women researchers in GOV at EU level has stayed consistent in recent years (at 54 % in 2021, compared to 53 % in 2018). However, at both EU and country levels, the proportion of researchers among men R&D personnel continues to exceed the corresponding proportion of women in GOV. This is the case for all but five Member States (BG, IE, CY, MT, NL) and five Associated Countries (IS, BA, MK, RS, TR). Conversely, women R&D personnel in GOV are more likely than men to work as 'other supporting staff' at EU level. Women in roles recorded as 'technicians and other supporting staff' constitute 46 % of total women in GOV ([190]), compared to 37 % of the equivalent proportion of men. The proportion of men R&D personnel working as 'other supporting staff' exceeds the corresponding proportion of women in only three Member States (IE, CY, MT) and four Associated Countries (BA, MK, RS, TR).

([189]) UK data from 2018.
([190]) Data for the category of 'technicians and other supporting staff' available for BE, BG, EL, FR, LV, LT, NL, FI, SE.

Figure 3.11 Distribution (%) of R&D personnel across occupations in GOV, by sex, 2021



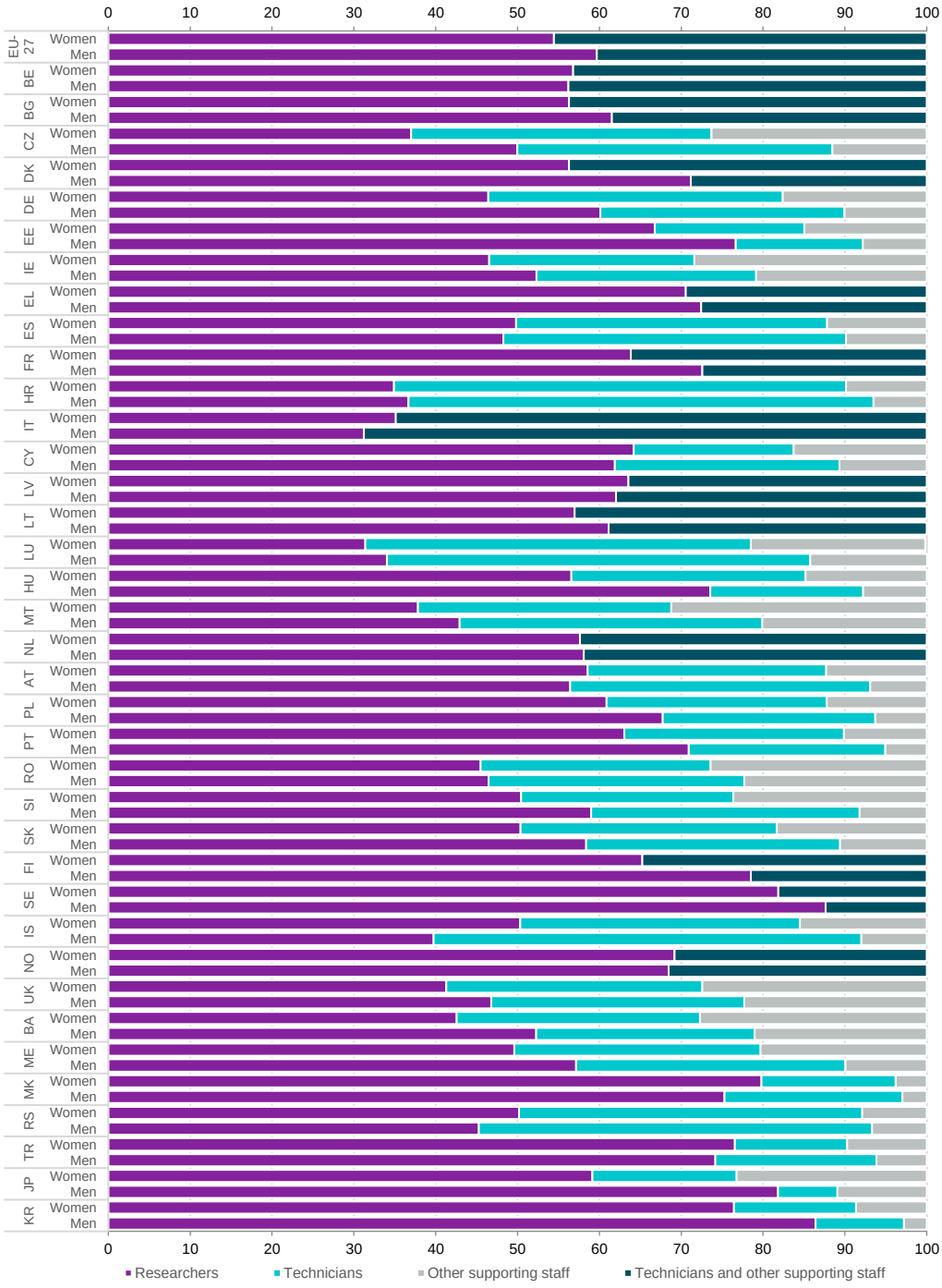
Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: DE (2021 - All professional positions, Total - Women, Total), FI, NL (2021 -Researchers, 'Technicians and other supporting staff', Total - Women, Total); Break in time series: SE (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Estimated: EU-27 (2021 - Researchers, Total - Women, Total), IE (2021 - All professional positions - Women, Total), IT (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Provisional: DK (2019 - All professional positions - Women, Total); Difference in methodology: JP (2021 - All professional positions - Women, Total); Reference year differs: DK: 2019, UK: 2018, ME: 2019, MK: 2020, RU: 2020; Data not available: EU-27, BE, BG, EL, FR, IT, LV, LT, NL, FI, SE, NO, RU (Technicians, 'Other supporting staff' - Women, Men, Total), ME, UK, US, IL (All professional positions - Women, Men, Total).

As in HES and GOV sectors, women R&D personnel more likely to hold researcher roles than other roles in BES (see Figure 3.12). This trend is reversed in only nine Member States (CZ, DE, IE, ES, HR, IT, LU, MT, RO) and three Associated Countries (UK, BA, ME), where women are more likely to have roles as technicians or 'other supporting staff' than researchers. The same pattern is observed for men, with seven Member States (CZ, ES, HR, IT, LU, MT, RO) and three associated countries (IS, UK, RS) where more men have roles as technicians or 'other supporting staff' than as researchers.

At EU level in 2021, the proportion of women researchers among all women R&D personnel in BES was 54 %, compared to 60 % for men. While the proportion of women researchers has risen slightly from 52 % (She Figures 2021), men R&D personnel are still more likely than women to be researchers, with the only exceptions being six Member States (BE, ES, IT, CY, LV, AT) and five Associated Countries (IS, NO, MK, RS, TR).

Figure 3.12 Distribution (%) of R&D personnel across occupations in BES, by sex, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD – R&D personnel by sector and function

Notes: Definition differs, see metadata: DE (2021-Researchers, “Other supporting staff”, Technicians and “other supporting staff”, Total- Women, Total), FI, NO (2021-Researchers, Technicians and “other supporting staff”, Total- Women, Total); Break in time series: SE, NO (2021-Researchers, Technicians and “other supporting staff”, Total-Women, Total); Estimated: EU-27(2021- Researchers, Total-Women, Total), IE(2021- All professional positions-Women, Total), IT(2021-Researchers, Technicians and “other supporting staff”, Total-Women, Total); Provisional: DK(2019-Researchers, “Other supporting staff”, Technicians and “other supporting staff”-Women, Total); Difference in methodology: JP(2021- All professional position-Women, Total); Reference year differs: DK: 2019,UK: 2018,ME: 2019,MK: 2020,RU: 2020; Data not available: EU-27, BE, BG, EL, FR, IT, LV, LT, NL, FI, SE, NO, RU (Technicians, “Other supporting staff”-Women, Men, Total),ME, UK, US, IL (All professional positions-Women, Men, Total).

In most countries, both women and men researchers in BES are more likely to work in Services of the Business Economy than in Manufacturing, comprising approximately 60 % or more in 15 countries

Latest data show that in all but five Member States (DE, IT, LU, SI, FI) and three Associated Countries (BA, ME, MK) (out of 34 countries with available data), women researchers in BES are more likely to work in Services of the Business Economy ([191]) than in Manufacturing, with the distribution of women in Services of the Business Economy ranging between 26 % and 84 %, of all women researchers in BES (see Figure 3.13). Beyond these two major categories, in most countries only a small proportion of women (and men) researchers in BES work in 'other economic activities', ranging from 0 to 23 %, with values generally less than 10 %. Very similar trends are evident for men researchers working in BES.

The proportion of women researchers in Manufacturing is less than the proportion for men for 20 of the 34 countries where 2021 data are available (including 15 out of 26 Member States ([192])). The largest differences between the proportions of women and men are in North Macedonia ([193]) and Bosnia and Herzegovina (both 29 pp in favour of women), while the largest gaps in favour of men are in Austria (17 pp) and Italy (13 pp). Similarly, in the Services of the Business Economy, the proportion of women researchers is lower than that of men in half of the countries ([194]) with differences below 10 pp. There are three exceptions: North Macedonia has a gap of 27 pp in favour of men, while Austria and the UK ([195]) have gaps of 17 pp and 12 pp, respectively, in favour of women.

Conversely, the proportion of women researchers employed in 'other economic activities' is higher than the equivalent for men in more than half of She Figures countries ([196]), including 18 Member States. Both women and men researchers are less likely to work for employers with economic activities in this category. The difference in the proportions is smaller than in other BES economic activities and does not exceed 5 pp, with the exception of Italy (8 pp in favour of women), Estonia (7 pp in favour of women), and Bosnia and Herzegovina (29 pp in favour of men).

([191]) Category based on NACE codes.

([192]) BG, CZ, DE, EE, ES, FR, HR, IT, LT, MT, AT, PL, SK, FI, SE. Data not available for NL.

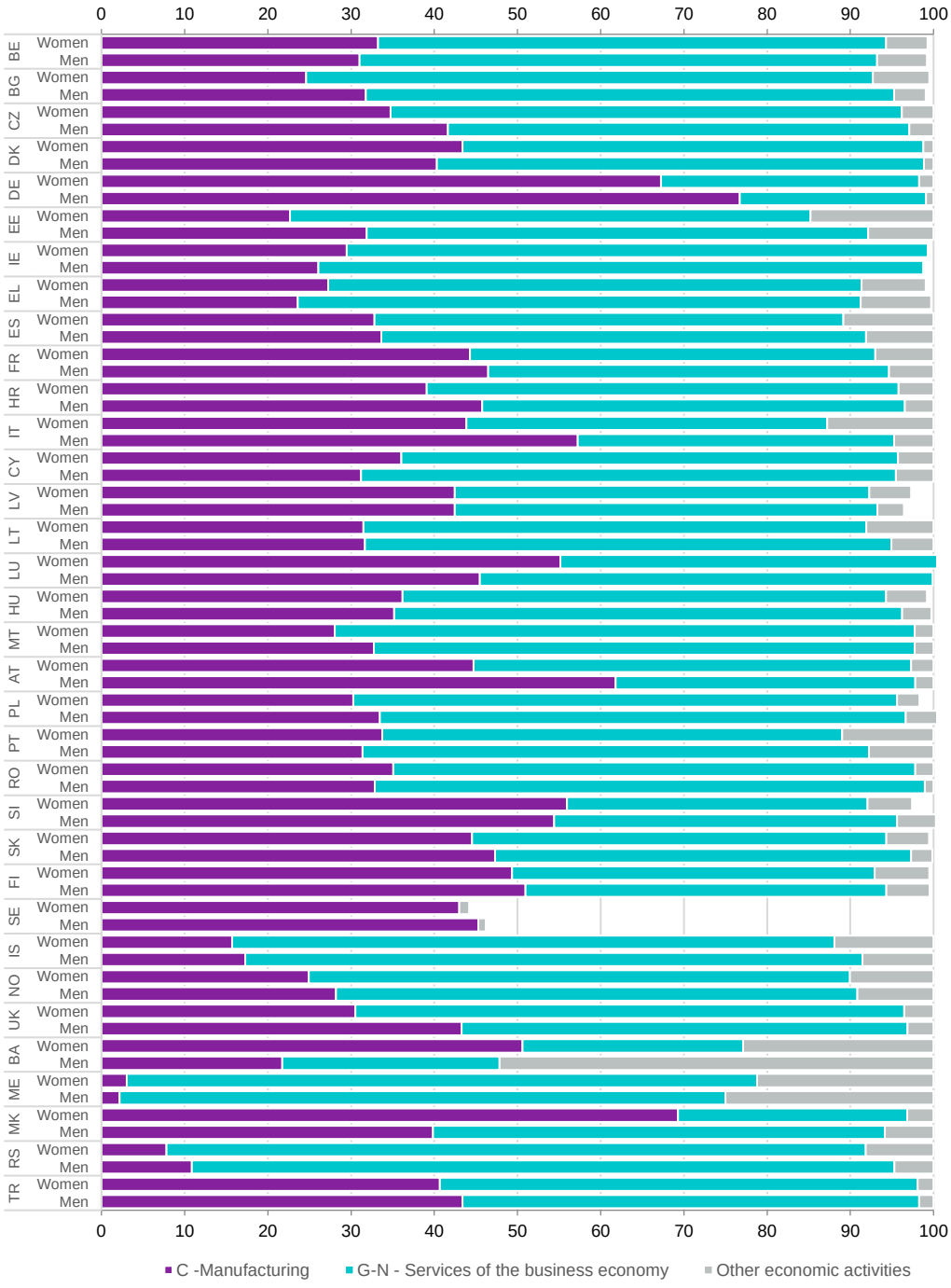
([193]) Data for MK available for 2020.

([194]) BE, DK, IE, EL, ES, CY, LV, LT, LU, HU, PT, RO, SI, SK, IS, MK, RS.

([195]) Latest data available for the UK are from 2017.

([196]) BG, CZ, DK, DE, EE, ES, FR, HR, IT, LV, LT, HU, AT, PT, RO, SI, SK, FI, SE, IS, NO, UK, RS, TR. Latest data for the UK are from 2017.

Figure 3.13 Distribution (%) of researchers in BES, across economic activities (NACE Rev. 2), by sex, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_bempoccr2).

Notes: Definition differs, see metadata: BE, BG, CZ, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, BA, RS,TR ('other economic activities'); Break in time series: BE, BG, CZ, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, BA, RS, TR ('other economic activities'); Estimated: EU-27 (Total - All NACE economic activities); Provisional: DK (All economic activities), ME, UK ('other economic activities'); Low reliability: BE, BG, CZ, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, BA, RS, TR ('other economic activities'); Reference year differs: DK: 2019, UK: 2017, ME: 2019, MK: 2020, RU: 2019; Data not available: EU-27, NL, JP, KR (C - Manufacturing, G-N - Services of the business economy, 'other economic activities' - Women, Total), RU, US, SE (G-N - Services of the business economy - Women, Total).

The highest shares of women among researchers are in the activities of Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations and the Manufacture of Chemicals and Chemical Products

Latest data suggest similar trends to those observed in She Figures 2021 (see Table 3.3):

- The proportion of women among researchers is largest in the area of Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations, where a larger share of women than men researchers is observed in 23 of the 29 countries for data are available ([197]) (see Table 3.1). Women also comprise a majority of R&D personnel working in Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations in 15 Member States ([198]) and six Associated Countries ([199]) (see Annex 3.4).
- Women account for a majority or equal share of researchers employed in Manufacture of Chemicals and Chemical Products in eight Member States (BG, HR, CY, LV, LT, PL, SI, SK) and three Associated Countries (IS, ME, MK) ([200]).
- The proportion of women among researchers working in Services of the Business Economy is lower than that of men in every country.
- Women are similarly less likely than men to be employed in Manufacturing, except in Bosnia and Herzegovina, Montenegro, and North Macedonia, where women make up the majority of the Manufacturing labour force in BES ([201]).
- Women are also far less likely than men to work in 'other economic activities'. Bulgaria and Serbia are the only countries where women are more likely than men to be in these fields. In Romania, this proportion is roughly equal.

([197]) BE, BG, DK, DE, IE, EL, ES, FR, HR, IT, HU, MT, AT, PL, PT, SI, SK, IS, NO, UK, BA, MK, RS, TR. Data for DK are from 2019 and data for the UK are from 2017.

([198]) BG, DK, EL, ES, FR, HR, IT, CY, LV, HU, AT, PL, PT, SI, SK.

([199]) IS, NO, UK, BA, MK, TR. Latest data available for the UK are from 2017.

([200]) Data for ME available for 2019; data for MK available for 2020.

([201]) Data for ME available for 2019; data for MK available for 2020.

Table 3.3 Proportion (%) of women among researchers in BES, by selected economic activity (NACE Rev. 2), 2021

Country	C - Manufacturing	C20 - Manufacture of chemicals and chemical products	C21 - Manufacture of basis pharmaceutical products and pharmaceutical preparations	G-N - Services of the business economy	'Other economic activities'
EU-27	-	-	-	-	-
BE	29.1	33.7	46.4	27.3	24.1
BG	31.8	66.0	77.3	39.3	51.8
CZ	12.1	43.3	37.0	15.4	17.6
DK	27.0	41.0	53.5	24.5	26.2
DE	14.0	28.7	46.7	20.4	26.0
EE	19.1	41.8	32.1 (9/28)	25.7	38.4
IE	26.8	-	48.0	23.8	20.0 (2/10)
EL	32.1	48.0	69.0	27.9	27.2
ES	30.5	48.4	65.6	30.4	37.6
FR	22.0	49.5	60.5	23.1	27.9
HR	27.3	76.8	80.8	32.9	34.8
IT	19.8	35.9	57.3	26.9	46.5
CY	35.6	100.0 (2/2)	53.2	30.8	31.3
LV	33.0	69.0 (20/29)	65.7	32.6	43.5
LT	29.4	62.9	-	28.6	40.1
LU	17.1	-	-	12.4	-
HU	18.9	-	55.4	17.7	24.1
MT	20.4	-	32.6	24.3	23.1 (3/13)
NL	-	-	-	-	-
AT	14.3	32.6	57.1	25.2	22.0
PL	22.3	63.0	71.3	24.7	18.1
PT	31.7	49.1	66.6	28.2	38.0
RO	34.0	-	33.9	31.4	50.0
SI	25.1	50.9	63.1	22.2	27.2
SK	15.7	54.2	72.7	16.4	28.5
FI	17.8	-	-	18.3	22.0
SE	24.2	-	-	-	30.3
IS	33.1	71.0	100.0 (4/4)	34.7	43.2
NO	20.8	-	56.1	23.51	24.6
UK	16.6	37.3	50.9	25.8	24.2
BA	67.7	-	71.4	47.8	28.4
ME	50.0 (2/4)	100.0 (2/2)	-	42.7	37.8
MK	68.2	50.0 (6/12)	100 .0 (12/12)	38.5	40.0 (10/25)
RS	29.8	47.1 (8/17)	50.0 (2/4)	37.0	50.5
TR	26.0	49.3	65.1	28.1	29.0

Source: Eurostat – Research and development statistics (online data code: rd_p_bempoccr2).

Notes: Definition differs, see metadata: BE, BG, CZ, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, BA, RS, TR ('other economic activities'); Break in time series: BE, BG, CZ, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, BA, RS, TR ('other economic activities'); Estimated: EU-27 (Total - All NACE economic activities); Provisional: DK (All economic activities), ME, UK ('other economic activities'); Low reliability: BE, BG, CZ, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, BA, RS, TR ('other economic activities'); Reference year differs: DK: 2019, MK: 2020, ME: 2019, UK: 2017; Data not available: EU-27, NL, JP, KR (C-Manufacturing, G-N - Services of the business economy, 'other economic activities' - Women, Total), RU, US, SE (G-N - Services of the business economy - Women, Total). For proportions based on fewer than 30 researchers, the numerator and denominator are displayed in brackets.

Annex indicators

Annex 3.1 R&D personnel in HES, by sex and occupation, 2021 (HC)

Country	Women					Men					Total				
	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total
EU-27	**535938**	**-**	**-**	**-**	**778912**	**685075**	**-**	**-**	**-**	**828598**	**1221013**	**-**	**-**	**-**	**1607510**
BE	15947	-	-	10205	26152	20778	-	-	6214	26992	36725	-	-	16419	53144
BG	4673	-	-	692	5365	3836	-	-	439	4275	8509	-	-	1131	9640
CZ	9906	3559	2870	6429	16335	17945	3153	1432	4585	22530	27851	6712	4302	11014	38865
DK	12256	2974	2679	5653	17909	15257	1861	1173	3034	18291	27513	4835	3852	8687	36200
DE	125078	12252	42140	54392	179470	176755	15517	9947	25464	202219	301833	27769	52087	79856	381689
EE	2452	418	529	947	3399	2614	308	160	468	3082	5066	726	689	1415	6481
IE	9059	300	837	1138	10196	9745	325	479	803	10549	18804	625	1316	1941	20745
EL	15792	-	-	11549	27341	22083	-	-	7202	29285	37875	-	-	18751	56626
ES	60487	8213	10880	19093	79580	76893	7641	6503	14144	91037	137380	15854	17383	33237	170617
FR	57697	-	-	36008	93705	79991	-	-	18657	98648	137688	-	-	54665	192353
HR	5603	1248	929	2177	7780	5208	899	254	1153	6361	10811	2147	1183	3330	14141
IT	34895	-	-	34787	69682	48172	-	-	23867	72039	83067	-	-	58654	141721
CY	728	53	70	123	851	1128	62	63	125	1253	1856	115	133	248	2104
LV	3363	-	-	1793	5156	2932	-	-	1047	3979	6295	-	-	2840	9135
LT	6565	-	-	1525	8090	5212	-	-	712	5924	11777	-	-	2237	14014
LU	651	35	128	163	814	1117	62	15	77	1194	1768	97	143	240	2008
HU	10111	2759	2237	4996	15107	15721	2440	928	3368	19089	25832	5199	3165	8364	34196
MT	433	30	218	248	681	720	84	64	148	868	1153	114	282	396	1549
NL	14216	-	-	9556	23772	16866	-	-	6582	23448	31082	-	-	16138	47220
AT	17907	5218	2732	7950	25857	23884	2440	1017	3457	27341	41791	7658	3749	11407	53198
PL	49642	9952	10739	20691	70333	56356	8564	4427	12991	69347	105998	18516	15166	33682	139680
PT	28444	1120	801	1921	30365	27843	933	291	1224	29067	56287	2053	1092	3145	59432

Country	Women					Men					Total				
	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total
RO	7882	673	1726	2399	10281	7339	501	913	1414	8753	15221	1174	2639	3813	19034
SI	2155	422	330	752	2907	2668	308	112	420	3088	4823	730	442	1172	5995
SK	8492	474	181	655	9147	9520	558	38	596	10116	18012	1032	219	1251	19263
FI	12691	-	-	4801	17492	12701	-	-	3595	16296	25392	-	-	8396	33788
SE	18137	-	-	2530	20667	20610	-	-	2230	22840	38747	-	-	4760	43507
IS	1303	20	438	458	1761	1234	20	99	119	1353	2537	40	537	577	3114
NO	15737	-	-	6813	22550	14978	-	-	3111	18089	30715	-	-	9924	40639
UK	165295	8849	0	8849	174144	191160	15165	0	15165	206325	356455	24014	0	24014	380469
BA	783	71	131	202	985	841	64	58	122	963	1624	135	189	324	1948
ME	421	91	87	178	599	437	80	22	102	539	858	171	109	280	1138
MK	1276	145	124	269	1545	1168	76	60	136	1304	2444	221	184	405	2849
RS	6086	1581	234	1815	7901	5660	820	129	949	6609	11746	2401	363	2764	14510
TR	70692	6126	5756	11882	82574	86120	6490	4801	11291	97411	156812	12616	10557	23173	179985
RU	21279	-	-	-	-	24558	-	-	-	-	45837	7478	15545	23023	68860
JP	97460	11878	45320	57198	154658	243671	6382	22471	28853	272524	341131	18260	67791	86051	427182
KR	38792	26146	18954	45100	83892	75843	32796	17632	50428	126271	114635	58942	36586	95528	210163

Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD – R&D personnel by sector and function.

Notes: Definition differs, see metadata: DE (2021 - Researchers, 'Other supporting staff', 'Technicians and other supporting staff', Total - Women, Total), FI (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); break in time series: SE (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Estimated: EU-27 (2021 - Researchers, Total - Women, Total), IE (2021 - All professional positions - Women, Total), IT (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Provisional: DK (2019 - All professional positions -Women, Total); Difference in methodology: JP (2021 - All professional positions - Women, Total); Reference year differs: DK: 2019, MK: 2020, RU: 2020; Data not available: EU-27, BE, BG, EL, FR, IT, LV, LT, NL, FI, SE, NO, RU (Technicians, 'Other supporting staff' - Women, Men, Total), US, IL (All professional positions - Women, Men, Total).

Annex 3.2 R&D personnel in GOV, by sex and occupation, 2021 (HC)

Country	Women					Men					Total				
	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total
EU-27	**136309**	**-**	**-**	**-**	**250763**	**165571**	**-**	**-**	**-**	**260906**	**301880**	**-**	**-**	**-**	**511669**
BE	2540	-	-	1403	3943	4490	-	-	1244	5734	7030	-	-	2647	9677
BG	2877	-	-	2071	4948	2141	-	-	1644	3785	5018	-	-	3715	8733
CZ	4543	2792	1936	4728	9271	6624	1898	1022	2920	9544	11167	4690	2958	7648	18815
DK	1390	360	308	668	2058	1377	139	104	243	1620	2767	499	412	911	3678
DE	28718	12365	24250	36615	65333	46360	14330	19389	33719	80080	75078	26695	43639	70334	145413
EE	421	81	73	154	575	202	31	21	52	254	623	112	94	206	829
IE	495	182	142	324	819	503	232	222	454	957	998	414	364	778	1776
EL	8135	-	-	5903	14038	11128	-	-	6675	17803	19263	-	-	12578	31841
ES	20775	10675	4663	15338	36113	17162	7089	3560	10649	27811	37937	17764	8223	25987	63924
FR	11286	8677	2884	11561	22847	19188	7721	1998	9719	28907	30474	16398	4882	21280	51754
HR	1655	720	323	1043	2698	1241	476	147	623	1864	2896	1196	470	1666	4562
IT	16552	7467	5338	12805	29357	16711	7819	3528	11347	28058	33263	15286	8866	24152	57415
CY	132	64	64	128	260	89	39	63	102	191	221	103	127	230	451
LV	594	-	-	483	1077	441	-	-	343	784	1035	-	-	826	1861
LT	1505	-	-	645	2150	1461	-	-	374	1835	2966	-	-	1019	3985
LU	295	158	152	310	605	482	164	82	246	728	777	322	234	556	1333
HU	3186	1137	808	1945	5131	4710	1113	576	1689	6399	7896	2250	1384	3634	11530
MT	76	1	4	5	81	64	6	13	19	83	140	7	17	24	164
NL	4213	-	-	2106	6319	5053	-	-	2583	7636	9266	-	-	4689	13955
AT	3057	1098	932	2030	5087	4045	1047	605	1652	5697	7102	2145	1537	3682	10784

Country	Women					Men					Total				
	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total
PL	3163	1156	668	1824	4987	2539	716	291	1007	3546	5702	1872	959	2831	8533
PT	3995	1394	273	1667	5662	2567	694	132	826	3393	6562	2088	405	2493	9055
RO	3400	876	1943	2819	6219	3510	927	1979	2906	6416	6910	1803	3922	5725	12635
SI	1194	283	357	641	1834	1211	264	163	425	1637	2405	547	520	1066	3471
SK	2587	542	514	1056	3643	2447	319	267	586	3033	5034	861	781	1642	6676
FI	2121	-	-	870	2991	2710	-	-	834	3544	4831	-	-	1704	6535
SE	6491	-	-	5171	11662	6537	-	-	2054	8592	13028	-	-	7225	20254
IS	162	5	32	37	199	125	46	27	73	198	287	51	59	110	397
NO	3272	-	-	2177	5449	3251	-	-	1676	4927	6523	-	-	3853	10376
MK	217	16	13	29	246	119	24	39	63	182	336	40	52	92	428
RS	2113	719	323	1042	3155	1288	727	348	1075	2363	3401	1446	671	2117	5518
TR	2518	257	698	955	3473	4819	1263	1835	3098	7917	7337	1520	2533	4053	11390
JP	7252	6463	13068	19531	26783	27409	4868	17579	22447	49856	34661	11331	30647	41978	76639
KR	8088	5407	3692	9099	17187	22734	5308	4446	9754	32488	30822	10715	8138	18853	49675

Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.
Notes: Definition differs, see metadata: DE (2021 - All professional positions, Total - Women, Total), FI, NL (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Break in time series: SE (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Estimated: EU-27 (2021 - Researchers, Total - Women, Total), IE (2021 - All professional positions - Women, Total), IT (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Provisional: DK (2019 - All professional positions - Women, Total); Difference in methodology: JP (2021 - All professional positions - Women, Total); Reference year differs: DK: 2019, UK: 2018, ME: 2019, MK: 2020, RU: 2020; Data not available: EU-27, BE, BG, EL, FR, IT, LV, LT, NL, FI, SE, NO, RU (Technicians, 'Other supporting staff' - Women, Men, Total), ME, UK, US, IL (All professional positions - Women, Men, Total).

Annex 3.3 R&D personnel in BES, by sex and occupation, 2021 (HC)

Country	Women					Men					Total				
	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total
EU-27	**323588**	**-**	**-**	**-**	**594136**	**1119115**	**-**	**-**	**-**	**1874958**	**1442703**	**-**	**-**	**-**	**2469094**
BE	18776	-	-	14273	33049	49102	-	-	38248	87350	67878	-	-	52521	120399
BG	3592	-	-	2790	6382	5954	-	-	3721	9675	9546	-	-	6511	16057
CZ	4272	4238	3035	7273	11545	25976	20032	5991	26023	51999	30248	24270	9026	33296	63544
DK	7921	-	-	6151	14072	23087	-	-	9354	32441	31008	-	-	15505	46513
DE	49144	38070	18610	56680	105824	265209	131805	44236	176041	441250	314353	169875	62846	232721	547074
EE	799	219	179	398	1197	2403	487	245	732	3135	3202	706	424	1130	4332
IE	4099	2209	2500	4710	8808	12640	6481	5032	11512	24153	16739	8690	7532	16222	32961
EL	5534	-	-	2309	7843	13562	-	-	5162	18724	19096	-	-	7471	26567
ES	24682	18830	6029	24859	49541	54789	47531	11207	58737	113526	79471	66361	17236	83596	163067
FR	54656	29079	5013	34092	88748	201691	78576	13544	92120	293810	256347	107655	18557	126212	382558
HR	952	1505	269	1774	2726	2167	3360	384	3744	5911	3119	4865	653	5518	8637
IT	14337	16496	9099	25595	39932	47833	73726	28429	102155	149988	62170	90222	37528	127750	189920
CY	233	71	59	130	363	487	216	84	300	787	720	287	143	430	1150
LV	598	-	-	343	941	1215	-	-	744	1959	1813	-	-	1087	2900
LT	1436	-	-	1084	2520	3430	-	-	2182	5612	4866	-	-	3266	8132
LU	174	261	118	379	554	1027	1562	431	1993	3019	1201	1823	549	2372	3573
HU	5809	2936	1520	4456	10265	25665	6515	2709	9224	34889	31474	9451	4229	13680	45154
MT	132	108	109	217	349	440	379	206	585	1025	572	487	315	802	1374
NL	24956	-	-	18363	43319	78141	-	-	56350	134491	103097	-	-	74713	177810
AT	8714	4333	1828	6161	14875	37833	24559	4642	29201	67034	46547	28892	6470	35362	81909

Country	Women					Men					Total				
	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total	Researchers	Technicians	'Other supporting staff'	'Technicians and other supporting staff'	Total
PL	24744	10947	4969	15916	40660	77930	29872	7222	37094	115024	102674	40819	12191	53010	155684
PT	14136	6018	2269	8287	22423	32681	11066	2337	13403	46084	46817	17084	4606	21690	68507
RO	2246	1389	1305	2694	4940	4653	3129	2232	5361	10014	6899	4518	3537	8055	14954
SI	2171	1117	1017	2134	4305	6677	3714	930	4644	11321	8848	4831	1947	6778	15626
SK	1147	713	417	1130	2277	5816	3090	1055	4145	9961	6963	3803	1472	5275	12238
FI	6373	-	-	3393	9767	28531	-	-	7817	36348	34904	-	-	11210	46115
SE	21980	-	-	4869	26849	65298	-	-	9218	74516	87278	-	-	14087	101365
IS	663	450	204	654	1317	1216	1600	245	1845	3061	1879	2050	449	2499	4378
NO	6778	-	-	3018	9796	22882	-	-	10549	33430	29660	-	-	13567	43226
UK	35810	27121	23764	50886	86696	130165	86043	61974	148016	278181	165975	113164	85738	198902	364877
BA	83	58	54	112	195	92	47	37	84	176	175	105	91	196	371
ME	66	40	27	67	133	92	53	16	69	161	158	93	43	136	294
MK	316	65	15	80	396	256	74	10	84	340	572	139	25	164	736
RS	651	544	102	646	1297	1104	1171	163	1334	2438	1755	1715	265	1980	3735
TR	33993	6100	4311	10411	44404	90844	24149	7517	31666	122510	124837	30249	11828	42077	166914
RU	59912	-	-	-	-	118569	-	-	-	-	178481	26784	154015	180799	359280
JP	69211	20619	27198	47817	117028	529622	46811	70739	117550	647172	598833	67430	97937	165367	764200
KR	79205	15487	8935	24422	103627	350260	43714	11270	54984	405244	429465	59201	20205	79406	508871

Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD – R&D personnel by sector and function.

Notes: Definition differs, see metadata: DE (2021 - Researchers, 'Other supporting staff', 'Technicians and other supporting staff', Total - Women, Total), FI, NO (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Break in time series: SE, NO (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Estimated: EU-27 (2021 - Researchers, Total -Women, Total), IE (2021 - All professional positions - Women, Total), IT (2021 - Researchers, 'Technicians and other supporting staff', Total - Women, Total); Provisional: DK (2019 - Researchers, 'Other supporting staff', 'Technicians and other supporting staff' - Women, Total); Difference in methodology: JP (2021 - All professional positions - Women, Total); Reference year differs: DK: 2019, UK: 2018, ME: 2019, MK: 2020, RU: 2020; Data not available: EU-27, BE, BG, EL, FR, IT, LV, LT, NL, FI, SE, NO, RU (Technicians, 'Other supporting staff' - Women, Men, Total), ME, UK, US, IL (All professional positions - Women, Men, Total).

Annex 3.4 Researchers in BES, by sex and selected economic activity (NACE Rev.2), 2021 (HC)

Country	Women					Men				
	C - Manufacturing	C20 - Manufacture of chemicals and chemical products	C21 - Manufacture of basis pharmaceutical products and pharmaceutical preparations	G-N - Services of the business economy	'Other economic activities'	C - Manufacturing	C20 - Manufacture of chemicals and chemical products	C21 - Manufacture of basis pharmaceutical products and pharmaceutical preparations	G-N - Services of the business economy	'Other economic activities'
EU-27	-	-	-	-	-	-	-	-	-	-
BE	6240	575	2505	11467	932	15237	1134	2893	30543	2939
BG	884	157	133	2447	243	1893	81	39	3779	226
CZ	1485	238	88	2625	162	10814	312	150	14405	757
DK	3438	430	1417	4387	95	9309	619	1230	13512	267
DE	33054	2888	5486	15235	853	203461	7186	6274	59319	2431
EE	181	28	9	500	118	766	39	19	1448	189
IE	1209	-	382	2862	2	3298	-	414	9189	8
EL	1509	260	489	3546	427	3199	282	220	9176	1146
ES	8098	1348	1905	13912	2673	18430	1438	997	31919	4438
FR	29480	4153	4460	32425	4648	104352	4241	2913	108153	12017
HR	372	53	63	540	40	992	16	15	1100	75
IT	9981	1088	2112	9872	2908	40371	1939	1571	26821	3343
CY	84	2	42	139	10	152	0	37	313	22
LV	254	20	90	298	30	516	9	47	617	39
LT	452	215	-	868	116	1086	127	-	2171	173
LU	96	-	-	79	0	467	-	-	559	0
HU	2103	-	875	3374	287	9026	-	705	15668	903
MT	37	0	15	92	3	144	2	31	286	10
AT	3897	253	715	4583	234	23373	523	537	13629	831
PL	7493	1122	895	16166	667	26068	660	360	49268	3012

Country	Women					Men				
	C - Manufacturing	C20 - Manufacture of chemicals and chemical products	C21 - Manufacture of basis pharmaceutical products and pharmaceutical preparations	G-N - Services of the business economy	'Other economic activities'	C - Manufacturing	C20 - Manufacture of chemicals and chemical products	C21 - Manufacture of basis pharmaceutical products and pharmaceutical preparations	G-N - Services of the business economy	'Other economic activities'
PT	4769	372	605	7813	1554	10254	385	304	19892	2535
RO	788	0	58	1409	49	1529	79	113	3075	49
SI	1215	167	480	784	116	3633	161	281	2752	311
SK	511	71	32	571	59	2751	60	12	2909	148
FI	3146	315	-	2776	418	14539	-	-	12374	1481
SE	9454	-	-	-	258	29575	-	-	-	594
IS	104	22	4	480	79	210	9	0	902	104
NO	1690	-	176	4407	681	6448	-	138	14341	2093
UK	10461	1055	625	22598	1203	52637	1774	604	65145	3773
BA	42	0	30	22	19	20	0	12	24	48
ME	2	2	0	50	14	2	0	0	67	23
MK	219	6	12	87	10	102	6	0	139	15
RS	51	8	2	547	53	120	9	2	932	52
TR	13821	1143	1205	19527	645	39411	1175	645	49857	1576

Source: Eurostat – Research and development statistics (online data code: rd_p_bempoccr2).

Notes: Definition differs, see metadata: BE, BG, CZ, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, BA, RS,TR ('other economic activities'); Break in time series: BE, BG, CZ, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, BA, RS,TR ('other economic activities'); Estimated: EU-27 (Total - All economic activities); Provisional: DK (All economic activities), ME, UK (Other economics activities); Low reliability: BE, BG, CZ, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, BA, RS, TR ('other economic activities'); Reference year differs: DK: 2019, MK: 2020, ME: 2019, UK: 2017; Data not available: EU-27, NL, JP, KR (C-Manufacturing, G-N - Services of the business economy, 'other economic activities' - Women, Total), RU, US, SE (G-N - Services of the business economy - Women, Total).

CHAPTER 4 – LABOUR MARKET PARTICIPATION OF RESEARCHERS

Key takeaways

Women remain underrepresented among researchers, despite positive changes over the past decade. The gender gap varies by sector of the economy, with a relatively higher share of women working in HES and GOV, compared to BES. Gender segregation persists across fields of R&D; while women are well-represented in the fields of Social Science and Humanities, they remain underrepresented in Natural Sciences and Engineering and Technology. This implies that gender disparities exist across fields in tertiary education (see Chapter 2) and persist into the labour market.

- **Women comprise just over one-third (34 %) of the total population of researchers at EU level** (see Figure 4.1). There are fewer women than men researchers among the economically active population; approximately 10 women researchers and 17 men researchers for every 1 000 people in the labour force.
- **Despite women's lower representation among researchers, the CAGR is higher for women than men researchers at EU level** (4.2 % and 3.3 %, respectively), indicating that the gender gap is narrowing slightly (see Figure 4.2).
- **Gender segregation persists across the three broad economic sectors**. While women researchers continue to be well represented in HES (44 %) (see Figure 4.5) and GOV (45 %) (see Figure 4.6), they remain underrepresented in BES (22 %) (see Figure 4.7).
- **Over the last decade, the number of women researchers has grown in every sector at EU level**, with higher growth rates in BES compared to HES and GOV (see Figure 4.8, Figure 4.9, and Figure 4.10). However, the rate of growth varies in BES at country level, indicating that gender balance is yet to be achieved in many countries.
- **Women researchers are better represented in the younger age groups in HES and GOV, while men researchers are better represented in the older age groups** (see Figure 4.11 and Figure 4.12). To the extent that age is a proxy for seniority, this suggests that more men researchers are in senior research positions (discussed further in Chapter 6).
- **In HES and GOV, gender balance is achieved in Social Science and Humanities, but women remain underrepresented in Natural Sciences and Engineering and Technology,** indicating horizontal gender segregation (see Table 4.1 and Table 4.3). Even in sectors of the economy where women's representation is relatively higher, disparities persist within STEM fields.
- **Since 2017, the proportion of women researchers has grown across all fields of R&D in HES and GOV in the majority of countries examined** (see Table 4.2 and Table 4.4). However, this growth is not significant enough to reach gender balance in STEM fields in most countries.
- **Women and men researchers were more equally distributed across broad fields of study in HES and GOV in 2021 than in 2017** (see Table 4.7). The Dissimilarity Index (DI) measures the proportion of women and men in a field of R&D who would have to move to another field of R&D to ensure that the proportions of women are the same across all the possible fields of R&D. There is a slightly greater decrease in DI in HES compared to GOV at country level, i.e. fewer disparities between women and men researchers across fields of study in HES.

Introduction

Chapter 4 examines women's and men's participation as researchers in the labour market and how employment patterns across key sectors of the economy have evolved over time. Continuing from Chapters 2 and 3, this chapter assesses the extent to which horizontal gender segregation ([202]) persists beyond Doctoral studies by examining women's representation in different fields of R&D in key economic sectors. Historically, women are underrepresented in R&I; this has been shown in previous editions of She Figures which have highlighted a persistent gender gap in research careers since 2003 ([203]). Several EU policies and funding programmes, including measures implemented through Horizon Europe as well as the 2020 Commission Communication on a new European Research Area ([204]), have aimed to close these gaps in R&I. This chapter aims to provide a deeper understanding of the extent of gender segregation in research careers to understand progress towards a more inclusive and gender-equal work environment.

- **Section 4.1 presents findings from indicators on the proportion of women among researchers**, as well as changes since the 2012 ERA Communication and the more recent 2020 Communication, which reaffirmed the European Commission's commitment to promoting gender equality in research and innovation ([205]).
- **Section 4.2 presents data on the distribution of women and men researchers across key economic sectors**. It covers the four main sectors of the economy: Business Enterprise Sector (BES), Government sector (GOV), Higher Education Sector (HES), and Private Non-Profit sector (PNP). She Figures 2021 found a comparatively higher proportion of women employed in HES and GOV compared to BES, and this section compares the sectors in which women and men work and explores the extent of gender segregation within those sectors.
- **Section 4.3 examines changes in the numbers of women and men researchers since 2013 in HES, GOV, and BES**. Given that public financial support for business R&D increased across the EU from 2000 to 2020 ([206]), these indicators explore the extent to which this support has improved women's representation.
- **Section 4.4 examines the proportions of women and men researchers by age group**. Age is used as a proxy for seniority to determine the relative presence of women and men in more senior research positions and thereby assess gender differences in patterns of employment.
- **Section 4.5 presents indicators on the gender gap for researchers in R&D fields** in the main economic sectors and how this gap has developed over time.
- **Section 4.6 assesses the gender gap among researchers by using the DI**. The DI is a measure of the percentage of women and men in a field of R&D who would have to move to another field to ensure a balanced distribution of women and men across fields of R&D.

([202]) Horizontal gender segregation refers to the under- or over-representation of women or men in occupations or sectors, independent of rank or level. EIGE, (n.d.) Horizontal segregation. Available at: https://eige.europa.eu/publications-resources/thesaurus/terms/1225

([203]) European Commission, Directorate-General for Research and Innovation, She figures 2003 – Women and science – Statistics and indicators, Publications Office of the European Union, 2003, https://op.europa.eu/en/publication-detail/-/publication/31442d26-88c7-42db-a985-b8d843517089/language-en

([204]) European Commission, A new ERA for Research and Innovation, 2020, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A628%3AFIN

([205]) European Commission, Directorate-General for Research and Innovation, A new ERA for research and innovation – Staff Working Document, Publications Office of the European Union, 2020, https://op.europa.eu/en/publication-detail/-/publication/f8f19fc4-2888-11eb-9d7e-01aa75ed71a1/

([206]) European Investment Bank (EIB), *Innovation is any change, big or small, that makes a difference*, 2023, https://www.eib.org/attachments/lucalli/20220315_innovation_overview_en.pdf

Background

Women's participation in the labour market is hindered by various structural challenges, particularly the pervasiveness of gender stereotypes, which negatively impact women pursuing a career in research.

The EU Gender Equality Strategy 2020-2025 highlights the importance of increasing women's participation in the labour market to gain from their positive impact on the economy, as well as empowering women to shape their own lives, play a role in public life, and be economically independent ([207]). The Strategy highlights the EU cohesion policy, which supports women's (re)integration into the labour market and gender equality in certain sectors of the economy where more men are employed (e.g. ICT and engineering).

In recent years, the EU legal and policy framework has evolved to promote women's access to the labour market and (to some extent) increase their representation in R&I. Directive (EU) 2019/1158 (Work-Life Balance Directive) ([208]) requires Member States to: introduce a minimum of 10 working days of paternity leave; introduce five days per year of leave for workers who provide care to a relative; ensure that two months of parental leave cannot be transferred between parents; and ensure that the right to flexible working arrangements is extended to carers and parents of children up to eight years old ([209]). By providing these options, both women and men workers, including researchers, can better manage their work responsibilities alongside family commitments, facilitating their labour market participation.

In July 2023, the Commission unveiled a comprehensive set of measures to strengthen the ERA ([210]). These measures contribute to one of the actions of the ERA Policy Agenda 2022-2024, Action 4, to 'promote attractive and sustainable research careers, balanced talent circulation and international, transdisciplinary and intersectoral mobility across the ERA'. Efforts are made to ensure synergies between ERA actions, thus these measures also contribute to Action 5, to 'promote gender equality and foster inclusiveness, taking note of the Ljubljana Declaration'. Measures under Action 4 include:

- A proposal for a Council Recommendation that establishes a new European framework for research careers, which explicitly highlights the need to address persisting gender inequalities in research careers ([211]). In December 2023, the Council adopted Conclusions, emphasising the importance of integrating gender equality considerations into initiatives supporting researchers' careers and fostering innovation ([212]). Recommendations include promoting inclusive GEPs and sustainable institutional changes to foster gender equality in research teams, creating attractive and safe working conditions, enhancing the attractiveness of research careers, and supporting career diversification and progression, paying specific attention to the barriers faced by women in early- and mid- stage research careers.
- A new Charter for Researchers, replacing the 2005 Charter and Code for Researchers ([213]) includes updated principles to address evolving challenges. One of the principles under Pillar 1 is Gender Equality, which states that all stakeholders should foster gender balance in research teams, managerial, decision-making bodies, recruitment and promotion committees, and advisory groups. It also promotes sustainable institutional changes, such as the implementation of GEPs.

The challenges faced at EU level are reflected at **Member State** level. Generally, gender stereotypes affect women's participation in the labour market in all Member States, and additional action may be needed to support women's equal participation in research. For example, an Estonian study found that research institutions are not ready to formally tackle the issue of gender equality due to a lack of corresponding

([207]) European Commission, A Union of Equality: Gender Equality Strategy 2020-2025, 2020, https://ec.europa.eu/newsroom/just/items/682425/en#:~:text=The%20key%20objectives%20are%20ending,gender%20balance%20in%20decision%2Dmaking

([208]) 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, *OJ L 188, 12.7.2019, pp. 79-93.*

([209]) European Commission, Employment, Social Affairs & Inclusion, 2019, https://ec.europa.eu/social/main.jsp?langId=en&catId=89&furtherNews=yes&newsId=9438

([210]) European Commission, EU countries agree on steps to attract and retain research talent, 2023, https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/eu-countries-agree-steps-attract-and-retain-research-talent-2023-12-08_en

([211]) European Commission, Proposal for a Council Recommendation on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe, 2023, https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52023DC0436

([212]) Council Recommendation of 18 December 2023 on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe, C/2023/1640, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:C_202301640

([213]) European Commission, New initiatives to empower research careers to strengthen the European Research Area, 2023, https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3807

regulations or working documents not being applied in practice. In addition, HEIs do not recognise structural obstacles for women, paving the way for organisational bias that hinders women researchers' professional development ([214]). Some Member States also face a strong anti-gender political climate, which affects the implementation of policies that seek to combat these gender stereotypes.
In recognition of challenges at EU and country level in relation to gender stereotypes and biases that prevent women from working as researchers, together with a lack of gender mainstreaming in higher education policies and grant funding, several recent laws and policies seek to reverse this trend:

- **National higher education and R&I laws**. For example:
    - the Higher Education Ordinance in Sweden specifies that there must be gender-equal representation among applicants shortlisted for a teaching post, facilitating the labour market participation of women working in higher education.
    - Malta's Research and Innovation Strategic Plan 2023-2027 (see Box 19) and Spain's Law 17/2022 of 5 September amending Law 14/2011 of 1 June on Science, Technology and Innovation both stipulate quotas to ensure that sufficient women are recruited into the R&I sector.
- **Government R&I strategies** that include gender equality-specific targets. For example, the National Strategy for Research, Innovation and Artificial Intelligence 2022-2027 ([215]) in Romania has a strategic objective to develop R&I systems by increasing the number of women researchers and their research skills (see Box 19).
- **Government gender equality action plans and policies**. For example, Denmark's Statement, Perspective and Action Plan for Gender Equality 2023 ([216]) states that the Danish Agency for Higher Education plans to publish a fourth edition of the Talent Barometer, showing the numbers of women in research and the distribution of research grants in order to identify disparities, ensure fair representation, and allocate resources equitably.

The indicators presented in this chapter span 2013 to 2021. Several laws and policies were introduced during this period (see Box 19).

Box 19: Laws and policies implemented at Member State level to support women's participation in research

- In 2020, Law No 2020-1674 on research programming for the years 2021-2030 sets the strategic direction for research up to 2030 in **France** and includes measures to boost the attractiveness of scientific careers and address gender equality in R&I. It includes requirements that recruitment and tenure commissions – which are formed to hire new candidates in public research or HEIs – must not be composed of more than 60 % of members of the same sex.
- **Malta's** National Research and Innovation Strategic Plan 2023-2027[217] was launched for public consultation in 2022. It includes proposals for a number of coordinated gender mainstreaming actions to promote women's advancement in STEM and R&I. These range from promoting women role models in STEM and R&I careers, identifying barriers for women and girls in taking up STEM studies and research careers, improving women's representation in key roles and decision-making structures in R&I, and other actions relating to equal recruitment, promotion and pay procedures, institutional change through GEPs, coordinated actions between public funding bodies, and monitoring and analysis of gender statistics.

([214]) Urmann, H., Lees, K., Remmik, M., Tubelt, E., Roos, L., Vilson, M., Puur, S. M., Aksen, M. and Espenberg, S., *Gender equality in Estonian research – current situation and ways of improving*, Tartu: Centre for Applied Social Sciences (CASS), University of Tartu, 2020.

([215]) Ministry of Research, Innovation and Smart Specialisation, National Strategy for Research, Innovation and Smart Specialisation 2022-2027, 2022, https://www.mcid.gov.ro/transparenta-decizionala/strategia-nationala-de-cercetare-inovare-si-specializare-inteligenta-2022-2027/

([216]) Danish Agency for Digitalisation, Statement/Perspective and Action Plan for Equality 2023, n.d., https://digmin.dk/ligestilling/publikationer/2023/redegoerelseperspektiv-og-handlingsplan-for-ligestilling-2023

[217] Government of Malta (2022) MALTA'S NATIONAL RESEARCH AND INNOVATION STRATEGIC PLAN 2023-2027, https://mcst.gov.mt/wp-content/uploads/2023/01/%E2%80%A2RI-Report-Final.pdf.

Alongside laws and policies, measures have been introduced to encourage women's labour market participation and reintegration. These include training, networking, grants, mentoring, and campaigns, some of which have been introduced since She Figures 2021.

Some of the measures identified aim to:

- **Create networks and communities for women** to mentor, connect, and inspire each other. Many organisations undertaking these measures are composed of women at different levels of seniority who support each other through recruitment and promotions, networks of women who provide training and support for one another, and awards that recognise institutions' efforts to promote gender balance within R&I. One example includes an annual networking event for women junior researchers in Czechia, that aims to promote women role models for aspiring researchers ([218]).
- **Provide resources that encourage women to enter the labour market**, such as awards, funding programmes, and grants. For example, Cyprus' CUT Women's Personality Award: 'Squaring the Circle', established in 2021, honours women who excel in multiple roles and aims to inspire students and the broader community ([219]). This financial award is used to recruit post-doctoral students or doctoral associates in order to elevate their professional qualifications and experience.
- **Facilitate the reintegration of women into the workforce following parental leave**. For example, the Hungarian Academy of Sciences makes grant application opportunities more flexible for women on parental leave, thereby acknowledging the additional challenges for women in balancing work and caregiving responsibilities ([220]). A similar initiative in Denmark saw the Independent Research Fund Denmark adjust their application criteria (the applicant must have completed their PhD at least three, but no more than six, years ago) to take into account parental leave, widening the pool of researchers eligible to apply for grants ([221]).
- **Introduce policies, projects and awareness-raising campaigns to combat gender stereotypes** that posit women as naturally less proficient in STEM subjects. In recognition of the underrepresentation of women in STEM, communication campaigns and institutional-level events and training have been implemented to challenge gender stereotypes and encourage women to specialise in STEM and enter the labour force.

([218]) National Contact Centre – Gender and Science, Brunch for budding female scientists with prof. Milena Králíčková, rector of Charles University, n.d., https://genderaveda.cz/akce/brunch-pro-zacinajici-vedkyne-s-prof-milenou-kralickovou-rektorkou-univerzity-karlovy/

([219]) Cyprus University of Technology, Squaring the Circle Female Personality Award, 2021, https://www.cut.ac.cy/news/article/?contentId=450080

([220]) Magyar Tudományos Akadémia, Women in Research Careers Presidential Committee, n.d., https://mta.hu/nok-a-kutatoi-eletpalyan-elnoki-bizottsag

([221]) Independent Research Fund Denmark, The Inge Lehmann Programme 2021: Modified rules for calculation of PhD age of applicants, 2021, https://dff.dk/en/current-news-and-events/the-inge-lehmann-programme-2021-modification-of-the-rules-for-calculation-of-phd-age-of-applicants

4.1 Gender gap in women's and men's participation as researchers

Previous editions of She Figures showed that women researchers are underrepresented at EU level. In light of recent policy developments to address the gender gap in research (e.g. measures under the ERA Policy Agenda 2022-2024), this section presents indicators that explore women's and men's representation as researchers.

Women remain underrepresented among researchers at EU and country level

At EU level, women represented just over one-third (34 %) of researchers in 2021 (see Figure 4.1), reflecting little change compared to 2018 (33 %) ([222]).

Of the 38 Member States, Associated Countries, and G20 countries for which data are available, gender balance is achieved in only 14 countries ([223]). Women are underrepresented in the remaining 24 countries ([224]). Although the proportion of women researchers has grown in 23 countries ([225]), the rise does not exceed 2 pp, except in Malta (3 pp), the Netherlands (4 pp), and Bosnia and Herzegovina (5 pp), indicating that the representation of women researchers is growing very slowly at country level.

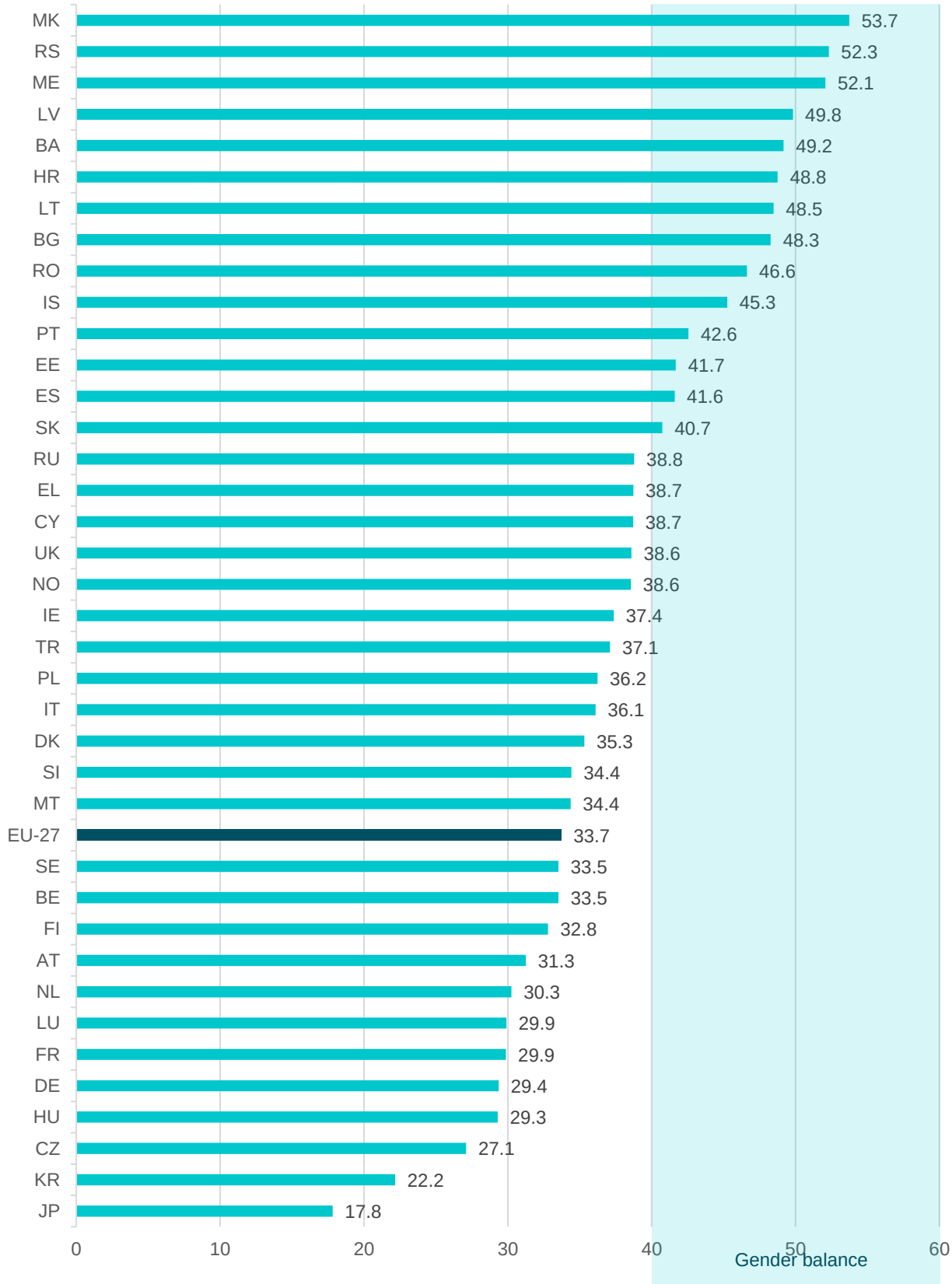
However, the number of women researchers grew at a faster rate than the number of men researchers at EU and country level, suggesting that the gender gap is narrowing

Figure 4.2 shows the CAGR for the number of women and men researchers between 2013 and 2021. Here, the CAGR refers to the extent to which the number of women and men researchers are growing or declining, where a positive value indicates that the number of researchers is increasing, while a negative value signifies that the number of researchers is declining. At EU level, the CAGR for women and men researchers is 4.2 % and 3.3 % respectively, indicating that the number of women researchers is growing at a slightly faster rate than that of men researchers.

Of the 38 countries for which data are available, the CAGR for women researchers is higher than that for men in all but 12 countries (BG, CZ, EE, EL, LV, LT, HU, PL, PT, SI, SK, RU). The highest CAGR for both women and men researchers is in Poland (8.3 % and 9.2 %, respectively). The lowest rates are in Russia for women researchers (1.6 %) and North Macedonia for men researchers (-3.8 %). The largest differences in the CAGR for women and men researchers are in Bosnia and Herzegovina (8.8 % for women and 3.2 % for men) and the Netherlands (5.3 % for women and 1.6 % for men), indicating that the number of women researchers is growing at a significantly faster rate than the number of men researchers in these countries.

([222]) European Commission, Directorate-General for Research and Innovation, *She Figures 2021: The Path Towards Gender in Research and Innovation*, Publications Office of the European Union, 2021.
([223]) BG, EE, ES, HR, LV, LT, PT, RO, SK, IS, BA, ME, MK, RS.
([224]) BE, CZ, DK, DE, IE, EL, FR, IT, CY, LU, HU, MT, NL, AT, PL, SI, FI, SE, NO, UK, TR, JP, RU, KR.
([225]) BG, CZ, IE, EL, ES, FR, HR, IT, CY, LU, MT, NL, AT, SI, SE, NO, BA, ME, MK, RS, TR, JP, KR.

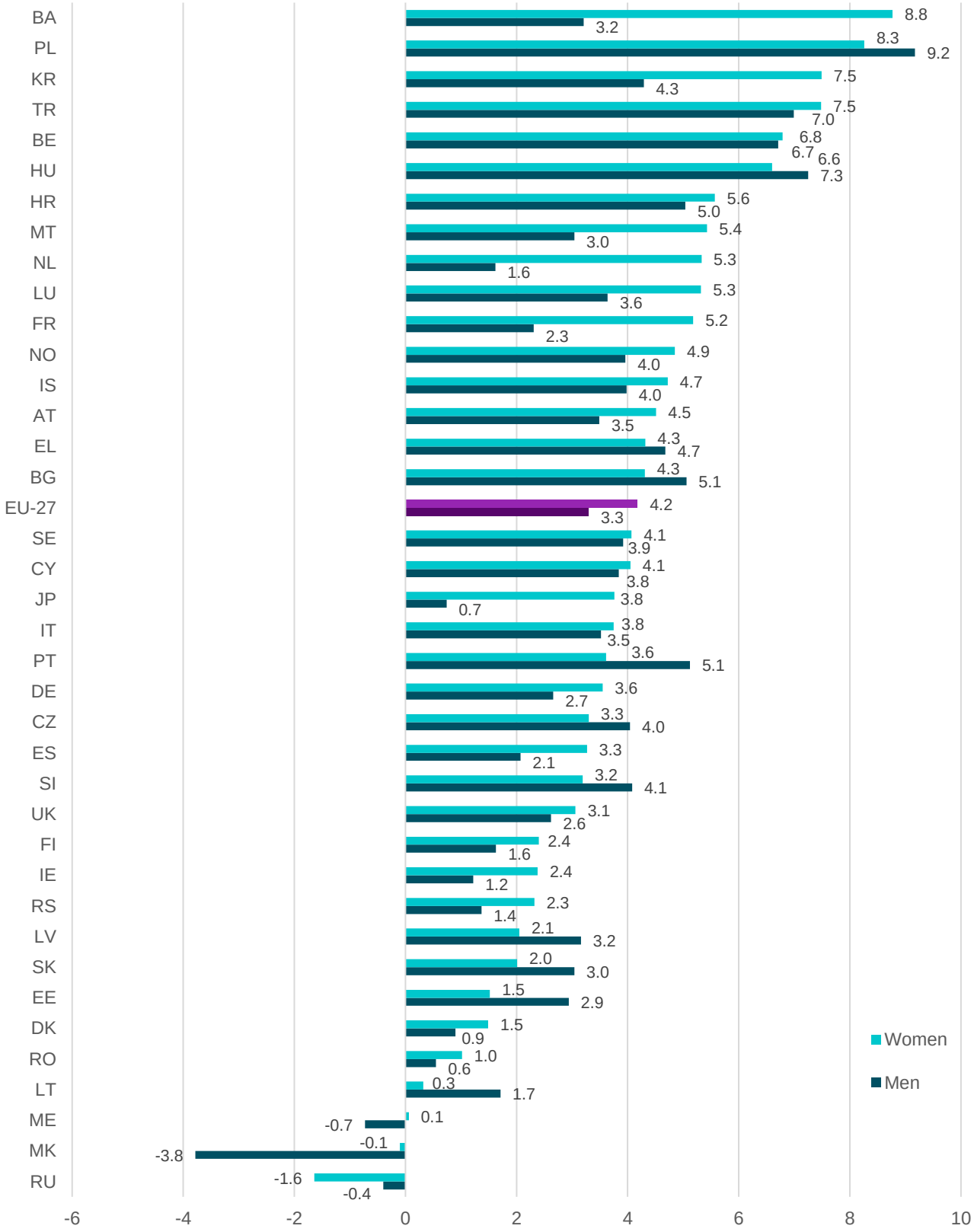
Figure 4.1 Proportion (%) of women researchers, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: FI (Researchers - Women, Total); Break in time series: BE, SE (Researchers - Women, Total); Estimated: EU-27, UK (Researchers - Women, Total); Provisional: DK (Researchers - Women, Total); Difference in methodology: JP (Researchers - Women, Total); Reference year differs: DK: 2019, UK: 2018, ME: 2019, MK: 2020, RU: 2020; Data not available: IL, US.

Figure 4.2 CAGR for researchers, by sex, 2013-2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: FI (Researchers - Women, Total) (2013,2021); Break in time series: BE, SE (Researchers - Women, Total) (2013, 2021); Estimated: EU-27, UK (Researchers - Women, Total) (2013, 2021); Provisional: DK (Researchers - Women, Total) (2013, 2021); Difference in methodology: JP (Researchers - Women, Total) (2013, 2021); Reference year differs 2021: DK: 2019, UK: 2018, ME: 2019, MK: 2020, RU: 2020; Reference year differs 2013: MK: 2015, KR: 2016; Data not available: IL, US.

Women researchers represent a lower proportion of the economically active population than men researchers, demonstrating that women are still underrepresented in this profession

The labour force (active population) is composed of both employed (aged 15+) and unemployed (aged 15-74) people ([226]). At EU level, in 2021, the proportion of women researchers per thousand economically active persons was 10.2, considerably less than the proportion of men researchers, at 17.3 per thousand (see Figure 4.3). The population of men researchers has grown from 15.1 per thousand in 2018 to 17.3 thousand in 2021. This growth was larger than that experienced by the population of women researchers, which grew from 8.7 per thousand in 2018 to 10.2 per thousand in 2021. As a result, even though both women and men populations experienced growth, there are still fewer women researchers in 2021. In addition, the absolute gap between women and men has increased from 6.4 per thousand to 7.1 per thousand.

This trend is somewhat reflected at country level, despite some variation in the proportion of women and men researchers. In most Member States and Associated Countries, there are fewer women researchers per thousand economically active persons ([227]). The largest differences between the representation of women and men researchers are in Austria (a difference of 13.1 per thousand), Finland (a difference of 14.0 per thousand), and Sweden (a difference of 13.6 per thousand) ([228]). However, women researchers are also highly represented in these countries in comparison to other Member States and Associated Countries. In line with She Figures 2021, the highest proportions of women researchers per thousand active women are in Iceland (22.1 per thousand) and Norway (18.8 per thousand) in 2021.

In eight Member States and Associated Countries (BG, HR, LV, RO, ME, MK, RS, TR), women constitute a higher proportion of researchers per thousand economically active persons than the corresponding proportion of men researchers. However, despite these eight countries having a higher proportion of women researchers, the proportion of women is only marginally higher (a difference of no more than 2 researchers per thousand). By contrast, in the remaining countries with a higher proportion of men researchers, the differences are much larger, ranging from 0.6 (IS) to 14.0 (FI).

Box 20: Actions to foster women's participation in research careers in Associated Countries

In **Iceland**, WomenTechIceland is a non-profit organisation dedicated to encouraging equality in the technology industry. It serves as a bridge between segmented communities in Icelandic society to foster greater diversity and inclusion ([229]). WomenTechIceland is also a touchpoint for events, news and discussions about women and technology in Iceland, connecting the Icelandic tech industry to the global tech community. An example of one of their initiatives is The Women Innovators Incubator programme, which is part of a year-long partnership between WomenTechIceland, and Women in Technology Huawei. It aims to motivate women to recognise and explore the potential of their ideas, with the winner awarded a prize of the equivalent of EUR 6 700, as well as resources to launch the project from idea to business.

In **Norway**, the ODA-Nettverk set up the ODA Awards to recognise the work of organisations and individuals to increase diversity in the technology industry ([230]). ODA's goal is to achieve 40 % of women in the technology industry, thereby supporting women's participation in research careers within the tech industry.

([226]) Those outside the labour force are neither employed nor unemployed (e.g. children, students, pensioners).

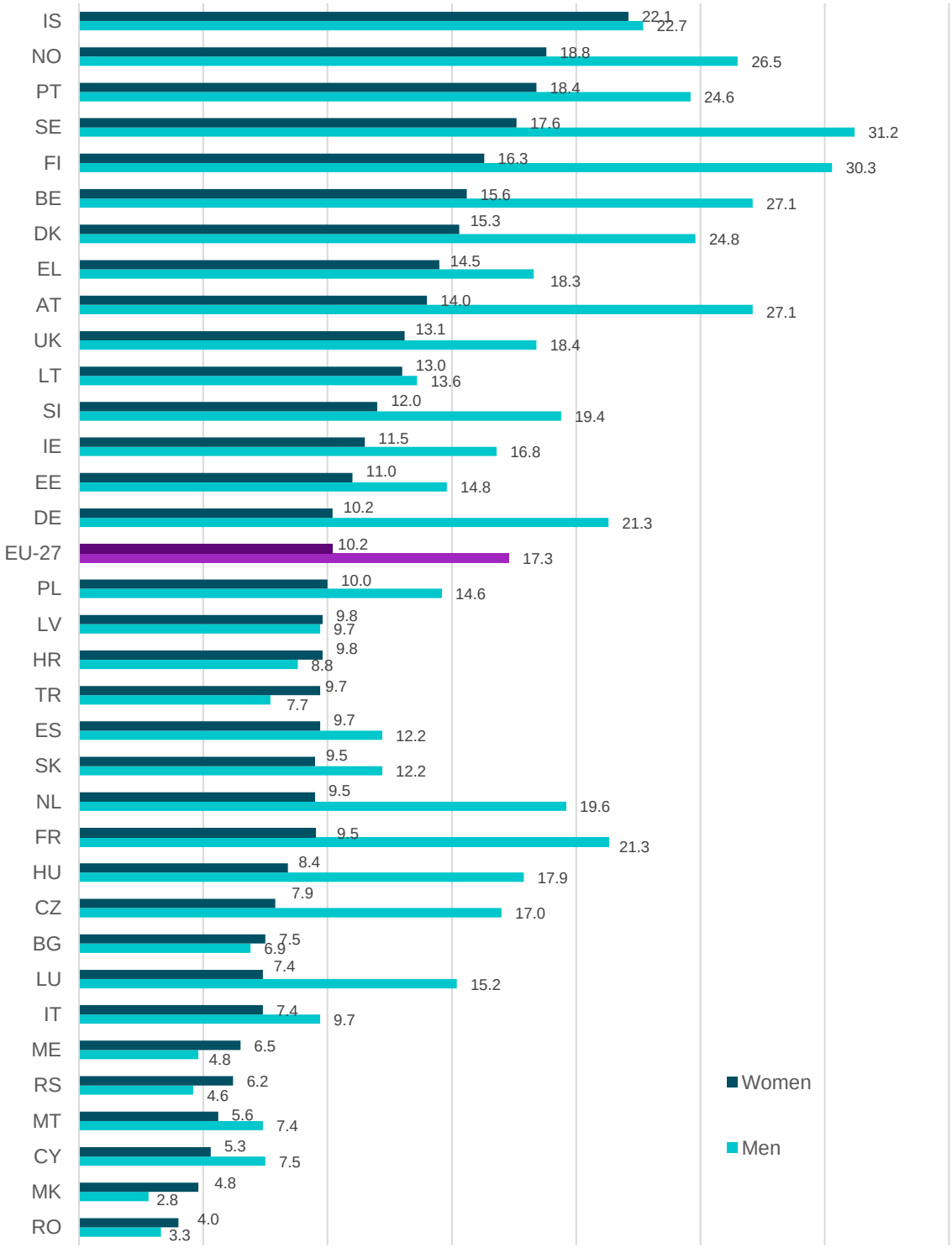
([227]) BE, CZ, DK, DE, EE, IE, EL, ES, FR, IT, CY, LT, LU, HU, MT, NL, AT, PL, PT, SI, SK, FI, SE, IS, NO, UK.

([228]) AT: 14 per thousand women, 27.1 per thousand men; FI: 16.3 per thousand women, 30.3 per thousand men; SE: 17.6 per thousand women, 31.2 per thousand men.

([229]) WomenTechIceland, Advancing women in tech to create a more inclusive society through advocacy, allyship and activism, n.d., https://www.womentechiceland.com/

([230]) ODA, ODA Award Organisation 2023 finalists, 2023, https://odanettverk.no/2023/04/19/oda-award-organization-2023-finalists/

Figure 4.3 Proportion of researchers per thousand labour force, by sex, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and EU-LFS (online data code: lfsa_agan).

Notes: Definition differs, see metadata: ES, FR (Active population), FI, JP (Researchers); Break in time series: EU-27, BE (Researchers), BG, CZ, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, RS (Active population); Estimated: EU-27, UK (Researchers - 2021); Provisional: DK (Researchers - 2021); Reference year differs: DK: 2019, UK: 2018, ME: 2019, MK: 2020, TR: 2020, RU: 2019; Data not available: RU, BA (Active population), JP (Active population).

4.2 Distribution of women and men researchers across the main economic sectors

This section compares the distribution of women and men researchers across the main economic sectors and examines the degree of gender segregation in those sectors. Given the observed gender gap in women's and men's participation as researchers, indicators in the following section reveal how this gap compares in key sectors of the economy.

While most women researchers work in HES, most men researchers work in BES

Researchers work in four main sectors of the economy: BES, GOV, HES, and PNP. The latest data show a high concentration of researchers in BES (56 %) and HES (32 %), while 11 % of researchers in the EU work in GOV. This pattern has changed markedly since 2017, when HES was the main source of employment for researchers in the EU (employing 47 % of researchers). Given that BES is now the main source of employment for researchers in the EU, it is important to consider the extent of the gender gap in BES compared to other economic sectors. Figure 4.4 presents the distribution of women and men researchers across the four main sectors of the economy in 2021.

Women researchers are considerably more likely to work in HES (53 %) than any other sector of the economy, and men researchers are more likely to work in BES (56 %) than any other sector at EU level. The lowest proportions of women and men researchers are both in PNP (1.1 % and 0.6 %, respectively) and there are also relatively few women and men researchers in GOV (14 % and 8 %, respectively).

This trend is reflected across Member States, Associated Countries, and G20 countries. Women researchers most commonly work in HES in all countries observed, except in seven countries, where women most frequently work in BES ([231]). Meanwhile, men researchers most commonly work in BES in 21 countries ([232]), while in the remaining 15 countries ([233]), the largest proportion of men researchers work in HES.

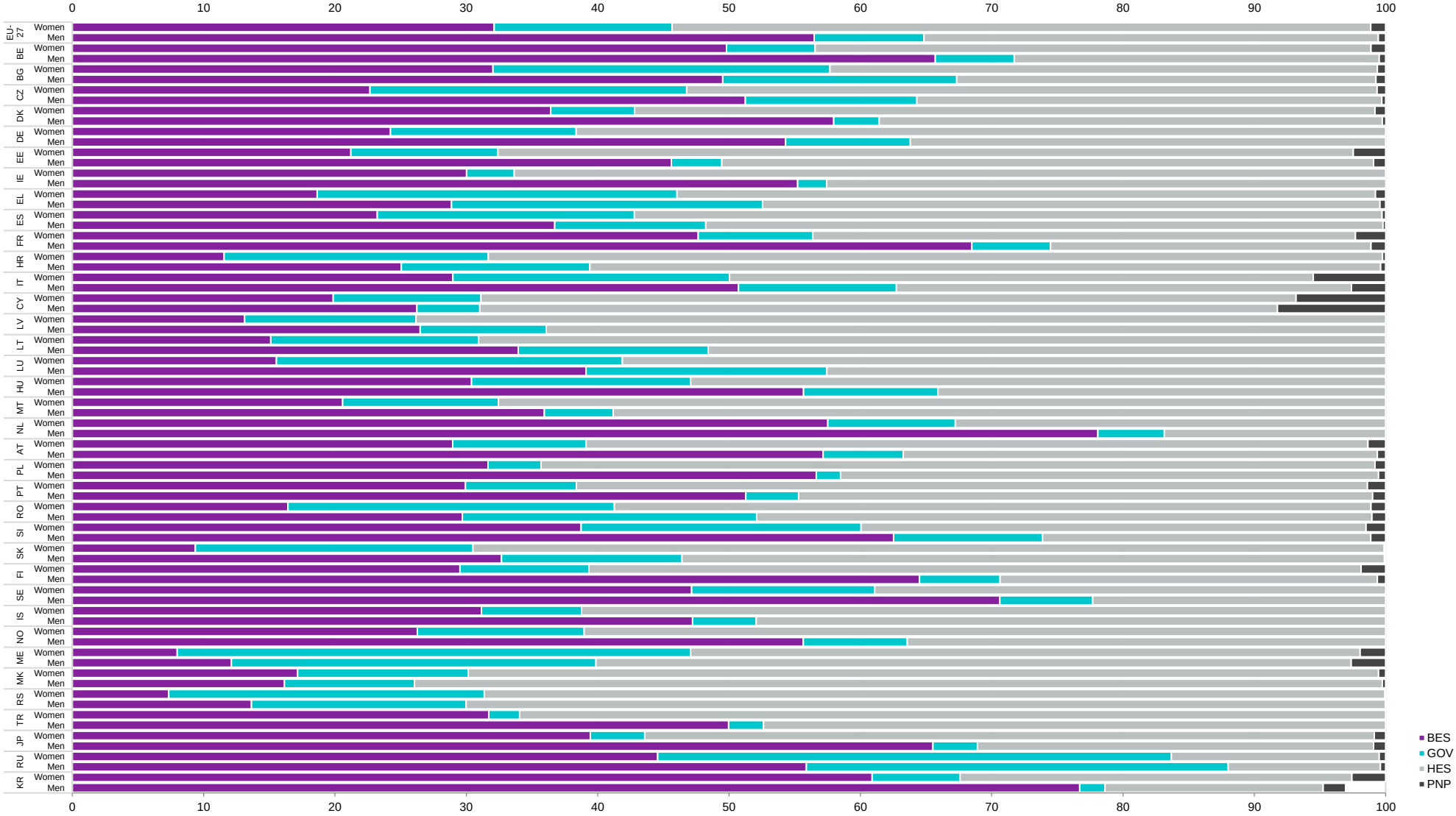
There is a high representation of women and men researchers in GOV in Montenegro (39 % and 28 %, respectively) and Russia (39 % and 32 %, respectively) compared to most other countries, where women's and men's representation did not surpass 20 %. No country has a concentration of researchers higher than 6 % in PNP, except Cyprus, where women constitute 7 % and men 8 % of the total researcher population.

([231]) BE: 50 %, FR: 48 %, NL: 58 %, SI: 39 %, SE: 47 %, RU : 45 %, KR: 61 %.

([232]) BE, BG, CZ, DK, DE, IE, FR, IT, HU, NL, AT, PL, PT, SI, FI, SE, NO, TR, JP, RU, KR.

([233]) DE, EE, HR, CY, LV, LT, LU, MT, RO, SK, IS, ME, MK, RS, TR.

Figure 4.4 Distribution of researchers across sectors, by sex, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: DE (GOV, HES), NL (GOV, PNP), FI (All), NO (BES); Break in time series: BE (BES, Total), SE (All), NO (BES); Estimated: EU-27, IE (HES), IT (HES); Provisional: DK; Difference in methodology: JP (Researchers - Women, Total); low reliability: LU (PNP); Reference year differs: DK: 2019, UK: 2018, ME: 2019, MK: 2020, RU: 2020; Data not available: DE, IE, LV, LT, HU, MT, SE, IS , NO, TR (PNP, Women, Total), IL, US.

Women are well represented in HES and GOV, yet remain underrepresented in BES at both EU and country level

Figures 4.5, 4.6 and 4.7 show the proportion of women researchers in HES, GOV and BES, respectively. At EU level, gender balance is achieved for women researchers working in HES and GOV (representing 44 % and 45 % of the total researcher population, respectively). However, women are underrepresented in BES, comprising only 22 % of the total researcher population. As this sector is the main source of employment for researchers in the EU, this underrepresentation demonstrates evidence of a pronounced gender gap.

At country level, a similar pattern is evident. Gender balance is achieved in HES in every Member State, Associated Country, and G20 country, except Czechia (36 %), Cyprus (39 %), Luxembourg (37 %), Hungary (39 %), Malta (38 %), Japan (29 %), and South Korea (34 %), where women remain underrepresented. Notably, although women were underrepresented in HES in Germany and France in 2018, gender balance has now been achieved (from 39 % to 41 % in Germany, and from just under 40 % ([234]) to 42 % in France). Similarly, the current researcher population in GOV is gender-balanced in the majority of Member States, Associated Countries, and G20 countries ([235]). This is the only sector where women are overrepresented in some countries (EE, PT, BA, ME, MK, RS). However, women continue to be underrepresented in eight Member States, Associated Countries, and G20 countries (BE, DE, FR, LU, UK, TR, JP, KR).

Gender balance is achieved in only three countries (BA, ME, MK) in BES, with women underrepresented in every other Member State, Associated Country, and G20 country. Of the countries in which women are underrepresented, they are significantly underrepresented in nine ([236]), where they make up less than 20 % of the total researcher population. Japan has the lowest representation of women in all three sectors; 29 % in HES, 21 % in GOV, and just 12 % in BES.

Achieving gender equality in BES is crucial not only from a social justice perspective, but also to ensure better-informed decision-making and performance, foster innovation, and boost economic growth ([237]).

Box 21 describes two initiatives to increase women's participation in BES research.

Box 21: Initiatives to increase women's participation in BES research

In **Denmark**, the Innovation Fund invests in businesses, researchers and entrepreneurs that create new solutions for society's biggest challenges. In 2018, Innowomen was created, a network aiming to support better gender balance among entrepreneurs and researchers, as well as the foundation's applicants ([238]). A number of strategies were implemented, including adjusting requirements and formulations in application forms and ensuring greater gender balance on panels. The network also aims to inspire other women entrepreneurs and researchers through the appointment of notable women researchers working in BES. In 2023, the Innowomen group appointed four new members ([239]).

In **Croatia**, Women in Adria is a community of women providing online career mentoring, education, conferences, and networking opportunities for women in business, including specific network communities for women in the science and pharmaceutical industry, the IT industry, and the engineering industry ([240]).

([234]) 39.9 %

([235]) BG, CZ, DK, IE, EL, ES, HR, IT, CY, LV, LT, HU, MT, NL, AT, PL, RO, SI, SK, FI, SE, IS, NO, RU.

([236]) CZ, DE, LU, HU, AT, SK, FI, JP, KR.

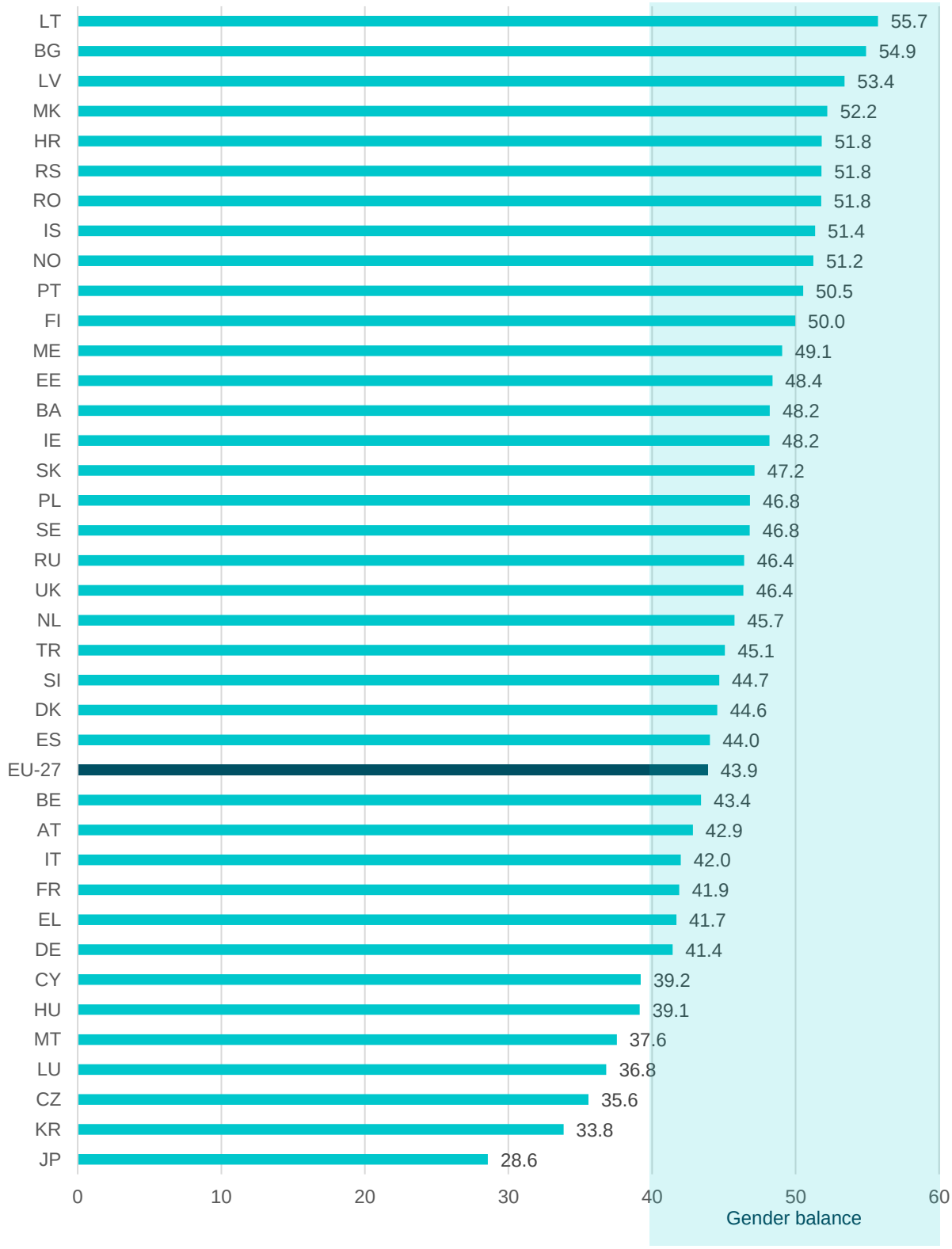
([237]) United Nations Development Programme (UNDP), *Making the business case for gender equality*, 2018, https://www.undp.org/blog/making-business-case-gender-equality

([238]) Innovationsfonden, Innovationsfondens Innowomen, 2023, https://innovationsfonden.dk/da/news-article/innovationsfondens-innowomen

([239]) Innovation Fund Denmark, Innovation Fund Denmark appoints new Innowomen, 2023, https://innovationsfonden.dk/en/news/innovation-fund-denmark-appoints-new

([240]) Women in Adria, Women in Adria empowers women to change the world, n.d., https://www.womeninadria.com/o-nama/

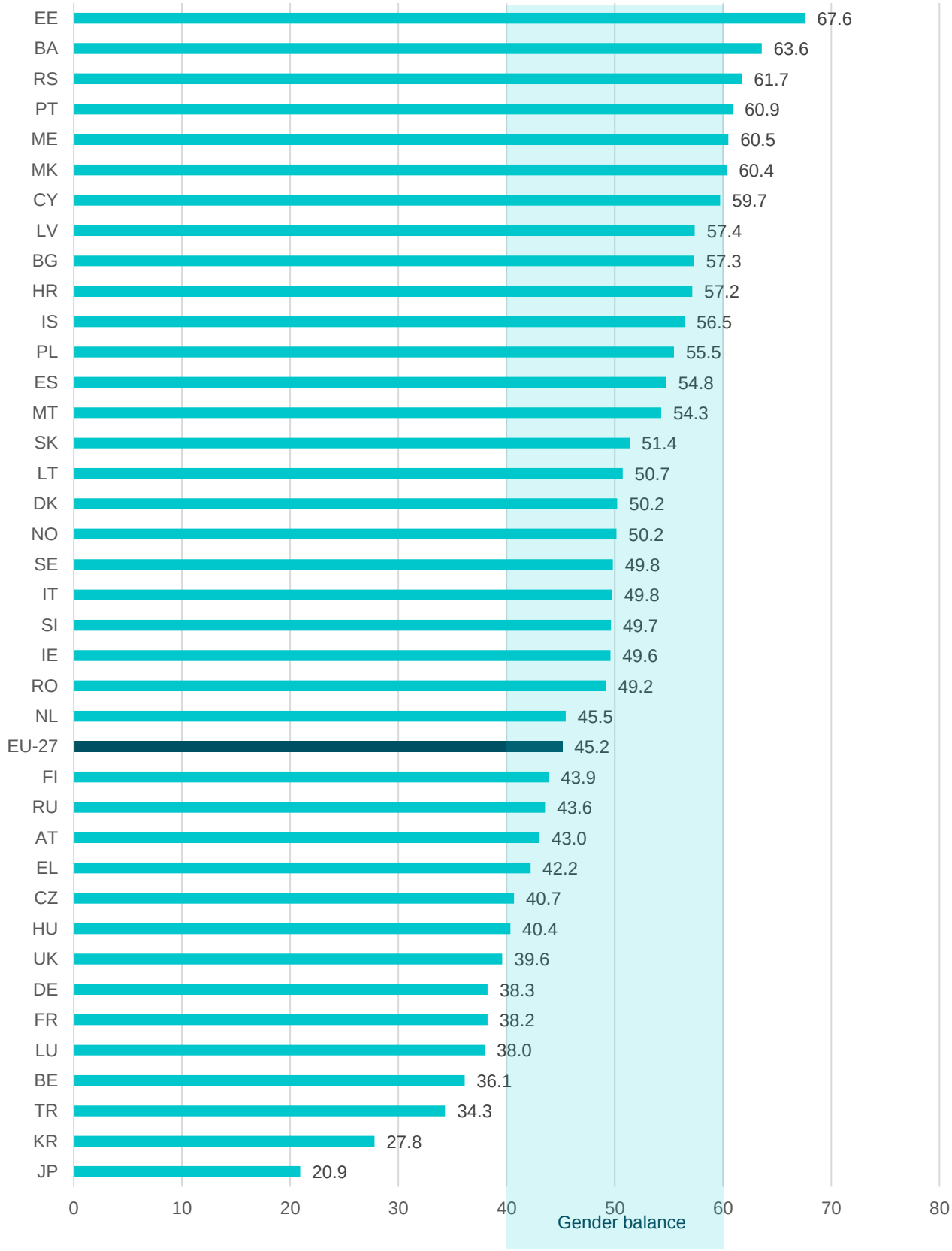
Figure 4.5 Proportion (%) of women researchers in HES, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: DE, FI (Researchers - Women, Total); Break in time series: BE, SE (Researchers - Women, Total); Estimated: EU-27 (Researchers - Women, Total), IE, IT, UK (Researchers - Women, Total); Provisional: DK (Researchers - Women, Total); Difference in methodology: JP (Researchers - Women, Total); Reference year differs: DK: 2019, UK: 2018, ME: 2019, MK: 2020; Data not available: IL, US.

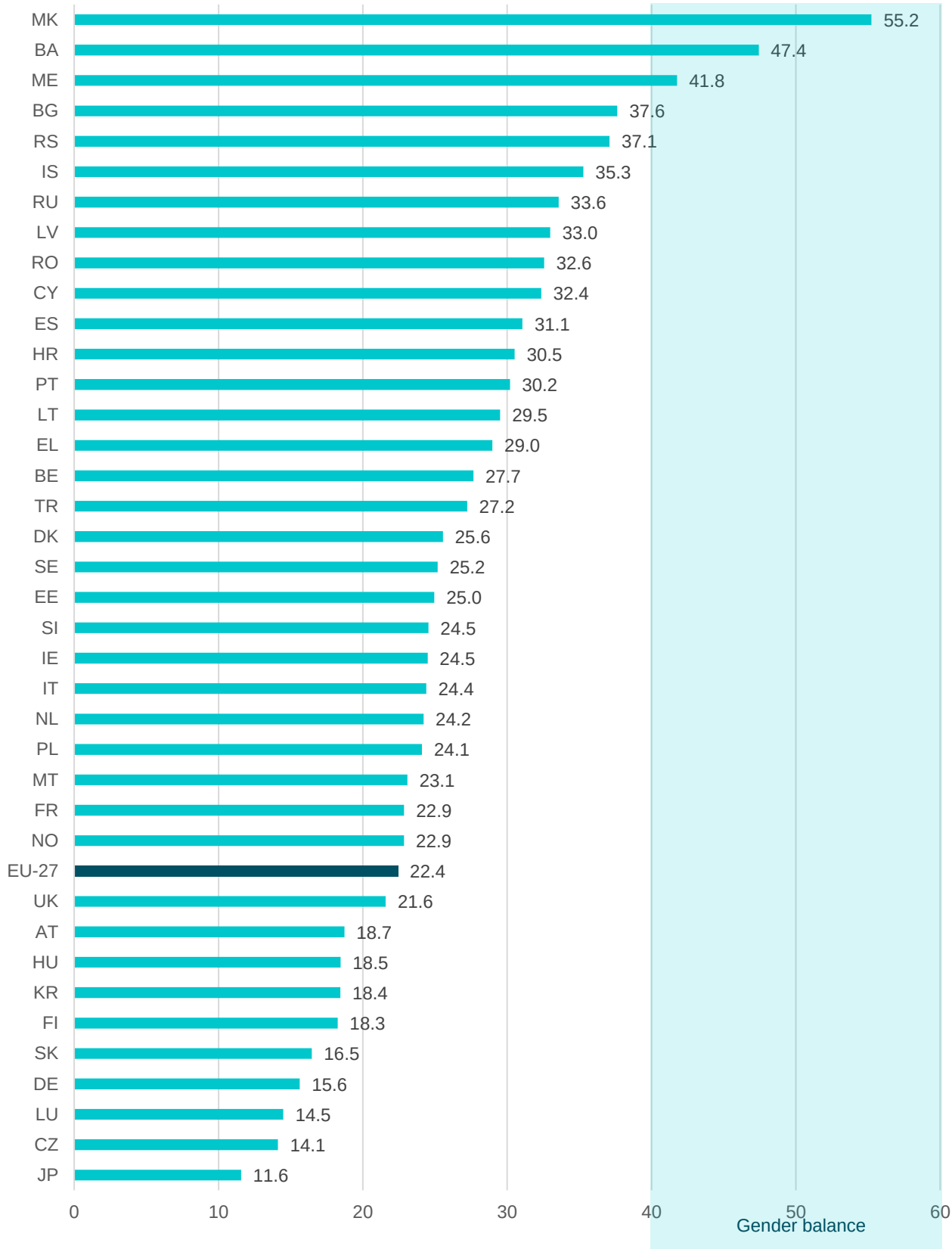
Figure 4.6 Proportion (%) of women researchers in GOV, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: DE, NL, FI (Researchers - Women, Total); Break in time series: BE, SE (Researchers - Women, Total); Estimated: EU-27, UK (Researchers - Women, Total); Provisional: DK (Researchers - Women, Total); Difference in methodology: JP (Researchers - Women, Total); Reference year differs: DK: 2019, UK: 2018, ME: 2019, MK: 2020; Data not available: IL, US.

Figure 4.7 Proportion (%) of women researchers in BES, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: FI (Researchers - Women, Total), NO; Break in time series: BE, SE (Researchers - Women, Total), NO; Estimated: EU-27, UK (Researchers - Women, Total); Provisional: DK (Researchers - Women, Total); Difference in methodology: JP (Researchers - Women, Total); Reference year differs: DK: 2019, UK: 2018, ME: 2019, MK: 2020; Data not available: IL, US.

4.3 Growth in the number of women and men researchers across the main economic sectors

This section examines the change in the number of women and men researchers over time and across sectors to gain insight into the evolution of the gender gap in HES, GOV and BES since 2013.

Between 2013 and 2021, women researchers grew at more than twice the rate of men researchers in HES and GOV at EU level

At EU level, the number of women researchers has grown at a faster rate than that of men researchers in HES, GOV, and BES since 2013, as shown by the CAGR. More specifically, in HES, the number of women researchers has grown at a rate of 2.9 % while the number of men researchers has grown at a rate of 1.2 % (see Figure 4.8). In GOV, the number of women researchers has grown at a rate of 3.1 %, compared to 1.4 % for men researchers (see Figure 4.9). In BES, the average annual growth rate is considerably higher for both women and men researchers compared to the other two sectors, with the number of women researchers growing at a rate of 7.1 % and the number of men researchers growing at a rate of 5.2 % (see Figure 4.10). However, where initial numbers are low, changes over time can translate into larger percentages, thus the CAGR of women researchers in BES, where the total number of women is considerably lower than the number of men (see Figure 4.7), should be read cautiously.

In most Member States, Associated Countries, and G20 countries, the CAGR for women researchers is higher than for men researchers in HES (36 out of 38 countries). The only countries in which the CAGR is (marginally) lower for women researchers are Czechia (2.4 % for women and 2.5 % for men) and Latvia (1.9 % for women and 2.0 % for men). Figure 4.5 shows that the gap is closing in all countries in which women are underrepresented in HES, except Czechia. Bosnia and Herzegovina has the largest difference in the CAGR for women and men researchers, with the number of women researchers growing at a rate of 10.2 %, compared to 3.8 % for men. Notably, the CAGR for women researchers is positive in every country except Lithuania (-1.9 %), Sweden (-0.6 %), Montenegro (-0.8 %) and North Macedonia (-1.3 %). However, the CAGR for men researchers is also negative in each of these countries (-2.4 %, -1.8 %, -1.7 % and -3.4 %, respectively), suggesting that this decline may reflect wider trends affecting both women and men.

In GOV, there was considerable variation at country level in the CAGR for both women and men researchers. The highest CAGR for women and men researchers is in Malta (32.5 % and 18.0 %, respectively), while the lowest CAGR for women and men researchers – with a notable decline – is in Poland (-8.8 % and -14.7 %, respectively). However, this may be partly explained by changes in the categorisation of some entities from GOV to BES (also reflected in a high CAGR in BES in Poland for both women and men (see Figure 4.10)).

Following a similar trend to HES, the CAGR is higher for women researchers than men in most Member States, Associated Countries, and G20 countries (31 out of 38) in GOV. The only countries in which the growth rate is slower for women researchers are Belgium, Greece, Lithuania, Luxembourg, Hungary, Austria and Finland. Of the eight countries where women researchers are underrepresented in this sector, all but Belgium and Luxembourg have a higher CAGR for women researchers, suggesting that the gender gap is closing (see Figure 4.6). Again, similar to HES, Bosnia and Herzegovina has the largest difference in the CAGR for women and men researchers, with the number of women researchers growing at a rate of 13.9 % and the number of men decreasing at a rate of 4.5 %.

Box 22: Measures to support women's participation in HES and GOV

Spain's 'Guide to mentoring programmes in science, technology and innovation: Description and analysis from a gender perspective', developed by the Ministry of Science and Innovation, Women and Science Unit in 2023, identifies and describes more than 40 mentoring programmes in

universities, associations, and research centres across Spain ([241]). The Guide aims to enable researchers to overcome institutional and structural barriers by providing access to mentoring. This not only provides early career researchers with a network to help women through recruitment and promotion processes, but also provides women with diverse leadership role models to improve the representation of women in these sectors.

In **France**, the national programme 'Femmes & Sciences' aims to support Doctoral students and encourage them to build their careers ([242]). The mentoring programme has four axes: 1) monthly one-to-one meetings between mentors and mentees (Doctoral students); 2) training workshops (on job interview preparation, postdoc opportunities abroad) and meetings with women researchers to learn about their professional journeys and career choices; 3) mentoring circles where thematic discussions and exchanges can happen informally; and 4) testimonies from women scientists describing their backgrounds and career choices. Since 2015, it has supported more than 300 women Doctoral students, expanding to include other HEIs.

Overall, both women's and men's representation in BES is growing at a much faster rate than in HES and GOV. In line with the trends in HES and GOV, women's participation in BES has grown in every country except Malta, Romania, Bosnia and Herzegovina, and Russia. However, although the CAGR is higher for women researchers than men researchers in most Member States, Associated Countries, and G20 countries for which data are available (23 out of 38), this was the case in considerably fewer countries compared to HES and GOV.

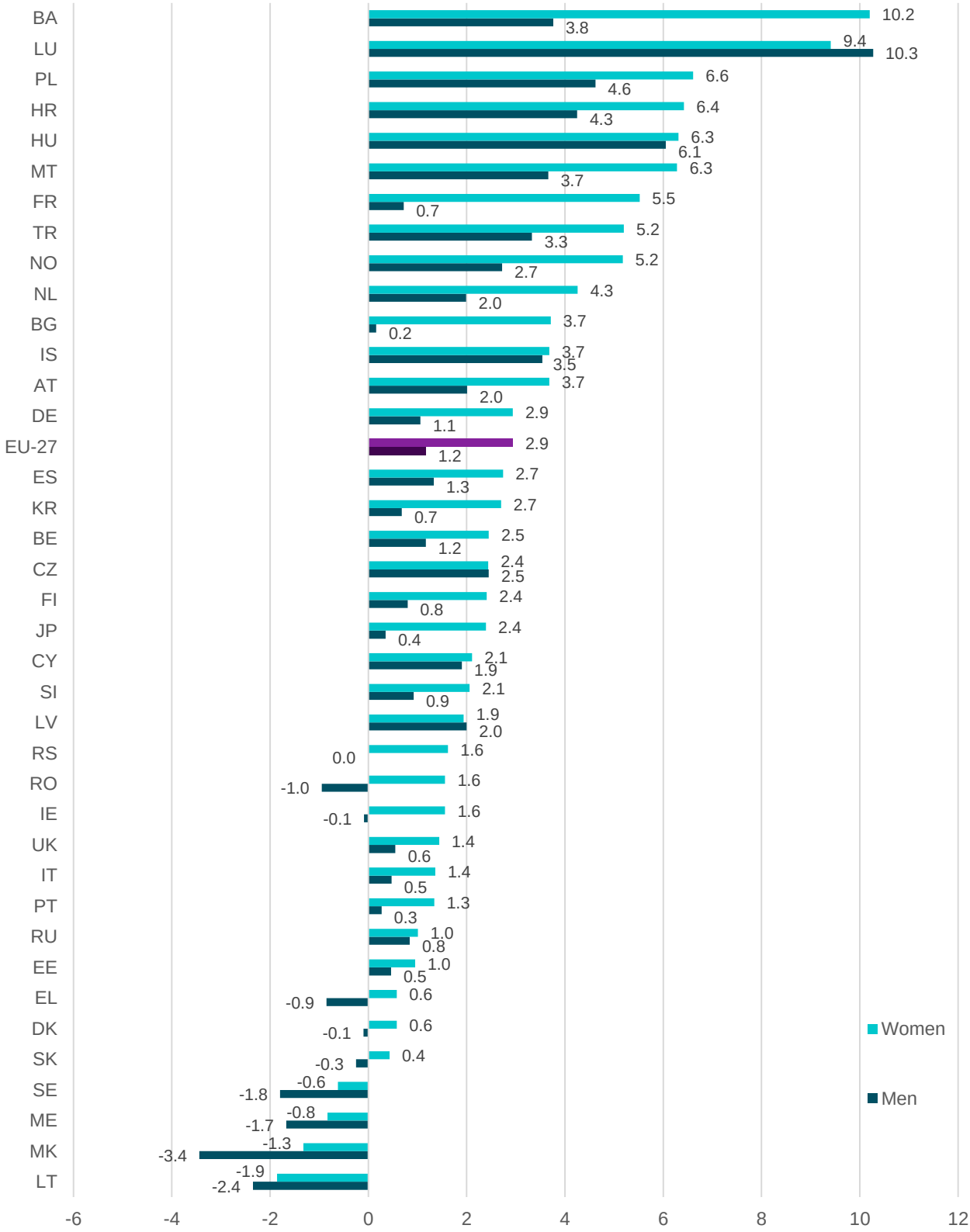
Figure 4.7 shows nine countries in which women are significantly underrepresented in BES. Figure 4.10 shows a higher CAGR for women researchers compared to men researchers in all but one of those nine countries (SK). However, of the three countries in which gender balance is reached in BES, the CAGR is lower for women researchers than men researchers in two (Bosnia and Herzegovina, and North Macedonia). Of the remaining 26 countries in which women are underrepresented, the CAGR for women researchers is lower than that of men in 12 ([243]), indicating women's underrepresentation is becoming more pronounced in these countries. Therefore, while overall, the numbers of women and men are growing faster in this sector, there are still a number of countries where little progress has been made to achieve gender balance (see for instance Box 21 with the measures identified across Member States to increase women's representation in BES).

([241]) Women and Science Unit, *Guide to mentoring programs in science, technology and innovation: Description and analysis from a gender perspective*, 2023, https://www.ciencia.gob.es/dam/jcr:1a34ac63-4a4d-4f66-a4f5-956d791ca632/Gu%C3%ADa%20de%20programas%20mentorazgo%20en%20CTI%20UMyC_acc.pdf

([242]) Ministry of Science and Innovation of Spain, Guide to mentoring programmes at CTI UMyC, n.d., https://www.femmesetsciences.fr/mentorat

([243]) BG, DK, EE, HR, LV, LT, MT, RO, PT, SI, RS, RU.

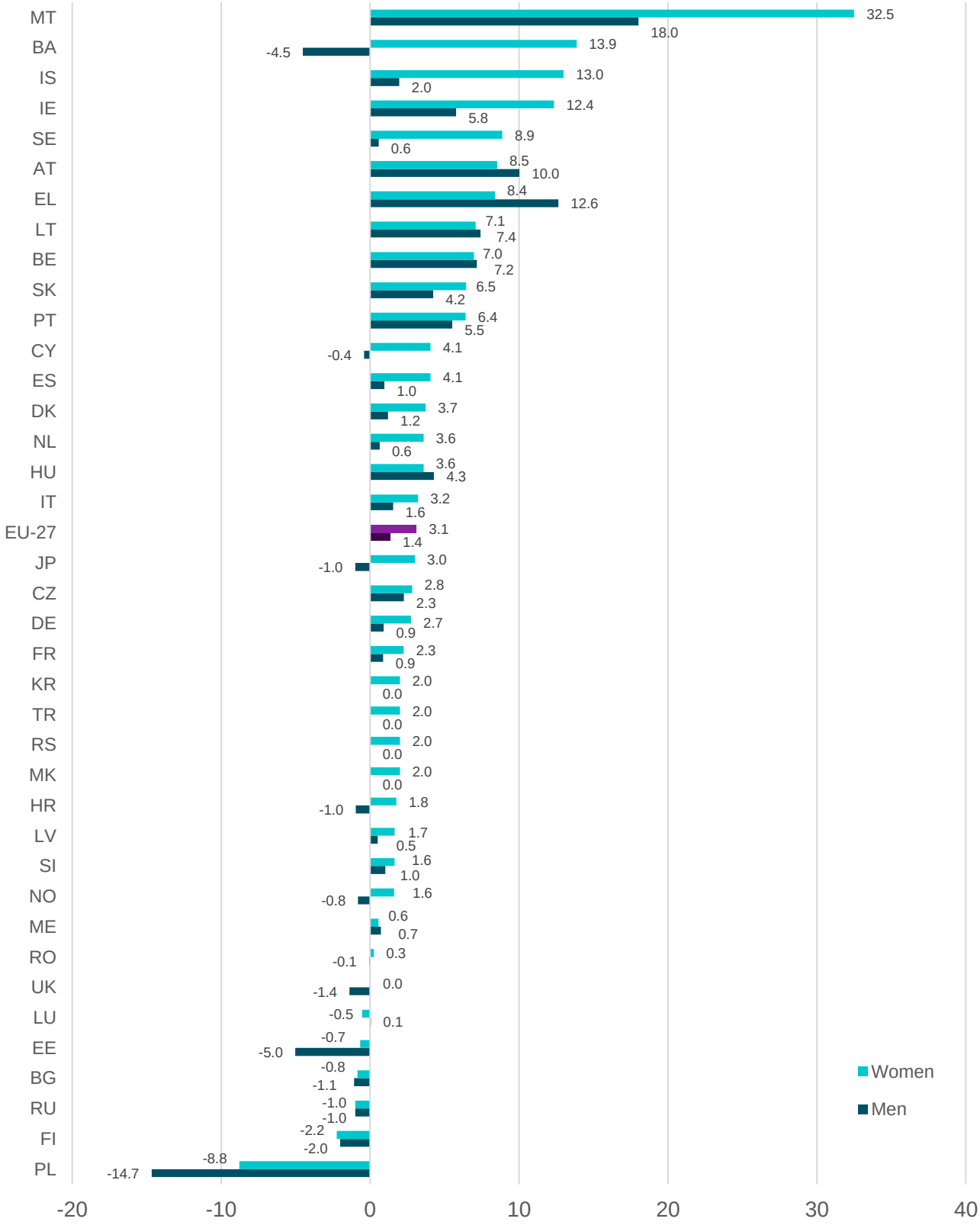
Figure 4.8 CAGR for researchers in HES, by sex, 2013-2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: DE, FI (Researchers - Women, Total); Break in time series: BE, SE (Researchers - Women, Total); Estimated: EU-27 (Researchers - Women, Total), IE, IT, UK (Researchers - Women, Total); Provisional: DK (Researchers - Women, Total); Difference in methodology: JP (Researchers - Women, Total); Reference year differs (2021): DK: 2019, UK: 2018, ME: 2019, MK: 2020, RU: 2020; Reference year differs (2013): MK: 2015, KR: 2016; Data not available: IL, US (2013, 2021).

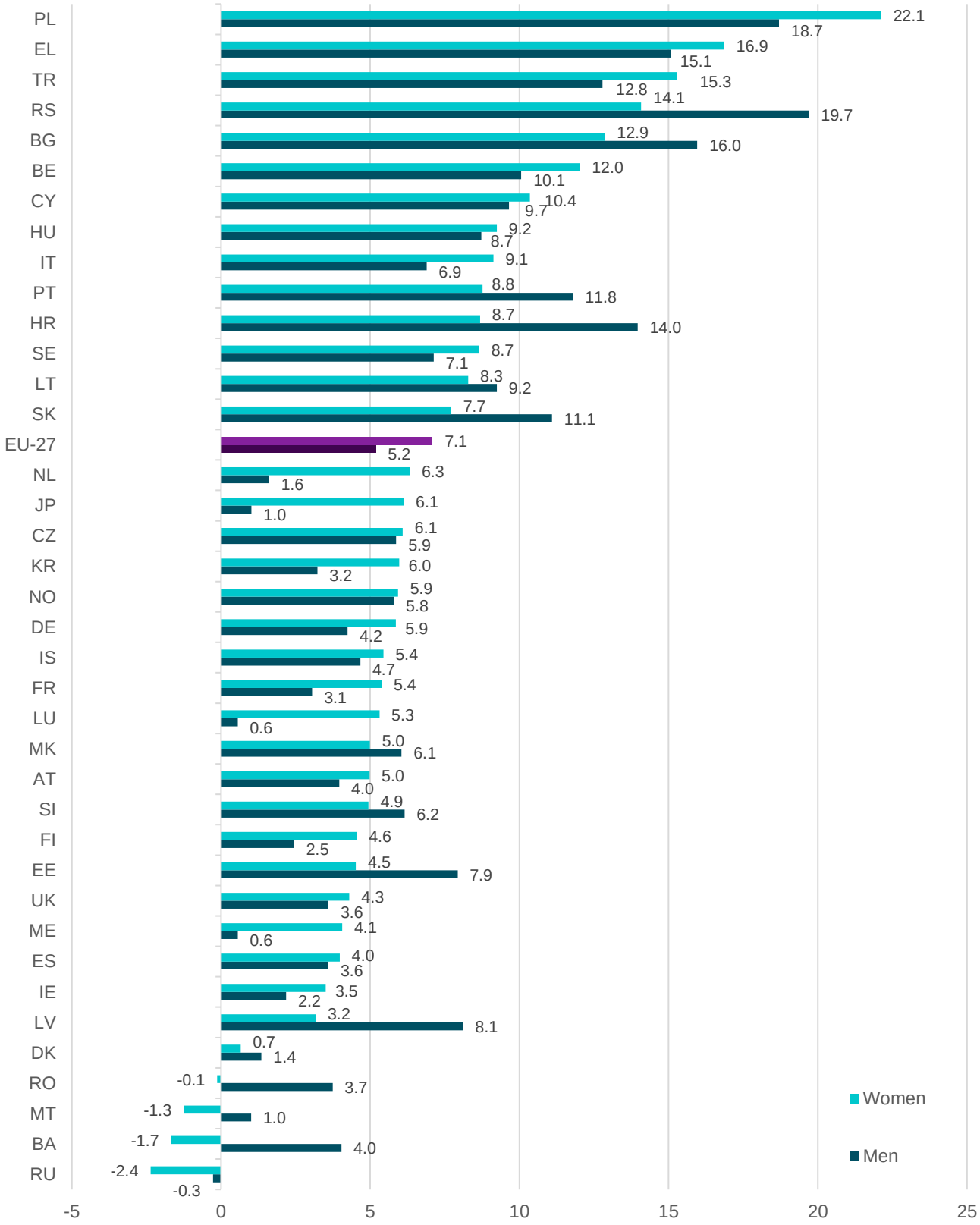
Figure 4.9 CAGR for researchers in GOV, by sex, 2013-2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: DE, FI, NL (Researchers - Women, Total); Break in time series: SE (Researchers - Women, Total); Estimated: EU-27 (Researchers - Women, Total); Provisional: DK (Researchers - Women, Total); Difference in methodology: JP (Researchers - Women, Total); Reference year differs (2021): DK: 2019, UK: 2018, ME: 2019, MK: 2020, RU: 2020; Reference year differs (2013): MK: 2015, KR: 2016; Data not available: IL, US (2013, 2021).

Figure 4.10 CAGR for researchers in BES, by sex, 2013-2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: FI,NO (Researchers - Women, Total); Break in time series: BE, SE, NO (Researchers - Women, Total); Estimated: EU-27; Provisional: DK (Researchers - Women, Total); Difference in methodology: JP (Researchers - Women, Total); Reference year differs (2021): DK: 2019, UK: 2018, ME: 2019, MK: 2020, RU: 2020; Reference year differs (2013): MK: 2015, KR: 2016; Data not available: IL, US (2013, 2021).

4.4 Women's and men's participation among researchers by age group

Women's participation in research careers is impacted by a range of structural issues, including gender stereotypes and biases around gendered abilities that affect various stages of researchers' careers, from securing research grants and resources to advancing to senior leadership positions (see Chapter 6) ([244]). These barriers create a vicious cycle whereby fewer women can access and advance in research careers, leading to a lack of role models and opportunities. Another structural barrier is institutional policies that do not support flexible work arrangements, family-friendly leave, and childcare support. In the EU, about 33 % of women have taken a career break of at least six months due to childcare, compared to just over 1 % of men ([245]). Laws and policies have been introduced to promote women's reintegration into the labour market after career breaks, as well as measures (e.g. grants, special supports) to reconcile women researchers' research and care responsibilities (see Box 23).

To understand how gender differences shape women's and men's participation throughout their research careers, the following indicators show the participation of researchers by age group. Here, age is used as a proxy for seniority, as senior research positions typically require many years of experience. This proxy helps to determine the relative presence of women and men in more senior research positions and thus assess gender differences in patterns of employment. Chapter 6 explores the distribution of women and men grade A staff according to age group, demonstrating that both women and men are mostly distributed in the 55+ age group, corroborating the age-seniority correlation.

In both HES and GOV, more men than women researchers are present in the 55+ age group, suggesting that women are less represented in senior research positions

Figure 4.11 shows the distribution of women and men researchers in HES, by age. The highest proportion of women researchers (ranging from 27 % in Norway to 35 % in North Macedonia) are employed in the 35-44 age group in just over half of Member States and Associated Countries for which data are available (CZ, EE, HR, HU, RO, SI, SK, NO, BA, ME, MK, RS). The highest proportion of men researchers is also in this age group (CZ, EE, HR, CY, LT, HU, RO, SK, BA, MK). In all but three of the countries examined (CZ, RO, SK), there are higher proportions of women researchers than men researchers in this age group.

Similarly, in the under-35 age group, there are higher proportions of women researchers compared to the corresponding proportions of men researchers in 18 of 23 countries ([246]). This youngest age group constitutes the highest proportions of women researchers in seven countries (EL, IT, CY, AT, PL, PT, FI) and of men researchers in four countries (EL, AT, SI, FI).

However, the 55+ age group presents a reverse trend: it has a higher proportion of men researchers than women researchers in every country. The data show that the proportion of men researchers is highest in the 55+ age group in nine countries (BG, ES, IT, LV, PL, PT, NO, ME, RS), including in Latvia where women are most represented compared to the other age groups (32 % of women compared to 40 % of men). While this pattern is to be expected given that, prior to any measures to tackle gender inequality, the majority of researchers hired would have been men, it nevertheless suggests an ongoing higher prevalence of men in more senior positions.

([244]) European Commission, Directorate-General for Justice and Consumers, *2021 report on gender equality in the EU*, Publications Office of the European Union, Luxembourg, 2021, https://data.europa.eu/doi/10.2838/57887

([245]) Eurostat, Population by effects of childcare on employment and educational attainment level, lfso_18stwked and Population with work interruption for childcare by duration of interruption and educational attainment level, last update 24 February 2020.

([246]) BG, CZ, EL, ES, HR, IT, CY, HU, AT, PL, PT, RO, SI, SK, NO, BA, ME, RS.

Box 23: Actions to support women returning to research careers in HEIs after parental leave

In **France**, the National Action Plan for Professional Equality Between Men and Women for 2021-2023 ([247]) includes measures to facilitate women's reintegration into HES following parental leave. Measure 3.4 aims to minimise the impact of parental/family leave on salary and career development, while Measure 3.5 supports part-time work as an alternative to parental leave for those with children under three years old. Measure 2.1 aims to enhance awareness of research and academic roles, focusing on the presence of women in high-ranking positions in order to promote gender diversity and address barriers to the careers of women researchers and research-teaching staff.

Figure 4.12 shows the distribution of women and men researchers, by age, for GOV. Aligning with the findings in HES, there are higher proportions of both women and men researchers in the 35-44 age group. More specifically, women researchers are most represented in 11 of 23 Member States and Associated Countries ([248]) and men researchers are most represented in 10 of 23 countries ([249]). In this age group, there are higher proportions of women researchers than the corresponding proportion for men researchers in 17 of the 23 countries for which data are available ([250]).

In contrast to HES, GOV has similar proportions of women researchers in both the under-35 and 45-54 age groups. For example, in the under-35 age group, women are most represented in seven countries (CZ, DE, ES, LV, LT, AT, PT), and for the 45-54 age group, women are most represented in six countries (BG, EL, HR, IT, ME, MK). A similar number of countries have a proportion of women researchers higher than the corresponding proportion for men researchers in the under-35 age group (16 out of 22 ([251])) and the 45-54 age group (16 out of 23 ([252])). This is the case for both age groups in only six countries (HU, PL, RO, SK, NO, BA). No countries exhibit a higher proportion of women researchers in the 55+ age group. In contrast, this is the case for men researchers in seven countries (CZ, EE, CY, PT, RO, SK, MK). This suggests a pattern similar to that in HES, where men are more likely than women to hold senior research positions in GOV.

([247]) Ministry of National Education and Youth, National Action Plan for Professional Equality Between Women and Men, n.d., https://www.enseignementsup-recherche.gouv.fr/sites/default/files/content_migration/document/PNA_2021_13_1385189.pdf

([248]) EE, CY, HU, PL, RO, SI, SK, NO, BA, RS, TR.

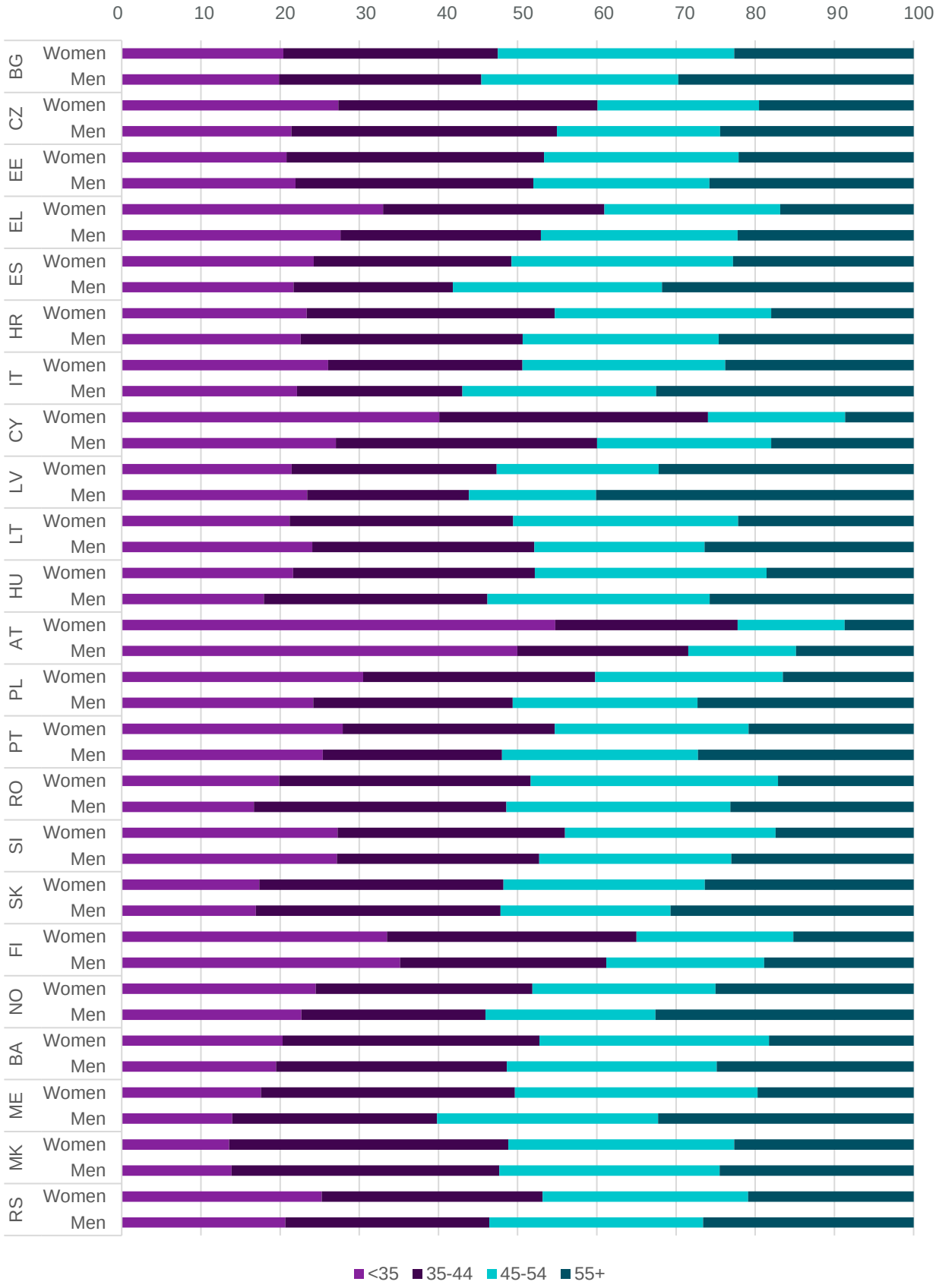
([249]) HU, AT, PL, SI, NO, BA, ME, MK, RS, TR.

([250]) BG, DE, ES, HR, IT, CY, HU, AT, PL, RO, SI, SK, NO, ME, MK, RS, TR.

([251]) BG, CZ, DE, ES, HR, IT, HU, AT, PL, PT, RO, SK, NO, BA, RS, TR.

([252]) BG, EE, EL, IT, LV, LT, HU, PL, PT, RO, SI, SK, NO, BA, ME, MK.

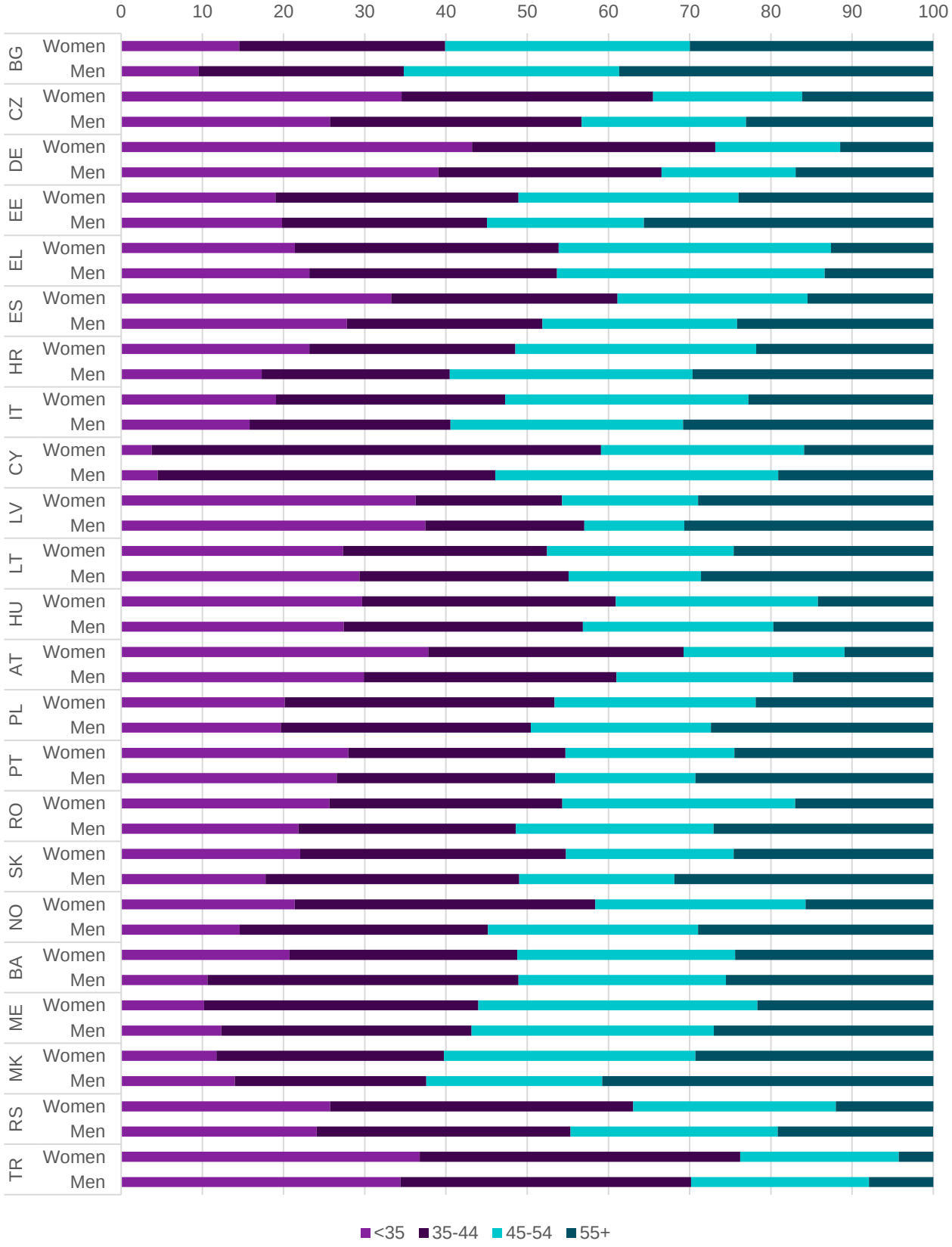
Figure 4.11 Distribution of researchers in HES across age groups, by sex, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persage).

Notes: Definition differs, see metadata: HU; Estimated: IT; Reference year differs: CZ: 2020, LV: 2015, FI: 2015, NO: 2014, ME: 2019, MK: 2020; Data not available: EU-27, BE, DK, DE, IE, IT, MT, NL, SE, IS, UK, TR, JP, RU.

Figure 4.12 Distribution of researchers in GOV across age groups, by sex, 2021



Source: Eurostat – Research and development statistics (online data code: rd_p_persage).

Notes: Definition differs, see metadata: DE, HU; Reference year differs: CZ: 2020, LV: 2015, NO: 2014, ME: 2019, MK: 2020; Data not available: EU-27, BE, DK, IE, FR, LU, MT, NL, SI, FI, SE, IS, UK, RU.

4.5 Evolution of women's representation among researchers in key economic sectors, by field of R&D

As explored in Chapter 2, women remain underrepresented among Doctoral graduates in STEM fields and well-represented in Education, Arts and Humanities, and Social Sciences, reflecting horizontal gender segregation ( ). These disparities have consequences for women's career choices and representation in the labour market. In Section 4.5 and Section 4.6, two different approaches are taken to observe horizontal gender segregation in the main economic sectors. Section 4.5 examines the distribution of women and men across fields of R&D to compare the populations of women and men researchers. In Section 4.6, the DI is used to look at how many women and men would have to move to different fields to reach an equal balance.

Women's representation in different R&D fields in the labour market reflects their representation in different fields in tertiary education, with horizontal gender segregation persisting across women's careers

As a large proportion of researchers are employed in HES (see Section 4.3), it is useful to understand women's representation in this sector and how it has developed over time. To assess the extent to which women's participation has changed, Table 4.1 shows the evolution of the proportion of women researchers in HES by field of R&D from 2017 to 2021. The data show that the proportion of women researchers has increased in most Member States, Associated Countries and G20 countries for which data are available for every R&D field. More specifically, women's representation has increased in 20 of 35 countries in Natural Sciences ([253]), 26 of 35 countries in Engineering and Technology ([254]), 22 of 37 countries in Medical and Health Sciences ([255]), 20 of 35 countries in Agricultural Sciences ([256]), 24 of 36 countries in Social Sciences ([257]), and 25 of 37 countries in Humanities ([258]). The proportion of women researchers has grown in every R&D field from 2017 to 2021 in Germany, Spain, Italy, Austria, Portugal, Sweden, and Türkiye.

At country level, only Romania had achieved gender balance in Engineering and Technology within HES in 2017, but five countries have achieved gender balance in 2021 (ES: 40 %, HR: 47 %, RO: 44 %, MK: 41 %, RS: 41 %). Women researchers were significantly underrepresented in four countries in this field in 2017 (15 % in Luxembourg, 16 % in Malta, 10 % in Japan, 14 % in South Korea), with some improvements observed in Luxembourg and Malta in 2021 (increasing to 18% and 22%, respectively). By contrast, in Natural Sciences, while women were underrepresented in 19 of 35 countries in 2017, they are underrepresented in 21 of 36 countries in 2021. This indicates that women's representation declined slightly in this field.

Most countries have achieved gender balance in Medical and Health Sciences in HES, with women underrepresented only in Japan (32 %), similar to 2017. Similarly, women are only underrepresented in two countries in Social Sciences (JP: 29 %, KR: 37 %) and Humanities (MT: 32 %, JP: 36 %). However, in these countries, women are least represented among researchers across all fields (MT: 34 %, JP: 18 %, KR: 22 %) and have low representation in Engineering and Technology (MT: 26 %, JP: 14 %, KR: 31 %) and Natural Sciences (MT: 22 %, JP: 10 %, KR: 14 %), suggesting low overall participation of women researchers in the research sector rather than horizontal gender segregation.

In Social Sciences and Humanities, women's representation has remained largely the same. Romania is a notable exception, where the proportion of women has grown by 9 pp in Humanities, from 39 % to 48 %, achieving gender balance. Romania is the only country to reach gender balance in every R&D field in 2021.

In summary, when disaggregated by field of R&D, the data show that gender balance has largely been achieved in HES in the fields of Medical and Health Sciences, Agricultural Sciences, Social Sciences and Humanities, while women remain underrepresented in Natural Sciences and Engineering and Technology. The proportions of women and men employed in each R&D field thus reflect the proportions of women and

([253]) DK, DE, IE, ES, HR, IT, CY, LV, LU, AT, PL, PT, RO, SK, FI, SE, NO, MK, RS, TR.

([254]) BE, CZ, DK, DE, EE, IE, ES, HR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, SE, IS, NO, BA, MK, RS, TR.

([255]) BE, DE, EE, EL, ES, HR, IT, LV, LT, MT, NL, AT, PT, RO, SI, FI, SE, NO, BA, ME, MK, TR.

([256]) BE, CZ, DK, DE, EE, ES, IT, LV, LT, HU, NL, AT, PT, RO, FI, SE, BA, MK, RS, TR.

([257]) BE, CZ, DK, DE, EE, EL, ES, HR, IT, LT, MT, AT, PT, SI, SK, FI, SE, IS, NO, BA, ME, RS, TR, RU.

([258]) BG, CZ, DK, DE, EE, IE, EL, ES, IT, LU, HU, MT, AT, PT, RO, SI, SK, FI, SE, IS, NO, ME, MK, RS, TR.

men at Doctoral level (Chapter 2), indicating horizontal gender segregation in both tertiary education and the labour market. In light of this persistent underrepresentation, Box 24 describes recent measures implemented in Associated Countries to support women's participation in science and technology research careers.

Box 24: Supporting women within science & technology research careers in Associated Countries

In **North Macedonia**, the project 'STEM education and career – a challenge for girls and young women (WomenInStem)' was set up in 2021 to promote careers in STEM ([259]). The goal is to raise girls' awareness of STEM careers, increase the number of STEM students in HEIs, reduce and stop the brain drain, and model staff in high demand in the labour market with skills and experience.

In **Kosovo**, the Association of Women in the Energy Sector of Kosovo produced a position paper, Gender Diversity, in 2022 ([260]) that presents an overview of gender equality in the energy sector in Kosovo. It aims to outline the current status, trends and future prospects of women in the sector, focusing on career progression, available opportunities and obstacles. Its primary goal is to offer targeted suggestions for boosting gender diversity.

In **Serbia**, the AFA network is a non-profit organisation established in 2014 to promote women's inclusion in STEAM fields. The AFA links individuals, corporations, investors, institutions, and government entities to extend the reach of the network to as many women as possible. It offers them opportunities for collaboration, knowledge and experience-sharing, development, and the use of their full potential to ensure their equal participation in science and technology innovation processes ([261]).

Since 2017, the proportion of women researchers has grown in all R&D fields in HES in most countries

Table 4.2 shows the CAGR of women researchers in each R&D field in HES from 2017 to 2021, where a positive value indicates an increase in the number of women researchers and a negative value indicates a decrease. Overall, the number of women researchers has grown in HES in the majority of Member States, Associated Countries and G20 countries in every R&D field for which data are available. This is the case in 28 of 32 countries ([262]) in Natural Sciences; in 27 of 32 countries ([263]) in Engineering and Technology; in all countries (except DK and PL, which remained the same) in Medical and Health Sciences; in 23 of 32 countries ([264]) in Agricultural Sciences; in 26 of 33 countries ([265]) in Social Sciences; and in 21 of 34 countries ([266]) in Humanities.

The number of women researchers in HES has grown in every R&D field in 12 countries ([267]). Of these, the highest CAGR across all fields is in Hungary and Malta, ranging between 4 % and 14 % in each field. By contrast, the CAGR has decreased in four countries in three fields (LT: -6 % in Natural Sciences, -1 % in Social Sciences, -7 % in Humanities; RO: -9 % in Natural Sciences, -4 % in Engineering and Technology, -14 % in Agricultural Sciences; SK: -7 % in Engineering and Technology, -2 % in Agricultural Sciences, -1 % in Social Sciences; MK: -3 % in Natural Sciences, -1 % in Engineering and Technology, -10 % in Humanities).

The field with the largest range in values is Agricultural Sciences: for example, in Latvia, the CAGR of women's researchers has declined by 19 %, while in Russia, it has grown by 29 %. The field with the smallest range is Natural Sciences, ranging from -9 % in Romania to 14 % in Malta.

([259]) Government of the Republic of North Macedonia, STEM education and career – a challenge for girls and young women (WomenInStem), n.d., https://macedonia2025.com/project/stem-education-and-career-a-challenge-for-girls-and-young-women-womeninstem/#

([260]) Association of Women in the Energy Sector, Gender Diversity, 2022, https://abgj.rks-gov.net/publikimet/105/search?search=grat%C3%AB+n%C3%AB+shkenc%C3%AB

([261]) AFA Network, https://www.afa.co.rs/afa-network?lang=en

([262]) BE, CZ, DK, DE, EE, IE, EL, ES, HR, IT, CY, LV, LU, HU, MT, NL, AT, PL, PT, SK, FI, SE, IS, NO, BA, RS, TR, RU.

([263]) BE, CZ, DK, DE, EE, IE, EL, ES, HR, IT, CY, LV, LU, HU, MT, NL, AT, PL, PT, FI, SE, IS, NO, BA, RS, TR, RU.

([264]) BE, CZ, DK, DE, EE, EL, ES, IT, CY, LT, HU, MT, NL, AT, PT, FI, SE, NO, BA, MK, RS, TR, RU.

([265]) BE, CZ, DK, DE, EE, EL, ES, HR, IT, CY, LU, HU, MT, NL, AT, PT, RO, SI, FI, SE, IS, NO, ME, MK, TR, RU.

([266]) DE, EE, IE, ES, IT, CY, LV, LU, HU, MT, PT, RO, SI, SK, FI, SE, IS, NO, BA, ME, TR.

([267]) DE, EE, ES, IT, CY, HU, MT, PT, FI, SE, NO, TR.

Table 4.1 Evolution of the proportion (%) of women researchers in HES, by field of R&D, 2017-2021

Country	2017						2021					
	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities
BE	36.6	21.9	53.1	38.3	51.6	50.2	32.0	24.8	57.5	50.9	54.6	49.3
BG	-	-	59.1	-	53.4	60.2	64.6	44.5	55.9	-	-	-
CZ	28.5	21.8	45.3	37.8	42.1	40.4	26.6	24.9	44.7	45.6	45.2	41.2
DK	31.2	25.4	53.6	54.5	46.7	48.4	34.0	26.3	53.0	55.7	49.4	49.5
DE	32.1	20.4	50.4	50.2	44.9	49.7	33.7	22.3	52.5	52.0	48.1	51.9
EE	38.0	27.3	63.9	46.7	60.0	59.7	37.1	30.7	67.8	52.1	60.4	61.5
IE	37.7	27.6	61.8	52.0	52.3	52.3	42.7	31.9	59.4	50.7	52.1	56.0
EL	40.1	35.2	41.0	41.5	41.3	43.3	36.9	34.2	43.5	41.2	48.3	50.4
ES	42.6	38.6	44.3	41.8	43.7	43.6	43.8	40.0	46.4	43.7	45.1	45.3
HR	48.5	34.7	55.1	50.0	56.2	58.6	53.5	40.8	57.7	49.1	58.7	56.6
IT	45.0	26.5	43.1	44.5	45.2	49.1	45.2	28.3	44.3	45.3	46.1	49.2
CY	34.0	30.6	43.2	33.3 (4/12)	44.6	42.1	36.7	33.7	41.0	31.8 (7/22)	44.6	41.7
LV	43.5	38.2	65.5	60.2	70.4	69.9	44.1	38.2	65.8	60.8	64.7	68.3
LT	48.7	35.2	62.2	54.1	63.6	62.9	46.1	35.9	65.8	61.2	64.9	58.4
LU	26.0	14.9	54.5	-	59.0	51.6	29.7	18.4	50.5	-	53.6	56.5
HU	29.2	22.7	48.3	41.6	48.5	46.2	27.4	24.6	46.5	43.8	45.0	47.0
MT	30.4 (28/92)	15.7 (28/178)	47.7	25.0 (2/8)	43.4	29.3	26.3	21.6	48.1	23.1 (3/13)	47.9	32.0
NL	39.7	29.3	43.1	44.8	53.7	50.8	38.9	32.5	51.3	49.3	52.1	49.7
AT	30.8	25.6	47.9	55.1	49.9	54.8	33.0	28.0	49.9	56.3	53.8	56.6
PL	42.3	29.1	58.4	52.3	49.5	49.4	46.3	35.7	56.5	50.0	48.8	48.9
PT	50.7	30.5	59.7	55.8	54.7	52.3	50.8	32.6	62.7	58.0	55.9	52.6
RO	48.6	44.4	58.5	51.4	58.4	39.4	51.7	44.4	59.0	52.9	53.7	47.9
SI	-	-	56.6	-	50.4	50.9	33.0	27.8	57.5	57.0	50.7	54.6
SK	44.2	34.3	58.4	51.0	53.0	48.2	47.8	32.0	55.1	50.7	53.9	48.3
FI	32.7	28.4	62.5	59.9	59.7	58.5	33.8	28.0	63.5	62.7	62.2	62.4
SE	30.1	27.3	55.4	49.4	51.9	49.7	34.2	29.6	57.8	51.5	55.3	52.2
IS	37.6	20.3	63.0	65.6	57.3	50.9	34.9	28.8	56.3	56.5	58.6	54.5

Country	2017						2021					
	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities
NO	33.7	25.5	59.7	56.1	52.0	49.2	37.1	26.1	62.0	51.1	55.0	52.9
UK	38.9	24.6	61.4	55.0	47.9	54.3	38.9	24.6	61.4	55.0	47.9	54.3
BA	58.9	31.3	45.6 (26/57)	39.2	47.6	64.0	54.5	34.0	70.0	47.0	50.4	58.7
ME	48.6	39.3	61.5 (8/13)	53.3 (24/45)	40.3	56.3	40.4	38.5	71.4 (10/14)	53.3 (24/45)	48.2	66.5
MK	43.7	36.9	67.5	41.7	47.1	62.2	44.4	40.9	71.1	41.8	46.1	69.8
RS	53.9	38.0	58.9	46.8	51.8	56.9	54.7	40.9	58.0	52.0	52.1	63.3
TR	44.6	33.7	48.7	33.3	44.0	41.7	45.3	35.5	50.9	33.9	44.6	44.3
JP	14.2	10.2	32.2	21.2	29.2	35.9	14.2	10.2	32.2	21.2	29.2	35.9
RU	41.3	28.3	56.3	54.9	57.7	66.5	38.0	28.3	52.5	52.2	59.5	64.9
KR	30.6	14.2	44.3	28.4	36.5	40.9	30.6	14.2	44.3	28.4	36.5	40.9

Source: Eurostat – Research and development statistics (online data code: rd_p_perssci).

Notes: Available flags 2021 - Definition differs, see metadata: DE, FI; Break in time series: SE; Confidential: BG (All fields of science except Medical and Health Sciences, Humanities); Estimated: IE, ES, IT; Provisional: DK. Available flags 2017 - Definition differs, see metadata: DE (Natural Sciences, Engineering and Technology, Medical and Health Sciences, Humanities); Confidential: BG (Natural Sciences, Engineering and Technology, Agricultural Sciences), SI (Natural Sciences, Engineering and Technology, Agricultural Sciences); Estimated: ES, IT, UK (Women); Reference year differs: BG: 2020, DK: 2019, SI: 2020, UK: 2017, BA: 2020, ME: 2019, MK: 2020, JP: 2015, RU: 2019, KR: 2015, JP: available data only for 2015, KR: 2015 (latest available year), BA: 2014 (latest available year); Data not available: EU-27, BG (2021 - Natural Sciences, Engineering and Technology, Agricultural Sciences, Social Sciences – 2021, Natural Sciences, Engineering and Technology, Agricultural Sciences - 2017), FR (Women, 2021 - All fields of sciences - 2017), SI (Natural Sciences, Engineering and Technology - 2017), UK, BA, JP (2021), US. For proportions based on fewer than 30 researchers, the numerator and denominator are displayed in brackets.

Table 4.2 CAGR (%) of women researchers in HES, by field of R&D, 2017-2021

Country	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities
BE	1	9	5	2	6	-1
BG	-	-	13	-	-	-6
CZ	5	5	5	2	1	0
DK	12	3	0	1	15	-5
DE	1	5	5	2	4	1
EE	3	10	3	13	2	5
IE	3	1	4	-2	-1	6
EL	4	7	16	25	4	-1
ES	2	4	4	3	3	3
HR	12	11	5	-3	8	-3
IT	2	4	1	2	3	2
CY	8	7	4	15	3	1
LV	6	3	10	-19	-1	10
LT	-6	0	11	14	-1	-7
LU	9	17	7	-	4	3
HU	11	10	13	11	9	5
MT	14	11	6	11	8	4
NL	4	8	10	9	3	0
AT	4	7	2	1	7	0
PL	5	6	0	-3	-4	-8
PT	2	3	2	3	1	1
RO	-9	-4	16	-14	12	1
SI	-	-	4	-2	5	4
SK	9	-7	3	-2	-1	3
FI	4	4	4	10	3	3
SE	7	4	5	4	6	5
IS	6	3	1	-4	5	6
NO	5	4	4	8	6	4
BA	6	8	14	3	-12	14
ME	-7	-6	12	0	3	11
MK	-3	-1	9	3	4	-10
RS	3	1	3	3	-1	-1
TR	3	4	6	4	4	8
RU	6	7	10	29	7	-2

Source: Eurostat – Research and development statistics (online data code: rd_p_perssci).

Notes: Available flags 2021 - Definition differs, see metadata: DE, FI; Break in time series: SE; Confidential: BG; Estimated: IE, ES, IT; Provisional: DK; Available flags 2017 - Definition differs, see metadata: DE (Natural Sciences, Engineering and Technology, Medical and Health Sciences, Humanities); Confidential: BG (Natural Sciences, Engineering and Technology, Agricultural Sciences), SI (Natural Sciences, Engineering and Technology, Agricultural Sciences); Estimated: ES, IT, UK (Women); Reference year differs: DK: 2019, SI: 2020, UK: 2017, BA: 2020, ME: 2019, MK: 2020, JP: 2015, RU: 2019, KR: 2015, JP: Available data only for 2015, KR: 2015 (latest available year), BA: 2014 (latest available year), UK: 2015 (latest available year); Data not available: EU-27, BG (Natural Sciences, Engineering and Technology, Agricultural Sciences, Social Sciences - 2021, Natural Sciences, Engineering and Technology, Agricultural Sciences - 2017), FR (Women, 2021, All fields of sciences - 2017), SI (Natural Sciences, Engineering and Technology - 2017), UK, BA, ME, JP, KR, US.

Despite growth in women's representation across all fields of R&D in HES, horizontal gender segregation persists in the distribution of women and men researchers across R&D fields

Despite growth in the representation of women researchers across all R&D fields in most countries, gender segregation persists across R&D fields (see Table 4.3). In most Member States, Associated Countries, and G20 countries for which data are available, men researchers are largely concentrated in Engineering and Technology (18 of 34 countries ([268])), while there is a higher proportion of women in Medical and Health Sciences (18 of 35 countries ([269])), closely followed by Social Sciences (13 of 34 countries ([270])).

The lowest proportions of women and men researchers are in Agricultural Sciences, with less than 10 % of women and 12 % of men researchers working in this field in every country for which data are available. Similarly, in Humanities, women and men researchers both constitute less than 19 % across all countries, except for the UK and Montenegro, where women researchers constitute 23 % and 26 %, respectively. Notably, there is no country in which the majority of women or men researchers are represented in either of these R&D fields.

Bosnia and Herzegovina is the only country where women researchers are distributed more in Engineering and Technology than all other fields, at 29 %. In nearly half of the countries, the proportion of women researchers working in this field is less than half that of men researchers ([271]). Similarly, in Natural Sciences, only Estonia and Poland have the highest proportion of women researchers compared to all fields (25 % and 22 %, respectively). The proportion of women researchers exceeds the corresponding proportion of men researchers in this field in just seven countries (HR, IT, PT, SK, BA, RS, TR). By contrast, only three countries have a higher proportion of men researchers compared to the corresponding proportion of women researchers in both Social Sciences (ME, MK, TR) and Humanities (MT, RO, TR). In addition, a higher proportion of women researchers work in the field of Medical and Health Sciences compared to men researchers in all Member States, Associated Countries, and G20 countries examined. These data therefore provide further evidence of horizontal gender segregation in the fields of R&D among the population of researchers in HES.

([268]) BE, CZ, DE, EL, HR, IT, CY, LV, LT, LU, PL, PT, RO, SI, SK, UK, BA, RS.

([269]) BE, BG, CZ, DK, DE, EL, LV, LT, NL, RO, SI, SE, IS, NO, UK, MK, RS, TR.

([270]) IE, ES, HR, CY, LU, HU, MT, AT, PT, SK, FI, ME, RU.

([271]) BE, DK, DE, EE, IE, LT, LU, MT, PT, SI, FI, SE, IS, NO, UK, RU.

Table 4.3 Distribution of researchers in HES across fields of R&D, by sex, 2021

Country	Sex	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities
BE	Women	16.3	11.9	31.5	5.6	24.6	10.1
	Men	26.6	27.7	17.9	4.1	15.7	7.9
BG	Women	-	-	41.4	-	-	11.1
	Men	-	-	37.5	-	-	7.9
CZ	Women	17.3	17.1	29.8	6.5	20.3	9.0
	Men	26.3	28.4	20.4	4.3	13.6	7.1
DK	Women	15.6	8.2	40.9	5.7	21.3	8.4
	Men	24.3	18.6	29.2	3.6	17.5	6.9
DE	Women	14.4	12.1	31.8	3.4	22.6	15.9
	Men	20.1	29.8	20.4	2.2	17.2	10.4
EE	Women	24.8	10.5	15.1	6.6	24.4	18.6
	Men	39.4	22.3	6.7	5.7	15.0	10.9
IE	Women	22.6	11.1	25.0	2.9	26.1	12.3
	Men	28.2	22.0	15.9	2.6	22.3	9.0
EL	Women	13.8	19.2	24.4	8.9	20.8	13.0
	Men	16.9	26.5	22.6	9.1	15.9	9.1
ES	Women	17.4	19.0	19.4	2.9	28.2	13.2
	Men	17.5	22.4	17.7	2.9	27.0	12.5
HR	Women	12.3	22.6	20.9	6.5	24.4	13.3
	Men	11.5	35.4	16.5	7.2	18.5	11.0
IT	Women	25.9	14.8	16.3	6.1	22.9	14.0
	Men	22.8	27.2	14.8	5.4	19.4	10.5
CY	Women	21.0	21.8	10.3	1.0	34.5	11.4
	Men	23.4	27.8	9.6	1.3	27.7	10.3
LV	Women	16.9	20.7	21.2	3.9	19.7	17.6
	Men	24.5	38.3	12.6	2.9	12.3	9.4
LT	Women	14.5	11.1	24.2	4.4	31.3	14.6
	Men	21.3	25.0	15.8	3.5	21.3	13.1
LU	Women	21.7	14.9	8.6	-	38.1	16.7
	Men	29.8	38.5	4.9	-	19.3	7.5
HU	Women	13.5	9.1	23.7	6.6	29.7	17.4
	Men	23.0	18.0	17.5	5.4	23.3	12.6
MT	Women	10.9	9.7	26.8	0.7	39.5	12.5
	Men	18.3	21.1	17.4	1.4	25.8	16.0
NL	Women	15.0	12.4	35.7	5.0	22.1	9.7
	Men	19.9	21.8	28.6	4.3	17.1	8.3
AT	Women	18.7	14.1	21.9	3.6	27.1	14.6

Country	Sex	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities
	Men	28.4	27.1	16.5	2.1	17.5	8.4
PL	Women	22.0	16.3	20.8	5.9	20.2	14.8
	Men	22.5	25.9	14.1	5.2	18.7	13.6
PT	Women	22.3	12.9	17.2	3.2	26.5	18.0
	Men	22.1	27.2	10.5	2.4	21.3	16.6
RO	Women	13.7	29.9	38.5	7.9	8.1	2.0
	Men	13.8	40.2	28.7	7.5	7.5	2.3
SI	Women	12.9	14.3	27.2	9.3	25.7	10.5
	Men	21.1	29.9	16.2	5.7	20.2	7.1
SK	Women	16.0	15.3	19.8	4.9	26.9	17.1
	Men	15.6	29.0	14.4	4.2	20.6	16.3
FI	Women	15.8	9.7	24.4	3.7	32.3	14.2
	Men	30.8	24.9	14.0	2.2	19.6	8.5
SE	Women	17.0	9.5	31.4	3.1	28.2	11.0
	Men	28.7	19.8	20.2	2.5	20.0	8.9
IS	Women	12.2	3.1	42.4	2.7	29.0	10.6
	Men	24.0	8.0	34.9	2.2	21.6	9.3
NO	Women	9.4	5.7	36.4	1.6	34.5	12.5
	Men	16.8	16.9	23.4	1.6	29.7	11.7
UK	Women	16.7	9.6	31.4	1.4	18.2	22.8
	Men	22.7	25.5	17.1	1.0	17.1	16.6
BA	Women	15.0	28.7	7.3	9.3	23.8	15.9
	Men	10.8	47.9	2.7	9.0	20.0	9.6
ME	Women	10.9	18.8	2.4	5.7	35.9	26.4
	Men	15.6	28.8	0.9	4.8	37.1	12.8
MK	Women	9.3	15.2	28.4	7.4	25.7	14.1
	Men	12.7	24.0	12.6	11.2	32.9	6.7
RS	Women	17.0	20.6	24.6	6.5	21.3	10.1
	Men	15.1	32.0	19.1	6.4	21.1	6.3
TR	Women	6.1	12.9	41.3	2.4	23.3	13.9
	Men	6.1	19.3	32.7	3.8	23.8	14.4
RU	Women	26.0	16.4	5.3	3.3	32.4	16.6
	Men	34.5	33.9	3.9	2.4	18.0	7.3

Source: Eurostat – Research and development statistics (online data code: rd_p_perssci).

Notes: Definition differs, see metadata: DE, FI; Break in time series: SE; Confidential: BG (All fields of R&D except Medical and Health Sciences, Humanities); Estimated: IE, ES, IT; Provisional: DK; Reference year differs: DK: 2019, SI: 2020, UK: 2017, BA: 2020, ME: 2019, MK: 2020, RU: 2019; Data not available: EU-27, UK, JP, BG (All fields of R&D except Humanities), FR (Women).

Although horizontal gender segregation persists in GOV, it is slightly less than in HES

The proportion of women researchers in each R&D field in 2017 and 2021 in GOV is shown in Table 4.4. The data show that since 2017, women's representation has grown in most Member States, Associated Countries, and G20 countries in every field for which data are available. More specifically, the proportion of women has grown in 25 of 36 countries in Natural Sciences ([272]), 16 of 29 countries in Engineering and Technology ([273]), 20 of 34 countries in Medical and Health Sciences ([274]), 21 of 31 countries in Agricultural Sciences ([275]), 18 of 34 countries in Social Sciences ([276]) and 20 of 34 countries in Humanities ([277]).

In Germany ([278]), the Netherlands ([279]), and Türkiye ([280]), women's representation has increased in every R&D field in GOV. The largest increases in the proportion of women researchers in Natural Sciences and Engineering and Technology are also in Germany. By contrast, in Belgium ([281]) and Hungary ([282]), women's representation has fallen in five of six R&D fields. The largest decline in the proportion of women in Engineering and Technology is in Montenegro (19 pp).

Disaggregating the data by R&D field shows that women's representation across different fields in GOV is generally similar to women's representation in these fields in HES (Table 4.3). In 2021, women researchers remain underrepresented in Natural Sciences (16 of 37 countries) and Engineering and Technology (26 of 33 countries). Women represented over 40 % in the Medical and Health Sciences (31 of 35 countries), Agricultural Sciences (27 of 33 countries), Social Sciences (31 of 35 countries) and Humanities (33 of 36 countries). This pattern has remained largely unchanged since 2017, where women were underrepresented in 17 of 36 countries in Natural Sciences and 24 of 30 countries in Engineering and Technology, and well-represented in 32 of 36 countries in Medical and Health Sciences, 23 of 31 countries in Agricultural Sciences, 31 of 35 countries in Social Sciences, and 31 of 34 countries in Humanities. Despite increases in the proportion of women researchers across all R&D fields in most countries, this growth is not sufficient to overturn the gender imbalance in STEM and horizontal gender segregation persists.

Although women's representation follows a similar pattern across fields of R&D in both HES and GOV, horizontal gender segregation is more evident in HES. For example, while women are underrepresented in approximately 45 % of countries in Natural Sciences (16 out of 37 countries) and 80 % of countries in Engineering and Technology (26 out of 33 countries) in GOV in 2021, in HES, women are underrepresented in around 60 % of countries in Natural Sciences (21 out of 36 countries) and about 85 % in Engineering and Technology (31 out of 36 countries).

Women researchers' representation in GOV is growing in more countries since She Figures 2021, indicating that the gender gap is narrowing in this sector

To explore how women researchers' representation is evolving over time in each of these R&D fields in GOV, Table 4.5 shows the CAGR of women researchers between 2017 and 2021.

([272]) BE, BG, DK, DE, EE, IE, EL, HR, IT, CY, LT, LU, NL, AT, PL, RO, SI, SK, FI, IS, NO, BA, RS, TR, RU.

([273]) BG, DK, DE, EL, ES, IT, LV, LT, NL, PL, RO, SK, FI, SE, RS, TR.

([274]) CZ, DE, EE, ES, HR, IT, LV, HU, NL, AT, PL, PT, SK, FI, IS, NO, MK, RS, TR, RU.

([275]) CZ, DE, EE, IE, EL, ES, HR, IT, CY, LV, MT, NL, AT, PT, FI, SE, IS, NO, RS, TR, RU.

([276]) DE, IE, EL, ES, HR, CY, LT, LU, MT, NL, AT, PT, SI, SK, IS, NO, RS, TR.

([277]) BG, CZ, DK, DE, EE, EL, ES, IT, LV, NL, AT, PL, PT, RO, SK, SE, NO, ME, TR, RU.

([278]) By 3 pp in Natural Sciences, 2 pp in Engineering and Technology, 0.1 pp in Medical and Health Sciences, 1 pp in Agricultural Sciences, 1 pp in Social Sciences, 3 pp in Humanities.

([279]) By 8 pp in Natural Sciences, 11 pp in Engineering and Technology, 18 pp in Medical and Health Sciences, 7 pp in Agricultural Sciences, 4 pp in Social Sciences, 5 pp in Humanities.

([280]) By 1 pp in each R&D field.

([281]) By 3 pp in Engineering and Technology, 1 pp in Medical and Health Sciences, 4 pp in Agricultural Sciences, 1 pp in Social Sciences, 1 pp in Humanities.

([282]) By 5 pp in Natural Sciences, 4 pp in Engineering and Technology, 12 pp in Agricultural Sciences, 0.05 pp in Social Sciences, 4 pp in Humanities.

When all R&D fields are considered, the CAGR of women researchers in this period is positive across all fields in six Member States, Associated Countries and G20 countries (DE, EL, ES, NL, PT, RS). Therefore, across HES and GOV, the CAGR is positive in every field in Germany, Spain, and Portugal.

In conjunction with findings from She Figures 2021, which calculated the CAGR of women researchers in GOV from 2010 to 2018, both Greece and Austria have a positive CAGR in each field of study ([283]), demonstrating a long-term upward trajectory in women's representation in this sector. By contrast, in Sweden, there is a reverse trend: between 2010 and 2018, the number of women researchers increased in every R&D field, but between 2017 and 2021, Sweden is the only country where the number of women has declined in each field of study, except Humanities.

The CAGR of women researchers shows a decline in Natural Sciences in six of 33 countries (EE, SI, SE, BA, MK, TR), and in Engineering and Technology in eight of 27 countries (CZ, LV, LU, RO, FI, SE, IS, NO). Although this has improved since She Figures 2021, where the CAGR was negative in 14 of 38 countries in Natural Sciences and 20 of 38 countries in Engineering and Technology, the current decline nevertheless demonstrates that the gender gap is widening in these countries in fields where women are already underrepresented.

The CAGR is negative in 12 of 31 countries in Medical and Health Sciences (BG, DK, HR, LV, LT, LU, PL, RO, FI, SE, ME, MK), 6 of 28 countries in Agricultural Sciences (BG, HU, RO, SK, SE, TR), 9 of 31 countries in Social Sciences (BE, CZ, EE, IT, CY, MT, RO, FI, SE) and 7 of 31 countries in Humanities (HR, LV, RO, FI, IS, BA, TR). Thus, even in fields where women's representation is higher, more efforts are needed to ensure that women are equally able to participate in these fields to ensure balanced representation.

([283]) Greece: Natural Sciences: 3 %; Engineering and Technology: 21 %; Medical and Health Sciences: 2 %; Agricultural Sciences: 4 %; Social Sciences: 4 %. Austria: Natural Sciences: 2 %; Engineering and Technology: 1 %; Medical and Health Sciences: 17 %; Agricultural Sciences: 8 %; Social Sciences: 2 %.

Table 4.4 Evolution of the proportion (%) of women researchers in GOV, by field of R&D, 2017-2021

Country	2017						2021					
	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities
BE	33.7	26.7	62.6	48.4	42.2	55.6	35.8	24.2	61.9	44.4	41.2	54.8
BG	53.8	40.1	83.2	65.1	66.7	63.8	54.4	43.2	73.9	63.3	65.6	64.2
CZ	35.8	29.3	57.2	50.0	52.0	40.9	34.7	29.0	60.2	52.3	46.3	45.4
DK	30.1	25.0 (1/4)	59.6	-	50.4	49.8	33.8	33.3 (8/24)	54.9	-	49.0	52.0
DE	34.9	23.1	51.9	45.8	52.9	50.5	37.9	25.3	52.0	46.8	54.1	53.4
EE	30.0	60.9 (14/23)	85.9	71.1	67.6 (23/34)	66.3	38.1	-	88.1	75.0	32.0 (8/25)	69.5
IE	30.0	-	86.1	42.0	49.7	-	33.6	43.5 (27/62)	69.8	45.6	60.9	50.0 (7/14)
EL	41.2	27.5	37.5	41.6	53.5	64.7	41.5	31.4	37.5	46.5	53.7	65.5
ES	46.0	35.7	57.0	49.7	49.8	45.4	45.2	38.0	62.5	52.0	51.0	46.4
FR	-	-	-	-	-	-	-	-	-	-	-	-
HR	54.9	-	54.8	47.3	59.0	52.3	57.0	-	57.1	55.8	63.8	46.5
IT	39.7	38.7	54.4	48.7	59.0	58.8	41.7	39.6	57.9	51.7	54.7	60.5
CY	63.5	-	33.3 (2/6)	32.6 (15/46)	77.1 (27/35)	75.9 (22/29)	65.3	11.1 (1/9)	33.3 (3/9)	36.6 (15/41)	78.8 (26/33)	74.2 (23/31)
LV	56.9	27.4	86.8	54.8	80.0 (16/20)	62.8 (27/43)	56.0	33.7	87.1 (27/31)	62.9	59.9	65.6 (21/32)
LT	46.2	26.4	69.9	61.5	66.9	67.3	46.3	28.5	53.6	58.6	69.1	66.8
LU	46.9	19.5	70.4 (19/27)	100.0 (1/1)	36.4	-	47.4	18.0	56.5 (13/23)	77.8 (7/9)	36.7	-
HU	37.3	29.2	44.3	53.7	44.8	52.0	32.7	25.3	48.6	41.3 (19/46)	44.7	47.8
MT	-	-	-	17.6 (3/17)	28.6 (4/14)	-	30.8 (4/13)	25.0 (1/4)	62.1	37.5 (3/8)	66.7 (2/3)	22.2 (2/9)
NL	28.4	30.7	40.3	39.0	47.1	49.6	36.4	41.3	57.8	46.0	51.2	54.4
AT	36.4	30.9	42.1	35.3	50.0	52.0	36.6	30.7	53.6	41.1	52.5	54.5
PL	34.8	37.9	57.8	-	-	56.8	43.1	43.7	60.8	62.0	59.9	63.2
PT	60.8	42.1	61.8	64.4	66.2	61.6	60.1	40.0	62.7	66.8	69.4	67.5
RO	44.7	46.7	70.2	59.1	61.7	45.2	46.7	47.3	69.5	58.7	54.9	46.5

Country	2017						2021					
	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities
SI	35.2	-	67.4	-	47.0	58.8	39.2	-	-	-	55.7	55.8
SK	47.9	32.1	53.7	53.4	59.8	54.0	50.4	34.5	57.0	44.1	67.0	55.8
FI	41.5	28.9	64.3	48.9	56.1	71.7	44.6	29.1	69.8	50.8	54.7	70.1
SE	42.2	26.3	56.3	56.3	54.2	57.9	37.3	26.4	55.2	64.5	48.5	65.0
IS	47.9	33.3 (19/57)	55.6 (15/27)	13.6 (3/22)	55.6 (5/9)	60.9 (28/46)	49.6	25.0 (2/8)	72.6	32.1 (9/28)	70.0 (7/10)	58.1 (18/31)
NO	37.3	30.5	55.3	46.1	50.2	58.8	40.6	28.4	59.7	47.7	53.1	62.0
UK	37.9	19.3	45.3	43.7	51.1	55.5	37.9	19.3	45.3	43.7	51.1	55.5
BA	40.0 (14/35)	-	50.0 (1/2)	-	-	42.9 (9/21)	40.7 (11/27)	22.7 (10/44)	-	-	-	42.9 (3/7)
ME	59.4	57.1 (12/21)	68.8	-	75.5	25.0 (9/36)	57.3	38.3 (23/60)	62.3	83.3 (5/6)	74.7	61.1 (11/18)
MK	54.7	-	61.0	-	63.6 (14/22)	51.3	53.4	-	75.0	-	-	49.0
RS	63.3	51.6	74.5	56.9	49.4	58.2	65.8	52.9	78.7	61.6	50.4	57.8
TR	33.2	33.2	33.3	33.2	33.3	33.1	34.3	34.3	34.3	34.3	34.3	34.4
JP	15.1	7.7	34.8	17.5	30.3	28.9	15.1	7.7	34.8	17.5	30.3	28.9
RU	41.1	34.3	59.0	57.6	57.5	59.2	42.5	33.1	60.5	59.6	56.9	59.9
KR	30.9	12.8	58.3	27.7	42.8	49.8	30.9	12.8	58.3	27.7	42.8	49.8

Source: Eurostat – Research and development statistics (online data code: rd_p_perssci).

Notes: Available flags 2021 – Definition differs, see metadata: DE, NL, FI; Break in time series: SE; Confidential: BG (All fields of science except Medical and Health Sciences, Humanities; Estimated: ES; Provisional: DK. Available flags 2017 – Definition differs, see metadata: DE, NL FI; Confidential: PL (Agricultural Sciences, Social Sciences, Humanities), SI (Engineering and Technology, Agricultural Sciences); Estimated: ES; Reference year differs: DK: 2019, UK: 2017, BA: 2020, ME: 2019, MK: 2020, JP: 2015, RU: 2019, KR: 2015, JP: Available data only for 2015, KR: 2015 (latest available year), BA: 2014 (latest available year); Data not available: EU-27, FR (Women - 2021, All fields of sciences, Women – Total - 2017), PL (Agricultural Sciences, Social Sciences - 2017), SI (Agricultural Sciences - 2017, Engineering and Technology, Medical and Health Sciences - 2021), UK, ME (2021), BA, JP, KR (2021 - 2017), MK (Engineering and Technology (2021) - Agricultural sciences (2017), US. For proportions based on fewer than 30 researchers, the numerator and denominator are displayed in brackets.

Table 4.5 CAGR (%) of women researchers in GOV, by field of R&D, 2017-2021

Country	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities
BE	5	8	17	15	-6	7
BG	0	6	-3	-1	1	0
CZ	1	-4	2	2	-13	8
DK	10	183	-6	-	4	9
DE	5	10	3	2	4	5
EE	-3	-	8	1	-23	3
IE	19	-	18	3	16	-
EL	3	21	2	4	4	7
ES	9	1	4	1	5	3
HR	9	-	-1	14	11	-12
IT	5	2	5	1	-3	2
CY	8	-	11	0	-1	1
LV	2	-2	-18	10	54	-6
LT	3	0	-12	0	0	6
LU	5	-3	-9	63	5	-
HU	3	14	3	-48	16	13
MT	-	-	-	0	-16	-
NL	10	10	10	12	8	11
AT	2	1	17	8	2	0
PL	9	10	-16	-	-	15
PT	5	6	6	2	7	14
RO	4	-1	-7	-2	-1	-4
SI	-25	-	-	-	9	0
SK	6	7	3	-15	13	3
FI	8	-1	-12	0	-8	-22
SE	-4	-3	-1	-9	-8	10
IS	6	-43	46	32	9	-10
NO	2	-3	3	0	2	4
BA	-4	-	-	-	-	-17
ME	5	38	-5	-	18	11
MK	-6	-	-12	-	-	11
RS	3	5	1	4	9	4
TR	-2	2	5	-2	9	-7
RU	3	0	3	3	16	2

Source: Eurostat – Research and development statistics (online data code: rd_p_perssci).

Notes: Available flags 2021 – Definition differs, see metadata: DE, NL, FI; Break in time series: SE; Confidential: BG (All fields of science except Medical and Health Sciences, Humanities); Estimated: ES, Provisional: DK. Available flags 2017 – Definition differs, see metadata: DE, NL FI; Confidential: PL (Agricultural Sciences, Social Sciences, Humanities), SI (Engineering and Technology, Agricultural Sciences); Estimated: ES; Reference year differs: DK: 2019, UK: 2017, BA: 2020, ME: 2019, MK: 2020, JP: 2015, RU: 2019, KR: 2015, JP: Available data only for 2015, KR: 2015 (latest available year), BA: 2014 (latest available year); Data not available: EU-27, FR (Women - 2021, All fields of science, Women – Total - 2017), PL (Agricultural Sciences, Social Sciences - 2017), SI (Agricultural Sciences - 2017, Engineering and Technology, Medical and Health Sciences - 2021), UK, ME (2021), BA, JP, KR (2021 - 2017), MK (Engineering and Technology (2021) - Agricultural sciences (2017)), US.

Women and men researchers have similar distributions across all R&D fields in GOV, demonstrating evidence of less horizontal gender segregation in GOV compared to HES

Table 4.6 presents the distribution of women and men researchers in GOV in more detail. It shows that the highest proportion of women researchers work in the fields of Natural Sciences in 16 of 35 Member States, Associated Countries and G20 countries ([284]), and in Medical and Health Sciences in 12 of 33 countries ([285]). Similarly, the highest proportion of men researchers work in Natural Sciences in this sector in 21 of 35 countries ([286]), followed by Medical and Health Sciences in 8 of 33 countries ([287]). By contrast, in most countries, there is a higher proportion of women researchers in Medical and Health Sciences, followed by Social Sciences, in HES (see Table 4.3). The data therefore indicate less horizontal gender segregation in GOV.

Women form the highest proportion of researchers in Engineering and Technology in GOV in just three countries (BE, FI, BA). In addition, the highest proportion of women researchers work in Social Sciences in GOV in three countries (IE, NL, PL). The highest proportion of women researchers share the same field as the corresponding highest proportion of men researchers in most countries (27 of 35 ([288])). However, even though women and men researchers' representations largely follow the same pattern across R&D fields, implying that women and men are equally likely to be employed in each field, Table 4.6 shows persistent underrepresentation of women researchers in STEM.

([284]) BG, CZ, DE, CY, LV, LT, LU, HU, AT, RO, SI, SK, UK, BA, RS, RU.

([285]) DK, EL, ES, HR, IT, MT, PT, SE, IS, NO, ME, MK.

([286]) BG, CZ, DE, IT, CY, LV, LT, LU, HU, NL, AT, PL, RO, SI, SK, IS, NO, UK, MK, RS, RU.

([287]) DK, EL, ES, HR, MT, PT, SE, ME.

([288]) BE, BG, CZ, DK, DE, EE, EL, ES, HR, CY, LV, LT, LU, HU, MT, AT, PT, RO, SI, SK, FI, SE, UK, ME, RS, TR, RU.

Table 4.6 Distribution of researchers in GOV across fields of R&D, by sex, 2021

Country	Sex	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities
BE	Women	23.4	28.7	17.8	16.8	3.0	10.3
	Men	23.7	51.0	6.2	11.9	2.4	4.8
BG	Women	47.4	9.3	8.1	12.0	7.9	15.4
	Men	53.3	16.4	3.8	9.3	5.6	11.5
CZ	Women	50.6	2.4	16.7	8.5	4.6	17.2
	Men	65.3	4.0	7.6	5.3	3.6	14.2
DK	Women	8.1	0.58	43.2	-	19.3	28.9
	Men	15.9	1.2	35.7	-	20.3	26.9
DE	Women	44.4	18.5	8.5	6.0	13.4	9.1
	Men	45.1	33.9	4.9	4.3	7.0	4.9
EE	Women	10.2	-	35.2	7.8	1.9	44.9
	Men	34.7	0.5	9.9	5.5	8.4	41.1
IE	Women	14.3	5.5	12.1	30.5	36.2	1.4
	Men	27.8	7.0	5.2	35.8	22.9	1.4
EL	Women	9.0	12.4	45.4	3.7	4.1	25.4
	Men	9.3	19.9	55.4	3.1	2.6	9.8
ES	Women	14.4	8.6	63.7	6.3	5.1	2.0
	Men	21.1	17.0	46.2	7.0	5.9	2.8
HR	Women	31.1	-	35.1	7.3	19.0	7.6
	Men	31.2	-	35.1	7.7	14.4	11.7
IT	Women	25.3	11.5	45.9	6.9	8.6	1.9
	Men	35.0	17.4	33.1	6.3	7.0	1.2
CY	Women	48.5	0.8	2.3	11.4	19.7	17.4
	Men	38.2	9.0	6.7	29.2	7.9	9.0
LV	Women	46.3	5.2	4.6	25.1	15.3	3.5
	Men	49.0	13.8	0.91	20.0	13.8	2.5
LT	Women	31.4	10.0	14.3	8.8	12.5	23.0
	Men	37.6	25.7	12.7	6.4	5.8	11.8
LU	Women	56.6	11.9	4.4	2.4	24.8	-
	Men	38.4	33.0	2.1	0.41	26.1	-
HU	Women	32.2	3.2	18.9	0.60	15.0	30.2
	Men	44.7	6.5	13.5	0.57	12.5	22.3
MT	Women	5.3	1.3	84.2	4.0	2.6	2.6
	Men	14.1	4.7	60.9	7.8	1.6	10.9
NL	Women	21.8	16.9	12.0	14.4	24.2	10.6
	Men	31.9	20.1	7.3	14.1	19.2	7.4
AT	Women	23.0	15.7	10.7	6.6	22.7	21.2
	Men	30.1	26.8	7.0	7.2	15.6	13.4
PL	Women	14.7	11.0	14.2	8.0	25.6	26.4
	Men	24.2	17.7	11.4	6.1	21.4	19.2
PT	Women	9.4	5.7	76.4	3.3	3.4	1.9
	Men	9.7	13.2	70.8	2.6	2.3	1.4
RO	Women	42.7	24.9	5.0	9.1	8.5	9.8

Country	Sex	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities
	Men	47.2	26.8	2.1	6.2	6.8	10.9
SI	Women	39.0	-	-	3.5	10.5	16.2
	Men	61.1	-	-	5.1	6.0	12.7
SK	Women	39.6	10.1	5.6	5.3	18.9	20.4
	Men	41.2	20.3	4.5	7.2	9.9	17.0
FI	Women	21.1	25.3	15.9	18.7	16.8	2.2
	Men	20.5	48.3	5.4	14.2	10.9	0.7
SE	Women	4.4	4.6	81.0	0.6	7.3	2.1
	Men	7.8	13.4	69.1	0.4	8.2	1.2
IS	Women	35.2	1.2	42.6	5.6	4.3	11.1
	Men	46.4	4.8	20.8	15.2	2.4	10.4
NO	Women	16.5	6.1	32.4	10.0	20.7	14.4
	Men	24.3	15.5	22.0	11.0	18.3	8.9
UK	Women	41.1	10.2	12.1	11.0	17.9	7.7
	Men	41.6	26.2	9.1	8.8	10.6	3.8
BA	Women	45.8	41.7	-	-	-	12.5
	Men	29.6	63.0	-	-	-	7.4
ME	Women	19.5	7.1	51.1	1.6	17.3	3.4
	Men	22.3	17.5	47.4	0.47	9.0	3.3
MK	Women	33.1	-	46.4	-	-	20.5
	Men	44.0	-	23.6	-	-	32.5
RS	Women	52.4	11.2	6.1	11.4	8.3	10.8
	Men	44.0	16.1	2.7	11.4	13.1	12.8
TR	Women	10.6	21.9	7.3	42.4	16.0	1.8
	Men	10.6	21.9	7.3	42.4	16.0	1.7
RU	Women	41.8	23.1	12.7	9.1	6.3	7.1
	Men	44.5	36.7	6.5	4.9	3.7	3.7

Source: Eurostat – Research and development statistics (online data code: rd_p_perssci).
Notes: Definition differs, see metadata: DE, NL, FI; Break in time series: SE; Confidential: BG (All fields of R&D except Medical and Health Sciences, Humanities); Estimated: ES; Provisional: DK; Reference year differs: DK: 2019, SI: 2020, UK: 2017, BA: 2020, ME: 2019, MK: 2020, RU: 2019; Data not available: EU-27, FR (Women), UK, BA, ME, MK (Engineering and Technology, Agricultural Sciences, Social Sciences), JP, RU; SI (Data for 2021 for some fields of R&D are confidential); SE (Not all researchers classified by field of R&D).

4.6 Dissimilarity Index (DI) for researchers

This section assesses the extent of the gender gap in the researcher population using the DI. The DI is a measure of the proportion of women and men in a field of R&D who would have to move to another field to ensure a balanced distribution of women and men across fields of R&D. By comparing the values of the DI in 2021 with the values from 2017, the following indicator provides an assessment of progress towards achieving an equal distribution of researchers in R&D fields, thus monitoring horizontal gender segregation.

Researchers are more equally distributed across fields since 2017, with a slightly more equal distribution in GOV compared to HES

Table 4.7 presents the evolution of the DI for researchers in HES and GOV from 2017 to 2021. The DI is computed using seven R&D fields: Natural Sciences; Engineering and Technology; Medical and Health Sciences; Agricultural Sciences; Social Sciences; Humanities; and 'any other field of R&D'. The maximum value of 1 indicates the presence of only women or men in each R&D field, while the minimum value of 0 indicates a distribution of women and men within each occupation that is equal to the overall average proportion of women. As the DI does not compare the distribution between women and men, it does not indicate gender balance in each R&D field.

In 2017, the DI was higher in HES than in GOV in 14 of 30 countries ([289]), and lower in 12 of 30 countries ([290]). In 2021, the DI is higher in HES compared to GOV in 11 of 30 countries ([291]) and lower in 15 of 30 countries ([292]). This suggests slightly fewer disparities in HES compared to GOV, across all fields of R&D. However, when comparing the ranges of the DI, in 2017, it ranged from 0.03-0.38 in HES and 0.04-0.32 in GOV. By comparison, in 2021, it ranges from 0-0.33 in HES and 0-0.31 in GOV. Therefore, while the distribution of researchers across fields in HES has marginally improved, there remains a slightly more equal distribution in GOV compared to HES (reflecting the findings in Section 4.5).

In most Member States, Associated Countries and G20 countries, there has been a decrease in the DI in HES (18 of 30 countries ([293])) and GOV (20 of 30 countries ([294])). This indicates more similarity in the distribution of women and men researchers across R&D fields compared to 2017.

The largest decrease in the DI for HES is in Luxembourg, which has reduced from 0.38 in 2017 to 0.23 in 2021. The largest increase for HES is in Cyprus, which has grown from 0.12 in 2017 to 0.31 in 2021. For GOV, the largest decrease is in Latvia (0.25 in 2017 to 0.11 in 2021) and the largest increase is also in Cyprus, rising from 0.09 in 2017 to 0.31 in 2021. Estonia is the country with the most unequal distribution in researchers across fields for both economy sectors in 2021 (0.33 in HES and 0.31 in GOV), while Türkiye is the only country to achieve an equal distribution of researchers in both economic sectors.

([289]) DK, IE, HR, IT, CY, LV, LU, HU, PL, PT, SK, SE, IS, RS.

([290]) BE, EE, EL, ES, LT, NL, RO, FI, NO, ME, MK, RU.

([291]) BE, BG, DK, DE, EE, LV, LT, NL, RO, FI, ME.

([292]) CZ, IE, EL, ES, HR, IT, HU, MT, AT, PT, SK, SE, IS, NO, RS.

([293]) CZ, DK, DE, IE, HR, LV, LU, HU, MT, AT, PT, SK, SE, NO, UK, RS, TR, RU.

([294]) BE, CZ, DK, DE, HR, LV, LU, HU, NL, AT, PT, RO, SK, FI, SE, NO, UK, ME, TR, RU.

Table 4.7 Evolution of the DI for researchers in HES and GOV, 2017 and 2021

Country	2017		2021	
	HES	GOV	HES	GOV
BE	0.22	0.26	0.26	0.23
BG	-	-	0.16	0.13
CZ	0.20	0.20	0.14	0.16
DK	0.20	0.19	0.14	0.09
DE	0.23	0.23	0.18	0.16
EE	0.25	0.26	0.33	0.31
IE	0.22	0.17	0.16	0.20
EL	0.04	0.10	0.16	0.18
ES	0.03	0.04	0.13	0.17
HR	0.16	0.13	0.03	0.05
IT	0.13	0.12	0.15	0.16
CY	0.12	0.09	0.31	0.31
LV	0.27	0.25	0.16	0.11
LT	0.19	0.21	0.29	0.22
LU	0.38	0.32	0.23	0.23
HU	0.19	0.18	0.12	0.16
MT	0.23	0.23	0.17	0.24
NL	0.12	0.14	0.16	0.13
AT	0.23	0.23	0.16	0.19
PL	0.16	0.10	-	0.16
PT	0.15	0.14	0.06	0.08
RO	0.10	0.11	0.11	0.08
SI	-	0.24	-	-
SK	0.15	0.14	0.12	0.14
FI	0.28	0.30	0.29	0.23
SE	0.23	0.22	0.12	0.14
IS	0.21	0.17	0.22	0.24
NO	0.18	0.19	0.16	0.18
UK	0.22	0.22	0.16	0.16
BA	-	0.19	-	0.21
ME	0.13	0.16	0.18	0.13
MK	0.20	0.23	-	-
RS	0.14	0.11	0.10	0.12

Country	2017		2021	
	HES	GOV	HES	GOV
TR	0.09	0.09	0.00	0.00
RU	0.25	0.26	0.16	0.16

Source: Eurostat – Research and development statistics (online data code: rd_p_perssci).

Notes: Definition differs, see metadata: DE, FI (2021), DE (2017 – Natural Sciences, Engineering and Technology, Medical and Health Sciences, Humanities); Break in time series: SE (2021); Confidential: BG (All fields of science except Medical and Health Sciences, Humanities, 2021), SI (2017 - Natural Sciences, Engineering and Technology, Agricultural Sciences); Estimated: IE (2021), ES, IT (2017, 2021), UK (2017 - Women); Provisional: DK (2021); Reference year differs: DK: 2019, SI: 2020, BA: 2020, ME: 2019, MK: 2020, RU: 2019; Data not available (2021): EU-27, UK, JP, BG (All fields of science except Humanities), FR (Women); Data not available (2017): EU-27, BG, FR, SI, BA, JP.

Annex indicators

Annex 4.1 Number of researchers, by sex, 2017-2021

Country	2017		2018		2019		2020		2021	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**849213**	**1740762**	**-**	**-**	**925105**	**1876843**	**-**	**-**	**1007232**	**1980923**
BE	27465	51402	-	-	29932	61825	-	-	37685	74738
BG	9935	11036	10456	12336	10777	12394	10859	12369	11214	12020
CZ	16005	43784	16461	45505	17313	46377	17992	47201	18845	50691
DK	21472	38613	-	-	21746	39827	-	-	-	-
DE	173700	449425	-	-	187231	480163	-	-	202940	488324
EE	3099	4245	3199	4082	3283	4451	3678	4981	3765	5268
IE	12605	22116	-	-	14116	22887	-	-	13653	22888
EL	23301	38315	-	-	25942	40509	28028	44206	29688	46972
ES	91499	134496	95717	139081	99772	141600	101263	142924	106232	149153
FR	117754	298463	-	-	-	-	135524	325268	139651	327868
HR	6637	7071	6840	7118	7558	8095	7852	8175	8230	8649
IT	67131	128429	71076	139343	75878	146287	75762	141290	78539	139043
CY	897	1460	989	1663	1087	1803	1151	1878	1173	1857
LV	3919	3585	3770	3669	3908	3816	4198	4196	4555	4588
LT	9292	9475	9407	9791	9233	9578	9534	9897	9506	10103
LU	994	2546	-	-	1019	2703	-	-	1120	2626
HU	13024	29705	15366	39604	17433	40658	17713	44464	19106	46096
MT	478	1068	487	1026	520	1039	544	1103	641	1224
NL	32626	92208	35191	94962	37891	98143	40000	99928	43385	100060
AT	25144	58504	-	-	28319	64860	-	-	30086	66184

Country	2017		2018		2019		2020		2021	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
PL	71611	116294	73088	119745	73175	121432	71845	124575	78183	137578
PT	39148	50511	41576	54547	43171	57652	44466	60215	47226	63727
RO	12790	14577	12705	14766	12745	14423	13275	14815	13681	15666
SI	4549	9530	5008	10380	5303	10622	5492	10836	5604	10678
SK	11259	15602	11843	16912	11837	17014	11808	16888	12239	17801
FI	17948	36191	18677	36738	19670	38621	20472	40820	21590	44225
SE	34931	72111	-	-	36990	74189	-	-	46608	92445
IS	1755	2028	1755	2028	-	-	-	-	2128	2575
NO	22052	35882	23112	36517	23794	37863	24397	38706	25787	41111
UK	201858	319078	206687	328790	-	-	-	-	-	-
BA	-	-	-	-	1061	1060	873	1025	948	980
ME	762	766	791	805	826	760	-	-	-	-
MK	1749	1597	1850	1614	1810	1585	1841	1585	-	-
RS	8098	8084	8329	7884	8518	7881	8809	7853	8875	8087
TR	78056	132713	84701	145329	90168	153605	94682	163248	107203	181783
IL	-	-	-	-	-	-	-	-	-	-
JP	150545	780175	154964	780694	158927	783253	166304	785422	175419	808185
RU	142290	217503	136431	211423	136074	212147	134389	212108	-	-
KR	97042	385754	104728	409442	113187	424949	119551	438494	130055	456611
US	-	-	-	-	-	-	-	-	-	-

Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: FI (Researchers - Women, Total); Break in time series: BE (2021), HU (2018), SE (2021) (Researchers - Women, Total); Estimated: EU-27 (2017, 2019, 2021), UK (2017, 2018); Provisional: DK (2019, 2020 (Total)), FR (2017, 2018 (Total)); Difference in methodology: JP (Researchers - Women, Total); Estimated value: RU (2017, 2018); Data not available: BA, IL, US (2017) -- EU-27, BE, DK, DE, IE, EL, FR, LU, AT, SE, BA, IL, US (2018) - FR, IS, UK, IL, US (2019) - EU-27, BE, DK, DE, IE, LU, AT, SE, IS BA, ME, IL, US (2020) - DE, BA, ME, MK, IL, US (2021).

Annex 4.2 Number of researchers in HES, by sex, 2017-2021

Country	2017		2018		2019		2020		2021	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**473742**	**646393**	**489867**	**658739**	**505839**	**667289**	**514905**	**673123**	**535938**	**685075**
BE	13661	18811	14811	20097	14704	19919	15172	20077	15947	20778
BG	4153	3771	4434	4030	4403	3765	4484	3838	4673	3836
CZ	8618	16392	8910	16777	9438	17328	9759	17566	9906	17945
DK	11299	14539	12003	15486	12256	15257	-	-	-	-
DE	109274	169893	112908	172470	115537	173300	120192	175520	125078	176755
EE	2092	2297	2168	2330	2127	2334	2359	2501	2452	2614
IE	8354	10085	-	-	9235	10399	-	-	9059	9745
EL	11799	17646	-	-	13667	19477	14727	21798	15792	22083
ES	53416	72298	55436	73158	57478	75073	58447	75013	60487	76893
FR	49396	74497	-	-	-	-	55829	77684	57697	79991
HR	4474	4581	4557	4533	5091	5007	5268	5035	5603	5208
IT	32014	45623	32187	45512	33515	46745	33553	46928	34895	48172
CY	607	975	643	1033	693	1098	711	1112	728	1128
LV	2947	2516	2793	2541	2951	2613	3095	2798	3363	2932
LT	6588	5400	6668	5368	6299	5196	6777	5313	6565	5212
LU	502	851	-	-	532	937	-	-	651	1117
HU	6952	10372	8417	14871	9574	15038	9522	15423	10111	15721
MT	324	599	338	607	367	650	389	671	433	720
NL	11261	14839	11529	14828	12144	15622	13180	16253	14216	16866
AT	15227	22106	-	-	17106	23915	-	-	17907	23884
PL	50658	60505	52139	60615	51222	58782	48381	55659	49642	56356

Country	2017		2018		2019		2020		2021	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
PT	26850	27457	28639	28893	28760	28656	27981	27495	28444	27843
RO	7664	7859	7615	7496	7506	7361	7593	7476	7882	7339
SI	1827	2547	1985	2752	2043	2615	2100	2609	2155	2668
SK	8280	9510	8630	10046	8502	9838	8300	9556	8492	9520
FI	10920	11513	11366	11738	12022	12130	12217	12154	12691	12701
SE	14585	18910	-	-	16112	20071	-	-	18137	20610
IS	1155	1019	1155	1019	-	-	-	-	1303	1234
NO	13189	13904	13853	13990	14478	14343	14761	14562	15737	14978
UK	162179	189792	165295	191160	-	-	-	-	-	-
BA	-	-	-	-	927	944	766	893	783	841
ME	408	503	396	490	421	437	-	-	-	-
MK	1229	1236	1312	1269	1250	1216	1276	1168	-	-
RS	5746	5790	5915	5918	5927	5694	6139	5556	6086	5660
TR	57359	75199	60003	77455	63379	80155	63588	80471	70692	86120
IL	-	-	-	-	-	-	-	-	-	-
JP	89106	240249	90993	240434	93191	241451	95206	241643	97460	243671
RU	19516	22597	20537	23952	21725	26704	21279	24558	-	-
KR	32569	70308	34712	73817	36650	73969	38405	77519	38792	75843
US	-	-	-	-	-	-	-	-	-	-

Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel, by sector and function.

Notes: Definition differs, see metadata: DE, FI (2021); Break in time series: HU (2018), SE (2021), BE; Estimated: UK (2017, 2018), IE (2021), IT, EU-27; Provisional: DK (2019, 2020 (Total)), FR (2017, 2018 (Total)); Difference in methodology: JP (Researchers - Women, Total); Estimated value: RU (2017, 2018); Data not available: BA, IL, US (2017) - IE, EL, FR, LU, AT, SE, BA, IL, US (2018) - FR, IS, BA, IL, US (2019) - DK, IE, LU, AT, SE, IS, ME, IL, US (2020) - DK, BA, ME, MK, IL, RU, US (2021).

Annex 4.3 Number of researchers in GOV, by sex, 2017-2021

Country	2017		2018		2019		2020		2021	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**118019**	**151406**	**121150**	**156177**	**125217**	**157532**	**129630**	**161218**	**136309**	**165571**
BE	1811	3141	2069	3713	2134	3879	2487	4410	2540	4490
BG	2852	2085	2734	2092	2782	2188	2896	2192	2877	2141
CZ	4308	6261	4320	6487	4354	6465	4484	6596	4543	6624
DK	1358	1263	1389	1358	1390	1377	-	-	-	-
DE	23233	40629	24719	42259	25822	43530	27154	44579	28718	46360
EE	394	248	376	198	401	207	434	200	421	202
IE	299	378	-	-	342	418	-	-	495	503
EL	6657	9330	-	-	7338	10466	7663	10508	8135	11128
ES	17534	16659	18154	16861	19198	16782	19418	16674	20775	17162
FR	11286	19188	-	-	-	-	11853	19314	12177	19668
HR	1478	1250	1542	1245	1634	1326	1725	1314	1655	1241
IT	14271	15559	14688	15715	15136	15872	15568	16038	16552	16711
CY	113	78	114	81	123	88	135	94	132	89
LV	497	399	520	378	470	377	564	461	594	441
LT	1513	1370	1476	1374	1384	1390	1460	1435	1505	1461
LU	255	427	-	-	286	470	-	-	295	482
HU	2640	3473	2745	5161	3379	4667	3192	5093	3186	4710
MT	7	25	11	21	5	12	14	15	76	64
NL	2898	4962	3310	4792	3576	5065	3801	4999	4213	5053
AT	2703	3895	-	-	2968	4069	-	-	3057	4045
PL	3090	2692	2739	2363	2547	1735	3014	2373	3163	2539
PT	3214	2113	3360	2141	3532	2307	3626	2346	3995	2567

Country	2017		2018		2019		2020		2021	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
RO	3352	3504	3360	3704	3522	3745	3576	3673	3400	3510
SI	1004	1166	1069	1212	1123	1199	1154	1165	1194	1211
SK	2167	2241	2327	2301	2400	2306	2525	2375	2587	2447
FI	2068	2707	1991	2644	1967	2662	2042	2631	2121	2710
SE	7017	6363	-	-	5680	5811	-	-	6491	6537
IS	115	140	115	140	-	-	-	-	162	125
NO	3024	3399	3101	3343	3117	3267	3234	3269	3272	3251
UK	3220	5207	3225	4916	-	-	-	-	-	-
BA	-	-	-	-	27	26	24	54	82	47
ME	299	170	303	170	323	211	-	-	-	-
MK	230	178	225	126	217	119	239	157	-	-
RS	1819	1215	1906	1206	2008	1284	2113	1288	2132	1321
TR	2451	4928	2497	5052	2185	4450	2325	4645	2518	4819
IL	-	-	-	-	-	-	-	-	-	-
JP	6394	28204	6545	28200	6807	28113	6998	27451	7252	27409
RU	56141	73940	56159	75207	49992	63563	52543	68106	-	-
KR	7752	21981	8073	22397	8730	23405	8088	22734	8720	22650
US	-	-	-	-	-	-	-	-	-	-

Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: DE, NL, HR (2017- 2020), FI (2021); Break in time series: HU (2018), SE (2021); Estimated: EU-27, SE (2019); Provisional: DK (2019, 2020 (Total), FR (2017, 2018 (Total), DK (Researchers - Women, Total); Difference in methodology: JP (Researchers - Women, Total); Estimated value: RU (2017, 2018, Women); Data not available: BA, IL, US (2017) - IE, EL, LU, AT, SE, BA, IL, US (2018) - FR, IS, UK, IL, US (2019) - DK, IE, LU, AT, SE, IS UK, ME, IL, US (2020) - DK, BA, ME, MK, IL, RU, US (2021).

Annex 4.4 Number of researchers in BES, by sex, 2017-2021

Country	2017		2018		2019		2020		2021	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**248698**	**933583**	**-**	**-**	**283722**	**1041154**	**-**	**-**	**323588**	**1119115**
BE	11706	29147	-	-	12460	37377	-	-	18776	49102
BG	2859	5082	3223	6144	3515	6361	3398	6246	3592	5954
CZ	2990	20988	3155	22120	3407	22458	3639	22883	4272	25976
DK	8668	22723	-	-	7921	23087	-	-	-	-
DE	41193	238902	-	-	45872	263332	-	-	49144	265209
EE	553	1647	584	1505	691	1864	819	2237	799	2403
IE	3952	11653	-	-	4539	12070	-	-	4099	12640
EL	4589	11082	-	-	4687	10347	5404	11693	5534	13562
ES	20261	45273	21886	48816	22880	49509	23169	50984	24682	54789
FR	54656	201691	-	-	-	-	64887	224754	66554	224521
HR	685	1240	741	1340	833	1762	859	1826	952	2167
IT	17665	64395	20972	75285	23341	80062	22604	74716	22761	70535
CY	134	305	187	443	200	492	218	520	233	487
LV	475	670	457	750	487	826	539	937	598	1215
LT	1191	2705	1263	3049	1550	2992	1297	3149	1436	3430
LU	237	1268	-	-	201	1296	-	-	174	1027
HU	3432	15860	4204	19572	4480	20953	4999	23948	5809	25665
MT	147	444	138	398	148	377	141	417	132	440
NL	18467	72406	20352	75342	22171	77456	23019	78676	24956	78141
AT	6901	32172	-	-	7837	36450	-	-	8714	37833
PL	17076	52152	17415	55711	18611	59812	19846	65623	24744	77930

Country	2017		2018		2019		2020		2021	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
PT	8774	20636	9233	23178	10519	26336	12327	29827	14136	32681
RO	1732	3120	1666	3453	1629	3180	1993	3528	2246	4653
SI	1698	5771	1920	6365	2070	6708	2148	6950	2171	6677
SK	763	3725	844	4457	920	4855	971	4941	1147	5816
FI	4565	21687	4884	22065	5258	23542	5792	25744	6373	28531
SE	13329	46838	-	-	15198	48307	-	-	21980	65298
IS	485	869	485	869	-	-	-	-	663	1216
NO	5839	18579	6158	19184	6199	20253	6402	20875	6778	22882
UK	34261	121553	35810	130165	-	-	-	-	-	-
BA	-	-	-	-	107	90	83	78	83	92
ME	38	78	72	132	66	92	-	-	-	-
MK	249	158	281	201	318	237	316	256	-	-
RS	532	1078	506	760	580	903	554	1009	651	1104
TR	18246	52586	22201	62822	24604	69000	28769	78132	33993	90844
IL	-	-	-	-	-	-	-	-	-	-
JP	53557	503493	55970	504013	57368	505533	62504	508470	69211	529622
RU	66085	120262	59321	111884	63895	121463	59912	118569	-	-
KR	54768	288599	59968	308269	65571	321877	70067	331049	79205	350260
US	-	-	-	-	-	-	-	-	-	-

Source: Eurostat – Research and development statistics (online data code: rd_p_persocc) and OECD-R&D personnel by sector and function.

Notes: Definition differs, see metadata: FI, NO (2021); Break in time series: HU (2018), BE (2021), SE, NO (2021); Estimated: EU-27 (2017, 2019, 2021), UK; Provisional: DK (2019, 2020 (Total), FR (2017, 2018 (Total); Difference in methodology: JP (Researchers - Women, Total); Estimated value: RU (2017, 2018); Data not available: BA, IL, US (2017) – EU-27, BE, DK, DE, FR, LU, AT, SE, BA, IL, US (2018) - FR, IS, UK, IL, US (2019) – EU-27, BE, DK, DE, IE, LU, AT, SE, IS, UK, ME, IL, US (2020) - DK, UK, ME, MK, IL, RU, US (2021).

Annex 4.5 Number of researchers in HES, by field of R&D and sex, 2021

Country	Natural sciences		Engineering and technology		Medical and health sciences		Agricultural sciences		Social sciences		Humanities	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	-	-	-	-	-	-	-	-	-	-	-	-
BE	2603	5535	1897	5764	5030	3714	886	855	3927	3263	1604	1647
BG	-	-	-	-	1935	1437	-	-	-	-	517	301
CZ	1712	4716	1693	5093	2952	3654	640	762	2015	2444	894	1276
DK	1908	3700	1009	2833	5009	4450	694	551	2606	2671	1030	1052
DE	17992	35445	15080	52576	39727	35964	4200	3876	28223	30478	19856	18416
EE	609	1031	258	582	371	176	161	148	597	391	456	286
IE	2046	2747	1005	2143	2261	1546	264	257	2368	2177	1115	875
EL	2176	3720	3034	5840	3850	4991	1401	2002	3286	3515	2045	2015
ES	10505	13486	11505	17229	11746	13577	1731	2227	17040	20756	7960	9618
FR	-	-	-	-	-	-	-	-	-	-	-	-
HR	690	600	1267	1841	1172	858	363	377	1367	961	744	571
IT	9042	10959	5176	13112	5677	7145	2133	2577	7986	9335	4881	5044
CY	153	264	159	313	75	108	7	15	251	312	83	116
LV	567	718	695	1123	713	370	132	85	663	361	593	275
LT	949	1109	730	1305	1586	824	287	182	2055	1110	958	682
LU	141	333	97	430	56	55	0	0	248	215	109	84
HU	1368	3622	924	2836	2396	2753	666	856	2998	3667	1759	1987
MT	47	132	42	152	116	125	3	10	171	186	54	115
NL	2135	3354	1767	3677	5078	4822	710	730	3144	2885	1382	1398
AT	3343	6781	2520	6481	3924	3942	646	501	4856	4174	2618	2005

Country	Natural sciences		Engineering and technology		Medical and health sciences		Agricultural sciences		Social sciences		Humanities	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
PL	10940	12694	8100	14588	10324	7963	2939	2935	10004	10509	7335	7667
PT	6334	6146	3658	7569	4888	2909	920	667	7527	5942	5117	4610
RO	1080	1009	2356	2953	3032	2104	620	552	638	551	156	170
SI	271	550	300	780	571	422	196	148	540	526	221	184
SK	1359	1482	1301	2760	1679	1366	414	403	2286	1956	1453	1553
FI	2001	3915	1230	3157	3091	1778	470	280	4097	2486	1802	1085
SE	3075	5908	1715	4084	5693	4152	555	522	5105	4121	1994	1824
IS	159	296	40	99	553	430	35	27	378	267	138	115
NO	1479	2510	894	2530	5720	3501	245	234	5426	4447	1973	1756
UK	26435	41600	15245	46812	49789	31358	2271	1859	28868	31351	36166	30379
BA	115	96	220	428	56	24	71	80	182	179	122	86
ME	46	68	79	126	10	4	24	21	151	162	111	56
MK	118	148	194	280	362	147	94	131	328	384	180	78
RS	1032	854	1254	1811	1495	1083	395	364	1297	1193	613	355
TR	-	5235	-	16623	-	28140	-	3257	-	20478	-	12387
JP	-	27035	-	38877	-	75025	-	9515	-	36321	-	18819
RU	-	9212	-	9055	-	1044	-	648	-	4800	-	1945
KR	-	10479	-	29334	-	10193	-	3477	-	10610	-	6340

Source: Eurostat – Research and development statistics (online data code: rd_p_perssci).

Notes: Definition differs, see metadata: DE, FI; Break in time series: SE; Confidential: BG (All fields of science except Medical and Health Sciences, Humanities; Estimated: IE, ES, IT; Provisional: DK; Reference year differs: BG: 2020, DK: 2019, SI: 2020, UK: 2017, BA: 2020, ME: 2019, MK: 2020, JP: 2015, RU: 2019, KR: 2015, JP: Available data only for 2015, KR: 2015 (latest available year), BA: 2014 (latest available year); Data not available: EU-27, BG (Natural Sciences, Engineering and Technology, Agricultural Sciences, Social Sciences – 2021, Natural Sciences, Engineering and Technology, Agricultural Sciences - 2017), FR (Women - 2021/All fields of science - 2017), SI (Natural Sciences, Engineering and Technology - 2017), UK, BA, JP (2021), US.

Annex 4.6 Number of researchers in GOV, by field of R&D and sex, 2021

Country	Natural sciences		Engineering and technology		Medical and health sciences		Agricultural sciences		Social sciences		Humanities	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	-	-	-	-	-	-	-	-	-	-	-	-
BE	595	1066	729	2288	453	279	427	535	75	107	261	215
BG	1363	1142	268	352	232	82	345	200	227	119	442	246
CZ	2300	4325	108	264	760	502	388	354	207	240	780	939
DK	112	219	8	16	600	492	0	0	268	279	402	371
DE	12763	20885	5315	15701	2443	2258	1736	1971	3837	3255	2624	2290
EE	43	70	0	1	148	20	33	11	8	17	189	83
IE	71	140	27	35	60	26	151	180	179	115	7	7
EL	732	1030	1010	2209	3694	6169	303	348	331	285	2065	1087
ES	2987	3626	1786	2915	13236	7931	1300	1202	1056	1014	410	474
FR	-	-	-	-	-	-	-	-	-	-	-	-
HR	514	387	0	0	580	435	120	95	315	179	126	145
IT	4183	5846	1897	2899	7604	5530	1134	1058	1418	1172	316	206
CY	64	34	1	8	3	6	15	26	26	7	23	8
LV	275	216	31	61	27	4	149	88	91	61	21	11
LT	473	549	150	376	215	186	133	94	188	84	346	172
LU	167	185	35	159	13	10	7	2	73	126	0	0
HU	1025	2105	103	304	601	636	19	27	477	589	961	1049
MT	4	9	1	3	64	39	3	5	2	1	2	7
NL	920	1610	713	1014	506	369	607	714	1018	972	448	375

Country	Natural sciences		Engineering and technology		Medical and health sciences		Agricultural sciences		Social sciences		Humanities	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
AT	703	1219	480	1082	328	284	203	291	695	629	648	540
PL	466	615	348	449	449	289	254	156	811	543	835	487
PT	375	249	226	339	3050	1817	133	66	134	59	77	37
RO	1453	1657	847	942	171	75	309	217	288	237	332	382
SI	450	712	-	-	-	-	40	59	121	70	187	148
SK	1024	1007	262	497	146	110	138	175	490	241	527	417
FI	447	555	536	1309	338	146	397	385	356	295	47	20
SE	286	481	298	829	5257	4264	40	22	475	505	134	72
IS	57	58	2	6	69	26	9	19	7	3	18	13
NO	540	790	200	505	1059	714	327	358	676	596	470	288
UK	1324	2165	327	1363	391	473	354	456	577	552	247	198
BA	11	16	10	34	0	0	0	0	0	0	3	4
ME	63	47	23	37	165	100	5	1	56	19	11	7
MK	79	69	-	-	111	37	-	-	-	-	49	51
RS	1116	581	238	212	129	35	242	151	176	173	231	169
TR	-	512	-	1056	-	353	-	2045	-	769	-	84
JP	-	6580	-	8140	-	2866	-	8478	-	455	-	312
RU	-	28270	-	23316	-	4150	-	3082	-	2372	-	2373
KR	-	4210	-	12517	-	579	-	1874	-	2428	-	155

Source: Eurostat – Research and development statistics (online data code: rd_p_perssci).

Notes: Definition differs, see metadata: DE, NL, FI; Break in time series: SE; Confidential: BG (All fields of science except Medical and Health Sciences, Humanities; Estimated: ES; Provisional: DK; Reference year differs: DK: 2019, UK: 2017, BA: 2020, ME: 2019, MK: 2020, JP: 2015, RU: 2019, KR: 2015; Data not available: EU-27, FR (Women - 2021, All fields of science, Women - Total - 2017), PL (Agricultural Sciences, Social Sciences - 2017), SI (Agricultural Sciences - 2017, Engineering and Technology, Medical and Health Sciences - 2021), UK, ME (2021), BA, JP, KR (2021 - 2017), MK (Engineering and Technology (2021) - Agricultural Sciences (2017), US.

CHAPTER 5 – WORKING CONDITIONS OF RESEARCHERS

Key takeaways

- **The proportion of women researchers employed part-time in the higher education sector (HES) exceeded that of men researchers** by 5 percentage points (pp) at EU level in 2022 (20 % of women and 15 % of men researchers).
- **There was no difference in the proportion of women and men researchers in precarious employment** (defined as contracts lasting less than three years) in HES at EU level in 2022, with both comprising approximately 19 %.
- **Little difference was found in the international mobility of women and men PhD students** in Member States and Associated Countries in 2021. In majority of countries (16 out of 25) the difference between women and men is approximately 1 pp or less. However, bibliometric data suggest that **women were far less likely to be internationally mobile during their careers** ([295]).
- **An inverse correlation is observed among the proportion of women researchers and R&D expenditure per researcher**. Countries where the representation of women among researchers is low tend to have higher relative R&D expenditure. Women represented less than 40 % of researchers in most countries where R&D expenditure per capita stood above 100 000 PPS.
- **Spending per researcher in R&D continued to be highest in the business enterprise sector (BES)** at 185 000 purchasing power standards (PPS) ([296]) at EU level in 2021, followed by the government sector (GOV) at 169 000 PPS and HES at 107 000 PPS.
- **Significant variations are found between countries in the proportion of research organisations explicitly addressing actions and measures to foster gender equality, as demonstrated on their websites**, ranging from 85 % in Germany to 14 % in Bulgaria.
- **The gender overall earnings gap (GOEG) across scientific R&D activities (20 %) was lower than the GOEG for total economic activities (23 %)** at EU level in 2018.
- **A correlation is observed between age and the GOEG**. The GOEG between women and men widens with age across scientific R&D activities and the total economy, indicating greater gender inequalities in earnings in older age groups.

([295]) Reflected in an EU average ratio of 0.48, where <1 indicates that men are more mobile than women, a value of >1 indicates that women are more mobile than men, and 1 means equal mobility.

([296]) According to Eurostat, "the purchasing power standard, abbreviated as PPS, is an artificial currency unit. Theoretically, one PPS can buy the same amount of goods and services in each country. However, price differences across borders mean that different amounts of national currency units are needed for the same goods and services depending on the country. PPS are derived by dividing any economic aggregate of a country in national currency by its respective purchasing power parities." See: Eurostat, Glossary: Purchasing power standard (PPS), 2014, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Purchasing_power_standard_(PPS)#:~:text=The%20purchasing%20power%20standard%2C%20abbreviated%20as%20PPS%2C%20is,same%20goods%20and%20services%20depending%20on%20the%20country.

Introduction

Chapter 5 discusses the comparative working conditions of women and men researchers. This includes gender differences in part-time and precarious contracts, in the international mobility of researchers, R&D expenditure, the extent to which research organisations undertake actions to promote gender equality, and the gender pay gap in R&I.

- **Section 5.1 examines differences in women's and men's representation in employment under part-time and precarious contracts** in HES. It aims to better understand the extent of the gender gap in relation to employment flexibility and security across Member States and Associated Countries.
- **Section 5.2 reflects on international mobility of women and men researchers.** It examines gender differences in the mobility of Doctoral graduates who, during their PhD programme, moved for at least three months to a country other than that in which they obtained their PhD. It then compares the ratio of women and men who are internationally mobile, based on affiliation information in published papers.
- **Section 5.3 examines country differences in R&D expenditure per researcher and by sector of employment**. It also explores the potential relationship between R&D expenditure and the proportion of women researchers.
- **Section 5.4 presents the measures and/or actions taken by research organisations to promote gender equality.** More specifically, it examines the extent to which measures or actions fostering supportive and inclusive working environments are promoted across HEIs and public research organisations (PROs).
- **Section 5.5 examines the gender overall earnings gap (GOEG) across scientific R&D activities and the total economy ([297]) and explores the correlation between the differences in GOEG and age.** This synthetic indicator offers a comprehensive overview of the gender pay gap between women and men in scientific R&D activities in the total economy. It is used here for the first time and is based on average hourly earnings, monthly average number of paid hours, and employment rate.

([297]) According to the Eurostat glossary, the total economy, in a national context, is defined as the entire set of resident institutional units, that 'is capable, in its own right, of owning assets, incurring in liabilities and engaging in economic activities and in transactions with other entities' (Eurostat, Statistics Explained, Glossary: Total Economy and Institutional Unit, 2023, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Total_economy#:~:text=Total%20economy%20is%20in%20the%20context%20of%20national,as%20the%20entire%20set%20of%20resident%20institutional%20units).

Background

Women's participation in the overall labour market in the EU stood at a historical peak of 70 % in 2023 ([298]), compared to 67 % in 2018 and 62 % in 2008 ([299]). However, challenges persist in relation to inequalities in working conditions. This is reflected in EIGE's 2023 Gender Equality Index, with a score of 73.8 out of 100 at EU level in the domain of work. This domain measures the degree to which both women and men have access to equal employment opportunities and examines the quality of working conditions, such as the availability of flexible working arrangements and career prospects ([300]) ([301]).

A combination of factors, including gender stereotypes, the perpetuation of the 'glass ceiling', 'leaky pipeline', and 'sticky floor' effects, horizontal segregation (including the overrepresentation of women in low-paid service jobs) and unequal sharing of care responsibilities ([302]) contribute to structural barriers that prevent equal pay and gender equality within the labour market. As highlighted in the EU Gender Equality Strategy 2020-2025 ([303]), gender stereotypes related to women's caring responsibilities mean that women carry a disproportionate burden of unpaid care work. This was exacerbated by the COVID-19 pandemic, when women felt pressure to reduce their paid workload or even to quit their jobs temporarily to meet unpaid care demands inside their households, increasing their engagement in part-time and precarious work ([304]). In the R&I sector, this also affected opportunities for research and publishing. The double burden of paid and unpaid care work also contributed to an increased level of stress and mental health struggles among women working in academia ([305]).

Box 25: Key definitions for Chapter 5

The '**glass ceiling'** refers to invisible, systemic barriers to women's abilities and opportunities to obtain higher ranked positions within an organisation or firm. It entails unconscious biases and discrimination that restrict women's access to top decision-making and managerial positions and affect their ability to get pay raises or promotions ([306]).

([298]) Eurostat, Statistics Explained, Gender statistics, 2024, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Gender_statistics

([299]) Eurostat, Women's employment in the EU, 2020, https://ec.europa.eu/eurostat/web/products-eurostat-news/-/EDN-20200306-1

([300]) EIGE, Gender Equality Index: About the domain of work, 2023, https://eige.europa.eu/gender-equality-index/2023/domain/work

([301]) EIGE, Gender Equality Index, 2023, https://eige.europa.eu/gender-equality-index/2023

([302]) Directive (EU) 2023/970 of the European Parliament and of the Council of 10 May 2023 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, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023L0970

([303]) 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, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2020:152:FIN

([304]) Blasko, Z., Papadimitriou, E. and Manca, A.R., *How will the COVID-19 crisis affect existing gender divides in Europe*, Publications Office of the European Union, Luxembourg, 2020; King. T.L. 'Precarious work and the COVID-19 pandemic: the need for a gender equality focus', *British Medical Journal,* 2023, https://doi.org/10.1136/bmj-2022-072872 ; Woodbridge., L.M., Um, B. and Duys, D.K., *Women's experiences navigating paid work and caregiving during the COVID-19 pandemic*, Wiley Online Library, 2021, https://doi.org/10.1002/cdq.12274

([305]) European Commission, Directorate-General for Research and Innovation, *COVID-19 impact on gender equality in research & innovation – Policy report*, Publications Office of the European Union, 2023, Luxembourg, https://data.europa.eu/doi/10.2777/171804

([306]) EIGE, Glossary and thesaurus, 2016, https://eige.europa.eu/publications-resources/thesaurus/terms/1099?language_content_entity=en

Horizontal gender segregation refers to a concentration of one gender in a specific field, sector, or occupation ([307]).

The 'leaky pipeline' effect defines the progressive reduction in the numbers of women as they disproportionately exit academic careers due to various (structural) factors that make them advance at lower rates compared to men ([308]).

The '**sticky floor**' refers to a discriminatory employment pattern that keeps (women) workers in lower-level positions, with limited opportunities for and invisible barriers to career advancement ([309]).

In addition to broader gender inequalities in the labour market, there are challenges specific to the research sector. These include the precarity of research careers, especially in the early stages.

The EU has taken steps to make research careers more attractive to both women and men and encourage institutional change (i.e. changes in values, processes, and rules to support gender equality) in research organisations. This includes actions taken to improve the working conditions of researchers within the ERA ([310]). At the Competitiveness Council of November 2021, the Council adopted **Conclusions on the governance of the European Research Area (ERA) ([311]) and a Pact for Research and Innovation in Europe ([312])**, setting out priorities and a streamlined governance framework for the ERA. This included an **ERA Policy Agenda for 2022-2024**. Gender equality and inclusiveness is one of the core values and principles for European research and innovation, with the actions of the ERA Policy Agenda 2022-2024 set to be implemented on a voluntary basis by Member States ([313]), together with the European Commission and in cooperation with Associated Countries.

Action 5 of the New ERA Framework (2022-2024) aims to promote gender equality and foster inclusiveness. It will deliver on four outcomes: (1) developing a policy coordination mechanism to support all aspects of gender equality through inclusive GEPs and policies, and establishing a dedicated EU network for their implementation; (2) devising a strategy to counteract gender-based violence in the European R&I system; (3) developing a policy approach to inclusive gender equality that addresses gender mainstreaming and opening to intersectionality with other diversity dimensions; and (4) formulating principles for the integration and evaluation of the gender dimension in R&I content ([314]).

([307]) EIGE, Horizontal segregation, n.d., https://eige.europa.eu/publications-resources/thesaurus/terms/1225?language_content_entity=en#:~:text=It%20is%20understood%20as%20under,as%20income%2C%20prestige%2C%20etc

([308]) The Economist, Glass-ceiling index, 2024, https://www.economist.com/graphic-detail/glass-ceiling-index

([309]) EIGE, Glossary and thesaurus, 2016, https://eige.europa.eu/publications-resources/thesaurus/terms/1374?language_content_entity=en

([310]) European Commission, European Research Area (ERA), n.d., https://eur-lex.europa.eu/EN/legal-content/glossary/european-research-area-era.html

([311]) European Council, Council of the European Union, Future governance of the European Research Area (ERA) – Council conclusions, 2021, https://data.consilium.europa.eu/doc/document/ST-14308-2021-INIT/en/pdf

([312]) European Council, Council of the European Union, *New Pact and governance structure for the European Research Area (ERA)*, Press release, 26 November 2021, https://www.consilium.europa.eu/en/press/press-releases/2021/11/26/new-pact-and-governance-structure-for-the-european-research-area-era/

([313]) 18 Member States, two Associated Countries and several stakeholder organisations committed to Action 5.

([314]) European Commission, Directorate-General for Research and Innovation, *European Research Area policy agenda – Overview of actions for the period 2022-2024*, Publications Office of the European Union, Luxembourg, 2022, https://data.europa.eu/doi/10.2777/52110 .

Action 5 is deployed in synergy with other actions **of the New ERA Framework (2022-2024)**. This includes Action 3, which focuses on the reform of the assessment system for research and researchers, and Action 4, which aims to strengthen the attractiveness of research careers and support the mobility of researchers across the ERA (see Section 0), including through developing a European framework for research careers. In line with Action 4, the Council Recommendation on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe was adopted in December 2023, following the Commission proposal of July 2023 ([315]).

Closely linked to Action 5 of the New ERA Framework, a commitment to gender equality in R&I has been reaffirmed with **Horizon Europe**. This is reflected in the introduction of a GEP eligibility criterion for public bodies, research organisations and HEIs from Member States and Associated Countries in respect of funding from 2022 onwards (see Section 5.4) ([316]).

The **European Parliament Resolution of December 2023 on young researchers** emphasised the importance of supporting young researchers, particularly in the aftermath of the COVID-19 pandemic. It calls on the Council to adopt and implement the proposed Council recommendation for a revised Charter for Researchers and a European Competence Framework for Researchers, and to give priority to implementing a 'Career Observatory' – an open monitoring and reporting system across Europe that tracks annual progress in framework and employment conditions, including remuneration, social security, type of contract, and pension levels ([317]).

Most recently, the **Proposal for a Council Recommendation on attractive and sustainable careers in higher education (2024)** notes the lack of inclusiveness and competitiveness in terms of attractive working conditions in higher education, which disproportionately affect women researchers ([318]). It proposes to create a common EU-level framework on attractive, inclusive, and sustainable careers in higher education that seeks to promote competitive, free, inclusive, safe, fair, and non-discriminatory conditions in academia.

To align with the objectives defined at EU level, and in addition to laws and policies implementing GEP requirements (see Section 0), **Member States** have recently implemented laws and policies to support the working conditions of researchers:

- Requirements to ensure equal career opportunities for women in research performing organisations (RPOs) and HEIs as outlined within **national (gender) equality laws and policies**. This includes addressing gender-based discrimination and harassment and supporting work-life balance to minimise the impact of parental leave on salary and career development. These requirements are also set out as targets within

([315]) Council Recommendation of 18 December 2023 on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe (C/2023/1640), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:C_202301640

([316]) European Commission, Directorate-General for Research and Innovation, *Horizon Europe guidance on gender equality plans*, Publications Office of the European Union, Luxembourg, 2021, https://op.europa.eu/en/publication-detail/-/publication/ffcb06c3-200a-11ec-bd8e-01aa75ed71a1

([317]) European Parliament, Resolution of 14 December 2023 on young researchers, 2023/2884(RSP), 2023, https://www.europarl.europa.eu/doceo/document/TA-9-2023-0482_EN.html

([318]) Proposal for a Council recommendation on attractive and sustainable careers in higher education, SWD(2024) 74 final, Proposal for a Council Recommendation on attractive and sustainable careers in higher education.pdf (europa.eu)

governmental gender equality action plans to advance gender equality in employment practices.

- **National higher education laws and policies** that include stipulations that research organisations develop and implement transparent, inclusive, and equitable systems of recruitment and career development opportunities.
- Gender equality requirements set out in **national labour laws**, obliging employers, including HEIs, research organisations and other public sector bodies to guarantee equal career opportunities and pay, and to prevent discrimination and harassment based on sex and gender.

Some notable examples of laws and policies were implemented between 2018 (the reference year of most Chapter 5 data in She Figures 2021) and 2021-2023 (the reference years for most indicators in She Figures 2024). These are presented in Box 26.

Box 26: Laws and policies implemented at Member State level to support working conditions of researchers between 2018 and 2023

In **Czechia**, the Governmental Strategy for Gender Equality in the Czech Republic for 2021-2030 (adopted in 2020) sets concrete measures to promote gender equality. Important goals in the education and research section include: 1) maximising the potential of all individuals regardless of gender; 2) integrating gender considerations into the operation and management of educational and research institutions; and 3) enriching education and research content with a gender perspective. Within the latter, the Strategy outlines measures to enhance working conditions in R&I, such as providing grants for parents returning to work after parental leave, funding care services for R&D staff (e.g. through targeted aid programmes), and supporting the increase of underrepresented genders in R&D ([319]).

In **Spain**, Law 17/2022 on Science, Technology and Innovation (amending a 2011 law) and Law 2/2022 on the University System introduced additional requirements on achieving (gender) equality in the context of R&I and HEIs. Article 4 of Law 17/2022 on Science, Technology and Innovation include details of measures to promote equality in the context of research careers ([320]). In addition, Law 2/2022 on the University System includes a requirement for HEIs to prepare a plan for inclusion and non-discrimination. It also introduced provisions to support work-life balance, and to account for the negative impact of gender-based violence on women's research careers ([321]).

Croatia has made significant strides to enhance the working conditions of researchers. In 2022, the implementation of the Act on Higher Education and Scientific Activity enabled fixed-term contracts to be prolonged during parental leave (and leave on other specific grounds). It also introduced a requirement to establish ethical committees and disciplinary committees in HEIs and PROs ([322]) (see also Box 39 in Chapter 6). In 2023, the Croatian

([319]) Úřad vlády České republiky, Strategie rovnosti žen a mužů na léta 2021-2030, 2020, https://www.vlada.cz/assets/ppov/rovne-prilezitosti-zen-a-muzu/Aktuality/Strategie_rovnosti_zen_a_muzu.pdf

([320]) Ley 17/2022, de 5 de septiembre, por la que se modifica la Ley 14/2011, de 1 de junio, de la Ciencia, la Tecnología y la Innovación, Jefatura del Estado, https://boe.es/boe/dias/2022/09/06/pdfs/BOE-A-2022-14581.pdf

([321]) Legislación Consolidada, Ley Orgánica 2/2023, de 22 de marzo, del Sistema Universitario, https://www.boe.es/buscar/pdf/2023/BOE-A-2023-7500-consolidado.pdf

([322]) Hrvatski Sabor, Zakon o visokom obrazovanju i znanstvenoj djelatnosti, Odluku, O Proglašenju Zakona o Visokom Obrazovanju i Znanstvenoj Djelatnosti, Narodne Novine, Službeni List Republike Hrvatske, 2022, https://narodne-novine.nn.hr/clanci/sluzbeni/2022_10_119_1834.html

government adopted a Decree on programme financing of public HEIs and public research institutes. State funds allocated to the institution's budget are intended to achieve specific objectives, such as the development of programmes that enhance social engagement, with a focus on strengthening diversity, fairness, and social inclusion in higher education and science ([323]).

In addition to regulations and national policies, Member States have implemented measures to improve the working conditions of women researchers and increase their participation in R&I careers. These include awards and accreditations recognising institutions' work in advancing inclusion and gender equality, targeted training and guidance, events and networking opportunities to drive systemic and cultural change, and funding to support work-life balance initiatives such as parental leave.

([323]) Vlada Republike HrvatskeUredba o programskom financiranju javnih visokih učilišta i javnih znanstvenih instituta u Republici Hrvatskoj, Narodne Novine, Službeni List Republike Hrvatske, 2023, https://narodne-novine.nn.hr/clanci/sluzbeni/2023_07_78_1245.html

5.1 Women and men researchers working in part-time employment and under precarious contracts

Part-time and precarious work contracts have historically been more common among women, partly due to their caregiving responsibilities. While such contracts may appear to offer some benefits, such as flexibility, they are commonly linked to uncertainty, poor job security, unfavourable working conditions, and lower pay ([324]). They can also limit career advancement opportunities and can contribute to the gender pay gap, gender bias in career choice, and overall gender inequality in the workplace.

Box 27: Information about sources used for indicators on precarious and part-time work

In previous editions of She Figures, the MORE Survey served as the primary source for assessing the working conditions of researchers, including precarious and part-time contracts. However, due to the discontinuation of the MORE Survey, She Figures 2024 incorporates alternative indicators from Eurostat data covering HES. These indicators are not directly comparable with previous editions but are the best available proxies.

A higher proportion of women researchers (20 %) are employed part-time compared to men researchers (15 %) in HES

Figure 5.1 shows the proportion of part-time ([325]) researchers in HES in 2022 by gender. At EU level, the proportion of women researchers employed part-time exceeds that of men by 5 pp (20 % for women and 15 % for men).

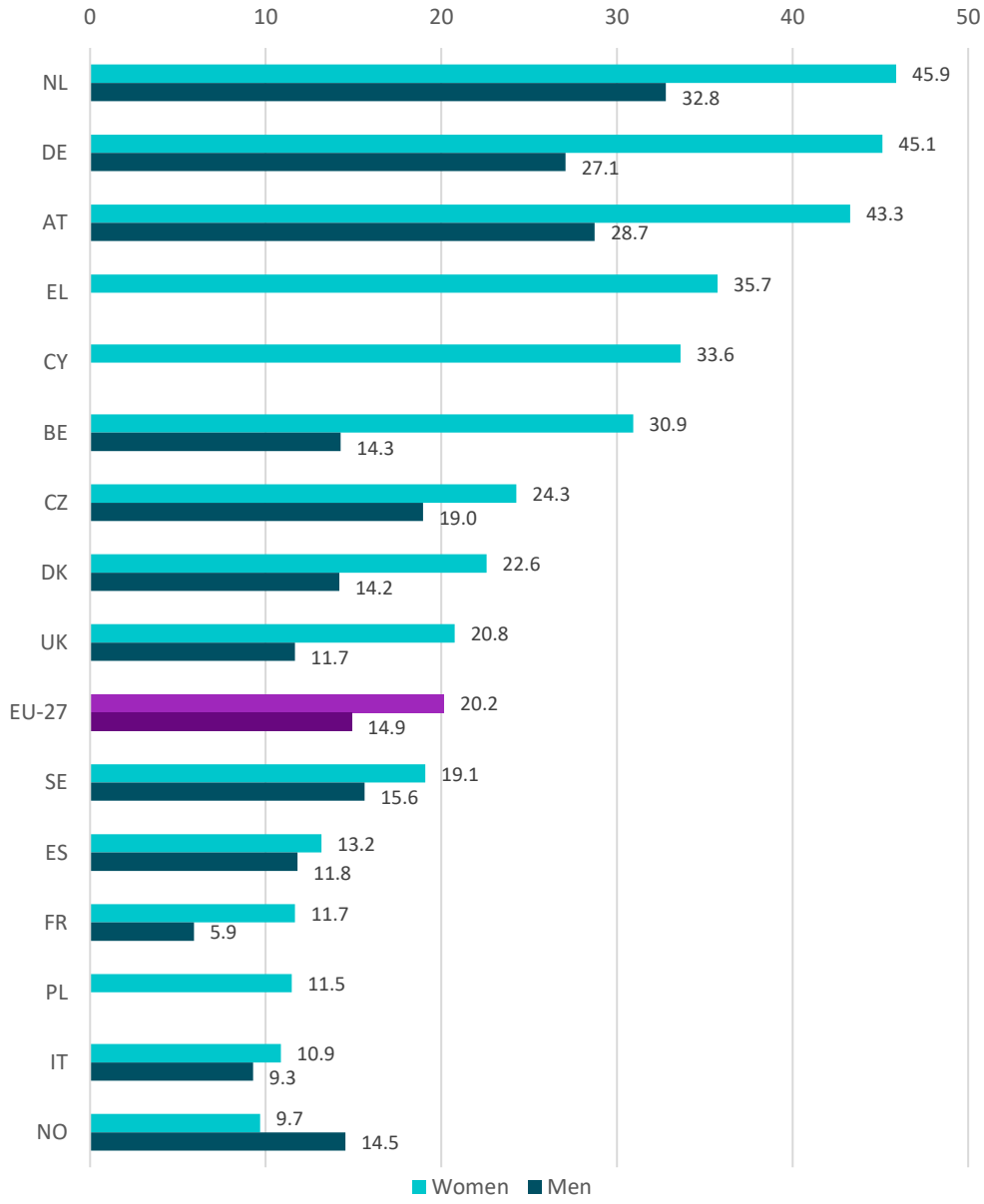
Women researchers are more likely to be employed part-time than men researchers in HES in almost every Member State and Associated Country for which data are available (11 out of 12 countries ([326])). An exception is Norway, where 10 % of women researchers work part-time, compared to 15 % of men researchers. The largest difference between the proportion of women and men researchers working part-time is in Germany (18 pp), closely followed by Belgium (17 pp). The highest proportions of part-time women researchers are in Germany, the Netherlands, and Austria, where over 40 % of women researchers are employed part-time (45 %, 46 %, and 43 %, respectively).

([324]) European Parliament, Policy Department for Citizens' Rights and Constitutional Affairs Directorate-General for Internal Policies, *Precarious work from a gender and intersectionality perspective, and ways to combat it,* 2020, https://www.europarl.europa.eu/RegData/etudes/STUD/2020/662491/IPOL_STU(2020)662491_EN.pdf

([325]) Eurostat defines part-time work as follows: 'A person in a part-time job is assumed to work less than a comparable full-time worker having a job in the same occupation and in the same organisation ('local unit'). For people who can't compare working hours because e.g. they are working alone, the benchmark is the group of people who work in the same occupation and the same branch of industry in the same country' (Eurostat, Statistics Explained, Part-time and full-time employment – statistics, 2023, https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=612325#Main_concept).

([326]) Countries where the proportion of women working part-time was higher than men, where comparable data was available: BE, CZ, DK, DE, ES, FR, IT, NL, AT, SE, UK.

Figure 5.1 Proportion (%) of researchers employed part-time in HES, by sex, 2022



Source: Eurostat - Custom extraction from EU-LFS data.

Notes: Low reliability: Part-time job: BE (Men: 2022), CZ, FR, AT, SE, NO (Women, Men: 2022), EL (Women: 2022), DK (Women, Men: 2021), CY (Women: 2020), Full-time job: BG (Men: 2022), EE, HR, LT, MT, RO, SI (Women, Men: 2022), EL (Women: 2017), CY (Women: 2020, Men: 2022); Values are not publishable because of very low reliability: Part-time job: EE, IE, LV, LT, LU, HU, PT, SI, FI, IS, RS (Women, Men: 2022), EL, HR, CY, PL (Men: 2022), SK (Women: 2022); Full-time job: IE (Women: 2022), IS (Men: 2022), LV, LU, SK (Women, Men: 2022); Definition differs, see metadata: LU, HU (Year: 2022, FTPT: Part-time job, Full time job, Sex: Women, Men); Reference year differs: Women: EL: 2017, DK: 2021, FR: 2018, CY: 2020, PL: 2014, NO: 2016, UK: 2019, Men: DK: 2021, FR: 2017, SE: 2019, NO: 2016, UK: 2019; Data not available: LV, LU, SK, ME, MK (Part-time job, Full-time job: Women, Men: 2022), BG, EE, MT, HU, PT, RO, SI, FI, IS, RS (Part-time job: Women, Men: 2022), IE (Part-time job, Full-time job: Women: 2022, Part-time job, Men: 2022), IS (Full-time job, Men: 2022).

One-fifth (19 %) of women and men researchers work under precarious employment contracts in HES

Figure 5.2 shows the proportion of women and men researchers under precarious contracts in HES. In this context, precarious working contracts are defined as fixed-term contracts lasting three years or less. Understanding how precarious contracts affect women's participation in the labour market and their career advancements can be challenging. As with part-time contracts, it can be difficult to deduce whether precarious contracts hinder women's inclusion in the labour market.

While there is no difference in the proportion of women and men working under precarious employment contracts in HES at EU level (19 % for both), and therefore no gender gap overall, more variation is observed across Member States and Associated Countries. Of the 17 countries for which data are available, the prevalence of precarious contracts in HES is higher among women than men researchers in 12 countries. Portugal has the largest difference between the proportion of women and men researchers working under precarious contracts, at 29 % for women and 23 % for men.

Czechia, Spain, France, Sweden, and Norway all had lower proportions of women researchers employed under precarious contracts compared to men. Of these, France had the largest difference, with 14 % of women researchers employed under these contracts, compared to 19 % of men researchers.

In Germany, Cyprus, Austria, and Finland, over 40 % of women researchers work under precarious contracts, highlighting the prevalence of this employment arrangement. Notably, women constitute a slightly larger proportion of precarious contract researchers compared to men, with differences ranging from 2-3 pp (except for Cyprus, where data for men researchers are unavailable) (see Figure 5.2). In some countries examples of initiatives that support work-life balance exist, as illustrated in Box 28 below.

BOX 28: Measures to support flexible working arrangements

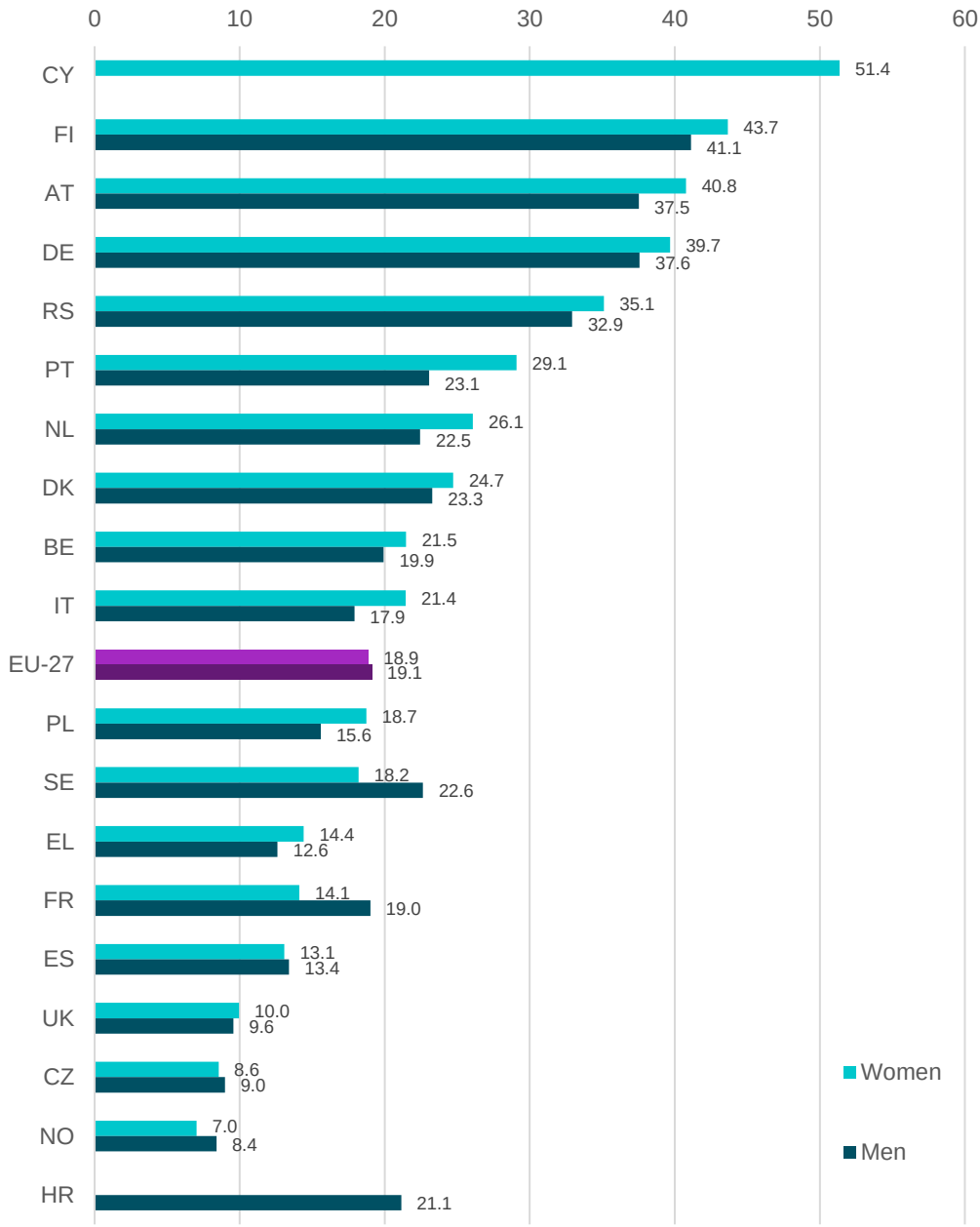
In **Germany**, the Family Friendly HEI audit supports universities, companies and institutions to address the challenge of combining work and family responsibilities for women in research. Supported by an auditor, participating entities assess the state of their family and lifecycle measures and define a strategy to strengthen work and study conditions to help women to balance career and care responsibilities. Since 1998, over 1 800 certificates have been awarded to employers successfully completing the audit ([327]).

Hungary's Research, Development and Innovation Strategy 2021-2030 encourages the implementation of flexible working arrangements through family-friendly measures, such as campaigns to inform researchers and prospective researchers with children about alternative employment opportunities (e.g. part-time or teleworking) and available support (e.g. increased application age) ([328]) (see also Box 46 in Chapter 7).

([327]) Berufundfamilie, Auditing Companies, Institutions and Universities, n.d., https://www.berufundfamilie.de/english-info/audit-at-one-glance

([328]) Hungarian Ministry of Innovation and Technology, Research, Development and Innovation Strategy of Hungary 2021-2030, 2021, https://nkfih.gov.hu/hivatalrol/hivatal-kiadvanyai/magyarorszag-kutatasi-fejlesztesi-innovacios-strategiaja-2021-2030

Figure 5.2 Proportion of researchers in HES working under precarious contracts, by sex, 2022



Source: Eurostat - Custom extraction from EU-LFS data.

Notes: Low reliability: Fixed-term job: BE, DK, HR, AT, SE, RS (Men: 2022), EL (Women 2021, Men: 2020), FR (Women: 2020), CY (Women: 2020, Men: 2021), CZ, PT (Women: 2022, Men: 2021), PL (Women: 2015, Men: 2014), NO (Women, Men: 2016), UK (Women, Men: 2019), RS (Women, Men: 2022), Permanent job: BG, LT, IE (Men: 2022), AT, CY (Women: 2020), MT, EE, HR, RO, SI, RS (Women, Men: 2022); Values are not publishable because of very low reliability: Fixed-term job: IE, LT, LU, HU, SI, SK, SI (Women, Men: 2022), CY (Men: 2021), NL, LV (Men: 2022), Permanent job: LV, LU, NL, SK (Women, Men: 2022), IE, FI (Women: 2022), FR (Men: 2020), CY (Men: 2021), AT, SE, IS (Men: 2022), AT (Women: 2020), UK (Women, Men: 2019); Break in time series: Fixed-term job, Permanent job: EL (Women: 2021), CY (Women: 2020, Men: 2021), PT (Men: 2021); Definition differs, see metadata: Fixed-term job, Permanent job: HU, MT (Women, Men: 2022); Reference year differs: Women: EL: 2021, FR: 2020, CY: 2020, AT: 2020, PL: 2015, NO: 2016, UK: 2019, Men: CZ: 2021, EL: 2020, FR: 2020, CY: 2021, PL: 2014, PT: 2021, NO: 2016, UK: 2019; Data not available: LV, LU, SK, ME, MK (Fixed-term job, Permanent job: Women, Men: 2022), BG, EE, MT, HU, PT, RO, SI, LT, IS (Fixed-term job: Women, Men: 2022), HR (Women: Fixed-term job: 2022), IE (Women: Permanent job: 2022), CY, IS (Permanent job: Men: 2022).

5.2 International mobility of women and men researchers

This section presents indicators on international mobility rates of women and men researchers during their PhD and in their careers. Opportunities for international mobility can contribute to the attractiveness and development of research careers, as well as making the R&I system more competitive, supporting better knowledge production and dissemination, and enabling more diverse career paths ([329]). However, there can be barriers to international mobility, including personal circumstances and difficulties finding an appropriate research position or accessing necessary funding ([330]). Assessing the extent to which women and men experience international mobility can help to explain gender differences in career choices and trajectories. However, the latest data (2021) may be impacted by COVID-19 travel restrictions, which limited the opportunity for international mobility and influenced the ways in which researchers participated in international academic and scientific environments ([331]).

Stronger researcher mobility continues to be one of the new ERA's priorities and a focus of Action 4 of the ERA Policy Agenda 2022-2024. Tools such as the European Competence Framework for Researchers and the ERA4You initiative are intended to improve the geographical and cross-sectoral talent flow and employability of researchers in R&I ([332]). Additionally, the ERA Talent Platform serves as a one-stop-shop for researchers, combining the functionalities of EURAXESS ([333]), and as an observatory for research careers. Recently introduced, the RESAVER Pension Fund ([334]) supports the mobility of research personnel by providing a pan-European pension solution for R&I employees and research organisations. The Commission also launched the ERA Policy Platform in January 2024, which provides a comprehensive overview of current ERA policies, activities, and achievements from Member States.

Box 29: Information about sources used for indicators on international mobility

In previous editions of She Figures, the MORE Survey served as the primary source for assessing the working conditions of researchers, including international mobility. However, due to the discontinuation of the MORE Survey, She Figures 2024 incorporates alternative indicators from Eurostat data (for international mobility of PhD graduates) and bibliometric data (for the indicator 'Ratio of internationally mobile women to men'). These indicators are not directly comparable with previous editions but are the best available proxies.

([329]) Council Recommendation of 18 December 2023 on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe, https://eur-lex.europa.eu/eli/C/2023/1640/oj

([330]) European Commission, MORE4 Study, 2021, https://euraxess.ec.europa.eu/sites/default/files/policy_library/more4_final_report.pdf

([331]) European Commission, Directorate-General for Research and Innovation, *The COVID-19 Impact on Gender Equality in Research & Innovation*, Policy report, Publications Office of the European Union, Luxembourg, 2023, https://op.europa.eu/en/publication-detail/-/publication/cee1e9a7-ea92-11ed-a05c-01aa75ed71a1/language-en

([332]) European Commission, Directorate-General for Research and Innovation, *European Research Area Policy Agenda: Overview of Actions for the period 2022-2024*, Publications Office of the European Union, Luxembourg, 2021, https://op.europa.eu/en/publication-detail/-/publication/490ee6ca-aa58-11ec-83e1-01aa75ed71a1/language-en/format-PDF/source-search

([333]) EURAXESS is a portal produced by the European Commission which provides free support (in the form of job, funding and hosting opportunities, alongside career development guidance) to researchers and innovators aiming to advance their careers by moving to other countries. See: European Commission, EURAXESS, n.d., https://euraxess.ec.europa.eu/

([334]) RESAVER Pension Fund, n.d., https://www.resaver.eu/resaver-pension-fund

Overall, there is little difference in the international mobility of women and men during Doctoral-level studies

The latest data show that in just under half of the countries for which data are available (12 out of 25 ([335])), the proportion of internationally mobile researchers among women graduates is higher than or equal to the proportion of mobile researchers among men graduates. However, the difference between women and men is negligible in most countries (approximately 1 pp or less in 16 countries ([336])). This is in line with findings from She Figures 2021, which showed an EU-27 average difference in the international mobility of women and men of 0.3 pp. However, there are substantial differences in the calculation method of this indicator between these two editions of She Figures, limiting comparability ([337]).

The highest percentage of internationally mobile researchers is recorded for Italy, where PhD graduates who moved to a different country during their Doctoral studies constitute the majority (73 % of women and 69 % of men). Italy also has the largest gap in favour of women, at 5 pp (see Figure 5.3). The biggest gap in favour of men is in Denmark, at 9 pp (19 % for women and 28 % for men).

Latest data suggest that international mobility for both women and men PhD students has decreased since She Figures 2021, which was based on 2019 data. The EU average for international mobility for PhD students in 2019 was 23 % for women and 22 % for men, and in 10 of 27 Member States the proportion of internationally mobile women ([338]) and men ([339]) Doctoral graduates was higher than 20 %. By comparison, the latest data (available in 22 countries ([340])) show that Greece and Italy are the only two countries where more than 20 % of women PhD graduates pursue their studies internationally. Similarly, Denmark, Spain and Italy were the only three (of 20 countries ([341])) where over 20 % of men PhD graduates were internationally mobile in 2021. This could reflect the restrictions and measures imposed during the COVID-19 pandemic, which saw cancellations and delays to numerous mobility schemes, and HEIs offering alternative arrangements, such as remote teaching ([342]). As noted above, comparability is limited due to substantial differences in the calculation method of this indicator between She Figures editions.

[335] Data not available for DE, BE; Estimated: BG, NL; Reference year difference: NL:2018, UK:2019; Definition differs: TR. Countries where the proportion of women graduates who were internationally mobile was higher than that of men: BG, ES, FR, IT, LU, AT, PL, PT, SK, SE, UK, RS.

([336]) BG, CZ, ES, HR, HU, PL, PT, RO, SK, SI, FI, SE, NO, UK, RS, TR.

([337]) Data presented in She Figures 2021 are based on the MORE Survey, whereas these data are taken from Eurostat.

([338]) Countries where the proportion of internationally mobile women researchers was over 22.5 % in 2019: DK, EE, ES, FR, IT, HU, AT, PL, PT, SK (She Figures 2021).

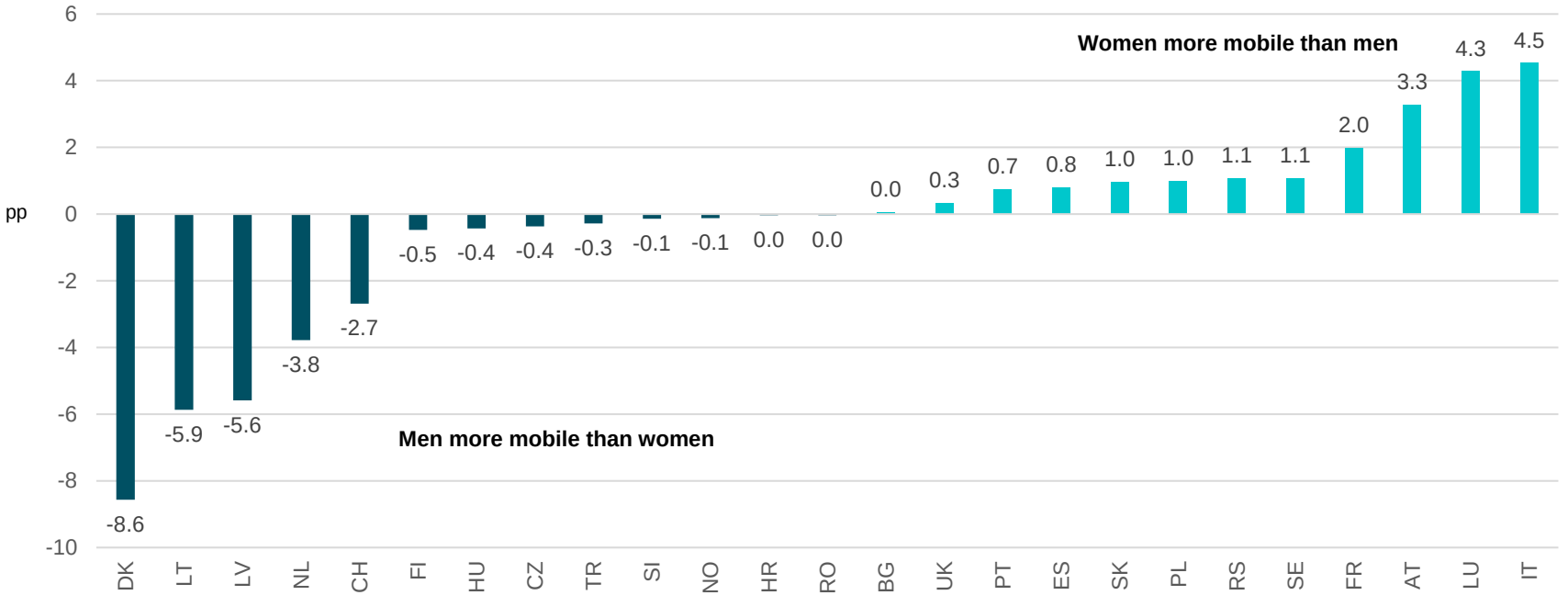
([339]) Countries where the proportion of internationally mobile men researchers was over 22.2 % in 2019: BG, ES, HR, IT, LT, PT, SI, SK (She Figures 2021).

([340]) Latest data on international mobility of women researchers not available for BE, DE.

([341]) Latest data on international mobility of men researchers not available for BE, DE, CY, MT.

([342]) European Commission, *The impact of COVID-19 on higher education: a review of emerging evidence*, Analytical report, 2021, Publications Office of the European Union, Luxembourg, https://op.europa.eu/o/opportal-service/download-handler?identifier=876ce591-87a0-11eb-ac4c-01aa75ed71a1&format=pdf&language=en&productionSystem=cellar&part=

Figure 5.3 Differences (pp) in international credit mobility of women and men PhD graduates ([343]), 2021



Source: Eurostat – Credit mobile graduates (at least three months abroad) by education level, country of destination, type of mobility and sex (educ_uoe_mobc02); Eurostat – Graduates by education level, programme orientation, sex and field of education (educ_uoe_grad02).

Notes: Definition differs, see metadata: TR; Estimated: BG, NL; Not applicable: BE; Reference year differs: NL: 2018, CH:2020, UK: 2019; Data not available: DE (Women and Men graduates and Women and Men graduates who – during their PhD – moved for at least three months to a country other than that where they attained their PhD), BE (Women and Men graduates who – during their PhD – moved for at least three months to a country other than that where they attained their PhD).

([343]) Credit mobility is defined as '*temporary tertiary education or/and study-related traineeship abroad within the framework of enrolment in a tertiary education programme at a 'home institution' (usually) for the purpose of gaining academic credit (i.e. credit that will be recognised in that home institution)'*. See: EIGE, Credit mobile graduates (at least 3 months abroad) by education level, type of mobility scheme, type of mobility and sex, n.d., https://dgs-p.eige.europa.eu/data/metadata/ta_eductrain_parteduc_mobil__educ_uoe_mobc01

Bibliometric data suggest that women researchers are much less internationally mobile than men

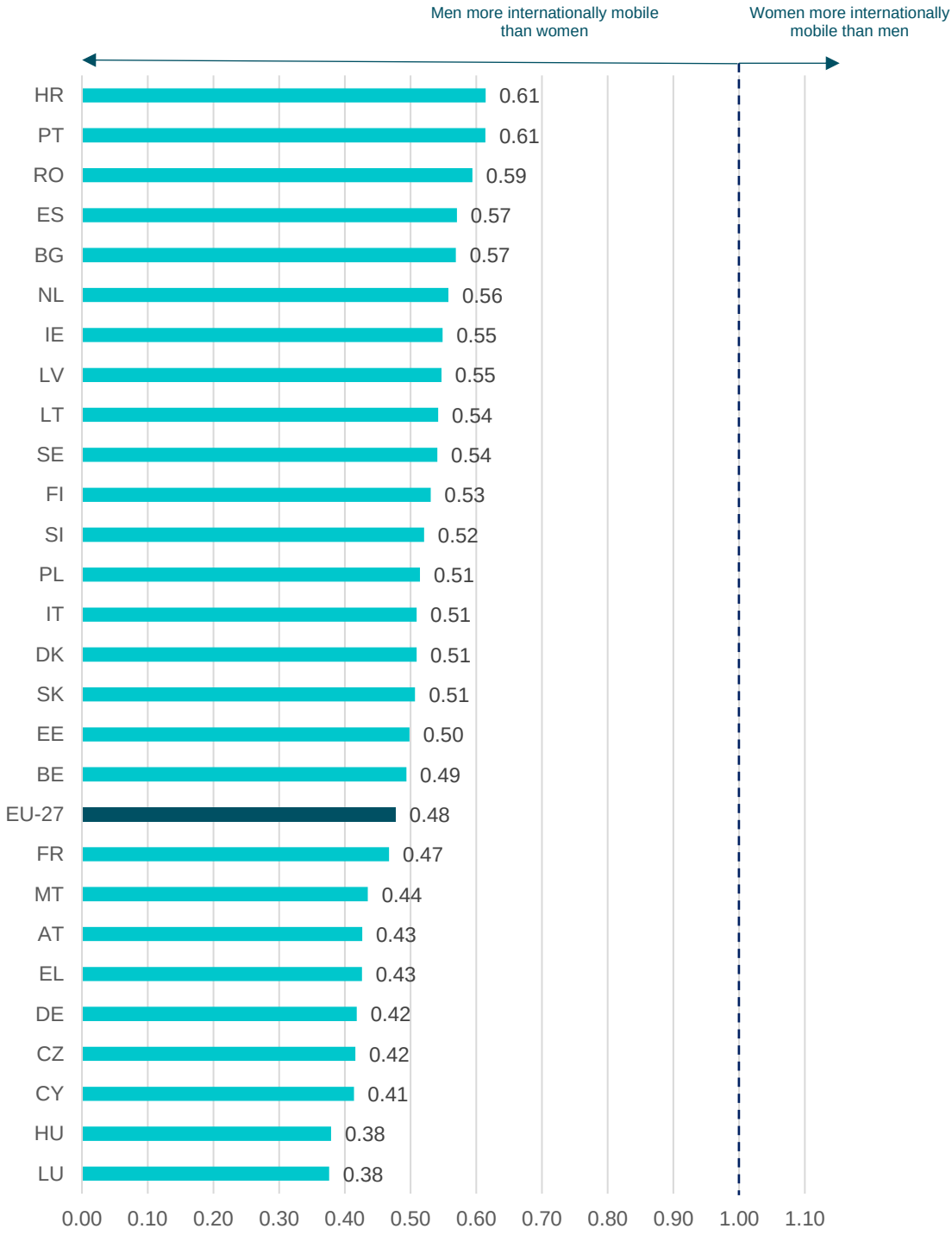
Despite the similar rates of international mobility between women and men, gender differences are identified in relation to length of stay. Women researchers with family obligations and single parents tend to consider only short research visits due to their caregiving demands. Other gender expectations, such has the fact that, historically, women followed their partners and not the other way around, also impact women's choices to be mobile researchers ([344]).

While Figure 5.3 shows the international mobility of women and men during their PhD studies, Figure 5.4 shows the differences in the international mobility of women and men during their careers through the ratio of internationally mobile women active authors ([345]) compared to men in 2022. This indicator uses affiliation history in the published papers of active authors as a means of determining international mobility. Authors are considered internationally mobile where they have publications with affiliations in at least two countries. A value of 1 indicates that the proportion of women who are internationally mobile is equal to the proportion of men, while a value of less than 1 shows a lower proportion of women who are internationally mobile and a value of more than 1 shows a higher proportion of women who are internationally mobile compared to men. This indicator is a proxy for the indicator presented in She Figures 2021 'Sex differences in international mobility of researchers in HES in post-PhD stages', which can no longer be produced due to the discontinuation of the MORE Survey. A ratio of 0.48 was observed at EU level, indicating that women are much less internationally mobile than men. This trend is consistent across all Member States, with ratios ranging from 0.38 (LU, HU) to 0.61 (HR, PT).

([344]) European Commission, Study on mobility patterns and career paths of EU researchers, 2010, https://euraxess.ec.europa.eu/sites/default/files/policy_library/more_hei_report_final_version.pdf .

([345]) 'Active authors' are those who have produced 10+ papers over the period 2013 to 2022, and at least one paper in the previous five years, or those who produced a minimum of four papers in the last five years.

Figure 5.4 Ratio of internationally mobile women compared to men, 2022



Source: Scopus.

Notes: Active authors are defined as those who have published 10+ papers in 2013-2022 and at least one paper in the last five years, or those who produced four or more papers in the last five years.

5.3 Country differences in R&D expenditure per researcher

The level of national investment in R&D is relevant in assessing the working conditions of researchers. Sufficient investment allows for better resources, facilities and support systems, and enables more inclusive policies such as flexible working hours. This section looks at the levels of R&D expenditure by country and sector to gain insight into the correlation between the presence of women researchers and national R&D expenditure.

At EU level, the latest data ([346]) show R&D expenditure of just under 160 000 purchasing power standards (PPS) per capita researcher in full-time equivalent (FTE) roles in 2021. This is lower than comparable expenditure in other competing economies such as the US (282 000 PPS, based on 2019 data) and Japan (167 000 PPS, based on 2021 data). However, EU level R&D expenditure stands above some other G20 economies such as Türkiye (142 000 PPS, based on 2021 data) and UK (120 000 PPS, based on 2019 data).

At country level, the latest available data show significant variation in expenditure per researcher, ranging from 50 000 PPS (BA) to 221 000 PPS (DE ([347])).

In countries with a high representation of women among researchers, the relative R&D expenditure tends to be lower

Similar to previous editions of She Figures, the latest data show that the proportion of women among researchers and R&D expenditure per researcher continues to have an inverse correlation (see Figure 5.5). At EU level, women made up 30 % of the R&D workforce in 2019 and the R&D expenditure was 160 000 PPS. In 2021, of the 30 countries for which data are available, women researchers account for over 40 % of the R&D workforce in 11 countries ([348]). In all of these countries, R&D expenditure per capita was below 100 000 PPS, except in Croatia (117 000 PPS), Romania (114 000 PPS) and Iceland (157 000 PPS).

Conversely, of 19 countries where the proportion of women researchers is less than 40 %, only three (Greece, Hungary, Slovakia) have R&D expenditure lower than 100 000 PPS. Notably, Germany and Austria have some of the highest R&D expenditure (221 000 and 205 000 PPS, respectively) but the lowest representation of women researchers (23 % and 25 % of the R&D workforce, respectively). While the data indicate an inverse correlation between R&D expenditure and women's representation, the exact relationship between R&D expenditure and women's representation as researchers cannot be inferred from these data. One possible explanation is that research careers are less attractive in countries where there are fewer resources in research (as reflected in lower R&D expenditure), to the extent that this impacts research remuneration, funding opportunities and research infrastructure. Therefore, men may be less likely to select research careers in countries with lower R&D expenditure, and therefore it is easier for women to access such careers. Conversely, in countries with greater R&D expenditure, women may face greater barriers to entry.

([346]) Draws from 2021 data. However, the latest EU level data for this indicator, as presented in Figure 5.5, are from 2019, due to the availability of data on women researchers.

([347]) Data for DE from 2019.

([348]) BG, HR, LV, LT, PT, RO, IS, BA, ME (2019), MK (2020), RS.

Spending per researcher in R&D continues to be highest in BES across most countries

At EU level, the latest data show that R&D expenditure per researcher is highest in BES (185 000 PPS), followed by GOV (169 000 PPS), and HES (107 000 PPS).

Similar trends are observed at country level. In 26 of the 38 countries for which data are available, expenditure per researcher is highest in BES compared to HES and GOV ([349]) (see Table 5.1). In BES, 11 ([350]) of 39 countries recorded expenditure per researcher higher than 200 000 PPS, compared to seven ([351]) of 38 countries in GOV, and none in HES.

The highest overall R&D expenditure in BES is in the US (292 000 PPS) and Luxembourg (285 000 PPS), while the lowest is in North Macedonia (49 000 PPS) and Bulgaria (81 000 PPS).

However, of the three sectors, the highest overall spending per researcher is recorded in GOV in the UK (362 000 PPS) and Japan (323 000 PPS). Other countries with notably high expenditure per researcher in GOV are South Korea (265 000 PPS), Germany (237 000 PPS), and Austria (229 000 PPS), while the lowest expenditure is in Malta (27 000 PPS) and Bosnia and Herzegovina (32 000 PPS).

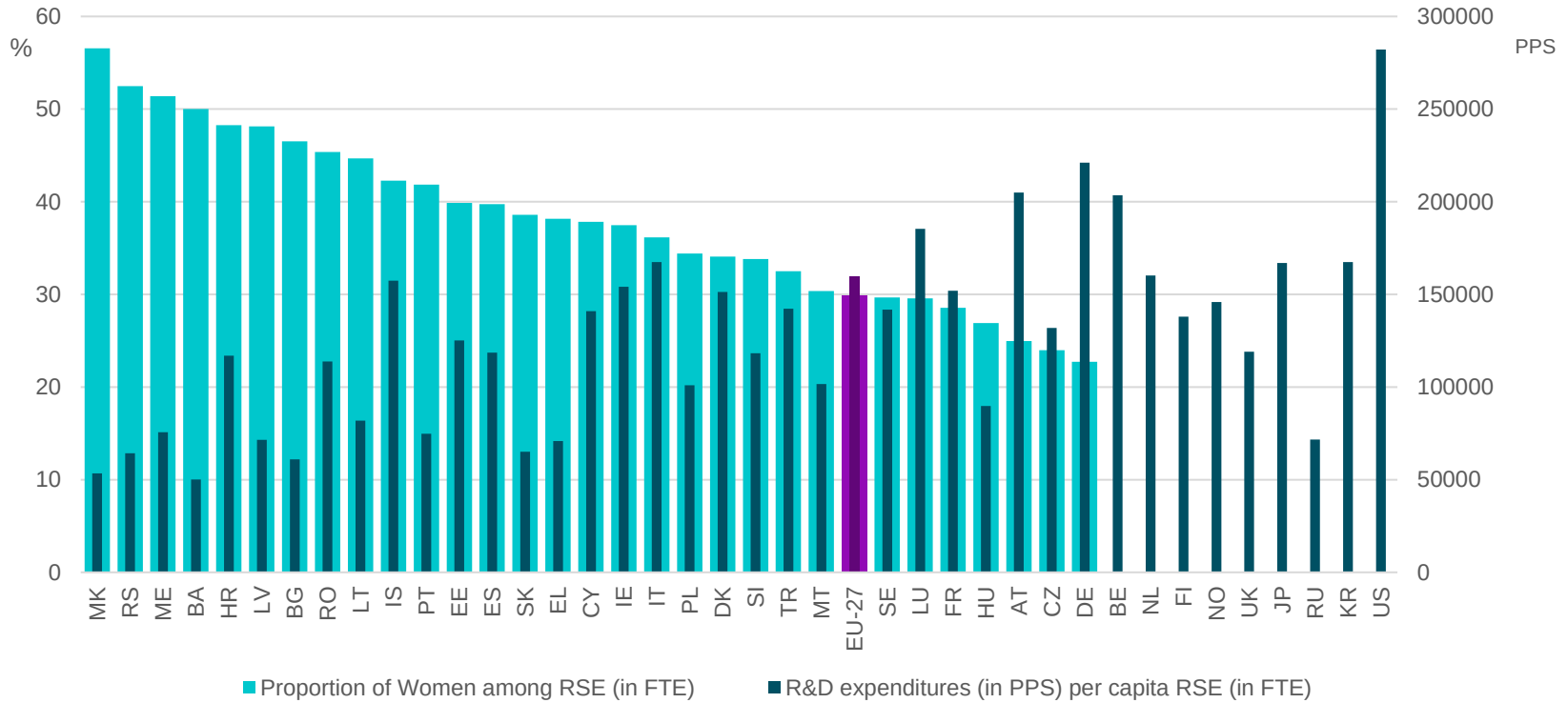
In HES, expenditure per researcher ranged from 19 000 PPS in Bulgaria to 181 000 PPS in the Netherlands.

([349]) For R&D expenditure (in PPS) per researcher in FTE data, only BES data are available for the US, thus comparison with other sectors is not possible.

([350]) BE, DE, IE, HR, IT, LU, AT, RO, IS, RS, US (BES only).

([351]) BE, DE, IE, AT, UK, JP, KR.

Figure 5.5 Proportion (%) of women among researchers (FTE) and R&D expenditure (PPS) per capita researcher (FTE), 2021



Source: Eurostat – Research and development statistics (online data codes: rd_p_persocc, rd_e_gerdtot).

Notes: Latest available year for most of the countries is 2021. Definition differs, see metadata: Researchers, FTE: FI, JP; R&D expenditure: US; Estimated: Researchers, FTE: EU-27, US - R&D expenditure: EU-27; Provisional: Researchers, FTE: DK -- R&D expenditure: DK, UK; Researchers and R&D expenditure; Break in time series: Researchers, FTE: BE, SE; Reference year differs: EU-27: 2019, DK: 2019, DE: 2019, FR: 2017, UK: 2019, ME: 2019, MK: 2020, RU: 2015, KR: 2015, US: 2019; Data not available: Researchers, FTE: BE, NL, NO, JP, KR, US (Women), UK, RU (Women, Total) -- R&D expenditure (UK, RU).

Table 5.1 R&D expenditure (PPS) per capita researcher (FTE), by sector of employment, 2021

Country	HES	GOV	BES
EU-27	107 493	168 720	185 075
BE	113 581	207 201	246 116
BG	19 229	56 825	80 717
CZ	92 191	126 868	155 491
DK	135 150	146 363	174 104
DE	153 862	236 897	246 208
EE	93 473	116 652	161 828
IE	49 413	201 731	262 343
EL	41 858	81 287	114 760
ES	69 410	131 594	170 075
FR	114 492	197 410	163 370
HR	73 901	110 509	206 052
IT	111 514	151 581	221 343
CY	110 074	144 956	173 525
LV	52 751	92 142	103 643
LT	53 481	84 109	129 849
LU	104 226	199 734	285 074
HU	51 758	59 001	111 688
MT	73 849	26 600	138 477
NL	181 084	149 894	153 535
AT	164 935	228 970	221 638
PL	79 870	78 973	119 897
PT	48 671	110 122	101 447
RO	32 819	100 396	207 492
SI	66 423	93 304	144 889
SK	30 358	66 024	134 390
FI	109 556	128 501	152 927
SE	178 666	149 963	132 450
IS	95 964	87 646	212 570
NO	128 012	162 407	155 428
UK	50 547	361 768	193 354
BA	35 748	32 117	162 875
ME	55 763	99 554	82 848
MK	55 727	49 322	49 254
RS	27 058	76 366	276 894
TR	165 253	172 637	130 409
JP	101 695	322 898	174 643
RU	33 415	68 180	91 464
KR	132 776	265 056	162 786
US	-	-	292 446

Source: Eurostat – Research and development statistics (online data codes: rd_p_persocc, rd_e_gerdtot).

Notes: Latest available year for most of the countries is 2021. Definition differs, see metadata: Researchers, FTE: DE (HES, GOV), NL (GOV), FI, JP (HES, GOV, BES), NO (BES)-- R&D expenditure: DE (GOV), HU (HES, GOV, BES), NL (GOV); Estimated: Researchers, (FTE), HES, GOV: IE, IT; R&D expenditure, HES, GOV: IE, IT, EU-27 (Researchers and R&D expenditure in all sectors); Provisional: DK, UK (Researchers and R&D expenditure in all sectors); Break in time series: Researchers, FTE: BE, NO (BES), SE (HES, GOV, BES); Reference year differs: UK: 2019, ME: 2019, MK: 2020, RU: 2015, KR: 2015, US: 2019; Data not available: Researchers, (FTE), HES, GOV: US (Women, Total) - R&D expenditure, HES, GOV (US).

5.4 Institutional change to promote gender equality in research organisations

This section explores the extent to which research organisations have introduced measures promoting institutional change towards gender equality, notably the inclusion of information on actions and measures towards gender equality on their websites. The GEP eligibility criterion introduced under Horizon Europe (see Box 30) requires organisations to implement GEPs in order to access funding. GEPs must be formal documents, published on the institutions' website, demonstrating a commitment to gender equality through set objectives and detailed actions. This aligns with the 2021 Ljubljana Declaration on Gender Equality in Research and Innovation, which recognises GEPs as a key instrument for promoting institutional change ([352]).

Box 30: Policies, initiatives, and requirements for (inclusive) GEPs at EU and national level

At **EU level**, a GEP eligibility criterion was introduced into Horizon Europe calls for proposals with deadlines in 2022 and beyond. To meet the criterion, a GEP needs to meet four process-related requirements:

- Publicly available and signed by top management;
- Dedicated resources and expertise to ensure it can be implemented;
- The organisation must collect and monitor data disaggregated by sex/gender as part of their GEP;
- Must include training on gender equality.

Additionally, five thematic areas are recommended for inclusion within the GEP:

- Work-life balance and organisational culture;
- Gender balance in leadership and decision-making;
- Gender equality in recruitment and career progression;
- Integration of the gender dimension into research and teaching content;
- Measures against gender-based violence, including sexual harassment.

Implementing GEPs is a longstanding approach to achieving institutional change in R&I, as reflected in the European Commission's 2012 Communication on the ERA ([353]). The European Commission's 2020 Communication on the new ERA recognises the need to develop inclusive GEPs, as well as the need to address diversity by opening policy to intersections with other social categorisations (e.g. ethnicity, disability and sexual orientation). It proposes to build on Horizon Europe to develop inclusive GEPs with Member

([352]) Council of the European Union, Ljubljana Declaration Gender Equality in Research and Innovation, 2021, https://data.consilium.europa.eu/doc/document/ST-12044-2021-INIT/en/pdf

([353]) 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, COM(2012) 0392 final, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52012DC0392

States and stakeholders ([354]). This is reflected in Action 5 of the ERA Policy Agenda 2022-2024, which aims to develop a policy coordination mechanism to support all aspects of gender equality through inclusive GEPs and policies, and a dedicated EU network for their implementation.

The EU has implemented several measures to further support the development and implementation of (inclusive) GEPs:

- Funding projects that support GEP implementation, comprising Horizon-Europe funded projects dedicated to the implementation of inclusive GEPs, going beyond the requirements set by the GEP eligibility criterion. For example, this set of projects includes 'Twinning Research and Innovation Institutions to Design and Implement Inclusive GEPs' (NEXUS) ([355]), 'Assessment and implementation of Agriculture and Life Science Universities' first Gender Equality Plans in widening countries' (AGRIGEP) ([356]), 'Securing Sports Education Through Innovative and Inclusive Gender Equality Plans' (SUPPORTER) ([357]) and 'Building Gender Equality through gender budgeting for Institutional Transformation' (BUDGET IT) ([358]).
- Introducing an EU Award for Gender Equality Champions ([359]) in 2022 to complement and boost the Horizon Europe eligibility requirement for HEIs and research organisations to have a GEP, by rewarding those institutions for their achievements in implementing GEPs.

Member States have implemented GEP requirements at national level. Drawing on findings from a 2022 survey of national authorities and research funding organisations (RFOs), GENDERACTIONplus reports that GEPs are mandatory in the half of the 16 countries surveyed (Belgium (Flemish Community), Ireland, Greece, Spain, Croatia, Austria, Sweden, Norway) and apply predominantly to public sector entities. Czechia and Denmark have mechanisms in place to support GEP implementation. Findings from previous studies indicate that GEP requirements are also in place in Finland, France, and Germany. GENDERACTIONplus notes that Belgium (French-speaking Community), Lithuania, Poland, Portugal and Slovakia, do not have national requirements for GEPs ([360]).

Research for She Figures 2024 identified GEP requirements in Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Austria, Finland and Sweden. In Slovenia, Action 6.4.1 of the 2022 Resolution on the Slovenian Scientific Research and Innovation

([354]) European Commission, Directorate-General for Research and Innovation, *Approaches to inclusive gender equality in research and innovation (R&I)*, 2022, Publications Office of the European Union, Luxembourg, https://european-digital-innovation-hubs.ec.europa.eu/system/files/2023-05/Approaches%20to%20inclusive%20gender%20equality%20in%20research.pdf

([355]) European Commission, Twinning Research and Innovation Institutions to Design and Implement Inclusive GEPs factsheet, 2023, https://cordis.europa.eu/project/id/101094949

([356]) European Commission, Assessment and implementation of Agriculture and Life Science Universities' first Gender Equality Plans in widening countries factsheet, 2023, https://cordis.europa.eu/project/id/101094158

([357]) European Commission, SUPPORTER factsheet, 2023, https://cordis.europa.eu/project/id/101094529

([358]) European Commission, Building gender equality through gender budgeting for institutional transformation factsheet, 2023, https://cordis.europa.eu/project/id/101094391

([359]) European Commission, Directorate-General for Research and Innovation, *EU Award for Gender Equality Champions*, n.d., https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/prizes/eu-award-gender-equality-champions_en

([360]) GENDERACTIONplus, *Deliverable reports*, 2023, https://genderaction.eu/wp-content/uploads/2023/07/GENDERACTIONplus_D6.1_Benchmarking-analysis-of-monitoringevaluation-of-GEPs.pdf

Strategy 2030 includes 'the introduction of institutional equality plans gender as a mandatory strategy paper of institutions in the field of research; and innovations that receive public funding for their operations' ([361]). Malta's Research and Innovation Strategic Plan 2023-2027 includes specific recommendations on gender mainstreaming in R&I, including national GEP requirements and the introduction of a national certification scheme for GEPs.

Some countries have developed guidelines and policies to support the implementation of all mandatory requirements set out in Horizon Europe, as well as the five recommended thematic areas. For example, the 2022 review of Gender Equality in Irish HEIs made several new recommendations to promote gender equality within HEIs to align with Horizon Europe. These include: a set of national requirements incorporating the four Horizon Europe process-related requirements; requiring HEIs to have a vice-president or equivalent with responsibility for equality, diversity and inclusion, who is a member of the HEI's senior executive/management team; recommendations on areas of leadership; organisational culture; teaching, learning and research; intersectionality; career development; precarity and data capture, analysis and reporting ([362]).

Horizon Europe mandates that GEPs be publicly available. As such, research organisations are expected to have information on their actions and measures towards gender equality available on their websites. Accordingly, they should be identified as organisations that take actions or measures towards gender equality.

A key tool for institutional change is the development and implementation of targeted actions and strategies aimed at promoting gender equality in RPOs. Introduced for the first time in She Figures 2021, the following indicator uses web-scraping techniques to identify whether organisations' websites contain relevant information, based on key phrases (see box below). The search was based on a specific list of terms and phrases, translated into each country's official language(s).

There are a few limitations to this indicator which should be noted. Firstly, it is possible that some organisations include information about gender equality actions on their websites, but without using any of these key phrases. Secondly, information included as PDF documents within a website would not be captured by this approach. Therefore, it is likely that some organisations describe relevant measures but in a format that remains undetected. As a result, the extent of gender equality initiatives may be understated. This underscores the need for supplementary methods to achieve a more comprehensive assessment. The European Commission has made progress towards this with a pilot GEP compliance check at the end of 2023 among a randomly selected set of beneficiaries and affiliated entities of projects that are funded under the current Framework Programme. Improvements have been made to the search terms used and the organisations included in She Figures 2024 compared to the previous edition to increase accuracy of this indicator. However, this somewhat limits the comparability of this indicator compared to She Figures 2021.

([361]) National Assembly of the Republic of Slovenia, Resolution on the Slovenian Scientific Research and Innovation Strategy 2030, 2022, http://www.pisrs.si/Pis.web/pregledPredpisa?id=RESO133

([362]) Higher Education Authority (HEA), *Report of the Expert Group: 2nd HEA National Review of Gender Equality in Irish Higher Education Institutions*, 2022, https://hea.ie/assets/uploads/2022/03/Report-of-the-Expert-Group-2nd-HEA-National-Review-of-Gender-Equality-in-Irish-Higher-Education-Institutions.pdf

Box 31: Methodology used to monitor research organisations' measures towards gender equality

Web-scraping techniques were used to collect data to calculate the proportion of research organisations whose websites publish information on actions and measures towards gender equality. This entailed searching the content of the institutional websites of more than 6 500 HEIs and other PROs for particular terms or phrases. This was completed using a Google search application programming interface, SerpApi.

The searches used search terms in the official language(s) of the participating countries. The search terms (in English) are:

- Gender equality plan
- Equal opportunities officer
- Equal participation officer
- Eliminate/prevent sex discrimination
- Eliminate/prevent harassment
- Harassment policy
- Gender diversity committee
- Gender diversity office
- Gender diversity task force
- Gender equality body
- Gender equality policy
- Gender equality action
- Gender equality training
- Gender Action Policy
- Gender Action Plan
- Gender Mainstreaming
- Gender Focal Point
- Gender balance
- Gender dimension
- Gender-responsive innovation
- Gender-transformative
- Gender perspective
- Gender empowerment
- Women's careers
- Work-life balance
- Gender-based violence
- Equal treatment office
- Equal treatment officer
- Anti-discrimination action
- Diversity office
- Diversity officer
- Equality office
- Equality officer
- Inclusion office
- Inclusion officer
- Gender equality charter

There is considerable variation between countries in the proportion of research organisations whose websites mention actions and measures towards gender equality

Of the 36 countries for which web-scraping was conducted, 13 ([363]) were identified as having 50 % or more of their research organisations taking actions or measures towards gender equality, based on content that could be detected in the web-scraping. The highest performers are Germany, Italy and Ireland, at 85 %, 80 %, and 78 %, respectively. Germany and Ireland both have national GEP requirements ([364]). Aligning with the high performance against this indicator, the EU-funded INSPIRE project similarly identified Ireland as advanced

([363]) BE, CZ, DK, DE, IE, EL, IT, LV, NL, PL, SE, IS, NO.

([364]) In Germany, the Federal Equality Law (updated in 2021) obliges non-university public research institutions to issue a GEP (Ministry of Justice, Federal Equality Law, 2021, https://www.gesetze-im-internet.de/bgleig_2015/index.html). Requirements for GEPs in HEIs are imposed at regional level (ERAC SWG, *Report by the ERAC SWG on Gender in Research and Innovation on Gender Equality Plans as a catalyst for change,* 2021, https://data.consilium.europa.eu/doc/document/ST-1202-2021-INIT/en/pdf). In Ireland, the Gender Action Plan for Higher Education Institutions 2018-2020 sets actions that HEIs must take to promote gender equality, including developing and implementing Gender Equality Action Plans (HEA, *Accelerating Gender Equality in Irish Higher Education Institutions – Gender Action Plan 2018-2020*, 2018, https://hea.ie/assets/uploads/2018/11/Gender-Equality-Taskforce-Action-Plan-2018-2020.pdf). The 2022 National Review of Gender Equality in Irish Higher Education Institutions further recommended the national requirement that all GEPs must be published online and signed by the President (HEA, *Report of the Expert Group: 2nd HEA National Review of Gender Equality in Irish Higher Education Institutions*, 2022, https://hea.ie/assets/uploads/2022/03/Report-of-the-Expert-Group-2nd-HEA-National-Review-of-Gender-Equality-in-Irish-Higher-Education-Institutions-1.pdf).

in its systematic and comprehensive gender equality efforts ([365]). In the 2022 edition of the EU Award for Gender Equality Champions, three different research organisations in Ireland were awarded a prize in all three categories ([366]).

Somewhat surprisingly, given the amount of policy focus dedicated to GEPs in recent years and the inclusion of national requirements in several Member States and Associated Countries, less than one-third of research organisations are identified as taking actions or measures towards gender equality in more than one-third of countries (13 of 36) ([367]). None of these 13 countries have national GEP requirements, other than Finland. In contrast, of the 13 countries with the highest proportions of research organisations taking actions or measures towards gender equality, eight have national GEP requirements ([368]).

These results must once again be interpreted with caution, as the web-scraping did not capture documents in PDF format and it is therefore likely that some organisations with GEPs or other commitments towards gender equality were not detected.

In most countries, more than 50 % of HEIs mention actions and measures towards gender equality on their websites ([369])

Similar to She Figures 2021, data from 2023 indicate that in 18 of 27 Member States ([370]), over half of HEI websites include information on actions and measures towards achieving gender equality. The highest proportions are recorded in Ireland (100 % ([371])), Italy (99 %), Spain (95 %) and Portugal (94 %) (see Figure 5.7).

In 2023, five countries (BG, EE, SK, FI, SI) have fewer than 40 % of HEIs with gender equality actions on their websites, compared to two in 2020 (PL, SI). However, there are indications of increases in Poland and Slovenia (from 37 % of HEIs in 2020 to 55 % in 2023, and from 26 % in 2020 to 37 % in 2023, respectively).

Several countries have taken steps to promote gender equality in R&I, as illustrated by the examples in Box 32.

Box 32: Member States' efforts to align with the goals of Horizon Europe to promote gender equality in R&I

In 2020 in **Czechia**, the Czech Academy of Sciences developed a handbook on 'How to Make a Difference: Gender Equality in a Research Institution' ([372]). In 2022, two e-learning courses were created, 'Gender Equality in the Institution' and 'Gender Equality Plans I + II' ([373]), with financial support from the government. These educational materials targeted personnel responsible for the gender equality agenda and the creation of a GEP in connection with the requirements of Horizon Europe.

Cyprus developed a guiding document to support gender equality and better implementation of GEPs at institutional level, 'Going beyond the formal adoption of a gender equality plan: Guide for universities' ([374]). This initiative stems from the findings of the project, 'Taking a Reflexive Approach to Gender Equality for Institutional Transformation' (TARGET), funded under Horizon 2020 ([375]). Published by the Research

and Innovation Foundation in 2020, the guide serves as a resource for universities to effectively implement GEPs.

In **Estonia**, an international conference was organised by the Estonian Research Council in 2022. GEARING-Roles ([376]) promoted best practices in implementing GEPs at research institutions and discussed the current state of gender equality and the gender dimension in the Estonian research system.

HEIs continue to be more likely to take actions and measures towards gender equality than PROs

The latest findings are consistent with She Figures 2021, which found that the proportion of PROs whose websites promoted gender equality actions or measures was comparatively lower than HEIs. There are some exceptions: Germany, Greece, Luxembourg, Poland and Slovenia. The proportion of PROs that take action towards gender equality varies significantly at country level, with values ranging from 0 % (BA) to 86 % (DE).

Similar to the pattern for HEIs, the data suggest that measures and actions towards gender equality are less likely to be published on PROs' websites in 2023 than in 2020 (based on She Figures 2021). Of the 28 countries for which data are available for 2023 and also reported in She Figures 2021, an increase between these two time points is observed in only eight countries ([377]). However, these results should be interpreted with caution, as they may be explained in part by improvements to the methodology for this indicator since She Figures 2021.

([365]) Caprile M et al. (2023) INSPIRE D2.2 4 x Country-cluster reports, Member States country information. Available at: https://inspirequality.eu/sites/default/files/2023-12/INSPIRE_D2.2_4xCountryClusterReports_29EP23_submitted_0.pdf .

([366]) European Commission, (n.d.). EU Award for Gender Equality Champions. 2022 edition details and winners. Available at: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/prizes/eu-award-gender-equality-champions_en#ref-2022-edition-details-and-winners .

([367]) EE, MT, LT, FI, SK, BA, TR, AL, HU, MD, UA, BG, XK.

([368]) The top performing 13 countries were: DE, IT, IE, NL, BE, SE, PL, CZ, IS, DK, EL, LV, NO. Of these, DE, IE, BE, SE, CZ, DK, EL and NO were identified as having mandatory GEP requirements at national or regional level.

([369]) 21 countries where over 50 % of HEIs mention actions and measures towards gender equality on their websites are: BE, CZ, DK, DE, IE, ES, FR, HR, IT, CY, LV, LT, NL, AT, PL, PT, RO, SE, IS, NO, IL.

([370]) BE, CZ, DK, DE, IE, ES, FR, HR, IT, CY, LV, LT, NL, AT, PL, PT, RO, SE.

([371]) This is based on a small sample where 16 out of 16 HEIs in Ireland included information on actions or measures towards gender equality on their websites.

([372]) Gender a věda, Crofony, T., Dvořáčková, J., Rypáčková, P. and Víznerová, H., 'Jak na změnu: Genderová rovnost ve výzkumné instituci', *Sociologický ústav AV ČR*, 2020, v.v.i, https://genderaveda.cz/wp-content/uploads/2021/02/NKC_Jak-na-zmenu-A5_2021_FINAL.pdf

([373]) Gender a věda, *Nový e-learning k plánům genderové rovnosti*, n.d., https://genderaveda.cz/novy-e-learning-k-planum-genderove-rovnosti/

([374]) TARGET, Caprile, M., Sepou, K. and Wroblewski, A., *Going Beyond the Formal Adoption of a Gender Equality Plan: Guide for Universities*, Cyprus, 2020, https://www.research.org.cy/wp-content/uploads/Cyprus-Guide-Universities_EN.pdf

([375]) European Commission, *Horizon 2020, Taking a Reflexive approach to Gender Equality for institutional Transformation*, CORDIS EU research results, n.d., https://cordis.europa.eu/project/id/741672

([376]) Estonian Research Council, GEARING-Roles, Annual conference on gender equality in research and higher education, 2022, https://etag.ee/en/activities/gender-mainstreaming-in-research/gearing-roles/gearing-roles-international-conference-2022/

([377]) BE, CZ, DE, EL, IT, NL, PL, SI.

The findings for HEIs are based on a low sample size in 12 countries ([378]), while the findings for PROs are based on a low sample size in 11 countries ([379]). Therefore, in addition to the fact that not all document formats are captured by this analysis, it is important to note that a small sample size can result in large percentages. As such, these findings should be treated with caution.

BOX 33: Initiatives to support gender-sensitive teaching in higher education

In **Spain**, Xarxa Vives d'Universitats is an NGO that coordinates the joint work of 22 universities in Valencia participating in the ERASMUS+ programme ([380]). It has developed 17 discipline-specific guides ([381]) for incorporating a gender perspective in university teaching ([382]), together with guides for specific teaching methods.

Each guide provides recommendations for adapting teaching content and the learning environment, and highlights key challenges and possible solutions for specific problems. For example, the History guide highlights that failing to take a gender perspective on history can lead to a biased and incomplete understanding of the past. The guide offers examples of good practices, teaching resources and consultation tools that allow students to study the past in a critical and gender-informed manner.

The guides are available in Catalan, Spanish, and English, with 16 000 downloads as of January 2024. They are recognised as good practices by EIGE in its Gender Equality in Academia and Research (GEAR) tool ([383]), as well as being identified as a resource supporting organisations to meet Horizon Europe requirements (e.g. integration of the gender dimension into research and teaching content).

In **Slovakia**, the Comenius University in Bratislava developed a handbook on gender sensitive education in 2022, which aims to raise teachers' awareness of common mistakes in teaching methods, share good practices, and encourage self-reflection on how gender relations are anchored in and shape their course syllabi and research papers ([384]).

([378]) Numbers of HEI websites scraped in 2023: DK (17/26), EE (7/18), IE (16/16), HR (13/23), CY (15/27), LV (13/24), LU (2/8), MT (3/7), IS (6/7), BA (7/16), MD (6/25), AL (4/15).

([379]) Number of PRO websites scraped in 2023: IE (2/7), CY (2/19), LV (9/19), LU (4/6), MT (2/9), IS (5/14), BA (0/16), MD (2/21), AL (2/16), XK (1/13), IL (5/16).

([380]) European Commission, Erasmus+, Higher education institutions holding an ECHE, 2021, 2027, n.d., https://erasmus-plus.ec.europa.eu/document/higher-education-institutions-holding-an-eche-2021-2027

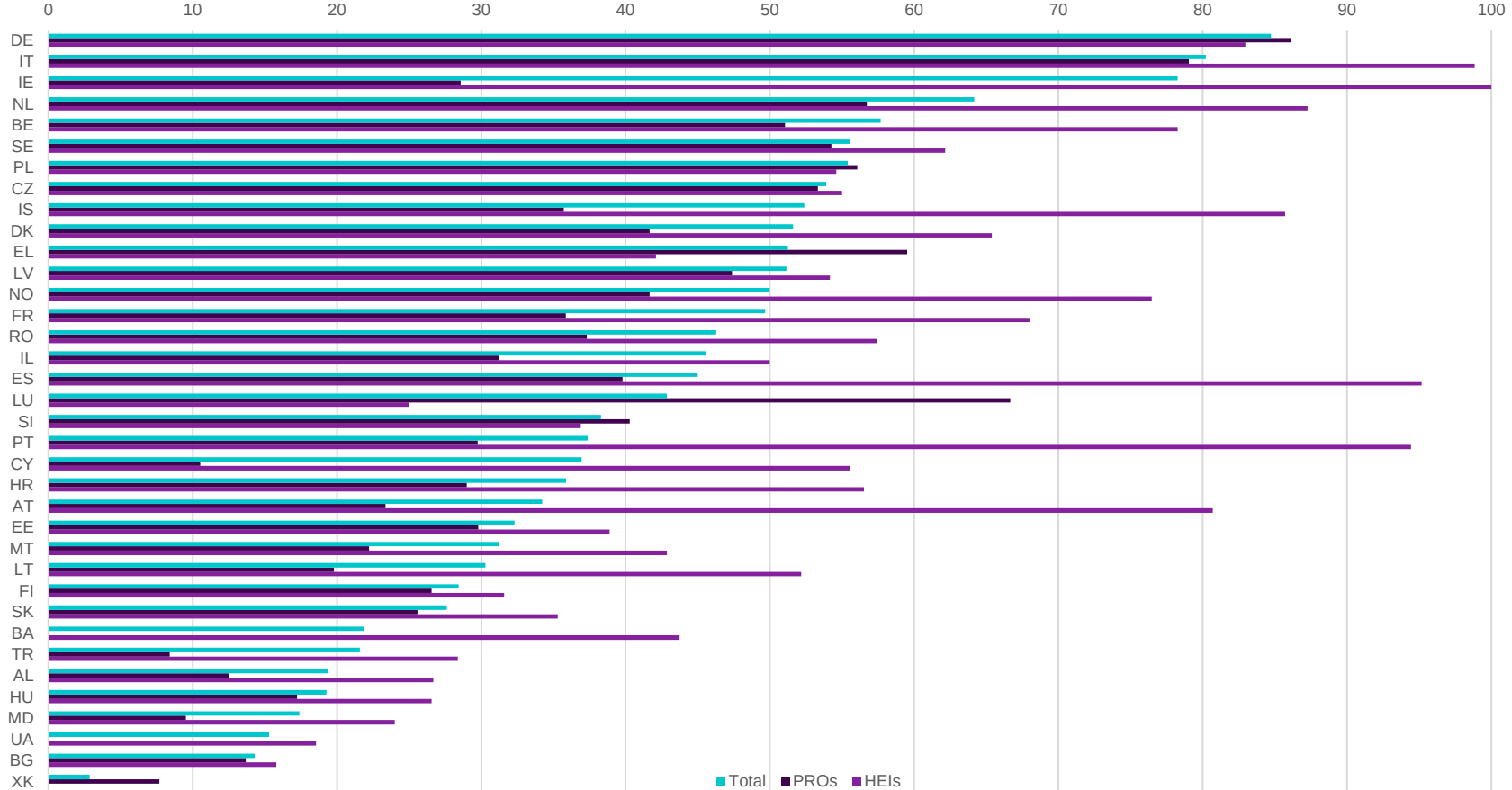
([381]) Anthropology; Philology and Linguistics; Philosophy; History; History of Art; Museology and Museography; Physics; Mathematics; Communication; Law and Criminology; Education and Pedagogy; Sociology, Economics and Political Science; Geography; Tourism; Biology; Nursing; Medicine; Human Nutrition and Dietetics; Psychology; Physical Activity and Sport Sciences; Architecture; Computer Science; Telecommunication; Electronics Engineering; Industrial Engineering; Multimedia Engineering; Agricultural Engineering; Naval, Marine and Nautical Engineering.

([382]) Xarxa Vives d'universitats, Guides for university teaching with a gender perspective, n.d., https://www.vives.org/programes/igualtat-genere/guies-docencia-universitaria-perspectiva-genere/

([383]) EIGE, Gender Equality in Academia and Research: GEAR tool, n.d., https://eige.europa.eu/gender-mainstreaming/toolkits/gear/legislative-policy-backgrounds/spain?language_content_entity=en

([384]) Comenius University in Bratislava, *Handbook on gender-sensitive education*, 2022, https://uniba.sk/o-univerzite/plan-rodovej-rovnosti-uk/detail-aktuality-rr/back_to_page/aktuality-k-teme-rodovej-rovnosti/article/na-nasej-univerzite-vznikla-prirucka-o-rodovo-citlivom-vzdelavani/

Figure 5.6 Proportion (%) of research organisations taking actions or measures towards gender equality, by type of organisation, 2023



Source: For the lists of research organisations: ETER, Cordis and the Statistical Correspondents of Member States and countries associated with Horizon Europe. Number of research organisations web-scraped and number of research organisations for which web-scraping indicated that they have taken actions and measures taken towards gender equality, by type of organisation (PRO/HEI).

Notes: Number of websites with information on actions/measures towards gender equality for BA was 0 out of 16.

5.5 Gender pay gap in scientific R&D

The principle of equal pay for equal work has been enshrined in the European Treaties since 1957 (today enshrined in Article 157 of the Treaty on the Functioning of the European Union (TFEU)) ([385]). It is reiterated as a principle in the European Pillar of Social Rights, adopted in November 2017 ([386]) and reinforced by the Directive on Pay Transparency, proposed in 2021 by the European Commission, and subsequently adopted in 2023 by the Council after the Parliament's first reading ([387]). The right to equal pay is supported by EU-level measures such as the EU Gender Equality Strategy 2020-2025 ([388]) and the EU Equal Pay Day ([389]). Despite EU policies and strategies aiming to achieve gender equality in earnings between women and men, the gender pay gap persists. Factors driving the gap include gender stereotypes in social and professional domains, a gender-segregated labour market, unequal labour participation, and barriers to entering certain occupations. This is a complex issue, with variations between countries and economies ([390]).

This section presents the gender overall earnings gap (GOEG), a synthetic indicator measuring the combined impact of three factors on the difference in average earnings between all women and men of working age, both employed and not employed. The three factors are: (1) average hourly earnings, (2) monthly average of the number of hours paid, and (3) employment rate. It provides an overall picture of the pay gap between women and men in Europe. Previous editions of She Figures used the gender pay gap (GPG) indicator, which is based on average hourly earnings. The GOEG is now used because it captures differences between women and men in employment and hours worked, along with hourly earnings.

Compared to the total economy, there is a lower GOEG in scientific R&D activities, but also greater variation between countries

Figure 5.7 shows the GOEG across scientific R&D activities and in the total economy. The latest available data (2018) show that women's average overall earnings at EU level are lower than men's in scientific R&D activities and across total economic activities. However, the GOEG in R&D (20 %) appears slightly lower in comparison to the general economy (23 %) at EU level.

Substantial variation is observed in the GOEG across scientific R&D activities, ranging from 311 % in favour of women (Estonia) to 55 % in favour of men (Austria). The large difference observed for Estonia is explained by differences in employment rates between women and men – when looking at average earnings and hours worked, little difference is observed between women and men. Where data are available, the average earnings of women of working age are higher than the corresponding average earnings of men in nine Member States in scientific R&D activities. In comparison, the GOEG for the total economy ranges from 3 % (Romania) to 34 % (Austria). This shows a much smaller range of values, but also that the GOEG is in favour of men in all countries when looking at the total economy. In some countries, large differences are observed in the GOEG across scientific R&D activities and across the total economy. In Estonia and Bulgaria, women have significantly higher average overall earnings than men, as reflected in GOEGs of -311 % and -105 %, respectively. This contrasts with the GOEG for total economic activities, at 24 % and 11 %, respectively. In contrast, Sweden and Finland have similar GOEGs for R&D and total economy (23 % compared to 20 %, and 24 % compared to 20 %, respectively).

([385]) Europa, EUR-Lex, (2008). Consolidated version of the Treaty on the Functioning of the European Union - Article 157 (ex Article 141 TEC). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A12008E157 .

([386]) European Commission, Secretariat-General, (2017). European Pillar of Social Rights. Publication Office of the European Union. Available at: https://op.europa.eu/en/publication-detail/-/publication/ce37482a-d0ca-11e7-a7df-01aa75ed71a1/language-en/format-PDF/source-62666461

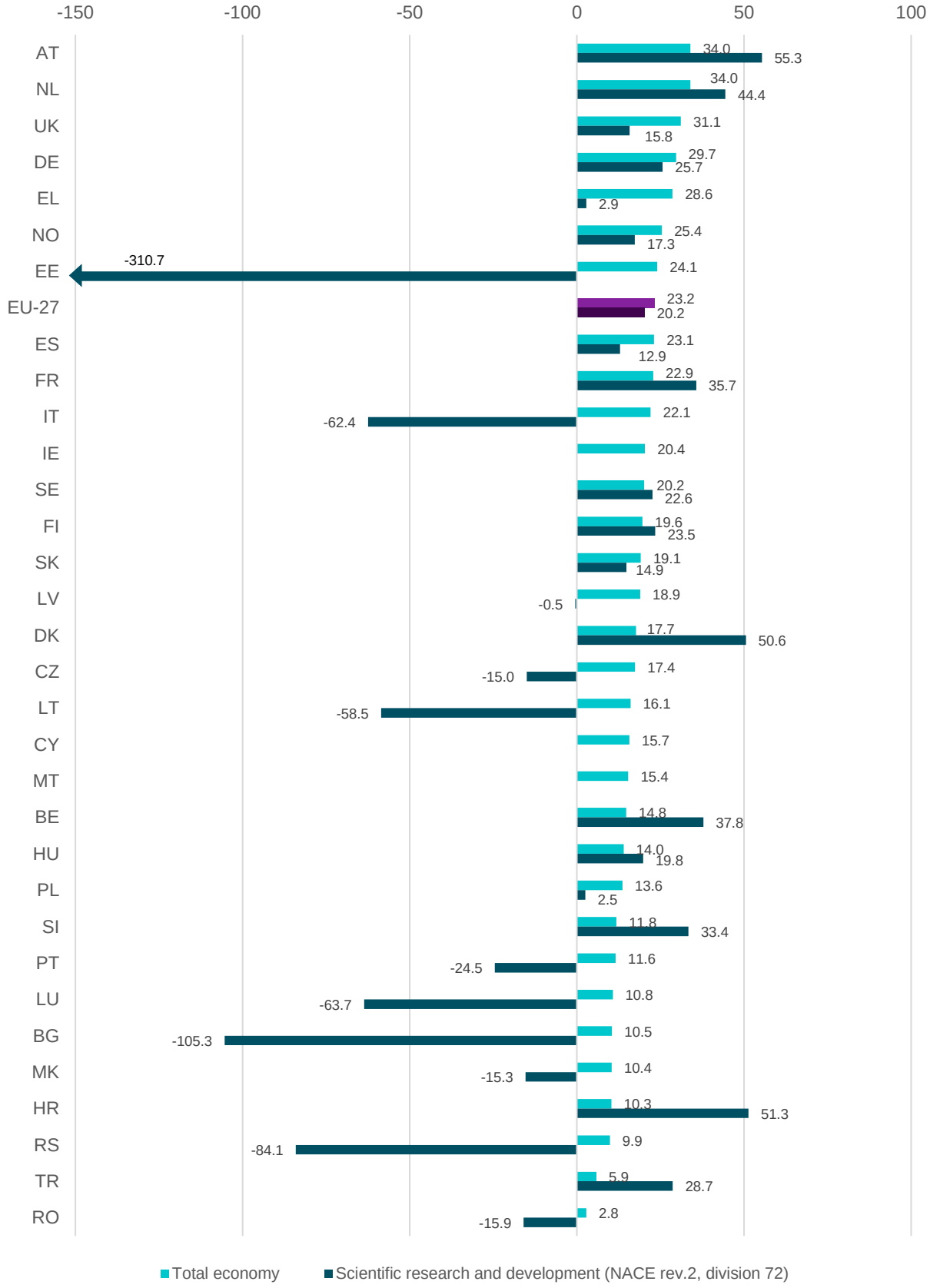
([387]) Directive (EU) 2023/970 of the European Parliament and of the Council of 10 May 2023 to strengthen the application of the principle of equal pay for equal work or work of equal value between men and women through pay transparency and enforcement mechanisms, *OJ L 132, 17.5.2023, pp. 21–44,* https://eur-lex.europa.eu/legal-content/EN/TXT/?toc=OJ%3AL%3A2023%3A132%3ATOC&uri=uriserv%3AOJ.L_.2023.132.01.0021.01.ENG

([388]) European Commission, A Union of Equality: Gender Equality Strategy 2020-2025, 2020, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0152

([389]) European Commission, Directorate-General for Communication, Equal Pay Day, n.d., https://commission.europa.eu/strategy-and-policy/policies/justice-and-fundamental-rights/gender-equality/equal-pay/equal-pay-day_en

([390]) Leythienne, D., Perez-Julian, M. and Eurostat, *Gender pay gaps in the European Union – a statistical analysis*, Revision 1, 2021 edition, https://ec.europa.eu/eurostat/en/web/products-statistical-working-papers/-/ks-tc-22-002

Figure 5.7 GOEG (%) in scientific R&D and in the total economy, 2018



Source: Eurostat – Structure of Earnings Survey (SES) (custom extraction based on online data code: TEQGES01).

Notes: Confidential: Scientific research and development (NACE rev.2, division 72): IE, CY, MT.

The GOEG between women and men widens with age across scientific R&D activities and the total economy

Table 5.2 presents the GOEG for scientific R&D activities and the total economy for the latest available data (2018), broken down into four age categories: under-35; 35-44; 45-54; and 55-and-over.

At EU level, the GOEG increases with age across the total economy and for scientific R&D activities. In scientific R&D activities, the widest earning gap in favour of men exists for those aged 55-and-over, at 45 %. The gap reduces to 28 % among those aged 45-54, then drops further to 15 % in the 35-44 age group, and to 2 % among under-35s. This may be linked to vertical segregation, which is covered in more detail in Chapter 6. Across the total economy, the differences between age categories are less pronounced. In the higher age categories, there is a gap in favour of men of around 30 % (31 % for those aged 55-and-over; 32 % for those aged 45-55). For those aged 35-44, the GOEG stands at 27 % in favour of men, and at 16 % for the under-35s. Widening of the pay gap with age may be linked to interruptions in women's careers, such as those related to caring responsibilities, over the course of their professional life ([391]).

Among Member States and Associated Countries, there is a far greater range in the GOEG in scientific R&D activities than in the total economic activity. Countries with the widest GOEG disparity between scientific R&D activities and the total economy in favour of women are Greece (-806 % in R&D activities, compared to 31 % in the total economy in the 55-and-over age category), Lithuania (-351 % in R&D activities, compared to 12 % in the total economy in the 45-54 age category; and -193 % in R&D activities, compared to 16 % in the total economy among under-35s), and Serbia (-431 % in R&D activities, compared to 53 % in the total economy in the 35-44 age group).This could be linked to a slightly higher proportion of women researchers in these countries, which is associated with lower R&D expenditure (see Figure 5.5).

The GOEG is more likely to be favourable for women in scientific R&D activities than in the total economy

When looking at the total economy, only one country has a GOEG in favour of women in the under-35 age category (Luxembourg) and in the 45-54 category (Romania), at 0.7 % and 1.1 %, respectively, in favour of women. In contrast, across scientific R&D activities, a GOEG in favour of women is evident in at least one age category in all but eight countries ([392]) for which data are available. In Bulgaria, Italy, Lithuania and Serbia, the GOEG in favour of women is present across three different age categories, predominantly for the under-35s, those aged 35-44 and those aged 45-54.

([391]) Eurostat, (2024). Statistics Explained. Gender pay gap statistics. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Gender_pay_gap_statistics#Gender_pay_gap_levels_vary_significantly_across_EU ; EIGE, (2023). A Better Work-Life Balance: Bridging the gender care gap. https://eige.europa.eu/publications-resources/publications/better-work-life-balance-bridging-gender-care-gap?language_content_entity=en

([392]) GOEG in favour of men in scientific R&D activities across all age categories: BE, DK, DE, FR, HU, NL, AT, FI.

Table 5.2 GOEG (%) in scientific R&D and in the total economy, by age group, 2018

Country	Scientific research and development (NACE rev.2, division 72)				Total economy			
	<35	35-44	45-54	55+	<35	35-44	45-54	55+
EU-27	1.7	14.9	27.9	44.5	15.8	26.6	32.2	30.9
BE	33.3	56.6	23.0	4.7	10.1	17.1	18.1	22.3
BG	21.2	-131.1	-58.9	-54.1	13.3	19.1	16.0	3.5
CZ	-22.6	13.3	21.0	-58.4	16.5	29.8	26.7	19.2
DK	39.8	67.3	25.3	52.2	15.6	21.4	22.8	20.2
DE	2.2	30.7	39.4	49.4	18.8	37.5	42.9	40.6
EE	-	-86.5	13.4	-	25.1	30.0	25.9	17.7
IE	C	C	62.3	C	13.8	25.8	32.9	33.2
EL	2.4	33.4	41.3	-805.6	18.2	24.7	24.2	30.7
ES	1.7	-3.3	41.4	7.4	13.1	22.8	27.9	28.9
FR	0.5	14.8	41.3	67.7	13.6	21.9	27.7	30.8
HR	37.5	55.1	-	86.8	12.3	14.5	21.3	9.6
IT	-97.5	-89.2	-68.9	1.4	19.6	24.6	27.4	26.3
CY	C	C	C	C	9.3	14.0	22.3	13.3
LV	-136.3	-4.9	100.0	55.6	19.1	22.8	14.9	14.7
LT	-192.8	-56.7	-351.4	34.6	16.3	20.8	12.4	14.2
LU	-166.2	-38.8	2.6	100.0	-0.7	12.8	23.1	26.4
HU	21.7	13.3	6.9	78.2	14.4	24.3	17.8	14.5
MT	C	C	C	C	12.0	21.7	25.4	22.5
NL	16.3	36.7	42.8	68.1	19.5	37.0	47.2	47.2
AT	65.3	52.3	60.1	40.6	27.2	38.9	39.7	45.3
PL	14.0	-21.8	-44.2	43.8	16.8	20.3	15.9	7.6
PT	-93.6	15.4	26.9	C	7.3	16.0	19.5	19.2
RO	-53.5	-139.8	23.3	26.0	6.7	3.4	-1.1	-5.7
SI	63.8	11.9	47.9	-49.2	16.0	17.6	14.6	10.5
SK	2.3	8.9	-15.5	62.5	18.8	28.2	24.7	20.6
FI	24.3	20.3	38.2	21.7	18.4	21.4	23.6	23.4
SE	25.5	-2.6	5.0	43.4	19.3	20.6	21.3	22.3
UK	-1.8	-16.8	C	41.4	23.5	36.3	42.2	42.9
NO	-70.4	28.2	-27.2	53.6	20.9	19.5	25.1	30.7
MK	100.0	-30.4	-67.7	-	33.9	38.5	40.0	34.5
RS	-19.9	-430.6	-123.7	13.4	72.6	53.4	38.7	13.0
TR	46.0	-71.7	20.4	C	10.8	12.9	27.0	12.6

Source: Eurostat – SES (custom extraction based on online data code: TEQGES01).

Notes: Confidential: Scientific research and development (NACE rev.2, division 72): IE (Age groups: <35, 35-44, 55+), CY, MT (Age groups: All), MK (Age groups: 55+), PT, TR (Age groups: 55+), UK (Age groups: 45-54); Data not available: Scientific research and development (NACE rev.2, division 72): EE (Age groups: <35, 55+), HR (Age groups: 45-54), MK (Age groups: 55+).

Annex indicators

Annex 5.1 International credit mobility rates (%) of Doctoral graduates during their PhD, by sex, 2021

Country	Women	Men
BG	2.6	2.5
CZ	10.4	10.8
DK	19.1	27.7
ES	28.4	27.6
FR	8.6	6.6
HR	10	10.1
IT	73.9	69.3
CY	2.2	0.0
LV	6.2	11.8
LT	9.5	15.3
LU	19.1	14.8
HU	3.4	3.8
MT	2.6	0.0
NL	11.1	14.9
AT	13.6	10.3
PL	4.4	3.4
PT	1.2	0.5
RO	1.4	1.5
SI	0.9	1.1
SK	1.3	0.3
FI	2.2	2.7
SE	8.7	7.6
NO	0.1	0.2
CH	11.3	14
UK	4.4	4.1
MK	0.0	0.0
RS	5.8	4.7
TR	0.1	0.4

Source: Eurostat – Credit mobile graduates (at least three months abroad) by education level, country of destination, type of mobility and sex (educ_uoe_mobc02); Eurostat – Graduates by education level, programme orientation, sex and field of education (educ_uoe_grad02).

Notes: Definition differs, see metadata: TR; Estimated: BG, NL; Not applicable: BE; Reference year differs: NL (2018), UK (2019); Data not available: BE, DE (women and men).

Annex 5.2 Total R&D expenditure for HES, GOV, BES in million PPS, 2021

Country	HES	GOV	BES
EU-27	**69053**	**37080**	**206069**
BE	2519	1327	11583
BG	64	269	652
CZ	1287	1056	3982
DK	2416	241	4403
DE	18602	15091	68210
EE	226	63	375
IE	645	141	3235
EL	966	717	1513
ES	4858	3082	10268
FR	10485	5999	33645
HR	359	232	517
IT	6379	3715	16015
CY	85	13	93
LV	144	60	121
LT	317	142	444
LU	145	142	294
HU	535	396	2933
MT	39	2	74
NL	4841	930	11233
AT	2677	874	7982
PL	4749	280	8644
PT	1404	198	2515
RO	199	653	1314
SI	162	177	960
SK	290	211	640
FI	1388	440	4132
SE	3267	626	10278
IS	103	11	289
NO	1875	749	3064
UK	8728	2491	25723
BA	42	4	27
ME	13	18	5
MK	56	8	23
RS	275	259	440
TR	8205	1082	14731
JP	13963	9828	92395
RU	3091	10012	19080
KR	5426	7006	46253
US	-	-	335436

Source: Eurostat – Research and development statistics (online data code: rd_e_gerdtot).

Notes: Definition differs, see metadata: R&D expenditure: DE (GOV), HU (HES, GOV, BES), NL (GOV); Estimated: IE, IT (R&D expenditure in HES and GOV), EU-27 (R&D expenditure in all sectors); Provisional: DK, UK (R&D expenditure in all sectors); Reference year differs: UK: 2019, ME: 2019, MK: 2020, RU: 2015, KR: 2015, US: 2019; Data not available: US (R&D expenditure in HES and GOV).

CHAPTER 6 – CAREER ADVANCEMENT AND PARTICIPATION IN DECISION-MAKING

Key takeaways

At EU level, women are well-represented across all levels of tertiary education and academic grades, except the highest positions. Despite a gradual increase in women's representation in top-level roles, they remain underrepresented in grade A, equivalent to full professorship positions. The Glass Ceiling Index (GCI) illustrates the ongoing issue of the 'leaky pipeline' effect, where women disproportionately exit academic careers due to various (structural) factors ([393]). When examining data by field of R&D ([394]), it becomes evident that women are underrepresented in the highest positions in all fields, even where gender balance is achieved at Doctoral level and among lower-ranking researchers. This highlights the extent of vertical gender segregation across fields.

Women have a minimal presence among the heads of HEIs, as well as among board members and board leaders ([395]). Recent policies to address this persistent underrepresentation of women include Directive (EU) 2022/2381 of the European Parliament and of the Council of 23 November 2022, which establishes requirements to improve the gender composition of boards.

- While gender balance is reached among Bachelor's, Master's, and Doctoral students (ISCED levels 6, 7, and 8), as well as among grade B and C staff, **only 30 % of women hold grade A positions** (see Figure 6.1).
- **Women's representation is considerably lower among all tertiary education levels and academic staff ([396]) in STEM, compared to all fields** (see Figure 6.2).
- Despite being well-represented across tertiary levels of education and among grade C and grade B staff, **women constitute only 34 % of grade A staff in Humanities and the Arts, and Social Sciences** (see Figure 6.3). Even in subjects where women are typically well-represented, that representation still declines as they advance up the career ladder.
- Despite the slight rise in the number of women occupying grade A positions at EU level (see Figure 6.4), the proportion of men in these roles remains significantly higher. More specifically, among academic staff, **16 % of men hold grade A positions, compared to 9 % of women** (see Figure 6.5). For both women and men, **most grade A holders fall into the 55+ age category** (see Figure 6.8). However, **women constitute just over one-quarter of grade A staff within this age group** (see Table 6.3). These statistics underscore the pronounced underrepresentation of women in the highest academic positions.
- **Women continue to be underrepresented among grade A staff in all fields,** including in Humanities and the Arts (38 %), Social Sciences (35 %), and Medical and Health Sciences (33 %), fields in which gender balance is achieved among Doctoral graduates (see Chapter 2) and researchers (see Chapter 4). Notably, **women's underrepresentation is more pronounced in STEM fields,** where women represent 24 % in Natural Sciences and 19 % in Engineering and Technology (see Table 6.2).
- The GCI compares the proportion of women in all academic grades to the proportion of women in the highest academic grade in order to understand how likely women are to move to higher positions in academia. **2022 data show that the GCI is 1.42 and has not changed since 2019** (see Figure 6.7).

([393]) The Economist, Glass Ceiling Index, 2024, https://www.economist.com/graphic-detail/glass-ceiling-index

([394]) The fields of R&D included here are: Natural Sciences, Engineering and Technology, Medical and Health Sciences, Agricultural and Veterinary Sciences, Social Sciences, Humanities and the Arts, and 'Unknown'.

([395]) Boards include scientific boards and administrative/advisory boards of national umbrella research performing/funding organisations.

([396]) 'Academic staff' can refer to academic staff or researchers, depending on the country of reference. 'Academic staff' is used throughout this chapter to refer to both. Notes under the relevant figures and tables outline which countries refer to which group.

Although women have a slightly better chance of reaching a grade A position compared to 2019, they are still considerably disadvantaged in moving into higher positions in academia compared to men.

- **Women are underrepresented among those in grade A positions in the 35-44 age group (33 %), the 45-54 age group (32 %), and the 55+ group (27 %), gender achieved only in the lowest age group (under-35s) (58 %)** (see Table 6.3). The data show that the higher the age group, the lower women's representation.
- In 2022, women represented only **26 % of heads of institutions** (see Figure 6.9), **38 % of board members and 39 % of board leaders** at EU level (see Figure 6.11).

Introduction

Chapter 6 compares the proportions of women and men at different stages of academic careers and analyses women's participation in decision-making and leadership positions across different fields. The low numbers of women in leadership positions, particularly in STEM, have a detrimental impact on innovation, the quality and relevance of knowledge and technology, and the international competitiveness of Europe's research sector in general ([397]).

- **Section 6.1 analyses the pattern of women and men's representation in a typical academic career.** It examines sex-disaggregated data showing the representation of women and men researchers from Bachelor level (ISCED 6) through to the highest-level positions among academic staff ([398]) (grade A), across all fields of R&D. It then explores the same data for STEM and for Humanities and the Arts and Social Sciences. Finally, it observes progress towards reducing vertical gender segregation in R&I.
- **Section 6.2 analyses the gender gap in career progression and senior positions in academia.** These indicators examine the evolution in the proportion of women across academic grades, as well as the representation of women in top-level positions across fields of R&D. It identifies the positions and fields in which women are concentrated, providing insights into gender gaps and the extent to which they are closing.
- **Section 6.3 explores the GCI** ([399]). The Index presents a ratio of the proportion of women in academic grades (A, B, and C) to the proportion of women in the top academic grade (A). This measure provides an indication of women's chances of moving up the career ladder, thus the extent to which the glass ceiling phenomenon is waning.
- **Section 6.4 analyses women's representation among grade A staff by age group.** As a result of various structural barriers, such as stereotypes about caring responsibilities ([400]), more women than men take career breaks or leave the labour force permanently, causing fewer women to reach higher positions in academia. This section considers the distribution of grade A academic staff by sex and age group to assess the extent to which women are able to progress to higher-level positions, and whether the barriers to women's advancement to the top positions have eased with greater policy measures.
- **Section 6.5 explores women's participation in leadership positions in research.** It presents indicators on women's participation among heads of HEIs and as board members and leaders, to assess the progress of women's representation in leadership positions in R&I.

Box 34: Definition of researchers

This chapter presents data on researchers in the higher education sector (HES). Researchers are defined in line with the 2015 Frascati Manual, which provides guidelines for data collection in R&D ([401]):

'Researchers are professionals engaged in the conception or creation of new knowledge. They conduct research and improve or develop concepts, theories, models, techniques instrumentation, software, or operational methods'.

([397]) European Commission, Structural change in research institutions: Enhancing excellence, gender equality and efficiency in research and innovation, 2012, https://eige.europa.eu/sites/default/files/structural-changes-final-report_en_0.pdf

([398]) Throughout this chapter, 'academic staff' can refer to 'academic staff' or 'researchers', depending on the country. Notes under each Figure specify which category applies to which country.

([399]) The 'glass ceiling' phenomenon refers to the structural barriers that prevent women from accessing top decision-making and leadership positions in organisations, https://www.economist.com/graphic-detail/glass-ceiling-index

([400]) Eurostat (2022), 'More women than men outside the labour force', https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220622-1#:~:text=At%20national%20level%2C%20women%20outside,%25)%20and%20Ireland%20(8.2%25).

([401]) OECD, Frascati Manual 2015, https://www.oecd-ilibrary.org/docserver/9789264239012-en.pdf?expires=1715249309&id=id&accname=guest&checksum=0E73F4D220C4C0116FB315F60ED17665

Where not available, data on academic staff in HES are presented instead. The definition used for academic staff is in line with UNESCO Institute for Statistics (UIS)/OECD/ Eurostat data collection on education statistics (UOE) and includes:

- 'Personnel employed at the tertiary level of education whose primary assignment is instruction and/or research,
- Personnel who hold an academic rank with such titles as professor, associate professor, assistant professor, instructor, lecturer or the equivalent of any of these academic ranks,
- Personnel with other titles, (e.g. dean, director, associate dean, assistant dean, chair or head of department), if their principal activity is instruction or research.

It excludes student teachers, student researchers, or teachers' aides, or paraprofessionals ([402])'.

([402]) UNESCO-UIS/OECD/Eurostat, UOE Data Collection on formal education, Manual on concepts, definitions and classifications, Montreal, Paris, Luxembourg, 2022, p. 47.

Background

Box 35: Key definitions for Chapter 6

- The '**leaky pipeline effect'** refers to the phenomenon whereby a specific demographic group significantly decreases in representation or disappears entirely from a career or education stage. The term is often used to describe women's underrepresentation in higher career positions in STEM and medical careers, among others ([403]).
- The '**glass ceiling effect'** is a metaphorical or invisible systemic barrier that prevents women from advancing into positions of leadership or decision-making in an organisation, typically a workplace ([404]).
- The '**sticky floor effect'** is a metaphor to describe discriminatory employment patterns that keep workers, mainly women, in lower ranks, with low mobility and invisible barriers to career advancement ([405]).
- **Vertical gender segregation** refers to the unequal distribution of women and men across different levels of hierarchy within an organisation, field, or sector ([406]).
- **Horizontal gender segregation** refers to the unequal distribution of women and men across occupations or sectors independent of rank or level ([407]).

She Figures 2021 showed that women remain underrepresented in academic and administrative leadership and decision-making positions in universities and research institutions. The 'leaky pipeline' and 'glass ceiling' effects can help to explain the challenges and barriers to women that contribute to this underrepresentation.

In recognition of these persistent barriers to women's career advancement in R&I, the EU has introduced a number of policies and proposals for recommendations. Four notable examples include:

- The introduction of **a new eligibility criterion for organisations to have a GEP in place in order to access Horizon Europe funding** ([408]). 'Gender balance in leadership and decision-making' stands as one of the five recommended thematic building blocks of a GEP. This can entail evaluating the representation of women in decision-making positions at the organisation's highest levels, identifying barriers to increase such representation, establishing targets to promote gender balance in leadership roles, and delineating the steps that can be taken, and by whom, to achieve these targets ([409]).
- **Directive (EU) 2022/2381 of the European Parliament and of the Council of 23 November 2022**, which specifically addresses women's representation on boards ([410]). This legislative act aims to encourage gender-balanced representation on boards in all Member States and seeks to establish minimum requirements in the form of binding measures to improve the gender composition of boards.

([403]) Gendering the Academy and Research: Combatting Career Instability and Asymmetries (GARCIA), *Academic Careers and Gender Inequality: Leaky Pipeline and Interrelated Phenomena in Seven European Countries*, 2015, https://eige.europa.eu/sites/default/files/garcia_working_paper_5_academic_careers_gender_inequality.pdf

([404]) EIGE, Glass ceiling, n.d., https://eige.europa.eu/publications-resources/thesaurus/terms/1099?language_content_entity=en

([405]) EIGE, Sticky floor, n.d., https://eige.europa.eu/publications-resources/thesaurus/terms/1374?language_content_entity=en

([406]) Constitutive Assembly of the Coalition for Advancing Research Assessment, https://coara.eu/about/

"https://eige.europa.eu/publications-resources/thesaurus/terms/1243?language_content_entity=en

([407]) EIGE, Horizontal segregation, n.d., https://eige.europa.eu/publications-resources/thesaurus/terms/1225?language_content_entity=en#:~:text=It%20is%20understood%20as%20under,as%20income%2C%20prestige%2C%20etc

([408]) European Commission, Directorate-General for Research and Innovation Horizon Europe guidance on gender equality plans, 2021, https://op.europa.eu/en/publication-detail/-/publication/ffcb06c3-200a-11ec-bd8e-01aa75ed71a1

([409]) EIGE, Gender Equality in Academia and Research – GEAR tool, n.d., https://eige.europa.eu/gender-mainstreaming/toolkits/gear/gender-balance-leadership-and-decision-making?language_content_entity=en#:~:text=Ensuring%20that%20an%20appropriate%20number,is%20highly%20important%20for%20success

([410]) Directive (EU) 2022/2381 of the European Parliament and of the Council of 23 November 2022 on improving the gender balance among directors of listed companies and related measures, OJ L 315/44, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022L2381

- **Council Recommendation on a European framework to attract and train research, innovation, and entrepreneurial talent in Europe** (adopted in December 2023) ([411]), following the Commission's proposal in July 2023, highlights persisting gender equalities in career progression in research careers. The new Framework defined by the Council Recommendation emphasises the importance of gender balance and equality throughout various facets of research careers, including recruitment, selection, working conditions, career development and progression. It also proposes a transparent, structured, inclusive, and gender-equal career accession and progression system. It suggests that tenure-track-like systems, such as a fixed-term contract with the prospect of a progression to a permanent position subject to positive evaluation, should be considered by Member States and RPOs.
- The **Agreement on Reforming Research Assessment (2022)** ([412]) and the launch of the **Coalition for Advancing Research Assessment (2022)** ([413]) are facilitated by the European Commission and form part of the ongoing reform of the research assessment, a priority action under the ERA policy agenda. The Agreement's vision is for research assessments to recognise the diversity of research outputs and reward those that lead to higher quality and impact. As part of the Agreement, one of the 10 principles for reforms is to 'Ensure gender equality, equal opportunities and inclusiveness', agreeing to 'consider gender balance, the gender dimension, and take into account diversity in the broader sense (e.g. racial or ethnic origin, sexual orientation, socioeconomic background, disability) in research teams at all levels, and in the content of research and innovation'.

Despite new legislation to promote gender equality in R&I, challenges persist at **Member State level** in improving and advancing women's careers and progression to leadership positions. One of the key challenges is the unstable nature of academic employment in the earlier stages of an academic career, which acts as a reinforcing factor complicating reintegration into the academic sphere. Academic employment structures create precarious work, including temporary employment contracts (see Chapter 5), short-term grant-based funding, and preconditions for grant applications that often require a consistent publication record ([414]), all of which disproportionately affect women researchers. Research shows that structural biases in evaluations and research assessments – tools used in hiring and promotion decisions – also implicitly discriminate against women ([415]). As a result, women are less likely to progress to higher levels.

Laws and policies have been implemented or revised across Member States to address the issue of vertical gender segregation in R&I.

- **National research and higher education laws** that refer to specific requirements to achieve gender equality in research institutions and/or HEIs. Examples include:
    - Law 3653/2008 ([416]) in Greece, whose Article 57 requires the establishment of gender-balanced procedures and decision-making processes in the research sector;
    - Higher Education and Scientific Research Act in the Netherlands, which stipulates requirements such that universities must have a balanced representation of women and men on executive boards ([417]);
    - Act on Higher Education and Scientific Activities in Croatia, which enforces regulations that prevent penalisation for career breaks due to maternity and parental leave ([418]).

([411]) Council Recommendation of 18 December 2023 on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe (C/2023/1640), Council Recommendation of 18 December 2023 on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe

([412]) Agreement on Reforming Research Assessment, https://coara.eu/app/uploads/2022/09/2022_07_19_rra_agreement_final.pdf

([413]) Constitutive Assembly of the Coalition for Advancing Research Assessment, https://coara.eu/about/

([414]) Faber, S. T., Pristed Nielsen, H. P. and Gemzøe, A. S., Gender balance initiatives in research funding: Barriers and possible measures to increase the share of women within natural science and technology, Villum Foundation, 2019, https://vbn.aau.dk/ws/portalfiles/portal/306503018/Gender_balance_initiatives_in_research_funding.pdf

([415]) Özgümüs, A., Rau, H. A., Trautmann, S.T. and König-Kersting, C. 'Gender Bias in the Evaluation of Teaching Materials', *Frontiers in Psychology*, Vol. 11, 2020, p. 1074. doi: 10.3389/fpsyg.2020.01074.

([416]) Law 3653/2008, Institutional framework for research and technology and other provisions, https://www.e-nomothesia.gr/kat-ekpaideuse/n-3653-2008.html

([417]) Higher Education and Scientific Research Act, Articles 9(3)(1), 10(2)(1) and 11(2)(1), https://wetten.overheid.nl/BWBR0005682/2023-09-01

([418]) Article 48 (1) and (2) in the Act on Higher Education and Scientific Activities, https://narodne-novine.nn.hr/clanci/sluzbeni/2022_10_119_1834.html

- **National (gender) equality laws and gender equality strategies** aiming to combat gender stereotypes, prohibit discrimination based on gender, and strengthen women's access to senior positions within HEIs and research organisations. For example:
    - Law No 2023-623 of 19 July 2023 in France ([419]) legislates that the rate of first appointments of women to senior and executive positions must be raised from 40 % to 50 % and requires the proportion of people of the same sex in senior or executive positions to be no less than 40 %;
    - Welfare Development Plan 2023-2030 in Estonia ([420]), whose sub-goal 5: 'Gender equality and equal treatment', aims to achieve balanced participation of women and men at all levels of decision-making and leadership. It does this through increasing transparency and objectivity in selection processes to achieve gender balance in decision-making and management levels in the public and business sectors;
    - National Strategy for Promoting Equal Opportunities and Treatment for Women and Men and Preventing and Combating Domestic Violence 2021-2027 in Romania ([421]) (discussed further below).
- **Government R&I strategies** to improve the representation of women in key roles and decision-making structures in R&I. For example, Malta's National Research and Innovation Strategic Plan 2023-2027 ([422]) includes actions to ensure that at least 40 % of women are employed in key roles and decision-making structures in R&I and that recruitment and promotion procedures in RFOs and RPOs are gender-proof.

The data presented in chapter 6 cover the period 2019-2022. Some notable laws and policies introduced at Member State level with relevance for women's career advancement and decision-making in R&I are described in the following box.

Box 37: Laws and policies implemented at Member State level to support women's career progression and participation in decision-making between 2019 and 2022

In **France**, Law No 2019-828 ([423]) of 6 August 2019 guarantees equal access of women and men to employment frameworks, grades and jobs in the public service. The National Action Plan for professional equality between men and women for 2021-2023 ([424]) was also introduced in 2019, extending the 2012 'Sauvadet' Law No 2012-347 ([425]), which ended in December 2020, and which contained provisions regarding the equal access of women to senior positions within the internal structure of respective ministries, including research.

Since 2021, the Scientific Research and Innovation Activities Act ([426]) in **Slovenia** requires public research institutions to promote the age and gender balance of research programme leaders and key management function holders through the development of transparent internal operating systems of recruitment and career development. (Articles 29 and 57). The 2022 Resolution on the Slovenian Scientific Research and Innovation Strategy 2030 ([427]) includes measures to ensure gender balance in the selection and appointment of members of the committees and working bodies in the field of R&I (Measure 6.4.5).

Some recent laws and policies include:

([419]) Law No 2023-623 to strengthen women's' access to senior management roles in the civil service of 19 July 2023, published on 20 July 2023, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000047862217/2023-09-14/

([420]) Ministry of Social Affairs, Welfare Development Plan 2023-2030, https://sm.ee/en/media/3110/download

([421]) National Agency for Equal Opportunities for Women and Men, National Strategy on promoting equal opportunities and treatment between women and men and for preventing and combating violence against women 2022–2027, n.d., https://anes.gov.ro/wp-content/uploads/2023/01/Monitorul-Oficial-Partea-I-nr.-1239Bis.pdf

([422]) Ministry for Education, Sport, Youth, Research and Innovation, National Research and Innovation Strategic Plan 2023-2027, n.d., https://meae.gov.mt/en/Public_Consultations/MEDE/Pages/Consultations/NationalResearchandInnovationStrategicPlan20232027.aspx

([423]) L'Assemblée nationale et le Sénat, (2019) LOI n° 2019-828 du 6 août 2019 de transformation de la fonction publique. Available at: https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000038889182/

([424]) Inserm, Plan for Professional Equality between Women and Men at Inserm January 2021-December 2023, n.d., https://www.inserm.fr/wp-content/uploads/inserm-planegaliteprofh2123-0521-en.pdf

([425]) Law no 2012-347 of March 12, 2012 relating to access to permanent employment and to the improvement of the conditions of employment of contractual agents in the public service, to the fight against discrimination and establishing various provisions relating to public service, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000025489865

([426]) Državni zbor Republike Slovenije, Zakon o znanstvenoraziskovalni in inovacijski dejavnosti, 2021, http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO7733

([427]) Državni zbor Republike Slovenije, Resolucija o znanstvenoraziskovalni in inovacijski strategiji Slovenije 2030, 2022, http://www.pisrs.si/Pis.web/pregledPredpisa?id=RESO133

- **Estonia's** Welfare Development Plan 2023-2030, which includes gender equality as a sub-goal and aims to support the achievement of sustainable gender balance at all decision-making and management levels ([428]).
- **Spain's** Organic Law 2/2023 of the University System ([429]), which requires the composition of evaluation and selection panels for calls and projects to comply with the principle of gender balance. It specifically establishes that the composition of the bodies, councils and committees of the Spanish System of Science and Innovation shall be gender-balanced (40 % to 60 % of each sex).
- **French** Law No 2023-623 to strengthen women's access to senior management roles in the civil service, which includes ministries, funding organisations, public universities, and research organisations. The law increases the quota of people of each sex from 40 % to 50 % for first appointments to high level and senior management roles in the civil service. The rule must be applied from 2026 ([430]).

In addition to laws and policies, measures have been implemented to improve career advancement and women's participation in decision-making at Member State level. The measures comprise a range of initiatives such as targeted recruitment efforts, funding mechanisms, mentorship programmes, training, and networking opportunities. These aim to improve women's career advancement in R&I by:

- **Promoting women's integration into the workforce following a career break**. In Czechia, the Career Restart grant ([431]) supports women to rejoin the workforce following parental leave, while in Spain, the State Research Agency published a document that outlines measures to prevent women from being penalised for taking career breaks ([432]).
- **Creating networks of women researchers and increasing their visibility in R&I**. The #HerResearch initiative in Greece aims to boost the careers of women tech researchers through funding, training, and networking ([433]), while in Ireland, 'Women in Research Ireland' organises events and workshops on career development, networking and work-life balance ([434]).
- **Supporting women's career advancement in STEM fields**. The Global Women's Breakfast in Romania brings together a community of researchers working in STEM to celebrate achievements, network, and gain recognition ([435]), while Denmark's non-profit organisation, Danwise, supports women to apply for funding and initiatives to promote a more inclusive research environment in STEM ([436]).
- **Achieving gender balance in leadership and management positions**. Funding programmes, such as Westerdijk Talent Impulse in the Netherlands, promote the appointment of women to full professors ([437]), while initiatives like Train the Trainers workshops in Italy provide training on gender equality in research organisations, highlighting the importance of gender balance in decision-making processes and governing bodies ([438]).

([428]) Sotsiaalministeerium, Heaolu arengukava 2023-2030, 2023, https://www.sm.ee/heaolu-arengukava-2023-2030#welfare-development-

([429]) Ministerio de Universidades, Ley Orgánica 2/2023, de 22 de marzo, del Sistema Universitario, 2023, https://www.boe.es/buscar/pdf/2023/BOE-A-2023-7500-consolidado.pdf

([430]) L'Assemblée nationale et le Sénat (2023) Loi n° 2023-623 visant à renforcer l'accès des femmes aux responsabilités dans la fonction publique du 19 Juillet 2023 parue au JO n°166 du 20 Juillet 2023, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000047862217/2023-09-14/

([431]) Masaryk University Grant Agency, 'Support for Integration of Researchers After a Career Break', https://gamu.muni.cz/en/pro-vedce/career-restart

([432]) Agency State of Investigation, Measures implemented in the AEI to promote gender equality in its financing actions, n.d., https://www.aei.gob.es/ciencia-igualdad/medidas-implementadas-genero-aei

([433]) Women Entrepreneurs Association of Greece, #Her_Research, n.d., https://her-research.gr/

([434]) Women in Research Ireland, https://womeninresearch.ie/index.html

([435]) National Institute for Research and Innovation in Chemistry and Petrochemistry (ICECHIM) Bucharest, Global Women's Breakfast Romania, n.d., https://iupac.org/gwb/2022/global-woments-breakfast-romania/

([436]) Danwise (Danish Society for Women in Science), DANWISE |

([437]) Dutch Research Council, 'Westerdijk Talent Impulse', https://www.nwo.nl/en/researchprogrammes/westerdijk-talent-scheme

([438]) National Research Council, Train the Trainers: Becoming gender equality trainers, n.d., https://www.cnr.it/it/news/10963/train-the-trainers-diventare-formatori-e-formatrici-sul-tema-delle-parita-di-genere

6.1 Pattern of women and men's representation in a typical academic career

She Figures 2021 showed evidence of vertical gender segregation, meaning that women were relatively well represented in the lower levels but underrepresented in the top positions. Given the growing recognition of the need to reform institutional cultures through the introduction of policies that require the implementation of GEPs and quotas, this section explores women's representation across all academic levels and academic positions in fields of R&D to map out trends in women's career advancement.

A typical academic career has multiple stages. An individual usually first begins as a student at Bachelor's level or equivalent (ISCED 6), followed by Master's level (ISCED 7), and then Doctoral level (ISCED 8). After graduating from Doctoral-level studies, an individual then progresses through academic positions from grades C to A, with grade A being equivalent to full professorship and, therefore, the highest level at which research is conducted.

Box 38: Definitions of academic grades

Grade A: The single highest grade/post at which research is normally conducted within the institutional or corporate system, such as full professors and directors of research.

Grade B: All researchers working in positions that are not as senior as the top position (A) but more senior than newly qualified PhD holders (C), such as associate professors, principal investigators or senior researchers.

Grade C: The first grade/post into which a newly qualified PhD (ISCED 8) graduate would usually be recruited within the institutional or corporate system, i.e. post-doctoral positions. Examples include researchers, investigators, assistant professors or post-doctoral fellows.

Grade D: Either postgraduate students not yet holding a PhD (ISCED 8), who are engaged as researchers (on the payroll) or researchers working in posts that do not normally require a PhD, such as PhD students, junior researchers or research or administrative assistants.

Gender balance is achieved in every level of tertiary education and academic grade, except the highest positions (grade A), where women represent 30 %.

Figure 6.1 shows that at EU level, women represent more than half of Bachelor and Master's (ISCED 6 & 7) students (55 %) and graduates (58 %) and just under half of Doctoral (ISCED 8) students (49 %) and graduates (48 %). Gender balance is thus observed overall among undergraduate and postgraduate students and graduates (see Chapter 2).

However, when analysing the representation of women among academic staff, a different trend emerges. 2022 data show that women represent 47 % of grade C positions and 42 % of grade B positions, yet only 30 % of grade A positions, i.e. women continue to be underrepresented in the highest academic positions. Compared to 2019 data, only small improvements of 1-2 pp are observed in women's representation across all grades and positions. For grade B positions, the proportion of women was 40 % in 2019 and 42 % in 2022, while for grade A positions, the proportion was 28 % in 2019 and 30 % in 2022, a small increase of approximately 2 pp.

Box 39: Actions to encourage women to stay in R&I and support their reintegration

In **Croatia**, the 2022 Act on Higher Education and Scientific Activity regulates the employment and career advancement of academics, scientists, and other researchers, and supports their research financing and supervision ([439]). Article 48(1) and (2) state that deadlines for advancing to higher posts for academics and researchers are to be postponed and fixed-term contracts are to be prolonged during parental leave, among

([439]) Croatian Parliament, Act on Higher Education and Scientific Activity, 2022, https://narodne-novine.nn.hr/clanci/sluzbeni/2022_10_119_1834.html

other conditions. Since it is predominantly women who take parental leave in Croatia ([440]), this Act seeks to keep women in R&I.

In **Spain**, measures implemented by the State Research Agency to promote gender equality in R&I funding actions ([441]) in 2019 include extensions of deadlines for obtaining Doctoral degrees, providing flexibility for women who need additional time to complete their degrees. The Agency also gives consideration to interruptions due to maternity or other circumstances in evaluation processes, ensuring that women are not penalised for career interruptions and that their contributions are fairly assessed. As a result, women with care responsibilities are given greater flexibility when it comes to the eligibility requirements for grants and scholarships.

Women are particularly underrepresented in STEM across all academic levels and grades. However, their representation declines more steadily from tertiary education through to the top-level positions

Compared to the total share of students and graduates across all fields, the share of women is considerably smaller among students and graduates across all tertiary education levels and academic staff in STEM fields at EU level (see Figure 6.2) ([442]).

In 2022, women accounted for 32 % of Bachelor (ISCED 6) and Master's students (ISCED 7) and 35 % of Bachelor's and Master's graduates, while representing 37 % of Doctoral students and graduates (ISCED 8) in STEM. Among academic staff, women represented 35 % of grade C positions, declining to 30 % of grade B positions, and shrinking further to 20 % of staff in grade A positions. Therefore, at every level, women are underrepresented and become less represented as they move up the academic ladder.

There was no more than 2 pp difference in the proportion of women students, graduates, and staff at all levels in STEM across the EU between 2019 and 2022, demonstrating minimal progress overall in addressing this underrepresentation. Nonetheless, Member States have made efforts to support women's careers in STEM fields, some examples of which can be found in Box 40.

Box 40: Actions to advance women's careers in STEM fields

In **Hungary**, the Women in Technology Hungary (WiTH) Association introduced a mentorship programme for young women, Women in Technology Hungary ([443]). This measure was initiated in 2021 by Vodafone Hungary (co-founded by Lenovo Hungary, BOOKR Kids, and other private companies) to increase women's participation in science and technology occupations and the labour market participation of women researchers, and to improve career advancement and women's participation in decision-making. The programme aims to support and empower women in technology and increase the number and visibility of women leaders by creating a collaborative knowledge platform with mentoring opportunities.

In the **Netherlands**, the Foundation for Dutch Scientific Research Institutes (NWO-I) ([444]), a private umbrella organisation for nine research institutes, supervised by the Dutch Research Council NWO), established the Women in Science Excel (WISE) fellowships in 2016 to provide talented women researchers an opportunity to develop their own research group at one of the NWO institutes. The programme aims to improve gender balance in Dutch institutes by increasing the numbers of women researchers and supporting them to advance in their careers.

([440]) Within the last decade, the share of men on parental leave was only 4-8 % (Ombudsperson for Gender Equality, *Annual Report for 2022*, 2022, https://www.prs.hr/application/uploads/Izvješće_o_radu_PRS_u_2022_cjelo.pdf).

([441]) State Research Agency, Measures implemented in the AEI to promote gender equality in its financing actions, n.d., https://www.aei.gob.es/ciencia-igualdad/medidas-implementadas-genero-aei

([442]) This indicator includes only the broad fields Natural Sciences, Mathematics and Statistics, and Engineering, Manufacturing and Construction (for ISCED 6-8 levels), which are the categories used in the Eurostat data, and the broad fields Natural Sciences and Engineering and Technology when looking at grades A-C, based on the WiS database.

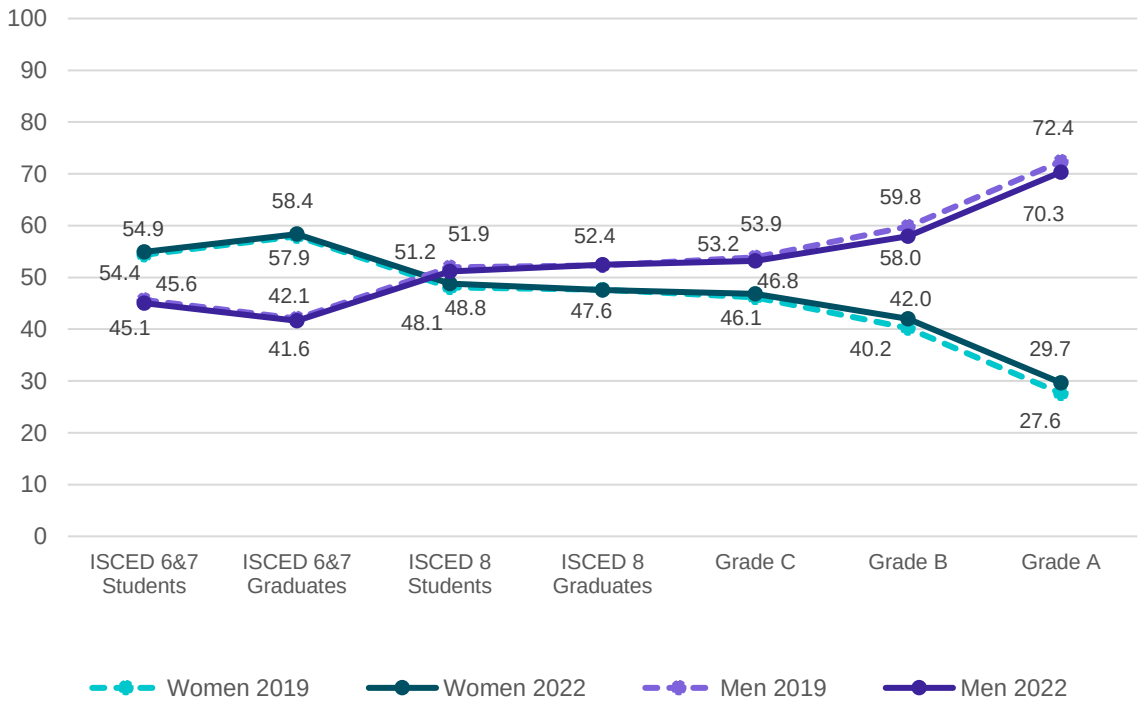
([443]) Women In Technology Hungary, 40 év feletti női példaképek a digitális gazdaság területén, n.d., https://www.womenintech.hu/

([444]) NWO-I, n.d., https://www.nwo-i.nl/en/nwo-institutes-organisation/

Figure 6.3 shows the proportion of women and men across all academic levels and grades from 2019 to 2022 in the fields of Humanities and the Arts and Social Sciences. Women tend to be well-represented in Humanities and the Arts and Social Sciences, while facing underrepresentation in STEM subjects (see Chapters 2 and 4). Figure 6.3 sheds light on whether women's representation in these typically women-dominated subjects endures as they advance up the career ladder.

The latest data (2022) show that women comprise 65 % of students at Bachelor and Master's level (ISCED 6 and 7) and 69 % of graduates at these levels. Similarly, at Doctoral level (ISCED 8), women represent 56 % of students and 54 % of graduates. However, in line with the trend observed across all fields, women's representation declines from 54 % in grade C positions to 43 % in grade B positions, and to 34 % in grade A positions. Therefore, while women account for two-thirds of Bachelor's and Master's students and graduates in these fields, they represent only one-third of grade A positions. Similar to all fields, there have been small increases in the proportion of women in grades A-C in the fields of Humanities and the Arts and Social Sciences, of 1-2 pp since 2019.

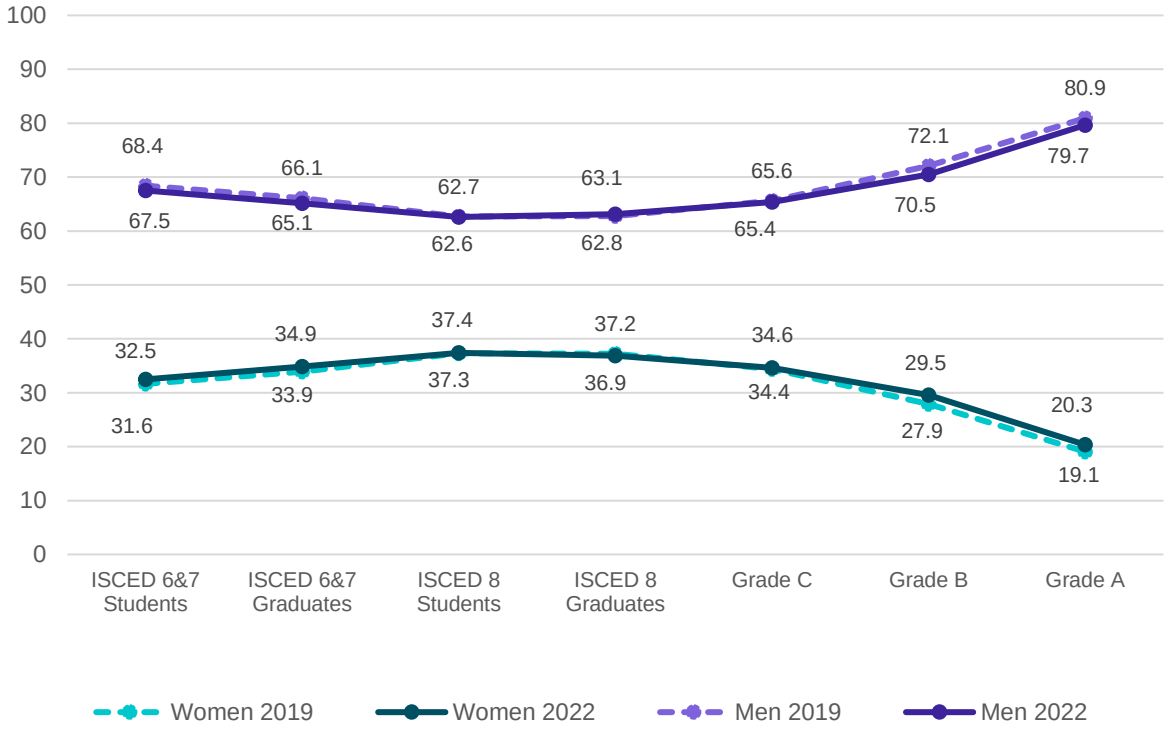
Figure 6.1 Proportion (%) of women and men in a typical academic career, students and academic staff in the EU, 2019 and 2022



Source: WiS database, DG Research and Innovation - T1_questionnaires, Education Statistics (online data codes: educ_uoe_enrt03, educ_uoe_grad02).

Notes: Data are HC from T1_questionnaires of WiS database; Where data for Researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR). Researchers are used as reference population for: BE, DK, DE, EE, ES, FR, HR, CY, LV, HU, MT, AT, PL, PT, RO, SK, FI, IS, NO, RS, TR, BA, GE, AM, MD, UA. Academic staff are used as reference population for: BG, IE, EL, IT, LT, NL, SI, SE. *For* Education Statistics: Reference year differs: BE (FR): 2019, DK: 2021, ES: 2021, FR: 2021, CY: 2021, HU: 2021, AT: 2021, PT: 2021, RO: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021, AM: 2021; *For WiS data:* Data not available: BG (grade C: Women, Men, Total), ES (grade A: Women, Men, Total), CY (grade A,B,C, Women, Men, 2019), LV (grade A,B,C, Women, Men, 2019), SI (grade A,B,C, Women, Men, 2019), IS (grade A,B,C), RS (grade A,B,C, Women, Men, 2019), GE (grade A,B,C), AM (grade A,B,C), MD (grade A,B,C), UA (grade A,B,C); Data not available: DK, ES, CY, UA (All grades except Total) (Academic staff - 2022), BG, LT (Researchers - 2022); Not applicable: BG (grade C - Women, Men, Total), ES (grade A - Women, Men, Total), AM (grade A, B, C - Women, Men, Total).

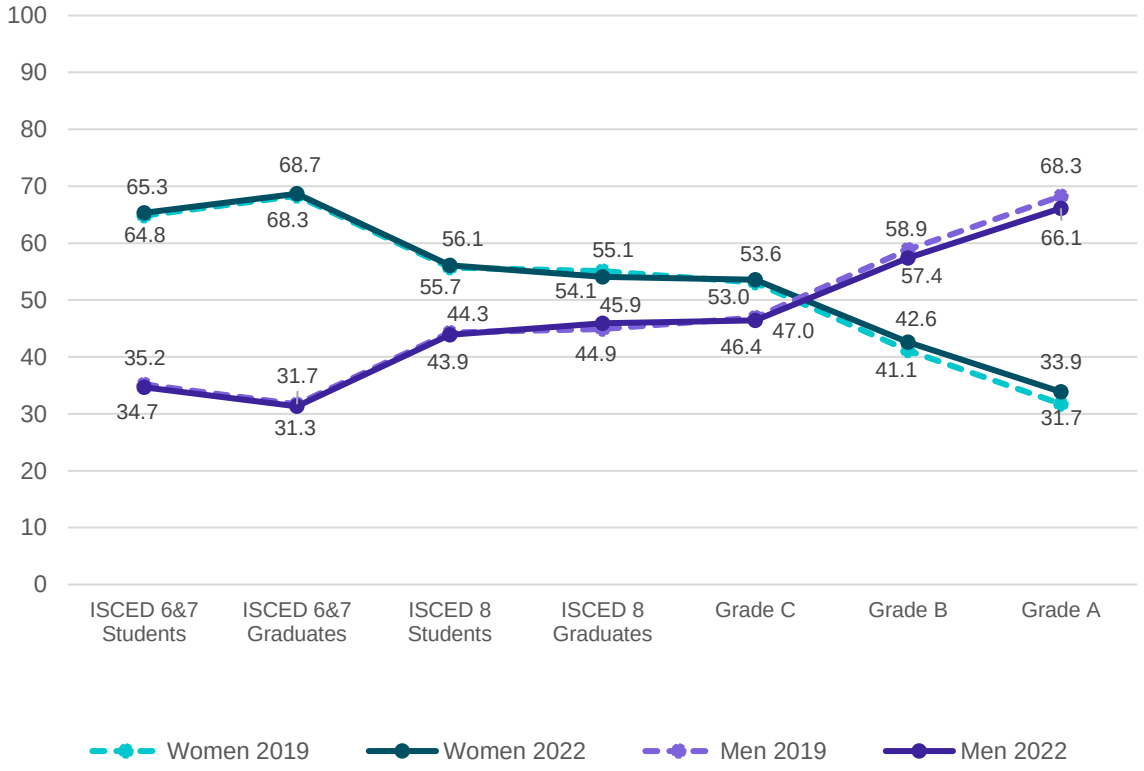
Figure 6.2 Proportion (%) of women and men in a typical academic career in science and engineering, students and academic staff, 2019-2022



Source: WiS database, DG Research and Innovation - T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for Researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR). Researchers are used as reference population for: BE, DK, DE, EE, FR, HR, CY, LV, HU, MT, AT, PL, PT, RO, SK, FI, IS, NO, RS, TR, BA, GE, AM, MD, UA. Academic staff are used as reference population for: BG, IE, EL, ES, IT, LT, NL, SI, SE. For Education Statistics: Reference year differs: BE (FR): 2019, DK: 2021, ES: 2021, FR: 2021, CY: 2021, HU: 2021, AT: 2021, PT: 2021, RO: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021; For WiS data: Data not available: BG (grade C: Women, Men, Total), ES (grade A: Women, Men, Total), EE (grade A, B, C, D), CY (grade A, B, C, Women, Men, 2019), LV (grade A, B, C, Women, Men, 2019), SI (grade A, B, C, Women, Men, 2019), IS (grade A, B, C), RS (grade A, B, C, Women, Men, 2019), GE (grade A, B, C, D), AM (grade A, B, C, D), MD (grade A, B, C, D), UA(grade A, B, C); Data not available: DK, ES, CY, UA (All grades except Total) (Academic staff - 2022), BG, LT (Researchers - 2022) Not applicable: BG (grade C - Women, Men, Total), ES (grade A - Women, Men, Total), AM (grade A,,C,D - Women, Men, Total).

Figure 6.3 Proportion (%) of women and men in a typical academic career in humanities and social sciences, students and academic staff, 2019-2022



Source: Women in Science database, DG Research and Innovation - T1_questionnaires, Education Statistics (online data codes: educ_uoe_enrt03, educ_uoe_grad02)

Notes: Data are HC from T1_questionnaires of WiS database. Where data for Researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR). Researchers are used as reference population for: BE, DK, DE, EE, FR, HR, CY, LV, HU, MT, AT, PL, PT, RO, SK, FI, IS, NO, RS, TR, BA, GE, AM, MD, UA. Academic staff are used as reference population for: BG, IE, EL, ES, IT, LT, NL, SI, SE. Reference year differs: BE (FR) (Latest available year, 2019), CZ (Latest available year, 2020), DK, ES, FR, CY, HU, AT, PT, RO, (Latest available year: 2021), BE(FR), EL, IT, LV, LT, NL, AT, SI, FI, SE (Earliest available year: 2018); Data not available: IE, HU (Women and Men, all grades), BG (Women and Men, grades A and B); Not applicable: BG (Women and Men, grade C).

6.2 The gender gap in career progression and senior positions in academia

She Figures 2021 showed that relatively few women reach grade A positions in academia. To assess the extent to which the gender gap in career progression and senior positions in academia has changed, the following indicators show the proportion of women across academic grades, followed by their representation in the highest grade (grade A). It also provides information about the representation of women in top-level positions across fields of R&D. It sheds light on whether and how the gender segregation observed in specific fields during tertiary education and across different sectors of research shift as women advance to senior positions.

As seniority levels rise, the representation of women in academic positions declines

As shown above in Figure 6.1, Table 6.1 shows that there is gender balance among academic staff at lower levels, but underrepresentation among grade A staff at EU level.

Table 6.1 also shows the proportion of women in each grade by country. In 2022, women represented more than 40 % of total academic staff across all Member States and Associated Countries except Czechia (36 %), Greece (38 %), Cyprus (39 %), Slovakia (40 %). Women constituted more than 40 % of grade D staff across all countries except Slovakia, where they were underrepresented (26 %). For grade C positions, women accounted for more than 40 % in all countries except (narrowly) Belgium (39 %), Spain (just under 40 %), and Slovakia (37 %). For grade B positions, eight countries do not achieve gender balance ([445]), while for grade A positions, only eight countries achieve gender balance ([446]). This mirrors the trend at EU level, which shows a decline in women's representation as they move up the career ladder.

Figure 6.4 shows the change in women's representation among grade A positions between 2019 and 2022. It shows that, in 2019, women accounted for less than 25 % of grade A staff in eight Member States and Associated Countries ([447]). However, while women's representation among grade A staff remained low in these countries in 2022, the proportion increased in each (ranging from 0.5 pp to 4 pp).

Box 41: Actions to support women's career advancement in Norway

NORDICORE was a five-year (2017-2023) Nordic Centre of Excellence, part of the Centre for Gender Equality Research at the Institute for Social Research. It studied key issues to understand what promotes and inhibits gender equality within academia and research. The Centre consisted of five work packages, including 'Making gender balance from below', which aimed to improve the gender balance at professor level (and other levels) by implementing measures, raising awareness and fostering learning. It also aimed to understand the factors contributing to creating an inclusive and attractive work environment for both women and men, and the kinds of measures that contribute to improving gender balance across all levels ([448]).

Kilden is a unit within the Norwegian Research Council that focuses on gender perspectives and gender balance in research ([449]). It has produced a policy brief on gender equality, gender balance and diversity in R&I, exploring developments in the Norwegian research sector from 2010 to 2021 ([450]).

([445]) BE, DK, DE, EL, CY, HU, NL, AT.

([446]) BG, HR, LV, LT, RO, RS, TR, BA.

([447]) BE, DK, DE, EL, ES, IT, HU, NL.

([448]) Centre for Research on Gender Equality, NORDICORE – Gender balance in academia, n.d., https://www.samfunnsforskning.no/core/english/projects/nordicore/#:~:text=About%20NORDICORE,Research%2C%20led%20by%20Mari%20Teigen

([449]) Kilden genderresearch.no, https://kjonnsforskning.no/en

([450]) Kilden genderresearch.no, Gender equality, gender balance and diversity in research and innovation, n.d., https://kjonnsforskning.no/sites/default/files/rapporter/policy_brief_gender_equality_gender_balance_and_diversity_in_research_and_innovation.pdf

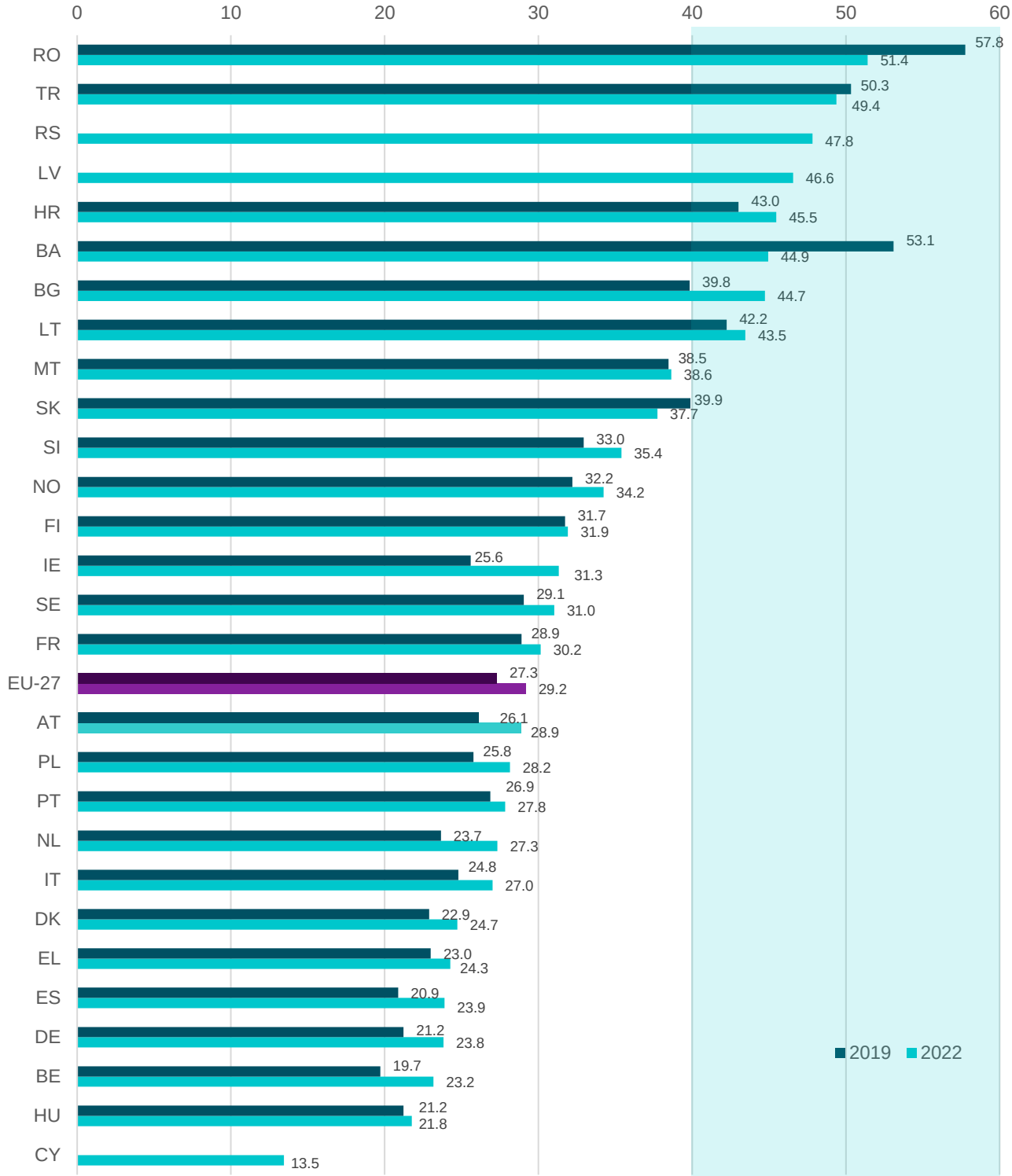
Table 6.1 Proportion (%) of women among academic staff, by grade and total, 2022

Country	Grade A	Grade B	Grade C	Grade D	Total
EU-27	**29.7**	**42.0**	**46.8**	**48.0**	**43.6**
BE	23.2	33.9	39.4	49.7	43.4
BG	44.7	48.3	-	54.9	51.7
CZ	-	-	-	-	35.7
DK	24.7	35.6	46.9	54.1	46.1
DE	23.8	30.1	46.3	45.1	41.6
EE	-	-	-	-	49.8
IE	31.3	41.5	49.4	-	46.6
EL	24.3	33.8	40.1	47.7	37.9
ES	-	43.3	39.8	46.0	44.6
FR	30.2	45.6	41.6	44.0	41.4
HR	45.5	53.3	59.2	60.1	52.4
IT	27.0	42.3	45.6	50.4	41.7
CY	13.5	31.3	40.7	51.2	39.2
LV	46.6	51.9	59.0	58.8	54.1
LT	43.5	56.7	66.0	65.1	59.6
HU	21.8	33.9	45.0	45.1	41.1
MT	38.6	41.1	41.2	42.5	41.2
NL	27.3	34.8	46.8	48.1	44.6
AT	28.9	30.8	43.4	45.5	42.2
PL	28.2	42.8	51.9	52.6	46.2
PT	27.8	43.7	51.6	53.4	50.7
RO	51.4	61.5	54.7	55.9	56.4
SI	35.4	44.5	48.6	48.3	44.5
SK	37.7	46.9	37.3	26.2	40.0
FI	31.9	48.4	51.5	50.3	47.9
SE	31.0	47.5	46.2	53.3	48.0
NO	34.2	50.5	49.2	58.2	51.2
RS	47.8	55.2	57.5	61.0	55.2
TR	49.4	49.8	49.1	49.5	49.4
BA	44.9	51.3	49.9	46.3	48.2

Source: WiS database, DG Research and Innovation – T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for Researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR). Researchers used as reference population for BE, CZ, DK, DE, EE, ES, FR, HR, CY, LV, HU, MT, AT, PL, PT, RO, SK, FI, IS, NO, RS, TR, BA, GE, AM, MD, UA. Academic staff used as reference population: BG, IE, EL, IT, LT, NL, SI, SE. Reference year differs: BE(FR): 2019, CZ: 2020, DK: 2021, ES: 2021, FR: 202, CY: 2021, HU: 2021, AT: 2021, PT: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021, AM: 2021; Data not available: BG (grade C: Women, Men, Total), CZ, EE, IE (grade D: Women, Men, Total), ES (grade A: Women, Men, Total), IS, GE (grade A,B,C,D), AM (grade A,B,C,D), MD (grade A,B,C,D), UA; Not applicable: BG (grade C - Women, Men, Total), ES (grade A - Women, Men, Total), AM (grade A,B,C,D - Women, Men, Total).

Figure 6.4 Evolution of the proportion (%) of women among grade A positions, 2019 and 2022



Source: WiS database, DG Research and Innovation - T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for Researchers are not available or incomplete, data for Academic staff are presented; Data for BE = BE (FL) + BE (FR). Researchers used as reference population for BE, DK, DE, EE, ES, FR, HR, CY, LV, HU, MT, AT, PL, PT, RO, SK, FI, IS, NO, RS, TR, BA, GE, AM, MD, UA. Academic staff used as reference population: BG, IE, EL, IT, LT, NL, SI, SE. Reference year differs (latest available year): BE(FR): 2019, CZ: 2020, DK: 2021, ES: 2018, FR: 2021, CY: 2021, HU: 2021, AT: 2021, PT: 2021, RO: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021, AM: 2021; Reference year differs (earliest available year): BE(FR): 2016, ES: 2015, SI: 2018; Data not available (grade A: Women, Men, Total): CZ, EE, CY (2019), LV (2019, IS, RS (2019), GE, AM, MD, UA . Data not available (All grades except Total): CZ, EE, GE, AM, MD, UA.

As a proportion of all academic staff, women represent a considerably lower proportion of grade A staff (9 %) compared to the proportion of men (16 %)

Figure 6.5 compares the proportion of women academic staff in grade A positions out of the total women academic staff (grades A, B, C, and D) with the same proportion for men academic staff. 2022 data show that despite improvements in the proportion of women among grade A staff at EU level, women are considerably less likely to hold a grade A position than men (9 % for women and 16 % for men). This gap has changed little since 2018 at EU level (8 % for women and 16 % for men).
At country level, a greater proportion of men continue to hold grade A positions in every Member State and Associated Country. In 17 countries ([451]), men are twice as likely (or more) to hold these positions. While there were 11 countries in which men grade A holders comprised over 20 % of the total population of men academic staff ([452]), this was only the case for women grade A staff in four countries (Croatia, Serbia, Türkiye, Bosnia and Herzegovina). Notably, gender balance is also achieved among grade A positions in these four countries (see Figure 6.4).

Greece has the largest difference between the proportion of women and men in grade A positions relative to the population of women and men academic staff, with a difference of 14 pp (17 % for women and 31 % for men). Another considerable difference is observed in Cyprus, where men are four times as likely to hold grade A positions (4 % for women and 17 % for men), indicating a pronounced gender gap. The country with the smallest difference between women and men is Türkiye (20.70 % for women; 20.71 % for men)) followed by Malta (10 % for women and 11 % for men).

Box 42: Actions to advance women's careers in academia and research

Through the Implementation Agreement in **Germany**, federal and state governments have legally committed to supporting gender equality in their jointly funded research institutions and initiatives ([453]). For example, the Agreement contains specific provisions on career promotion, stipulating that in cases where candidates are equally qualified, the candidate of the underrepresented sex will be preferred in promotion procedures.

In **Ireland**, the Aurora leadership programme ([454]) was developed for women up to senior lecturer level (or professional services equivalent) working in a university, college, or related organisation. It helps women to better understand and address barriers to career development. Women from various Irish HEIs can connect and attend events to build networks, support career development, and participate in mentorship projects.

In the **Netherlands**, the Dutch Network of Women Professors ([455]) promotes and sustains equal representation of women in academia. With over 1 600 women professors and associate professors representing every discipline and every Dutch university, the Network pushes for an inclusive and safe academic community for women of all backgrounds and positions.

The Austrian University Act contains a number of articles on gender equality and covers all public universities in **Austria** ([456]). The triennial performance agreements between the universities and the Ministry for Higher Education specify measures to increase the numbers of women in leadership positions and provide targeted support for women junior academics.

([451]) BE, DK, DE, IE, EL, ES, IT, CY, LT, HU, NL, AT, PL, PT, FI, SE, NO.

([452]) EL, ES, FR, HR, IT, LV, LT, SI, RS, TR, BA

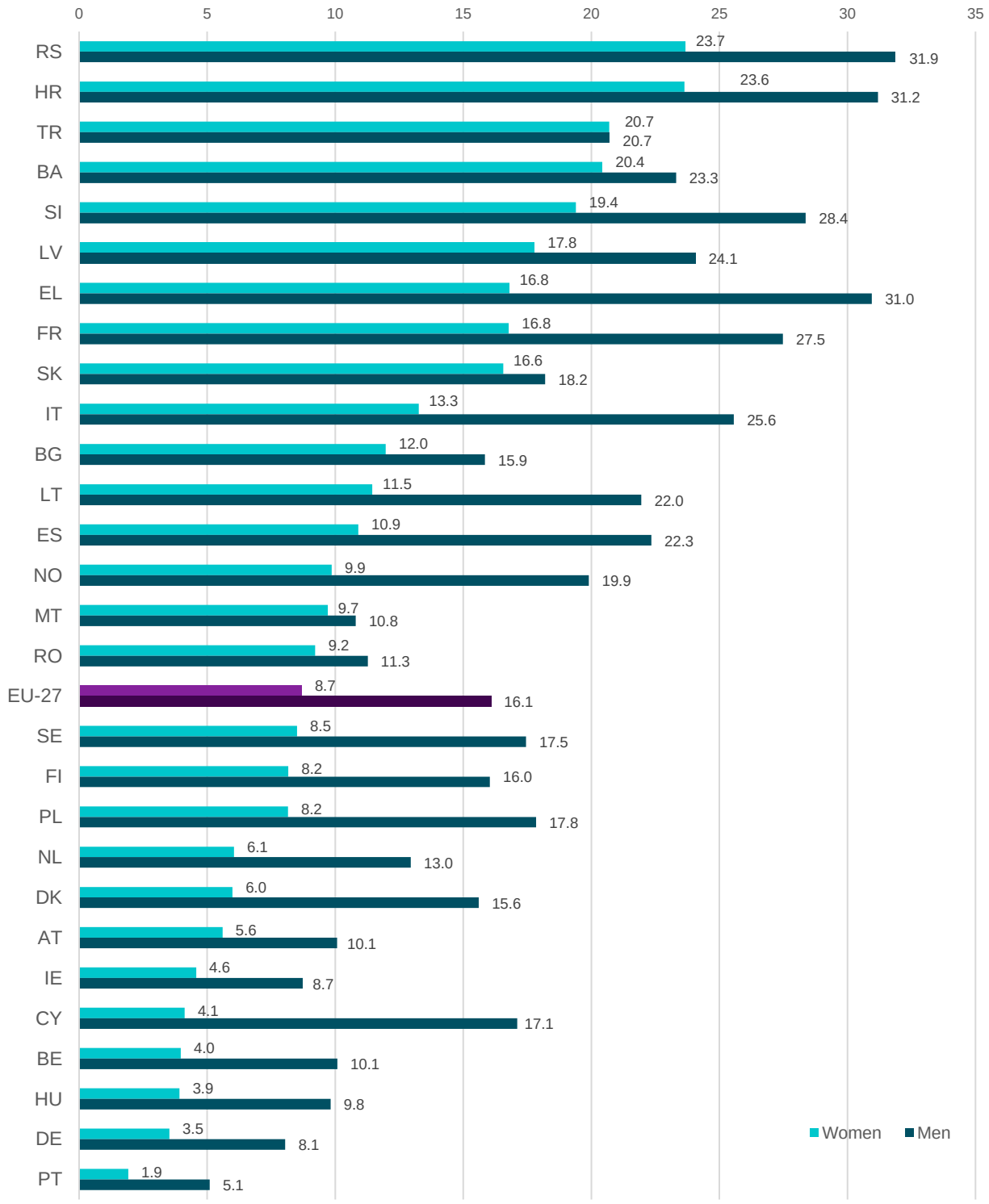
([453]) Federal State Government, Implementation Agreement, n.d., https://www.gwk-bonn.de/fileadmin/Redaktion/Dokumente/Papers/AV_Glei.pdf

([454]) Advance HE, Aurora Leadership Programme, n.d., https://www.advance-he.ac.uk/programmes-events/developing-leadership/aurora

([455]) Dutch Network of Women Professors, https://www.lnvh.nl/expertise-within-the-lnvh

([456]) EIGE, Gender Equality in Academia and Research GEAR Tool: Austria, https://eige.europa.eu/gender-mainstreaming/toolkits/gear/legislative-policy-backgrounds/austria?language_content_entity=en#:~:text=Such%20a%20supervisory%20board%20must,gender%20equality%20plans%20(GEPs)

Figure 6.5 Proportion (%) of grade A staff among all academic staff, by sex, 2022



Source: WiS database, DG Research and Innovation - T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR). Researchers used as reference population for BE, DK, DE, EE, FR, HR, CY, LV, HU, MT, AT, PL, PT, RO, SK, FI, IS, NO, RS, TR, BA. Academic staff used as reference population: BG, IE, EL, ES, IT, LT, NL, SI, SE. Reference year for WiS data: 2022. Reference year differs: BE(FR): 2019, CZ: 2020, DK: 2021, EL: 2021, ES: 2021, FR: 2021, CY: 2021, HU: 2021, AT: 2021, PT: 2021, RO: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021, AM: 2021; Data not available: CZ (grade A: Women, Men, Total), IS (2022), GE, AM, MD (2022), UA (2022) (grade A: Women, Men, Total), ; Data not available: DK , ES, CY, UA (All grades except Total) (Academic staff - 2022), BG, LT (Researchers - 2022); Not applicable: ES (2022), AM (2022).

A gender imbalance is evident when analysing the proportion of women and men in the highest academic positions. The gender gap may also vary depending on the field of study (see Chapter 2). The following indicators explore whether this is also the case among grade A staff.

Although well-represented in Humanities and the Arts, Social Sciences and Medical and Health Sciences at Doctoral level (see Chapter 2), women are underrepresented among grade A staff in these fields (38 %)

At EU level, women are underrepresented in grade A academic positions in every field of R&D (see Table 6.2). Women have a similar level of representation in Medical and Health Sciences (33 %), Agricultural and Veterinary Sciences (33 %) and Social Sciences (35 %). Even where women are most represented, Humanities and the Arts, gender balance is not achieved (38 %). This trend is also reflected at country level: in more than half of the countries examined, women are underrepresented among grade A staff in Humanities and the Arts ([457]), Social Sciences ([458]) and Medical and Health Sciences ([459]).

Research has shown that women tend to choose fields like Humanities and the Arts and Social Sciences due to teachers' and parents' high expectations of girls' achievements in literacy and their low expectations of their achievements in mathematics ([460]). Studies show that women and men's subject choices are determined by how each perceives the usefulness of studies, with women considering studies useful for personal growth and the improvement of society and men perceiving that their studies will afford them a better social position and income ([461]). Persistent gender stereotypes that depict women as nurturers and men as providers are internalised during the socialisation process and steer both women and men toward 'gender-appropriate' stereotypical subject and career choices. Figure 6.3 shows that despite achieving gender balance among Doctoral graduates, grade C and grade B staff in Humanities and the Arts and Social Sciences , women remain underrepresented in grade A positions in these fields, demonstrating the leaky pipeline effect and the extent of vertical gender segregation.

Women are most underrepresented in Natural Sciences and Engineering and Technology, where they comprise 24 % and 19 %, respectively, of total grade A academic staff at EU level. At country level, women are significantly underrepresented (less than 20 %) among grade A positions in Engineering and Technology in most countries for which data are available ([462]). Similarly, women are underrepresented in Natural Sciences in 18 countries ([463]) and are significantly underrepresented in eight ([464]).

The greatest proportion of women in grade A positions work in Social Sciences (29 %), while men in grade A positions work most frequently in Natural Sciences (23 %) and Social Sciences (23 %)

Figure 6.6 shows the distribution of grade A staff across the different fields of R&I, disaggregated by sex. The highest proportion of women grade A staff at EU level in 2022 is in Social Sciences (29 %), while the highest proportions of men grade A staff are in Natural Sciences (23 %) and Social Sciences (23 %). Meanwhile, the lowest proportions of both women and men grade A staff are in Agricultural and Veterinary Sciences (4 % and 3 %, respectively).

There are only small differences in women and men's distributions in Medical and Health Sciences and Agricultural and Veterinary Sciences at EU level (no more than 3 pp). However, there are more noticeable gaps in Natural Sciences (17 % of women and 23 % of men), Engineering and Technology (12 % of women and 21 % of men) and Humanities and the Arts (19 % of women and 13 % of men). This mirrors trends of

([457]) BE, DK, DE, EL, ES, IT, CY (based on a low number of grade A staff), NL, PL, PT, SK.

([458]) BE, DK, DE, EL, ES, IT, CY, NL, AT, PL, PT, SE, NO.

([459]) BE, DK, DE, EL, ES, IT, CY, NL, AT, PL, PT, FI, SE.

([460]) Trusz, S. 'Why do females choose to study humanities or social sciences, while males prefer technology or science? Some intrapersonal and interpersonal predictors', *Social Psychology of Education*, Vol. 23, 2020, pp. 615-639, https://doi.org/10.1007/s11218-020-09551-5

([461]) Soto Personat, G., Agut Nieto, S., and Agost Felip, M.R., 'The gender gap in career choice: Influence of gender stereotypes in the process of career decision making', ICERI2019 Proceedings, 2019, pp. 2445-2452.

([462]) BE, DK, DE, EL, ES, IT, CY, NL, AT, PL, PT, RO, FI, SE, NO.

([463]) BE, DK, DE, EL, ES, IT, CY, LT, MT, NL, AT, PL, PT, SI, SK, FI, SE, NO.

([464]) BE, DK, DE, EL, CY, NL, AT, FI.

lower proportions of women in Natural Sciences and Engineering and Technology and higher proportions of women in Humanities and the Arts (see Table 6.2).

Compared to She Figures 2021, the gap between the proportion of women and men in Natural Sciences and Engineering and Technology has remained the same. For example, data from the previous edition showed a 6 pp gap in Natural Sciences and a 9 pp gap in Engineering and Technology, both in favour of men. A similar gap exists between women and men in the field of Humanities and the Arts, which still has a difference of 6 pp in favour of women.

Most countries have a lower proportion of women in grade A positions in 2022 in Natural Sciences ([465]) (the most pronounced difference is in Finland, at 16 pp) and Engineering and Technology ([466]) (the largest difference is in Bosnia and Herzegovina, at 33 pp). By contrast, there is a higher proportion of women in Humanities and the Arts ([467]) (the largest difference is in Austria, at 16 pp) and Social Sciences ([468]) (the largest difference is in Lithuania, at 15 pp).

Box 43: Associated Countries' actions to advance women's careers in STEM

In **Moldova**, a study by the Moldova State University makes several recommendations to the government to support women in STEM ([469]). These include strengthening mechanisms around gender imbalances in decision-making, financing, publication, and dissemination processes, by introducing a gender quota, for example. The report also recommends mainstreaming the gender dimension in research and development policies, programmes and projects.

In **Albania**, the Network of Albanian Women in STEM (NAW-STEM) ([470]) contributes to the social and economic empowerment of women by increasing their representation in STEM, both in academia and industry. The Network uses projects, events and publications to increase the visibility of women in STEM and support and facilitate structural change to enable women's advancement in STEM careers.

([465]) BE, DK, DE, EL, HR, CY, LV, LT, MT, NL, AT, PL, RO, SI, SK, FI, SE, NO.

([466]) BE, DK, DE, EL, HR, IT, LV, LT, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, NO, RS, TR, BA.

([467]) BE, DK, DE, EL, HR, LV, LT, NL, AT, PL, PT, SI, SK, FI, SE, NO, RS.

([468]) BE, DK, DE, EL, HR, IT, LV, LT, MT, NL, AT, PL, PT, SI, SK, FI, SE, TR, BA.

([469]) Iatco, M. and Bevziuk, V., *Analysis of challenges to ensuring gender equality in science and research: Recommended policies for Republic of Moldova*, Moldova State University, 2023, https://politicalstudies.uvt.ro/index.php/psf/article/view/19/18

([470]) Scidev Centre, Network of Albanian Women in STEM, n.d., https://scidevcenter.org/2021/07/06/network-of-albanian-women-in-stem/

Table 6.2 Proportion (%) of women among grade A staff, by main field of R&D, 2022

Country	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural and veterinary sciences	Social sciences	Humanities and the arts
EU-27	**24.0**	**19.5**	**32.8**	**32.6**	**34.5**	**38.2**
BE	19.3	16.7	24.0	27.1	26.0	26.6
DK	16.1	13.3	28.4	23.1	27.9	36.5
DE	18.3	13.0	18.0	27.4	28.0	34.8
EL	15.4	13.9	30.3	22.4	29.4	33.6
ES	23.9	16.8	30.2	28.9	29.7	35.0
HR	44.9	25.4	51.4	48.4	53.8	51.5
IT	27.7	17.0	20.7	25.5	31.0	39.6
CY	11.8	19.5	22.9	-	5.6	13.0 (3/23)
LV	42.7	38.1	66.4	67.3	65.7	69.0
LT	26.3	22.4	47.6	34.2	54.2	52.3
MT	33.3 (3/9)	20.0 (2/10)	42.9 (6/14)	-	50.0 (2/4)	-
NL	19.9	18.7	34.0	25.3	30.3	38.0
AT	17.8	14.4	25.8	23.8	34.2	44.4
PL	22.0	15.6	37.4	39.1	31.3	29.7
PT	29.6	14.8	28.3	32.5	28.5	39.8
RO	49.4	17.7 (3/17)	60.8	40.0 (8/20)	50.0 (11/22)	-
SI	21.4	24.2	41.1	42.3	40.9	43.1
SK	29.9	29.1	41.1	30.4	49.6	39.8
FI	15.8	12.0	35.6	37.3	40.8	49.3
SE	20.8	19.6	36.7	34.7	38.9	40.2
NO	21.0	16.7	49.4	25.3	37.2	40.1
BA	53.2	37.1	52.6	49.1	45.7	48.6
RS	50.4	49.1	49.3	49.9	49.9	47.7
TR	62.5 (10/16)	28.6	60.5	78.6 (11/14)	50.0 (11/22)	-

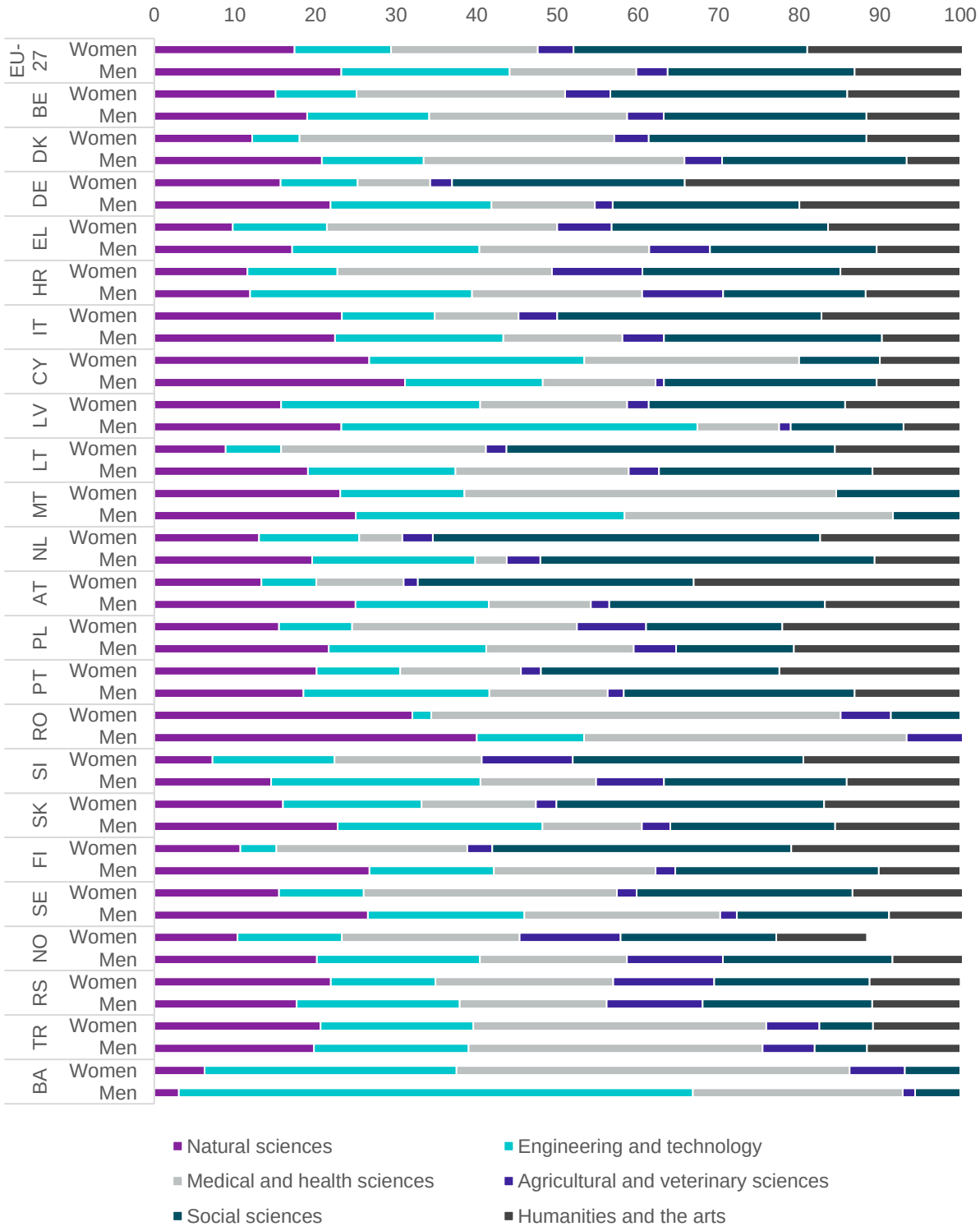
Source: WiS database, DG Research and Innovation - T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for Researchers are not available or incomplete, data for Academic staff are presented; Data for BE = BE (FL) + BE (FR). Researchers used as reference population for BE, DK, DE, EE, FR, HR, CY, LV, HU, MT, AT, PL, PT, RO, SK, FI, IS, NO, RS, TR, BA. Academic staff used as reference population: BG, IE, EL, ES, IT, LT, NL, SI, SE.
Reference year differs: BE(FR): 2019, CZ: 2020, DK: 2021, IE: 2021, EL: 2021, ES: 2021, FR: 2021, CY: 2021, LV: 2018, HU: 2021, AT: 2021, PT: 2021, RO: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021, AM: 2021; Data not available: (All Fields of Research and Development): BG, CZ, EE, IE, FR, CY (Agricultural and Veterinary Studies), HU, MT (Agricultural and Veterinary Studies, Humanities and the Arts), RO (Humanities and the Arts), IS, BA (Humanities and the Arts), GE, AM, MD, UA; Not applicable: ES, AM. For NL, the data for the field of Medical and Health Sciences

exclude university medical centres, where the percentage of women among grade A staff was 29.7% in 2022 ([471]). For proportions based on fewer than 30 women, the numerator and denominator are displayed in brackets.

([471]) LNVH Monitor Vrouwelijke hoogleraren, 2023, nvh-monitor-vrouwelijke-hoogleraren-2023.pdf

Figure 6.6 Distribution (%) of grade A staff across field of R&D, by sex, 2022



Source: WiS database, DG Research and Innovation - T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for Researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR). Data for BG, IE, ES, FR are not broken down by field of R&D. Researchers used as reference population for BE, DK, DE, EE, FR, HR, CY, LV, HU, MT, AT, PL, PT, RO, SK, FI, IS, NO, RS, TR, BA. Academic staff used as reference population: BG, IE, EL, ES, IT, LT, NL, SI, SE. Reference year differs: BE (FR): 2019, DK: 2021, EL: 2021, ES: 2021, FR: 2021, CY: 2021, LV: 2018, HU: 2021, AT: 2021, PT: 2021, RO: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021, AM: 2021; Data not available: BG, CZ, EE, IE, FR, HU, IS, GE, AM, MD, UA (All Fields of Research and Development).

6.3 Glass Ceiling Index (GCI)

The GCI is a ratio of the proportion of women in all academic grades (A, B and C) to the proportion of women in grade A in a given year. A GCI of 1 indicates that women and men have equal chances of being promoted. A score of less than 1 means that women are overrepresented at grade A level and a GCI score of more than 1 indicates that women are underrepresented in grade A positions. In brief, a higher GCI signifies a stronger glass ceiling effect, making it more difficult for women to advance into higher positions in academia. **The glass ceiling effect has remained the same since 2019 at EU level, with women still far less likely than men to reach grade A positions**

At EU level, the GCI is 1.42 in 2022, compared to 1.42 in 2019. At country level, the GCI has decreased in the majority of EU-27 Member States and Associated Countries for which data are available, compared to 2019 ([472]). This indicates a reduction in the glass ceiling effect and an improvement in women's prospects of moving up the academic hierarchy. However, no country has a GCI of less than 1, showing that, despite improvements, women remain less likely than men to progress to the top positions.

The largest reduction in the GCI is in Ireland (from 1.80 in 2019 to 1.49 in 2022), while the largest rise in the GCI is in Romania (from 1.05 in 2019 to 1.10 in 2022).

Women have the highest chance of progressing to top positions in Türkiye, which has a GCI of 1.00 (0.99 in 2019), Bulgaria and Malta (from 1.13 in 2019 to 1.05 in 2022), then Bosnia and Herzegovina, where the GCI increased from 0.95 in 2019 to 1.09 in 2022. This means that women were slightly more likely than men to be promoted to the highest academic position in 2019, but are now slightly less likely to be promoted to these positions.

Box 44: Measures implemented within higher education institutions to increase the number of women professors

Universities in **the Netherlands** have all made efforts to counter the underutilisation of women's talents, especially those in higher-level positions. Measures include recruitment quotas for women professors, resulting in a significant increase in the numbers of women professors in 2015-2020 ([473]). Similar targets are set for 2020-2025, with the goal of ensuring that all universities have at least 25 % women professors by 2025.

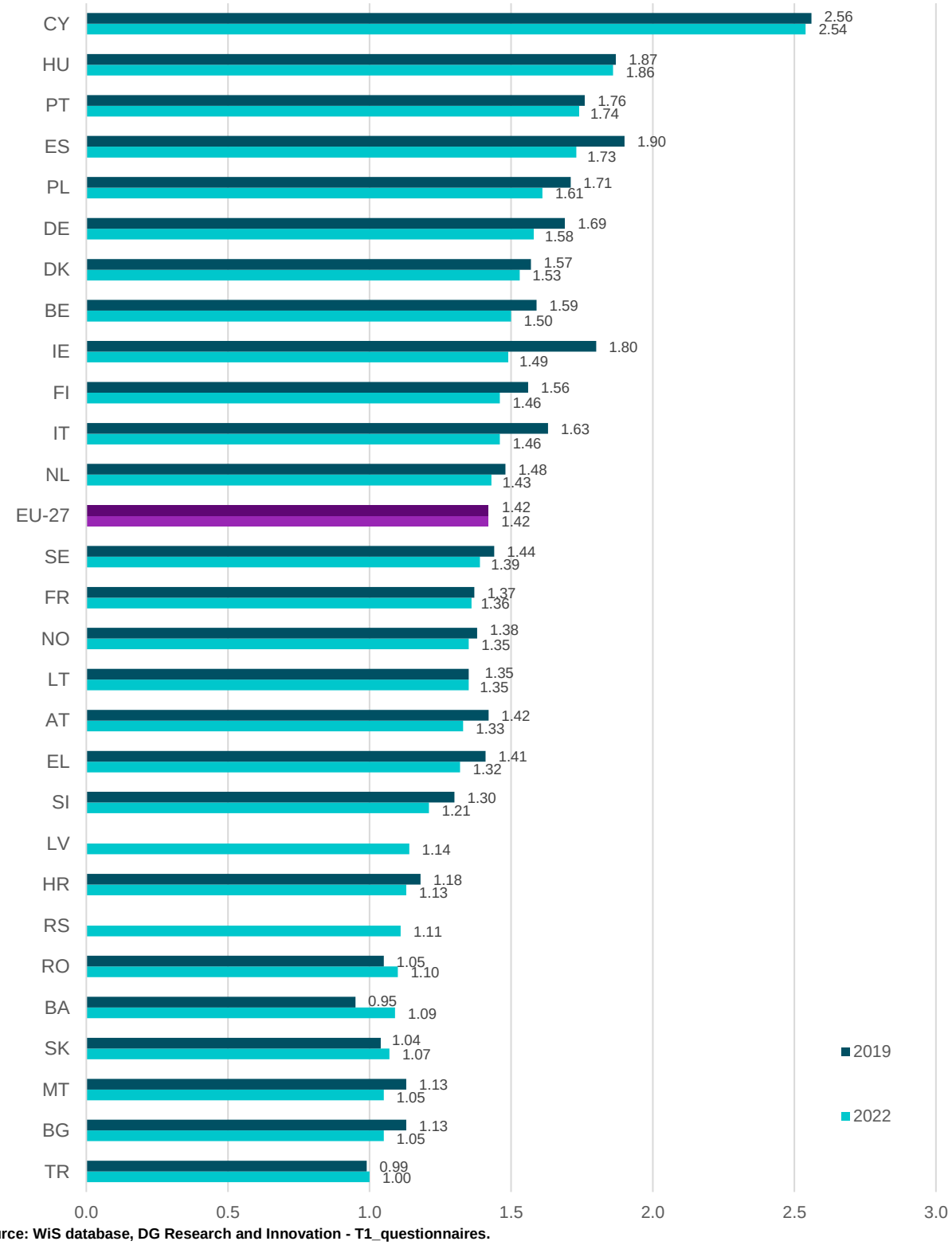
In **Sweden**, the government has adopted a system of 'appropriation directions' to complement the Higher Education Act and Higher Education Ordinance ([474]). These directions set targets to recruit women professors. Between 2021 and 2023, HEIs were given new and individual goals, including 50 % of newly recruited women professors by 2030.

([472]) BE, BG, DK, DE, IE, EL, ES, FR, HR, IT, CY, HU, MT, NL, AT, PL, PT, SI, FI, SE, NO

([473]) EIGE, Gender Equality in Academia and Research – GEAR tool, 2024, https://eige.europa.eu/gender-mainstreaming/toolkits/gear/legislative-policy-backgrounds/netherlands?language_content_entity=en

([474]) EIGE, *Sweden: Promoting Gender Equality in Research*, n.d., https://eige.europa.eu/gender-mainstreaming/toolkits/gear/legislative-policy-backgrounds/sweden?language_content_entity=en

Figure 6.7 Glass Ceiling Index, 2019-2022



Source: WiS database, DG Research and Innovation - T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for Researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR). Reference years for WiS data: 2019-2022; Researchers used as reference population for: BE, CZ, DK, DE, ES, FR, HR, CY, LV, HU, MT, AT, PL, PT, RO, SK, FI, IS, NO, RS, TR, BA, GE, AM, MD, UA; Academic staff used as reference population: BG, IE, EL, IT, LT, NL, SI, SE. Reference year differs (latest available year): BE(FR): 2019, CZ: 2020, DK: 2021, EL: 2021, ES: 2021, FR: 2021, CY: 2021, HU: 2021, AT: 2021, PT: 2021, SI: 2021, SK: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021, AM: 2021; Reference year differs (earliest available year): BE(FR): 2018, EL: 2015, IT: 2017, CY: 2017, LV: 2018, RO: 2018, SI: 2018, FI: 2015, UA: 2015; Data not available (grade C: Women, Men, Total), IE (grade D: Women, Men, Total), ES (grade A: Women, Men, Total), GE, AM, MD, EE (grade A,B,C,D) Data not available: DK, ES, CY, UA (All grades except Total) (Academic staff - 2022 , BG, LT (Researchers - 2022): Not applicable: BG (grade C: Women, Men, Total), ES (grade A: Women, Men, Total), AM (grade A,B,C: Women, Men, Total).

6.4 Women's representation among grade A staff by age group

The previous sections have shown that vertical gender segregation persists across all fields of R&D. This section compares how women's representation in the highest level of academia varies by age. A recent Council Recommendation includes tackling gender biases in assessments to facilitate women's career progression ([475]), while policies such as the Work-Life Balance Directive (2019) ([476]) and the EU Pay Transparency Directive (2023) ([477]) have been implemented to alleviate the pressure on women to balance work and caring responsibilities and ensure they do not negatively impact on their careers. As grade A positions typically require several years of academic experience, the following indicators shed light on how women's representation differs according to different age groups in order to understand the extent of the leaky pipeline effect in academia.

Women continue to be underrepresented in all age categories among grade A positions except the under-35 age group, where gender balance is achieved (48 %)

Table 6.3 shows the pattern of women's representation in grade A positions by age group. Women are underrepresented in every age group among grade A staff at EU level in 2022, except for the under-35s, where gender balance is achieved (48 %). Women represent 33 % of grade A positions in the 35-44 age group, 32 % in 45-54 age group, and 27 % in the 55+ age group, demonstrating that the higher the age group, the lower women's representation.

While this may suggest that it is becoming easier for women to reach grade A positions, the values for the under-35 category are based on low absolute numbers and should be treated with caution. Interestingly, although low absolute numbers were also observed in the under-35s in 2018 (as reported in She Figures 2021), women represented over 40 % in only five countries (Bulgaria, Luxembourg, Malta, Romania, Slovakia), growing to eight countries in 2021 (Bulgaria, the Netherlands, Austria, Poland, Portugal, Romania, Norway, Serbia), suggesting that the pattern of women's representation in grade A positions is improving ([478]).

Women are underrepresented among grade A positions in four countries in the under-35 age group (Germany, Croatia, Lithuania, Malta ([479]), 11 countries in the 35-44 age group ([480]), 12 countries in the 45-54 age group ([481]) and 11 countries in the 55+ age group ([482]). However, for the under-35 age category, in all but one country (Germany), these proportions are based on low overall numbers (<30). Since there are very few women in this age category, but it is where they are most represented, this in turn shows that only a limited number of women occupy these top positions.

Exceptions to the EU-level trend of a decline in women's representation in older age groups are observed in Bulgaria, Croatia, Serbia, and Türkiye. In Bulgaria, gender balance is achieved in the two highest age groups, and women constitute the majority in the 35-44 age group and all grade A holders among the under-35s (again, based on low absolute values of <30). Gender balance is reached in the three highest age categories in Croatia, but women in the under-35 age group are only 33 % of grade A position holders (based on a small number of researchers). Gender balance is reached in the three highest age categories in Serbia, and women

([475]) Council Recommendation of 18 December 2023 on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe, https://eur-lex.europa.eu/eli/C/2023/1640/oj

([476]) 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, OJ L 188, 12.7.2019, pp. 79-93, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32019L1158

([477]) Directive (EU) 2023/970 of the European Parliament and of the Council of 10 May 2023 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, OJ L 132/21, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023L0970

([478]) It should be noted that while there are more countries in which women represent over 40 % of under-35s in 2021 compared to 2018, some of the countries for which this was true in 2018 (Luxembourg, Malta and Slovakia) are no longer gender balanced.

([479]) Except for DE, these figures are based on low overall numbers.

([480]) BE, DE, IT, LT, NL, AT, PL, SI, FI, SE, NO.

([481]) BE, DE, IT, MT (based on low overall numbers), NL, AT, PL, PT, SI, FI, SE, NO.

([482]) BE, DE, IT, NL, AT, PL, PT, SI, FI, SE, NO.

form the majority in the under-35 age group (based on a small number of researchers). Finally, in Türkiye, the data show that gender balance is achieved in the three highest age groups.

For both women and men, most grade A position holders are aged 55+ (58 % and 64 %, respectively), but women comprise only around one-third of all grade A staff in this age group

Figure 6.8 provides a more detailed view of the proportion of women and men in grade A positions by showing the age distribution of grade A staff according to sex. 2022 data show that the majority of women and men in grade A positions are aged 55+ (58 % of women and 64 % of men), around one-third are aged 45-54 (33 % of women and 28 % of men), a small proportion are aged 35-44 (8 % of women and 7 % of men) and very few are under 35 (0.35 % of women and 0.16 % of men). The largest gap in the distribution between women and men researchers is in the highest age category, where men exceed women by 6 pp.

For countries with data available, the proportion of women and men in grade A positions is lowest in the under-35 age group. The highest proportion in this age group is in Malta, where women account for 41 %. Romania has the second largest proportion in this age category, with women comprising 13 %. The age group with the most variation is 45-54, where the proportion of women and men ranges from 13 % of women and 15 % of men grade A staff in Portugal to 45 % of both women and men grade A staff in Türkiye.

Women and men are most represented in the 55+ age group in the majority of countries (except Belgium, Germany, the Netherlands and Türkiye, where women are most represented in the 45-54 age group). In four countries, the representation of women and men in this age group is considerable: in Bulgaria, Italy, Poland, and Portugal, more than 70 % of women and men are in this age category. However, Table 6.3 indicates that women are most underrepresented in the older age groups. As women are mostly distributed in the 55+ age group but are still least represented in this age group, these indicators together demonstrate the extent of women’s underrepresentation in grade A positions.

Table 6.3 Proportion (%) of women among grade A staff, by age group, 2022

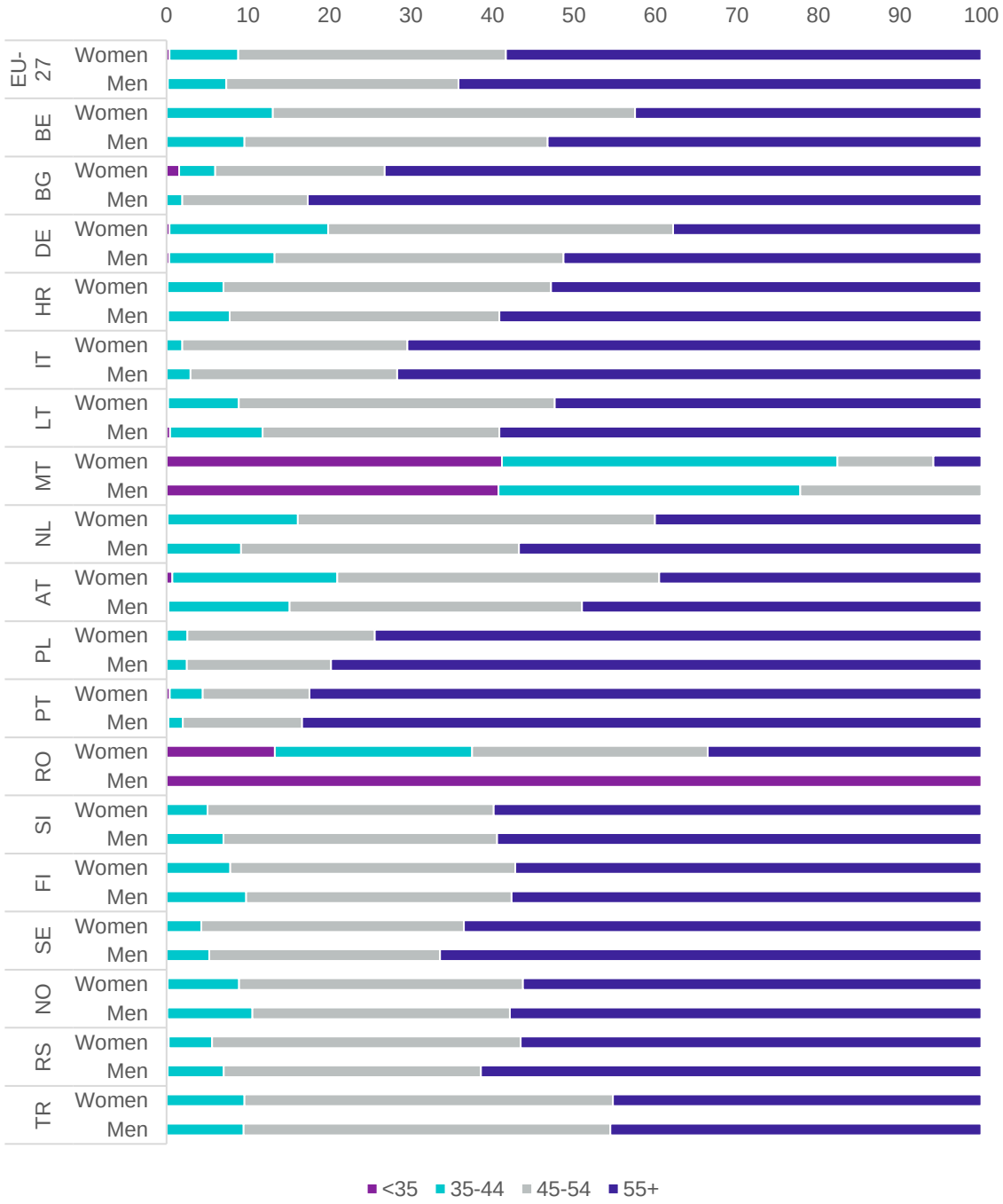
Country	<35	35-44	45-54	55+	Total
EU-27	**47.7**	**33.0**	**32.4**	**27.4**	**29.4**
BE	-	29.9	27.2	20.0	23.2
BG	100.0 (20/20)	64.8	52.2	41.8	44.7
DK	-	-	-	-	24.7
DE	26.3	32.0	27.2	18.7	23.8
IE	-	-	-	-	31.3
EL	-	-	-	-	24.6
ES	-	-	-	-	26.3
FR	-	-	-	-	30.2
HR	33.3 (2/6)	43.1	50.4	42.7	45.5
IT	-	19.6	28.8	26.7	27.0
CY	-	-	-	-	13.5
LV	-	-	-	-	46.6
LT	25.0 (1/4)	37.0	50.6	40.5	43.5
HU	-	-	-	-	21.8
MT	38.9 (7/18)	41.2 (7/17)	25.0 (2/8)	100.0 (1/1)	38.6
NL	100.0 (1/1)	39.1	32.0	20.6	27.3
AT	54.6 (6/11)	35.6	30.9	24.7	28.9
PL	50.0 (1/2)	28.7	33.8	26.8	28.2
PT	40.0 (2/5)	46.7	25.9	27.8	27.8
RO	65.4 (17/26)	-	-	-	51.4
SI	-	28.4	36.4	35.6	35.4
SK	-	-	-	-	37.7
FI	-	27.3	33.5	31.8	31.9
SE	-	26.9	33.9	30.1	31.0
NO	40.0 (2/5)	30.4	36.5	33.6	34.2
RS	66.7 (6/9)	41.5	52.4	45.8	47.8
TR	-	49.7	49.5	49.2	49.4
BA	-	-	-	-	44.9

Source: WiS database, DG Research and Innovation – T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for Researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR). Researchers used as reference population for: BE, CZ, DK, DE, EE, FR, HR, CY, LV, HU, MT, AT, PL, PT, RO, SK, FI, IS, NO, RS, TR, BA, GE, AM, MD, UA; Academic staff used as reference population: BG, IE, EL, ES, IT, LT, NL, SI, SE. Reference year differs: BE(FR): 2019, CZ: 2020, DK: 2021, ES: 2021, FR: 2021, CY: 2021, HU: 2021, AT: 2021, PT: 2021, RO: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021, AM: 2021; Data not available: CZ, EE, IS, GE, AM, MD, UA, (All age groups except Total): BE(FR), DK, IE, EL, ES, FR, CY, HU, SK, BA, (age group: <35, sex: Women): BE(FL), IT, SI, FI, SE, TR, (age group: 35-44, 45-54, 55+, sex: Women): RO; not applicable: ES (2022), AM (2022). For NL, the data for Medical and Health Sciences exclude university medical centres, where the percentage of women among grade A staff was 29.7 % in 2022 ([483]). Each EU aggregate is computed based on the available data at country-level for the respective age group. This explains why the EU figure for 'Total' is smaller than the EU figures of all age groups. For proportions based on fewer than 30 women, the numerator and denominator are displayed in brackets.

([483]) LNVH Monitor Vrouwelijke hoogleraren, 2023, nvh-monitor-vrouwelijke-hoogleraren-2023.pdf

Figure 6.8 Distribution (%) of grade A staff across age groups, by sex, 2022



Source: WiS database, DG Research and Innovation – T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for Researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR). Reference year differs: BE (FR): 2019, CZ: 2020, DK: 2021, EL: 2021, ES: 2021, FR: 2021, CY: 2021, HU: 2021, AT: 2021, PT: 2021, RO: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021, AM: 2021; Data not available: BE (FR), DK, IE, FR, HU, BA, CY, EE, LV (all age groups except Total), BE, SI, FI, SE, TR (age group: <35), IT (age group:<35, sex: Women), BG, NL, SK (age group:<35, sex: Men), RO (all age groups other than <35, sex: Men), CZ, EE, IS, GE, AM, MD, UA. For NL, the data for Medical and Health Sciences exclude university medical centres, where the percentage of women among grade A staff was 29.7% in 2022 ([484]).

([484]) LNVH Monitor Vrouwelijke hoogleraren, 2023, https://www.lnvh.nl/monitor2023/EN.html

6.5 Women's participation in leadership positions

Women's representation in leadership positions is addressed in Directive 2022/2381 of the European Parliament and of the Council and is a key area of Horizon Europe's guidance on GEPs (now an eligibility criterion for accessing Horizon Europe funding). The EU Gender Equality Strategy 2020-2025 emphasises the importance of inclusive and diverse leadership in improving organisational culture and research outputs. To examine the progress of women's representation in leadership positions in R&I, this section presents data on women's participation among heads of HEIs and as board members and leaders.

Women remain underrepresented among the heads of HEIs at EU level (26 %), although the representation has slightly grown by 2 pp since 2019

Figure 6.9 shows the proportion of women and men among heads of institutions in HES in 2022. At EU level, women are underrepresented, at 26 %. This nevertheless marks a slight improvement since 2019, when women comprised 24 % of heads of institutions. A similar trend is observed at country level. In 20 of the 32 countries for which data are available ([485]), women constitute less than 30 % of heads of institutes. In seven of those countries ([486]), women are significantly underrepresented. Gender balance is achieved in Ireland (47 % women), Latvia (48 % women), the Netherlands (46 % women ([487])), Norway (41 % women), and Türkiye (44 % women).

Notably, for some of these countries (Ireland, the Netherlands, Norway), this finding conflicts with other indicators showing women's underrepresentation in grade A positions (see Figure 6.1, Figure 6.4 and Table 6.1).

The presence of women as heads of universities has improved, yet gender balance is only achieved in Latvia, Norway, and Türkiye

Figure 6.10 shows the proportion of women among heads of universities or assimilated institutions that are accredited to deliver PhDs in 2022 (this differs slightly from Figure 6.9, which includes institutions that may not offer PhD programmes). Several proportions are based on low absolute numbers (<30), meaning that small changes in numbers translate into large changes in percentage terms. This somewhat limits an interpretation of women's representation in these positions.

The proportions of women as heads of assimilated institutions accredited to deliver PhDs at both EU and country level follow a similar pattern to that shown in Figure 6.9, with women mostly underrepresented – and sometimes significantly underrepresented – in these positions.

At EU level, women represent 22 % of heads of universities, an increase of 5 pp since 2019. At country level, the proportion of women heads of universities ranges from 8 % in Romania to 59 % in Türkiye. Notably, Latvia, Iceland, Norway and Türkiye are the only countries to achieve gender balance, although for Latvia, Iceland and Norway this is based on low values.

[485] BG, CZ, DE, EE, EL, ES, FR, HR, IT, CY, HU, MT, AT, PL, PT, RO, SK, RS, GE, MD (note: based on low numbers)

([486]) CZ, EL, FR, CY, HU, RO, SK

([487]) Data for NL include universities of applied sciences and university medical hospitals.

Box 45: Actions to support women reaching decision-making positions in higher education and research

In **Denmark**, the Gender Equality Act ([488]) stipulates that all universities and other research organisations are required to report the gender composition in the highest management body (the board) and all employee categories. In addition, the Act requires these organisations to report their targets to increase the underrepresented sex on their boards, along with a timeline for these targets to be met ([489]).

In **France**, Law no 2013-660 of 22 July 2013 on higher education and research ([490]) contains provisions that require parity for new research governance bodies and gender parity for elections to all governing bodies of research organisations. It also requires all universities and research organisation to nominate Gender Officers ([491]). It explicitly includes the objective to strengthen gender equality in national higher education and research organisations and in university decision-making bodies.

In the **Netherlands**, various articles in the Higher Education and Scientific Research Act (Articles 9(3)(1), 9(7)(2), 10(2)(1), 11(2)(1) and 11(5)(2)) mandate that universities take a balanced distribution of seats between women and men into account in the appointment of members of their respective executive boards. It also includes provisions to support the equal distribution of leadership positions between women and men at universities and other HEIs.

In **Austria**, the Austrian Science Fund (FWF) strives for balanced participation of women and men in all bodies, functions, processes and programmes, and aims to use sustainable measures to engage researchers to support structural changes towards equality at national research institutions. Its Equality and Diversity Strategy 2019-2020 was accompanied by an action plan, which included the following measures: expansion of equal opportunity monitoring (quantitative and qualitative); further development of programmes and special measures to increase the number of women applicants; a target of 50 % of women on the FWF Board; and awareness-raising and competence-building among the FWF Board (integration of a gender dimension into the research approach) ([492]).

([488]) Mænd og kvinder på de danske universiteter: Danmarks talentbarometer 2019, https://ufm.dk/publikationer/2020/filer/talentbarometer-2019.pdf

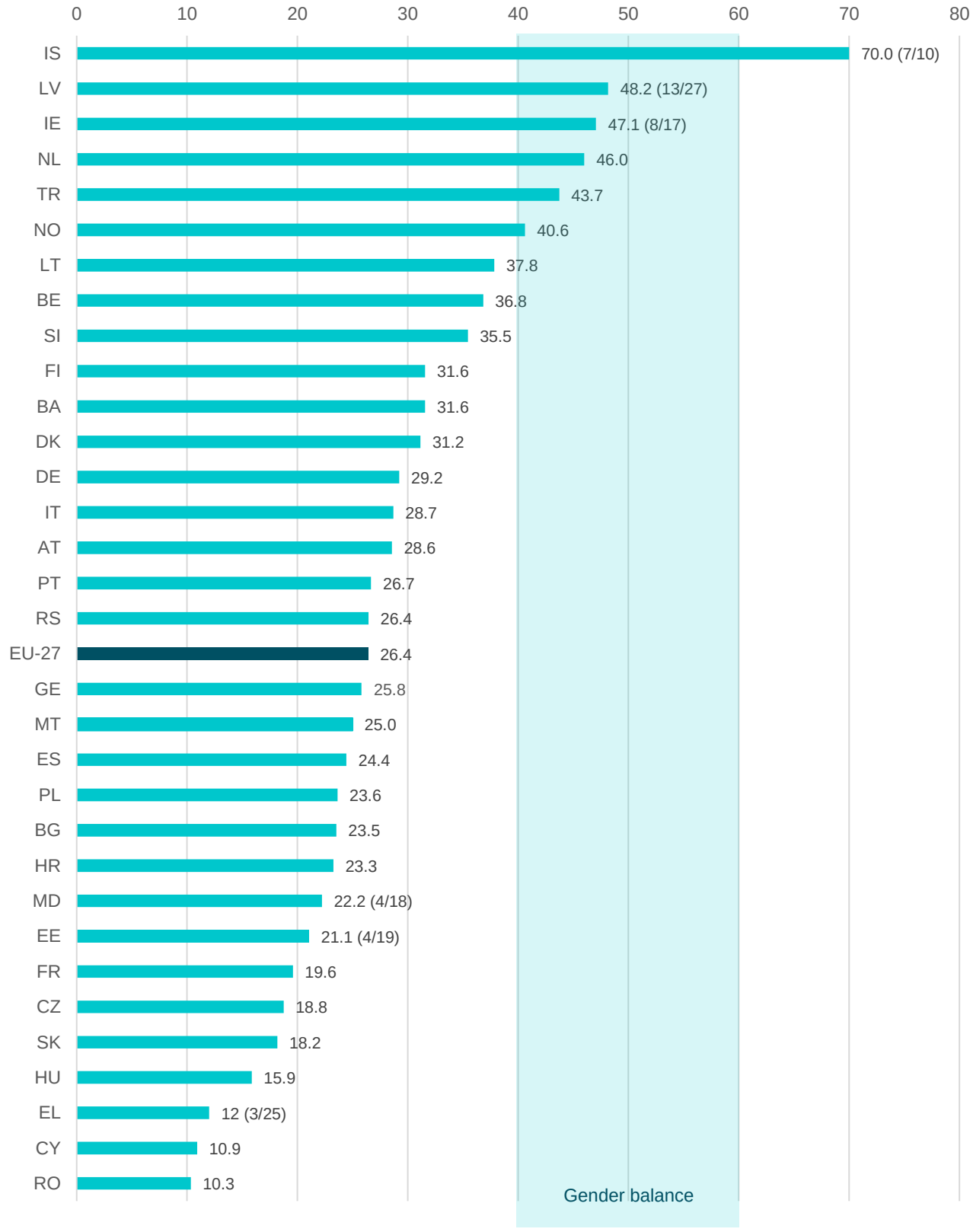
([489]) EIGE, Gender Equality in Academia and Research – GEAR tool: Denmark, n.d., https://eige.europa.eu/gender-mainstreaming/toolkits/gear/legislative-policy-backgrounds/denmark?language_content_entity=en#:~:text=The%20Gender%20Equality%20Act%20aims,value%20of%20women%20and%20men

([490]) Law no 2013-660 of 22 July 2013 on higher education and research, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000047862217/2023-09-14/

([491]) EIGE, Gender Equality in Academia and Research – GEAR tool: France, n.d., https://eige.europa.eu/gender-mainstreaming/toolkits/gear/legislative-policy-backgrounds/france?language_content_entity=en#:~:text=In%20the%20specific%20area%20of,bodies%20introduced%20by%20the%20Act

([492]) FWF, Gender Diversity Strategy 2018, https://www.fwf.ac.at/fileadmin/Website/publications/Publikationen/FWF-relevante_Publikationen/FWF_Strategy_Gender_Diversity_2018.pdf

Figure 6.9 Proportion (%) of women among heads of institutions in HES, 2022

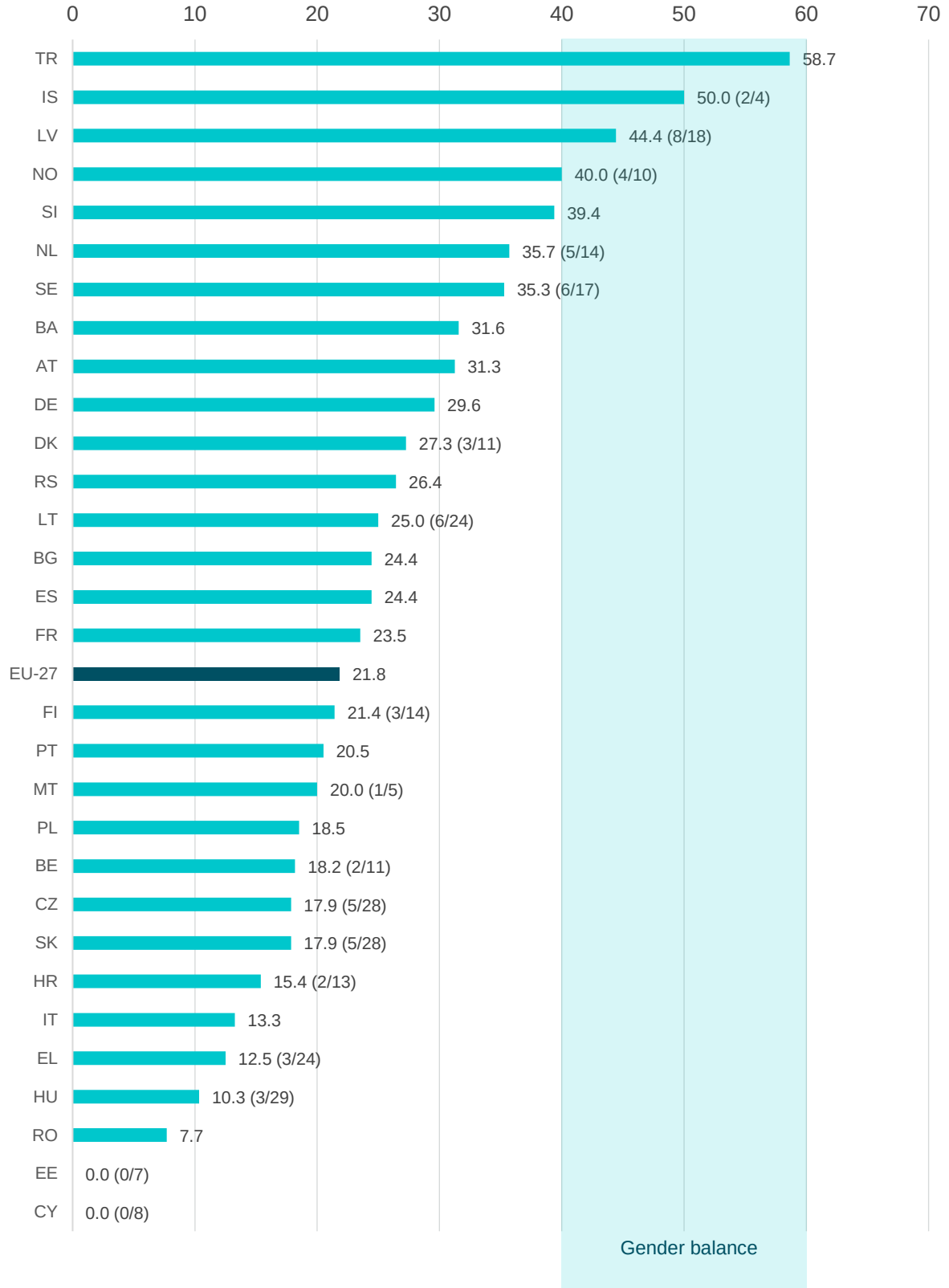


Source: WiS database, DG Research and Innovation - T7_questionnaires.

Notes: Data are HC from T7_questionnaires of WiS database. Data for BE = BE (FL) + BE (FR).

Reference year differs: CZ (2021), CY (2021), PT (2021), GE (2021); Data not available: SE (2022), AM, UA (Women, Men, Total).

Figure 6.10 Proportion (%) of women among heads of universities or assimilated institutions based on capacity to deliver PhDs, 2022



Source: WiS database, DG Research and Innovation - T8_questionnaires.

Notes: Data are HC from T8_questionnaires of WiS database. Data for BE = BE (FL) + BE (FR).

Reference year differs: CY (2021), PT (2021), SE (2021); Data not available: IE (Women, Men, Total), GE (Women, Men, Total), AM (Women, Men, Total), MD (Women, Men, Total), UA (Women, Men, Total), CY, EE, HR (Women).

Women remain underrepresented among board members (38 %) and board leaders (39 %) at EU level, but their representation varies greatly at country level

Figure 6.11 shows the proportion of women on boards, both as leaders and as members (including leaders). These can include scientific and administrative boards, as well as advisory boards of a research organisation, and they can be publicly or privately managed and financed. As boards advise and coordinate research and direct core aspects of the research agenda, they have widespread influence on scientific policy and their members possess extensive decision-making power.

Women are slightly underrepresented as board members (38 %) and board leaders (39 %) in 2022, at EU-level. At country level, the representation of women and men among board members and leaders varies substantially. Among board members, women are under-represented in 17 countries ([493]), with gender balance among board members in the remaining 13 countries for which data are available ([494]). Among board leaders, women are underrepresented in 17 countries ([495]). In comparison, women form the majority of board leaders in six countries (Estonia, Spain, Portugal, Finland, Sweden, Norway) and gender balance among board leaders is achieved in seven countries (Belgium, Bulgaria, Denmark, Latvia, the Netherlands, Slovakia, Iceland). Overall, six countries have achieved gender balance among both board members and board leaders (Belgium, Bulgaria, Denmark, the Netherlands, Slovakia, Iceland).

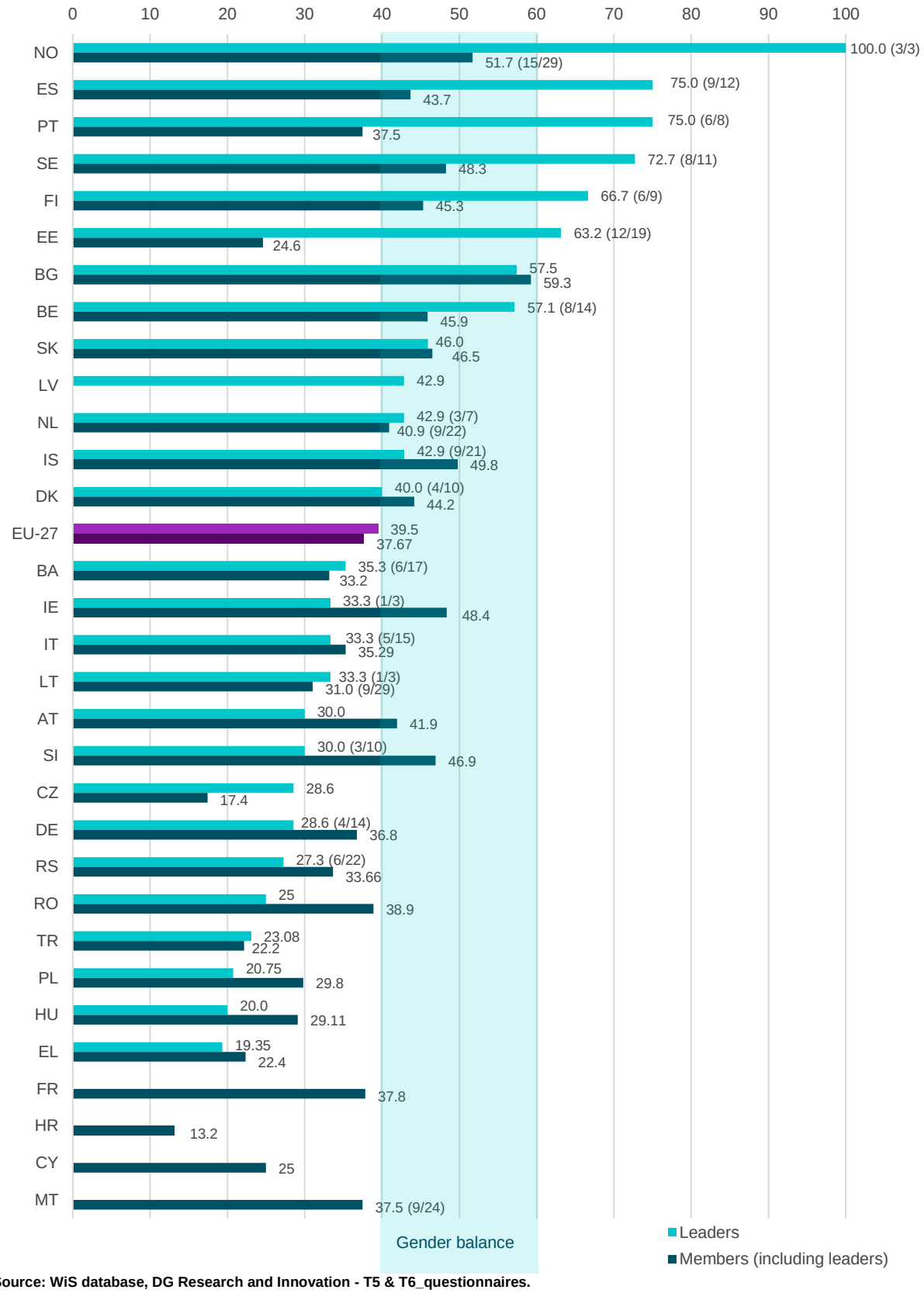
Greece has the largest imbalance between women and men for both board members and leaders: women are outnumbered by men by 1 to 4. Similarly, in Hungary, women are outnumbered by men among board leaders by 1 to 4 and represent just under 1 in 3 board members. Notably, although women account for less than 30 % of heads of institutes in HES in Bulgaria and Slovakia (see Figure 6.9), women are well-represented among both board members and board leaders in these countries.

([493]) CZ, DE, EE, EL, FR, HR, IT, CY, LT, HU, MT, PL, PT, RO, RS, TR, BA.

([494]) BE, BG, DK, IE, ES, NL, AT, SI, SK, FI, SE, IS, NO.

([495]) CZ, DE, IE, EL, HR, IT, CY, LT, HU, MT, AT, PL, RO, SI, RS, TR, BA.

Figure 6.11 Proportion (%) of women on boards, members and leaders, 2022



Source: WiS database, DG Research and Innovation - T5 & T6_questionnaires.

Notes: Data are HC from T5+T6_questionnaires of WiS database. Data for BE = BE (FL) + BE (FR). Reference year differs: FR, MT (2017), RO (2019); Data not available: FR, HR, CY, MT(Leaders); LV (Members); GE, AM, MD, UA (Members and leaders).

Annex indicators

Annex 6.1 Numbers of academic staff, by grade and sex, 2022

Country	Grade A		Grade B		Grade C		Grade D		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	42644	86712	115958	152823	113103	131244	175591	190793	449988	564333
BE	685	2270	1804	3522	3354	5149	11430	11577	17273	22518
BG	1293	1598	2694	2882	-	-	6815	5600	10802	10080
DK	799	2432	1787	3233	2798	3171	7958	6757	13342	15593
DE	3925	12556	13341	30972	30234	35017	63635	77392	111135	155937
EE	-	-	-	-	-	-	-	-	2734	2760
IE	244	535	952	1340	4149	4254	-	-	5345	6129
EL	979	3054	876	1719	1312	1964	2876	3156	6043	9893
ES	-	-	2246	2940	128	194	2202	2583	4771	5922
FR	12259	28397	40791	48627	6177	8688	13870	17635	73097	103347
HR	1811	2172	4205	3685	578	398	1068	708	7662	6963
IT	4238	11448	11265	15341	8528	10182	7931	7812	31962	44783
CY	30	193	80	176	338	492	280	267	728	1128
LV	597	685	988	917	1052	730	721	505	3358	2847
LT	508	661	1266	967	2090	1076	572	307	4436	3011
HU	300	1078	1230	2404	4970	6083	1156	1409	7656	10974
MT	17	27	99	142	14	20	45	61	175	250
NL	1030	2739	1189	2232	3527	4017	11278	12170	17024	21158
AT	850	2094	991	2231	4516	5897	8829	10575	15186	20797
PL	7052	2774	12112	9100	16596	17947	3765	4177	39525	33998

Country	Grade A		Grade B		Grade C		Grade D		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
PT	521	1351	2676	3452	11351	10635	12649	11056	27197	26494
RO	128	121	313	196	283	234	664	523	1388	1074
SI	416	759	423	527	564	597	741	792	2144	2675
SK	2047	3377	4395	4968	5686	9564	230	649	12358	18558
FI	806	1719	2405	2565	3036	2855	3619	3581	9866	10720
SE	2109	4688	7830	8650	1822	2125	13257	11613	24781	26862
NO	1552	2981	5312	5206	1310	1352	7563	5439	15737	14978
RS	2328	2539	2099	1706	2665	1974	2739	1748	9831	7967
TR	14258	14616	8702	8788	16679	17288	29254	29874	68893	70566
BA	160	196	181	172	255	256	187	217	783	841

Source: WiS database, DG Research and Innovation - T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR).
Data not available: BG (grade C: Women, Men, Total), ES (grade A: Women, Men), CZ, EE, GE, AM, MD (grade A,B,C,D), ES (grade A, sex: Women, Men), IS; Not applicable: BG (grade C - Women, Men, Total), ES (grade A - Women, Men, Total), AM (grade A,B,C,D - Women, Men, Total); Data not available: DK, ES, CY, UA (All grades except Total) (Academic staff - 2022), BG, LT (Researchers - 2022). For NL, the data for Medical and Health Sciences exclude university medical centres, where the percentage of women among grade A staff was 29.7 % in 2022 ([496]).

([496]) LNVH Monitor Vrouwelijke hoogleraren, 2023, nvh-monitor-vrouwelijke-hoogleraren-2023.pdf

Annex 6.2 Numbers of senior academic staff (grade A), by field of R&D and sex, 2022

Country	Grade A															
	Natural sciences		Engineering and technology		Medical and health sciences		Agricultural and veterinary sciences		Social sciences		Humanities and the arts		Total		Unknown	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	5107	16175	3516	14544	5348	10945	1309	2704	8511	16155	5721	9277	43780	101863	1783	3161
BE	102	427	68	340	175	553	38	102	199	566	95	262	685	2270	8	20
BG	-	-	-	-	-	-	-	-	-	-	-	-	1293	1598	1293	1598
DK	97	506	47	307	312	787	34	113	216	557	93	162	799	2432	0	0
DE	604	2704	368	2466	347	1585	105	278	1113	2861	1317	2468	3925	12556	71	194
IE	-	-	-	-	-	-	-	-	-	-	-	-	244	535	-	-
EL	95	521	114	707	279	641	66	229	262	630	160	316	979	3054	3	10
ES	940	3000	338	1675	399	924	93	229	938	2224	510	949	3218	9001	0	0
FR	-	-	-	-	-	-	-	-	-	-	-	-	12259	28397	-	-
HR	206	253	199	585	474	449	200	213	438	376	265	250	1811	2172	29	46
IT	986	2568	488	2389	442	1691	203	593	1389	3095	730	1112	4238	11448	0	0
CY	8	60	8	33	8	27	0	2	3	51	3	20	30	193	-	-
LV	440	590	689	1122	510	258	74	36	681	356	399	179	2793	2541	-	-
LT	45	126	35	121	129	142	13	25	207	175	79	72	508	661	-	-
HU	-	-	-	-	-	-	-	-	-	-	-	-	300	1078	300	1078
MT	3	6	2	8	6	8	0	0	2	2	0	0	17	27	4	3
NL	131	526	125	544	54	105	38	112	484	1114	175	285	1030	2739	23	53
AT	113	523	58	346	92	265	15	48	291	560	281	352	850	2094	0	0
PL	422	1494	248	1346	760	1262	234	364	461	1008	602	1424	2774	7052	47	154
PT	105	250	54	312	78	198	13	27	154	387	117	177	521	1351	0	0
RO	41	42	3	14	65	42	8	12	11	11	-	-	128	121	-	-

Country	Grade A															
	Natural sciences		Engineering and technology		Medical and health sciences		Agricultural and veterinary sciences		Social sciences		Humanities and the arts		Total		Unknown	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
SI	30	110	63	197	76	109	47	64	119	172	81	107	416	759	0	0
SK	327	768	352	859	290	416	52	119	680	691	346	524	2047	3377	0	0
FI	86	459	36	265	191	345	25	42	299	434	169	174	806	1719	0	0
SE	326	1242	221	908	661	1138	51	96	564	885	299	444	2109	4688	5	5
NO	160	602	88	439	346	355	23	68	610	1032	325	485	1552	2981	-	-
RS	510	448	302	512	513	462	291	302	449	533	262	277	2328	2539	1	5
TR	2942	2899	2702	2803	5181	5328	942	946	946	949	1545	1691	14258	14616	-	-
BA	10	6	50	125	78	51	11	3	11	11	0	0	160	196	0	0

Source: WiS database, DG Research and Innovation - T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for Researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR). Reference year differs: BE(FR): 2019, DK: 2021, IE: 2021, ES: 2021, FR: 2021, CY: 2021, LV: 2018, HU: 2021, AT: 2021, PT: 2021, RO: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021, AM: 2021; Data not available: BG, IE, ES, FR, HU, GE, AM, MD, UA (All Fields of Research and Development), RO (Humanities and the Arts, sex: Women, Men); Data not available: IE, LT (2022 - Fields of Research and Development). For NL, the data for Medical and Health Sciences exclude university medical centres, where the percentage of women among Grade A staff was 29.7 % in 2022 ([497]).

([497]) LNVH Monitor Vrouwelijke hoogleraren, 2023, nvh-monitor-vrouwelijke-hoogleraren-2023.pdf

Annex 6.3 Numbers of academic staff (grade A), by age group and sex, 2022

Country	<35		35-44		45-54		55+		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	**72**	**79**	**1757**	**3597**	**6836**	**14297**	**12129**	**32213**	**20939**	**50513**
BE	0	0	67	157	228	610	218	873	513	1640
BG	20	0	57	31	269	246	947	1321	1293	1598
DE	20	50	753	1656	1604	4589	1367	6253	3744	12548
HR	2	4	124	164	727	717	954	1282	1811	2172
IT	-	1	82	336	1172	2903	2984	8208	4238	11448
LT	1	3	44	75	197	192	266	391	508	661
MT	7	11	7	10	2	6	1	0	17	27
NL	1	0	144	224	394	836	360	1391	1030	2739
AT	6	5	172	311	336	752	336	1026	850	2094
PL	1	1	70	174	636	1245	2059	5615	2774	7052
PT	2	3	21	24	68	195	428	1112	521	1351
RO	17	9	31	-	37	-	43	-	128	9
SI	-	-	21	53	146	255	249	451	416	759
NO	2	3	136	311	541	942	873	1725	1552	2981
RS	6	3	124	175	881	801	1316	1559	2328	2539
TR	0	0	1366	1381	6447	6579	6445	6656	14258	14616

Source: WiS database, DG Research and Innovation - T1_questionnaires.

Notes: Data are HC from T1_questionnaires of WiS database. Where data for Researchers are not available or incomplete, data for Academic staff are presented. Data for BE = BE (FL) + BE (FR).
Reference year differs: BE(FR): 2019, DK: 2021, ES: 2021, FR: 2021, CY: 2021, LV: 2018, HU: 2021, AT: 2021, PT: 2021, RO: 2021, SK: 2021, FI: 2021, NO: 2021, BA: 2021, GE: 2021, AM: 2021; Data not available: BE(FR) , DK, IE, FR, CY, HU, BA,LV (all age groups except Total), IT (age group:<35, sex: Women), SI (age group: <35, sex: Women, Men), GE, AM, MD, UA, ES, EE; not applicable: ES, AM (2022); Data not available: DK, ES, CY, UA (All grades except Total) (Academic staff - 2022), IE, BG, LT (Researchers - 2022). For NL, the data for Medical and Health Sciences exclude university medical centres, where the percentage of women among grade A staff was 29.7 % in 2022 ([498]).

([498]) LNVH Monitor Vrouwelijke hoogleraren, 2023, nvh-monitor-vrouwelijke-hoogleraren-2023.pdf

Annex 6.4 Numbers of heads of institutions in HES, by sex, 2019 and 2022

Country	2019			2022		
	Women	Men	Total	Women	Men	Total
EU-27	630	2036	2666	721	2009	2730
BE	18	22	40	14	24	38
BG	10	44	54	12	39	51
CZ	9	52	61	12	52	64
DK	13	26	39	19	42	61
DE	92	322	414	121	293	414
EE	4	16	20	4	15	19
IE	4	18	22	8	9	17
EL	4	21	25	3	22	25
ES	9	41	50	22	68	90
FR	-	-	-	19	78	97
HR	35	97	132	30	99	129
IT	135	396	531	157	390	547
CY	5	52	57	6	49	55
LV	24	30	54	13	14	27
LT	16	25	41	14	23	37
HU	11	53	64	10	53	63
MT	12	29	41	14	42	56
NL	5	17	22	23	27	50
AT	26	71	97	22	55	77
PL	93	382	475	104	336	440
PT	25	82	107	28	77	105
RO	10	80	90	9	78	87
SI	36	74	110	39	71	110
SK	7	26	33	6	27	33
FI	8	31	39	12	26	38
SE	20	28	48	20	30	50
IS	4	6	10	7	3	10
NO	8	23	31	13	19	32
RS	21	60	81	23	64	87
TR	1026	2633	3592	2054	2642	4696
BA	49	143	192	66	143	209
GE	15	49	64	16	46	62
AM	-	-	-	-	-	-
MD	-	-	-	4	14	18

Source: WiS database, DG Research and Innovation - T7_questionnaires.

Notes: Data are HC from T7_questionnaires of WiS database. Data for BE = BE (FL) + BE (FR). For HU, LV, LU, UK and RO the WiS 2018 questionnaires are used. Year: 2022: Reference year differs: CZ, CY, PT (2021); Data not available: FR, MD (2019), SE, GE (2022), AM (Women, Men, Total). For NL, from 2022 onwards, universities of applied sciences are included in the data.

Annex 6.5 Numbers of heads of universities or assimilated institutions, based on capacity to deliver PhDs, by sex and proportion (%) of women, 2022 and 2019

Country	2022			2019		
	Women	Men	Total	Women	Men	Total
EU-27	254	909	1163	172	794	1034
BE	2	9	11	1	10	11
BG	11	34	45	7	35	42
CZ	5	23	28	3	26	29
DK	3	8	11	3	8	11
DE	37	88	125	32	100	132
EE	0	7	7	0	7	7
EL	3	21	24	4	20	24
ES	22	68	90	9	41	50
FR	16	52	68	-	-	68
HR	2	11	13	2	10	12
IT	13	85	98	9	89	98
CY	0	8	8	0	8	8
LV	8	10	18	7	9	16
LT	6	18	24	7	18	25
HU	3	26	29	3	27	30
MT	1	4	5	1	4	5
NL	5	9	14	3	11	14
AT	10	22	32	8	23	31
PL	55	242	297	22	179	201
PT	8	31	39	8	31	39
RO	4	48	52	4	48	52
SI	26	40	66	21	45	66
SK	5	23	28	7	25	32
FI	3	11	14	3	11	14
SE	6	11	17	8	9	17
IS	2	2	4	1	3	4
NO	4	6	10	4	6	10
RS	23	64	87	21	60	81
TR	122	86	208	20	177	197
BA	66	143	209	49	143	192

Source: WiS database, DG Research and Innovation - T8_questionnaires.

Notes: Data are HC from T8_questionnaires of WiS database. Data for BE = BE (FL) + BE (FR). Year: 2022: Reference year differs: CY, PT, SE, (2021); Data not available: FR (Women, Men, 2019), IE, GE, AM, MD, UA.

CHAPTER 7 – RESEARCH AND INNOVATION OUTPUT

Key Takeaways

Chapter 7 presents indicators on women's and men's R&I output, gender differences in funding success rates, and the integration of a gender dimension in R&I content. At EU-level, gender gaps persist among authors of research publications and inventors.

- **Women are less likely to be authors than men.** Gender disparity tends to widen as authors advance in seniority (women represent 48 % of early-stage authors; 45 % of mid stage authors; and 36 % of senior stage authors) and is observed across all fields of R&D. The same trends are evident among active authors ([499]), with disparity increasing with seniority.
- In the early stages of academic careers, there is little difference in the publishing rates for women and men, reflected in a ratio of 0.9 (where 1.0 indicates equal publishing). However, **as authors progress in seniority, women tend to publish less than men** (reflected in ratios of 0.8 at mid stage, and 0.7 at senior stage). The same patterns are observed in each field of R&D ([500]).
- When looking at the field-weighted citation impact (FWCI) of publications across Member States, there is a ratio of approximately 1.0, i.e. **there is no gender difference in the impact of citations.**
- **The presence of women on authorship teams has risen over time**, attaining gender balance in over half of the fields of R&D ([501]) from 2018 to 2022. However, women still face significant underrepresentation in fields such as Engineering and Technology and Natural Sciences.
- Only **16 % of authorship teams have a gender-balanced composition overall.** The most common team composition is 60 % or more men (31 % of all teams).
- For all authorship teams that publish internationally, **women are underrepresented in international collaboration teams across all fields of R&D**, comprising only 31 %.
- Based on patent applications, **women comprise only 9 % of inventors.** There has been no observable increase in the proportion of women among patent applicants in the last decade and most patent applications are made by men-only teams. Broken down by International Patent Classification (IPC), at EU level, the proportion of women among inventors during 2018-2021 was highest in section C (chemistry and metallurgy: 21 %).
- **Women have a slightly lower funding success rate than men overall** (28 % compared to 32 %), but higher funding success rates in Engineering and Technology, Humanities and the Arts, and in multi-disciplinary research.
- **A small percentage of all Scopus publications incorporate a gender dimension in their R&I content and the proportion of a country's publications with a gender**

([499]) Authors who produced 10 or more papers in the last 20 years and at least one paper in the last five years, or those who produced four or more papers in the last five years.

([500]) The fields of R&D are: Agricultural and Veterinary Sciences, Engineering and Technology, Humanities and the Arts, Natural Sciences, Medical and Health Sciences and Social Science.

([501]) Agricultural and Veterinary Sciences, Humanities and the Arts, Medical and Health Sciences, and Social Sciences.

dimension varies across different fields of research. Medical and Health Sciences has the highest proportion of publications with a gender dimension (4 %), while Engineering and Technology has the lowest (0.3 %).

- Across all She Figures countries, **only a small proportion of Horizon 2020 projects (1.7 %) incorporate a gender dimension.** Regarding Horizon Europe projects, an exploratory analysis shows similar trends, although very few substantial deliverables were available for analysis as the projects were in the early stages, thereby limiting the reliability of the findings.
- The EU **publishes slightly less than the global average for research that contributes to SDG 5**, proportionate to the amount of research produced in the EU (reflected in a Relative Activity Index score of 0.9, where 1 indicates a contribution in line with the amount of research produced).

Introduction

The synergy of gender balance and diversity within research teams, coupled with the integration of a gender perspective in the content of research serves as a powerful catalyst for enhancing scientific excellence. It not only enriches the quality of Research and Innovation (R&I) outputs but also heightens their societal relevance ([502]). Chapter 7 presents indicators on women's and men's R&I outputs, gender differences in funding success rates, and the integration of a gender dimension in R&I content (GDRIC).

- **Section 7.1 presents indicators on women's and men's representation among all authors and active authors** ([503]), looking at different fields and levels of seniority.
- **Section 7.2 presents indicators on the gender gap in the average number of publications of active authors**. This section compares the average publication count for women and men among active authors, by seniority level and field of research, followed by the average citation impact of publications by women and men active authors, by seniority level.
- **Section 7.3 presents indicators on women's and men's representation in authorship teams**. This section looks at women's and men's relative representation in authorship teams and examines how representation varies by field of research and over time. It also explores women's and men's representation in international collaborations.
- **Section 7.4 presents indicators on women and men's contributions as corresponding authors.** This section compares the proportion of women with corresponding authorships for all fields of R&D and considers how this has changed over time. It then presents the proportion of women with corresponding authorships in international collaborations.
- **Section 7.5 presents indicators on the gender gap in inventorship and innovation.** Gender biases in inventorships and innovation influence the design and target users of innovations, impacting the conversion of research outcomes into innovative solutions ([504])([505])([506]). This section explores gender gaps in patent application teams and academic-corporate collaborations.
- **Section 7.6 presents indicators on differences in research funding success rates for women and men**. This section explores the extent of the gender gap in funding success rates, overall, and when disaggregated by field of R&D. **Section 7.7 presents indicators on the integration of a gender dimension in research and innovation**

([502]) Nielsen, M.W., Alegria, S., Borjeson, L., Etzkowitz, H., Falk-Krzesinski, H., Joshi, A., Leahey, E., Smith-doerr, L., Woolley, A. & Schiebinger, L., 'Opinion: Gender diversity leads to better science', Proceedings of the National Academy of Sciences, Vol. 114, 2017, pp. 1740-1742.

([503]) Active authors are defined as those that have produced 10 or more papers in the last 20 years and at least one paper in the last five years, or those who produced four or more papers in last five years.

([504]) European Research Area and Innovation Committee (ERAC Standing Working Group on Gender in Research and Innovation (SWG GRI), *Innovating innovation: Policy brief on gender and innovation*, 2019, https://data.consilium.europa.eu/doc/document/ST-1210-2019-INIT/en/pdf

([505]) European Patent Office (2022) Fewer than 1 in 7 inventors in Europe are women. Available at: https://www.epo.org/en/news-events/news/fewer-1-7-inventors-europe-are-women#:~:text=A%20new%20study%20released%20by,EPO%20from%201978%20until%202019

([506]) World Economic Forum (2024) Women inventors make gains, but gender gaps remain. Available at: https://www.weforum.org/agenda/2024/03/women-inventors-gender-gap-stem-patents/#:~:text=Gender%20Inequality,-Follow&text=Only%2017%25%20of%20inventors%20holding,latest%20Global%20Gender%20Gap%20Report.

content. Incorporating a gender dimension in R&I content adds value to research, helps researchers to consider and question gender norms and stereotypes, supports an in-depth understanding of different needs, behaviours and attitudes linked to gender, and supports the societal relevance of research ([507]). This section explores the extent to which publications and EU-funded projects incorporate a gender dimension.

([507]) European Commission, Directorate-General for Research and Innovation, *Gendered innovations 2: how inclusive analysis contributes to research and innovation*, Policy review, Publications Office of the European Union, Luxembourg, 2020, https://data.europa.eu/doi/10.2777/316197

Background

She Figures 2021 revealed persistent gender gaps in authorship of research publications, reflecting broader systemic inequalities in academia. For example, women often shoulder non-promotable tasks, such as mentoring students and serving on committees ([508]) ([509]). These tasks, while fundamental, do not directly contribute to career advancement, thereby widening the gender gap. As discussed in previous chapters, Covid-19 may have further affected women's opportunities for research and publishing, with the increased double burden of balancing paid and unpaid care responsibilities, leading to an increased level of stress and mental health struggles among women in academia ([510]). A further issue is a lack of a gender perspective in research content (which refers to the analysis of differences between women and men in terms of biological characteristics as well as social and cultural features in research). This is key to developing inclusive and unbiased knowledge and solutions that will address societal issues ([511]).

The gender disparity in R&I outputs extends beyond academia. Women are significantly underrepresented among patent applicants, facing systemic barriers, such as limited access to funding which directly impede their career advancement and recognition ([512]). Addressing these disparities can foster more equitable economic growth and societal benefits, creating an inclusive environment that motivates more women to pursue and succeed in research and innovation careers.

The **EU** has taken action to support gender equality within R&I outputs by supporting women's representation as members of research teams, integrating a gender dimension in research content and by supporting women-led start-ups and women innovators. As set out in the Gender Equality Strategy 2020-2025, the European Commission is committed to advancing gender equality in research and innovation ([513]). To address persisting gender inequalities in the sector, the Commission is implementing initiatives through the ERA policy framework and the current primary Funding Programme for R&I, Horizon Europe (successor to Horizon 2020).

Gender equality in research teams and outputs

Gender equality is a priority of the **ERA** since 2012, when the Commission published the ERA Communication 2012 framework which included gender equality and gender

([508]) Elsevier, *Gender in the Global Research Landscape*, 2017, at:https://assets.ctfassets.net/zlnfaxb2lcqx/57uxjkQA2aUQSpWayDUd5c/6653475e50db61cfb0f828e291c1e08a/Elsevier-gender-report-2017.pdf

([509]) Babcock, L., Recalde, M.P., Vesterlund, L., Weingart, L. (2017)'Gender Differences in Accepting and Receiving Requests for Tasks with Low Promotability', American Economic Review, 107(3), pp.714-747. Available at: https://pubs.aeaweb.org/doi/pdfplus/10.1257/aer.20141734

([510]) European Commission, Directorate-General for Research and Innovation, *COVID-19 impact on gender equality in research & innovation – Policy report*, Publications Office of the European Union, 2023, Luxembourg, https://data.europa.eu/doi/10.2777/171804

([511]) European Commission, Directorate-General for Research and Innovation, *Gendered innovations 2 – How inclusive analysis contributes to research and innovation – Policy review*, Publications Office of the European Union, 2020, https://data.europa.eu/doi/10.2777/316197

([512]) European Commission, Directorate-General for Research and Innovation, *She Figures 2021*, https://research-and-innovation.ec.europa.eu/knowledge-publications-tools-and-data/publications/all-publications/she-figures-2021_en

([513]) https://ec.europa.eu/newsroom/just/redirection/document/68222

mainstreaming in research as one of its five priorities ([514]). In 2015, Council Conclusions on advancing Gender Equality in the European Research Area stressed the need for structural changes to overcome gender inequality in research institutions' decision-making bodies and urged Member States to develop ERA national action plans ([515]).

The persistent issue of gender inequality in the EU's R&I sector was further highlighted in the 2020 Communication on a new ERA for Research and Innovation ([516]), which proposed coordinated action with education policies and research funders to promote gender inclusion through the development of inclusive GEPs with Member States and stakeholders.

During the Competitiveness Council of November 2021, a package was adopted upholding gender equality as a core principle for EU R&I ([517]). It included the Pact for Research and Innovation in Europe ([518]), which set out shared principles for R&I. The package also featured the ERA Policy Agenda 2022-2024 outlining voluntary actions to enhance R&I across Europe ([519]). The new ERA includes a reinforced commitment to gender equality in R&I:

- The Pact for Research and Innovation in Europe includes 'gender equality and equal opportunities for all' as one of its key values ([520]).
- Part of the ERA Policy Agenda 2022-2024 is a dedicated Action, Action 5 entitled, 'Promote gender equality and foster inclusiveness, taking note of the Ljubljana Declaration' ([521]). Action 5 also recognises the importance of a gender perspective in R&I outputs, as reflected in the indicators in the ERA dashboard, which is used to monitor progress (and which includes two indicators on authorship ([522])). Under this Action, the Commission and the ERA forum (comprising of EU Member States, countries associated to Horizon Europe, third countries and relevant R&I stakeholders) aim to develop principles to support the integration of a gender dimension in R&I content.
- Synergies between ERA actions are also materialising, especially Actions 3 and 4 which, although not explicitly referencing gender equality, focus on the assessment system for research, researchers and institutions, (Action 3) and on strengthening the attractiveness

([514]) 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, COM/2012/0392 final, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012DC0392

([515]) Competitiveness Council, 30 November – 1 December 2015, https://www.consilium.europa.eu/en/meetings/compet/2015/11/30-01/

([516]) 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, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2020:628:FIN

([518]) Council Recommendation (EU) 2021/2122 of 26 November 2021 on a Pact for Research and Innovation in Europe ST/13701/2021/INIT, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.431.01.0001.01.ENG

([519]) European Commission, Directorate-General for Research and Innovation, *European Research Area Policy Agenda: Overview of actions for the period 2022-2024*, Publications Office of the European Union, Luxembourg, 2021, https://commission.europa.eu/system/files/2021-11/ec_rtd_era-policy-agenda-2021.pdf

([520]) European Commission, Directorate-General for Research and Innovation, A pact for research and innovation in Europe, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2777/56361

([521]) The Ljubljana declaration of the Slovenian presidency prioritised the need for gender mainstreaming in research and innovation and set out concrete priorities to achieve gender equality, emphasising fair and inclusive career paths in research, the use of tools such as GEPs to support institutional change, action against gender-based violence, and monitoring and evaluation (https://www.gov.si/assets/ministrstva/MIZS/Dokumenti/PSEU/Ljubljana-Declaration-on-Gender-Equality-in-Research-and-Innovation-_endorsed_final.pdf).

([522]) These indicators are: "Proportion of papers with mixed gender authorship, 2000-2020" and "Proportion of women in authorships of the top 10 % most cited publications, 2000- 2018". Details of ERA monitoring cycle for 2023 can be found at: https://european-research-area.ec.europa.eu/era-monitoring-reports.

of research careers (Action 4), thus addressing significant elements in overcoming the barriers to gender equality.

The European Commission's efforts to strengthen gender equality in R&I are also evident under the EU's main funding programme for R&I for 2021-2027, **Horizon Europe** ([523]), which includes gender equality as a cross-cutting priority. The predecessor to Horizon Europe, Horizon 2020, encouraged the promotion of gender balance among research teams and invited applicants to explore the inclusion of a gender dimension in an R&I content ([524]). Horizon Europe goes further by:

- Implementing a mandatory GEP requirement for certain categories of legal entities seeking Horizon Europe funding (see Chapter 5).
- Requiring the integration of a gender dimension in R&I content by default (except where explicitly specified otherwise).
- Aiming to increase gender balance among research teams, experts' groups, evaluation committees and Horizon Europe-related boards. Where experts' scores for proposals are tied (ex aequo proposals), gender balance among research teams is one of the ranking criteria for setting a list of projects to be funded.
- Allocating specific funding for gender studies and intersectional research.

The Commission has supported various initiatives and projects funded under Horizon 2020 and Horizon Europe to support and complement its policies. Some examples for Horizon 2020-funded projects are shown in Box 46.

Box 46: Examples of initiatives and projects funded under Horizon 2020

- GENDER-NET Plus ([525]) ran from 2017 until 2023, following on from the FP7-funded GENDER-NET Project ([526]). Under GENDER-NET, a manual for incorporating a gender analysis into research content, curricula and indicators was prepared ([527]). GENDER-NET Plus supported 13 research projects that implemented a gender dimension, as well as exploring gender equality in research funding ([528]).
- the GRANteD Project aimed to better understand gender biases in grant allocations and produce a methodology that would allow this issue to be investigated more robustly ([529]).

([523]) Andriescu, M. & Collier, N., *ERA monitoring 2023 – 18-month review of the implementation of the ERA policy agenda ('EU-level report')*, Publications Office of the European Union, Luxembourg, 2023, https://data.europa.eu/doi/10.2777/499744

([524]) Regulation (EU) No 1291/2013 of the European Parliament and of the Council of 11 December 2013 establishing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020) and repealing Decision No 1982/2006/EC, Text with EEA relevance, OJ L 347, http://data.europa.eu/eli/reg/2013/1291/oj

([525]) GENDER-NET Plus, n.d., https://cordis.europa.eu/project/id/741874

([526]) GENDER-NET, n.d., https://cordis.europa.eu/project/id/618124

([527]) Ana Puy, Women and Science Unit at the Cabinet of the Secretary of State for Research, Development and Innovation, MINECO, *GENDER-NET Report*: *Manuals with guidelines on the integration of sex and gender analysis into research contents, recommendations for curricula development and indicators*, 2016, https://eige.europa.eu/sites/default/files/d3.11_manuals_with_guidelines_on_the_integration_of_sex_and_gender_analysis_into_research.pdf

([528]) GENDER-NET Plus, n.d., https://gender-net-plus.eu/

([529]) GRANteD, n.d., https://www.granted-project.eu/home/

Innovation

A new element under Horizon Europe was the establishment of the European Innovation Council (EIC) in 2021, following a pilot phase from 2018-2020. The aim of the EIC is to identify and expand potential breakthrough technologies through funding and supporting individual technology companies ([530]).

The EIC ensures gender parity in the membership of its Board, as well as in the expert juries and evaluators who assess applications for EIC funding. The EIC also promotes gender equality through dedicated initiatives to support women-led start-ups and women innovators, such as the Women TechEU initiative and the EU Prize for Women Innovators:

- The **European Prize for Women Innovators** was first launched in 2011 and was expanded by EIC and EIT in 2023. It continues to celebrate the women entrepreneurs responsible for Europe's most ground-breaking innovations ([531]). Applicants are evaluated according to the extent to which their work is pioneering, the impact of their innovation, and their ability to inspire and empower other women and girls. By highlighting their successes, this award not only provides financial recognition but enhances public awareness of women's contributions to the EU innovation ecosystem, fostering role models for aspiring women innovators.
- **Women TechEU** was launched in 2021 to provide targeted funding to advance women-led innovative businesses in the deep-tech industry ([532]). It aims to foster a more equal and prosperous European deep-tech ecosystem by supporting women-led startups and promoting women leaders in the investment space. In April 2023, the Commission announced the results of the second Women TechEU call, targeting innovative European deep-tech companies founded by women, with almost three times as many women-founded companies being selected in this year compared to the pilot.

Despite the above-mentioned measures to actively promote and support women researchers and entrepreneurs in innovation, in 2020 and 2021 there was a low share of women (20 %) in companies funded by the EIC Accelerator, and of women leaders (24 %) and researchers (over 30 %) of EIC Pathfinder projects ([533]). The Communication on the New European Innovation Agenda ([534]), issued in 2022, aims to develop new technologies to address the most pressing societal challenges and to bring them to the market through innovative solutions. Under the Agenda, it was mentioned that the Commission would pilot an innovation gender and diversity index ([535]) to include data on women and other less-represented groups to assess the gender investment gap at the level of women-led companies and funds. The

([530]) European Innovation Council, n.d., https://op.europa.eu/en/publication-detail/-/publication/1efb9aff-86cf-11eb-ac4c-01aa75ed71a1

([531]) European Prize for Women Innovators, n.d., https://eic.ec.europa.eu/eic-prizes/european-prize-women-innovators-powered-eic-eit_en

([532]) WomenTechEU, n.d., https://eismea.ec.europa.eu/programmes/european-innovation-ecosystems/women-techeu_en

([533]) EIC, *EIC Impact Report*, 2022, https://eic.ec.europa.eu/document/download/4ff551a6-e92e-4c96-a205-9542ab752c34_en?filename=2022-EIC-Impact-Report-141222.pdf

([534]) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A New European Innovation Agenda, COM/2022/332, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0332

([535]) GENDEX, https://cordis.europa.eu/project/id/101105161

project is developing a harmonised methodology for systematic data collection and suggesting adequate data analytics to better inform policy.

Regulations and policies to facilitate women's R&I outputs and support inclusion of a gender dimension in R&I content have also been introduced at **Member State level**. Box 47 below describes several national laws and policies in this regard which were introduced during the time period covered by the indicators presented in this chapter (2018-2022).

Box 47: Laws and policies implemented at Member State level to facilitate women's R&I outputs and to support inclusion of a gender dimension in R&I between 2018-2022

- The National Recovery and Resilience Plan 2021-2026 in **Croatia** (developed as part of the EU Recovery and Resilience Facility (RRF)) incorporates gender equality and equal opportunities as horizontal priorities. The Plan envisages special funding programmes for STEM and ICT projects that incorporate an equality dimension (such as research on gender biases in AI and the development of technologies to help people with disabilities or older people) ([536]).
- In **Slovenia**, the Resolution on the Slovenian Scientific Research and Innovation Strategy 2030 was introduced in 2022. It includes integrating the gender dimension in research as part of a broader objective on gender mainstreaming ([537]).
- The amended Law 17/2022 on Science, Technology and Innovation in **Spain** ([538]) specifically aims to promote women's entrepreneurship. It requires that social criteria specified for all phases of public procurement include equality criteria, as well as mandating that the composition of evaluation and selection committees include mechanisms to avoid gender bias.
- **Hungary**'s Research, Development and Innovation Strategy (2021-2030)[539] entails a specific aim to increase the application age for certain grants for those who took parental leave, facilitating women's R&I outputs.
- The National Strategy for Gender Equality 2021-2026 ([540]) in **Italy** aims to review support for women entrepreneurs who are mothers. This review includes the introduction of protections for female workers with only one source of income from self-employment (e.g. researchers, entrepreneurs, scholarship holders) during and immediately after pregnancy or adoption.

([536]) Vlada Republike Hrvatske, Nacionalni plan oporavka i otpornosti 2021-2026, 2021 https://planoporavka.gov.hr/UserDocsImages/dokumenti/Plan%20oporavka%20i%20otpornosti%2C%20srpanj%202021..pdf?vel=13435491

([537]) Based on the first paragraph of Article 10 of the Act on Scientific Research and Innovation Activities (Official Gazette of the Republic of Slovenia, No. 186/21) and Article 109 of the Rules of Procedure of the National Assembly (Official Gazette of the Republic of Slovenia, No. 92/07 – official consolidated text, 105/10, 80/13, 38/17, 46/20, 105/21 - dec. US and 111/21) was adopted by the National Assembly at its meeting on 23 March 2022. *Resolucijo o znanstvenoraziskovalni in inovacijski strategiji Slovenije 2030 (2022). Pravno-informacijski sistem*, http://www.pisrs.si/Pis.web/pregledPredpisa?id=RESO133

([538]) Agencia Estatal Boletín Oficial del Estado. Law 17/2022, of September 5, which modifies Law 14/2011, of June 1, on Science, Technology and Innovation, https://www.boe.es/eli/es/l/2022/09/05/17

([539]) National Research, Development and Innovation Office (2021) Proposal on the Research, Development and Innovation Strategy of Hungary (2021-2030), https://nkfih.gov.hu/english/research-development-innovation-strategy/proposal-of-the-rdi-strategy-of-hungary

([540]) Department of Equal Opportunities (2021) National Strategy for Gender Equality, https://www.pariopportunita.gov.it/media/2049/strategia_parita-_genere_en.pdf

- As part of **Estonia's** Research and Development, Innovation and Entrepreneurship Strategy 2021-2035 ([541]), impact assessments were developed to ensure that equal opportunities, including gender balance, is considered and assessed when hiring, allocating grants, and in the composition of decision-making bodies. The Strategy also aims to develop flexible academic career models to promote gender equality.

In addition to the developments described in Box 47, several other national policy developments have taken place since 2022, including:

- Organic Law 2/2023, of 22 March, on the University System ([542]) in Spain specifically aims to promote scientific projects with a gender perspective and to ensure that evaluation and selection committees for all university calls and projects include mechanisms to avoid gender bias.
- The Republic of Croatia's Act on Higher Education and Scientific Activity (2022)[543] addresses programme financing of public HEIs and scientific institutes. It has a strategic goal to strengthen the social engagement of public HEIs and RPOs with special objectives, such as respect for gender equality, diversity, fairness and inclusiveness. The aim is to incentivise these institutions to develop and implement programmes that advance gender equality in R&I.

In response to the underrepresentation of women researchers in the labour market and particularly in decision-making positions (see Chapters 4 and 6), Member States have introduced measures to support women's access to funding (see Section 7.6) and to promote a gender dimension in R&I content (see Section 7.7).

([541]) Republic of Estonia Ministry of Education and Research, Strategic Planning for 2021-2035, n.d., https://www.hm.ee/en/ministry/ministry/strategic-planning-2021-2035#documents--2

([542]) Government of Spain, Organic Law 2/2023, of 22 March, on the University System, https://www.boe.es/buscar/act.php?id=BOE-A-2023-7500.

([543]) Republic of Croatia, (2022) Act on Higher Education and Scientific Activity, https://narodne-novine.nn.hr/clanci/sluzbeni/2022_10_119_1834.html.

7.1 Women's and men's representation among all authors and among active authors

This section provides insights into the representation of women and men among authors, both overall and among 'active authors' ([544]). Research has identified a significant proportion of researchers or authors leaving research after publishing just one or two papers. This distinction enables an exploration of whether this attrition is influenced by gender across all career stages ([545]). To understand gender differences across fields and over women's and men's careers, the proportion of women among authors across fields of R&D and seniority levels is explored.

Box 48: Definition of active authors

Active authors are defined as those who produced 10 or more papers in the last 20 years and at least one paper in the last five years, or those who produced four or more papers in the last five years. Seniority level is estimated via the time elapsed since an author's first publication in a journal indexed in Scopus. It has three categories:

- <5 years or 'early stage' (for authors whose first publication was in the last five years)
- 5 to 10 years or 'middle stage' (for authors who have been publishing for between 5 and 10 years)
- >10 years or 'senior stage' (for authors who have been publishing for more than the last 10 years)

There is gender balance among early stage (48 %) and mid stage authors (45 %) but not senior stage authors (36 %)

Figure 7.1 shows the proportion of women among all authors (i.e. those who published at least once during the period 2018-2022, regardless of when their publication career started) in all fields of R&D, by seniority level. At EU level, women and men are similarly represented among authors at the early stage (48 % women). By the mid-level, this drops slightly, to 45 % women, declining to 36 % at senior level.

The proportion of women among all authors is 1-3 percentage points (pp) higher for each stage compared to active authors (Figure 7.2). This means there is only a small difference in women's representation between 'active' and 'all' authors, and therefore no clear gender difference in attrition of authors after their initial publications.

Member States show similar trends among all authors as observed among active authors. At the early stage, gender balance is achieved among all authors, while by the mid stage, there are only four countries where women are underrepresented (DE, 37 %; LU, 28 %; MT, 37 %;

([544]) Active authors are defined as those who produced 10 or more papers in the last 20 years and at least one paper in the last five years, or who produced four or more papers in the last five years.

([545]) Dlouhy et al. 2023, Evolution of professionals' careers upon graduation in STEM and occupational turnover over time: Patterns, diversity characteristics, career success, and self-employment https://onlinelibrary.wiley.com/doi/full/10.1002/job.2615

AT, 39 %). Among senior stage authors, while the EU average shows overall underrepresentation, 11 countries have gender balance ([546]). These trends are also reflected among Associated Countries and G20 countries.

Across different fields of R&D, there are differences in women's representation as authors

Table 7.1 presents the same data found in Figure 7.1, but organised by field of R&D. There is gender balance throughout all stages of seniority for Agricultural and Veterinary Sciences, across all levels in the field of Medical and Health Sciences and, until the senior stage in the fields of Humanities and the Arts, Natural Sciences and Social Sciences. However, women are still underrepresented across all stages of seniority in Engineering and Technology.

When looking at Member States, similar variations by field are evident: although senior stage authors within the field of Agricultural and Veterinary Science are overall gender-balanced (42 %), 11 countries are not balanced ([547]). Similarly, for Medical and Health Sciences (overall is 44 %), the population of authors is not gender balanced by the senior stage in 8 countries ([548]). For fields where women are, on average, underrepresented by the senior stage, gender balance is achieved for 17 countries in the field of Humanities and the Arts ([549]), seven countries for Natural Sciences ([550]) and 15 for Social Sciences ([551]). As before, similar trends are seen for the Associated Countries and the G20.

([546]) BG, EE, ES, HR, IT, LV, LT, PL, PT, RO, FI.

([547]) BE, CZ, DK, DE, EL, CY, LU, HU, MT, NL, AT

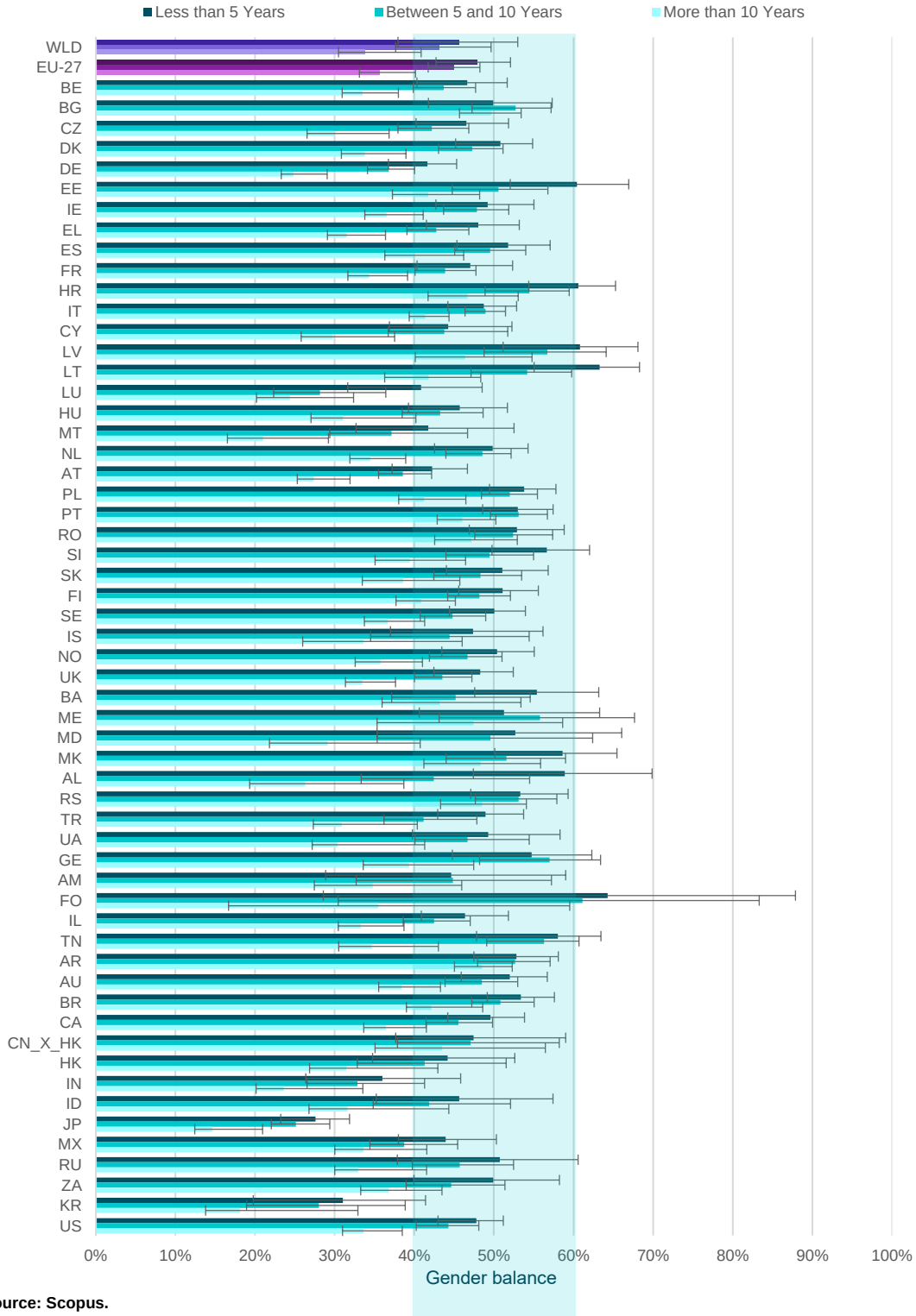
([548]) CZ, DE, EL, CY, LU, HU, MT, AT.

([549]) BG, EE, IE, EL, ES, HR, IT, CY, LV, LT, LU, PL, PT, RO, SI. FI, SE.

([550]) BG, HR, IT, LV, PL, PT, RO.

([551]) BG, EE, IE, ES, HR, IT, LV, LT, PL, PT, RO, SI, SK, FI, SE.

Figure 7.1 Proportion (%) of women among all authors in all fields of R&D, by seniority level, 2018-2022



Source: Scopus.

Notes: Data not available: XK.

Table 7.1 Proportion (%) of women among all authors, by field of R&D and seniority level, 2018-2022

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
WLD	50.4	48.8	36.8	35.4	33.8	25.8	51.5	48.5	39.8	53.9	51.4	40.3	41.4	39.8	30.9	52.2	49.8	40.5
EU-27	56.4	54.5	42.5	32.4	31.7	26.2	52.5	48.8	37.9	59.7	57.1	43.6	41.8	40.3	33.0	53.6	50.0	39.4
BE	54.0	50.7	37.5	29.5	29.8	24.1	53.9	48.4	34.7	56.3	54.6	39.8	40.5	38.3	30.6	53.3	50.2	34.8
BG	51.3	59.5	46.7	41.1	44.3	45.7	59.7	65.4	47.2	56.2	59.3	58.5	44.8	51.1	49.2	58.1	56.4	52.7
CZ	53.4	51.1	34.5	34.5	32.3	23.2	52.5	46.7	29.2	59.8	56.6	38.6	43.5	39.6	28.5	49.9	42.3	34.1
DK	54.0	55.4	37.7	31.6	30.1	20.8	49.2	48.7	34.9	62.8	57.5	41.3	42.2	40.6	28.9	55.5	52.2	37.2
DE	57.5	52.3	33.2	25.7	23.3	16.2	48.9	43.4	30.0	56.3	52.2	31.5	36.9	32.6	22.9	49.3	44.4	30.4
EE	55.0	56.3	42.4	37.9	26.3	27.3	67.1	59.0	52.2	73.6	68.4	54.2	55.6	45.8	36.3	63.9	58.4	51.6
IE	50.2	49.0	39.6	32.3	34.7	23.9	60.4	42.8	44.8	60.0	58.0	44.9	40.1	40.6	30.3	58.6	51.8	45.6
EL	54.0	54.8	34.7	37.1	33.5	21.8	55.0	55.3	44.9	54.8	50.2	39.1	44.0	40.3	28.9	51.7	47.4	31.7
ES	54.2	56.1	46.1	35.5	37.1	31.0	47.0	45.0	39.8	61.4	58.9	46.4	44.7	44.8	37.1	52.0	49.7	40.8
FR	53.6	54.0	39.8	31.9	31.7	24.2	52.6	48.3	36.8	59.2	55.6	44.1	41.7	39.8	31.6	52.7	48.1	37.7
HR	67.8	61.6	52.9	39.9	40.7	33.9	58.6	47.4	47.6	70.2	65.8	54.3	52.0	51.0	44.0	66.6	56.9	53.2
IT	57.1	53.6	46.8	35.5	36.9	33.0	48.7	48.3	40.2	58.3	59.1	48.5	43.4	45.8	40.5	53.2	50.1	42.6
CY	42.9	38.6	31.9	34.7	35.5	23.2	61.5	64.7	46.4	52.2	53.2	36.7	39.4	40.7	24.6	48.1	49.7	38.3
LV	60.7	61.3	55.6	45.1	47.9	37.8	72.3	69.4	54.2	70.2	71.9	56.5	52.1	53.2	41.1	68.5	66.5	60.4
LT	77.6	72.6	50.1	54.9	41.5	35.6	67.7	55.6	46.9	72.4	65.5	50.5	56.4	49.3	36.0	72.2	65.6	56.8
LU	27.8	38.5	30.9	27.7	18.3	13.2	87.5	50.0	40.9	62.1	43.7	34.9	38.7	26.9	21.9	53.1	31.4	31.1
HU	51.6	51.6	32.6	30.7	30.2	22.9	50.5	43.6	32.4	56.7	54.5	38.8	40.3	39.8	28.4	47.5	46.4	35.4
MT	40.0	36.4	32.0	30.2	24.6	12.1	45.5	70.0	23.3	56.5	44.6	27.9	34.6	25.0	16.4	47.8	55.0	24.0
NL	52.3	52.3	34.8	31.1	30.6	19.5	56.9	54.1	34.7	61.4	59.1	41.7	40.7	40.9	29.3	56.7	54.5	38.7
AT	48.3	50.3	36.0	27.7	24.8	16.5	57.5	47.9	35.6	53.6	51.7	34.6	37.6	34.7	24.8	48.7	46.9	31.9
PL	66.2	62.5	51.4	41.9	42.0	31.6	54.6	52.9	41.9	67.2	64.9	53.6	49.8	50.1	39.5	55.7	54.6	41.7
PT	58.4	63.4	56.1	41.2	42.3	37.5	59.6	55.0	51.3	62.6	61.1	54.7	45.3	49.1	44.1	55.5	54.2	47.7
RO	56.7	51.9	56.5	49.2	48.3	47.0	63.2	55.4	41.0	61.2	61.6	56.5	49.6	50.9	46.8	61.9	55.3	52.2
SI	70.7	63.2	50.2	37.3	38.1	29.1	65.0	58.0	43.7	69.7	59.3	49.5	47.7	44.3	35.3	63.9	55.6	44.4
SK	64.9	52.1	43.3	37.6	37.5	30.5	55.8	55.9	36.0	65.5	61.7	49.3	47.3	45.7	36.7	48.8	51.7	45.5
FI	58.9	57.6	45.3	31.3	32.3	26.5	67.6	56.1	47.8	65.0	61.4	52.7	41.4	40.9	34.7	61.2	58.1	46.3
SE	61.6	48.6	39.5	31.4	29.9	23.2	55.4	49.7	39.9	60.9	56.0	44.8	42.1	39.0	31.6	59.6	51.2	42.1
IS	51.3	48.0	29.1	33.3	30.6	20.6	64.7	38.1	40.0	58.8	48.2	41.6	37.6	37.0	29.6	75.4	63.6	41.3

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
NO	55.0	51.2	39.7	30.3	31.2	22.8	55.4	51.1	40.4	64.9	59.0	45.5	39.2	39.5	30.3	55.2	53.8	39.3
UK	53.5	50.0	36.9	30.0	28.4	20.9	55.7	47.1	39.4	56.7	53.3	39.9	40.3	37.0	28.4	56.0	50.2	40.7
BA	58.3	45.6	42.7	30.6	31.8	27.7	40.0	66.7	55.6	71.3	54.1	53.3	41.4	37.7	37.5	48.6	53.1	40.0
ME	50.0	62.5	70.0	41.9	54.3	32.8	52.9	64.7	33.3	65.9	55.8	55.4	48.5	52.6	46.5	55.9	53.4	40.9
MD	60.0	50.0	50.0	50.0	35.9	28.8	40.0	45.5	0.0	58.7	69.4	35.9	55.6	43.5	29.4	43.5	42.9	66.7
MK	63.5	56.8	44.2	48.7	46.2	37.0	56.3	27.8	66.7	65.2	62.3	59.3	51.4	44.1	41.4	62.5	55.2	55.6
AL	55.6	33.3	16.0	28.6	31.8	31.4	60.7	35.7	30.0	56.4	47.1	20.6	59.3	43.4	25.5	61.4	38.5	33.3
RS	53.7	62.3	55.2	42.4	43.2	41.1	59.8	60.2	49.4	64.4	60.5	56.4	48.6	51.6	47.6	57.0	52.7	45.9
TR	53.0	45.9	27.0	40.5	33.7	24.6	47.9	42.9	42.3	55.8	46.0	35.4	44.0	38.7	28.4	51.7	42.6	35.6
UA	47.3	50.2	40.9	38.6	39.5	26.2	58.3	40.5	37.0	63.6	63.2	47.6	43.0	43.8	29.0	53.9	49.7	35.9
GE	56.3	68.8	40.9	45.3	45.8	32.5	43.8	61.9	38.5	61.8	60.4	50.0	49.2	53.0	36.5	64.7	68.3	42.5
AM	33.3	64.3	46.2	26.2	31.4	32.9	68.4	44.4	0.0	61.6	59.2	57.3	35.8	41.5	31.5	59.5	38.9	38.1
FO	100.0	54.5	27.3	0.0	-	0.0	100.0	-	-	62.5	66.7	50.0	50.0	50.0	27.3	75.0	100.0	0.0
IL	44.9	46.6	34.1	30.4	31.4	22.6	46.6	39.5	39.7	54.6	51.6	39.8	39.7	38.6	29.7	55.8	47.0	42.0
TN	66.4	67.5	37.5	58.6	53.4	24.2	53.8	56.0	46.4	57.5	59.5	44.0	59.6	56.7	30.9	63.0	50.8	31.3
AR	59.3	63.4	54.1	34.8	43.2	43.6	53.6	48.9	46.3	59.5	57.5	52.3	49.6	52.5	49.4	54.9	54.0	50.3
AU	54.9	53.0	34.2	33.4	30.9	24.0	59.5	56.9	48.6	59.7	57.3	45.8	42.5	41.0	31.3	60.0	56.9	47.8
BR	56.1	53.6	42.4	40.0	39.2	30.7	54.6	47.8	49.8	63.1	60.9	51.9	47.5	46.7	38.3	51.7	47.5	42.2
CA	55.5	51.4	36.5	31.0	28.7	21.5	55.4	51.2	44.5	59.0	54.9	44.2	40.8	38.0	29.5	59.6	57.2	46.1
CN_X_HK	51.9	50.2	44.4	42.4	42.8	41.0	48.2	47.9	41.4	55.4	53.4	48.6	46.2	46.3	42.9	50.9	48.9	44.0
HK	46.8	39.3	27.1	38.6	35.2	25.8	50.7	50.0	36.4	47.8	47.2	36.8	40.8	38.8	27.9	51.6	46.6	35.4
IN	37.5	35.1	20.4	31.8	28.8	19.9	42.1	37.0	33.4	41.5	38.1	28.4	34.9	31.9	21.8	37.9	34.9	26.3
ID	47.4	46.9	37.3	39.4	36.1	25.7	40.7	44.7	35.4	59.1	52.2	41.4	43.3	40.5	30.3	41.5	38.3	29.5
JP	36.6	35.3	18.2	17.2	16.9	9.5	28.9	24.7	19.8	36.1	30.8	17.6	24.5	23.2	13.4	34.0	30.9	20.4
MX	46.2	39.7	33.8	36.6	30.8	26.9	45.2	43.0	34.2	49.2	45.5	42.3	41.6	36.9	31.7	49.7	43.6	37.1
RU	57.2	56.3	49.7	40.7	36.2	26.3	64.6	58.8	39.6	59.4	57.7	48.2	44.8	40.9	30.8	63.2	61.7	41.3
ZA	54.3	48.8	35.4	36.5	29.6	23.8	50.5	41.7	42.3	60.3	55.4	45.2	44.7	38.4	31.0	51.3	46.6	41.9
KR	36.8	33.5	23.1	25.2	21.9	13.3	49.7	40.8	23.3	37.2	35.3	23.2	29.7	27.0	17.0	40.7	34.0	21.4
US	54.1	49.7	33.9	31.1	29.4	21.0	54.0	49.7	41.6	55.5	52.2	40.0	40.8	38.2	28.7	58.9	55.9	43.7

Source: Scopus.

Notes: Data not available: XK.

Women are less likely to be active authors than men, with an increasing gender gap as authors advance in seniority

Figure 7.2 shows gender balance among early-stage active authors at EU level (45 %). This is also true for all Member States and Associated Countries, with the exception of Germany, Cyprus, Malta and Austria, where women are slightly underrepresented among early-stage active authors (35-40 % for each country), and Montenegro, where women comprise a majority of active authors (62 %, based on a total of 26 active authors in this age group).

Among middle stage authors, the EU-27 achieved gender balance, at 41 %. This is also the case for all but six Member States (CZ, DE, CY, LU, MT, AT). However, among senior stage authors, the EU-27 average decreases to 35 %. Seventeen of the 27 Member States are not gender-balanced for senior stage authors, and women account for less than 30 % of senior stage active authors in seven countries (CZ, DE, CY, LU, HU, MT, AT). This indicates a widening gap between women and men authors as women advance in seniority.

Similar trends are evident in the Associated Countries: among senior stage authors, women are underrepresented in 12 out of 17 countries ([552]), with proportions below 30 % in three (MD, AL, UA). Among the G20 countries, only Brazil (40 %), Argentina (47 %) and China (excluding Hong Kong) (43 %) have gender-balanced representation among active authors with more than 10 years' experience.

In every field of R&D, as the seniority of authors increases, women's representation decreases

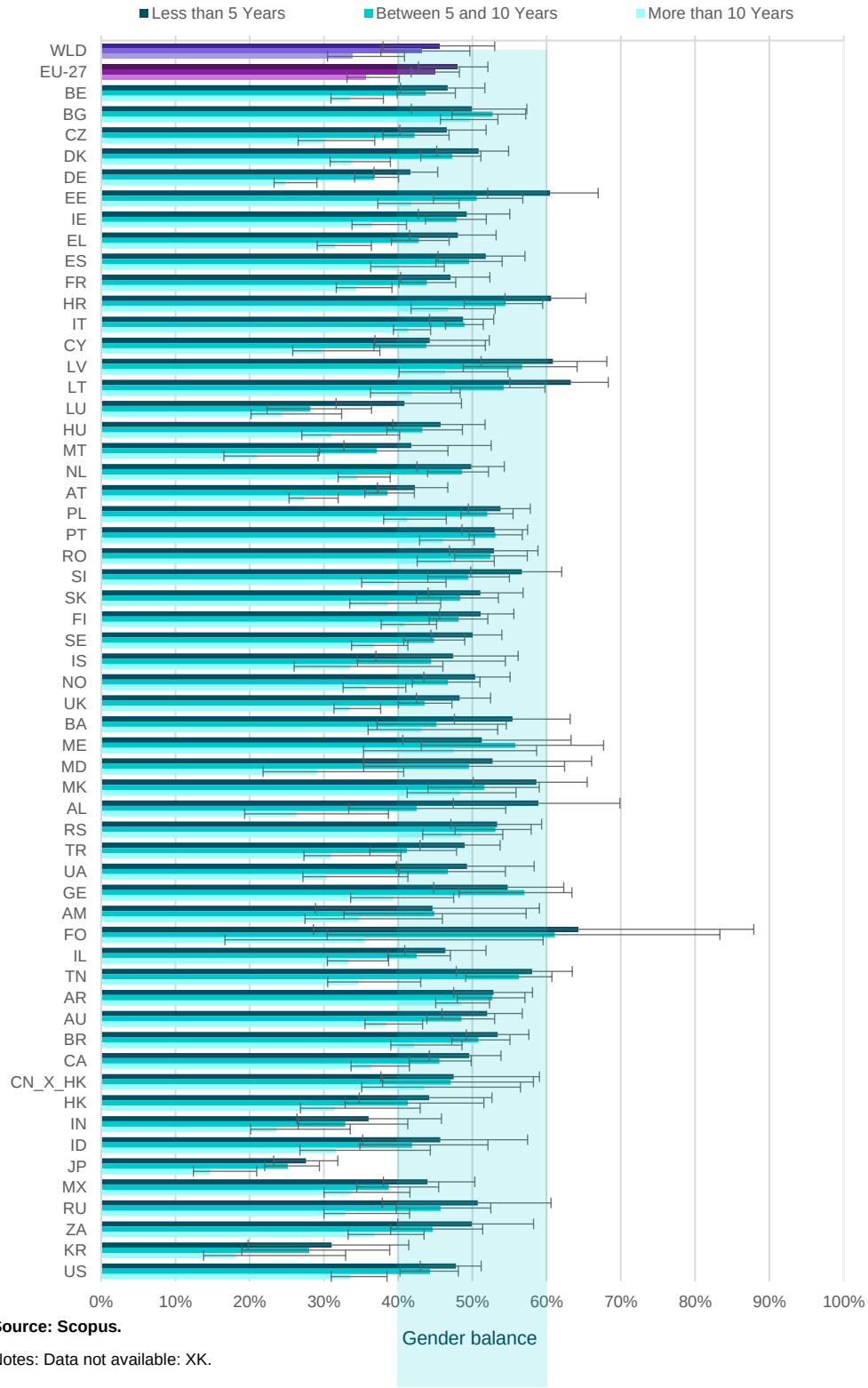
There is an overall trend of reduced women's representation compared to men among authors as authors advance in seniority levels, although the proportion of women differs by field ([553]). At EU level, gender balance is observed across all seniority stages in Agricultural and Veterinary Sciences. However, in four fields (Humanities and the Arts, Medical and Health Sciences, Natural Sciences, and Social Sciences), there is gender balance among authors in the early stages, with gender gaps emerging as authors become more senior. In Engineering and Technology, women are consistently underrepresented at all seniority stages, representing only 22 % of early-stage authors, 31 % at mid stage and 26 % at senior stage. Such differences by field of R&D can be partly explained by the persistence of gender segregation in fields of study in higher education (see Chapter 2).

Among Member States, Associated Countries and G20 countries, trends are largely consistent with those at EU level. However, in Argentina, for Engineering and Technology, women account for 36 % of early-stage authors, increasing to 42 % at the senior stage.

([552]) IS, NO ,UK, MD, AL, TR, UK, GE, AM, FO, IL, TN.

([553]) Specific fields: Agricultural and Veterinary Sciences; Engineering and Technology; Humanities and the Arts; Medical and Health Sciences; Natural Sciences; and Social Sciences.

Figure 7.2 Proportion (%) of women among active authors in all fields of R&D, by seniority level, 2018-2022



Source: Scopus.

Notes: Data not available: XK.

Table 7.2 Proportion (%) of women among active authors, by field of R&D and seniority level, 2018-2022

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
WLD	49.8	46.6	36.1	35.4	32.6	25.8	48.1	46.4	38.9	52.3	49.3	39.1	40.7	38.1	30.3	49.6	47.9	39.6
EU-27	56.9	52.6	41.9	33.1	30.9	26.3	50.0	46.4	37.4	57.4	54.5	42.2	41.0	38.7	32.4	51.6	48.6	38.7
BE	55.0	48.3	36.1	29.9	28.5	23.4	50.0	43.0	34.7	56.5	52.9	38.5	40.3	36.0	29.5	53.5	48.2	33.3
BG	45.6	61.3	47.2	37.5	43.6	46.8	52.4	52.6	46.3	56.7	57.9	59.5	43.1	51.2	50.2	53.7	50.9	51.8
CZ	52.6	46.9	33.5	36.7	30.2	22.5	37.7	42.9	26.5	55.8	51.9	36.3	43.0	35.7	27.1	39.8	39.2	33.4
DK	52.4	54.4	35.4	33.8	28.8	19.5	47.5	42.6	35.0	58.8	54.1	39.5	44.0	38.6	27.9	54.1	50.4	37.0
DE	54.1	47.5	31.9	25.1	21.0	16.3	49.0	40.1	29.1	52.6	48.2	29.5	33.2	29.3	21.9	45.8	42.2	29.7
EE	64.3	53.2	39.9	34.4	26.3	25.2	50.0	61.0	50.4	76.3	68.1	50.9	52.4	45.9	33.1	59.4	61.6	48.0
IE	52.3	45.6	39.2	34.6	35.3	23.3	52.9	37.4	48.0	60.1	54.3	43.1	40.6	39.5	29.2	59.6	48.2	45.3
EL	57.8	53.0	33.6	30.2	32.6	21.2	42.4	42.7	42.4	49.6	47.7	37.2	39.2	39.5	27.2	37.9	45.2	29.5
ES	57.3	55.0	45.3	37.4	36.8	30.6	48.9	44.8	39.5	58.8	56.9	45.1	44.9	43.9	36.1	52.2	48.9	39.8
FR	56.0	50.7	39.2	32.4	30.3	23.9	46.4	43.6	35.7	55.5	52.3	42.3	40.2	38.0	30.9	45.4	44.9	36.2
HR	63.0	60.8	52.0	38.5	38.6	34.8	47.4	44.6	46.9	69.4	60.9	53.6	53.0	49.0	43.6	60.4	55.2	52.3
IT	59.7	53.5	46.7	37.1	37.2	33.1	46.3	48.8	39.4	58.4	57.5	47.8	45.1	44.9	40.1	54.3	50.2	41.7
CY	36.4	35.7	29.5	25.5	29.1	21.3	62.5	66.7	61.1	40.9	48.6	36.1	27.1	36.2	23.6	46.2	47.3	35.9
LV	56.8	65.4	54.5	38.0	47.3	37.1	50.0	75.0	55.6	66.7	72.2	55.2	44.1	55.5	40.3	69.7	72.7	60.9
LT	81.5	74.7	50.1	43.7	39.3	35.2	65.4	59.4	47.7	68.5	63.1	50.2	46.0	48.3	35.6	71.0	68.1	57.3
LU	60.0	41.2	29.8	34.2	15.9	12.7	100.0	57.1	50.0	64.5	42.7	34.2	44.3	25.2	20.4	56.5	33.3	32.4
HU	58.4	46.6	32.3	32.9	28.1	22.3	57.7	40.6	29.6	52.7	50.4	36.4	39.6	37.2	26.8	48.2	41.7	34.1
MT	0.0	25.0	34.8	36.4	25.6	7.3	-	75.0	18.8	61.5	46.9	26.1	23.5	24.7	14.2	100.0	45.0	22.6
NL	49.8	49.5	34.2	34.6	29.9	19.2	-	51.8	34.5	59.5	57.6	40.3	43.2	40.1	28.8	57.4	53.9	39.0
AT	42.5	49.3	35.0	28.5	24.6	16.7	46.4	43.6	33.6	52.6	48.3	33.1	34.4	33.1	24.2	47.1	45.1	31.0
PL	65.5	60.4	51.7	42.9	41.6	31.8	51.5	48.7	40.6	65.6	63.3	53.0	49.0	48.6	39.5	52.5	55.3	41.0

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
PT	56.4	63.9	55.5	47.9	42.8	37.3	66.7	56.8	52.4	62.8	61.6	54.2	49.8	49.1	43.1	54.8	52.6	47.7
RO	61.5	52.6	56.2	47.9	49.4	47.4	72.9	50.0	39.2	64.4	60.0	56.7	51.5	50.3	47.3	63.2	56.1	52.9
SI	54.5	57.9	48.9	38.1	34.2	28.8	50.0	62.0	41.3	64.2	54.5	48.2	42.9	40.8	34.8	52.9	50.6	43.0
SK	77.9	52.0	42.9	36.4	37.2	30.3	48.7	53.8	33.1	62.4	60.3	48.9	48.7	43.9	36.1	40.5	48.3	44.8
FI	64.8	57.2	44.3	32.4	30.4	26.9	56.1	52.7	47.7	63.6	58.7	50.5	42.2	38.5	34.1	60.8	55.8	47.0
SE	58.4	48.0	38.3	29.6	29.5	22.8	50.9	49.2	39.4	55.9	53.1	43.1	40.5	37.2	30.5	54.9	48.9	41.1
IS	66.7	52.6	31.6	36.8	33.3	23.1	100.0	45.5	47.6	35.3	47.9	41.4	44.0	37.6	30.8	90.9	62.8	40.6
NO	57.0	47.9	39.9	26.7	29.5	22.9	55.0	50.4	40.1	62.0	56.9	44.1	38.8	37.7	30.3	50.9	50.8	39.3
UK	51.4	48.7	36.0	29.2	27.5	20.4	51.4	42.3	38.3	56.0	51.3	38.6	37.6	35.4	27.5	52.1	47.1	39.6
BA	60.0	45.8	38.9	33.3	33.8	31.5	30.0	75.0	80.0	45.3	51.2	54.8	41.3	34.0	37.6	26.5	52.6	41.8
ME	100.0	58.3	70.4	62.5	65.2	34.1	25.0	71.4	50.0	81.8	54.1	53.7	64.3	56.6	47.5	60.0	55.2	37.5
MD	0.0	-	33.3	50.0	56.5	28.1	-	16.7	0.0	61.5	72.2	31.8	47.1	50.0	26.8	50.0	0.0	-
MK	25.0	-	37.1	40.9	46.3	38.3	-	33.3	57.1	51.9	58.7	51.6	43.3	38.8	38.9	50.0	62.9	-
AL	50.0	33.3	22.2	25.0	9.1	30.4	100.0	33.3	28.6	60.0	39.1	22.2	62.5	30.2	25.4	57.1	29.2	25.0
RS	69.2	64.9	55.6	49.0	45.6	42.2	42.9	53.2	52.9	63.4	61.1	56.6	55.8	54.5	48.4	53.8	50.4	44.2
TR	51.0	41.5	25.9	35.4	31.0	23.5	42.6	40.4	39.6	49.3	42.0	34.2	40.5	35.7	27.5	41.3	38.2	33.1
UA	46.0	46.2	39.8	37.9	38.9	25.4	54.4	30.4	34.3	66.0	62.8	46.2	42.8	43.5	27.8	55.0	47.1	35.6
GE	50.0	55.6	43.2	30.4	43.2	30.6	60.0	50.0	36.8	62.8	60.0	46.6	43.5	50.4	35.4	55.6	71.1	43.0
AM	100.0	62.5	36.4	27.3	29.4	29.8	60.0	66.7	0.0	57.6	56.1	56.1	33.3	41.1	27.7	66.7	41.7	35.7
FO	100.0	66.7	27.3	-	-	0.0	100.0	-	-	-	80.0	50.0	-	50.0	26.3	100.0	100.0	0.0
IL	37.5	46.0	33.0	30.4	28.5	21.8	28.8	38.8	38.1	51.6	47.4	38.2	37.1	34.9	28.2	46.5	45.3	42.0
TN	70.5	66.8	35.3	62.2	49.5	22.3	66.7	61.5	35.3	61.4	58.3	42.7	62.3	54.5	28.6	57.4	44.7	29.7
AR	56.3	62.0	53.1	36.2	41.8	42.8	45.6	48.0	45.1	56.6	56.2	51.2	50.7	51.4	47.9	51.2	51.9	47.3
AU	56.5	51.2	33.7	33.3	30.0	23.8	62.8	57.3	49.0	59.2	55.9	45.0	44.0	39.9	30.8	59.8	55.1	47.3

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
BR	52.9	51.2	40.9	39.3	38.4	30.0	45.5	43.2	49.2	61.1	58.0	50.4	46.1	44.5	36.8	45.3	43.6	40.1
CA	57.4	47.9	35.0	29.7	27.8	20.8	43.2	48.7	43.0	56.2	52.7	42.4	38.9	36.1	28.3	57.9	56.3	45.0
CN_X_HK	51.6	48.2	44.1	42.0	41.4	40.6	39.5	45.2	40.9	54.4	51.9	48.3	45.6	44.7	42.5	47.6	46.5	43.4
HK	46.7	37.5	27.5	40.7	34.7	25.3	39.5	47.2	39.7	48.1	46.7	36.6	40.3	37.9	27.2	50.2	45.3	34.4
IN	35.6	31.8	18.8	29.3	26.9	19.0	33.8	31.5	26.6	41.1	35.8	27.4	32.2	29.0	20.6	34.8	31.5	24.1
ID	43.6	47.1	37.7	38.5	35.2	25.5	41.0	45.6	32.2	54.9	51.6	41.7	42.7	39.9	30.2	38.8	37.1	28.9
JP	34.6	31.4	16.6	17.6	17.7	9.1	23.8	21.1	17.2	30.3	25.7	15.8	23.6	22.4	12.5	35.3	28.4	18.3
MX	42.8	38.5	33.2	34.1	29.1	26.1	44.2	38.0	30.8	47.6	42.8	41.5	38.6	34.9	30.7	44.6	40.5	34.8
RU	56.0	55.2	48.8	40.6	35.6	26.0	59.7	55.6	38.6	59.0	55.9	47.9	44.4	39.9	30.4	61.1	59.8	40.5
ZA	58.9	46.7	35.8	35.0	27.9	23.9	50.0	39.5	40.2	55.6	53.6	45.0	43.5	36.0	31.1	43.2	42.0	40.6
KR	35.7	30.2	22.6	25.1	20.5	13.1	50.9	38.8	22.5	37.1	34.6	22.9	28.3	25.3	16.8	38.4	32.8	21.2
US	53.2	47.5	33.0	31.2	28.7	21.1	52.0	48.4	40.2	53.4	50.5	38.8	39.7	36.6	28.2	57.9	54.9	43.2

Source: Scopus.

Notes: Data not available: XK; Division by zero, not applicable is indicated by the use of '-'. This applies to: MT, NL (Humanities and the Arts, <5 years), MD, MK (Agricultural and Veterinary Sciences, <5 years; Humanities and the Arts, <5 years; Social Sciences, >10 years), FO (Engineering and Technology, <5 years and 5-10 years; Humanities and the Arts, 5-10 years and >10 years; Medical and Health Sciences, <5 years; Natural Sciences, <5 years).

7.2 Gender gap in the average number of publications of all authors

This section explores gender differences in the number of publications authors produce and how impactful those publications are. This is done by comparing the average publication count for women and men among all authors, by seniority level and field of research, then looking at the average citation impact of publications by women and men authors.

Among early-stage authors, women and men publish a comparable amount. However, as authors advance in seniority, women produce progressively fewer publications than men.

Figure 7.3 shows the ratio of the average number of publications by women compared to men in all fields of R&D, by seniority level, for the period 2018-2022. A ratio of 1.0 indicates that, on average, women and men (at a given seniority level) publish the same number of publications. A ratio above 1.0, means that, on average, women authors publish more than men authors, while a ratio of less than 1.0 indicates that women publish less than men.

In line with the results presented in She Figures 2021, the average number of publications produced by women, relative to men, decreases with seniority. At EU level, the number of publications for women and men were similar at early career stage, with a ratio of 0.9. Publication figures at the middle stage decreased to a ratio of 0.8, then decreased further at the senior stage, to 0.7. Combined with the findings from the previous section, this shows a trend of reduced participation and fewer outputs from women authors as seniority increases. This suggests a 'leaky pipeline phenomenon' (see Chapter 6) and also suggests barriers even for women who are able to continue publishing. Breaks in careers, particularly related to maternity leave, may negatively impact the productivity of women researchers, with further challenges in re-entering academia after a break potentially hindering research outputs ([554]). Women may also spend a greater proportion of their working hours than men on tasks other than research, such as coaching, mentoring and participating in committees ([555]) ([556]). Finally, previous research has indicated that 'ghost authorship' ([557]) is more common for women than men, particularly within 'hard sciences' (e.g., Natural Sciences) compared to 'soft sciences' (e.g. Social Sciences) ([558]). This means that although more women are influencing publications overtime, they are not receiving recognition for their efforts, resulting in persistent gender-based disparities in publications.

Similar trends can be observed across Member States and Associated Countries. Only 10 of all Member States and Associated Countries had an equal or higher publication rate among

([554]) Elsevier, *Gender in the Global Research Landscape*, 2017, Available at: https://assets.ctfassets.net/zlnfaxb2lcqx/57uxjkQA2aUQSpWayDUd5c/6653475e50db61cfb0f828e291c1e08a/Elsevier-gender-report-2017.pdf

([555])Misra J., Lundquist Hickes J., Templer., 2012, Gender, Work Time and Care Responsibilities Among Faculty', https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1573-7861.2012.01319.x

[556] Babcock, L., Recalde, M.P., Vesterlund, L., Weingart, L. (2017)'Gender Differences in Accepting and Receiving Requests for Tasks with Low Promotability', American Economic Review, 107(3), pp.714-747. Available at: https://pubs.aeaweb.org/doi/pdfplus/10.1257/aer.20141734

([557]) 'Ghost authors are those who participate in research, data analysis, and/or writing of a manuscript but are not named or disclosed in the author byline or acknowledgments', https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3276043/#:~:text=GHOST%20AUTHORSHIP,the%20author%20byline%20or%20acknowledgments

([558]) Ni, C., Smith, E., Yuan, H., Larivière, V. and Sugimoto, C.R., 2021, 'The gendered nature of authorship', *Science Advances,* Vol. 7, No 36, , https://europepmc.org/article/med/34516891

women than men authors for early-stage authors, ranging from 1.0 to 1.4 ([559]). Generally, the gender gap in publication rates increases as authors become more senior. In contrast, Malta and Norway have a ratio that stays consistent (in both cases, at 0.8) from early to senior stage. However, this is because women publish less than men at all stages.

The gender gap in publication rates increases as authors become more senior, for all fields of R&D

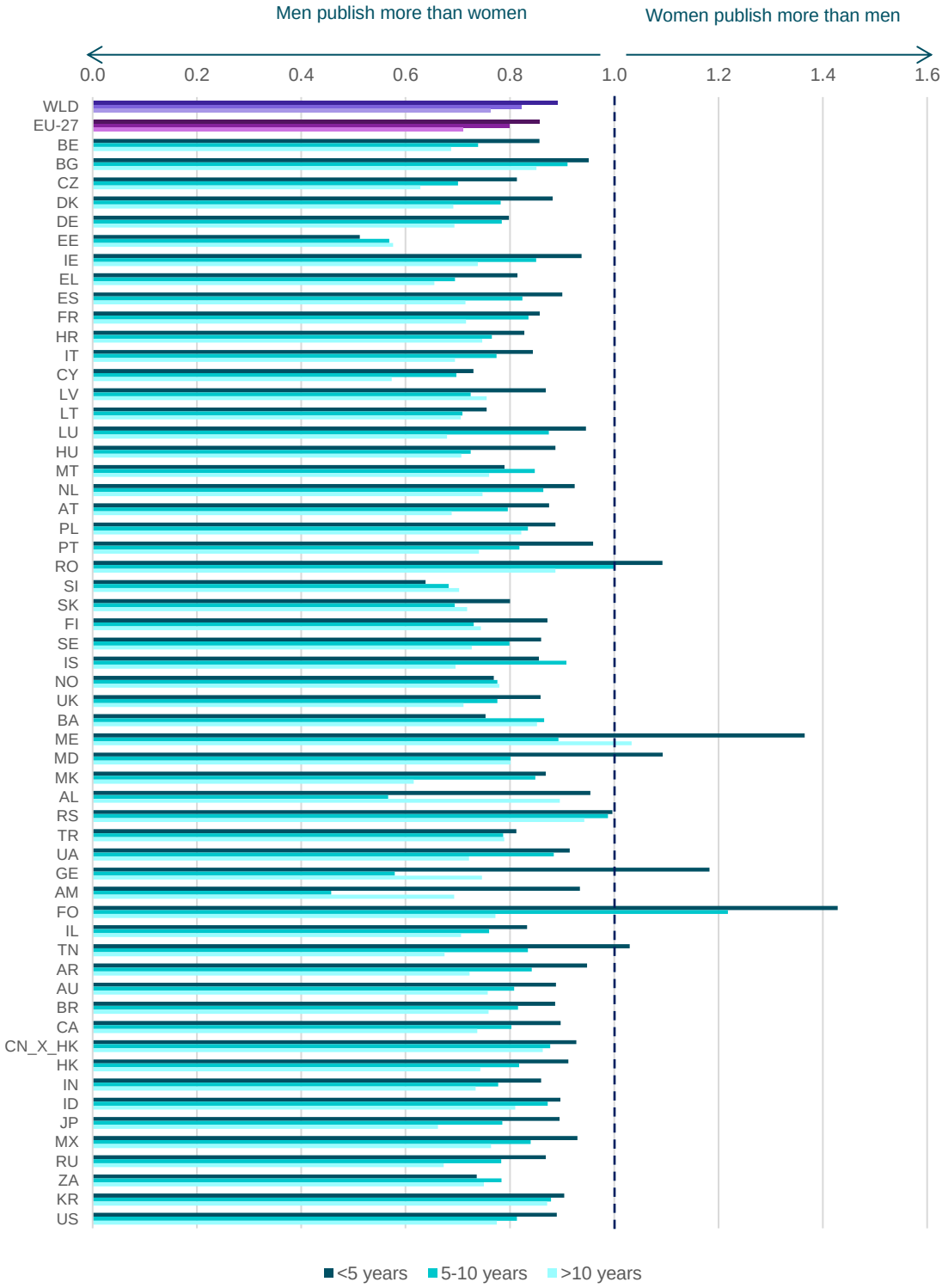
Table 7.3 shows the ratio of the average number of publications by women to those by men, by seniority level. At EU level, across every field of R&D, the average number of publications by women authors declines as seniority increases, compared to men.

However, there are a few exceptions across EU and Associated Countries where the publication rate is the same for women and men for the early stage to the most senior categories. This is the case in four countries for Agricultural and Veterinary Sciences (BG, CY, SI, AL), 16 countries for Humanities and the Arts ([560]), three countries for Medical and Health Sciences, (AL, FO, ZA), and four for Social Sciences (BA, MD, GE, IL).

([559]) BG, PT, RO, ME, MD, AL, RS, GE, FO, TN.

([560]) IE, HR, CY, LV, LU, SI, NO, BA, ME, RS, IL, CA, CN_X_HK, ID, RU, KR.

Figure 7.3 Ratio of average number of publications by women to those by men, all fields of R&D, by seniority level, 2018-2022



Source: Scopus.

Notes: Data not available: XK. Dotted line indicates a ratio of 1.0, where women and men publish the same amount.

Table 7.3 Ratio of average number of publications by women to those by men, by field of R&D, by seniority level, 2018-2022

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
WLD	0.92	0.85	0.82	0.96	0.89	0.87	0.90	0.88	0.87	0.90	0.82	0.76	0.92	0.84	0.79	0.89	0.86	0.86
EU- 27	0.97	0.87	0.81	0.99	0.90	0.80	0.94	0.87	0.85	0.85	0.77	0.69	0.89	0.83	0.73	0.90	0.87	0.82
BE	0.99	0.88	0.70	0.93	0.84	0.75	0.76	0.84	0.81	0.91	0.80	0.69	0.88	0.73	0.70	0.95	0.87	0.75
BG	0.92	1.07	1.02	0.99	0.95	0.93	0.95	0.71	0.89	1.03	0.81	0.93	0.93	0.99	0.84	0.93	0.91	0.84
CZ	0.90	0.70	0.74	1.04	0.85	0.77	0.84	0.93	0.81	0.87	0.75	0.68	0.85	0.70	0.63	0.80	0.80	0.78
DK	0.94	0.79	0.71	1.08	0.86	0.69	1.01	0.72	0.80	0.78	0.74	0.67	0.99	0.82	0.72	0.93	0.81	0.85
DE	0.85	0.81	0.75	0.94	0.86	0.77	0.99	0.82	0.84	0.82	0.73	0.64	0.79	0.81	0.73	0.87	0.86	0.82
EE	1.64	0.72	0.77	0.69	0.84	0.67	0.79	0.86	0.78	0.84	0.70	0.65	0.47	0.57	0.58	0.90	0.83	0.66
IE	0.98	0.89	0.85	1.06	0.93	0.77	0.82	0.74	1.09	0.94	0.82	0.73	0.99	0.87	0.76	0.93	0.79	0.79
EL	0.90	0.93	0.81	0.67	0.82	0.69	0.70	0.75	0.72	0.81	0.73	0.68	0.88	0.72	0.66	0.68	0.81	0.71
ES	1.00	0.89	0.79	1.00	0.90	0.77	0.99	0.96	0.85	0.84	0.79	0.73	0.95	0.85	0.73	0.89	0.87	0.81
FR	0.97	0.84	0.79	0.97	0.91	0.79	0.87	0.85	0.80	0.84	0.76	0.67	0.91	0.89	0.75	0.85	0.84	0.79
HR	0.96	0.90	0.89	1.06	0.83	0.90	0.75	0.93	0.92	0.95	0.83	0.84	0.88	0.72	0.72	0.69	0.78	0.81
IT	0.98	0.91	0.83	1.05	0.88	0.81	1.00	0.89	0.92	0.85	0.75	0.70	0.88	0.79	0.70	0.97	0.90	0.85
CY	0.45	0.75	0.69	0.77	0.68	0.47	0.53	1.32	0.94	0.70	0.72	0.71	0.72	0.71	0.58	0.79	0.75	0.63
LV	0.94	0.92	0.77	0.88	0.87	0.78	0.94	0.89	0.97	1.01	0.74	0.67	0.88	0.77	0.80	1.12	0.85	0.74
LT	1.89	1.05	0.90	0.69	0.84	0.70	0.97	0.82	0.80	0.83	0.77	0.74	0.69	0.66	0.72	1.06	0.93	0.84
LU	1.47	1.29	0.50	0.70	0.76	0.71	1.14	0.69	1.44	1.05	0.91	0.59	0.90	0.93	0.70	1.01	0.70	0.72
HU	1.17	0.78	0.81	1.04	0.89	0.80	0.93	0.81	0.78	0.94	0.79	0.71	0.89	0.70	0.72	0.98	0.86	0.80
MT	0.58	0.74	0.58	1.00	1.06	0.35	0.75	0.75	0.69	0.92	1.11	0.85	0.68	0.88	0.59	1.52	0.61	0.81
NL	0.93	0.79	0.73	1.04	0.90	0.75	1.04	0.85	0.96	0.85	0.80	0.70	0.99	0.92	0.77	0.99	0.90	0.87
AT	0.81	0.87	0.75	1.01	0.89	0.73	0.86	0.78	0.80	0.89	0.72	0.71	0.89	0.82	0.69	0.92	0.87	0.81

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
PL	1.07	0.90	0.91	0.98	0.90	0.89	0.93	0.89	0.81	0.85	0.83	0.79	0.90	0.84	0.83	0.92	0.94	0.86
PT	1.06	1.02	0.89	1.11	0.87	0.77	1.10	1.13	1.07	0.91	0.87	0.77	1.06	0.82	0.75	0.85	0.86	0.89
RO	1.15	1.05	1.03	1.07	1.08	0.94	1.08	1.06	1.00	1.11	0.88	0.93	1.13	1.04	0.90	1.13	1.02	0.99
SI	0.65	0.66	0.90	1.04	0.72	0.91	0.79	0.78	0.92	0.79	0.78	0.77	0.64	0.72	0.72	0.90	0.69	0.86
SK	1.49	0.95	0.86	0.83	0.81	0.87	0.99	0.85	0.64	0.90	0.87	0.80	0.79	0.67	0.72	0.79	0.80	0.82
FI	1.04	0.79	0.83	0.85	0.76	0.79	0.83	0.88	0.75	0.90	0.77	0.70	0.91	0.73	0.78	0.92	0.75	0.87
SE	0.81	0.93	0.79	0.91	0.91	0.82	0.96	0.84	0.81	0.83	0.77	0.71	0.94	0.84	0.75	0.84	0.84	0.77
IS	1.25	0.93	0.97	0.94	0.97	0.45	1.15	0.78	0.64	0.56	0.94	0.72	1.17	0.86	0.69	1.09	0.76	0.82
NO	0.97	0.82	0.81	0.85	0.89	0.81	0.81	0.78	0.89	0.90	0.80	0.78	0.74	0.82	0.78	0.83	0.76	0.82
UK	0.85	0.83	0.77	0.91	0.89	0.77	0.91	0.84	0.89	0.91	0.83	0.74	0.88	0.79	0.73	0.88	0.88	0.83
BA	0.88	0.80	0.79	1.03	0.95	1.08	0.54	1.07	1.63	0.59	0.82	0.86	1.06	0.82	0.91	0.64	0.81	1.01
ME	3.50	0.96	0.92	2.73	1.51	1.67	0.65	0.89	2.00	1.38	0.57	0.66	1.68	1.09	1.10	1.73	0.60	0.60
MD	0.53	1.00	0.50	1.09	1.27	0.88	0.95	0.32	0.00	1.31	0.68	0.57	0.93	0.82	0.81	0.88	0.26	5.50
MK	0.55	0.92	0.90	0.94	1.06	0.81	1.14	1.35	0.39	0.73	0.98	0.53	0.89	0.79	0.72	0.98	1.09	0.55
AL	0.98	0.88	1.19	1.06	0.24	0.71	1.20	1.01	0.54	0.79	1.10	1.16	1.18	0.47	0.92	0.87	0.70	0.50
RS	1.32	1.06	1.05	1.12	1.14	1.03	0.83	0.92	1.13	0.99	1.08	0.96	1.11	1.03	0.95	0.91	0.90	0.78
TR	0.89	0.77	0.83	0.80	0.81	0.73	0.88	0.89	0.80	0.77	0.74	0.83	0.86	0.84	0.79	0.78	0.77	0.77
UA	0.88	0.79	0.77	0.97	0.90	0.78	0.85	0.82	0.75	1.02	0.96	0.79	0.92	0.90	0.73	0.93	0.83	0.78
GE	0.67	0.90	0.64	0.61	0.72	0.78	1.40	0.98	0.71	0.99	0.87	0.66	1.44	0.44	0.77	0.61	0.90	1.23
AM	2.00	0.65	0.51	1.34	0.44	0.54	0.56	1.51	0.00	0.71	0.76	0.58	1.15	0.44	0.73	0.90	1.57	0.68
FO	-	1.47	0.66	0.00	-	0.00	-	-	-	0.72	0.98	0.96	0.67	1.19	0.68	1.17	-	0.00
IL	0.95	0.98	0.73	0.82	0.77	0.75	0.69	0.92	0.90	0.84	0.76	0.73	0.89	0.79	0.71	0.82	0.94	0.96
TN	0.98	0.86	0.64	1.08	0.76	0.63	1.03	1.01	0.59	1.00	0.85	0.75	1.00	0.81	0.65	0.90	0.83	0.76
AR	0.94	0.87	0.77	0.99	0.84	0.77	0.92	0.88	0.88	0.94	0.82	0.74	1.00	0.86	0.71	0.96	0.93	0.73

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
AU	1.05	0.85	0.76	0.88	0.88	0.75	1.01	0.94	0.99	0.93	0.85	0.79	0.93	0.83	0.73	0.96	0.83	0.86
BR	0.87	0.79	0.75	0.92	0.85	0.82	0.91	0.95	0.91	0.91	0.81	0.76	0.92	0.82	0.76	0.87	0.87	0.82
CA	0.99	0.76	0.75	0.91	0.87	0.82	0.73	0.89	0.90	0.91	0.82	0.71	0.92	0.80	0.75	0.92	0.89	0.83
CN_X_HK	0.91	0.86	0.88	0.95	0.90	0.88	0.81	0.89	0.95	0.93	0.88	0.89	0.93	0.88	0.87	0.86	0.85	0.88
HK	0.99	0.84	0.94	1.07	0.83	0.79	0.54	0.73	1.22	0.95	0.87	0.77	0.95	0.83	0.78	0.87	0.81	0.73
IN	0.86	0.77	0.75	0.87	0.77	0.71	0.71	0.83	0.59	0.93	0.79	0.79	0.86	0.78	0.73	0.83	0.76	0.70
ID	0.85	0.94	0.89	0.89	0.88	0.78	0.89	0.86	1.03	0.82	0.85	0.89	0.92	0.89	0.80	0.85	0.81	0.82
JP	0.92	0.81	0.76	1.04	0.98	0.79	0.92	0.76	0.62	0.77	0.69	0.63	0.96	0.83	0.69	1.01	0.87	0.74
MX	0.94	0.87	0.80	0.94	0.89	0.79	0.90	0.85	0.81	0.93	0.86	0.84	0.94	0.85	0.77	0.90	0.89	0.85
RU	0.86	0.81	0.72	0.94	0.86	0.77	0.84	0.85	0.91	0.93	0.83	0.79	0.92	0.81	0.67	0.91	0.86	0.86
ZA	1.04	0.71	0.80	0.75	0.80	0.85	0.90	0.79	0.79	0.72	0.83	0.80	0.74	0.78	0.75	0.70	0.74	0.78
KR	0.96	0.82	0.90	0.93	0.87	0.86	0.91	0.98	0.99	0.94	0.90	0.83	0.89	0.86	0.88	0.92	0.86	0.81
US	0.95	0.85	0.80	0.95	0.91	0.87	0.95	0.88	0.85	0.89	0.83	0.78	0.91	0.82	0.80	0.97	0.93	0.91

Source: Scopus.

Notes: Data not available: XK; Not applicable, division by zero: FO (Agricultural and Veterinary Sciences, <5 years; Engineering and Technology, 5-10 years; Humanities and the Arts, all years; Social Sciences, 5-10 years).

There is no gender difference in the impact of publications

Field-weighted citation impact (FWCI) is an indicator of the citation impact of a publication. FWCI is based on the actual number of citations received by an article compared to the expected number of citations for articles of the same document type (article, review, or conference proceeding paper), publication year and subject field. This section compares the FWCI of women's and men's publications: a score above 1.0 indicates that women produce publications that, on average, have a higher impact than men's publications, whereas a score below 1.0 means that women's publications have a lower impact than men's.

Figure 7.4 shows the average FWCI of publications by women compared to men in all R&D fields, by seniority. For the EU-27, the ratio of FWCI was around 1.0 across each seniority level, reflecting equal impact. At country level, the data show that most of the EU Member States and Associated Countries were close to 1.0, indicating that women's and men's publications have a similar impact. A ratio of less than 0.7 is evident for several countries among early-stage authors (SI, IS, MK, UA, GE) and mid-stage authors (CY, AM). The same trend appears in the G20 countries, but given the higher representation of women authors among mid- and senior- stage authors (as shown earlier in this chapter), Argentina has a slightly lower FWCI for publications authored by women at both the mid and senior stages.

There have been many efforts on reforming and enhancing research assessment processes to promote high-quality research and innovation. In 2022, the Coalition for Advancing Research Assessment (CoARA) was established, leading to the development of an Agreement on Reforming Research Assessment ([561]). The Agreement sets 10 commitments for changes in assessment practices for research, researchers and research performing organisations, with the main goal to maximise the quality and impact of research. It includes a principle of advancing equality as part of research assessment practices, referring to the consideration of gender aspects, but also diversity in research teams and research content.

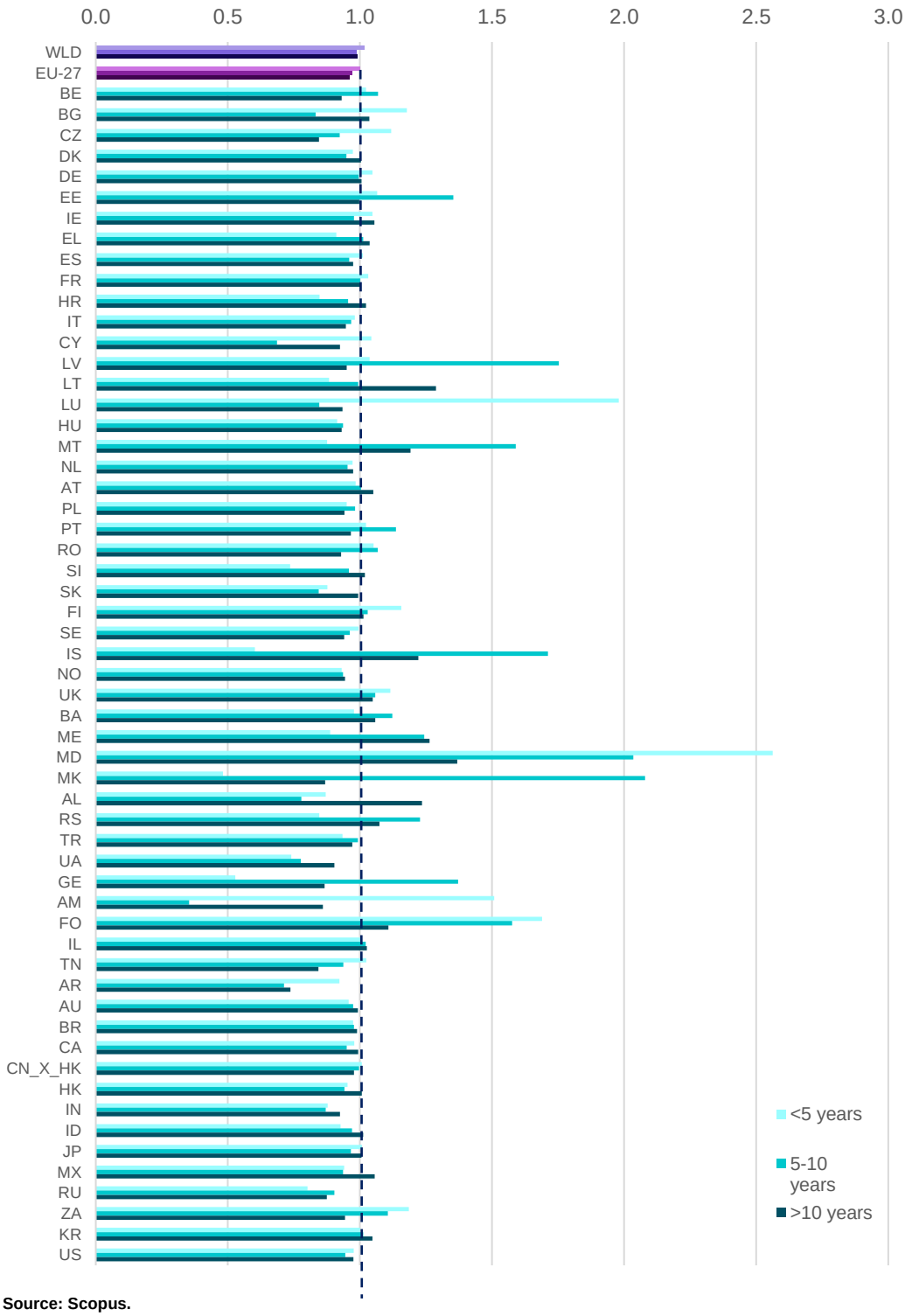
The impact of publications authored by women is similar or equal to the impact of publications authored by men in all fields of R&D

Table 7.4 further disaggregates the data in Figure 7.4 by R&D field ([562]). Despite the disproportionately low number of women publishing in the fields of Engineering and Technology and Natural Sciences, their publications have the same impact as those from men. This is illustrated by the FWCI of approximately 1.0 across all seniority levels at both global and EU level. At EU level, women's and men's publications have similar impact (with the ratio of FWCI ranging from 0.9 to 1.1) across all levels of seniority, in every R&D field. For most Member States, women and men have an equal impact across all levels of seniority in all fields of R&D. However, there are minor fluctuations for early-stage authors, with ratios lower than 0.7 in several Member States. This is the case for two countries for Agricultural and Veterinary Sciences, (EE, LU), four countries for Humanities and the Arts (BG, LV, LU, NL), and one country for Medical and Health Sciences (RO).

([561]) European Commission, 'Reforming research assessment: The Agreement is now final', 2022, https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/reforming-research-assessment-agreement-now-final-2022-07-20_en

([562]) Specific fields: Agricultural and Veterinary Sciences; Engineering and Technology; Humanities and the Arts; Medical and hHalth Sciences; Natural Sciences; and Social Sciences.

Figure 7.4 Ratio of average FWCI of publications by women to that of men, all fields of R&D, by seniority level, 2018-2022



Source: Scopus.

Notes: Data not available: XK. Dotted line indicates gender parity.

Table 7.4 Ratio of average FWCI of publications by women to that of men, by field of R&D, by seniority level, 2018-2022

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
WLD	1.05	1.04	1.05	0.99	0.96	0.95	0.97	0.85	0.98	0.97	0.95	0.94	1.00	0.98	0.99	1.00	0.97	1.01
EU-27	1.03	1.00	0.99	1.00	0.96	0.96	1.02	0.95	1.01	0.95	0.93	0.91	1.03	0.98	0.98	0.97	0.96	0.98
BE	1.01	1.02	0.96	1.02	1.04	1.04	1.08	1.03	1.02	0.99	1.02	0.85	1.01	1.10	1.01	1.12	0.96	1.03
BG	1.05	2.38	0.99	0.83	1.29	0.97	0.40	0.63	1.06	1.57	0.54	0.83	0.89	1.02	0.98	0.79	1.06	0.75
CZ	1.11	1.00	1.07	1.08	1.01	0.96	1.06	0.70	0.79	1.20	0.78	0.69	1.13	0.98	0.94	0.95	0.81	0.83
DK	1.07	0.94	1.04	1.12	0.96	0.96	2.54	1.29	1.02	0.79	0.90	0.94	1.09	0.99	1.01	0.87	0.87	1.00
DE	0.89	0.95	1.02	1.06	0.99	1.00	1.22	0.94	0.99	1.00	0.96	0.98	1.05	1.01	1.02	1.04	0.93	1.03
EE	0.59	1.04	1.04	0.78	1.00	1.25	3.08	0.93	0.98	0.96	2.01	0.79	0.90	1.07	1.12	1.01	0.86	1.02
IE	0.92	0.80	1.09	0.97	1.00	1.00	0.95	0.83	1.08	1.10	0.94	0.98	1.01	0.97	1.08	1.04	0.98	1.02
EL	1.03	1.12	1.07	0.86	1.03	1.07	1.33	1.18	1.18	0.88	0.99	1.00	0.93	0.99	1.04	0.96	0.96	1.02
ES	1.07	1.06	1.03	1.09	0.99	0.99	1.10	1.09	1.05	0.91	0.90	0.93	1.10	0.97	0.99	1.06	1.07	1.02
FR	1.02	1.00	1.01	1.08	0.97	1.00	1.07	0.76	1.01	0.95	0.98	0.94	1.11	1.02	1.04	0.83	0.81	0.96
HR	1.07	1.10	1.07	1.05	0.92	0.93	1.84	0.77	1.06	1.06	1.23	1.02	0.86	1.05	1.05	1.18	0.82	0.95
IT	1.11	0.99	1.00	0.98	0.94	0.94	1.03	0.95	1.04	0.99	0.99	0.93	0.99	0.94	0.95	0.95	0.97	0.96
CY	0.94	0.95	0.92	0.83	1.05	0.92	2.77	1.18	1.32	0.96	0.43	0.79	1.09	1.00	1.04	1.02	0.96	0.98
LV	1.17	1.25	0.80	0.91	1.13	0.93	0.64	0.55	1.16	0.96	2.61	0.74	1.04	1.11	1.19	0.72	1.14	1.03
LT	0.83	0.59	0.87	0.96	0.92	1.01	1.11	0.79	1.12	0.75	0.90	1.38	0.88	0.73	1.11	0.85	0.97	0.83
LU	0.36	1.10	1.03	0.75	1.00	1.16	0.06	0.71	1.16	2.89	0.59	0.66	1.61	1.03	1.29	1.52	1.13	1.06
HU	1.06	1.06	1.03	1.05	1.17	0.96	1.62	0.83	1.36	0.80	0.85	0.80	1.09	1.04	1.01	1.03	1.05	1.12
MT	0.77	0.80	1.32	0.81	0.70	2.48	17.01	1.78	1.43	0.66	1.61	1.05	0.87	0.75	1.89	1.02	1.87	0.79
NL	1.02	1.02	1.05	1.10	1.01	1.00	0.44	0.84	1.05	0.92	0.90	0.90	1.07	0.97	1.03	0.82	0.94	1.02

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
AT	1.17	0.96	1.02	0.89	0.99	1.04	1.14	0.91	0.92	1.00	1.03	1.02	1.11	1.02	1.07	0.98	1.00	0.88
PL	1.18	1.05	1.01	1.08	1.03	1.00	1.13	0.98	1.09	0.75	0.90	0.83	1.06	0.99	0.96	0.94	1.01	1.06
PT	1.16	1.08	0.97	1.10	1.03	1.00	0.89	1.23	1.13	1.06	1.14	0.88	1.06	1.13	1.04	0.94	1.07	0.97
RO	1.50	1.07	0.84	0.94	1.07	1.00	1.01	0.60	0.67	1.00	0.90	0.79	1.04	1.08	0.96	1.10	1.12	0.82
SI	1.14	1.12	1.12	1.07	0.92	1.16	0.82	0.78	0.87	0.46	0.94	0.85	0.99	1.03	1.18	0.69	0.86	0.93
SK	1.15	0.98	0.76	0.81	0.90	0.97	0.73	0.83	0.70	0.75	0.56	0.91	0.97	1.21	0.94	0.84	0.93	0.85
FI	1.06	1.23	1.06	0.91	0.99	1.02	0.69	1.31	1.10	1.08	0.96	0.91	0.98	1.04	0.98	1.07	0.99	0.96
SE	1.25	1.17	1.09	0.87	1.02	1.00	0.90	1.10	0.95	0.94	0.86	0.84	1.03	1.02	1.03	1.01	0.98	0.96
IS	0.85	0.83	1.02	1.22	1.26	1.05	2.24	1.09	2.09	0.57	1.91	0.99	0.75	1.21	1.16	0.53	0.98	1.28
NO	0.94	0.99	1.03	0.90	0.90	1.06	1.16	1.30	1.01	0.82	0.80	0.81	1.07	1.00	1.05	0.87	1.01	1.02
UK	0.88	1.08	1.10	1.00	1.03	1.09	1.03	0.85	1.04	1.10	1.02	0.98	1.05	1.08	1.11	1.01	0.99	1.02
BA	1.85	0.84	1.47	0.89	0.68	1.34	0.90	1.85	1.11	1.31	1.44	0.83	1.06	0.73	1.17	0.66	0.69	1.06
ME	1.18	1.02	1.10	1.67	0.36	1.79	0.66	0.46	1.35	1.07	3.51	0.91	0.94	0.49	1.16	0.78	0.92	0.47
MD	0.86	1.00	1.15	1.52	1.20	0.91	3.29	1.13	0.00	2.63	1.27	1.27	0.59	1.00	0.96	5.50	1.18	1.90
MK	0.50	0.72	1.41	0.35	1.07	0.94	1.36	0.80	0.98	0.40	3.78	0.76	1.23	0.97	0.91	0.99	0.86	0.93
AL	1.67	1.07	1.37	0.46	0.94	1.08	8.91	0.94	1.90	0.75	0.66	2.01	1.09	0.48	0.58	1.12	1.03	0.56
RS	1.05	1.32	1.09	1.31	1.08	1.11	1.00	0.65	1.08	0.59	1.36	0.99	1.26	1.13	1.07	0.60	1.07	0.86
TR	1.11	1.08	1.05	0.99	0.92	0.94	1.36	0.88	0.95	0.93	1.11	1.00	0.96	0.91	0.95	1.00	1.03	1.00
UA	0.88	0.83	0.81	0.95	0.92	0.92	0.91	1.03	1.22	0.36	0.32	0.51	0.92	1.01	0.88	0.96	1.04	1.12
GE	0.34	0.82	0.59	0.37	0.77	0.83	0.58	0.73	1.27	0.33	1.46	0.58	0.68	0.91	1.08	0.47	1.25	1.08
AM	2.48	0.80	1.23	0.89	0.89	0.97	1.00	0.72	0.00	2.27	0.16	0.45	0.82	0.61	0.92	1.19	1.08	1.38
FO	-	1.19	1.02	0.00	-	0.00	-	-	-	1.20	3.30	1.12	0.66	1.25	1.36	1.38	-	0.00

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
IL	1.08	1.08	0.98	0.98	1.04	1.26	0.95	0.88	0.96	1.04	1.09	0.93	1.00	1.04	1.07	1.18	0.94	0.99
TN	1.25	0.98	1.14	1.07	0.96	1.05	0.29	0.77	0.66	0.76	0.94	0.70	1.08	0.94	0.91	1.26	0.87	0.96
AR	0.92	0.93	0.98	1.39	0.97	1.00	1.04	0.99	1.20	0.75	0.54	0.57	1.15	0.93	0.92	1.11	0.75	0.97
AU	0.89	1.12	0.97	0.97	1.01	0.97	1.20	1.10	1.04	0.95	0.92	0.91	0.99	1.02	1.01	0.97	1.02	0.97
BR	1.12	1.10	1.09	1.04	1.03	1.03	1.10	0.83	0.82	0.89	0.91	0.88	1.04	1.02	1.02	0.88	1.03	0.86
CA	1.02	1.01	1.04	0.97	0.97	1.04	0.85	0.65	0.95	0.96	0.89	0.90	1.00	0.98	1.03	0.92	0.89	0.98
CN_X_HK	0.99	1.01	0.97	1.04	1.01	0.99	0.92	1.02	0.96	0.96	1.00	0.95	1.00	0.99	0.98	0.99	0.96	0.97
HK	1.32	0.93	1.33	0.93	0.93	1.08	0.65	0.75	1.10	0.99	0.96	0.98	0.99	0.94	1.01	0.74	0.98	1.04
IN	1.00	0.97	1.03	0.92	0.91	0.93	0.84	0.94	0.75	0.82	0.79	0.88	0.90	0.90	0.94	0.93	0.93	0.96
ID	0.90	0.96	1.05	0.99	0.97	0.92	0.89	1.10	0.68	0.73	1.01	0.93	0.97	0.96	1.07	0.90	0.90	1.00
JP	1.07	1.03	1.00	0.99	0.92	1.00	0.86	0.76	0.86	0.99	0.97	0.98	1.01	0.97	1.02	0.94	0.95	1.11
MX	1.13	1.17	1.17	1.07	1.01	1.03	1.38	1.26	0.80	0.81	0.80	0.93	1.05	1.01	1.04	1.05	0.94	1.14
RU	0.84	0.86	0.87	0.88	0.93	0.90	0.90	1.06	0.96	0.76	0.87	0.82	0.86	0.92	0.86	0.92	0.95	0.87
ZA	1.09	1.12	0.97	1.28	0.92	1.02	0.78	1.14	1.00	1.02	0.96	0.76	1.02	1.15	1.07	1.02	0.91	1.09
KR	0.96	0.97	1.02	1.04	1.04	1.03	0.79	1.04	1.08	0.99	1.06	1.03	0.99	0.98	1.03	1.03	0.98	1.07
US	1.02	0.96	1.04	1.02	0.95	0.99	0.85	0.71	0.86	0.96	0.93	0.94	1.00	0.96	1.02	0.92	0.90	0.98

Source: Scopus.

Notes: Data not available: XK.

7.3 Women's and men's representation in authorship teams

Gender balance in research teams helps to ensure that R&I outputs are socially relevant. A gender-balanced composition of research teams allows for diverse viewpoints at all stages of the project. For example, ensuring that the design of research questions avoids gender biases throughout the data collection, or that scientific outputs address the needs of different communities ([563]) ([564]) ([565]). This section looks at women's and men's relative representation in authorship teams and examines how representation varies by field of R&D and over time. Additionally, this section explores women's representation on international teams, given that women have historically been less likely than men to author publications resulting from international collaboration. This disparity affects the reach of their publications, highlighting the importance to promote diversity and inclusion in authorship teams for a more equitable and expansive scholarly landscape ([566])([567]).

Women are under-represented in authorship teams compared to men

Figure 7.5 shows the average proportion of women among authors on publications in all fields of R&D for 2018-2022. Similar to She Figures 2021, the data show that at EU level, the average proportion of women on authorship teams is only 34 %, indicating that women are underrepresented compared to men.

Ghost authorship may contribute to this underrepresentation on authorship teams, as women are more likely not to be mentioned or disclosed by the author. A recent study suggested that women are less likely than men to be given credit on authorship teams, showing that they are systematically less likely to be named as authors on publications ([568]).

The underrepresentation observed at EU level is reflected among Member States and Associated Countries, where women authors account for less than 50 % of authors on average within authorship teams in all countries. Further, Germany, Luxembourg and Austria had, on average, less than 30 % women authors on publication teams. However, 10 countries had a gender balance among authors ([569]).

([563]) Reardon, S. 'Scientific collaborations are precarious territory for women', Nature, 2022, https://www.nature.com/articles/d41586-022-01204-1

([564]) European Research Executive Agency, *Gender in EU research and innovation*, 2023, https://rea.ec.europa.eu/gender-eu-research-and-innovation_en#:~:text=Gender%20in%20R%26I,-%C2%A9%20European%20Union&text=Understanding%20how%20gender%20plays%20a,of%20greater%20goods%20and%20services.

([565]) Yang, Y., Tian, T.Y., Woodruff, T.K., Jones, B.F. & Uzz, B., 'Gender-diverse teams produce more novel and higher-impact scientific ideas', *PNAS*, Vol. 119, No 36, 2022, pp. 1-8, https://www.pnas.org/doi/epdf/10.1073/pnas.2200841119

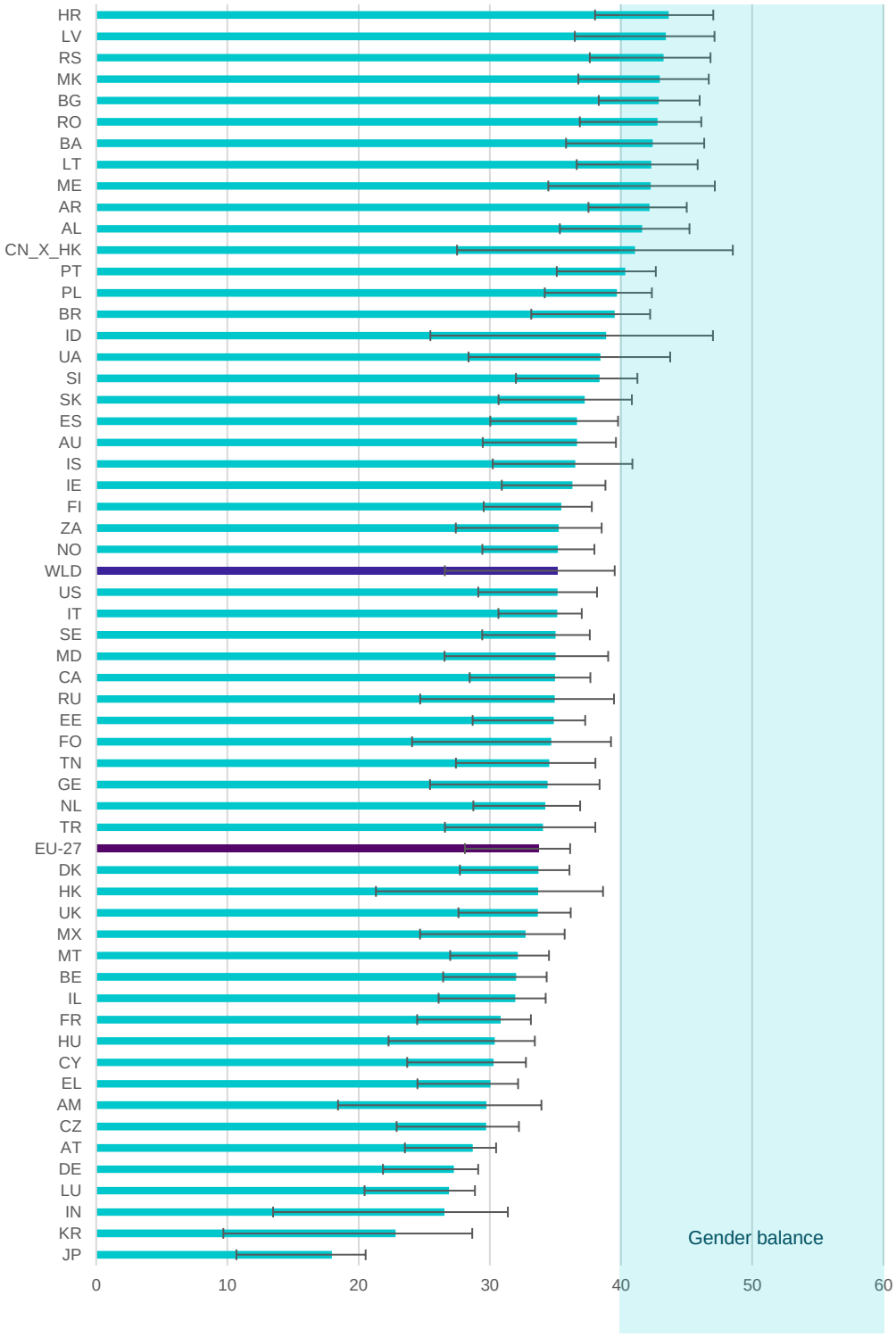
([566]) Elsevier, *Gender in the Global Research Landscape*, 2017, https://www.elsevier.com/__data/assets/pdf_file/0003/1083945/Elsevier-gender-report-2017.pdf; Elsevier, *The Researcher Journey Through a Gender Lens*, 2020, www.elsevier.com/__data/assets/pdf_file/0011/1083971/Elsevier-gender-report-2020.pdf

([567]) Elsevier, Hill-Parks, E., *Paving the way to increase diversity in journals – and research*, 2023, https://www.elsevier.com/en-gb/connect/paving-the-way-to-increase-diversity-in-journals-and-research

([568]) https://www.nature.com/articles/s41586-022-04966-w

([569]) BG, HR, LV, LT, RO, ME, MD, AL, RS, TR.

Figure 7.5 Average proportion (%) of women among authors on publications, all fields of R&D, 2018-2022



Source: Scopus.

Women's average representation on authorship teams has increased over time, reaching gender balance in Agricultural and Veterinary Sciences, Humanities and the Arts, Medical and Health Sciences and Social Sciences

Table 7.5 breaks down the proportion of women among publication authors by field of R&D. In the period 2018-2022, the average proportion of women authors in authorship teams ranged from 25 % in Engineering and Technology to 43 % in Humanities and the Arts.

On average, a slight increase is observed between 2013-2017 and 2018-2022 in women's representation in all fields, with four fields reaching gender balance in 2018-2022: Agricultural and Veterinary Sciences, Humanities and the Arts, Medical and Health Sciences, and Social Sciences (at 41-43 % women). In comparison, in 2013-2017, women were underrepresented on average among authorship teams in all fields (22-39 %).

Looking more closely at country-level 2018-2022 data for Member States and Associated Countries:

- For Humanities and the Arts, 34 out of 44 countries ([570]) reached gender balance, while Montenegro has a majority of women on authorship teams (65 %).
- In the field of Medical and Health Sciences, 34 countries have gender balance ([571])
- 30 countries have gender balance in Social Sciences ([572]).
- 21 countries have gender balance among authors in Agricultural and Veterinary Sciences ([573]).
- Only Romania achieved gender balance among authorship teams for Engineering and Technology, and only Romania and Albania for Natural Sciences.

Similar patterns are seen among G20 countries.

Table 7.6 shows the CAGR of the average proportion of women among authors on publications, by field of R&D, from 2013 to 2022. At EU level and throughout Member States, there is a small positive CAGR in all fields (1 % to 2 %), reflecting a small amount of growth in the proportion of women authors over time. In the Associated Countries, there is more variation in the CAGR (with some variations potentially attributable to low base sizes). The fields with the greatest differences are Agricultural and Veterinary Sciences, where three countries have a negative CAGR (ME, AL, GE) and Humanities and the Arts, where four countries have a negative CAGR (BA, MK, AL, AM).

([570]) BG, DK, EE, IE, EL, ES, FR, HR, IT, CY, LT, LU, NL, AT, PL, PT, RO, SI, SK, FI, SE, IS, NO, UK, BA, ME, MK, AL, RS, TR, UA, GE, FO,TN.

([571]) BG, DK, EE, IE, ES, HR, IT, CY, LV, LT, MT, NL, PL, PT, RO, SI, SK, FI, SE, IS, NO, UK, BA, ME, MD, MK, AL, RS, TR, UA, GE, AM, FO, TN,

([572]) BG, EE, IE, ES, HR, IT, LT, NL, PL, PT, RO, SI, SK, FI, SE, IS, NO, UK, BA, ME, MD, MK, AL, RS, TR, UA, GE, AM, FO, IL.

([573]) BG, ES, HR, IT, LV, LT, PL, PT, RO, SI, SK, FI, BA, ME, MD, MK, AL, RS, UA, AM, TN.

Table 7.5 Average proportion (%) of women authors on publications, by field of R&D, 2013-2017 and 2018-2022

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
WLD	36.5	39.4	26.3	28.5	40.0	43.0	39.3	42.7	28.7	31.7	40.5	42.6
EU-27	39.0	41.5	22.3	25.2	39.3	42.7	39.2	42.1	26.7	29.5	38.5	41.6
BE	34.6	36.5	20.8	23.3	34.9	38.5	36.2	39.1	25.2	27.9	35.5	38.5
BG	45.5	45.6	37.3	37.8	48.8	56.0	51.5	48.9	38.1	39.8	47.9	48.7
CZ	34.1	34.8	21.0	23.5	35.0	37.2	38.4	39.1	25.2	26.9	37.6	37.2
DK	35.7	39.6	20.4	22.4	35.4	40.6	38.9	41.6	25.8	28.6	35.9	39.5
DE	33.6	36.4	16.4	19.2	32.9	36.7	31.3	34.7	21.3	24.3	31.5	35.4
EE	41.1	37.2	21.7	22.8	52.6	52.5	46.6	45.4	29.0	29.2	48.8	46.9
IE	36.5	39.1	21.6	24.6	39.5	44.1	41.7	44.4	26.1	29.4	41.3	44.8
EL	35.0	38.4	20.1	23.0	41.8	45.1	33.6	37.0	23.7	26.9	31.6	35.7
ES	41.6	42.9	26.4	28.4	40.6	42.6	42.1	44.1	29.7	32.0	39.8	42.8
FR	36.4	38.1	21.2	23.0	38.8	40.9	38.1	39.9	25.4	27.3	36.7	38.1
HR	48.2	50.5	30.0	32.6	46.2	48.7	52.0	51.5	35.0	37.7	54.5	53.8
IT	40.9	42.6	25.1	28.0	38.5	42.7	40.1	41.9	29.9	32.6	38.6	41.4
CY	30.5	35.6	19.8	20.4	46.7	48.1	38.2	40.2	22.7	25.0	36.2	36.5
LV	47.3	48.7	34.5	36.0	60.6	65.7	47.1	52.0	35.3	38.1	59.0	60.1
LT	48.2	49.7	28.3	33.4	44.7	56.7	46.8	49.8	30.2	35.4	52.2	55.6
LU	36.9	35.1	17.8	18.4	36.4	43.2	35.0	38.4	21.2	23.6	30.8	32.8
HU	31.9	35.5	20.2	22.7	35.9	39.8	37.0	38.6	24.2	26.4	34.8	38.5
MT	29.1	33.5	16.6	21.3	30.7	33.3	38.1	41.7	23.3	25.1	35.2	39.2
NL	32.5	36.3	18.6	22.7	37.1	40.7	38.2	41.6	24.8	28.5	37.3	41.1
AT	34.0	37.3	16.9	20.2	34.8	40.1	32.7	35.4	22.2	25.3	33.6	37.5

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
PL	49.8	51.1	27.9	32.1	47.9	48.2	50.4	51.5	33.3	36.2	46.2	47.8
PT	48.4	49.5	29.0	31.1	47.4	48.6	48.0	50.1	33.3	36.2	44.7	47.1
RO	49.7	51.0	38.0	39.6	48.6	50.2	51.1	51.4	39.2	40.1	51.3	51.3
SI	42.6	46.5	26.5	28.6	49.3	52.7	44.3	46.0	30.1	32.5	47.7	50.1
SK	40.6	44.3	28.1	30.3	43.1	44.0	47.3	48.1	31.8	33.9	45.2	46.2
FI	40.4	42.3	21.4	23.7	45.4	50.6	44.5	46.5	26.5	28.9	44.4	47.6
SE	37.3	39.3	21.3	24.6	40.3	43.7	41.3	43.7	26.4	29.4	40.1	43.3
IS	36.0	38.3	15.3	24.2	35.0	42.7	42.6	46.4	25.3	30.6	43.3	47.0
NO	34.3	38.3	20.4	23.5	39.3	44.7	42.4	45.6	25.7	28.4	38.4	42.6
UK	35.0	38.5	19.7	23.1	38.8	42.2	38.2	41.0	24.8	27.7	38.9	41.6
BA	41.8	44.4	28.3	35.4	40.3	44.5	49.0	50.2	32.6	36.5	42.3	43.9
ME	49.3	48.1	34.7	36.3	65.2	65.0	44.5	46.9	37.9	37.1	48.9	48.6
MD	52.0	57.6	24.9	26.7	23.5	26.4	40.1	45.0	26.5	31.8	32.7	42.4
MK	45.6	46.3	36.5	38.9	50.8	57.1	52.8	49.5	35.4	37.4	45.9	47.0
AL	35.9	40.2	30.6	36.7	56.6	50.5	41.8	46.6	33.6	37.0	52.1	48.9
RS	52.3	51.9	36.6	36.3	46.6	49.9	51.4	50.3	39.7	40.4	45.2	47.7
TR	32.4	36.1	24.0	25.6	39.3	42.4	35.1	41.4	27.4	29.6	37.6	41.0
UA	39.8	45.1	23.7	29.6	42.2	55.1	44.2	54.2	26.0	33.0	51.2	52.8
GE	37.9	34.8	26.1	27.6	53.4	51.4	49.6	47.5	23.3	26.4	43.2	46.5
AM	39.6	45.5	20.5	25.5	47.2	37.5	42.3	45.4	21.0	26.4	37.5	43.6
FO	34.9	32.6	32.3	22.3	52.8	58.3	42.5	46.0	33.0	29.2	41.4	42.9
IL	32.0	34.7	19.3	22.8	37.8	39.2	37.0	39.7	23.4	26.0	41.2	44.6
TN	38.1	40.8	26.7	29.7	41.7	44.4	41.7	44.1	31.1	32.5	34.0	37.0

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
AR	48.2	48.7	34.9	35.0	48.9	50.8	46.6	45.8	39.8	39.8	49.2	50.1
AU	32.2	35.6	22.7	25.7	44.8	48.1	42.7	45.0	26.8	29.5	44.2	45.8
BR	41.0	42.6	27.1	28.6	44.8	44.7	49.9	50.2	32.7	33.9	44.1	43.6
CA	34.3	37.7	20.1	23.2	42.0	44.8	40.3	43.3	25.6	28.4	42.7	45.2
CN_X_HK	44.4	45.0	39.6	37.7	41.5	41.9	48.2	49.1	40.6	39.9	41.6	42.5
HK	35.4	36.8	28.9	30.4	39.5	39.1	37.6	39.2	29.8	31.7	35.4	37.9
IN	23.9	27.1	20.4	23.0	36.4	37.2	30.3	33.6	23.0	24.9	29.7	31.2
ID	37.9	41.2	27.6	31.8	37.3	38.6	43.5	49.1	31.8	37.0	35.6	37.7
JP	22.0	24.2	11.6	14.4	23.4	25.1	19.8	21.2	14.6	16.9	22.3	24.3
MX	32.8	34.7	23.1	25.7	40.3	39.9	40.4	41.4	27.1	29.3	38.7	40.0
RU	41.0	42.5	24.0	27.9	50.5	50.8	45.2	48.3	26.1	30.7	49.3	49.9
ZA	33.2	35.8	21.9	25.0	34.9	37.1	43.3	45.4	27.0	29.5	40.5	40.5
KR	26.0	28.3	15.2	17.9	31.9	38.3	25.2	28.9	18.4	20.9	26.2	31.0
US	34.6	37.7	21.2	24.2	41.2	43.6	39.2	42.5	26.3	29.1	42.7	45.9

Source: Scopus.

Notes: Data not available: XK.

Table 7.6 CAGR (%) of average proportion of women authors on publications, by field of R&D, 2013-2022

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
WLD	1.58	1.54	1.43	1.65	1.94	1.10
EU-27	1.20	2.23	1.61	1.44	1.85	1.64
BE	1.09	2.40	3.10	1.59	2.07	2.28
BG	-0.51	0.19	4.42	-0.70	0.70	-0.39
CZ	0.17	1.50	1.89	0.75	1.08	0.53
DK	2.07	2.19	3.65	1.42	2.04	1.96
DE	1.35	2.91	1.81	2.14	2.52	2.36
EE	-1.08	1.60	0.05	0.36	0.14	-0.13
IE	1.14	2.34	1.99	1.47	2.42	1.53
EL	2.69	2.46	1.08	1.75	2.20	2.13
ES	0.60	1.30	1.46	0.91	1.34	1.45
FR	0.89	1.71	1.19	0.92	1.41	0.56
HR	0.97	1.01	0.92	0.15	1.15	0.38
IT	0.71	2.00	1.89	0.92	1.36	1.50
CY	2.44	1.80	1.58	1.32	1.80	1.16
LV	1.57	1.16	-1.06	1.92	1.45	0.94
LT	0.63	2.85	3.29	1.42	3.11	0.95
LU	-1.64	2.73	2.83	2.49	2.33	0.49
HU	2.15	2.64	1.53	1.21	2.05	2.09
MT	2.81	6.64	-0.35	3.22	2.10	4.66
NL	2.21	3.94	2.08	1.85	2.76	2.40
AT	1.80	3.34	3.12	1.53	2.39	2.95
PL	0.55	2.28	-0.46	0.39	1.46	0.40
PT	0.53	1.40	0.89	1.05	1.71	1.62
RO	0.36	0.85	0.78	-0.04	0.64	0.69
SI	0.73	2.11	0.41	0.95	1.67	1.25
SK	1.95	1.24	0.45	0.43	0.84	0.82
FI	1.02	2.16	2.04	0.85	1.93	1.23
SE	1.44	2.60	2.27	1.24	2.03	1.58
IS	1.80	8.97	4.74	1.97	2.65	2.11
NO	2.23	3.12	1.87	1.68	2.10	2.02
UK	2.03	3.11	1.47	1.50	2.11	1.17
BA	0.07	2.89	-0.61	0.78	2.34	-0.07
ME	-1.84	2.37	1.92	4.12	-0.32	1.94
MD	6.32	2.41	3.23	3.69	3.84	4.04
MK	0.09	-0.09	-1.15	-1.07	0.62	-0.63
AL	-2.41	4.74	-3.63	1.57	2.12	-0.93
RS	-0.11	0.26	0.75	-0.11	0.60	1.37
TR	1.97	1.61	2.08	2.96	1.65	2.46
UA	1.25	4.50	6.61	2.52	4.06	-0.20
GE	-1.41	1.41	0.93	-0.15	3.26	0.67

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
AM	2.85	4.68	-6.64	1.78	4.25	1.29
FO	2.57	-	2.40	1.04	0.33	5.88
IL	1.53	2.44	1.37	1.50	1.99	1.72
TN	1.31	2.21	1.42	0.60	1.31	1.42
AR	0.35	-0.21	-0.17	-0.48	-0.20	-0.01
AU	1.87	2.18	1.28	1.13	1.84	0.98
BR	0.71	1.13	-0.76	0.20	0.74	-0.15
CA	1.96	2.85	1.79	1.42	2.10	1.32
CN_X_HK	0.45	-0.84	-0.33	0.38	-0.23	0.39
HK	0.77	1.40	0.13	1.18	1.50	1.56
IN	2.40	2.73	1.87	2.15	1.98	0.77
ID	1.67	4.00	-0.99	3.14	3.79	2.47
JP	1.94	4.10	1.24	1.34	2.87	1.51
MX	1.59	1.91	0.63	0.43	1.62	1.09
RU	0.91	3.13	3.15	0.94	3.04	1.86
ZA	1.18	3.01	1.50	1.43	1.58	0.48
KR	1.60	3.27	3.39	2.67	2.70	3.59
US	1.67	2.52	1.17	1.66	1.99	1.48

Source: Scopus.

Notes: Data not available: XK.

Across the EU, women are less represented than men in authorship teams that stem from international collaborations

Figure 7.6 shows the average proportion of women authors on publications resulting from international collaboration in all fields of R&D, for the period 2018-2022. At EU level, the average proportion of women on international authorship teams was 31 %. Comparing Figures 7.6 and 7.5 (international vs all publications), women are slightly less represented in international teams, making up 34 % of all teams and 31 % of international teams.

This finding is similarly evident among Member States, Associated Countries and G20 countries, all of which had no more than 40 % women in international authorship teams. However, nine countries have an equal or greater proportion of women in international authorship teams than overall authorship teams ([574]). This could be a result of women not frequently pursuing extended or distant research opportunities abroad (as explored further in section 5.2 in Chapter 5).

Women are underrepresented in international collaborations overall, but gender balance is evident in the field of Humanities and the Arts

Table 7.7 shows the average proportion of women authors on publications resulting from international collaborations, from 2013-2017 to 2018-2022, by field of R&D. Although there has been an increase in the proportion of women in international authorship collaborations between 2013-2017 and 2018-2022 at EU level, there is gender balance only in the field of Humanities and the Arts in the period 2018-2022. This shows that women are still generally underrepresented in international collaborations throughout almost all fields.

Among Member States and Associated Countries, 13 countries achieved gender balance in Agricultural and Veterinary Sciences ([575]), 33 achieved gender balance in Humanities and the Arts ([576]), 30 in Medical and Health Sciences ([577]) and 25 in Social Sciences ([578]). Overall, women were better represented in international teams in the 2018-2022 period compared to 2013-2017. The greatest gender gaps are observed in Engineering and Technology and in Natural Sciences.

Table 7.8 shows the CAGR of the average proportion of women authors on publications resulting from international collaborations, by field of R&D. At EU level, the CAGR is positive for each field of R&D, but differs slightly by field. The growth rate for the average proportion of women authors on publications stemming from international collaborations is higher in Engineering and Technology, Natural Sciences, and Humanities and the Arts (approximately 2 % in each field), followed by Agricultural and Veterinary Sciences, Medical and Health Sciences, and Social Sciences, each of which had CAGRs of approximately 1 %.

([574]) BE, DE, CY, LT, MT, AT, CH, HK, JP.

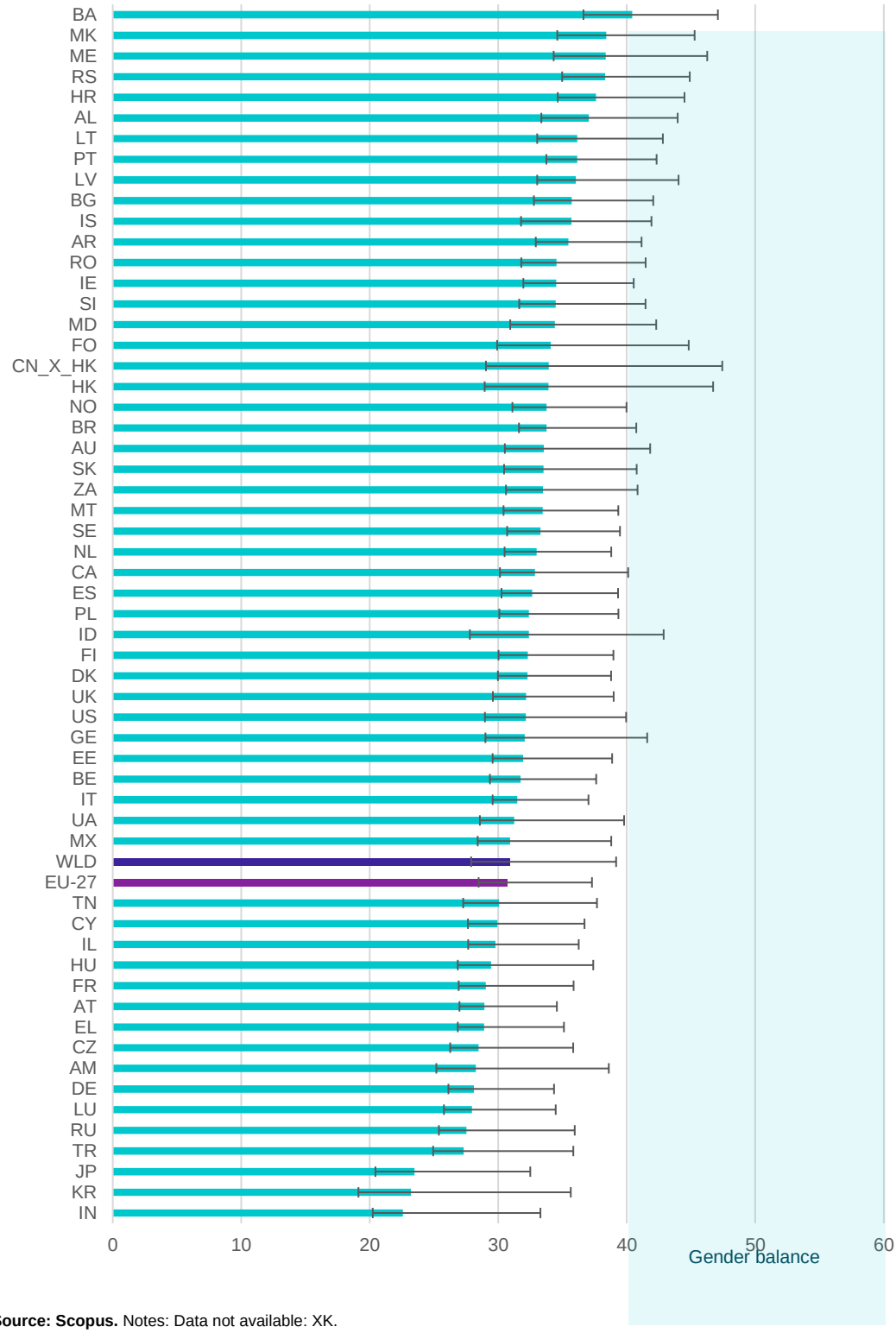
([575]) ES, HR, LT, PL, PT, RO, SI, BA, ME, MD, MK, RS, AM.

([576]) BE, BG, DK, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, HU, MT, NL, PL, PT, RO, SI, SK, FI, SE, NO, UK, BA, ME, MK, AL, RS, TR, UA, IL.

([577]) BG, DK, EE, IE, ES, HR, CY, LV, LT, MT, NL, PL, PT, RO, SI, SK, FI, SE, IS, NO, BA, ME, MD, MK, AL, RS, UA, GE, AM, FO.

([578]) BG, EE, IE, HR, LV, LT, MT, PL, PT, RO, SI, SK, FI, SE, IS, BA, MD, MK, AL, RS, UA, GE, AM, FO, IL.

Figure 7.6 Average proportion (%) of women authors on publications resulting from international collaboration, all fields of R&D, 2018-2022



Source: Scopus. Notes: Data not available: XK.

Table 7.7 Average proportion (%) of women authors on publications resulting from international collaboration, by field of R&D, 2013-2017 and 2018-2022

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
WLD	33.2	35.2	22.5	24.8	37.6	40.8	36.4	38.9	25.8	28.0	34.8	37.0
EU-27	34.8	37.3	21.3	23.9	37.1	41.3	36.2	38.8	25.2	27.8	34.4	37.4
BE	33.0	35.6	20.9	24.0	36.8	40.6	35.5	38.5	25.5	28.4	33.6	37.5
BG	37.9	39.2	32.6	33.4	34.8	44.8	42.2	43.0	32.0	33.6	40.7	42.7
CZ	31.4	32.8	21.3	24.0	32.6	37.1	36.5	38.0	24.3	26.6	33.6	35.6
DK	34.4	38.4	21.5	23.0	32.6	39.6	37.2	39.6	26.3	28.9	32.8	36.3
DE	32.2	34.8	18.6	21.5	34.5	38.9	32.5	35.2	22.9	25.8	31.5	35.0
EE	38.8	35.1	20.6	22.9	44.6	44.1	44.1	43.6	28.0	28.3	41.9	40.1
IE	36.5	39.1	21.8	24.7	40.1	44.8	39.9	42.2	26.0	29.4	38.2	42.0
EL	33.5	36.9	19.2	22.5	37.5	43.4	32.3	35.1	23.3	26.4	29.6	33.3
ES	38.0	39.7	24.4	26.6	39.0	43.3	38.0	39.7	27.5	29.9	35.6	38.8
FR	34.6	36.6	21.0	22.9	36.4	39.6	35.9	37.7	24.9	26.9	32.1	33.9
HR	41.0	46.1	24.9	30.4	42.3	48.7	44.1	45.4	30.4	34.3	43.8	45.7
IT	37.2	39.3	22.8	25.2	37.8	41.4	36.4	38.1	27.0	29.4	35.3	37.5
CY	31.4	34.8	19.1	20.3	44.8	49.6	37.6	39.8	22.6	25.1	34.0	35.0
LV	38.0	39.4	26.4	29.2	49.4	50.2	43.4	47.2	29.6	32.2	47.9	51.7
LT	40.2	41.6	23.9	29.3	49.6	53.8	42.6	44.7	26.8	31.8	42.9	45.8
LU	35.6	35.2	19.0	19.8	30.0	39.1	35.5	38.6	22.5	25.1	30.3	32.4
HU	31.1	32.9	21.3	23.0	35.9	41.8	35.6	37.2	24.1	26.4	35.1	38.6
MT	28.8	34.5	19.1	23.3	50.6	42.2	40.5	42.3	26.5	27.6	42.2	41.5
NL	32.2	36.0	19.3	23.0	38.6	41.9	36.4	39.8	25.4	28.7	35.0	39.1

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
AT	33.4	36.7	18.3	21.6	32.5	39.3	32.5	35.0	23.1	26.3	31.9	36.7
PL	39.5	41.9	24.8	28.0	38.1	42.7	39.5	41.5	26.7	30.1	39.7	41.2
PT	43.5	45.4	27.0	28.3	44.3	46.9	42.6	44.5	30.9	33.5	39.6	42.3
RO	42.4	42.9	31.8	32.5	37.9	43.0	42.5	41.8	31.1	32.3	44.0	45.0
SI	39.0	43.1	27.2	29.0	45.5	51.1	40.9	42.2	28.9	31.4	40.6	44.3
SK	35.7	39.0	25.5	28.3	37.0	45.3	41.6	43.7	28.1	31.0	39.7	42.1
FI	38.0	39.1	20.6	22.8	40.2	47.1	41.1	43.0	25.5	27.8	39.1	41.6
SE	35.9	38.0	21.3	24.1	38.6	43.1	38.9	41.5	26.6	29.3	37.2	39.7
IS	36.0	38.4	15.1	24.2	36.5	39.2	42.3	45.6	25.7	31.0	42.0	44.5
NO	33.5	37.5	20.8	23.4	37.6	45.0	40.9	43.7	26.2	28.7	35.7	39.4
UK	34.5	37.2	20.6	24.0	38.3	41.6	36.6	39.4	25.4	28.2	35.0	38.1
BA	40.8	42.9	25.6	32.3	45.3	50.3	47.5	47.5	32.5	36.2	41.6	44.0
ME	49.2	46.2	30.7	33.0	42.3	58.3	44.7	46.2	36.7	35.0	38.0	39.2
MD	43.8	50.7	22.1	25.7	27.5	26.9	39.7	43.8	24.9	30.8	35.8	45.0
MK	39.8	41.7	34.1	36.6	46.1	47.6	45.7	44.6	33.8	34.4	43.8	44.6
AL	32.3	36.5	30.2	31.6	40.5	39.8	41.0	45.3	30.6	32.7	43.0	42.7
RS	44.0	46.6	32.4	33.4	44.2	45.5	44.3	44.9	33.3	36.2	39.3	43.1
TR	29.4	30.9	20.4	21.1	38.8	41.3	34.5	36.5	23.3	24.5	32.3	33.9
UA	36.1	38.9	21.4	26.7	32.1	42.7	36.6	43.5	22.9	28.6	39.4	45.8
GE	36.0	33.1	22.5	24.0	39.3	36.1	45.4	45.6	21.8	25.2	42.4	43.4
AM	32.9	42.6	18.7	23.1	39.5	38.2	40.1	42.7	19.6	25.2	40.8	43.2
FO	33.7	33.7	30.9	21.4	70.4	68.3	43.1	44.3	33.0	28.7	49.7	42.9

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
IL	32.0	35.1	19.4	22.9	36.0	39.6	35.5	37.9	22.9	25.6	35.1	39.7
TN	37.4	38.9	24.5	26.5	37.0	37.1	37.0	37.4	29.0	29.6	29.9	31.4
AR	40.1	40.5	29.4	30.3	40.0	45.8	40.4	40.2	33.2	34.1	39.3	42.0
AU	31.5	34.6	23.4	26.0	41.0	43.7	38.8	41.3	26.7	29.2	37.5	39.1
BR	35.3	37.1	23.2	25.4	40.5	43.3	40.6	42.4	27.7	30.1	37.5	39.0
CA	33.2	36.5	20.6	23.8	39.1	43.7	36.8	39.9	25.6	28.5	37.4	40.3
CN_X_HK	36.8	36.9	31.6	31.2	38.5	39.2	40.9	41.7	32.9	32.8	36.3	37.4
HK	36.7	37.1	29.7	31.0	41.0	41.3	39.0	39.9	30.5	32.1	35.1	38.1
IN	23.9	25.8	16.4	18.3	31.1	32.7	28.5	30.6	19.1	20.6	27.2	27.2
ID	31.7	34.5	20.8	25.7	38.3	35.8	38.1	42.7	25.4	29.6	32.2	34.6
JP	25.4	27.8	17.7	20.6	26.9	28.8	26.9	28.8	19.8	22.2	25.9	28.0
MX	31.1	33.8	21.6	23.7	39.3	40.1	38.8	40.0	25.4	27.8	36.5	39.3
RU	31.8	33.9	20.6	23.7	39.4	45.3	36.0	37.9	21.5	25.2	39.0	41.7
ZA	31.4	34.1	21.0	23.5	36.7	41.5	40.9	43.0	25.9	28.5	37.4	38.0
KR	24.4	25.8	16.8	19.1	33.7	37.4	27.4	29.7	19.4	21.4	28.1	31.1
US	33.2	35.7	22.6	25.2	37.8	40.1	36.2	38.9	26.5	29.1	35.6	38.4

Source: Scopus.

Notes: Data not available: XK.

Table 7.8 CAGR (%) of average proportion of women authors on publications resulting from international collaboration, by field of R&D, 2013-2022

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
WLD	1.26	1.98	1.45	1.34	1.64	1.37
EU-27	1.27	2.26	2.23	1.38	1.83	1.84
BE	1.24	3.04	2.71	1.54	2.26	2.67
BG	0.13	0.91	2.36	0.30	0.98	-0.01
CZ	0.55	1.89	4.22	1.12	1.50	1.41
DK	2.13	1.60	4.20	1.26	1.83	1.78
DE	1.30	2.72	2.66	1.59	2.26	2.48
EE	-1.11	3.92	0.41	0.40	0.77	0.75
IE	1.23	1.93	2.95	1.48	2.19	1.61
EL	2.78	2.62	3.47	1.66	2.05	2.52
ES	0.98	1.79	1.40	0.95	1.64	1.62
FR	1.12	1.92	1.93	0.95	1.59	1.16
HR	1.83	3.17	-0.33	0.21	2.17	0.23
IT	0.97	1.78	2.35	0.86	1.41	1.31
CY	2.25	1.72	6.51	1.30	2.08	1.56
LV	0.75	1.65	-0.23	1.51	1.38	0.39
LT	0.57	4.70	3.21	2.16	4.62	2.56
LU	-0.97	2.73	2.01	2.42	2.25	1.62
HU	0.13	2.28	4.10	1.35	1.85	2.76
MT	3.23	9.38	2.44	1.90	2.79	4.86
NL	2.08	3.43	1.23	1.81	2.41	2.54
AT	1.67	2.85	3.45	1.39	2.24	3.04
PL	0.77	1.95	3.33	1.16	1.99	0.65
PT	0.90	0.82	1.21	0.79	1.45	1.82
RO	0.32	0.67	2.33	0.08	0.91	1.98
SI	0.30	1.70	1.04	0.84	1.87	1.31
SK	1.87	1.97	2.51	0.56	1.62	0.26
FI	0.69	1.86	3.00	0.84	1.89	1.10
SE	1.56	2.93	2.72	1.42	2.04	1.73
IS	1.75	8.79	-0.47	1.57	2.78	0.48
NO	2.27	2.56	2.24	1.61	1.98	1.87
UK	1.59	3.11	1.74	1.51	1.99	1.65
BA	-0.37	4.04	0.23	-0.08	2.13	-0.40
ME	-1.79	1.87	2.53	2.73	-0.06	6.07
MD	5.68	3.89	-4.83	3.66	4.30	0.85
MK	1.24	0.13	0.56	-0.53	0.02	1.30
AL	-1.82	3.62	-0.64	2.97	3.65	2.78
RS	0.57	0.05	3.51	0.64	1.37	1.78
TR	1.52	1.23	0.61	0.95	1.81	1.24
UA	1.88	4.90	-0.15	2.38	4.29	1.76

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
GE	-2.23	1.88	-2.29	0.23	3.25	-0.55
AM	2.00	3.92	-1.57	1.27	5.15	0.63
FO	3.55	-	1.32	0.68	-0.58	-5.72
IL	1.66	2.74	2.60	1.43	2.18	2.19
TN	0.21	1.36	-0.59	-0.28	0.59	0.76
AR	0.66	0.30	1.96	-0.11	0.43	0.87
AU	1.73	1.78	1.29	1.32	1.69	1.08
BR	0.98	1.85	0.25	1.00	1.75	0.90
CA	2.25	2.78	2.08	1.61	2.06	1.70
CN_X_HK	0.26	-0.05	-0.16	0.54	0.14	0.39
HK	0.53	1.26	-0.53	0.94	1.30	2.13
IN	1.64	2.07	0.57	1.16	1.61	-0.41
ID	1.48	4.71	-1.25	2.40	3.06	2.06
JP	2.14	2.82	1.66	1.48	2.31	1.77
MX	1.91	1.90	-0.01	0.45	1.88	2.16
RU	1.07	2.54	3.54	0.57	2.85	1.63
ZA	0.73	2.42	2.31	1.31	1.53	0.67
KR	1.48	2.35	2.57	1.80	2.07	2.76
US	1.50	2.19	0.99	1.48	1.74	1.56

Source: Scopus.

Notes: Data not available: XK.

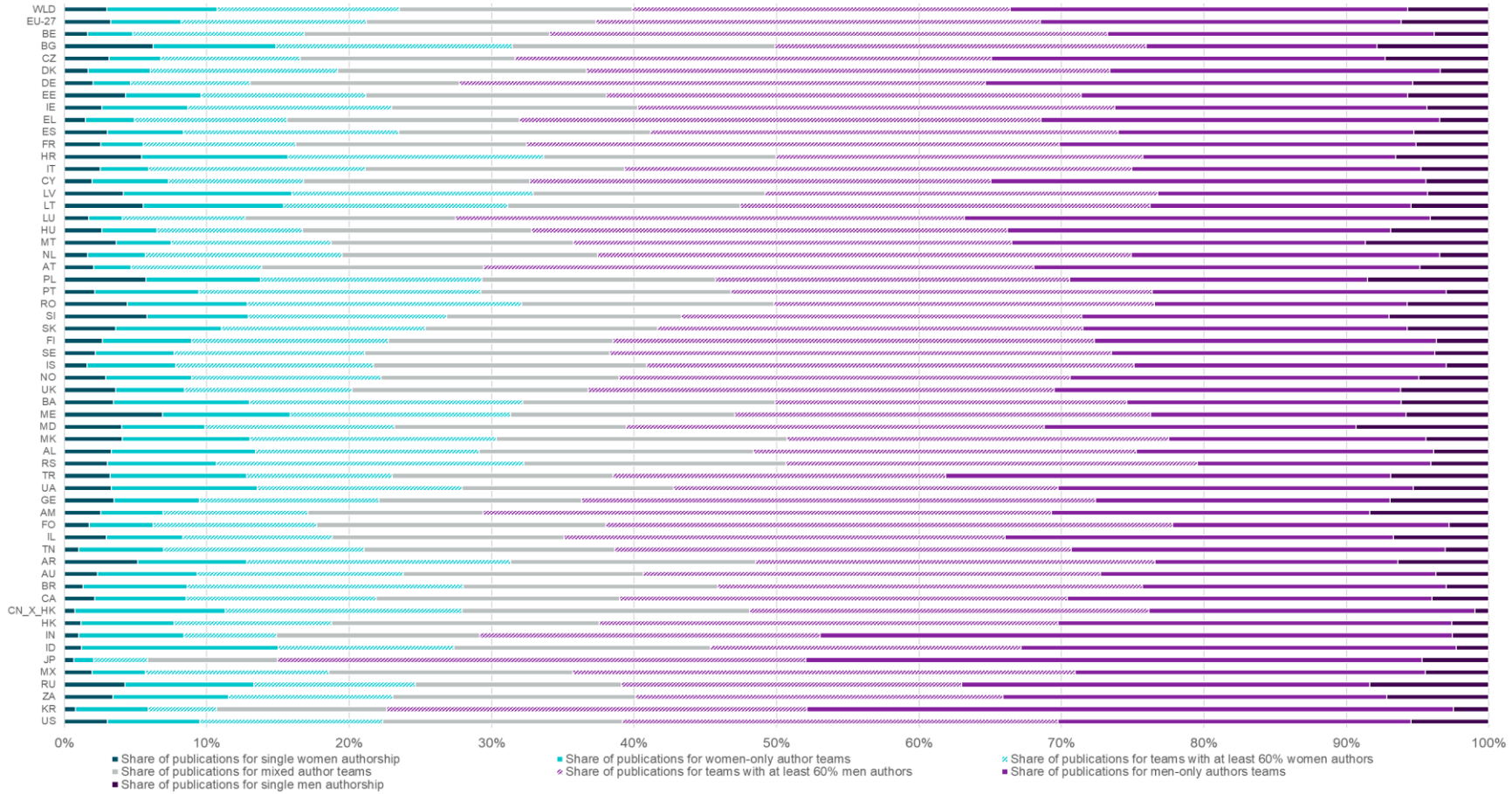
While most authorship teams include both women and men, only 16 % are gender-balanced

Figure 7.7 shows the distribution of authorship teams according to their gender composition for the period 2018-2022.

At EU level, 39 % of research teams are comprised of a single gender. This 39 % includes 3 % of teams consisting of individual women authors working alone and 6 % of teams made up of solo men authors. The remainder of this percentage consists of women-only and men-only teams. Conversely, 60 % of teams include both women and men. Within this 60 %, the most common composition is teams with a majority of men (60 % or more), which accounts for 31 % of the teams. Overall, only 16 % of all authorship teams are gender-balanced, indicating a persistent gender imbalance in authorship teams.

These trends are closely mirrored at Member State level; the proportion of gender-balanced teams ranges from approximately 15 % (CZ, DE, LU) to over 18 % (BG, IT), and majority-men teams comprise the largest proportion of all teams (25-39 % of total share). Similar trends are observed among Associated Countries and G20 countries, with slightly more variation. Among these countries, the proportion of gender-balanced teams ranges from 9 % in Japan to more than 20 % in North Macedonia, Faroe Islands and China (without counting Hong Kong). In all countries, majority-men or men-only teams are the most common team composition.

Figure 7.7 Distribution of publications by sex composition of the authors team, 2018-2022



Source: Scopus.
Notes: Data not available: XK.

7.4 Women's and men's contributions as corresponding authors

This section presents indicators on women's and men's contributions as corresponding authors ([579]). It compares the proportion of women with corresponding authorships for all fields of R&D, before considering how this has changed over time. The indicators then examine the proportion of women with corresponding authorships in publications stemming from international collaborations.

Figure 7.8 shows the proportion of women with corresponding authorships in all fields of R&D during 2018-2022. At EU level, women account for 35 % of corresponding authors. This is in line with the global average (34 %), showing that the gender gap in Europe is consistent with the rest of the world and demonstrating the widespread disparity between women and men corresponding authors. Among Member States and Associated Countries, the proportion of women corresponding authors ranges from 28 % (DE, CY, TN) to 46 % (BG, PT, ME, RS), with gender balance achieved in seven Member States and seven Associated Countries (580).

Among G20 countries, there are generally lower proportions of women corresponding authors and greater variation between countries. In Argentina, women account for more than four in 10 corresponding authors (42 %), but less than one-quarter of corresponding authors in Japan (15 %), South Korea (18 %) and India (24 %).

Table 7.8 shows small improvements in women's representation as corresponding authors over time in all R&D fields (reflected in increases of around 2 to 3 pp). For the EU average, gender balance among corresponding authors is achieved during 2013-2017 and 2018-2022 for Agricultural and Veterinary Sciences, Humanities and the Arts, and Social Sciences, and is newly achieved in 2018-2022 for Medical and Health Sciences. Women continue to be underrepresented among corresponding authors in the fields of Engineering and Technology and Natural Sciences (at 27 % and 31 %, respectively).

Among Member States, the proportion of women corresponding authors has increased in the field of Engineering and Technology in all but three countries (DK, EE, FI) and in the field of Natural Sciences for all but two countries (EE, FI). In Engineering and Technology, the proportions of women corresponding authors range from 19 % in Cyprus (an increase of more than 2 pp since 2013-2017) to 44 % in Romania, and two countries achieve gender balance (BG, RO). In Natural Sciences, the proportion of women corresponding authors ranges from 23 % to 44 % (CY and RO, respectively), and three countries achieve gender balance (BG and HR, in addition to RO).

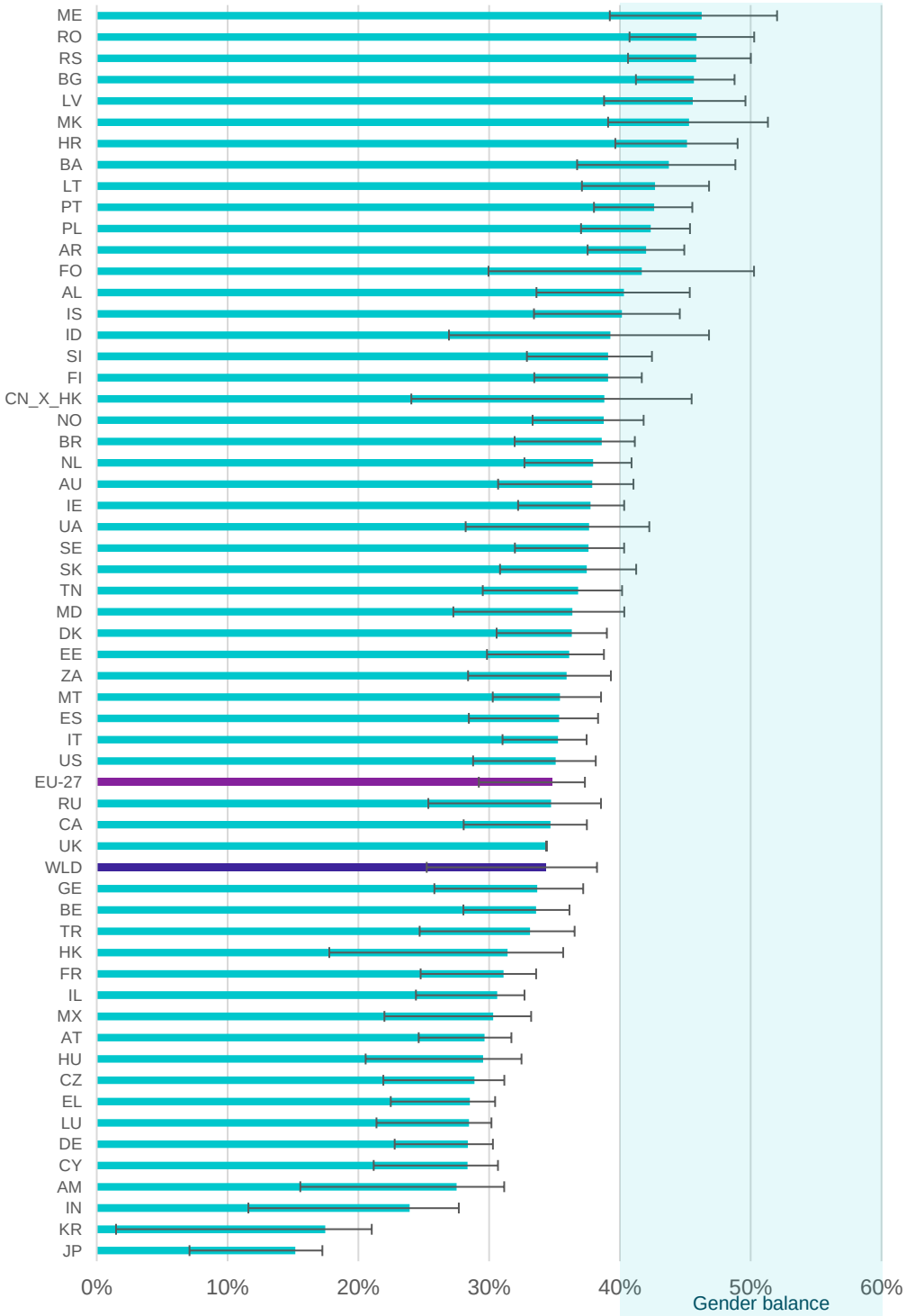
Table 7.10 shows the CAGR of the proportion of women with corresponding authorships by field of R&D over the period 2013-2022. On average, the proportion of women corresponding authors has grown slightly over time. At EU level, the fields with the largest growth are Engineering and Technology and Humanities and the Arts (each with a CAGR of 1.6 %).

([579]) Elsevier, n.d. https://scientific-publishing.webshop.elsevier.com/publication-recognition/what-corresponding-author/).
([580]) BG, HR, LV, LT, PL, PT, RO, IS, BA, ME, MK, AL, RS, FO.

Among Member States, the largest growth is observed in Engineering and Technology and Natural Sciences in Germany (2.7 % and 2.3 %, respectively), Ireland (2.9 % and 2.2 %, respectively), the Netherlands (3.2 % and 1.7 %, respectively) and Austria (2.5 % and 2.2 %, respectively). Across fields, the largest increases are in Bulgaria (5.8 % for Humanities and the Arts) and Malta (7.1 % for Social Sciences), while the largest decreases are in Luxembourg (-3.2 % for Agricultural and Veterinary Sciences) and Bulgaria (-2.0 % for Medical and Health Sciences).

Among Associated Countries, more variation is observed. For example, in the field of Humanities and the Arts, the CAGR ranges from -6.9 % (AM) to 9.6 % (IS).

Figure 7.8 Proportion (%) of women with corresponding authorships, all fields of R&D, 2018-2022



Source: Scopus.

Notes: Data not available: XK.

Table 7.9 Proportion (%) of women with corresponding authorships, by field of R&D, 2013-2017 and 2018-2022

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
WLD	**35.6**	**37.7**	**25.5**	**27.7**	**40.4**	**43.4**	**36.6**	**39.8**	**27.9**	**30.7**	**41.6**	**43.3**
EU-27	**40.9**	**43.0**	**25.1**	**27.2**	**40.3**	**43.5**	**37.6**	**40.5**	**28.8**	**31.0**	**40.6**	**43.3**
BE	39.0	38.9	24.2	25.0	37.1	41.1	35.9	38.2	27.7	29.6	40.2	42.4
BG	47.7	48.4	42.1	42.2	50.2	57.9	54.7	47.3	43.1	43.2	48.9	50.8
CZ	33.5	34.1	22.2	23.4	35.9	38.0	34.7	35.4	25.2	26.0	36.8	36.8
DK	41.1	42.7	24.7	23.8	37.8	42.8	42.7	43.7	29.7	30.5	38.7	41.8
DE	35.1	38.3	18.2	21.0	34.4	38.3	29.0	32.8	22.6	25.4	34.3	38.2
EE	43.1	39.0	25.6	24.2	52.0	50.3	46.6	43.3	33.2	30.9	51.4	46.9
IE	37.0	40.2	22.1	25.1	41.4	45.7	41.3	43.6	27.7	30.7	43.3	46.9
EL	32.1	35.2	20.4	21.9	43.7	47.2	30.0	32.6	24.3	26.0	31.4	35.9
ES	42.1	41.9	28.2	28.4	40.2	42.2	37.7	39.7	30.7	31.7	39.9	42.4
FR	38.1	39.5	23.7	24.5	40.0	42.2	35.1	36.1	27.4	28.6	38.0	39.1
HR	50.0	54.8	34.1	35.3	43.8	45.9	50.2	50.0	39.6	41.9	53.5	54.1
IT	41.3	43.9	28.7	30.8	38.7	43.0	34.5	37.9	31.8	34.6	39.1	42.5
CY	26.5	28.0	16.7	19.2	47.2	49.7	35.1	34.3	22.2	23.0	35.2	34.4
LV	49.5	54.0	36.5	39.2	59.2	69.2	42.7	51.0	37.1	39.8	58.6	63.1
LT	48.9	52.8	30.8	34.1	42.7	54.0	47.9	49.9	33.7	36.8	49.3	53.6
LU	37.0	37.0	19.6	19.6	40.0	46.6	32.6	35.4	23.3	25.7	31.6	36.7
HU	31.7	35.4	20.5	22.9	36.7	39.9	32.1	33.8	24.1	26.0	35.6	39.5
MT	29.5	38.0	20.3	26.3	29.6	31.8	40.4	44.8	27.2	28.5	35.7	41.9

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
NL	37.2	39.4	22.4	25.3	40.8	44.0	42.5	44.4	28.8	31.2	43.8	46.2
AT	37.1	40.5	20.1	22.4	36.1	41.1	29.5	32.9	23.7	26.9	35.7	39.7
PL	52.7	54.9	32.1	35.4	48.8	48.5	50.9	52.2	37.3	39.5	47.8	48.8
PT	53.3	51.5	34.0	34.0	49.0	49.6	48.7	50.5	38.7	39.5	48.2	48.0
RO	52.4	51.6	42.7	44.3	49.9	51.5	50.1	51.6	42.3	43.7	52.3	53.5
SI	46.7	49.1	29.9	30.9	48.7	52.7	43.2	42.6	32.8	34.6	47.8	49.8
SK	39.9	44.6	30.5	31.6	42.6	43.3	46.3	46.7	32.5	34.6	44.2	47.3
FI	45.9	45.2	26.6	25.9	49.6	53.6	48.4	48.8	32.1	31.9	49.4	50.7
SE	41.3	42.3	24.7	26.8	42.9	46.3	43.7	45.0	29.6	31.6	43.6	46.0
IS	40.2	42.9	20.8	28.8	37.1	47.7	44.6	47.9	32.2	35.7	47.1	48.7
NO	40.3	42.2	24.6	25.4	41.1	46.5	46.8	48.0	30.7	31.7	42.0	45.1
UK	37.1	40.4	20.8	23.9	40.0	43.4	37.0	39.6	25.9	28.5	40.6	43.0
BA	48.2	48.7	31.8	39.5	40.9	41.2	47.1	49.0	34.7	39.4	41.5	43.7
ME	50.6	53.6	44.0	39.6	68.6	60.9	43.5	47.4	43.5	43.6	55.6	46.6
MD	62.5	57.4	28.9	29.8	25.0	29.7	40.6	42.1	31.6	35.2	44.9	44.6
MK	49.0	50.4	42.6	43.7	52.2	55.1	56.2	48.8	41.5	40.1	54.6	51.9
AL	32.8	42.3	26.1	35.5	56.7	49.2	34.7	46.8	35.3	35.8	53.9	46.9
RS	54.5	55.2	44.2	41.7	46.7	47.4	51.2	49.6	45.2	44.6	47.3	48.6
TR	30.3	33.5	23.6	24.0	38.1	41.7	33.6	40.0	27.1	28.4	36.3	40.2
UA	42.1	46.3	23.5	29.4	44.0	55.8	40.4	52.5	25.8	33.0	53.4	51.8
AM	29.1	33.1	19.3	22.2	46.0	37.1	34.9	36.1	17.7	25.0	30.8	42.9
FO	40.4	39.4	46.4	21.6	42.9	57.1	50.9	56.3	41.6	35.2	44.4	46.8

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
IL	28.1	29.9	18.4	21.0	39.5	41.2	32.4	35.5	22.4	24.4	42.8	45.9
TN	39.1	43.9	32.5	33.1	45.1	49.8	43.1	43.4	35.0	35.3	34.3	38.6
AR	51.3	50.2	38.0	36.6	48.6	50.0	43.5	42.2	43.1	41.6	48.6	49.5
AU	34.3	38.2	23.5	25.6	46.2	49.3	43.1	44.8	28.3	30.3	46.7	47.4
BR	41.1	41.0	29.2	28.7	43.6	42.9	46.2	46.8	33.6	33.7	43.7	43.1
CA	34.5	36.9	19.7	22.6	43.0	45.6	37.4	40.2	25.4	28.1	43.9	46.8
CN_X_HK	38.6	39.3	37.7	36.7	42.1	41.5	41.8	43.4	37.8	37.9	39.5	40.3
HK	29.3	30.9	28.3	28.9	39.4	37.3	32.3	34.3	28.5	29.5	35.6	36.8
IN	22.9	24.6	17.5	19.7	39.8	40.0	28.7	29.9	19.9	21.4	30.0	30.0
ID	38.1	39.8	29.1	30.2	37.4	38.5	44.2	48.4	32.9	37.1	36.9	37.6
JP	17.2	19.1	11.3	13.4	27.7	28.4	14.6	15.5	12.9	14.7	22.6	24.7
MX	29.5	31.9	22.4	24.3	39.9	38.2	34.8	36.5	26.2	27.7	36.3	37.9
RU	40.7	41.8	24.6	28.6	48.2	48.8	42.2	47.7	26.4	31.2	47.7	47.4
ZA	36.3	38.1	22.3	23.8	35.7	36.7	44.5	44.7	29.1	30.5	42.6	41.5
KR	17.4	20.5	11.1	12.9	31.8	38.3	18.2	21.7	13.5	15.5	24.2	27.3
US	34.2	37.0	21.4	24.1	41.6	44.8	36.5	39.7	26.3	28.9	44.0	47.3

Source: Scopus.

Notes: Data not available: XK.

Table 7.10 CAGR (%) of proportion women with corresponding authorships, by field of R&D, 2013-2022

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
WLD	**0.95**	**1.54**	**1.42**	**1.61**	**1.84**	**0.98**
EU-27	**0.80**	**1.58**	**1.57**	**1.49**	**1.46**	**1.43**
BE	0.02	1.25	2.74	1.36	1.51	2.02
BG	-0.85	0.02	5.79	-2.03	0.09	0.34
CZ	0.26	0.62	0.94	0.47	0.52	0.25
DK	0.61	0.13	3.28	0.43	0.74	2.06
DE	1.39	2.66	1.90	2.46	2.32	2.20
EE	-1.32	-0.03	-1.42	-1.42	-1.11	-0.45
IE	0.84	2.89	2.24	0.83	2.22	1.28
EL	2.15	1.31	1.41	1.51	1.12	1.78
ES	0.03	0.33	1.57	1.17	0.77	1.22
FR	0.56	1.01	1.19	0.83	1.06	0.30
HR	0.89	-0.17	1.24	0.23	0.63	0.93
IT	0.72	1.55	2.30	1.99	1.40	1.91
CY	0.97	3.17	0.60	0.33	0.68	0.19
LV	1.78	1.76	-0.39	2.55	1.04	1.68
LT	-0.45	1.33	2.93	0.47	1.49	0.99
LU	-3.23	1.31	1.08	3.88	1.19	2.35
HU	2.18	1.94	1.71	1.68	1.96	2.88
MT	-1.48	2.59	-0.42	2.31	-1.19	7.09
NL	0.72	3.20	1.92	0.92	1.68	1.61
AT	1.39	2.49	3.82	1.96	2.24	2.90
PL	0.59	1.65	-0.77	0.22	0.92	0.20
PT	-0.49	0.42	0.68	0.88	0.85	0.92
RO	0.50	0.38	0.46	-0.08	0.57	1.08
SI	-0.03	0.93	0.26	0.40	1.65	1.47
SK	1.10	0.77	0.91	-0.50	0.94	-0.22
FI	-1.02	0.15	1.14	0.21	0.48	0.57
SE	1.24	1.03	2.16	0.75	1.09	1.19
IS	1.86	5.30	9.60	2.24	1.61	3.43
NO	0.53	1.41	2.31	0.92	0.78	1.60
UK	1.38	2.50	1.30	1.28	1.76	0.98
BA	-2.13	3.77	-2.01	-0.24	1.68	-0.07
ME	-1.60	-2.34	0.62	9.02	0.60	0.40
MD	0.57	3.33	6.54	0.45	2.07	-0.50
MK	1.66	-2.33	-3.32	-1.79	-1.92	0.32
AL	-0.32	3.75	-5.48	3.00	-0.27	-2.08

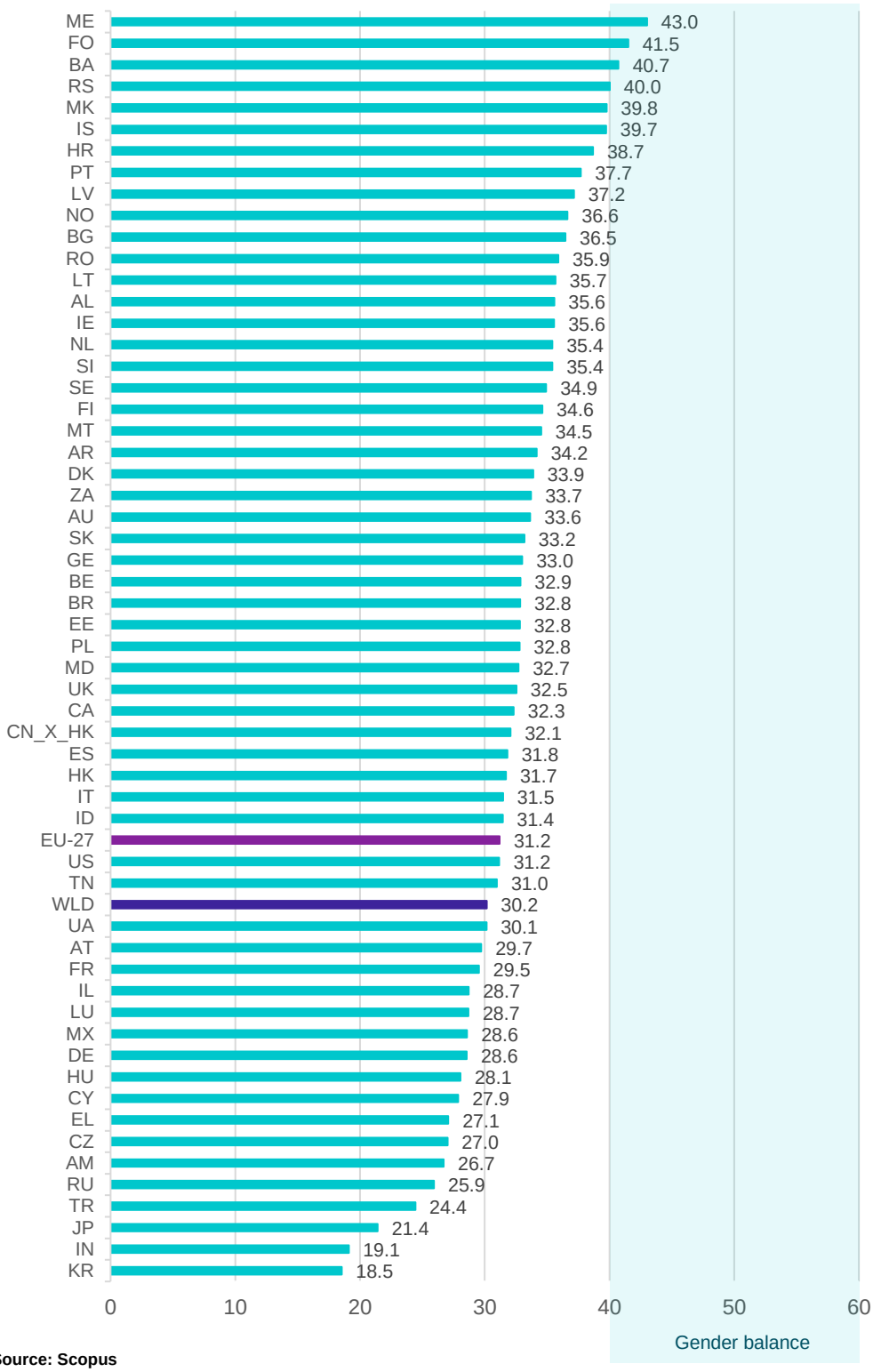
Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
RS	0.03	-0.49	1.01	-0.34	-0.23	1.13
TR	1.31	0.87	2.14	3.37	1.05	2.88
UA	-0.60	4.74	8.02	2.85	4.14	-0.10
GE	-2.31	1.01	2.66	0.42	5.20	-1.27
AM	-1.56	0.04	-6.85	-0.91	4.10	0.48
FO	7.59	-	4.61	2.18	-0.91	6.17
IL	1.06	2.53	1.05	2.40	2.05	1.53
TN	1.38	1.12	2.54	-0.87	1.20	2.73
AR	-0.27	-0.81	-0.53	-0.44	-0.37	0.08
AU	1.56	1.22	1.50	0.84	1.17	0.62
BR	-0.40	-0.46	-1.04	0.23	0.21	-0.36
CA	1.05	2.54	1.71	1.48	1.91	1.35
CN_X_HK	0.39	-0.55	-0.34	0.50	0.05	0.50
HK	0.14	1.00	-0.39	1.56	0.92	0.15
IN	0.09	2.38	1.57	0.98	1.18	0.20
ID	1.29	2.55	-0.19	2.62	3.73	1.94
JP	3.23	3.40	0.86	1.18	2.70	1.56
MX	1.39	1.57	0.40	0.60	1.11	0.49
RU	1.64	3.84	3.15	2.47	3.51	1.59
ZA	0.75	0.92	0.43	0.70	0.54	-0.04
KR	2.27	2.69	4.34	3.18	2.82	2.79
US	1.53	2.53	1.46	1.73	1.96	1.70

Source: Scopus.

Notes: Data not available: XK.

Figure 7.9 presents the proportion of women with corresponding authorships in international collaborations for 2018-2022. At EU level, women comprise 31 % of corresponding authorships in such publications, in line with the global average (30 %). Women are underrepresented among corresponding authorships in international collaborations in all Member States to varying degrees (ranging from 27 % in Czechia and Greece to 39 % in Croatia). Women are slightly better represented among Associated Countries, with four achieving gender balance (BA, ME, RS, FO), and are worse represented among G20 countries (ranging from 19 % in South Korea and India to 34 % in Argentina and South Africa).

Figure 7.9 Proportion (%) of women with corresponding authorships in all fields of R&D, international collaboration, 2018-2022



Source: Scopus

Notes: Data not available: XK.

7.5 The gender gap in inventorship and innovation

In Section 7.5, the report outlines the gender gaps within inventor teams, both overall and broken down by IPC class. These findings shed light on ongoing inequalities, with certain sectors showing more significant imbalances. Gender-balanced teams allow for different viewpoints and ideas to be considered, leading to more effective problem-solving. Additionally, promoting gender diversity in inventor teams can help break down barriers and biases, creating a fairer and more inclusive environment for everyone involved.

Women account for only 9 % of inventors, showing continued underrepresentation

Figure 7.10 shows the proportion of inventorships held by women, calculated based on the number of patent applications and the corresponding number of inventors (used as a proxy for inventorship). The data show that during the period 2018-2021, women were significantly underrepresented compared to men.

At EU level, women account for 9 % of inventors, compared to a global rate of 12 % (see Figure 7.10), showing that the EU is performing slightly worse than the world as a whole. This is broadly in line with She Figures 2021, where women also comprised around one in 10 inventors.

Among Member States, Austria has the lowest proportion of women inventors (6 %). Conversely, five countries are substantially over the EU-27 average, having at least 15 % women inventors, although this still represents significant underrepresentation ([581]). In Associated Countries, there is a similar pattern. Georgia (29 %) and Faroe Islands (24 %) have a higher number of patent applications by women compared to the EU average, whereas Armenia (5 %), Norway (8 %) and Ukraine (8 %) are below the average. Although still not gender balanced, some G20 countries have notably higher proportions of women engaged in inventorship compared to Member States. China without Hong Kong continues to have the highest rate of women inventorships (30 %), followed by Mexico (20 %).

Some Member States include a focus on women's entrepreneurship in their national laws and policies (see Box 49).

([581]) EL, ES, HR, LT, PT.

BOX 49: Measures to support women's entrepreneurship

In **Ireland**, the National Strategy for Women and Girls 2017-2020 emphasises women's labour market participation and entrepreneurship, with a specific Action Plan for Jobs, a series of funding programmes, such as Pathways to Work, and networking opportunities at local level ([582]).

In **Italy**, the National Strategy for Gender Equality 2021-2026 provides support for women entrepreneurs who are mothers by introducing financial protection during and immediately after pregnancy or adoption for self-employed women. Among the initiatives are incentives for the start-up of female enterprises by enhancing the Women's Entrepreneurship Fund to increase the resources directly granted to firms ([583]).

In **Spain**, the 2022 amendment to the Law on Science, Technology and Innovation includes the promotion of women entrepreneurs as an explicit aim under Article 4 (measures for effective equality) ([584]). In 2023, the Neotec Programme, which aims to foster the creation of technology-based companies through grants, committed a minimum of EUR 5 million (out of a total EUR 40 million) to projects led by women, in recognition that women have greater difficulty in accessing funds for transferring knowledge and developing businesses ([585]).

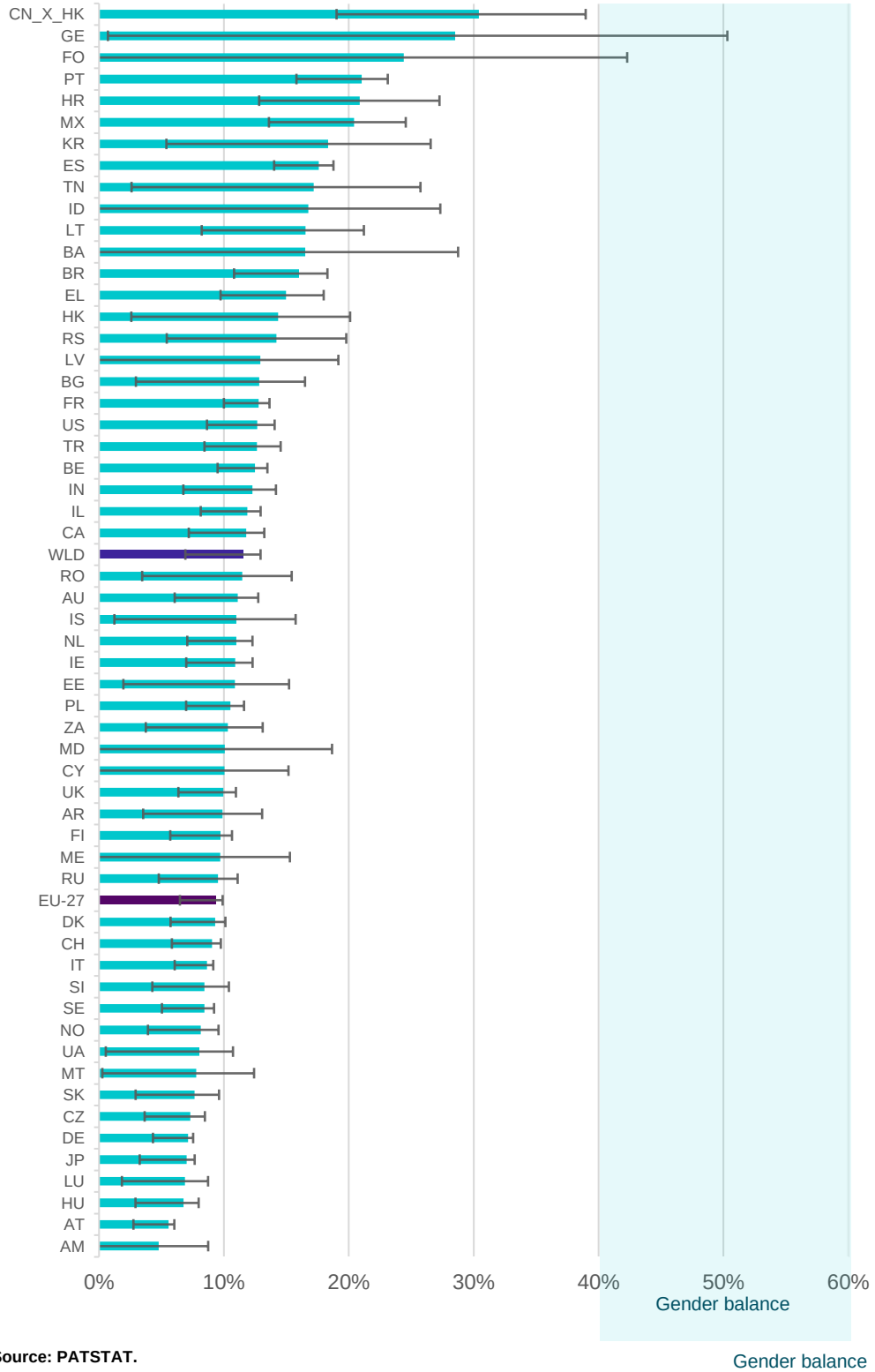
[582] National Strategy for Women and Girls 2017-2020, https://assets.gov.ie/6427/88cc57e206a34e94aeff2310f2b100d5.pdf

([583]) Women's Entrepreneurship Fund, n.d., https://www.pariopportunita.gov.it/media/2022/national-strategy-for-gender-equality-2021-26.pdf

([584]) Law on Science, Technology and Innovation, n.d., https://boe.es/boe/dias/2022/09/06/pdfs/BOE-A-2022-14581.pdf

([585]) Neotec Programme, n.d., https://www.cdti.es/en/ayudas/2023-neotec-grants

Figure 7.10 Proportion (%) of women among inventors, 2018-2021



Source: PATSTAT.

Gender balance

Notes: data not available: XK. Low absolute values (less than or equal to 30): BA, ME, MD, MK, AL, GE, FO, ID

Women inventors are significantly underrepresented in nearly every country and IPC

Table 7.11 shows the proportion of women inventorships per IPC class for 2008-2011 and 2018-2021. The IPC class refers to the classification system used for patents, according to the different areas of technology to which they pertain ([586]). The data show that, although there is an increase in the proportion of women applicants in all IPC classes between 2008-2011 and 2018-2021, women are still (significantly) underrepresented compared to men. At EU level, the proportion of patent applications submitted by women in 2018-2021 is highest in section C (Chemistry and metallurgy: 21 %), followed by section A (Human necessities: 16 %). In contrast, both sections E (Fixed construction) and F (Mechanical engineering, lighting, heating, weapons & blasting) have only 3 % of patent applications submitted by women.

Table 7.12 shows the four-year CAGR of the proportion of women inventors, by IPC section, from 2018-2022. Throughout the four-year period, the data show an increase in the proportion of patent applications submitted by women. However, at EU level, the greatest growth is in section E (Fixed constructions, e.g. construction of roads, railways, or bridges), at 4 %, with 3 % growth in sections D (Textiles and Paper) and F (Mechanical engineering, lighting, heating, weapons and blasting). All other sections have growth of only 1-2 %.

In some countries across Member States and Associated Countries, large changes are observed. For example, a CAGR of 25 % is seen in Cyprus for Section A. These larger fluctuations could be due to low numbers of inventorships in a given IPC section. Additionally, several Member States and Associated Countries have negative CAGRs ([587]), highlighting a greater disparity in the representation of women inventors in 2021 compared to 2018.

([586]) Section A: Human Necessities; Section B: Performing Operations and Transporting; Section C: Chemistry and Metallurgy; Section D: Textiles and Paper; Section E: Fixed Constructions; Section F: Mechanical Engineering, Lighting, Heating, Weapons and Blasting; Section G: Physics; Section H: Electricity, https://www.wipo.int/classifications/ipc/en/

([587]) Section A: CZ, EE, LV, PL, RO, SI, NO, BA, TR, UA, AM, FO; Section B: EE, HR, LV, LT, LU, HU, PL, SI, NO, RS, UA; Section C; CZ, IE, LV, IS, BA, TR, UA, TN; Section D: BE, CZ, DE, EE, IE, FR, LU, NL, PL, SK, IL; Section E: BG, CZ, EE, IE, LU, AT, PL, RO, SK, SE, NO, TR; Section F: CZ, FR, LV, LT, LU, HU, NL, AT, PL, RO, SI, SK, FI, IS, NO, RS; Section G: EE, HR, LV, LT, SI, NO, RS, TR, GE, IL: Section H; BE, LT, NL, AT, PT, SK, FI, NO, TR.

Table 7.11 Proportion (%) of women inventorships, by IPC class, 2008-2011 and 2018-2021

Country	A		B		C		D		E		F		G		H	
	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021
WLD	14.4	16.4	5.1	7.2	15.5	19.5	8.5	12.8	3.3	4.6	3.4	5.2	7.4	10.2	6.8	11.2
EU-27	14.9	15.9	4.4	6.1	17.1	21.3	7.7	11.2	3.0	3.9	3.0	4.2	6.4	7.9	5.0	6.4
BE	17.1	19.0	7.8	9.5	19.2	22.4	7.9	8.2	5.3	5.6	2.9	5.1	8.8	10.4	6.0	6.9
BG	32.9	11.3	2.7	15.2	18.7	34.6	0.0	27.8	0.0	3.1	9.4	14.3	15.8	11.2	9.4	1.5
CZ	14.7	16.1	2.0	4.4	11.9	15.7	6.7	8.1	1.6	2.5	0.3	2.0	3.2	7.0	1.2	2.3
DK	17.4	14.6	3.2	5.1	19.8	22.8	14.8	16.6	4.5	4.9	2.1	2.6	6.0	6.9	3.5	5.7
DE	12.3	12.7	3.2	4.7	12.7	17.5	5.6	8.3	2.4	3.4	2.6	3.7	4.4	5.7	3.1	4.7
EE	25.6	16.5	4.2	7.6	35.6	33.9	0.0	0.0	0.0	14.1	0.0	18.1	7.6	5.9	4.1	4.8
IE	11.5	13.3	6.4	8.1	18.9	23.3	6.5	11.1	1.4	2.0	1.1	4.2	12.0	9.8	5.6	7.3
ES	17.9	25.2	5.9	10.1	20.9	25.8	0.0	4.5	5.2	13.5	0.0	9.7	9.8	8.9	6.3	5.2
EL	22.7	25.8	10.2	12.0	30.0	35.5	8.8	16.7	5.6	5.6	7.7	10.4	12.9	14.2	12.2	12.8
FR	20.8	23.3	6.5	8.7	23.2	26.8	13.5	12.9	4.8	5.0	4.2	5.6	9.4	11.3	7.9	8.3
HR	29.9	37.9	15.3	8.5	40.2	53.5	0.0	0.0	0.0	0.0	0.0	9.7	31.0	4.8	6.2	0.0
IT	13.0	13.9	4.0	5.3	22.1	23.9	6.0	7.8	2.2	4.0	2.9	4.0	8.3	7.8	6.3	6.2
CY	8.0	16.7	8.3	5.9	59.6	22.1	0.0	50.0	0.0	0.0	0.0	5.6	0.0	8.3	0.0	3.6
LV	21.2	19.6	6.3	1.5	32.1	26.3	0.0	0.0	0.0	0.0	0.0	3.8	10.7	12.0	14.8	1.5
LT	21.4	25.4	3.1	4.6	33.5	29.3	0.0	50.0	0.0	8.3	0.0	7.3	3.2	7.6	5.8	4.2
LU	4.8	6.6	5.9	7.0	8.2	16.1	0.0	6.1	3.2	5.7	0.0	0.3	2.3	9.1	0.0	3.8
HU	17.4	16.3	2.3	2.5	23.5	20.5	0.0	21.7	7.2	0.4	4.8	2.2	2.5	5.9	2.4	2.2
MT	0.0	19.2	0.0	3.8	15.1	9.6	0.0	0.0	0.0	0.0	0.0	31.8	0.0	8.4	0.0	0.0
NL	12.8	14.6	6.1	7.5	12.9	17.9	9.9	10.5	3.3	7.1	5.2	6.9	6.8	10.0	5.0	6.8
AT	10.2	10.0	2.4	3.6	15.3	15.8	10.7	16.8	1.1	1.7	1.1	2.5	5.6	5.2	2.7	3.1
PL	19.5	22.0	6.3	6.6	28.4	27.4	23.4	7.4	2.8	3.5	0.6	2.7	5.0	8.1	3.2	4.8

Country	A		B		C		D		E		F		G		H	
	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021
PT	17.7	28.0	10.5	15.6	26.2	40.9	0.0	47.3	4.9	6.8	0.8	7.4	9.5	18.9	13.2	11.7
RO	27.2	22.3	12.9	12.4	47.6	36.2	100.0	0.0	18.2	0.6	0.0	3.9	2.3	10.7	10.8	11.8
SI	23.4	11.1	4.0	6.8	27.5	28.1	0.0	15.7	0.0	4.8	1.8	1.8	4.0	5.0	3.0	4.3
SK	23.8	12.7	0.6	5.5	24.3	17.7	6.6	27.9	0.0	3.1	0.0	1.1	9.4	8.8	1.0	6.6
FI	14.5	15.7	5.8	6.0	22.5	26.5	12.1	16.5	2.0	2.8	1.9	2.6	7.7	7.6	5.7	7.5
SE	16.7	14.7	5.5	6.0	20.6	19.1	12.3	16.6	2.9	2.4	3.2	3.1	5.9	6.9	4.3	8.0
IS	4.7	14.9	0.0	6.7	7.4	13.1	0.0	7.7	100.0	4.5	0.0	1.7	3.5	6.8	11.7	7.0
NO	13.0	15.0	4.4	4.0	18.4	21.9	5.0	19.6	0.8	1.2	1.3	2.8	4.5	4.8	4.5	3.4
UK	11.6	14.7	2.4	5.5	12.8	18.4	2.1	8.1	2.0	3.6	2.1	3.0	3.9	6.0	2.8	4.8
BA	13.7	15.6	4.5	6.3	15.7	20.5	8.0	17.6	2.6	3.3	2.2	3.6	5.9	7.8	5.3	7.2
ME	0.0	25.0	0.0	19.2	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	14.3	0.0	0.0
MD	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0
MK	24.6	0.0	0.0	0.0	16.2	0.0	0.0	0.0	0.0	31.7	0.0	4.8	0.0	0.0	0.0	0.0
RS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
TR	0.0	24.9	50.0	9.7	33.3	23.8	0.0	0.0	0.0	21.2	0.0	0.0	14.4	3.0	29.4	14.9
UA	13.2	22.2	8.6	10.3	27.1	30.2	11.3	14.3	4.8	5.1	7.5	8.5	7.8	7.1	6.9	6.6
GE	13.6	13.4	9.4	4.6	6.3	6.2	0.0	0.0	0.0	18.2	3.1	1.2	2.6	10.4	0.0	7.4
AM	41.3	40.0	0.0	0.0	39.3	27.8	0.0	0.0	0.0	0.0	0.0	0.0	42.9	0.0	100.0	57.1
FO	0.0	4.4	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0
IL	9.1	34.1	0.0	17.9	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0
TN	18.3	15.3	7.8	9.6	31.6	29.2	23.7	17.9	4.5	4.0	4.2	3.2	10.2	9.9	5.4	6.7
AR	10.5	20.0	0.0	15.8	34.2	35.1	0.0	0.0	100.0	0.0	0.0	33.3	13.2	18.3	8.1	16.0
AU	13.5	13.9	13.4	13.3	26.8	22.2	0.0	0.0	0.0	12.2	0.0	0.0	3.8	5.6	9.2	4.5
BR	13.0	14.9	8.5	7.3	17.9	19.5	3.0	11.4	2.0	2.6	2.6	3.9	8.8	10.5	6.1	6.7

Country	A		B		C		D		E		F		G		H	
	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021	2008-2011	2018-2021
CA	22.7	30.2	9.0	9.9	23.2	26.6	8.3	25.9	8.3	4.7	2.2	3.5	8.0	9.9	6.9	4.9
CN_X_HK	16.0	15.6	6.5	7.4	19.1	20.9	8.5	17.9	4.3	4.4	4.1	5.4	8.5	9.3	6.9	12.6
HK	29.4	32.4	23.4	23.3	31.8	33.2	26.2	26.0	15.2	22.6	21.5	23.2	23.6	28.0	28.9	32.6
IN	13.1	13.9	14.9	15.7	35.1	15.0	0.0	16.6	30.0	7.1	13.8	19.7	9.8	13.9	11.4	10.7
ID	16.7	15.2	6.6	7.7	13.9	15.3	10.1	18.6	12.0	5.9	6.3	7.4	11.0	12.5	12.3	11.3
JP	18.5	20.6	7.7	24.7	6.5	24.6	22.2	0.0	0.0	0.0	0.0	0.0	44.6	24.2	0.0	0.0
MX	9.4	12.1	4.0	6.0	7.4	10.3	5.6	8.1	2.5	4.2	2.8	4.1	5.3	6.7	4.5	5.5
RU	29.1	28.7	8.3	11.3	13.5	29.3	6.1	0.0	0.0	0.0	8.0	6.0	8.8	20.5	3.5	11.1
ZA	18.7	20.5	11.9	7.5	25.8	17.3	8.1	22.6	4.2	1.4	3.9	6.5	8.7	6.1	7.3	3.0
KR	12.8	20.1	9.4	6.6	18.2	24.3	0.0	100.0	1.1	2.3	1.5	1.2	4.4	6.4	8.7	7.2
US	17.7	18.7	9.9	13.4	18.1	22.5	12.6	16.7	10.7	12.0	10.4	13.1	17.1	18.1	17.1	19.3

Source: Computed using European patent applications (kind codes A1 and A2) in PATSTAT.

Notes: IPC sections: A = Human necessities; B = Performing operations & transporting; C = Chemistry & metallurgy; D = Textiles & paper; E =Fixed constructions; F = Mechanical engineering, lighting, heating, weapons & blasting; G = Physics; H = Electricity. Data not available: XK. Low absolute values (less than or equal to 30): GE, ID, RS, MT, BA, TN, FO (2018-2021, category A); FO, LV, TN, ME, BA, RS, MT, CY, ID (2018-2021, category B); CY, RO. BG, LV, RS, ID, IS, MT, TN, GE (2018-2021, category C); SI, IS, ZA, BH, PT, CY, LT, RU, LU, IE, PL, NO, EL, HK, SK, HU (2018-2021, category D); SK, BG EE, UA, BA, MD, RS, AR, LT, EL, HK, RO, IS (2018-2021, category E); BG, HR, MT, CY, TN, EE, MD, LT, IS, EL, UA, LV (2018-2021, category F); IS, LV, BA, AM, ME, ID, CY, RS, TN (2018-2021, category G); LV, RS, TN, CY, GE, IS (2018-2021, category H); MD, BG, CY, ID, SK, GE, RO, TN, EE, LT, FO (2008-2011, category A); AR, LT, LV, RO, UA, RS, CY, ID, HR, BG, EE (2008-2011, category B); RO, ID, RS, BG, EE, HK, LT, CY, GE, TN, MT, FO, MD (2008-2011, category C); MX, IE, IL, ID, RO, PL, SK, RU, IN, NO (2008-2011, category D); TN, HU, HK, RO, IS, LU, IN, RU, BR (2008-2011, category E); HK, UA, BG (2008-2011, category F); TN, IS, FO, SK, GE, UA, RS, ID, HR, BG, LT, LV, AR (2008-2011, category G); AR, BG, RS, HR, TN, MK, LT, GE, IS, LV (2008-2011, category H)

Table 7.12 CAGR (%) of four-year proportion of women inventorships, by IPC section, 2018-2021

Country	A	B	C	D	E	F	G	H
WLD	3.1	3.7	3.3	3.2	2.0	5.2	3.4	5.3
EU-27	1.9	2.1	2.5	2.7	3.7	2.6	2.5	1.2
BE	10.8	4.0	1.7	-5.0	7.5	5.3	8.7	-1.0
BG	20.6	6.7	12.4	0.0	-50.1	39.4	42.0	11.9
CZ	-0.9	4.9	-3.9	-10.2	-16.7	-19.4	15.6	16.8
DK	2.8	0.5	2.7	15.3	19.9	9.9	8.1	9.3
DE	0.7	3.7	3.1	-2.0	3.6	3.9	3.9	4.2
EE	-2.5	-10.7	1.4	-100.0	-1.1	21.3	-14.7	25.3
IE	1.6	4.4	-3.4	-29.1	-10.0	7.8	4.1	10.5
ES	2.9	13.4	4.4	0.0	0.0	0.0	49.5	-3.9
EL	0.7	3.1	2.8	14.6	16.7	6.8	3.3	2.4
FR	1.1	0.9	1.5	-4.6	-0.4	-0.6	0.9	0.4
HR	4.0	-20.5	6.2	0.0	0.0	80.7	-26.7	0.0
IT	3.3	0.5	0.8	1.8	6.4	1.0	2.3	3.7
CY	24.5	44.2	8.2	0.0	0.0	0.0	8.1	0.0
LV	-22.7	-56.8	-6.3	0.0	0.0	-35.4	-12.1	0.0
LT	7.1	-13.5	1.4	0.0	0.0	-11.5	-7.4	-14.1

Country	A	B	C	D	E	F	G	H
LU	-1.2	-2.3	2.3	-33.0	-8.7	-40.5	5.9	36.8
HU	0.1	-13.7	3.2	0.0	0.0	-19.5	4.9	-0.1
MT	17.6	0.7	0.0	0.0	0.0	0.0	16.2	0.0
NL	0.0	0.4	3.6	-4.3	15.9	-2.5	1.6	-4.2
AT	6.6	6.5	3.4	28.1	-6.2	-3.9	1.4	-2.9
PL	-1.7	-9.7	-0.2	-31.0	-22.3	-1.0	13.2	-0.4
PT	1.4	4.9	0.3	1.6	21.9	3.2	10.4	-5.9
RO	-6.7	14.0	4.5	0.0	-54.2	-16.1	9.3	25.1
SI	-5.0	-2.3	2.6	12.6	24.8	-25.0	-17.3	38.1
SK	12.2	9.0	3.2	-7.4	-13.7	-3.7	3.6	-9.0
FI	0.1	1.8	4.0	2.2	10.3	-2.1	1.5	-3.1
SE	4.6	1.9	2.1	10.9	-9.2	6.3	5.5	3.2
IS	5.0	10.9	-15.0	0.0	0.0	-21.1	0.0	11.4
NO	-4.0	-11.1	1.6	43.4	-23.1	-0.6	-8.9	-8.0
UK	5.0	8.5	5.6	27.6	14.3	1.2	7.1	6.4
BA	4.8	1.7	3.3	16.3	0.6	12.9	3.4	1.9
ME	-24.1	0.0	-100.0	0.0	0.0	0.0	0.0	0.0
MD	0.0	0.0	0.0	0.0	0.0	0.0	26.0	0.0

Country	A	B	C	D	E	F	G	H
MK	0.0	0.0	0.0	0.0	73.1	0.0	0.0	0.0
AL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TR	12.6	-4.2	21.1	0.0	0.0	-100.0	-38.4	15.3
UA	-5.9	4.5	-0.6	4.5	-8.7	3.0	-13.5	-10.8
GE	-8.7	-8.5	-22.7	0.0	0.0	0.0	11.2	31.3
AM	21.6	0.0	16.7	0.0	0.0	0.0	-100.0	0.0
FO	-7.0	0.0	4.1	0.0	0.0	0.0	8.5	0.0
IL	-24.4	15.4	0.0	0.0	0.0	0.0	0.0	0.0
TN	0.0	1.3	0.0	-2.7	17.1	6.0	-0.6	1.4
AR	26.7	46.2	-2.9	0.0	0.0	17.2	0.0	0.0
AU	7.0	44.0	7.3	0.0	0.0	0.0	6.6	-8.6
BR	1.2	2.2	0.9	-7.5	-13.0	12.2	8.0	7.6
CA	4.7	16.1	3.7	29.3	-20.9	-10.6	-10.1	0.9
CN_X_HK	2.9	5.7	4.0	1.9	-5.6	7.1	4.1	10.7
HK	2.7	-1.3	0.1	-5.5	-1.5	-1.3	2.3	2.4
IN	-4.5	-7.3	-12.9	-16.8	-13.6	1.7	-6.7	-19.8
ID	4.9	-5.2	7.3	-9.0	10.8	10.0	2.0	10.7

Country	A	B	C	D	E	F	G	H
JP	35.5	34.0	0.0	0.0	-100.0	0.0	18.7	0.0
MX	5.3	6.5	4.2	3.8	-1.5	5.8	2.9	4.0
RU	22.2	6.4	14.1	-100.0	-100.0	12.4	18.4	10.8
ZA	4.4	-3.4	3.2	5.8	-41.5	10.2	6.8	-12.2
KR	-2.9	-1.2	11.4	135.1	53.7	0.2	-2.4	19.3
US	2.1	0.6	-1.0	8.5	-8.1	1.9	-2.5	-1.8

Source: Computed using European patent applications (kind codes A1 and A2) in PATSTAT.

Notes: Data not available: XK. IPC sections: A = Human necessities; B = Performing operations & transporting; C = Chemistry & metallurgy; D = Textiles & paper; E =Fixed constructions; F = Mechanical engineering, lighting, heating, weapons & blasting; G = Physics; H = Electricity.

At EU-level, only 5 % of inventor teams are gender balanced

Figure 7.11 shows the distribution of patent applications by sex composition of inventor teams during 2018-2021. This is categorised into 'women alone', 'women-only teams', 'teams composed of at least 60 % women' (women-majority teams), 'mixed teams' (gender balance achieved), 'teams composed of at least 60 % men' (men-majority teams), 'men-only teams' and 'men alone'.

At EU level, men-only or men-majority teams comprise the vast majority of all inventor teams (more than 90%). Teams composed of an individual man or only men constitute more than three-quarters (78 %) of all patents applications ([588]). By contrast, teams comprised mostly or only of women make up just 4 % of all patent applications, and only 5 % of teams are gender balanced. This is on par with the global average (approximately 6 % of teams are gender balanced).

These trends are reflected across all Member States, with men-only or men-majority teams comprising a clear majority of all patent application teams (at least 78 %, and more than 90 % in 15 Member States ([589]). The proportion of gender-balanced patent application teams ranges from 0 % (MT - although this may be explained by low overall numbers) to more than 9 % (PT). The proportion of women-only or women-majority teams ranges from less than 2 % (CY, AT) to nearly 15 % (HR).

Similar trends are generally evident across the Associated Countries and G20 countries. In two countries (MK, AL) men-only or men-majority teams comprise not only the majority, but 100 % of all teams. However, this may be explained by small numbers overall. Conversely, gender-balanced teams make up more than 10 % of all teams in seven countries (BA, ME, AM, FO, TN, CN_X_HK, ID), including more than one-quarter of all teams (29 %) in Montenegro (again, this may be due to small numbers).

([588]) 50 % of teams are men-only; 28 % are comprised of individual men.

([589]) CZ, DK, DE, EE, IE, IT, CY, LV, LU, HU, MT, AT, SK, FI, SE.

Figure 7.11 Distribution of patent application, by sex composition of inventors' team (%), 2018-2021

Source: Computed using European patent applications (kind codes A1 and A2) in PATSTAT.
Notes: IPC class: All; Data not available: XK. Low absolute values (less than or equal to 30): BA, ME, MD, MK, AL, GE, FO, ID

There has been little change in the composition of inventor teams holding patents in the last decade

Table 7.13 shows the CAGR of the four-year proportions of patent applications, by sex composition of the inventor team, from 2012 to 2021. Overall, there is a slight increase in women-only teams (3 %), at least 60 % women teams (3 %), mixed teams (2 %), and at least 60 % men teams (2 %), with no change for solo women teams (0 %) or men-only teams (0 %) and a decrease in solo men teams (-2 %).

At country level, although the overall trend aligns with the EU average, there are some variations. The highest average growth rate for solo women teams is in Estonia (12 %). For women-only teams, the highest average growth rate is in Ireland (9 %). For teams with at least 60 % women, the highest growth is in Estonia (12 %) and Luxembourg (22 %). Across Member States and Associated Countries, there tends to be a greater decline across majority men teams than majority women teams. When looking at the CAGR for teams composed of majority women inventors, 8 countries saw a decline ([590]), compared to 14 countries for teams comprised of majority men inventors ([591]).

Women represent 26 % of authors on academic-corporate collaboration teams

Figure 7.12 presents the average proportion of women authors on publications that list both a corporate entity and any other entity among the author affiliations (e.g. academic, governmental organisations, medical organisations such as hospitals) in all fields of R&D, from 2018-2022.

At EU level, women account for an average of 26 % of authors on academic-corporate collaboration teams. At country level, no countries reach gender balance. The highest rates among Member States are found in Bulgaria (34 %), Malta (34 %), Romania (33 %), Latvia (33 %) and Denmark (32 %). Women are least represented among academic-corporate collaboration teams in Germany (24 %) and Austria (25 %). G20 countries follow a similar pattern to the EU-27 data, but Japan (16 %) and South Korea (20 %) are significantly lower.

By contrast, women are slightly better represented among authors on academic-corporate collaborations in Associated Countries. Women have better representation in Iceland (37 %), Moldova (41 %), North Macedonia (39 %), Albania (39 %) and Faroe Islands (38 %).

([590]) CY, LV, LT, AT, RO, SI, UA, IL.

([591]) BG, DK, EE, HR, LV, HU, RO, SI, IS, NO, UA, GE, FO, TN.

Table 7.13 CAGR (%) of the four-year proportions of patent applications, by sex composition of the inventor team, 2009-2021

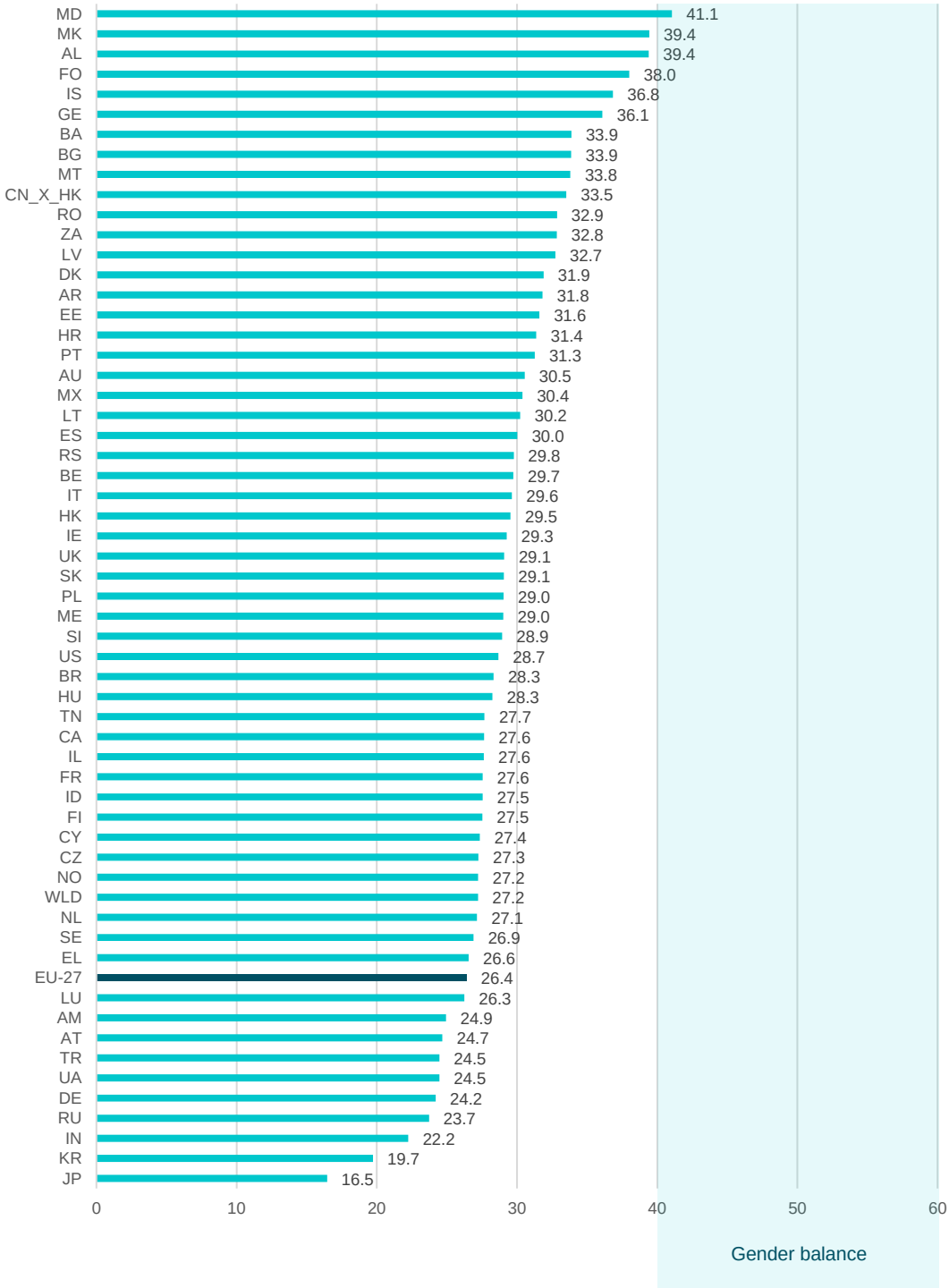
Country	Solo women teams	Women only team	Team comprising at least 60 % women	Mixed team	Team comprising at least 60 % men	Men only team	Solo men teams
WLD	2.00	3.95	3.90	2.33	2.35	-0.03	-1.70
EU-27	0.09	3.43	3.45	1.68	1.81	0.41	-1.80
BE	0.00	0.99	3.19	0.52	0.39	-0.07	-0.75
BG	-2.59	0.00	1.90	5.21	-3.62	0.61	-0.69
CZ	3.68	0.00	8.34	6.13	0.77	0.29	-2.45
DK	0.49	-0.82	6.04	-0.40	-1.34	1.54	-1.72
DE	1.05	1.68	3.25	2.55	1.30	0.08	-1.12
EE	12.37	-10.81	12.37	-9.27	-1.62	0.57	1.79
IE	4.29	9.23	0.51	-2.56	3.84	0.07	-2.96
ES	12.00	-12.79	1.74	1.31	1.74	1.94	-3.18
EL	-1.01	2.73	2.99	1.33	0.86	0.60	-2.42
FR	0.13	3.66	2.67	0.95	1.53	0.54	-2.59
HR	-3.12	0.00	0.02	0.37	-4.25	3.45	-3.39
IT	0.83	5.59	2.11	1.45	1.32	1.30	-1.96
CY	-15.10	0.00	-100.00	-6.43	23.89	2.47	-2.33
LV	-100.00	0.96	-6.53	-15.57	-4.99	-3.66	18.23
LT	0.00	0.00	-8.71	-4.01	0.97	-2.34	7.04
LU	-0.09	0.00	21.92	0.32	7.91	-1.26	-0.82
HU	-3.99	3.70	11.08	0.55	-2.26	0.03	0.63
MT	0.00	0.00	0.00	0.00	10.04	-1.80	-0.16
NL	0.96	5.19	2.31	2.87	3.09	0.32	-3.04
AT	-3.26	3.01	-0.96	-0.40	0.66	1.49	-2.29
PL	2.15	-0.15	0.33	0.96	1.12	0.45	-1.62
PT	-0.92	6.36	9.14	-0.15	3.96	-1.46	-2.80
RO	-4.99	0.00	-4.14	2.03	-4.09	-2.44	4.98
SI	-5.08	-10.32	-6.99	-2.00	-7.38	2.11	2.66
SK	0.00	0.00	5.33	9.69	0.88	-2.67	2.26
FI	-6.06	6.00	2.93	0.34	4.03	0.43	-2.71
SE	-4.41	1.48	5.62	0.49	3.22	0.76	-2.68
IS	0.00	-2.81	9.80	4.97	-4.46	-5.47	9.15
NO	1.22	10.69	3.07	0.11	-0.12	0.84	-1.29
UK	0.01	7.15	4.87	0.98	2.09	0.27	-1.87
BA	0.00	0.00	0.00	0.00	0.00	-13.93	-0.31
ME	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MD	0.00	0.00	0.00	0.00	3.39	-17.35	6.75
MK	0.00	0.00	0.00	-100.00	0.00	-6.03	0.00
AL	0.00	0.00	0.00	0.00	0.00	-18.05	0.00
RS	0.33	0.00	0.00	0.33	6.76	1.39	-5.89

Country	Solo women teams	Women only team	Team comprising at least 60 % women	Mixed team	Team comprising at least 60 % men	Men only team	Solo men teams
TR	-2.71	-1.68	14.83	0.54	4.45	-1.08	-0.89
UA	4.87	0.00	-0.92	-5.28	-1.68	-0.10	2.03
GE	-3.48	-100.00	0.00	0.00	-10.63	4.25	-3.48
AM	-100.00	0.00	0.00	0.00	0.00	-1.16	-4.95
FO	0.00	0.00	0.00	0.00	-8.62	0.00	-5.65
IL	-1.45	-0.91	-1.06	-1.13	1.66	1.31	-2.81
TN	-100.00	0.00	0.00	0.00	-5.37	1.66	-2.18
AR	5.92	-1.93	-4.34	5.05	-0.40	1.62	-2.48
AU	1.69	7.27	-3.24	1.58	1.91	0.04	-1.03
BR	-1.33	8.12	5.04	0.33	0.69	1.09	-3.26
CA	5.33	4.33	3.86	1.10	2.36	0.00	-2.49
CN_X_HK	2.13	0.93	2.01	1.76	1.30	-1.42	-1.26
HK	1.51	-15.30	0.00	4.72	5.04	1.13	-2.48
IN	-5.99	6.25	3.78	-0.90	1.69	-0.51	-0.16
ID	0.00	0.00	0.00	-5.61	5.26	1.52	-7.92
JP	2.69	7.74	5.96	3.07	2.15	-0.42	-0.59
MX	10.16	13.74	-10.68	1.38	3.79	-1.13	-1.89
RU	-2.96	-3.57	-1.24	-0.01	-0.18	0.05	0.39
ZA	-1.77	7.49	-2.17	-0.48	-0.48	0.84	-0.68
KR	-4.90	7.67	4.07	4.22	4.50	0.92	-2.32
US	-0.62	1.68	2.44	1.75	2.26	-0.21	-1.95

Source: Computed using European patent applications (kind codes A1 and A2) in PATSTAT.

Notes: IPC class: All; Data not available: XK.

Figure 7.12 Average proportion (%) of women authors on publications that list both a corporate entity and any other entity among the author affiliations, in all fields of R&D, 2018-2022



Source: Scopus.

Notes: Data not available: XK.

7.6 Differences in research funding success rates for women and men

Studies show that unconscious gender bias can occur in the evaluation of research for funding allocation ([592]). Allocating research grants requires gender-sensitivity and inclusivity, and research funding bodies should develop and implement comprehensive gender strategies covering internal and external processes associated with grant allocation ([593]) . If there is gender imbalance at the funding stage, these imbalances may be replicated throughout the research project ([594]). This section presents the funding success rates for women and men (overall and by field of R&D) and highlights gender differences in funding success rates.

Women have slightly lower funding success rates than men

Figure 7.13 presents research funding success rates by sex in 2022, calculated using the number of beneficiaries of a research grant divided by the number of applicants. At EU level, funding success rates are slightly lower for women (29 %) than men (32 %). This funding difference in favour of men is evident across most Member States and Associated Countries with available data (25 out of 44). Several countries have a (slightly) higher funding success rate for women than for men: Bulgaria (53 % vs 42 %), Denmark (19 % vs 16 %), Portugal (16 % vs 15 %), Slovenia (23 % vs 21 %) and Norway (29 % vs 24 %). The Netherlands achieved parity in funding success rates, with both women and men securing equal success rates (28 %).

In addition to actions taken at national level, including those introduced in Spain and Estonia (see Box 46), funding bodies have taken action to improve grant processes, helping to promote gender balance among funding recipients, and other organisations are also taking action to support women's access to funding (see Boxes 50 and 51).

Box 50: Actions to support women's access to funding

- The **Irish** Research Council (IRC) Gender Strategy and Action Plan 2013-2020 ([595]) was a framework that aimed to promote gender equality in research and academia in Ireland. The Strategy was evaluated in 2022 ([596]) and included an analysis of data on funding applications and beneficiaries. It showed that 'women are accessing research funding across all career stages at rates which compare very well, and in many cases exceed the rates for men.' Overall, the proportion of applications received from women was around 50 %, with similar success rates between women and men.
- The 2016-2020 Gender Strategy of Science Foundation **Ireland** (SFI) aimed to achieve gender balance in research teams and funding portfolios. SFI has also launched its

([592]) GENDER-NET Plus, 2022, https://anr.fr/fileadmin/Policy_Brief_Gender-Net_Plus_2022-02-01.pdf

([593]) EIGE, Gender Equality in Academia and Research – GEAR tool, n.d., https://eige.europa.eu/gender-mainstreaming/toolkits/gear/step-step-guide-funding/step-6

([594]) GENDER-NET Plus, 2022, https://anr.fr/fileadmin/Policy_Brief_Gender-Net_Plus_2022-02-01.pdf

([595]) Irish Research Council, Gender Strategy & Action Plan 2013-2020: Ensuring excellence and maximising creativity and innovation in Irish Research, 2013, https://research.ie/assets/uploads/2013/01/irish_research_council_gender_action_plan_2013_-2020.pdf

([596]) Ortus Economic Research and Loughborough University, *Review of Irish Research Council Gender Strategy and Action Plan*, 2022, https://research.ie/assets/uploads/2022/03/IRCGenderPlan-s.pdf

External EDI Strategy 2023-2028 ([597]), aiming to create an inclusive research culture and maximise equity of access to the Research and Innovation ecosystem. The Gender Strategy focuses on increasing female participation in STEM careers, streamlining gender initiatives across programs, and supporting women researchers during critical periods like maternity or adoption leave. SFI is committed to mitigating factors limiting women's participation in STEM and ensuring their retention and support throughout their careers.

- The #Her_Research mentorship programme was introduced in **Greece** in 2021, launching its third cycle in 2024. This programme offers free support in writing research proposals for Horizon Europe from specialised technical advisors, provides a five-hour educational and consulting package, and aims to motivate women to be more active in funding proposals ([598]).
- The **Croatian** Science Foundation implemented a policy in 2023, 'Ensuring gender equality and equal opportunities 2023-2026', which includes measures to support gender equality in funding processes. This includes introducing an equality dimension in tender documentation and research activities, integrating gender perspectives in research, developing indicators to monitor gender equality in research, and addressing bias in award procedures ([599]).
- In 2021, the National Science Centre in **Poland** undertook a survey aiming to inform grant procedures, including understanding experiences of grant applications and any difficulties faced (including balancing work and care responsibilities) ([600]).
- In **Sweden**, the Innovation Agency (VINNOVA) project, 'Who is being financed?', explores women's representation among project teams.

([597]) SFI, 2023, External Equality, Diversity and Inclusion (EDI) Strategy 2023-2028, https://www.sfi.ie/funding/sfi-policies-and-guidance/gender/SFI-External-Equality-Diversity-and-Inclusion-Strategy-2023-2028.pdf

([598]) #Her Research, n.d., https://her-research.gr/

([599]) Hrvatska zaklada za znanost, Osiguranje rodne ravnopravnosti i jednakih mogućnosti 2023-2026, 2023, https://hrzz.hr/wp-content/uploads/Osiguranje-rodne-ravnopravnosti-i-jednakih-mogucnosti-HRZZ.pdf

([600]) Narodowe Centrum Nauki, Funkcjonowanie kobiet i mężczyzn w nauce. Wyniki sondażu, 2022, https://www.ncn.gov.pl/sites/default/files/pliki/funkcjonowanie_kobiet_i_mezczyzn_w_nauce_wyniki_sondazu_NCN.pdf

Box 51: Measures to support gender balance among R&I funding recipients in Czechia

The Technological Agency of the Czech Republic (TACR) implemented three programmes for funding applied research, experimental development and innovation (ZÉTA, ÉTA, and KAPPA). These contained some measures supporting gender equality.

ZÉTA supported young researchers to carry out applied research in academic-corporate partnerships from 2017 to 2022. The programme introduced a required minimum target of 35 % women in research teams and considered the gender of the principal investigator (PI) in the evaluation process. While the age of the project team manager was limited to 35, this was extended for researchers who had taken time away from their careers for caring purposes, or due to illness. Data on applicants to the ZÉTA funding programme showed that women comprised 47 % of research team members and 63 % of PIs under the first call for proposals, and 53 % and 52 % (respectively) under the second call. This compared to approximately 19 % and 15 % (respectively) for other TACR-funded programmes in Czechia, demonstrating a clear impact.

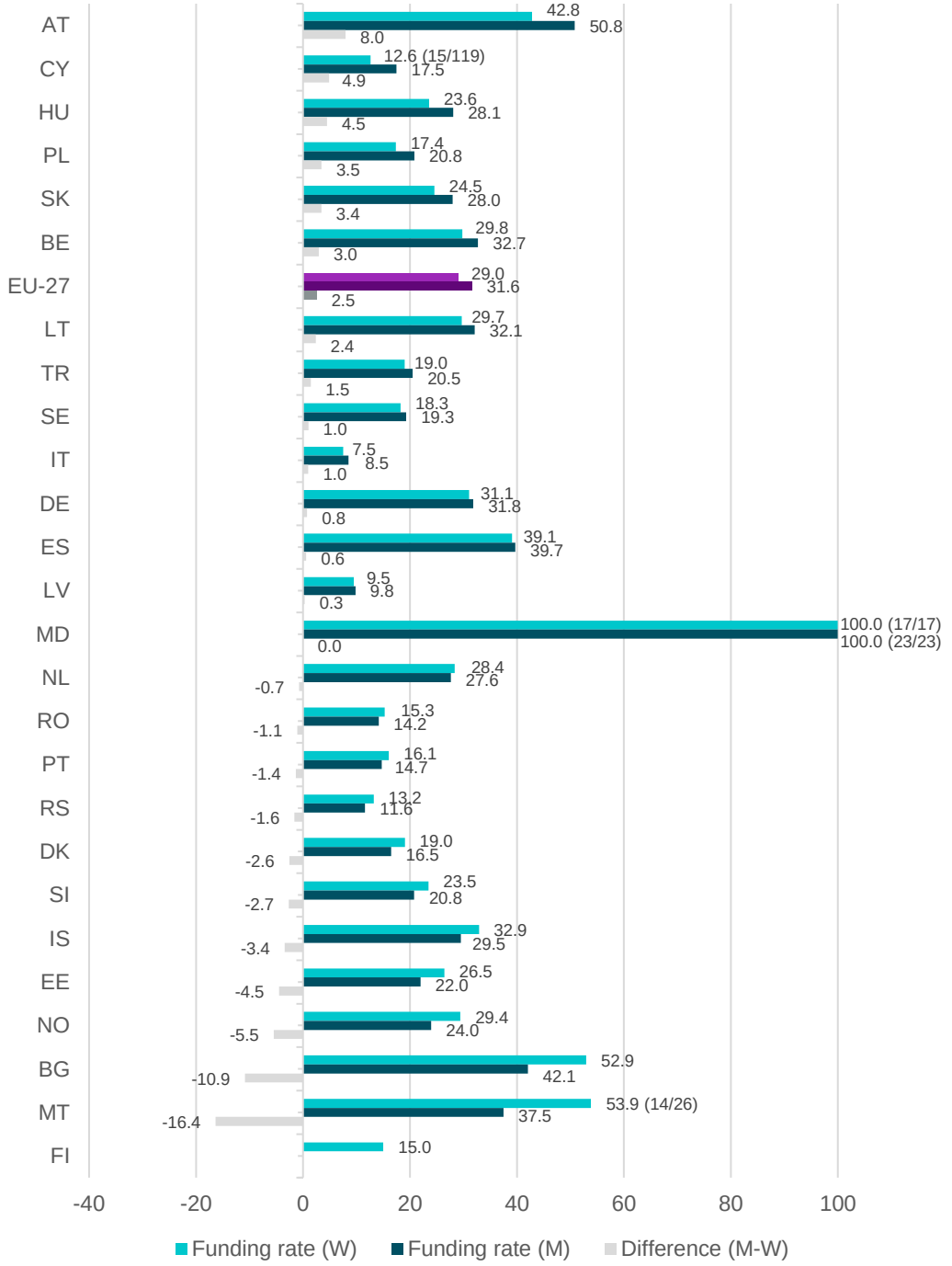
ÉTA was introduced in 2018 and was planned to run until 2023. It provided funding for applied research relating to social sciences and humanities, with the goal of encouraging a multi-disciplinary approach and connecting technical and non-technical research. In evaluating projects, a higher score was given to teams comprising both women and men (and a lower score for teams where this is not the case, although other factors are taken into account, e.g. the availability of relevant women and men experts in the field).

KAPPA (2020-2024) supports collaborative research with partners from Norway, Liechtenstein and Iceland. As with ZÉTA (and in line with Horizon Europe criteria), the gender of the PI is taken into consideration in the evaluation process; where projects receive the same score, this factor is taken into account in the selection.

Women have higher funding success rates than men in the fields of Engineering and Technology, Humanities and the Arts, and in multi-disciplinary research

Table 7.14 presents funding success rate differences between women and men, by field of R&D, in 2022. At EU level, women were more likely to have a higher success rate than men in Engineering and Technology (33 % vs 30 %), Humanities and the Arts (23 % vs 22 %), and multi-disciplinary fields (26 % vs 17 %). Women and men had equal success rates in Natural Sciences (26 %) and Social Sciences (21 %), but women had a lower success rate than men in Medical and Health Sciences (25 % vs 27 %) and Agricultural and Veterinary Sciences (26 % vs 29 %).

Figure 7.13 Research funding success rate differences between women and men (%), 2022



Source: Women in Science (WiS) database, DG Research and Innovation - T3_questionnaires.

Notes: Unit: percentage (calculated with headcount (HC) data). Calculation of data: data are HC from T3 questionnaires of WiS database. Values calculated only from the institutes that provided both applicants and beneficiaries; positive values mean that success rate is higher for men, while negative values mean that success rate is higher for women. Data for BE = BE(FL) + BE(FR). Other: EU aggregates estimated only when at least 60 % of the EU population on a given indicator is available. Estimates intended as an indication only.

Table 7.14 Research funding success rate differences between women and men (pp), by field of R&D, 2022

Country	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural and veterinary sciences	Social sciences	Humanities and arts	Multi - disciplinary
EU-27	**0.2**	**-2.9**	**2.3**	**2.9**	**0.5**	**-0.3**	**-9.8**
BE	10.9	10.7	4.1	-	15.1	5.0	0.0
BG	-20.2	-3.6	6.1	2.7	-25.0	9.8	-
DK	-2.8	-8.9	-0.4	0.3	-5.4	-1.5	-
DE	1.2	-2.7	0.3	-	1.1	-	-
EE	-8.9	5.2	2.8	44.3	-9.0	-9.5	-
ES	3.3	1.5	4.1	0.9	-3.3	-4.0	-
IT	1.5	2.7	2.5	4.0	-0.3	-3.7	-
CY	9.4	4.2	-6.6	-12.5	16.0	-	-
LV	-0.2	3.8	2.9	2.5	-5.2	-2.9	-
LT	-0.8	-23.6	24.2	10.0	8.7	6.1	-
HU	4.0	3.4	9.3	3.8	9.3	-4.3	-
MT	-	-12.7	-41.7	-	-	-	-30.0
NL	-1.0	-1.2	-	-	-2.4	-	-
AT	-2.7	8.0	-2.4	5.1	-4.3	-4.2	-
PL	3.8	-0.1	2.5	-0.6	3.7	7.8	-
PT	0.1	-2.7	-1.6	-0.6	1.0	-5.0	-
RO	-1.7	-1.7	0.5	-1.5	4.7	-2.3	-
SI	-2.3	-3.7	9.7	-10.1	-2.7	7.1	-8.2

Country	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural and veterinary sciences	Social sciences	Humanities and arts	Multi - disciplinary
SK	20.0	-13.9	-11.4	23.6	1.8	5.3	-
FI	-	-	-	-3.5	-	-	-
SE	-3.2	-3.7	2.0	-4.0	2.2	8.0	-
IS	2.7	-8.0	5.2	-	-4.3	-9.6	-1.1
NO	-10.0	-9.2	-6.1	-3.4	-3.2	-11.4	-
RS	3.4	-9.5	-4.5	-3.7	7.5	-5.6	-
TR	4.6	-2.0	5.7	-1.2	-5.1	-	12.2

Source: WiS database, DG Research and Innovation - T3_questionnaires.

Notes: Unit: pp (calculated with HC data). Calculation of data: data are HC from T3 questionnaires of WiS database. Values calculated only from the institutes that provided both applicants and beneficiaries; positive values mean that success rate is higher for men, while negative values mean that success rate is higher for women. Data for BE = BE(FL) + BE(FR). Other: EU aggregates estimated only when at least 60 % of the EU population on a given indicator is available. Estimates are intended as an indication only.

7.7 Integration of gender dimension in R&I content

Integrating a gender dimension into R&I content, i.e., sex and/or gender analysis through the entire R&I cycle, is key to developing inclusive and unbiased knowledge and solutions that can address societal issues adequately ([601]). This integration should span the entire process: from setting research priorities, defining concepts, and formulating research questions, to developing methodologies, gathering and analysing sex/gender-disaggregated data, and finally evaluating, reporting, and translating findings into products and innovations.

In health research, the analysis of sex and gender differences when developing and testing medication plays a key role, for example, as women and men can respond differently to treatments, impacting efficacy and safety profiles ([602]). Similarly, in climate change and environmental research, recognising gender-specific impacts and vulnerabilities is crucial for creating effective adaptation and mitigation strategies that benefit all, while in digital technologies, integrating a gender dimension ensures that digital products and services cater to a diverse user base and avoid creating or perpetuating biases.

At EU level, the importance of integrating a gender dimension in research and innovation content is acknowledged, for example, under the ERA ([603]), and the inclusion of a gender dimension in R&I content is promoted, most notably under Horizon Europe requirements. Building on Horizon 2020 requirements, Horizon Europe mandates the integration of a gender dimension into research and innovation content as a requirement by default, which is evaluated under the excellence criterion for Research and Innovation Actions (RIA), Innovation Actions (IA) and Programme Co-fund Actions (unless the topic description explicitly specifies otherwise) ([604]).

Firstly, this section examines the proportion of publications that incorporate a gender dimension ([605]), then it looks specifically into the proportion of Horizon 2020 and Horizon Europe projects that incorporate a gender dimension, based on specific data retrieved from the official portal for European data ([606]). These indicators are based on a bibliometric analysis which considers publications/projects to incorporate a gender dimension in R&I content where specific search terms relating to sex or gender are identified, and where more than one sex/gender is included. For Horizon Europe, only project titles and abstracts, deliverables and reports were included, and there were relatively few deliverables and reports

([601]) European Commission, Directorate-General for Research and Innovation, *Gendered innovations 2 – How inclusive analysis contributes to research and innovation – Policy review*, Publications Office of the European Union, 2020, https://data.europa.eu/doi/10.2777/316197

([602]) Bartz, D., Chitnis, T. & Kaiser, T.C., Rich-Edwards, J.W., Rexrode, K.M., Pennell, P.B., Goldstein, J.M., O'Neal, M.A., LeBoff, M., Behn, M., Seely, E.W, Joffe, H. & Manson, J.E. (2020) 'Clinical Advances in Sex- and Gender-Informed Medicine to Improve the Health of All: A Review', *Jama Intern Med*., 180(4), p.574-583. Available at: https://jamanetwork.com/journals/jamainternalmedicine/article-abstract/2760346

([603]) Ibid.

([604]) This requirement is recalled in the General Introduction to the Horizon Europe Work Programme, and in the General Annex D — Award Criteria (for Research and innovation actions, Innovation actions and Programme co-fund actions) and it is thus reflected in the corresponding application forms (proposal template) for Research and Innovation Actions, Innovation Actions and Programme Co-fund Actions under the Excellence evaluation criterion (under Methodology).

([605]) Based on all publications included in SCOPUS and published between 2018 and 2022.

([606]) Specifically, these indicators were computed using Horizon 2020 and Horizon Europe data, retrieved from the official portal for European data (https://data.europa.eu/data/datasets/cordish2020projects?locale=en; https://data.europa.eu/data/datasets/cordis-eu-research-projects-under-horizon-europe-2021-2027?locale=en). Only files containing report summaries, project abstracts, publications, titles, final results or project deliverables were included in this process.

available at the point of data extraction in November 2023 (approximately 9 000 projects, compared to approximately 30 000 for Horizon 2020). Further information is available in the She Figures 2024 Handbook.

A key limitation of this analysis is the timeline and, consequently, the availability of relevant files for Horizon Europe. The Horizon Europe programme commenced in 2021, with the first calls for project proposals launched in that year, and projects funded under the 2021 Work Programmes starting in 2022. The publications considered in this analysis cover the period from 2018 (towards the end of Horizon 2020) to 2022 (one year after the start of Horizon Europe). As a result, the number of projects available for analysis was limited, and none had yet delivered substantial outputs, making it challenging to assess the integration of the gender dimension. It is also important to note that, at the European Commission level, the effective integration of the gender dimension into R&I content of each project is assessed upon project completion, typically 2-4 years after their initiation. Therefore, the findings for Horizon Europe should be interpreted with caution, as the analysis was largely based on the project abstracts available at the time.

Finally, the section presents an indicator on the contribution of research to Sustainable Development Goal (SDG) 5.

Bibliometric data indicates that only a small percentage of publications incorporate a gender dimension in their R&I content, despite some progress

Table 7.15 shows the proportion of a country's publications incorporating a gender dimension in their R&I content during the period 2018-2022. This indicator uses bibliometric data from Scopus to determine whether gender-related terms are included within the title or abstract, as a proxy for identifying a gender dimension.

At EU level, the average percentage is only 2 %. This is closely reflected among Member States, with values ranging between 1 % and 3 %. Among Associated Countries, slightly higher percentages of publications are observed, with 4 % of projects in Iceland, Bosnia and Herzegovina, and Türkiye incorporating a gender dimension.

To estimate the growth rate per year, Table 7.15 shows the CAGR of the proportion of a country's publications with a gender dimension in their R&I content from 2013-2022. At EU level, the CAGR is 2 %. At country level, it ranges from -5 % (EE) to 9 % (LT). Five countries have a CAGR of 4 % or more: Lithuania (9 %) Luxembourg (6 %), Romania (5 %), Spain (4 %) and Portugal (4 %) However, six countries have a negative CAGR (BG, EE, LV, MT, FI, SE), most notably Estonia and Malta, where the CAGR is -5 % and -4 %, respectively.

In accordance with Horizon Europe's mandatory requirement to integrate a gender dimension in R&I content (except where explicitly specified otherwise), several Member States have demonstrated a commitment to improving the integration of a gender perspective in research (see Box 52).

Box 52: Member States' commitment to improving the integration of a gender dimension in research

In **Spain,** the 2023 Law on the University System encourages the promotion of scientific projects incorporating a gender perspective ([607]).

In **Croatia**, the National Recovery and Resilience Plan 2021-2026 includes a commitment to creating investment and funding opportunities for research that integrates a gender dimension, and equality more broadly, for example research on gender bias in AI ([608]).

In **Belgium**, VLIR-UOS (a body supporting partnerships between universities in Flanders and internationally) introduced an Equality & Inclusion Policy for 2020-2024, which includes an aim to incorporate gender analysis into the content of scientific projects, and a recommendation to assess whether gender analysis is part of a project's focus ([609]). Belgium's Women and Science Committee has provided funding awards since 2020, with the theme of 'Gender Health' in 2023 ([610]).

VINNOVA, **Sweden**'s innovation agency, has incorporated a gender perspective in its activities since 2015. This includes making efforts to ensure that gender perspectives are included in the R&I projects it funds, with an annual budget of SEK 3.5 billion (approximately EUR 302 million) ([611]).

Bibliometric data also shows that the proportion of a country's publications with a gender dimension varies by field of research

Table 7.16 shows the proportion of a country's publications with a gender dimension in their R&I content by field of R&D. For the EU-27, the highest proportion of publications with a gender dimension is in Medical and Health Sciences (4 %), followed by Social Sciences (3 %), Humanities and the Arts (2 %) and Agricultural and Veterinary Sciences (2 %). Both Engineering and Technology (0.3 %) and Natural Sciences (0. 7%) have proportions smaller than 1 %, which corresponds with findings in She Figures 2021.

Similar trends are seen across Member States. In all countries, the greatest proportion of publications with a gender dimension is in Medical and Health Sciences (ranging from 3 % in Belgium and Italy, to more than 6 % in Lithuania, Finland and Sweden) and the lowest proportions are observed in Engineering and Technology (<1 % across all countries and Natural Sciences (<1.5 % across all countries). There is greater variation in the fields of Agricultural and Veterinary Sciences (between 0.5 % and 3.6 %), Humanities and the Arts (between 1.4 % and 3.8 %) and Social Sciences (between 1.5 % and 4.6 %).

Similar trends are observed among Associated Countries and G20 countries, although in 14 countries, more than 5 % of publications in Medical and Health Sciences incorporate a

([607]) Law on the University System, 2023, https://www.boe.es/buscar/pdf/2023/BOE-A-2023-7500-consolidado.pdf

([608]) Croatia, National Recovery and Resilience Plan 2021-2026, https://planoporavka.gov.hr/UserDocsImages/dokumenti/Plan%20oporavka%20i%20otpornosti%2C%20srpanj%202021..pdf?vel=13435491

([609]) VLIR-UOS, Equality and Inclusion Policy, 2020, https://cdn.vliruos.be/vliruos/VLIR-UOS%20Gender%20policy%202020-2024%20final.pdf

([610]) Comité Femmes et Sciences, *Résultats du PRIX DE LA RECHERCHE*, 2023, https://www.femmes-sciences.be/resultats-du-prix-de-la-recherche-2023-genre-et-sante

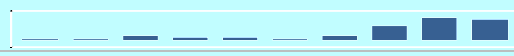
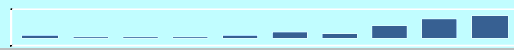
([611]) Vinnova, Equal funding for research, n.d., https://www.vinnova.se/en/m/equal-innovation/

gender dimension ([612]). In the Faroe Islands, this reaches over 12 %, where nearly 29 % of publications in Humanities and the Arts, and more than 11 % of publications in Social Sciences also incorporate a gender dimension (this may be partly explained by relatively low numbers ([613])).

([612]) IS, NO, BA, ME, MD, MJ, AL, RS, TR, UA, FO, TN, RU, ZA.

([613]) In the period 2018-2022, there were only 11 publications in Humanities and the Arts in the Faroe Islands, 64 publications in Social Sciences, and 221 in Medical and Health Sciences.

Table 7.15 Proportion (%) of a country's publications with a gender dimension in their R&I content, 2018-2022, and CAGR (%) and trend of the proportion, 2013-2022

Country	GDRIC (%) 2018-2022	CAGR (%) 2013-2022	Trend 2013-2022
WLD	**1.74**	**1.07**	
EU-27	**1.94**	**1.95**	
BE	1.77	0.68	
BG	1.67	-0.54	
CZ	1.83	0.44	
DK	2.37	0.00	
DE	1.58	2.76	
EE	2.07	-4.99	
IE	2.12	1.71	
EL	2.01	0.43	
ES	2.57	4.30	
FR	1.42	1.99	
HR	3.02	0.50	
IT	1.61	1.52	
CY	2.48	1.50	
LV	1.31	-0.54	
LT	2.64	9.07	
LU	1.58	5.99	
HU	2.12	1.78	
MT	1.98	-4.45	
NL	2.10	0.66	
AT	1.98	1.80	
PL	2.19	0.59	
PT	1.98	3.90	
RO	1.38	4.70	
SI	1.90	1.74	

Country	GDRIC (%)	CAGR (%)	Trend
	2018-2022	2013-2022	2013-2022
SK	1.94	0.63	
FI	2.67	-0.59	
SE	3.23	-0.42	
IS	3.66	-2.30	
NO	2.95	-0.81	
UK	2.08	1.80	
BA	4.12	-3.70	
ME	3.33	2.94	
MD	2.03	22.24	
MK	2.96	6.21	
AL	2.70	-4.85	
RS	2.61	2.52	
TR	3.52	-1.93	
UA	1.45	17.77	
GE	2.45	7.48	
AM	1.40	8.86	
FO	6.64	-	
IL	2.24	2.17	
TN	1.79	1.45	
AR	2.27	1.07	
AU	2.28	1.64	
BR	2.24	0.43	
CA	2.33	2.45	
CN_X_HK	0.77	3.71	
HK	1.38	-0.61	
IN	1.10	-1.85	
ID	1.53	3.41	

Country	GDRIC (%)	CAGR (%)	Trend
	2018-2022	2013-2022	2013-2022
JP	1.80	2.93	
MX	2.54	2.42	
RU	1.40	10.67	
ZA	2.97	-0.62	
KR	1.71	1.55	
US	2.23	2.70	

Source: Scopus.

Notes: Data not available: XK. For CAGR only, zero values or division by zero: FO.

Table 7.16 Proportion (%) of a country's publications with a gender dimension in their research content, by field of R&D, 2018-2022

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
WLD	2.15	0.22	2.31	3.69	0.72	2.99
EU-27	2.23	0.29	2.11	3.83	0.86	3.11
BE	1.82	0.27	2.12	2.95	0.84	2.85
BG	2.19	0.39	2.13	4.33	0.81	2.56
CZ	2.89	0.25	1.91	4.29	1.01	3.02
DK	2.09	0.23	2.30	4.31	1.10	2.64
DE	2.40	0.18	1.71	3.24	0.69	2.87
EE	2.07	0.16	2.57	5.79	1.03	2.91
IE	1.59	0.38	3.03	3.36	0.81	3.20
EL	1.69	0.29	1.93	4.15	0.85	2.49
ES	2.26	0.44	2.59	4.46	1.14	4.61
FR	2.18	0.23	1.71	3.09	0.66	2.29
HR	2.21	0.72	3.57	5.85	1.10	4.60
IT	1.72	0.25	1.49	3.00	0.79	2.36
CY	2.29	0.34	2.91	5.01	1.08	3.35
LV	0.54	0.12	1.77	4.18	0.52	1.45
LT	3.56	0.54	1.89	6.57	1.33	3.38
LU	2.27	0.23	2.02	3.75	0.47	2.62
HU	2.53	0.31	2.12	4.22	1.11	3.07
MT	0.90	0.21	1.35	4.07	0.62	1.69
NL	2.36	0.26	2.45	3.35	0.96	2.77
AT	3.28	0.30	2.15	3.83	0.98	2.92
PL	2.59	0.34	2.14	5.53	1.08	3.10
PT	2.04	0.30	2.25	3.81	0.88	3.58
RO	1.92	0.52	1.54	3.47	0.73	1.85
SI	1.87	0.35	2.01	3.96	0.93	2.53
SK	1.92	0.29	2.56	5.26	0.96	3.07
FI	2.55	0.28	2.75	6.19	1.10	3.44
SE	2.99	0.38	3.80	6.02	1.26	4.40
IS	2.46	0.52	3.66	6.59	1.53	5.87
NO	2.25	0.33	2.80	6.01	1.07	4.02
CH	2.49	0.24	1.65	3.40	0.91	2.78
UK	2.61	0.25	2.68	3.56	0.89	3.02
BA	2.30	0.76	4.40	7.62	0.87	4.21
ME	1.83	0.59	1.95	9.39	1.01	5.09
MD	1.73	0.19	1.94	5.22	0.87	1.76
MK	2.11	0.89	1.69	6.77	0.83	4.53
AL	2.00	0.94	2.13	5.50	0.96	4.17
RS	2.10	0.35	2.02	6.05	1.02	3.34

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
TR	2.89	0.33	3.78	6.99	0.98	4.78
UA	0.98	0.16	2.41	5.72	0.43	1.58
GE	2.25	0.24	1.39	4.97	0.87	4.66
AM	4.93	0.25	3.71	4.28	0.63	3.47
FO	1.82	0.74	28.89	12.36	3.29	11.47
IL	2.33	0.30	3.01	3.85	0.85	4.39
TN	1.54	0.23	4.06	6.29	0.53	1.86
AR	2.94	0.25	1.90	3.76	1.45	3.59
AU	2.93	0.31	2.99	3.80	1.11	3.16
BR	2.22	0.25	2.20	4.13	1.21	2.69
CA	2.52	0.24	3.35	3.99	1.08	3.92
CN_X_HK	1.42	0.10	1.59	2.42	0.36	1.51
HK	1.83	0.16	2.03	3.37	0.49	2.60
IN	1.77	0.21	4.13	3.08	0.46	2.10
ID	2.31	0.42	2.76	3.18	1.03	2.04
JP	3.15	0.21	1.64	3.77	0.80	2.90
MX	3.06	0.34	2.60	4.94	1.37	4.63
RU	2.71	0.13	1.94	5.24	0.52	2.79
ZA	3.25	0.34	3.96	5.59	1.39	3.76
KR	1.96	0.22	2.53	4.15	0.64	2.33
US	2.59	0.32	2.75	3.63	1.03	3.83

Source: Scopus.

Notes: Data not available: XK.

A small percentage of Horizon 2020 projects' abstracts and publicly available results include a gender dimension in their content

Figure 7.14 presents the extent to which projects funded under Horizon 2020 integrate a gender dimension as part of the project content (based on abstracts and publicly available project results ([614])). The EU average of 1.7 %, suggests a small proportion of Horizon 2020 projects integrated a gender dimension (although it should be noted that this was not a mandatory requirement under Horizon 2020, unlike Horizon Europe). Ten countries are above the EU average, ranging from 1.7 % (PL) to 2.4 % (IE, SI) ([615]), but three are at 1 % or less (HU, LV, LU). Among G20 countries, there are two instances where no projects have a gender dimension in R&I content (AL, HK), although in both cases overall numbers are relatively low ([616]).

Figure 7.15 displays the percentage of projects funded by Horizon Europe that incorporate a gender dimension. These values should be taken with caution due to the recency of projects, the limited number of projects to date (9 000 in total and fewer than 30 in 15 countries ([617]) at the point of data extraction in November 2023) and the fact that many projects are ongoing. Moreover, the integration of the gender dimension into R&I content is a comprehensive process that must be embedded throughout the entire R&I cycle, which abstracts - due to their brevity - cannot adequately reflect. For this reason, at the European Commission level, the effective integration of the gender dimension into the R&I content of each project is assessed in the final evaluation report upon project completion (with the typical duration of a project ranging from 2 to 4 years).

An exploratory analysis of Horizon Europe projects, using files available at this stage (primarily based on abstracts and project titles), reveals that the EU average for the proportion of projects incorporating a gender dimension is 1.2 %. At country level, although the values are generally similar, Bulgaria (1.4 %), Estonia (1.8 %), Italy (1.3 %) and Portugal (1.3 %) have a marginally higher rate than the EU average. A slightly different picture emerges among the Associated Countries, where four countries have a higher rate than the EU average (IS, NO, AL, XK) ([618]), but nine countries have 0 % ([619]). Once Horizon Europe projects are completed, a more accurate analysis of the extent of the integration of the gender dimension will be possible through an assessment of all their deliverables and the final evaluation reports.

([614]) Specifically, the following types of files were included in the analysis: report summaries, projects, publications, titles, final results or project deliverables.

([615]) BG, EE, IE, CY, MT, PL, PT, SI, SK, SE.

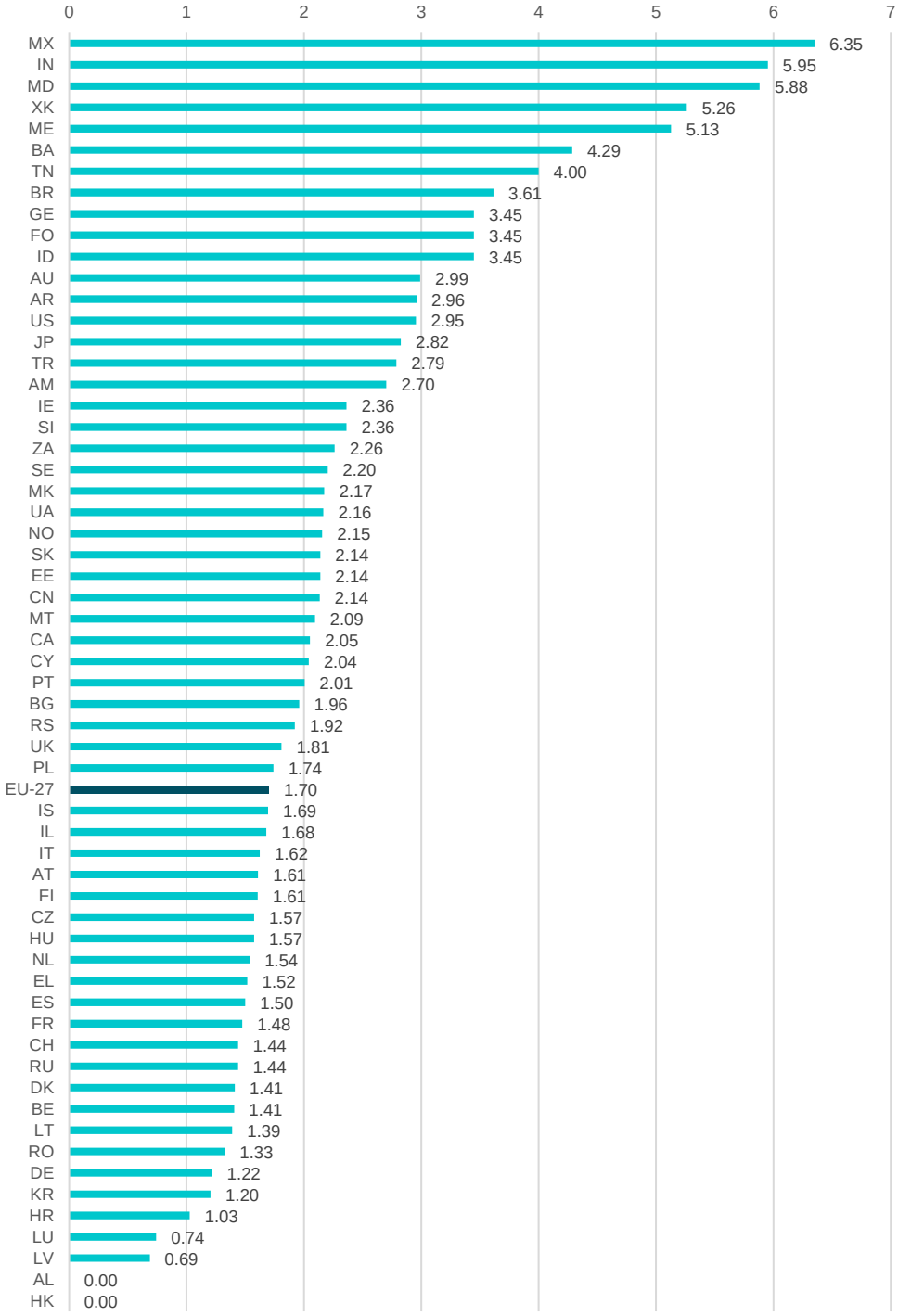
([616]) n=47 and n=32, respectively.

([617]) TN, AR, MK, KR, AL, BA, IN, GE, MX, ME, AM, FO, XK, HK, ID.

([618]) AL and XK are based on small numbers.

([619]) BA, ME, MD, MK, RS, GE, AM, FO, TN. Of these countries, seven (BA, ME, MK, GE, AM, FO, TN) are based on small numbers.

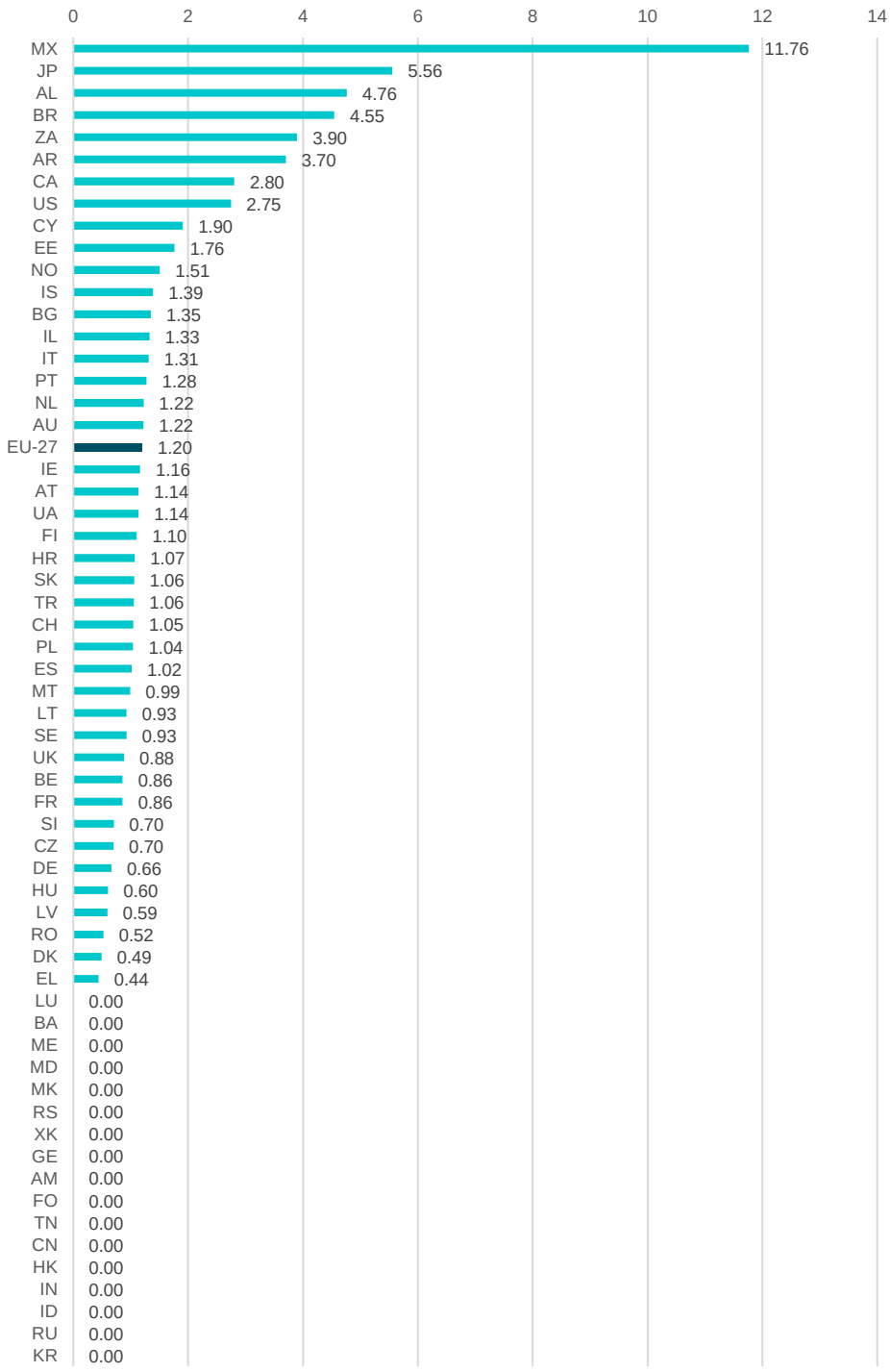
Figure 7.14 Proportion (%) of Horizon 2020 (2014-2020) projects integrating a gender dimension (GDRIC), by country, 2014-2020



Source: Computed using Horizon data, retrieved from CORDIS, EU Open Data Portal.

Notes: Data not available: FO; Other: WLD value not shown, as participation of Associated and third countries in Horizon 2020 projects is limited to collaboration with EU-27 partners, thus WLD is the same number of projects as EU-27; Low absolute values of less than or equal to 30: XK, FO, ID.

Figure 7.15 Proportion (%) of Horizon Europe (2020-2027) projects integrating a gender dimension (GDRIC), by country, 2021-2023



Source: Computed using Horizon data, retrieved from CORDIS, EU Open Data Portal

Notes: WLD value not shown, as participation of Associated and third countries in Horizon Europe projects is limited to collaboration with EU-27 partners, thus WLD is the same number of projects as EU-27; Low absolute values of less than or equal to 30: BA, ME, MK, AL, XK, GE, AM, FO, TN, AR, HK, IN, ID, MX, KR.

Figure 7.16 and Figure 7.17 show the percentage of Horizon 2020 projects and Horizon Europe projects that integrate intersectional aspects ([620]). Intersectionality refers to the analytical framework that considers how various aspects of identity and social categorisations such as racial or ethnical background, age, socioeconomic status, sexual orientation, and disability intersect with sex and gender and how these intersections impact individuals' experiences and social outcomes ([621]). This approach helps to avoid oversimplified understandings of gender and promotes more inclusive and effective strategies for addressing inequality and social injustice.

Figure 7.16 shows that at Member State level, 0.30 % of Horizon 2020 projects included an intersectional dimension, with the figure dropping slightly for Horizon Europe, to 0.27 % (as with the previous indicators, due to the early-stages of the Horizon Europe roll-out, there hasn't been sufficient time to see the uptake).

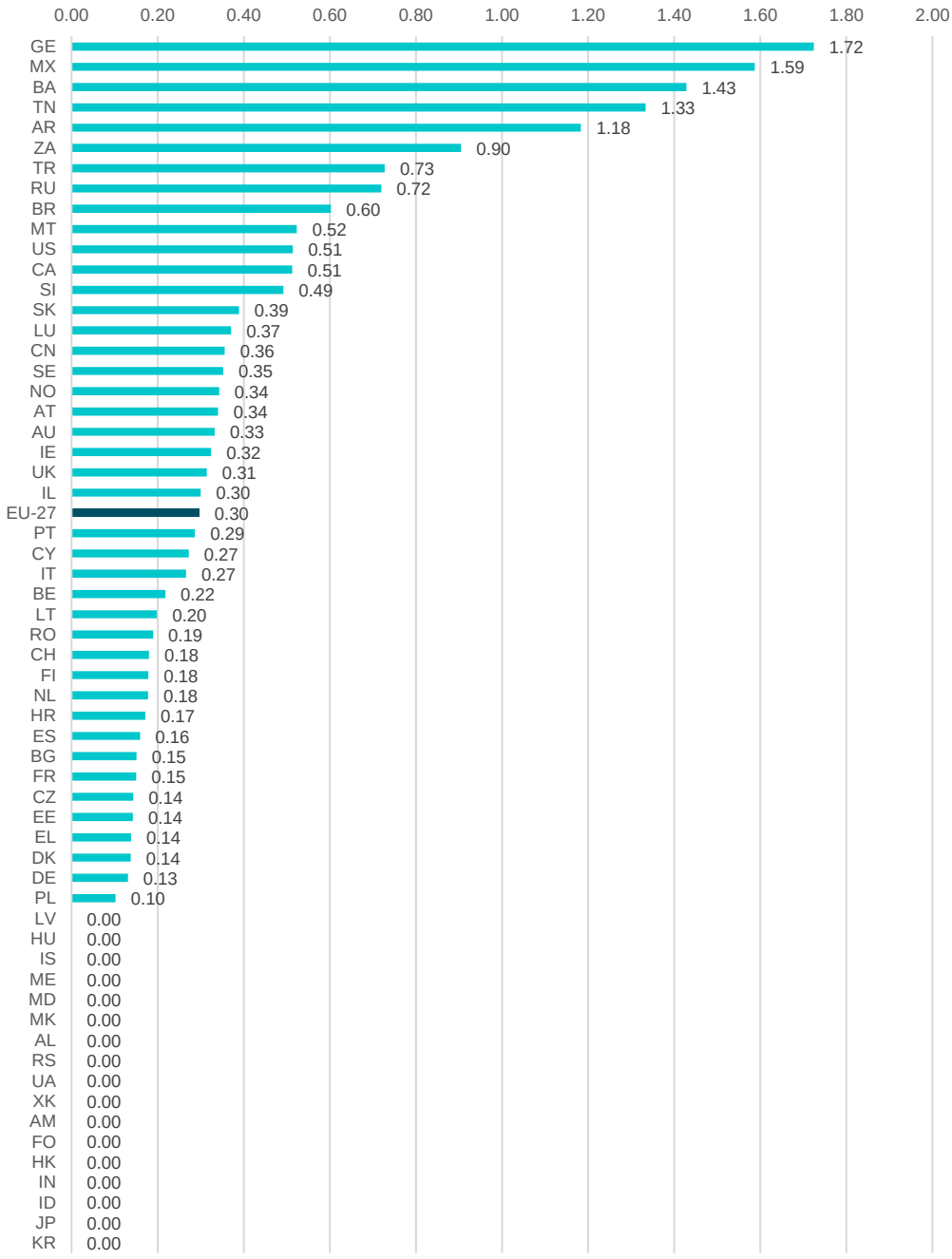
At country level, for Horizon 2020 projects, seven Member States (IE, LU, MT, AT, SI, SK, SE) slightly surpass the EU average. Among Horizon Europe projects, there is more variability, which may be explained in part by the low number of projects in some countries given the early stage of the Horizon Europe programme: 13 Member States exceed the EU average ([622]), while four (LT, LV, HU, FI) have a value of 0 %. Ireland, Malta, and Slovakia – all higher than the EU average values for both Horizon 2020 and Horizon Europe – have seen a slight rise in projects incorporating intersectional aspects, suggesting a potential for further growth over time.

([620]) In total, nearly 36 000 Horizon 2020 projects and 9 000 Horizon Europe were searched for intersectional aspects. The final list of keywords used, in addition to the GDRIC query, were: ("ethnic*" OR "race" OR "racis*" OR "indigen*" OR "LGBT*" OR "religio*" OR "sexual orientation" OR "belief" OR (("vulnerable" OR "marginali?ed" OR "disadvantaged" OR "underprivileged") AND ("group" OR "population" OR "communit*")) OR "social class" OR "social origin" OR "disabilit*" OR "conflict?affected" OR "violence?affected" OR "migrat* status" OR "intersect*".

([621]) EIGE, Thesaurus & Glossary, n.d., https://eige.europa.eu/publications-resources/thesaurus/terms/1050?language_content_entity=en#:~:text=Intersectional%20analysis%20aims%20to%20reveal,and%20gender%20with%20other%20grounds

([622]) BE, BG, EE, IE, HR, IT, CY, LT, MT, PL, PT, SK, SE

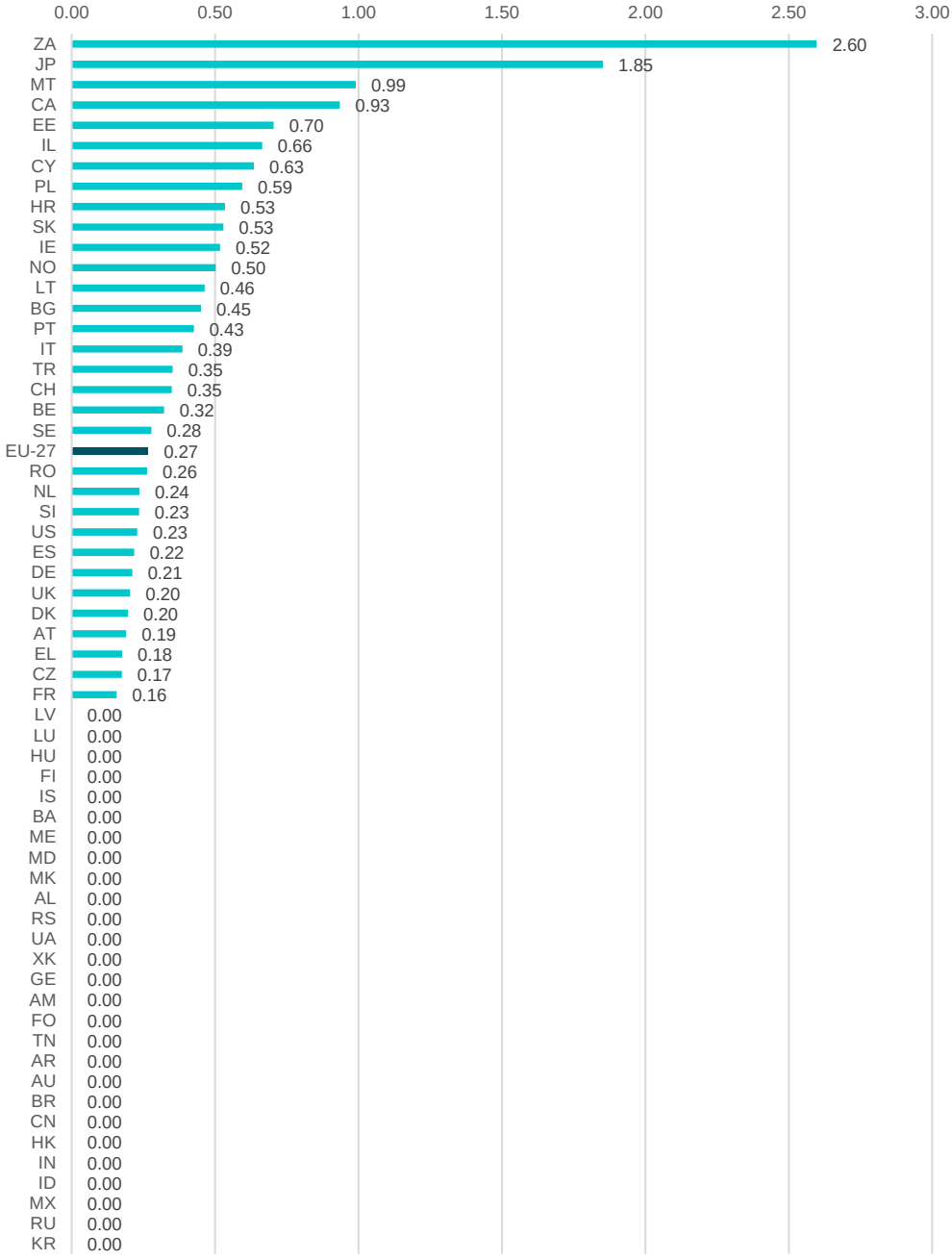
Figure 7.16 Proportion (%) of Horizon 2020 projects integrating intersectional aspects, by country, 2014-2020



Source: Computed using Horizon data, retrieved from CORDIS, EU Open Data Portal

Data not available for: FO. WLD value not shown, as participation of Associated and third countries in Horizon 2020 projects is limited to collaboration with EU-27 partners, thus WLD is the same number of projects as EU-27. Low absolute values of less than or equal to 30: XK, FO, ID.

Figure 7.17 Proportion (%) of Horizon Europe projects integrating intersectional aspects, by country, 2021-2023



Source: Computed using Horizon data, retrieved from CORDIS, EU Open Data Portal

Notes: Data not available for: FO. Other: WLD value not shown, as participation of Associated and third countries in Horizon 2020 projects is limited to collaboration with EU-27 partners, thus WLD is the same number of projects as EU-27; Low absolute values of less than or equal to 30: BA, ME, MK, AL, XK, GE, AM, FO, TN, AR, HK, IN, ID, MX, KR.

Bibliometric data indicates that the extent to which countries' research activity contributes to SDG 5, Gender Equality, varies greatly

Figure 7.18 shows the relative activity index (RAI) for research contributing towards SDG 5, 'achieve gender equality and empower all women and girls' ([623]). This indicator assesses the extent to which individual countries contribute to gender-focused research in comparison to global contributions. By analysing the disparity between national and global research outputs on SDG 5, the indicator highlights the countries leading (or lagging) in this area.

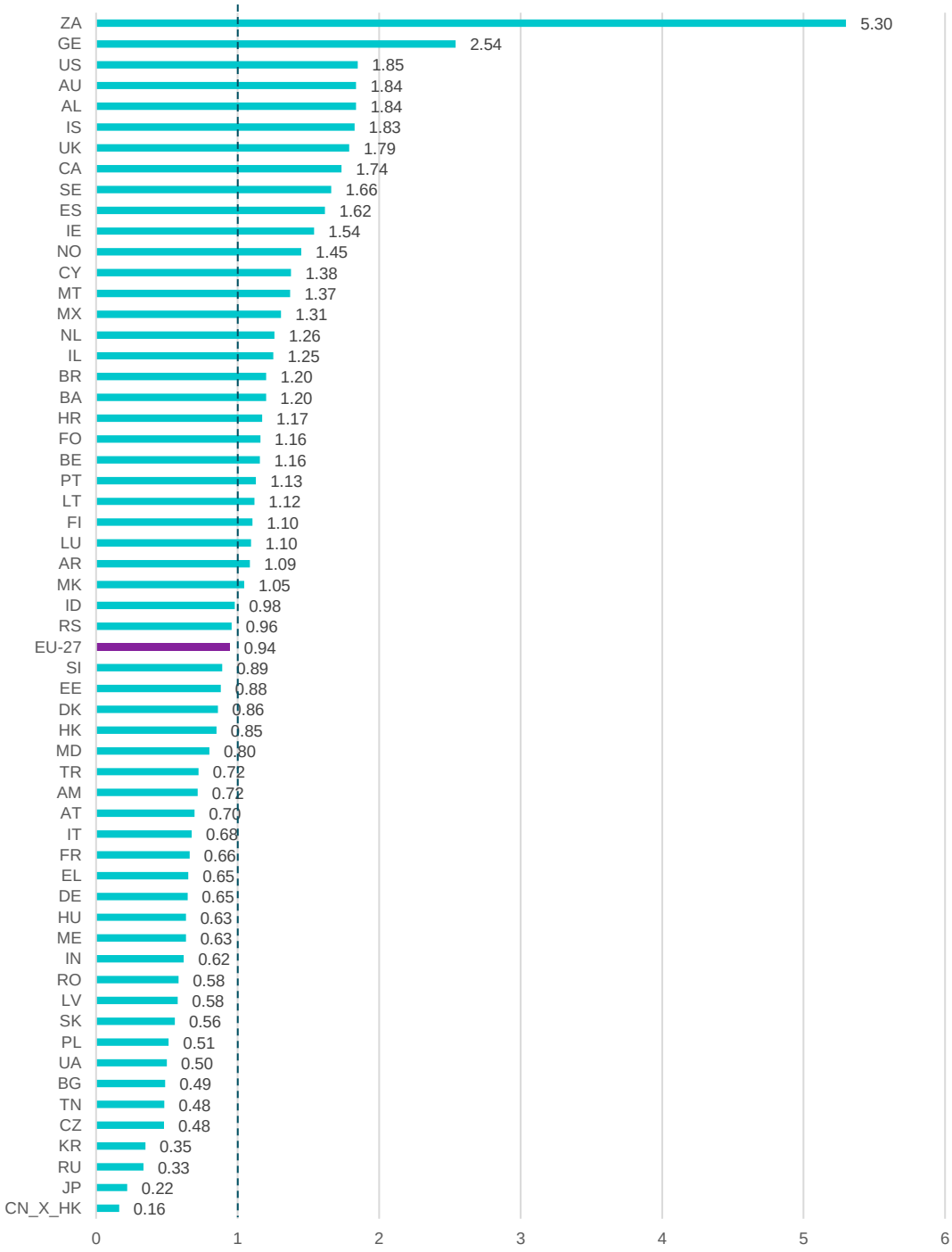
More specifically, the RAI represents the ratio of a country's percentage of SDG 5-contributing publications to the global percentage of SDG 5-contributing publications. If RAI >1.0, it indicates that the specific country is contributing more to SDG 5-focused research than the global average. If RAI <1.0, it suggests that the country is lagging behind the global average in SDG 5-focused research. If RAI is equal to 1.0, the country's contribution is in line with the global average.

At EU level, the RAI is 0.9. This indicates that the EU is producing slightly less research contributing to SDG 5 compared to the global average. The RAI varies quite substantially between individual Member States. The highest RAI scores are observed in Sweden (1.7), Spain (1.6) and Ireland (1.6), which show a greater than average contribution of research to SDG 5. The lowest RAI scores among Member States are in Bulgaria, Czechia and Poland, at 0.5, meaning a somewhat lower than average contribution of research activities to SDG 5.

Variation is also evident among Associated Countries, but to a greater extent. The lowest RAI is in Ukraine and Tunisia (0.5) and the highest is in Georgia (2.5, indicating a much greater relative contribution of research to SDG 5). Among G20 countries, even greater variation emerges: China and Japan had the lowest RAI scores at 0.2, while South Africa had the highest index score, at 5.3, indicating a significantly larger than average research contribution to SDG 5.

([623]) UN, SDG 5, n.d., https://sdgs.un.org/goals/goal5

Figure 7.18 RAI for research contributing to SDG 5 (%), 2018-2022



Source: Scopus.

Notes: Data not available: XK.

Annex indicators

Annex 7.1 Proportion (%) of women among active authors, by selected SDGs and seniority level, 2018-2022

Country	SDG 8 Decent Work and Economic Growth			SDG 12 Responsible Consumption and Production		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
WLD	**44.9**	**43.5**	**34.6**	**43.4**	**41.9**	**33.2**
EU-27	**49.2**	**47.7**	**36.6**	**45.0**	**43.8**	**36.8**
BE	51.7	52.3	27.0	37.9	33.7	32.2
BG	45.5	57.1	43.2	20.0	63.6	44.4
CZ	56.0	43.6	39.3	35.7	39.5	34.1
DK	52.4	49.3	33.1	45.0	37.9	38.0
DE	41.2	36.5	26.0	35.7	33.5	22.6
EE	100.0	80.0	46.4	66.7	40.0	34.4
IE	58.3	39.5	29.5	25.0	38.9	38.8
EL	52.0	48.8	29.8	58.3	42.7	31.5
ES	50.9	48.8	39.4	51.7	44.7	40.4
FR	48.6	43.9	30.5	41.9	35.9	35.4
HR	72.7	42.9	46.6	60.0	52.9	45.0
IT	47.2	46.6	37.3	48.4	48.6	37.1
CY	25.0	33.3	25.0	28.6	40.0	31.3
LV	85.7	81.3	69.7	42.9	76.9	59.6
LT	50.0	73.7	54.2	42.9	57.1	50.5
LU	75.0	0.0	6.7	50.0	0.0	28.6
HU	60.0	43.9	34.8	45.0	40.5	36.1
MT	-	50.0	0.0	0.0	50.0	16.7
NL	41.9	44.4	28.3	38.3	41.5	29.2
AT	41.2	40.9	32.4	36.8	41.1	24.8
PL	50.7	56.8	40.5	45.7	52.2	47.0
PT	43.1	53.2	46.8	52.9	48.5	47.5
RO	62.3	65.3	55.7	53.7	58.7	51.0
SI	50.0	22.2	54.4	0.0	44.0	47.2
SK	55.2	51.2	47.0	47.6	42.7	39.3
FI	51.7	54.0	46.6	54.3	54.5	39.4
SE	45.0	48.6	38.9	58.8	42.9	36.2
IS	80.0	0.0	35.0	83.3	80.0	41.7
NO	45.0	44.4	35.3	33.3	45.9	39.8
UK	43.2	45.4	33.9	38.1	38.7	31.5
BA	16.7	100.0	20.0	100.0	57.1	11.1
ME	66.7	100.0	100.0	75.0	75.0	100.0

Country	SDG 8 Decent Work and Economic Growth			SDG 12 Responsible Consumption and Production		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
MD	0.0	-	-	-	-	-
MK	50.0	66.7	28.6	-	40.0	33.3
AL	-	16.7	33.3	0.0	0.0	0.0
RS	60.0	56.9	49.2	64.3	64.6	44.3
TR	38.1	28.0	28.0	48.0	35.6	30.5
UA	63.7	60.6	57.4	63.9	72.0	28.9
GE	50.0	44.4	15.4	0.0	100.0	0.0
AM	100.0	100.0	0.0	-	-	-
FO	100.0	-	0.0	-	-	0.0
IL	28.6	40.0	27.8	70.0	56.3	31.8
TN	54.5	13.6	24.0	62.5	48.4	31.3
AR	40.0	52.6	48.5	47.4	48.7	61.4
AU	45.9	44.0	37.3	40.8	45.2	34.5
BR	48.5	42.0	36.4	45.8	44.7	39.4
CA	38.2	39.5	36.0	37.0	41.6	30.8
CN_X_HK	46.9	44.4	42.7	47.1	46.7	44.2
HK	62.5	38.9	36.1	55.6	45.0	30.4
IN	31.4	31.9	24.2	31.0	31.5	21.5
ID	39.4	34.9	25.4	43.2	40.7	26.0
JP	28.6	24.2	17.6	26.3	25.3	12.6
MX	45.2	35.5	32.5	47.5	31.4	32.1
RU	62.9	64.8	38.5	61.9	59.4	35.4
ZA	34.9	34.0	32.6	39.5	36.6	29.2
KR	35.1	25.4	18.6	34.1	33.0	15.3
US	46.0	42.9	33.1	45.9	41.7	30.5

Source: Scopus.

Notes: Data not available: XK; Division by zero: MT (Decent work and economic growth, <5 years), MD (Decent work and economic growth, 5-10 years, >10 years; Responsible consumption and production, all years), MK (Responsible consumption and production, <5 years), AL (Decent work and economic growth, <5 years), AM (Responsible consumption and production, all years), FO (Decent work and economic growth, 5-10 years; Responsible consumption and production, <5 years, 5-10 years).

Annex 7.2 Proportion (%) of women among all authors, by field of R&D, selected SDGs and seniority level, 2018-2022

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
WLD	**50.4**	**48.8**	**36.8**	**35.4**	**33.8**	**25.8**	**51.5**	**48.5**	**39.8**	**53.9**	**51.4**	**40.3**	**41.4**	**39.8**	**30.9**	**52.2**	**49.8**	**40.5**
EU-27	**56.4**	**54.5**	**42.5**	**32.4**	**31.7**	**26.2**	**52.5**	**48.8**	**37.9**	**59.7**	**57.1**	**43.6**	**41.8**	**40.3**	**33**	**53.6**	**50**	**39.4**
BE	54	50.7	37.5	29.5	29.8	24.1	53.9	48.4	34.7	56.3	54.6	39.8	40.5	38.3	30.6	53.3	50.2	34.8
BG	51.3	59.5	46.7	41.1	44.3	45.7	59.7	65.4	47.2	56.2	59.3	58.5	44.8	51.1	49.2	58.1	56.4	52.7
CZ	53.4	51.1	34.5	34.5	32.3	23.2	52.5	46.7	29.2	59.8	56.6	38.6	43.5	39.6	28.5	49.9	42.3	34.1
DK	54	55.4	37.7	31.6	30.1	20.8	49.2	48.7	34.9	62.8	57.5	41.3	42.2	40.6	28.9	55.5	52.2	37.2
DE	57.5	52.3	33.2	25.7	23.3	16.2	48.9	43.4	30	56.3	52.2	31.5	36.9	32.6	22.9	49.3	44.4	30.4
EE	55	56.3	42.4	37.9	26.3	27.3	67.1	59	52.2	73.6	68.4	54.2	55.6	45.8	36.3	63.9	58.4	51.6
IE	50.2	49	39.6	32.3	34.7	23.9	60.4	42.8	44.8	60	58	44.9	40.1	40.6	30.3	58.6	51.8	45.6
EL	54	54.8	34.7	37.1	33.5	21.8	55	55.3	44.9	54.8	50.2	39.1	44	40.3	28.9	51.7	47.4	31.7
ES	54.2	56.1	46.1	35.5	37.1	31	47	45	39.8	61.4	58.9	46.4	44.7	44.8	37.1	52	49.7	40.8
FR	53.6	54	39.8	31.9	31.7	24.2	52.6	48.3	36.8	59.2	55.6	44.1	41.7	39.8	31.6	52.7	48.1	37.7
HR	67.8	61.6	52.9	39.9	40.7	33.9	58.6	47.4	47.6	70.2	65.8	54.3	52	51	44	66.6	56.9	53.2
IT	57.1	53.6	46.8	35.5	36.9	33	48.7	48.3	40.2	58.3	59.1	48.5	43.4	45.8	40.5	53.2	50.1	42.6
CY	42.9	38.6	31.9	34.7	35.5	23.2	61.5	64.7	46.4	52.2	53.2	36.7	39.4	40.7	24.6	48.1	49.7	38.3
LV	60.7	61.3	55.6	45.1	47.9	37.8	72.3	69.4	54.2	70.2	71.9	56.5	52.1	53.2	41.1	68.5	66.5	60.4
LT	77.6	72.6	50.1	54.9	41.5	35.6	67.7	55.6	46.9	72.4	65.5	50.5	56.4	49.3	36	72.2	65.6	56.8
LU	27.8	38.5	30.9	27.7	18.3	13.2	87.5	50	40.9	62.1	43.7	34.9	38.7	26.9	21.9	53.1	31.4	31.1
HU	51.6	51.6	32.6	30.7	30.2	22.9	50.5	43.6	32.4	56.7	54.5	38.8	40.3	39.8	28.4	47.5	46.4	35.4
MT	40	36.4	32	30.2	24.6	12.1	45.5	70	23.3	56.5	44.6	27.9	34.6	25	16.4	47.8	55	24

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
NL	52.3	52.3	34.8	31.1	30.6	19.5	56.9	54.1	34.7	61.4	59.1	41.7	40.7	40.9	29.3	56.7	54.5	38.7
AT	48.3	50.3	36.0	27.7	24.8	16.5	57.5	47.9	35.6	53.6	51.7	34.6	37.6	34.7	24.8	48.7	46.9	31.9
PL	66.2	62.5	51.4	41.9	42.0	31.6	54.6	52.9	41.9	67.2	64.9	53.6	49.8	50.1	39.5	55.7	54.6	41.7
PT	58.4	63.4	56.1	41.2	42.3	37.5	59.6	55.0	51.3	62.6	61.1	54.7	45.3	49.1	44.1	55.5	54.2	47.7
RO	56.7	51.9	56.5	49.2	48.3	47.0	63.2	55.4	41.0	61.2	61.6	56.5	49.6	50.9	46.8	61.9	55.3	52.2
SI	70.7	63.2	50.2	37.3	38.1	29.1	65.0	58.0	43.7	69.7	59.3	49.5	47.7	44.3	35.3	63.9	55.6	44.4
SK	64.9	52.1	43.3	37.6	37.5	30.5	55.8	55.9	36.0	65.5	61.7	49.3	47.3	45.7	36.7	48.8	51.7	45.5
FI	58.9	57.6	45.3	31.3	32.3	26.5	67.6	56.1	47.8	65.0	61.4	52.7	41.4	40.9	34.7	61.2	58.1	46.3
SE	61.6	48.6	39.5	31.4	29.9	23.2	55.4	49.7	39.9	60.9	56.0	44.8	42.1	39.0	31.6	59.6	51.2	42.1
IS	51.3	48.0	29.1	33.3	30.6	20.6	64.7	38.1	40.0	58.8	48.2	41.6	37.6	37.0	29.6	75.4	63.6	41.3
NO	55.0	51.2	39.7	30.3	31.2	22.8	55.4	51.1	40.4	64.9	59.0	45.5	39.2	39.5	30.3	55.2	53.8	39.3
UK	53.5	50.0	36.9	30.0	28.4	20.9	55.7	47.1	39.4	56.7	53.3	39.9	40.3	37.0	28.4	56.0	50.2	40.7
BA	58.3	45.6	42.7	30.6	31.8	27.7	40.0	66.7	55.6	71.3	54.1	53.3	41.4	37.7	37.5	48.6	53.1	40.0
ME	50.0	62.5	70.0	41.9	54.3	32.8	52.9	64.7	33.3	65.9	55.8	55.4	48.5	52.6	46.5	55.9	53.4	40.9
MD	60.0	50.0	50.0	50	35.9	28.8	40.0	45.5	0.0	58.7	69.4	35.9	55.6	43.5	29.4	43.5	42.9	66.7
MK	63.5	56.8	44.2	48.7	46.2	37.0	56.3	27.8	66.7	65.2	62.3	59.3	51.4	44.1	41.4	62.5	55.2	55.6
AL	55.6	33.3	16.0	28.6	31.8	31.4	60.7	35.7	30.0	56.4	47.1	20.6	59.3	43.4	25.5	61.4	38.5	33.3
RS	53.7	62.3	55.2	42.4	43.2	41.1	59.8	60.2	49.4	64.4	60.5	56.4	48.6	51.6	47.6	57.0	52.7	45.9
TR	53.0	45.9	27.0	40.5	33.7	24.6	47.9	42.9	42.3	55.8	46.0	35.4	44.0	38.7	28.4	51.7	42.6	35.6
UA	47.3	50.2	40.9	38.6	39.5	26.2	58.3	40.5	37.0	63.6	63.2	47.6	43.0	43.8	29.0	53.9	49.7	35.9
GE	56.3	68.8	40.9	45.3	45.8	32.5	43.8	61.9	38.5	61.8	60.4	50.0	49.2	53.0	36.5	64.7	68.3	42.5

Country	Agricultural and veterinary sciences			Engineering and technology			Humanities and the arts			Medical and health sciences			Natural sciences			Social sciences		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
AM	33.3	64.3	46.2	26.2	31.4	32.9	68.4	44.4	0.0	61.6	59.2	57.3	35.8	41.5	31.5	59.5	38.9	38.1
FO	100.0	54.5	27.3	0.0	-	0.0	100.0	-	-	62.5	66.7	50.0	50.0	50.0	27.3	75.0	100.0	0.0
IL	44.9	46.6	34.1	30.4	31.4	22.6	46.6	39.5	39.7	54.6	51.6	39.8	39.7	38.6	29.7	55.8	47.0	42.0
TN	66.4	67.5	37.5	58.6	53.4	24.2	53.8	56.0	46.4	57.5	59.5	44.0	59.6	56.7	30.9	63.0	50.8	31.3
AR	59.3	63.4	54.1	34.8	43.2	43.6	53.6	48.9	46.3	59.5	57.5	52.3	49.6	52.5	49.4	54.9	54.0	50.3
AU	54.9	53.0	34.2	33.4	30.9	24.0	59.5	56.9	48.6	59.7	57.3	45.8	42.5	41.0	31.3	60.0	56.9	47.8
BR	56.1	53.6	42.4	40.0	39.2	30.7	54.6	47.8	49.8	63.1	60.9	51.9	47.5	46.7	38.3	51.7	47.5	42.2
CA	55.5	51.4	36.5	31.0	28.7	21.5	55.4	51.2	44.5	59.0	54.9	44.2	40.8	38.0	29.5	59.6	57.2	46.1
CN_X_HK	51.9	50.2	44.4	42.4	42.8	41.0	48.2	47.9	41.4	55.4	53.4	48.6	46.2	46.3	42.9	50.9	48.9	44.0
HK	46.8	39.3	27.1	38.6	35.2	25.8	50.7	50.0	36.4	47.8	47.2	36.8	40.8	38.8	27.9	51.6	46.6	35.4
IN	37.5	35.1	20.4	31.8	28.8	19.9	42.1	37.0	33.4	41.5	38.1	28.4	34.9	31.9	21.8	37.9	34.9	26.3
ID	47.4	46.9	37.3	39.4	36.1	25.7	40.7	44.7	35.4	59.1	52.2	41.4	43.3	40.5	30.3	41.5	38.3	29.5
JP	36.6	35.3	18.2	17.2	16.9	9.5	28.9	24.7	19.8	36.1	30.8	17.6	24.5	23.2	13.4	34.0	30.9	20.4
MX	46.2	39.7	33.8	36.6	30.8	26.9	45.2	43.0	34.2	49.2	45.5	42.3	41.6	36.9	31.7	49.7	43.6	37.1
RU	57.2	56.3	49.7	40.7	36.2	26.3	64.6	58.8	39.6	59.4	57.7	48.2	44.8	40.9	30.8	63.2	61.7	41.3
ZA	54.3	48.8	35.4	36.5	29.6	23.8	50.5	41.7	42.3	60.3	55.4	45.2	44.7	38.4	31.0	51.3	46.6	41.9
KR	36.8	33.5	23.1	25.2	21.9	13.3	49.7	40.8	23.3	37.2	35.3	23.2	29.7	27.0	17.0	40.7	34.0	21.4
US	54.1	49.7	33.9	31.1	29.4	21.0	54.0	49.7	41.6	55.5	52.2	40.0	40.8	38.2	28.7	58.9	55.9	43.7

Country	SDG 8 Decent Work and Economic Growth			SDG 12 Responsible Consumption and Production		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
WLD	**47.4**	**45.5**	**35.3**	**44.6**	**43.0**	**33.4**
EU-27	**50.0**	**48.5**	**37.4**	**46.6**	**44.6**	**36.8**
BE	53.7	50.7	28.7	40.9	35.3	33.7
BG	62.2	59.3	50.8	41.2	60.0	46.8
CZ	56.6	46.1	41.6	35.5	40.5	34.1
DK	42.2	52.8	34.4	48.0	43.1	37.1
DE	44.3	37.4	27.2	42.2	36.6	23.2
EE	60.0	71.4	45.5	80.0	33.3	38.5
IE	54.3	39.1	30.8	32.6	37.8	37.4
EL	62.0	49.3	31.0	61.0	43.1	32.5
ES	45.5	48.9	39.8	46.7	46.1	40.4
FR	42.1	46.1	32.8	43.1	39.5	35.5
HR	64.6	50.0	49.1	68.3	62.3	51.1
IT	45.3	48.1	38.3	46.6	46.9	37.5
CY	38.5	37.5	31.8	40.9	48.0	32.4
LV	64.5	75.0	67.6	55.9	67.5	55.4
LT	75.7	74.2	53.1	67.6	57.7	48.2
LU	60.0	6.7	5.6	30.0	12.5	35.3
HU	51.8	50.8	31.9	50.0	43.6	36.9
MT	66.7	80.0	14.3	66.7	66.7	14.3
NL	50.5	45.0	29.0	46.0	42.4	27.3

Country	SDG 8 Decent Work and Economic Growth			SDG 12 Responsible Consumption and Production		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
AT	41.0	43.0	31.8	32.5	40.2	25.2
PL	57.8	57.3	40.1	50.4	51.8	45.7
PT	50.5	52.8	46.7	51.4	48.3	46.8
RO	63.5	61.2	55.9	56.8	60.1	51.6
SI	61.9	41.2	53.2	29.2	51.3	48.2
SK	52.9	54.6	45.6	54.1	43.2	40.3
FI	53.7	55.3	46.5	48.5	56.9	38.8
SE	54.7	50.0	39.7	53.1	43.5	38.1
IS	63.6	33.3	34.8	50.0	66.7	43.8
NO	43.6	53.7	34.4	40.3	41.9	39.7
UK	46.6	46.1	35.1	40.1	40.7	31.4
BA	27.8	71.4	16.7	62.5	41.7	9.1
ME	50.0	66.7	100.0	83.3	75.0	100.0
MD	50.0	75.0	-	100.0	0.0	-
MK	77.8	66.7	33.3	100.0	40.0	45.5
AL	70.0	37.5	57.1	0.0	0.0	20.0
RS	51.0	54.3	52.3	53.6	63.9	43.8
TR	46.3	30.6	30.6	48.7	36.3	31.6
UA	60.8	58.8	58.2	62.9	67.9	25.9
GE	58.8	44.4	20.0	57.1	66.7	16.7
AM	85.7	66.7	0.0	33.3	-	100.0

Country	SDG 8 Decent Work and Economic Growth			SDG 12 Responsible Consumption and Production		
	< 5 Years	5-10 Years	> 10 Years	< 5 Years	5-10 Years	> 10 Years
FO	100.0	-	0.0	-	-	0.0
IL	40.0	45.7	24.7	39.0	53.3	31.4
TN	50.0	32.4	20.6	62.5	52.1	28.3
AR	50.0	48.6	54.1	47.6	52.9	63.7
AU	44.7	43.8	36.8	43.9	45.9	35.3
BR	52.2	46.5	37.6	49.0	44.6	39.3
CA	45.3	47.2	37.2	47.0	45.5	31.8
CN_X_HK	50.5	46.2	43.4	48.0	47.6	43.3
HK	43.6	45.2	36.4	47.9	46.3	30.0
IN	35.1	34.8	25.6	34.7	33.3	21.9
ID	43.2	37.0	25.3	45.2	43.6	27.5
JP	32.5	28.4	18.9	23.4	23.5	12.7
MX	45.3	36.5	32.6	44.2	40.5	31.9
RU	60.9	66.8	37.9	60.4	60.1	33.6
ZA	45.5	38.9	33.1	51.4	41.8	28.7
KR	37.7	27.7	18.2	37.7	31.2	16.4
US	50.7	45.4	33.9	45.5	43.6	31.2

Source: Scopus.

Notes: Data not available: XK; Division by zero: MD (Decent work and economic growth, >10 years; Responsible consumption and production, >10 years), AM (Responsible consumption and production, 5-10 years), FO (Engineering and Technology, 5-10 years; Humanities and the Arts, 5-10 years, more than 10 years; Decent work and economic growth, 5-10 years; Responsible consumption and production, <5 years, 5-10 years).

Annex 7.3 Average proportion (%) of women among authors on publications, by selected SDGs, 2013-2017 and 2018-2022

Country	SDG 8 Decent Work and Economic Growth		SDG 12 Responsible Consumption and Production	
	2013-2017	2018-2022	2013-2017	2018-2022
WLD	**36.8**	**39.3**	**34.1**	**36.9**
EU-27	**37.1**	**40.1**	**34.9**	**38.4**
BE	33.6	34.8	29.9	34.1
BG	45.4	54.9	49.7	50.6
CZ	43.8	40.4	33.2	35.2
DK	32.0	35.5	33.4	36.4
DE	28.8	33.8	24.5	30.1
EE	50.9	44.8	34.0	35.6
IE	37.2	37.8	31.2	34.6
EL	31.6	33.5	32.4	35.4
ES	37.2	39.9	38.0	40.5
FR	32.8	33.7	31.6	33.8
HR	49.5	49.9	45.7	48.7
IT	35.7	38.8	36.0	39.3
CY	28.8	28.1	32.2	31.3
LV	65.0	66.5	59.7	55.8
LT	57.5	55.1	47.8	47.2
LU	28.5	29.1	23.1	28.7
HU	36.6	38.5	30.5	35.7
MT	25.2	35.1	27.5	35.2
NL	30.9	36.3	28.9	34.9
AT	31.2	34.9	26.5	31.4
PL	47.8	48.4	46.4	46.6

Country	SDG 8 Decent Work and Economic Growth		SDG 12 Responsible Consumption and Production	
	2013-2017	2018-2022	2013-2017	2018-2022
PT	41.3	45.1	41.5	44.9
RO	56.4	55.6	51.6	50.2
SI	42.9	46.9	40.8	44.2
SK	51.7	50.3	42.8	43.8
FI	41.3	42.5	38.1	38.8
SE	36.4	40.1	35.0	37.4
IS	43.5	53.7	39.3	50.0
NO	33.6	38.7	30.1	36.2
UK	33.5	36.3	30.8	33.8
BA	37.9	44.8	37.1	41.1
ME	48.2	55.3	52.4	53.6
MD	44.5	58.7	27.0	48.4
MK	43.1	44.1	46.4	49.0
AL	56.7	53.3	48.5	47.8
RS	44.1	45.2	47.7	44.0
TR	31.2	30.5	36.8	35.2
UA	59.1	60.2	42.3	52.6
GE	36.0	43.6	33.0	35.5
AM	38.5	48.4	22.4	45.8
FO	31.3	59.4	44.4	46.9
IL	36.3	37.5	35.8	39.1
TN	26.2	30.3	31.8	37.6
AR	42.4	46.3	45.3	47.6
AU	36.0	37.8	34.0	34.5

Country	SDG 8 Decent Work and Economic Growth		SDG 12 Responsible Consumption and Production	
	2013-2017	2018-2022	2013-2017	2018-2022
BR	39.8	41.0	40.0	41.0
CA	35.3	37.7	30.7	33.0
CN_X_HK	43.9	42.3	42.5	41.0
HK	33.5	35.9	31.4	31.0
IN	28.2	30.2	25.0	26.2
ID	34.5	38.3	35.3	39.2
JP	20.1	24.1	17.6	22.6
MX	32.3	36.3	32.1	36.2
RU	52.8	53.7	44.3	48.9
ZA	33.2	34.9	32.7	34.4
KR	21.5	26.1	20.3	24.6
US	35.0	37.3	31.6	35.6

Source: Scopus.

Notes: Data not available: XK.

Annex 7.4 Average proportion (%) of women among authors on publications resulting from intra-EU-27+ collaboration in all fields of R&D, 2018-2022

Country	Proportion of women (%)
WLD	**32.5**
EU-27	**32.5**
BE	32.6
BG	39.4
CZ	30.6
DK	33.2
DE	28.6
EE	34.2
IE	34.0
EL	30.4
ES	34.5
FR	30.3
HR	40.2
IT	33.3
CY	29.9
LV	41.7
LT	39.7
LU	27.6
HU	31.3
MT	30.8
NL	32.6
AT	29.1
PL	35.6
PT	39.5
RO	38.6
SI	36.2
SK	36.0
FI	34.2
SE	34.2

Source: Scopus.

Notes: Data not applicable as no intra-EU-27 possible: IS, NO, UK, BA, ME, MD, MK, AL, RS, TR, UA, XK, GE, AM, FO, IL, TN, AR, AU, BR, CA, CN_X_HK, HK, IN, ID, JP, MX, RU, ZA, KR, US.

Annex 7.5 Average proportion (%) of women among authors on publications resulting from national collaboration in all fields of R&D, 2018-2022

Country	Proportion of women (%)
WLD	**37.5**
EU-27	**37.8**
BE	32.8
BG	50.8
CZ	33.3
DK	40.9
DE	27.5
EE	46.0
IE	42.2
EL	32.2
ES	42.4
FR	33.6
HR	52.1
IT	40.3
CY	31.7
LV	52.0
LT	46.3
LU	25.6
HU	33.9
MT	41.6
NL	40.4
AT	27.9
PL	45.6
PT	45.0
RO	52.1
SI	42.1
SK	43.3
FI	45.6
SE	42.3
IS	44.2
NO	40.8
UK	39.1
BA	47.9
ME	50.6
MD	38.9
MK	50.3
AL	53.2
RS	49.3
TR	36.5
UA	42.6
GE	39.7
AM	36.1
FO	51.1
IL	38.1
TN	41.1
AR	50.1
AU	44.2
BR	42.9
CA	42.2

Country	Proportion of women (%)
CN_X_HK	42.9
HK	36.1
IN	25.7
ID	38.3
JP	15.9
MX	34.4
RU	37.0
ZA	39.7
KR	22.8
US	38.8

Source: Scopus.

Notes: Data not available: XK.

Annex 7.6 Ratio of fractional FWCI for women authors to men authors on publications, by field of R&D, 2017 and 2022

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2017	2022	2017	2022	2017	2022	2017	2022	2017	2022	2017	2022
WLD	**1.01**	**0.99**	**0.95**	**0.95**	**0.97**	**0.94**	**0.96**	**0.95**	**0.93**	**0.94**	**0.93**	**0.93**
EU-27	**0.99**	**0.97**	**0.95**	**0.92**	**0.93**	**0.92**	**0.91**	**0.91**	**0.94**	**0.94**	**0.88**	**0.90**
BE	0.95	0.96	0.99	0.97	1.03	1.08	0.86	0.91	1.01	1.01	0.98	1.03
BG	0.76	0.88	0.84	0.83	0.86	0.74	0.63	0.61	0.74	0.81	0.83	0.82
CZ	0.95	0.89	0.96	1.01	0.93	1.01	0.79	0.80	0.94	0.97	0.81	0.84
DK	1.00	0.98	0.92	0.96	0.95	0.96	0.84	0.85	0.98	0.97	0.92	0.93
DE	1.00	0.96	1.01	0.99	1.05	0.96	0.96	0.97	1.01	0.99	0.94	0.98
EE	1.03	0.92	1.16	0.86	0.91	0.65	0.61	0.68	0.94	0.89	0.91	0.63
IE	1.11	1.03	1.03	0.93	1.05	0.94	0.84	0.89	1.05	0.93	0.93	0.84
EL	0.99	0.95	0.97	0.84	0.84	0.80	0.93	0.91	0.97	0.93	0.93	0.88
ES	0.99	0.99	0.94	0.89	1.10	0.99	0.78	0.83	0.94	0.93	0.92	0.92
FR	0.98	0.97	0.97	0.97	0.91	0.83	0.84	0.88	0.98	0.99	0.80	0.86
HR	1.00	0.96	0.83	0.83	0.78	0.86	0.60	0.65	0.83	0.82	0.77	0.69
IT	0.98	0.98	0.94	0.91	0.88	0.96	0.86	0.89	0.93	0.93	0.87	0.88
CY	0.99	1.04	0.99	0.81	0.68	0.84	0.88	0.71	0.97	0.86	0.75	0.67
LV	0.73	0.78	1.00	0.93	0.71	0.80	0.62	0.53	0.86	0.96	0.90	0.80
LT	0.97	1.01	0.97	0.83	1.19	0.61	0.71	0.63	0.86	0.89	0.75	0.72
LU	1.04	0.99	1.04	0.87	0.83	0.44	0.81	0.84	1.01	1.01	1.12	0.76
HU	1.05	0.99	1.02	0.90	0.91	1.07	0.81	0.88	1.00	0.98	1.06	1.01
MT	1.08	1.18	1.04	0.99	0.67	0.29	0.87	0.69	1.13	1.18	1.05	0.64
NL	1.01	0.99	0.99	0.98	0.90	0.98	0.84	0.87	1.00	1.00	0.87	1.00
AT	1.00	0.94	0.99	1.00	0.95	0.84	0.92	0.94	0.99	1.02	0.88	0.94

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2017	2022	2017	2022	2017	2022	2017	2022	2017	2022	2017	2022
PL	0.92	0.94	0.97	0.87	0.83	0.66	0.65	0.71	0.87	0.88	0.86	0.85
PT	1.01	0.98	0.93	0.85	0.86	0.85	0.71	0.75	0.93	0.90	0.83	0.91
RO	0.92	0.95	0.84	0.85	0.79	0.97	0.61	0.67	0.77	0.84	0.89	0.89
SI	0.91	0.86	0.88	0.81	0.77	0.77	0.81	0.80	0.81	0.86	0.76	0.62
SK	0.88	0.92	0.90	0.90	1.07	0.90	0.58	0.70	0.85	0.88	0.92	0.76
FI	1.01	0.99	0.89	0.89	1.07	1.12	0.75	0.81	0.89	0.90	0.89	0.83
SE	0.97	0.95	1.00	0.97	0.87	1.00	0.82	0.85	0.98	0.97	0.91	0.94
IS	1.07	0.88	1.01	0.97	0.90	0.89	0.68	0.78	1.04	1.02	0.86	0.73
NO	1.02	1.01	1.04	0.95	1.19	1.00	0.80	0.86	1.01	0.96	0.92	0.89
UK	0.99	0.95	1.01	0.97	0.97	1.03	0.89	0.94	0.98	0.98	0.93	0.95
BA	1.05	0.87	0.94	0.83	1.22	0.76	0.64	0.61	0.72	0.82	0.98	0.80
ME	0.69	0.75	0.73	0.62	1.07	0.96	0.85	0.52	0.77	0.72	0.52	0.89
MD	0.55	1.28	0.86	0.89	0.25	3.05	0.87	0.83	1.16	1.13	0.57	2.60
MK	0.84	0.93	1.09	1.08	0.69	0.43	0.58	0.62	0.88	0.87	1.25	0.88
AL	0.83	0.76	0.81	0.75	0.54	0.49	1.12	0.62	0.92	0.82	0.84	0.70
RS	0.93	1.06	0.94	0.75	0.90	1.36	0.53	0.65	0.80	0.76	0.86	0.85
TR	1.05	0.91	0.89	0.77	1.13	0.94	0.90	0.86	0.88	0.77	0.88	0.70
UA	0.96	0.79	0.97	0.98	0.87	0.77	0.48	0.57	0.90	0.98	0.94	0.87
GE	0.85	0.55	0.82	0.73	0.95	0.49	0.64	0.66	0.96	0.85	1.27	0.60
AM	0.68	0.70	0.98	0.73	0.59	0.72	0.63	0.57	0.91	0.76	0.62	0.98
FO	0.56	1.39	1.24	1.28	3.00	2.45	0.99	0.84	0.81	0.89	1.13	1.48
IL	0.93	1.05	1.01	1.05	0.95	1.09	0.88	0.94	1.01	1.03	1.04	1.03
TN	1.01	0.91	0.95	0.86	0.77	0.90	0.78	0.69	0.96	0.84	0.80	0.85

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2017	2022	2017	2022	2017	2022	2017	2022	2017	2022	2017	2022
AR	0.96	0.94	0.97	0.94	0.91	0.95	0.70	0.80	0.87	0.92	0.79	0.93
AU	1.02	0.98	0.99	0.96	0.95	0.88	0.86	0.89	0.98	0.94	0.93	0.92
BR	0.99	0.98	0.99	0.94	0.85	0.92	0.76	0.80	0.91	0.93	0.83	0.84
CA	1.00	1.00	1.02	0.95	0.86	1.00	0.84	0.88	0.96	0.95	0.93	0.95
CN_X_HK	0.94	0.94	0.94	0.95	0.91	0.87	0.89	0.90	0.91	0.93	0.89	0.87
HK	1.04	1.00	0.95	0.97	1.02	0.92	0.89	0.93	0.98	0.94	0.91	0.91
IN	1.03	0.94	0.88	0.87	0.74	0.67	0.95	0.85	0.89	0.88	0.83	0.78
ID	0.88	0.88	0.84	0.94	0.82	0.87	0.63	0.76	0.91	0.91	0.82	0.89
JP	1.06	1.11	1.09	1.13	0.82	0.90	1.15	1.13	1.10	1.11	1.04	1.04
MX	1.07	1.08	0.97	0.96	0.98	0.91	0.82	0.89	0.99	0.95	0.88	0.92
RU	0.83	0.80	0.91	0.92	1.01	0.85	0.58	0.67	0.89	0.88	0.94	0.71
ZA	1.02	0.99	0.96	0.88	1.01	1.07	0.79	0.91	0.97	0.97	0.89	0.90
KR	0.97	0.94	1.04	0.99	0.92	0.75	1.00	0.97	0.98	0.96	0.99	0.83
US	0.99	0.97	0.99	0.97	0.92	0.92	0.93	0.94	0.94	0.96	0.90	0.93

Source: Scopus.

Notes: Data not available: XK.

Annex 7.7 CAGR (%) of ratio of fractional FWCI for women authors to men authors on publications, by field of R&D, 2013-2022

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
WLD	**-0.26**	**0.99**	**-0.19**	**-0.19**	**0.31**	**0.01**
EU-27	**-0.09**	**0.16**	**1.06**	**0.00**	**0.25**	**0.51**
BE	-0.65	0.48	0.63	0.73	0.41	0.80
BG	0.08	0.10	0.17	-2.29	0.57	1.81
CZ	-0.75	0.31	8.38	1.24	0.68	1.04
DK	-0.25	0.51	1.82	-0.48	0.20	0.37
DE	-0.14	0.16	1.46	-0.11	0.09	0.78
EE	-2.30	-1.65	-0.58	1.90	0.41	-2.12
IE	1.43	-0.35	-0.39	-0.69	-0.65	-0.71
EL	-0.53	-1.31	1.36	0.17	-0.40	-0.60
ES	-0.55	-0.33	1.86	0.02	-0.27	0.40
FR	-0.21	0.33	1.31	0.78	0.41	0.83
HR	-1.06	0.77	-1.02	-2.15	0.78	-1.35
IT	0.06	0.63	2.44	0.52	0.41	0.17
CY	0.55	-0.35	-3.22	-5.52	-0.49	-2.88
LV	-1.06	-1.05	0.65	-1.95	-0.15	1.20
LT	1.86	-0.69	-3.80	-3.45	1.12	1.52
LU	-0.91	0.32	-7.49	2.16	1.30	-1.23
HU	-0.72	-0.90	1.43	0.09	-0.50	-1.27
MT	-2.25	-2.73	14.46	-8.86	-1.33	1.50
NL	0.48	0.27	0.83	-0.18	0.32	0.91
AT	-0.81	-0.62	-2.42	-0.19	0.31	0.65
PL	0.25	-0.64	0.71	1.17	0.71	1.05
PT	-1.00	-0.12	0.56	-1.85	-0.02	0.34
RO	-1.10	0.39	3.69	1.09	1.47	1.94
SI	-1.97	-0.88	-0.77	-0.66	0.75	-1.67
SK	-0.92	-0.10	0.69	-1.60	-0.02	-1.09
FI	0.03	-0.26	2.06	-0.39	-0.36	0.37
SE	-0.72	0.60	1.07	-0.24	0.09	0.84
IS	-0.45	1.79	-2.98	-0.85	-0.36	-3.28
NO	0.59	0.15	3.17	0.28	-0.02	0.57
UK	-0.63	-0.27	1.03	0.22	-0.19	-0.02
BA	0.32	3.22	3.08	-3.97	1.58	2.78
ME	-3.30	-6.47	7.30	-7.71	-3.34	3.53
MD	5.42	-0.02	-4.83	-0.85	2.74	2.57

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
MK	1.59	6.53	8.51	0.27	1.53	9.16
AL	3.58	-2.25	-2.57	-3.29	1.03	2.65
RS	0.94	-2.28	3.53	-3.20	-0.08	0.11
TR	-1.68	-2.08	-0.59	-1.35	-1.32	-2.93
UA	-0.14	0.79	-7.13	-1.79	1.85	6.81
GE	-5.86	0.65	-7.54	-2.83	-0.88	-1.02
AM	-3.31	-3.69	29.28	-6.88	-2.11	8.15
FO	5.07		4.54	-5.28	-3.88	-4.26
IL	-0.13	1.25	1.21	0.34	0.65	1.72
TN	-2.32	-2.07	-2.16	-1.85	-1.70	2.55
AR	-0.41	-0.64	3.30	1.20	1.03	2.91
AU	-0.19	-0.57	-0.52	0.10	-0.43	-0.41
BR	0.31	-0.49	1.79	-0.29	0.45	0.83
CA	0.00	-0.53	0.14	0.39	-0.37	0.30
CN_X_HK	-0.56	0.31	1.23	0.28	0.15	0.27
HK	-0.61	0.43	-0.27	-0.18	-0.24	0.31
IN	-0.38	0.08	-2.50	-1.23	-0.03	-0.73
ID	1.04	-0.16	-2.62	-2.39	-0.04	-1.16
JP	0.58	0.20	1.24	0.21	0.47	1.01
MX	0.63	-0.11	-3.15	0.99	0.25	1.13
RU	0.75	0.67	4.38	1.26	1.13	-0.79
ZA	0.54	-0.42	-0.49	0.28	0.33	-1.16
KR	-0.52	-0.91	-4.67	-0.75	-0.82	-2.24
US	-0.38	-0.39	-0.07	-0.09	0.17	0.25

Source: Scopus.

Notes: Data not available: XK; Zero values or division by zero: FO (Engineering and Technology).

Annex 7.8 Proportion (%) of publications for which a woman is corresponding author, by selected SDGs, 2013-2017 and 2018-2022

Country	SDG 8 Decent Work and Economic Growth		SDG 12 Responsible Consumption and Production	
	2013-2017	2018-2022	2013-2017	2018-2022
WLD	36.8	38.5	35.4	36.7
EU-27	38.2	40.9	38.3	40.5
BE	36.5	37.8	35.1	39.0
BG	42.3	53.5	51.7	48.3
CZ	44.4	38.2	31.9	34.6
DK	34.7	38.8	39.0	38.4
DE	30.1	34.7	28.1	32.7
EE	52.0	45.6	38.2	33.0
IE	37.9	39.1	33.0	36.7
EL	32.1	33.3	31.9	32.4
ES	38.3	39.9	40.7	41.2
FR	34.2	34.4	34.4	34.7
HR	48.5	49.5	48.9	48.6
IT	36.2	40.5	40.2	42.6
CY	25.0	23.4	20.9	27.8
LV	63.4	67.4	65.6	55.9
LT	59.9	54.0	51.3	45.3
LU	29.6	33.0	20.3	32.5
HU	37.1	40.0	31.6	35.3
MT	25.5	39.3	34.7	36.3
NL	34.8	38.8	34.3	38.8
AT	34.6	35.1	34.1	33.6
PL	51.5	48.8	52.0	48.2
PT	42.4	44.8	46.0	47.2
RO	55.8	55.0	56.3	51.3
SI	44.4	47.7	42.4	46.2
SK	50.0	50.7	41.2	45.4
FI	48.4	44.7	45.3	40.6
SE	39.8	43.3	41.7	41.7
IS	46.0	59.3	52.9	50.7
NO	36.9	39.5	34.6	38.3
UK	34.6	37.1	33.9	34.5
BA	35.4	47.1	28.6	47.6
ME	47.1	55.4	66.7	50.0
MD	37.5	58.3	16.7	55.2
MK	46.0	49.2	50.0	46.3
AL	58.5	48.0	55.2	44.7
RS	44.5	45.6	52.0	46.9

Country	SDG 8 Decent Work and Economic Growth		SDG 12 Responsible Consumption and Production	
	2013-2017	2018-2022	2013-2017	2018-2022
TR	29.5	27.6	35.9	32.9
UA	55.5	62.1	32.9	52.1
GE	38.5	36.4	60.0	26.4
AM	44.4	62.8	28.6	35.7
FO	100.0	40.0	50.0	42.9
IL	38.3	37.9	39.5	37.4
TN	25.6	31.4	33.6	41.0
AR	42.7	44.9	55.3	49.4
AU	37.5	38.1	36.9	35.1
BR	38.5	41.3	39.8	40.0
CA	36.4	37.9	31.2	33.5
CN_X_HK	40.9	38.9	38.9	37.7
HK	33.5	33.9	31.2	28.6
IN	28.2	27.6	23.1	23.2
ID	35.0	38.2	36.8	40.8
JP	21.3	24.0	20.1	22.7
MX	31.1	34.4	29.4	34.1
RU	48.7	51.9	46.1	46.9
ZA	35.6	36.1	34.0	36.6
KR	19.1	21.2	16.3	19.0
US	36.1	37.9	33.9	36.8

Source: Scopus.

Notes: Data not available: XK.

Annex 7.9 Proportion (%) of women with corresponding authorships in all fields of R&D, intra-EU-27+ collaboration, 2018-2022

Country	Proportion of women (%)
WLD	**35.0**
EU-27	**35.0**
BE	35.6
BG	41.2
CZ	31.4
DK	36.5
DE	30.7
EE	36.7
IE	36.8
EL	29.9
ES	35.8
FR	32.5
HR	41.5
IT	35.7
CY	28.2
LV	44.9
LT	41.4
LU	30.2
HU	31.9
MT	37.1
NL	36.9
AT	31.0
PL	39.2
PT	42.9
RO	42.8
SI	38.2
SK	37.1
FI	39.6
SE	38.5

Source: Scopus.

Notes: Data not applicable as no intra-EU-27 possible: IS, NO, UK, BA, ME, MD, MK, AL, RS, TR, UA, XK, GE, AM, FO, IL, TN, AR, AU, BR, CA, CN_X_HK, HK, IN, ID, JP, MX, RU, ZA, KR, US.

Annex 7.10 Proportion (%) of women with corresponding authorships in all fields of R&D, national collaboration, 2018-2022

Country	Proportion of women (%)
WLD	36.6
EU-27	39.4
BE	36.2
BG	56.9
CZ	31.7
DK	47.6
DE	29.7
EE	48.3
IE	45.4
EL	30.7
ES	39.4
FR	33.8
HR	55.0
IT	39.9
CY	28.6
LV	59.2
LT	47.6
LU	27.6
HU	33.4
MT	54.1
NL	49.1
AT	29.0
PL	50.4
PT	49.1
RO	57.1
SI	42.2
SK	45.5
FI	52.9
SE	48.3
IS	45.8
NO	48.4
CH	32.8
UK	40.1
BA	52.4
ME	56.3
MD	53.1
MK	58.8
AL	56.4
RS	53.8
TR	36.5

Country	Proportion of women (%)
UA	43.2
GE	36.6
AM	29.6
FO	83.3
IL	35.9
TN	46.8
AR	51.4
AU	47.5
BR	42.0
CA	42.7
CN_X_HK	40.3
HK	33.2
IN	23.6
ID	40.0
JP	12.6
MX	32.1
RU	38.0
ZA	43.0
KR	16.7
US	39.6

Source: Scopus.

Annex 7.11 Proportion (%) of women with corresponding authorships by field of R&D, international collaboration, 2013-2017 and 2018-2022

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
WLD	33.6	34.6	23.0	24.0	41.9	43.5	33.8	35.7	26.3	27.4	37.0	37.7
EU-27	36.9	38.2	23.6	24.8	41.7	44.9	34.1	36.3	27.2	28.6	37.4	39.2
BE	37.0	37.4	23.7	25.3	43.4	45.5	34.7	37.1	27.6	29.9	38.5	41.1
BG	42.5	39.6	37.0	36.1	38.5	52.1	41.7	36.6	36.7	36.3	42.1	44.2
CZ	31.2	31.6	22.4	23.1	36.3	40.8	30.9	32.9	24.5	25.5	32.8	34.6
DK	39.3	40.7	25.5	23.9	37.3	44.7	39.4	40.0	30.0	30.2	36.0	38.9
DE	33.8	36.4	20.3	22.6	39.8	43.1	29.7	32.3	24.5	26.7	34.9	37.4
EE	41.6	37.3	24.3	23.5	44.1	42.1	43.2	41.0	31.4	29.4	45.5	40.1
IE	38.6	41.3	22.3	25.2	45.1	49.5	38.9	40.8	28.0	30.8	40.4	44.2
EL	29.9	33.9	20.1	21.9	40.1	47.0	27.9	29.9	24.3	26.0	29.9	33.2
ES	39.6	38.8	26.6	26.5	42.1	45.6	34.3	35.7	29.5	30.0	36.5	38.8
FR	36.4	37.9	23.6	24.1	41.3	43.9	32.9	34.1	27.3	28.3	33.9	35.3
HR	44.4	48.4	28.9	32.0	38.7	45.7	39.7	42.1	34.1	37.9	40.7	45.5
IT	37.6	39.7	26.3	27.2	40.2	43.8	31.6	34.2	29.0	30.8	36.9	38.7
CY	29.4	29.0	17.4	18.5	49.2	54.3	35.0	33.9	23.8	23.3	34.8	33.4
LV	41.1	44.3	26.1	29.0	29.7	51.3	36.9	43.9	31.8	33.9	44.3	54.2
LT	40.4	43.0	23.9	29.2	57.6	53.3	41.0	42.6	28.9	32.3	44.6	44.2
LU	35.4	37.8	19.9	20.4	35.6	45.3	33.5	35.5	24.4	26.5	31.7	35.6
HU	30.5	32.3	21.6	22.5	44.0	39.7	31.2	31.7	24.6	25.7	38.5	38.2
MT	30.6	37.6	22.0	26.9	57.1	45.7	38.6	41.3	28.9	29.9	45.3	46.7
NL	36.5	38.5	23.0	25.2	44.1	46.7	38.0	40.4	28.8	30.9	41.1	44.0
AT	36.8	40.2	21.0	23.7	34.1	42.7	29.5	32.6	24.7	27.8	34.3	39.3

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
PL	41.9	42.9	27.8	28.8	41.9	44.0	36.0	38.5	29.7	31.3	42.7	40.5
PT	49.4	47.8	31.3	30.4	51.1	50.8	41.6	43.3	35.7	36.0	42.5	43.1
RO	43.1	43.2	36.4	35.4	46.7	45.1	39.0	39.1	34.0	34.7	44.9	46.9
SI	42.8	48.2	30.5	31.0	46.4	48.8	38.0	38.4	31.5	33.7	41.6	43.8
SK	32.0	39.9	26.4	29.1	39.8	47.3	38.5	41.2	28.0	31.2	38.1	43.2
FI	42.3	41.5	25.1	23.4	48.7	51.6	43.4	43.7	30.7	29.9	44.5	43.7
SE	40.2	40.7	24.3	25.5	43.9	48.4	39.8	41.6	29.6	30.9	40.9	42.3
IS	42.1	42.8	21.9	29.3	42.9	47.1	45.6	47.5	33.5	36.6	47.8	46.2
NO	39.9	40.9	25.4	24.7	42.1	48.3	44.2	45.0	31.5	31.7	39.7	41.5
UK	36.9	38.8	21.9	24.3	43.0	44.8	35.3	37.6	27.0	28.8	37.7	39.4
BA	47.3	45.5	33.0	35.4	51.2	36.2	45.9	43.2	35.8	39.5	43.0	44.6
ME	52.6	52.4	41.6	34.7	55.6	46.7	45.7	47.3	43.0	41.8	40.6	33.6
MD	51.1	45.3	27.0	25.1	50.0	41.2	41.4	36.5	31.2	31.9	62.1	47.5
MK	46.4	46.9	42.2	40.2	30.0	36.6	47.4	41.9	39.7	36.9	49.6	49.0
AL	33.3	37.6	28.6	28.0	28.6	38.5	34.6	44.6	34.4	32.2	49.0	38.9
RS	45.5	48.3	39.8	37.8	43.5	37.6	41.0	42.0	36.9	39.9	39.3	43.2
TR	26.1	27.8	20.4	18.4	38.4	41.3	29.5	31.2	22.7	21.6	31.5	32.3
UA	35.6	41.4	21.4	25.6	27.0	43.0	32.4	37.6	23.1	28.3	42.1	43.0
GE	36.0	30.6	24.1	20.8	20.0	42.6	42.3	42.9	24.4	25.4	41.9	42.5
AM	30.5	30.8	18.3	18.7	30.8	48.5	32.8	34.9	17.0	24.7	40.0	41.5
FO	37.2	41.1	41.7	22.7	60.0	100.0	51.5	54.1	40.0	35.1	55.0	53.3
IL	28.7	30.1	19.2	22.4	40.3	46.4	31.4	33.6	23.1	24.9	37.9	42.7
TN	36.4	41.7	29.3	28.6	30.6	46.8	35.3	33.6	32.3	31.2	28.7	31.1

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
AR	42.6	41.1	32.6	30.4	41.3	39.5	36.4	35.0	36.0	35.0	36.5	39.2
AU	32.7	36.0	23.0	25.0	45.0	46.1	37.8	39.7	27.5	29.2	40.0	39.9
BR	35.5	35.3	24.7	24.9	42.0	45.5	36.8	38.6	28.7	29.9	37.6	39.0
CA	34.7	36.4	20.3	23.3	42.7	46.4	34.3	36.7	26.1	28.3	39.7	42.3
CN_X_HK	32.9	32.7	31.3	30.2	41.9	40.8	34.9	35.9	31.7	31.2	36.0	36.1
HK	31.9	32.0	29.8	29.7	41.6	39.9	33.5	34.7	29.7	30.2	35.8	37.4
IN	20.9	22.0	13.4	14.8	35.5	35.5	25.0	24.8	16.2	17.0	26.6	24.5
ID	30.7	32.4	20.1	24.0	37.6	37.0	37.6	39.2	25.6	28.4	33.9	34.3
JP	21.8	23.7	18.0	19.8	34.4	32.5	21.5	22.9	19.1	20.8	25.8	27.9
MX	29.1	32.0	21.1	21.7	41.0	37.9	33.4	34.2	25.6	26.4	33.9	37.0
RU	31.6	31.5	21.1	22.6	40.3	42.7	30.5	32.6	22.1	24.6	38.1	36.6
ZA	34.9	36.0	20.8	21.6	43.7	44.7	41.6	41.6	28.2	29.0	41.0	40.0
KR	17.6	18.8	13.9	15.1	35.4	37.6	20.7	22.2	15.8	16.9	27.5	27.5
US	32.5	34.6	22.6	24.4	41.6	43.1	32.7	35.2	26.5	28.4	37.7	39.5

Source: Scopus.

Notes: Data not available: XK.

Annex 7.12 CAGR (%) of proportion of women with corresponding authorships in international collaborations, by field of R&D, 2013-2022

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
WLD	**0.47**	**1.01**	**1.04**	**1.14**	**0.89**	**0.61**
EU-27	**0.44**	**1.19**	**1.94**	**1.26**	**1.10**	**1.29**
BE	0.43	2.14	0.79	1.16	1.79	2.19
BG	1.17	0.79	1.71	1.86	0.24	1.18
CZ	0.51	0.24	4.30	1.46	0.60	0.25
DK	0.27	0.40	5.14	0.42	0.47	2.35
DE	1.11	1.96	2.44	1.68	1.60	2.17
EE	1.60	0.84	2.11	1.32	0.73	0.23
IE	1.22	2.15	3.95	0.69	1.81	1.08
EL	4.01	1.00	3.94	1.27	1.01	1.30
ES	0.17	0.86	0.72	0.92	0.82	0.81
FR	0.72	0.99	1.24	0.92	1.02	0.81
HR	0.83	2.01	4.07	0.65	1.63	1.86
IT	0.26	1.09	2.90	1.44	1.17	1.50
CY	1.13	1.12	5.14	0.44	0.02	1.16
LV	0.88	2.55	8.50	2.78	0.41	0.32
LT	1.12	2.83	4.82	0.45	2.37	1.84
LU	0.98	2.25	0.13	2.37	1.00	3.40
HU	0.61	1.81	2.70	1.62	1.47	2.36
MT	1.58	11.51	0.28	3.03	0.10	7.48
NL	0.93	2.59	1.77	1.25	1.48	1.91
AT	1.40	2.28	5.43	1.50	2.02	2.81
PL	0.46	1.18	3.35	1.42	0.93	0.07
PT	0.65	0.08	0.53	0.69	0.71	1.14
RO	0.78	1.22	0.49	0.24	0.13	1.58
SI	0.41	0.31	0.20	1.62	2.20	0.20
SK	1.19	1.39	1.86	0.24	1.72	0.88
FI	1.66	0.17	0.57	0.50	0.19	0.09
SE	0.81	0.98	1.19	1.11	1.01	1.38
IS	1.27	5.70	3.63	1.12	1.65	0.33
NO	0.68	0.11	2.49	0.76	0.28	0.99
CH	1.65	1.76	3.74	2.22	1.69	2.29
UK	0.75	1.88	1.10	1.26	1.26	1.00
BA	1.88	2.90	5.09	1.36	1.28	0.38
ME	1.38	5.15	1.49	6.07	0.43	11.19
MD	0.63	1.25	0.00	2.23	1.10	5.46
MK	1.96	0.77	-	0.78	2.52	6.84

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
AL	4.37	1.15	-	2.57	0.57	14.15
RS	0.35	1.37	5.42	1.01	0.62	3.44
TR	2.22	1.24	3.20	1.16	0.17	1.77
UA	0.81	4.09	9.97	2.29	3.51	0.19
GE	4.34	1.23	-	1.65	4.55	1.92
AM	3.02	3.69	5.84	0.96	4.46	3.54
FO	9.37	-	-	1.44	1.36	3.89
IL	1.60	2.77	2.34	1.99	1.86	1.79
TN	2.01	0.25	9.62	1.33	0.15	1.96
AR	0.54	2.16	1.15	0.14	0.39	0.82
AU	1.57	0.79	1.63	0.94	0.88	0.03
BR	0.42	0.14	0.53	0.80	0.76	0.50
CA	1.07	1.87	1.54	1.52	1.26	1.18
CN_X_HK	0.40	0.48	0.40	0.65	0.02	0.15
HK	0.94	0.19	1.22	1.42	0.38	0.41
IN	0.97	2.74	3.36	0.58	0.98	1.57
ID	3.19	3.31	0.08	1.24	3.00	1.13
JP	3.09	1.91	0.19	1.82	2.02	0.97
MX	0.77	0.37	1.19	0.31	0.39	1.36
RU	0.98	1.27	2.06	0.22	1.90	0.41
ZA	0.03	0.01	0.18	0.73	0.22	0.11
KR	1.69	1.11	4.95	1.50	1.47	1.32
US	1.07	1.90	0.88	1.63	1.44	1.15

Source: Scopus.

Notes: Data not available: XK; Zero values or division by zero: MK (Humanities and the Arts), AL (Humanities and the Arts), GE (Humanities and the Arts), FO (Engineering and Technology, Humanities and the Arts).

Annex 7.13 Ratio of average FWCI for publications with women as corresponding authors to average FWCI for publications with men as corresponding authors, all fields of R&D, 2022

Country	Average FWCI ratio
WLD	**0.91**
EU-27	**0.88**
BE	0.91
BG	0.54
CZ	0.78
DK	0.81
DE	0.91
EE	0.68
IE	0.83
EL	0.78
ES	0.84
FR	0.87
HR	0.59
IT	0.86
CY	0.66
LV	0.49
LT	0.64
LU	0.80
HU	0.78
MT	0.61
NL	0.86
AT	0.91
PL	0.73
PT	0.82
RO	0.69
SI	0.80
SK	0.75
FI	0.83
SE	0.83
IS	0.57
NO	0.86
UK	0.90
BA	0.48
ME	0.36
MD	1.06
MK	0.44
AL	0.58
RS	0.62
TR	0.69

Country	Average FWCI ratio
UA	0.69
GE	0.55
AM	0.59
FO	0.86
IL	1.02
TN	0.67
AR	0.69
AU	0.87
BR	0.85
CA	0.88
CN_X_HK	0.87
HK	0.92
IN	0.77
ID	0.75
JP	1.11
MX	0.99
RU	0.74
ZA	0.92
KR	0.92
US	0.91

Source: Scopus.

Notes: Data not available: XK.

Annex 7.14 Ratio of average FWCI for publications with women as corresponding authors to average FWCI for publications with men as corresponding authors, by field of R&D, 2017 and 2022

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2017	2022	2017	2022	2017	2022	2017	2022	2017	2022	2017	2022
WLD	**0.99**	**0.95**	**0.93**	**0.90**	**1.03**	**0.96**	**0.93**	**0.90**	**0.93**	**0.90**	**0.95**	**0.91**
EU-27	**0.96**	**0.92**	**0.93**	**0.90**	**1.00**	**0.97**	**0.84**	**0.84**	**0.92**	**0.90**	**0.89**	**0.88**
BE	0.89	0.89	0.91	0.94	1.26	1.13	0.68	0.85	0.95	0.99	0.97	0.98
BG	0.65	0.73	0.83	0.74	0.66	1.04	0.47	0.37	0.67	0.74	0.77	0.70
CZ	0.94	0.86	0.87	0.89	1.08	0.92	0.57	0.61	0.92	0.89	0.79	0.78
DK	0.90	0.95	0.89	0.95	0.92	0.96	0.66	0.72	0.98	0.89	0.84	0.84
DE	0.97	0.93	0.94	0.95	1.08	1.01	0.81	0.86	0.97	0.92	0.94	0.95
EE	1.05	0.91	1.31	0.81	0.83	0.57	0.52	0.54	1.06	0.84	1.00	0.66
IE	0.98	0.98	1.04	0.89	1.15	0.99	0.75	0.82	1.02	0.85	0.93	0.77
EL	0.93	0.93	0.88	0.82	0.90	0.64	0.71	0.68	0.98	0.87	1.00	0.68
ES	0.96	0.96	0.97	0.88	1.23	1.05	0.69	0.77	0.94	0.88	0.93	0.87
FR	0.97	0.88	0.90	0.94	0.84	0.90	0.73	0.80	0.94	0.92	0.76	0.81
HR	0.87	0.96	0.79	0.82	0.84	0.80	0.34	0.49	0.86	0.72	0.86	0.63
IT	0.93	0.92	0.94	0.91	0.92	1.01	0.77	0.81	0.89	0.88	0.88	0.84
CY	0.97	0.91	1.09	0.78	0.68	0.83	0.47	0.53	0.92	0.72	0.67	0.65
LV	0.48	0.54	0.84	0.92	0.78	0.70	0.26	0.28	0.84	0.84	0.76	0.79
LT	0.92	0.91	0.83	0.73	0.86	0.86	0.32	0.46	0.78	0.81	0.84	0.74
LU	1.12	1.54	1.03	0.62	0.54	0.53	0.63	0.69	0.98	0.88	0.92	0.75
HU	0.78	0.85	1.01	0.84	1.10	1.71	0.53	0.61	0.97	0.85	1.32	1.00
MT	1.30	1.17	1.13	0.94	0.58	0.34	0.35	0.32	1.25	1.13	1.41	0.56
NL	0.92	0.97	0.86	0.97	1.12	1.08	0.68	0.74	0.91	0.92	0.81	0.92
AT	0.94	0.91	0.97	1.05	0.94	1.10	0.79	0.81	0.93	0.99	0.88	0.91
PL	0.91	0.90	0.92	0.81	0.89	0.68	0.52	0.58	0.86	0.79	0.89	0.77
PT	1.00	1.01	0.95	0.84	0.90	1.11	0.62	0.71	0.95	0.86	0.83	0.89
RO	0.79	0.85	0.87	0.77	0.79	0.97	0.45	0.49	0.79	0.81	0.76	0.77
SI	0.90	0.83	0.85	0.75	0.75	0.93	0.53	0.87	0.81	0.79	0.74	0.60
SK	0.72	0.77	0.89	0.88	1.09	0.87	0.31	0.52	0.75	0.85	0.88	0.81
FI	0.84	0.96	0.90	0.86	0.96	1.20	0.59	0.71	0.89	0.83	0.89	0.84
SE	0.93	0.89	1.07	0.91	0.92	1.09	0.71	0.71	0.99	0.86	0.88	0.92
IS	0.97	0.93	1.06	0.87	1.46	0.94	0.43	0.46	0.96	0.82	0.92	0.64
NO	0.99	0.99	1.05	0.96	1.21	1.06	0.67	0.77	1.01	0.91	0.89	0.80
UK	0.95	0.91	0.91	0.91	0.98	1.05	0.81	0.83	0.93	0.92	0.90	0.91
BA	1.53	0.95	1.02	0.86	0.90	0.38	0.20	0.37	0.67	0.79	0.85	0.68
ME	0.83	0.91	0.90	0.61	1.92	1.59	0.08	0.20	0.90	0.88	0.40	1.12
MD	0.44	1.51	0.35	1.48	1.18	6.22	0.25	0.86	1.16	0.87	1.99	4.12

Country	Agricultural and veterinary sciences		Engineering and technology		Humanities and the arts		Medical and health sciences		Natural sciences		Social sciences	
	2017	2022	2017	2022	2017	2022	2017	2022	2017	2022	2017	2022
MK	1.62	1.45	1.14	0.88	1.03	0.31	0.13	0.36	0.78	0.61	2.16	0.65
AL	1.52	1.42	0.24	0.39	1.33	0.33	0.26	0.58	0.81	0.87	1.76	0.76
RS	0.81	1.06	0.85	0.67	0.87	1.14	0.47	0.48	0.87	0.73	0.86	0.73
TR	1.07	0.82	0.82	0.69	0.94	0.86	0.77	0.74	0.84	0.66	0.86	0.60
UA	0.89	0.68	0.98	0.95	0.71	0.51	0.47	0.39	0.84	0.82	0.80	0.72
GE	1.59	0.39	0.90	0.52	0.84	0.59	0.47	0.40	1.03	0.70	1.07	0.54
AM	1.40	1.42	0.62	0.71	0.89	1.08	0.17	0.39	0.91	0.80	0.65	0.94
FO	1.06	1.51	0.56	1.29	-	3.00	1.38	0.62	1.16	0.94	1.01	1.81
IL	0.90	0.90	0.98	1.02	0.99	1.18	0.87	0.95	1.04	0.95	1.05	1.02
TN	0.94	0.71	0.86	0.71	0.82	1.10	0.48	0.51	0.83	0.74	0.65	0.72
AR	0.91	0.89	0.94	0.90	1.00	0.99	0.56	0.62	0.82	0.83	0.83	0.65
AU	0.93	0.96	0.97	0.89	0.98	0.80	0.77	0.84	0.93	0.91	0.94	0.89
BR	0.93	0.90	1.00	0.85	0.93	1.05	0.72	0.81	0.93	0.89	0.81	0.84
CA	1.00	1.02	0.99	0.92	1.07	1.04	0.77	0.82	0.97	0.89	0.93	0.93
CN_X_HK	0.90	0.93	0.90	0.90	0.79	0.87	0.85	0.87	0.89	0.89	0.86	0.81
HK	0.85	1.04	1.01	0.97	0.78	1.00	0.71	0.89	1.00	1.00	0.91	0.90
IN	0.89	0.77	0.78	0.78	0.63	0.51	0.88	0.77	0.82	0.80	0.75	0.71
ID	0.72	0.75	0.74	0.85	0.91	0.68	0.41	0.63	0.87	0.80	0.79	0.79
JP	1.05	1.07	1.08	1.11	0.91	0.76	1.04	1.16	1.09	1.08	0.84	0.96
MX	0.98	1.07	0.85	0.84	1.04	1.52	0.87	0.94	0.98	0.89	0.80	0.88
RU	0.74	0.68	0.90	0.85	0.91	0.85	0.44	0.53	0.85	0.81	0.80	0.61
ZA	1.02	0.92	1.08	0.80	1.16	1.27	0.73	0.88	1.02	0.88	0.81	0.87
KR	0.89	0.79	1.05	0.98	0.95	0.85	0.95	0.89	1.01	0.94	0.97	0.83
US	0.97	0.91	0.99	0.94	1.01	0.99	0.88	0.90	0.94	0.92	0.92	0.92

Source: Scopus.

Notes: Data not available: XK; Zero values or division by zero: FO (Humanities and the Arts, 2017).

Annex 7.15 CAGR (%) of ratio of average FWCI for publications with women as corresponding authors to average FWCI for publications with men as corresponding authors, by field of R&D, 2013-2022

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
WLD	**-0.51**	**0.60**	**-0.42**	**-0.23**	**0.06**	**-0.50**
EU-27	**-0.38**	**-0.09**	**0.78**	**-0.03**	**0.06**	**0.04**
BE	-1.26	1.19	-0.52	1.33	1.27	1.50
BG	-0.16	0.27	-6.11	-3.77	-0.83	0.51
CZ	-0.03	0.18	4.91	1.49	0.36	-0.66
DK	-0.06	0.52	1.04	-1.51	-0.53	-0.20
DE	-0.46	-0.17	0.88	-0.17	-0.36	0.60
EE	-2.83	-2.04	-3.06	3.33	1.94	-2.33
IE	2.65	-2.32	-0.04	-2.66	-1.17	-2.56
EL	-0.38	-2.51	-1.91	-0.65	-0.42	-3.95
ES	-0.12	-0.52	1.74	-0.20	-0.26	-0.14
FR	-0.50	0.06	-0.85	0.81	0.17	0.02
HR	-0.69	1.44	-1.25	-1.67	-1.18	-2.02
IT	-0.28	0.36	3.47	-0.08	0.02	-0.68
CY	6.90	0.18	-3.14	-8.11	-1.31	-4.38
LV	-6.51	-2.30	19.59	-1.86	0.11	5.71
LT	2.85	-1.75	2.74	-3.32	2.61	-2.77
LU	2.86	-8.44	-1.27	-1.51	-2.01	1.90
HU	-3.72	-3.78	6.67	-2.79	-2.32	-4.35
MT	-0.86	-9.94	14.70	-20.97	-8.16	1.91
NL	1.10	0.67	0.51	0.40	0.59	0.83
AT	0.18	0.11	2.66	-1.02	0.28	-0.64
PL	-0.71	-1.69	0.93	1.46	0.00	-0.24
PT	0.73	-0.34	-1.34	-2.02	-0.24	-1.08
RO	-0.18	-0.70	2.91	-0.88	1.26	-0.51
SI	-0.65	0.24	1.68	1.36	1.77	0.58
SK	-2.48	-1.16	1.86	1.06	-0.02	2.66
FI	0.32	-0.89	3.04	-0.35	-0.90	0.42
SE	-1.01	-0.50	1.33	-0.54	-0.73	0.49
IS	4.06	-3.13	-5.24	-9.60	0.95	-3.52
NO	-0.10	-0.22	1.05	0.15	-0.58	-0.50
CH	-1.03	1.18	-2.02	0.20	0.42	0.87
UK	-0.52	-0.77	0.68	-0.26	-0.51	-0.59
BA	1.38	3.32	1.25	-3.57	2.40	4.87

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
ME	-0.59	-7.82	13.43	-15.90	-1.51	7.80
MD	41.67	6.83	-5.58	2.25	1.62	0.86
MK	9.66	2.75	-26.59	-5.13	0.46	-3.72
AL	26.73	-9.28	2.25	-6.30	2.31	12.21
RS	0.87	-5.42	4.17	-4.86	-0.59	-2.56
TR	-1.44	-2.65	0.48	-1.91	-2.21	-4.57
UA	2.14	0.89	-10.84	-3.56	-0.67	3.38
GE	-14.25	-0.61	7.15	-3.54	5.96	-5.00
AM	-1.00	-3.72	52.10	-12.80	-7.17	4.89
FO	13.99	-	11.92	-12.50	-2.91	-2.07
IL	-1.07	3.89	2.51	1.05	0.11	0.90
TN	-4.34	-1.42	1.25	0.99	-1.84	-1.21
AR	-0.16	-2.61	1.36	-0.54	-0.56	-0.35
AU	-0.33	-0.07	-2.88	0.77	-0.26	-1.03
BR	-0.07	-1.28	0.84	0.68	-0.05	0.91
CA	0.91	-0.48	0.28	-0.01	-0.67	-0.16
CN_X_HK	-0.11	0.01	1.18	0.42	-0.01	-0.12
HK	1.31	-0.14	1.71	-3.5	0.59	0.72
IN	-1.14	0.34	-3.62	-1.55	0.40	-0.15
ID	1.53	0.04	-3.01	-1.82	-0.54	-4.88
JP	0.86	0.13	0.10	0.94	0.15	-1.49
MX	0.41	-1.32	2.28	3.14	-1.60	1.81
RU	-1.66	-0.63	1.18	1.66	-0.18	-0.62
ZA	0.77	-0.59	1.47	0.50	-0.36	-1.21
KR	-3.12	-0.82	-4.25	-3.17	-1.14	-3.02
US	-0.74	-0.63	0.01	0.09	-0.26	-0.18

Source: Scopus.

Notes: Data not available: XK; Zero values: FO (Engineering and Technology).

Annex 7.16 Number of applicants and beneficiaries of research funding, by sex, 2022

	Women		Men	
Country	**Applicants**	**Beneficiaries**	**Applicants**	**Beneficiaries**
EU-27	**40748**	**11832**	**64384**	**20333**
BE	1659	494	2050	671
BG	187	99	145	61
DK	1224	233	2083	343
DE	3720	1156	9619	3063
EE	121	32	214	47
ES	10831	4234	15813	6278
IT	2298	173	4867	414
CY	119	15	526	92
LV	243	23	357	35
LT	303	90	324	104
HU	471	111	930	261
MT	26	14	112	42
NL	2112	599	3132	865
AT	2386	1022	7052	3582
PL	5009	869	5158	1073
PT	2198	353	1903	280
RO	2138	326	2189	310
SI	405	95	635	132
SK	216	53	454	127
FI	1172	176	1848	-
SE	3910	714	4973	960
IS	647	213	881	260
NO	1903	560	2894	693
RS	424	56	422	49
TR	5321	1012	7048	1445
MD	17	17	23	23

Source: WiS database, DG Research and Innovation T3_questionnaires.

Notes: Reference year differs: EL: 2019, ES: 2021, FR: 2017, IT: 2020, RO: 2021; Data not available: IE, EL, GE, BA, FR, JR, UA, AM (applicants and beneficiaries) (women, men, total), EL (applicants), IT (2022)

Annex 7.17 Number of women applicants and beneficiaries of research funding, by field of R&D, 2022

Country	Applicants / Beneficiaries	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities and arts	Multi - disciplinary	Unknown
EU-27	**Applicants**	**8456**	**5670**	**7589**	**3142**	**6864**	**3023**	**76**	**3392**
	Beneficiaries	**2369**	**1980**	**2139**	**900**	**1674**	**835**	**20**	**1406**
BE	Applicants	20	13	144	0	39	25	6	1412
	Beneficiaries	6	4	56	0	12	5	2	409
BG	Applicants	61	26	26	26	35	13	-	-
	Beneficiaries	35	12	17	11	17	7	-	-
DK	Applicants	245	95	407	43	318	116	0	0
	Beneficiaries	44	28	81	6	58	16	0	0
DE	Applicants	526	397	1579	-	1218	-	-	-
	Beneficiaries	174	135	504	-	343	-	-	-
EE	Applicants	37	11	12	11	20	30	-	-
	Beneficiaries	11	1	5	2	6	7	-	-
EL	Applicants	-	-	-	-	-	-	-	-
	Beneficiaries	111	82	143	41	145	128	-	-
ES	Applicants	2129	3164	1859	1493	964	881	-	341
	Beneficiaries	844	1357	680	570	354	299	-	130
CY	Applicants	37	33	23	6	16	4	-	-
	Beneficiaries	3	5	3	2	1	1	-	-
LV	Applicants	39	60	47	33	38	26	-	-
	Beneficiaries	4	3	4	3	5	4	-	-
LT	Applicants	53	22	18	10	68	131	1	-
	Beneficiaries	15	12	1	2	19	41	-	-
HU	Applicants	185	17	65	48	98	58	-	-
	Beneficiaries	44	4	13	11	22	17	-	-
MT	Applicants	1	10	6	3	1	-	5	-
	Beneficiaries	1	5	4	-	-	-	4	-
NL	Applicants	600	165	-	-	860	-	-	487
	Beneficiaries	162	50	-	-	200	-	-	187
AT	Applicants	445	52	231	25	226	293	0	1114
	Beneficiaries	141	6	54	4	50	92	0	675
PL	Applicants	1697	325	920	483	977	607	-	-
	Beneficiaries	325	60	165	93	136	90	-	-
PT	Applicants	556	425	526	227	308	156	0	0
	Beneficiaries	97	63	88	34	42	29	0	0
RO	Applicants	697	422	298	470	96	119	0	36
	Beneficiaries	123	54	40	60	18	26	0	5
SI	Applicants	71	53	64	44	42	67	64	0
	Beneficiaries	14	13	13	14	13	14	14	0

Country	Applicants / Beneficiaries	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities and arts	Multi - disciplinary	Unknown
SK	Applicants	42	43	34	25	52	20	0	0
	Beneficiaries	7	16	11	3	11	5	0	0
FI	Applicants	316	87	138	18	258	115	-	2
	Beneficiaries	50	14	16	4	39	18	-	0
SE	Applicants	699	250	1192	177	1230	362	0	0
	Beneficiaries	158	56	241	40	183	36	0	0
IS	Applicants	58	27	75	0	112	41	294	40
	Beneficiaries	21	11	38	0	50	21	66	6
NO	Applicants	465	380	334	75	494	154	-	1
	Beneficiaries	128	160	83	27	128	33	-	1
RS	Applicants	104	64	77	55	77	47	-	-
	Beneficiaries	17	11	12	5	4	7	-	-
TR	Applicants	1100	700	1257	757	822	2	50	633
	Beneficiaries	242	161	173	108	183	2	8	135
MD	Applicants	2	1	1	2	-	-	4	7
	Beneficiaries	2	1	1	2	-	-	4	7

Source: WiS database, DG Research and Innovation T3_questionnaires.

Notes: Reference year differs: ES: 2021, IT: 2020, SK: 2019; Data not available: BE(FL), BG, IE, EL, FR, HR, IT, BA, GE, AM, UA (applicants and beneficiaries) (women, total, all fields of research and development); not applicable: CY; Data not available: BG (multidisciplinary, unknown 2022), IT (2022 all fields of research and development).

Annex 7.18 Number of men applicants and beneficiaries of research funding, by field of R&D, 2022

Country	Applicants / Beneficiaries	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities and arts	Multi - disciplinary	Unknown
EU-27	**Applicants**	**15625**	**12359**	**9165**	**2895**	**6977**	**3033**	**133**	**8958**
	Beneficiaries	**4244**	**42**	**106**	**9**	**37**	**18**	**4**	**455**
BE	Applicants	110	53	235	0	72	44	12	1524
	Beneficiaries	45	22	101	0	33	11	4	455
BG	Applicants	43	47	7	20	17	11	-	-
	Beneficiaries	16	20	5	9	4	7	-	-
DK	Applicants	691	341	498	56	351	146	0	0
	Beneficiaries	105	-	-	-	-	-	-	-
DE	Applicants	2024	2576	3199	-	1820	-	-	-
	Beneficiaries	693	-	-	-	-	-	-	-
EE	Applicants	91	49	18	8	19	29	-	-
	Beneficiaries	19	-	-	-	-	-	-	-
EL	Applicants	-	-	-	-	-	-	-	-
	Beneficiaries	217	-	-	-	-	-	-	-
ES	Applicants	3603	4642	2175	1730	966	955	-	1742
	Beneficiaries	1548	-	-	-	-	-	-	-
CY	Applicants	143	269	62	24	27	1	-	-
	Beneficiaries	25	-	-	-	-	-	-	-
LV	Applicants	109	137	44	26	25	16	-	-
	Beneficiaries	11	-	-	-	-	-	-	-
LT	Applicants	98	55	37	10	41	83	-	-
	Beneficiaries	27	-	-	-	-	-	-	-
HU	Applicants	439	115	99	60	129	88	-	-
	Beneficiaries	122	-	-	-	-	-	-	-
MT	Applicants	-	75	24	9	-	-	4	-
	Beneficiaries	0	-	-	-	-	-	-	-
NL	Applicants	1131	471	-	-	853	-	-	677
	Beneficiaries	294	-	-	-	-	-	-	-
AT	Applicants	1086	179	329	19	225	261	0	4953
	Beneficiaries	315	-	-	-	-	-	-	-
PL	Applicants	2068	816	562	252	859	601	-	-
	Beneficiaries	474	-	-	-	-	-	-	-
PT	Applicants	560	585	303	111	219	125	0	0
	Beneficiaries	98	-	-	-	-	-	-	-

Country	Applicants / Beneficiaries	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities and arts	Multi - disciplinary	Unknown
RO	Applicants	802	723	194	221	64	123	0	62
	Beneficiaries	128	-	-	-	-	-	-	-
SI	Applicants	132	187	50	46	53	50	117	0
	Beneficiaries	23	-	-	-	-	-	-	-
SK	Applicants	109	163	43	45	61	33	0	0
	Beneficiaries	40	-	-	-	-	-	-	-
FI	Applicants	794	170	205	32	142	133	-	-
	Beneficiaries	-	-	-	-	-	-	-	-
SE	Applicants	1592	706	1081	226	1034	334	0	0
	Beneficiaries	309	-	-	-	-	-	-	-
IS	Applicants	113	61	77	0	57	60	464	49
	Beneficiaries	44	-	-	-	-	-	-	-
NO	Applicants	837	991	357	92	476	139	-	2
	Beneficiaries	147	-	-	-	-	-	-	-
RS	Applicants	96	130	45	37	71	43	-	-
	Beneficiaries	19	-	-	-	-	-	-	-
TR	Applicants	1289	1641	751	1115	884	3	78	1287
	Beneficiaries	343	-	-	-	-	-	-	-
MD	Applicants	0	5	3	3	-	-	6	5
	Beneficiaries	0	-	-	-	-	-	-	-

Source: WiS database, DG Research and Innovation T3_questionnaires.

Notes: Reference year differs: ES: 2021, IT: 2020, SK: 2019; Data not available: BE(FL), BG, IE, EL, FR, HR, IT, BA, GE, AM, UA (applicants and beneficiaries) (women, men, total, all fields of research and development); not applicable: CY; Data not available: BG (multidisciplinary, unknown 2022), IT (2022 all fields of research and development).

Annex 7.19 Number of country publications with a sex or gender dimension in their research content, by field of R&D, 2018-2022

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
WLD	**21904**	**12116**	**16559**	**190256**	**73202**	**72748**
EU-27	**5456**	**3190**	**4748**	**49342**	**20233**	**20381**
BE	209	112	174	2040	814	792
BG	70	40	33	329	185	94
CZ	298	96	141	1330	870	529
DK	215	76	125	2731	904	612
DE	1037	451	579	9363	3899	3453
EE	33	8	48	216	128	124
IE	95	70	130	1126	341	546
EL	120	85	59	1601	555	387
ES	902	547	1059	7744	3331	4671
FR	658	352	421	5663	2410	1550
HR	85	81	152	750	236	376
IT	705	418	453	7227	2966	2075
CY	21	15	27	288	108	149
LV	11	6	13	98	49	33
LT	71	38	45	375	186	200
LU	10	8	8	113	36	65
HU	127	50	73	799	447	324
MT	3	3	4	80	16	17
NL	376	159	342	4604	1521	1697
AT	256	102	119	1805	855	566
PL	544	304	388	3993	1925	1125
PT	241	133	138	1733	812	1037
RO	78	169	79	719	437	246
SI	48	36	69	374	199	172
SK	80	46	90	490	283	252
FI	174	81	148	2022	733	783
SE	326	198	296	4972	1544	1675
IS	21	10	17	209	80	95
NO	200	97	167	2530	744	1100
UK	1190	553	1675	13150	4551	6260
BA	17	21	24	253	36	70
ME	7	4	5	69	17	29
MD	3	2	4	41	15	7
MK	10	12	6	114	26	47
AL	7	7	5	60	19	37
RS	87	46	42	802	266	225

Country	Agricultural and veterinary sciences	Engineering and technology	Humanities and the arts	Medical and health sciences	Natural sciences	Social sciences
TR	622	249	312	7519	1455	1748
UA	55	60	109	985	290	251
GE	9	3	6	192	45	55
AM	7	3	10	53	30	16
FO	1	1	3	26	10	7
IL	106	66	244	1583	539	936
TN	50	40	16	618	172	95
AR	339	31	148	877	654	429
AU	1104	377	680	7512	3066	3484
BR	1576	226	308	6344	3050	1813
CA	885	325	774	8726	3262	3873
CN_X_HK	3344	1873	443	21938	11029	4099
HK	55	77	99	1079	400	663
IN	1012	991	394	7415	3430	2118
ID	415	254	212	1239	1655	961
JP	1029	450	130	9019	3410	1181
MX	598	128	154	2073	1253	996
RU	557	259	700	5397	2280	1940
ZA	432	104	356	2318	1033	1381
KR	500	430	171	6135	1950	1006
US	4168	2241	3890	46888	16949	21602

Source: Scopus.
Notes: Data not available: XK.

APPENDIX 1 – CORRESPONDENCE TABLE BETWEEN DIFFERENT EDITIONS OF SHE FIGURES

Name of indicator ([624])	SF2024 label	SF2021 label	SF2018 label	SF2015 label	SF2012 label
Chapter 2					
Proportion (%) of women among Doctoral graduates, 2021	Figure 2.1	Figure 2.1	Figure 2.1	Figure 2.2	Figure 2.1
Proportion (%) of women among Doctoral graduates, 2013 and 2021	Table 2.4	Table 2.1	Table 2.1	Table 2.1	n/a
Compound annual growth rate of Doctoral graduates, by sex, 2013-2021	Figure 2.2	Figure 2.2	Figure 2.2	Figure 2.3 (ISCED 6 graduates according to ISCED-97)	Figure 2.2
Proportion (%) of women among Doctoral graduates, by broad field of study, 2021	Table 2.5	Table 2.2	Table 2.2	Table 2.3	Table 2.1
Distribution (%) of Doctoral graduates across broad fields of study, by sex, 2021	Table 2.6	Table 2.3	Figure 2.3	Figure 2.4 (ISCED 6 graduates according to ISCED-97)	Figure 2.3
Proportion (%) of women among Doctoral graduates, by narrow field of study in Natural Sciences, ICT and Engineering, 2018 and 2021	Table 2.7	Table 2.4	Table 2.3	Table 2.5	Table 2.3
Compound annual growth rate (CAGR, %) and trend of Doctoral graduates (number), by sex and narrow field of study in Natural Sciences, ICT and Engineering, 2018-2021 ([625])	Table 2.8	Table 2.5	Table 2.4	Table 2.6 (ISCED 6 graduates according to ISCED-97)	Table 2.2
Ratio of bachelor graduates to bachelor entrants, by sex and broad field of study, 2021	Table 2.1	Table 2.6	Table 2.5	n/a	n/a
Ratio of Doctoral entrants to master graduates, by sex and broad field of study, 2021	Table 2.2	Table 2.7	Table 2.6	n/a	n/a
Ratio of Doctoral entrants to master graduates, by sex and narrow field of study in Natural Sciences, ICT and Engineering, 2021	Table 2.3	Table 2.8	Table 2.7	n/a	n/a

([624]) In She Figures 2024, EU averages relate to EU-27 (not including the United Kingdom). In She Figures 2021, EU-27 and EU-28 averages were presented. In She Figures 2018 and 2015, EU averages related to EU-28, while in She Figures 2012, EU averages related to EU-27 (not including Croatia).

([625]) In previous editions, this indicator also included a trendline.

Name of indicator ([624])	SF2024 label	SF2021 label	SF2018 label	SF2015 label	SF2012 label
Number of Doctoral (ISCED level 8) graduates, by sex, 2013 - 2021	Annex 2.1	Annex 2.1	Annex 2.1	Annex 2.2	Annex 2.1
Number of Doctoral (ISCED level 8) graduates by sex and broad field of study, 2021	Annex 2.2	Annex 2.2	Annex 2.2	Annex 2.4	Annex 2.2
Number of Doctoral (ISCED level 8) graduates by sex and narrow field of study in Natural Science and Engineering (fields EF4, EF5 and EF6), 2021	Annex 2.3	Annex 2.3	Annex 2.3	Annex 2.6	Annex 2.3
Ratio of Doctoral graduates to Doctoral entrants, by sex and broad field of study, 2021	Annex 2.4	Annex 2.4	Table 2.8	n/a	n/a
Chapter 3					
Proportion (%) of women in the EU among total employment, population of tertiary-educated HRSTCs, and population of S&Es, 2017-2021	Figure 3.1	Figure 3.1	Figure 3.1	Figure 3.1	Figure 1.1
Proportion (%) of tertiary educated and employed as professionals and technicians (HRSTC) among tertiary educated (HRSTE), by sex, 2021	Figure 3.2	Figure 3.2	Figure 3.2	Figure 3.2	Figure 1.2
Proportion (%) of tertiary educated and employed as professionals and technicians (HRSTC) among tertiary educated (HRSTE), by sex and migration status, 2022	Table 3.1	n/a	n/a	n/a	n/a
Proportion (%) of tertiary educated and employed as professionals and technicians (HRSTC) among tertiary educated (HRSTE), by sex and disability status, 2022	Table 3.2	n/a	n/a	n/a	n/a
Proportion (%) of scientists and engineers among total labour force, by sex, 2021	Figure 3.3	Figure 3.3	Figure 3.3	Figure 3.3	Figure 1.3
Proportion (%) of women among scientists and engineers (S&E) in the EU, by migration status, 2022	Figure 3.4	n/a	n/a	n/a	n/a
Proportion (%) of employed population in KIA among total employment, by sex, 2021	Figure 3.5	Figure 3.4	Figure 3.4	Figure 3.4	Figure 1.4
Proportion (%) of employed in KIABI among total employment, by sex, 2021	Figure 3.6	Figure 3.5	Figure 3.5	Figure 3.5	Figure 1.5
Proportion (%) of self-employed women among S&E and ICT Professionals, 2021	Figure 3.7	Figure 3.6	n/a	n/a	n/a
Unemployment rate of tertiary educated people, 2021	Figure 3.8	Figure 3.7	Figure 3.6	n/a	n/a
Distribution of R&D personnel across occupations in all sectors (business enterprise, government and higher education), by sex, 2021	Figure 3.9	Figure 3.8	Figure 3.7	Figure 3.6	Figure 3.9
Distribution of R&D personnel across occupations in the higher education sector, by sex, 2021	Figure 3.10	Figure 3.9	Figure 3.8	Figure 3.7	Figure 3.10
Distribution of R&D personnel in the government sector across occupations, by sex, 2021	Figure 3.11	Figure 3.10	Figure 3.9	Figure 3.8	Figure 3.11

Name of indicator ([624])	SF2024 label	SF2021 label	SF2018 label	SF2015 label	SF2012 label
Distribution of R&D personnel across occupations in the business enterprise sector, by sex, 2021	Figure 3.12	Figure 3.11	Figure 3.10	Figure 3.9	Figure 3.12
Distribution of researchers in the business enterprise sector across economic activities (NACE Rev. 2), by sex, 2021	Figure 3.13	Figure 3.12	Figure 3.11	Figure 3.10	Figure 2.6
Proportion (%) of women among researchers in the business enterprise sector, by selected economic activities (NACE Rev. 2), 2021	Table 3.3	Table 3.1	Table 3.1	Table 3.1	Table 2.8
R&D personnel in the higher education sector, by sex and occupation (headcount), 2021	Annex 3.1	Annex 3.1	Annex 3.1	Annex 3.1	Annex 3.4
R&D personnel in the government sector, by sex and occupation, (headcount), 2021	Annex 3.2	Annex 3.2	Annex 3.2	Annex 3.2	Annex 3.5
R&D personnel in the business enterprise sector, by sex and occupation, (headcount), 2021	Annex 3.3	Annex 3.3	Annex 3.3	Annex 3.3	Annex 3.5
Researchers in the business enterprise sector, by sex and selected economic activities (NACE Rev.2), 2021 (headcount)	Annex 3.4	Annex 3.4	n/a	n/a	n/a
Chapter 4					
Proportion (%) of women among researchers, 2021	Figure 4.1	Figure 4.1	Figure 4.1	Figure 4.1	Figure 1.6
Compound annual growth rate for researchers, by sex, 2013-2021	Figure 4.2	Figure 4.2	Figure 4.2	Figure 4.2	Figure 1.7
Proportion (%) of researchers per thousand labour force, by sex, 2021	Figure 4.3	Figure 4.3	Figure 4.3	Figure 4.3	Figure 1.8
Distribution of researchers across sectors of employment, by sex, 2021	Figure 4.4	Figure 4.4	Figure 4.4	Figure 4.4	Figure 1.10
Proportion (%) of women among researchers in the higher education sector, 2021	Figure 4.5	Figure 4.5	Figure 4.5	Figure 4.5	Figure 1.9
Proportion (%) of women among researchers in the government sector, 2021	Figure 4.6	Figure 4.6	Figure 4.6	Figure 4.6	Figure 1.9
Proportion (%) of women among researchers in the business enterprise sector, 2021	Figure 4.7	Figure 4.7	Figure 4.7	Figure 4.7	Figure 1.9
Compound annual growth rate for researchers in the higher education sector, by sex, 2013-2021	Figure 4.8	Figure 4.8	Figure 4.8	Figure 4.8	Figure 1.11
Compound annual growth rate for researchers in the government sector, by sex, 2013-2021	Figure 4.9	Figure 4.9	Figure 4.9	Figure 4.9	Figure 1.12
Compound annual growth rate for researchers in the business enterprise sector, by sex, 2013-2021	Figure 4.10	Figure 4.10	Figure 4.10	Figure 4.10	Figure 1.13
Distribution of researchers in the higher education sector across age groups, by sex, 2021	Figure 4.11	Figure 4.11	Figure 4.11	Figure 4.11	Figure 1.14
Distribution of researchers in the government sector across age groups, by sex, 2021	Figure 4.12	Figure 4.12	Figure 4.12	Figure 4.12	Figure 1.15

Name of indicator ([624])	SF2024 label	SF2021 label	SF2018 label	SF2015 label	SF2012 label
Evolution of the dissimilarity index for researchers in the higher education sector and government sector, 2017-2021	Table 4.7	Table 4.1	n/a	n/a	n/a
Evolution of the proportion (%) of women among researchers in the higher education sector, by field of R&D, 2017-2021	Table 4.1	Table 4.2	Table 4.2	Table 4.2	Table 2.5
Compound annual growth rate (%) of women researchers in the higher education sector, by field of R&D, 2017-2021	Table 4.2	Table 4.3	Table 4.3	Table 4.3	Table 2.4
Distribution of researchers in the higher education sector across fields of R&D, by sex, 2021	Table 4.3	Figure 4.13	Figure 4.13	Figure 4.13	Figure 2.4
Evolution of the proportion (%) of women among researchers in the government sector, by field of R&D, 2017 & 2021	Table 4.4	Table 4.4	Table 4.4	Table 4.4	Table 2.7
Compound annual growth rates (%) of women researchers in the government sector, by field of R&D, 2017-2021	Table 4.5	Table 4.5	Table 4.5	Table 4.5	Table 2.6
Distribution of researchers in the government sector across fields of R&D, by sex, 2021	Table 4.6	Figure 4.14	Figure 4.14	Figure 4.14	Figure 2.5
Evolution in the proportion (%) of women among researchers in the business enterprise sector, by field of R&D, 2010 & 2018	n/a ([626])	Table 4.6	Table 4.6	Table 4.6	Table 2.9
Number of researchers, by sex, 2017-2021	Annex 4.1	Annex 4.1	Annex 4.1	Annex 4.1	Annex 1.1
Number of researchers in the higher education sector, by sex, 2017-2021	Annex 4.2	Annex 4.2	Annex 4.2	Annex 4.2	Annex 1.2
Number of researchers in the government sector, by sex, 2017-2021	Annex 4.3	Annex 4.3	Annex 4.3	Annex 4.3	Annex 1.3
Number of researchers in the business enterprise sector, by sex, 2017-2021	Annex 4.4	Annex 4.4	Annex 4.4	Annex 4.4	Annex 1.4
Number of researchers in the higher education sector, by field of R&D and sex, 2021	Annex 4.5	Annex 4.5	Annex 4.5	Annex 4.5	Annex 2.4
Number of researchers in the government sector, by field of R&D and sex, 2021	Annex 4.6	Annex 4.6	Annex 4.6	Annex 4.6	Annex 2.5
Number of researchers in the business enterprise sector, by field of R&D and sex, 2018	n/a [627]	Annex 4.7	Annex 4.7	Annex 4.7	n/a
Chapter 5					
Proportion (%) of part-time employed among researchers in HES, by sex, 2022	Figure 5.1	Figure 5.1	Figure 5.1	Figure 5.1	n/a
Proportion (%) of researchers in HES working under ‘precarious’ contracts, by sex, 2022	Figure 5.2	Figure 5.2	Figure 5.2	Figure 5.2	n/a

([626]) Not included due to data availability issues.

([627]) Not included due to data availability issues.

Name of indicator ([624])	SF2024 label	SF2021 label	SF2018 label	SF2015 label	SF2012 label
Differences in the international credit mobility of women and men PhD graduates, 2021	Figure 5.3	n/a	n/a	n/a	n/a
Ratio of women who have been internationally mobile to men who have been internationally mobile, 2021	Figure 5.4	n/a	n/a	n/a	n/a
Proportion (%) of researchers in HES working under 'precarious' contracts, by sex and family status, 2019	n/a ([628])	Table 5.1	n/a	n/a	n/a
Proportion (%) of researchers in HES working under 'precarious' contracts, by sex and career stage, 2019	n/a ([629])	Table 5.2	n/a	n/a	n/a
Sex differences in international mobility of researchers in HES during their PhD, 2019	n/a, although see (non-comparable) Figure 5.3 and Figure 5.4 for reference ([630])	Figure 5.3	Figure 5.3	Figure 5.3	n/a, although see (non-comparable) Figure 1.16 for reference
Sex differences in international mobility of researchers in HES in post-PhD stages, 2019	n/a, although see (non-comparable) Figure 5.3 and Figure 5.4 for reference ([631])	Figure 5.4	Figure 5.4	Figure 5.4	n/a, although see (non-comparable) Figure 1.16 for reference
Proportion (%) of women among researchers (in FTE) and R&D expenditure (in PPS) per researcher (in FTE), 2021	Figure 5.5	Figure 5.5	Figure 5.5	Figure 5.5	Figure 4.4
R&D expenditure (in PPS) per capita researcher (in FTE), by sector of employment, 2021	Table 5.1	Figure 5.6	Figure 5.6	Figure 5.6	Figure 4.5
Proportion (%) of Research Organisations that take actions or measures towards gender equality, by type of organisation, 2023	Figure 5.6	Figure 5.7	n/a	n/a	n/a
Gender overall earnings gap (%) in the economic activity 'Scientific research & development' and in the total economy, 2018	Figure 5.7	n/a	n/a	n/a	n/a
Gender overall earnings gap (%) in the economic activity 'Scientific research & development' and in the total economy, by age group, 2018	Table 5.2	n/a	n/a	n/a	n/a
International credit mobility rates (%) of Doctoral graduates during their PhD, by sex, 2021([632])	Annex 5.1	Annex 5.1	Annex 5.1	Annex 5.4	n/a

([628]) Not included due to the discontinuation of the MORE Survey.

([629]) Not included due to the discontinuation of the MORE Survey.

([630]) Different data sources were used due to discontinuation of the MORE Survey.

([631]) Different data sources were used due to discontinuation of the MORE Survey.

([632]) The name of this indicator has varied slightly in previous editions.

Name of indicator ([624])	SF2024 label	SF2021 label	SF2018 label	SF2015 label	SF2012 label
International mobility rates (%) of higher education sector researchers in post-PhD career stages, by sex, 2019	n/a, although see (non-comparable) Figure 5.3 and Figure 5.4 for reference ([633])	Annex 5.2	Annex 5.2	Annex 5.5	n/a
Total intramural R&D expenditure for the business, government and higher education sectors in million PPS, 2021	Annex 5.2	Annex 5.3	Annex 5.3	Annex 5.3	Annex 4.4
Chapter 6					
Proportion (%) of women and men in a typical academic career, students and academic staff in the EU, 2019-2022	Figure 6.1	Figure 6.1	Figure 6.1	Figure 6.1	Figure 3.1
Proportion (%) of women and men in a typical academic career in science and engineering, students and academic staff, 2019-2022	Figure 6.2	Figure 6.2	Figure 6.2	Figure 6.2	Figure 3.2
Proportion (%) of women and men in a typical academic career in humanities and social sciences, students and academic staff, 2019-2022	Figure 6.3	n/a	n/a	n/a	n/a
Proportion (%) of women among academic staff, by grade and total, 2022	Table 6.1	Table 6.1	Table 6.1	Table 6.1	Table 3.1
Evolution of the proportion (%) of women among Grade A positions, 2019 vs. 2022	Figure 6.4	Figure 6.3	Figure 6.3	Figure 6.3	Figure 3.3
Proportion (%) of grade A staff among all academic staff, by sex, 2022	Figure 6.5	Figure 6.4	Figure 6.4	Figure 6.4	Figure 3.4
Proportion (%) of women among grade A staff, by main field of R&D, 2022	Table 6.2	Table 6.2	Table 6.2	Table 6.2	Table 3.2
Distribution of Grade A staff across fields of R&D, by sex, 2022	Figure 6.6	Figure 6.5	Figure 6.5	Figure 6.5	Figure 3.5
Glass Ceiling Index, 2019-2022	Figure 6.7	Figure 6.6	Figure 6.6	Figure 6.6	Figure 3.6
Proportion (%) of women among grade A staff, by age group, 2022	Table 6.3	Table 6.3	Table 6.3	Table 6.3	Table 3.3
Distribution of grade A staff across age groups, by sex, 2022	Figure 6.8	Figure 6.7	Figure 6.7	Figure 6.7	Figure 3.7
Proportion (%) of women among heads of institutions in the Higher Education Sector (HES), 2022	Figure 6.9	Figure 6.8	Figure 6.8	Figure 6.8	Figure 4.1
Proportion (%) of women among heads of universities or assimilated institutions based on capacity to deliver PhDs, 2022	Figure 6.10	Table 6.4	Table 6.4	Table 6.4	Table 4.1
Proportion (%) of women on boards, members and leaders, 2022	Figure 6.11	Figure 6.9	Figure 6.9	Figure 6.9	Figure 4.2
Number of academic staff, by grade and sex, 2022	Annex 6.1	Annex 6.1	Annex 6.1	Annex 6.1	Annex 3.1

([633]) Different data sources were used due to discontinuation of the MORE Survey.

Name of indicator ([624])	SF2024 label	SF2021 label	SF2018 label	SF2015 label	SF2012 label
Number of senior academic staff (grade A), by field of R&D and sex, 2022	Annex 6.2	Annex 6.2	Annex 6.2	Annex 6.2	Annex 3.2
Number of academic staff (grade A), by age group and sex, 2022	Annex 6.3	Annex 6.3	Annex 6.3	Annex 6.3	Annex 3.3
Number of heads of institutions in the Higher Education Sector (HES) by sex, 2019 and 2022	Annex 6.4	Annex 6.4	n/a	n/a	n/a
Number of heads of universities or assimilated institutions based on capacity to deliver PhDs by sex and proportion (%) of women, 2022 and 2019	Annex 6.5	Annex 6.5	n/a	n/a	n/a
Chapter 7					
Proportion (%) of women among all authors in all fields of R&D, per seniority level, 2018-2022 ([634])	Figure 7.1	Figure 7.1	n/a	n/a	n/a
Proportion (%) of women among all authors, by field of R&D and seniority level, 2018-2022 ([635])	Table 7.1	Table 7.1	n/a	n/a	n/a
Proportion (%) of women among active authors in all fields of R&D, per seniority level, 2018-2022 ([636])	Figure 7.2	Figure 7.2	n/a	n/a	n/a
Proportion (%) of women among active authors, by field of R&D and seniority level, 2018-2022	Table 7.2	n/a	n/a	n/a	n/a
Ratio of average number of publications by women to those by men in all fields of R&D, per seniority level, 2018-2022	Figure 7.3	Figure 7.3	n/a	n/a	n/a
Ratio of average number of publications by women to those by men, by field of R&D, per seniority level, 2018-2022	Table 7.3	Table 7.2	n/a	n/a	n/a
Ratio of average FWCI of publications by women to that of men in all fields of R&D, per seniority level, 2018-2022	Figure 7.4	Figure 7.4	n/a	n/a	n/a
Ratio of average FWCI of publications by women to that of men, by field of R&D, per seniority level, 2018-2022	Table 7.4	Table 7.3	n/a	n/a	n/a
Average proportion of women among authors on publications in all fields of R&D, 2018-2022	Figure 7.5	Figure 7.5	n/a	n/a	n/a
Average proportion of women among authors on publications, by field of R&D, 2013-2017 and 2018-2022	Table 7.5	Table 7.4	n/a	n/a	n/a
Compound annual growth rate (%) of average proportion of women among authors on publications, by field of R&D, 2013-2022	Table 7.6	Table 7.5	n/a	n/a	n/a

([634]) Previously this indicator was calculated as a ratio. In the current edition, this is presented as a proportion to try and make it easier to interpret.

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Name of indicator ([624])	SF2024 label	SF2021 label	SF2018 label	SF2015 label	SF2012 label
Average proportion of women among authors on publications resulting from international collaboration in all fields of R&D, 2018-2022	Figure 7.6	Figure 7.6	n/a	n/a	n/a
Average proportion of women among authors on publications resulting from international collaboration, by field of R&D, 2013-2017 and 2018-2022	Table 7.7	Table 7.6	n/a	n/a	n/a
Compound annual growth rate (%) of average proportion of women among authors on publications resulting from international collaboration, by field of R&D, 2013-2022	Table 7.8	Table 7.7	n/a	n/a	n/a
Distribution of publications by sex composition of the authors team, 2018-2022	Figure 7.7	n/a	n/a	n/a	n/a
Proportion (%) of women with corresponding authorships, in all fields of R&D, 2019-2022 ([637])	Figure 7.8	Figure 7.7	Figure 7.2	Figure 7.1	n/a
Proportion (%) of women with corresponding authorships, by field of R&D, 2013-2017 and 2018-2022 ([638])	Table 7.9	Table 7.8	Table 7.4	Table 7.1	n/a
Compound annual growth rate (%) of proportion women with corresponding authorships, by field of R&D, 2013-2022 ([639])	Table 7.10	Table 7.9	Table 7.2	n/a, although see (part comparable) Table 7.2	n/a
Proportion (%) of women with corresponding authorships in all fields of R&D, international collaboration, 2018-2022 ([640])	Figure 7.9	Figure 7.8	Figure 7.3	n/a	n/a
Proportion (%) of women among inventors, 2018-2021 ([641])	Figure 7.10	Figure 7.9	Figure 7.11	Figure 7.4	n/a
Proportion (%) of women inventorships, by IPC class, 2008-2011 and 2018-2021 ([642])	Table 7.11	Table 7.10	Table 7.15	Table 7.7	n/a
Compound annual growth rate (%) of the four-year proportion of women inventorships, by IPC section, 2018-2021 ([643])	Table 7.12	Table 7.11	Table 7.16	Table 7.8	n/a
Distribution of patent application by sex composition of the inventors' team (%), 2018-21	Figure 7.11	Figure 7.10	Figure 7.12	n/a	n/a
CAGR (%) of the four-year time moving periods of patent applications, by sex composition of the inventors' team, 2009–2021	Table 7.13	Table 7.12	Table 7.17	n/a	n/a

([637]) Previously this indicator was calculated as a ratio. In the current edition, this is presented as a proportion to try and make it easier to interpret.

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Name of indicator ([624])	SF2024 label	SF2021 label	SF2018 label	SF2015 label	SF2012 label
Average proportion of women among authors on publications that list, among the author affiliations, both a corporate entity and any other entity, in all fields of R&D, 2018-2022	Figure 7.12	Figure 7.11	n/a	n/a	n/a
Research funding success rate differences between women and men, 2022	Figure 7.13	Figure 7.12	Figure 7.13	Figure 7.5	Figure 4.3
Research funding success rate differences between women and men, by field of R&D, 2022	Table 7.14	Table 7.13	Table 7.18	Table 7.9	Table 4.2
Proportion (%) of a country's publications with a gender dimension in their research and innovation content, 2018-2022 and compound annual growth rate (%) and trend of the percentage, 2013-2022	Table 7.15	Table 7.14	Table 7.19	n/a	n/a
Proportion (%) of a country's publications with a gender dimension in their research content, by field of R&D, 2018-2022	Table 7.16	Table 7.15	Table 7.20	n/a, although see (noncomparable) Table 7.10	n/a
Proportion (%) of Horizon 2020 (2014-2020) projects integrating a gender dimension, by country 2014-2020	Figure 7.14	Figure 7.13	n/a	n/a	n/a
Proportion (%) of Horizon Europe (2020-2027) projects integrating a gender dimension (GDRIC), by country, 2021-2023	Figure 7.15	n/a	n/a	n/a	n/a
Proportion (%) of Horizon 2020 projects integrating intersectional aspects, by country, 2014-2020	Figure 7.16	Figure 7.14	n/a	n/a	n/a
Proportion (%) of Horizon Europe projects integrating intersectional aspects, by country, 2021-2023	Figure 7.17	n/a	n/a	n/a	n/a
Relative activity index for research contributing to SDG 5, 2018-2022	Figure 7.18	n/a	n/a	n/a	n/a
Proportion (%) of women among active authors, by selected SDGs and seniority level, 2018-2022 ([644])	Annex 7.1.	Annex 7.1.	n/a	n/a	n/a
Proportion (%) of women among all authors, by field of R&D, selected SDGs and seniority level, 2018-2022 ([645])	Annex 7.2	Annex 7.2	n/a	n/a	n/a
Average proportion of women among authors on publications, by selected SDGs, 2013-2017 and 2018-2022	Annex 7.3	Annex 7.3	n/a	n/a	n/a
Average proportion of women among authors on publications resulting from intra-EU27+ collaboration in all fields of R&D, 2018-2022	Annex 7.4	Annex 7.4	n/a	n/a	n/a
Average proportion of women among authors on publications resulting from national collaboration in all fields of R&D, 2018-2022	Annex 7.5	Annex 7.5	n/a	n/a	n/a
Ratio of FWCI for women authors to men authors based on fractional authorship on publications, by field of R&D, 2017 and 2022	Annex 7.6	Annex 7.7	n/a	n/a	n/a

([644]) Previously this indicator was calculated as a ratio. In the current edition, this is presented as a proportion to try and make it easier to interpret.

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Name of indicator ([624])	SF2024 label	SF2021 label	SF2018 label	SF2015 label	SF2012 label
CAGR (%) of ratio of FWCI for women authors to men authors based on fractional authorship on publications, by field of R&D, 2013-2022	Annex 7.7	Annex 7.8	n/a	n/a	n/a
Proportion (%) of publications for which a woman is corresponding author, by selected SDGs, 2013-2017 and 2018-2022 ([646])	Annex 7.8	Annex 7.9	n/a	n/a	n/a
Proportion (%) of women with corresponding authorships in all fields of R&D, intra-EU-27+ collaboration, 2018-2022 ([647])	Annex 7.9	Annex 7.10	n/a	n/a	n/a
Proportion (%) of women with corresponding authorships in all fields of R&D, national collaboration, 2018-2022 ([648])	Annex 7.10	Annex 7.11	n/a	n/a	n/a
Proportion (%) of women with corresponding authorships by field of R&D, international collaboration, 2013-2017 and 2018-2022 ([649])	Annex 7.11	Annex 7.12	Table 7.8	Table 7.3	n/a
CAGR (%) of proportion of women with corresponding authorships in international collaborations, by field of R&D, 2013-2022 ([650])	Annex 7.12	Annex 7.13	Table 7.6	Table 7.4	n/a
Ratio of average FWCI for publications with women as corresponding authors to average FWCI for publications with men as corresponding authors, in all fields of R&D, 2022	Annex 7.13	Annex 7.14	n/a	n/a	n/a
Ratio of average FWCI for publications with women as corresponding authors to average FWCI for publications with men as corresponding authors, by field of R&D, 2017 and 2022	Annex 7.14	Annex 7.15	n/a	n/a	n/a
CAGR (%) of ratio of average FWCI for publications with women as corresponding authors to average FWCI for publications with men as corresponding authors, by field of R&D, 2013-2022	Annex 7.15	Annex 7.16	n/a	n/a	n/a
Number of applicants and beneficiaries of research funding, by sex, 2022	Annex 7.16	Annex 7.17	Annex 7.1	Annex 7.1	Annex 4.2
Number of women applicants and beneficiaries of research funding, by field of R&D, 2022	Annex 7.17	Annex 7.18	Annex 7.2	n/a	n/a
Number of men applicants and beneficiaries of research funding, by field of R&D, 2022	Annex 7.18	Annex 7.19	Annex 7.3	Annex 7.2 (part)	Annex 4.3 (part)
Number of a country's publications with a gender dimension in their research and innovation content, by field of R&D, 2018-2022	Annex 7.19	Annex 7.20	n/a	n/a	n/a

Note: New indicators for She Figures 2024 are indicated with blue fill.

([646]) Previously this indicator was calculated as a ratio. In the current edition, this is presented as a proportion to try and make it easier to interpret.

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APPENDIX 2 – METHODOLOGICAL NOTES

These notes are intended to provide the reader with a brief reference guide about the coverage, identification and definition of groups, units and concepts presented and used in this publication.

For more detailed methodological notes on the data presented in this publication, please access the She Figures 2024 Handbook, available at: https://data.europa.eu/doi/10.2777/218571

Data sources

The majority of the She Figures data comes from Eurostat (the statistical office of the European Union) and is publicly available. This includes the indicators on ISCED 2011 level 8 graduates, knowledge-intensive activities, research and experimental development (R&D) expenditure and most indicators on researchers and R&D personnel. In particular, the publication draws upon Eurostat's databases on:

- Education and Training: https://ec.europa.eu/eurostat/web/education-and-training/database
- Science, Technology and Innovation: https://ec.europa.eu/eurostat/web/science-technology-innovation/database

Data on education and on R&D for countries that are not EU Member States or EFTA countries were also collected from:

- OECD: https://stats.oecd.org/ (Education and skills)

Data on population, labour force, unemployment and labour under-utilisation for countries that are not EU Member States or EFTA countries were also collected from the International Labour Organization (ILO): https://www.ilo.org/ilostat/ (subjects: a) population and labour force and b) unemployment and labour under-utilisation).

National Statistical Correspondents provided data for the indicators drawn from the Women in Science database which reports on the underrepresentation of women at the higher levels of the academic career path and in positions of power.

Bibliometric indicators were produced using the Scopus™ database and patent indicators were produced based on the EPO Worldwide Patent Statistical Database (PATSTAT).

An important addition to She Figures 2024 is the introduction of the She Figures Index, a composite indicator drawn from carefully selected She Figures indicators. This new index serves as a comprehensive tool to assess gender equality within the European Research Area (ERA) across EU Member States and offers insights into the current state of gender equality in R&I across Europe, tracking progress over time.

Throughout She Figures 2024, the data source for each indicator is presented below the corresponding figure/table.

Statistical terms and classifications

Students and Graduates

The International Standard Classification of Education (ISCED) is the UN framework for classifying educational programmes at different levels. Data presented in the She Figures 2021 have been collected in line with the ISCED 2011 classification (UNESCO, 2011).

Tertiary (or Higher) Education is comprised of four levels: short-cycle tertiary education (level 5), Bachelor's or equivalent (level 6), Master's or equivalent (level 7) and Doctoral or equivalent (level 8).

Entry into the ISCED level 5 programmes requires the successful completion of ISCED level 3 or 4 with access to tertiary education. ISCED level 8 programmes are designed primarily to lead to an advanced research qualification.

Programmes at this ISCED level are devoted to advanced study and original research and are typically offered only by research-oriented tertiary educational institutions such as universities.

Data referring to the reference year 2012 or earlier have been collected in line with the ISCED 1997 classification (UNESCO, 1997). The equivalents to ISCED 2011 levels 6-7 and 8 are the ISCED-97 levels 5A and 6 respectively used in previous publications.

The number of graduates refers to those graduating in the reference year and not to the number of graduates in the population. The number of graduates also refers to non-national students graduating in the country, but does not include national students graduating abroad.

Science and Technology (S&T) fields of education and training

The ISCED-F 2013 classification (UNESCO Institute of Statistics, 2014) distinguishes 29 narrow fields of education and training organised in 10 broad groups: education; humanities and arts; social sciences, journalism and information; business administration and law; natural sciences, mathematics and statistics; information and communication technology; engineering, manufacturing and construction; agriculture, forestry, fisheries and veterinary; health and welfare; and services. In other words, the student and graduate population analysed in this publication covers all fields.

International Standard Classification of Occupations (ISCO)

The International Standard Classification of Occupations (ISCO) is the International Labour Organization classification structure for organising information on labour and jobs. ISCO is a tool for organising jobs into a clearly defined set of groups according to the tasks and duties undertaken in the job. The first version of ISCO, adopted in 1957 and named ISCO-58, was followed by ISCO-68 and ISCO-88. Many current national occupational classifications are based on one of these three ISCO versions. ISCO was updated in 2007 to take into account developments in the world of work since 1988 and to make improvements in the light of experience gained in using ISCO-88. The update did not change the basic principles and the top structure of ISCO-88 (i.e. the ten major groups). However, significant sub structural changes were made in some areas. The updated classification is known as ISCO-08. The ILO provides a correspondence table linking ISCO-08 to ISCO-88 (ILO, 2012).

Among the ten major groups the She Figures looks at is Professionals and Technicians and associate professionals. Professionals are subdivided into six sub major groups: science and engineering professionals; health professionals; teaching professionals; business and administration professionals; information and communications technology professionals; and legal, social and cultural professionals.

Technicians and associate professionals are subdivided into five sub major groups: science and engineering associate professionals; health associate professionals; business and administration associate professionals; legal, social, cultural and related associate professionals; and information and communications technicians.

Human Resources in Science and Technology (HRST)

The Canberra Manual (OECD, 1995) proposes a methodology to identify individuals from the European Union Labour Force Survey case data, according to educational attainment and occupation, to approximate Human Resources in Science and Technology (HRST). The types of HRST presented in this publication are:

- HRSTE: HRST Education – people who have successfully completed tertiary education in any field of education and training (see Science and Technology – S&T – fields of education and training below)
- HRSTC: HRST Core – people who are both HRSTE and HRSTO (HRST Occupation).

Knowledge-intensive activities (KIA and KIABI)

An activity is classified as knowledge intensive if tertiary educated people employed (according to ISCED97, levels 5 to 6 or ISCED11, levels 5 to 8) represent more than 33% of the total employment in that activity. The definition is based on the average number of employed persons aged 15-64 at aggregated EU-27 level in 2008 and 2009 according to the NACE Rev. 2 at 2-digit (see 'NACE categories' below), using the EU Labour Force Survey data.

There are two aggregates in use based on this classification: total Knowledge-Intensive Activities (KIA) and Knowledge-Intensive Activities – Business Industries (KIABI). Further reference can be found in Chapter 3.

Scientists and Engineers (S&E) in employment

As per the ISCO-08 classification, S&E are defined as people who work as:

- Science and engineering professionals (ISCO-08, Code 21)
- Health professionals (ISCO-08, Code 22)
- Information and communications technology professionals (ISCO-08, Code 25).

Researchers and R&D personnel

The Frascati Manual (OECD, 2015) provides an international definition for R&D personnel (§5.6): 'R&D personnel in a statistical unit include all persons engaged directly in R&D,

whether employed by the statistical unit or external contributors fully integrated into the statistical unit's R&D activities, as well as those providing direct services for the R&D activities (such as R&D managers, administrators, technicians and clerical staff).'.

There are three categories of R&D personnel:

- Researchers (§5.35): 'Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned'.
- Technicians and equivalent staff (§5.40): 'Technicians and equivalent staff are persons whose main tasks require technical knowledge and experience in one or more fields of engineering, physical and life sciences or social sciences and humanities. They participate in R&D by performing scientific and technical tasks involving the application of concepts and operational methods, normally under the supervision of researchers. Equivalent staff perform the corresponding R&D tasks under the supervision of researchers in the social sciences and humanities'.
- Other supporting staff (§5.43): 'Other supporting staff includes skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with such projects'. It must be noted that from the reference year 2012 onwards, it is not compulsory for countries to report technicians separately from other supporting staff when providing data for their R&D personnel to Eurostat.

Main fields of Research and Development (FORD)

The Frascati Manual (OECD, 2015) defines six main fields of R&D (FORD):

- Natural sciences
- Engineering and technology
- Medical and health sciences
- Agricultural and veterinary sciences
- Social sciences
- Humanities and the arts.

These are adhered to in this publication, with one exception: in chapter 4, the field designations used by Eurostat are adopted.

The breakdown of researchers by field of R&D is based on the field where they work and not according to the field of their qualification.

Indicators about scientific publications were also produced by the above FORD. Scientific publications in Scopus™ are assigned to several major and minor subject areas. Major subject areas are defined according to 27 All Science Journal Classification (ASJC) categories. Each of the 27 subject categories is further subdivided into a total of 334 minor sub-categories. As some journals can be classified as multi-category (i.e., more than one subject), each publication may fall into more than one subject classification. For She Figures 2024, the ASJC classifications were mapped to the FORD. A full table of the mapping of FORD with the ASJC sub-categories can be found in the She Figures 2024 Handbook.

Sectors of the economy

The Frascati Manual (OECD, 2015) identifies and defines five sectors of the economy: the higher education sector (HES), the government sector (GOV), the business enterprise sector (BES), the private non-profit sector (PNP) and the 'Rest of the world' sector. The definitions for the first four sectors are:

HES (§3.67): 'It comprises all universities, colleges of technology and other institutions providing formal tertiary education programmes, whatever their source of finance or legal status, and all research institutes, centres, experimental stations and clinics that have their R&D activities under the direct control of, or administered by, tertiary education institutions'.

GOV (§3.60): 'The government sector consists of the following groups of resident institutional units: all units of central (federal), regional (state) or local (municipal) government including social security funds, except those units that provide higher education services or fit the description of higher education institutions provided in this manual. It consists also of all non-market NPIs that are controlled by government units that are not part of the Higher education sector'.

BES (§3.51): 'The business enterprise sector comprises all resident corporations, including not only legally incorporated enterprises, regardless of the residence of their shareholders. This group also includes all other types of quasi-corporations, i.e. units capable of generating a profit or other financial gain for their owners that are recognised by law as separate legal entities from their owners and set up for purposes of engaging in market production at prices that are economically significant. It comprises also the unincorporated branches of non-resident enterprises that are deemed to be resident because they are engaged in production on the economic territory on a long-term basis and all resident NPIs that are market producers of goods or services or serve business'.

PNP (§3.75):'The private non-profit sector comprises all non-profit institutions serving households (NPISH), as defined in the SNA 2008, except those classified as part of the Higher education sector. For completeness of presentation it comprises also, households and private individuals engaged or not engaged in market activities, as explained in the section "Criteria for the classification of institutional sectors for R&D statistics" earlier in this chapter'.

The 'rest of the world' sector is not referred to in this publication.

NACE categories

Researchers in the business enterprise sector are categorised using the Statistical Classification of Economic Activities in the European Community, Rev. 2 (NACE Rev.2). For a full listing of the NACE Rev.2 categories please see https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-RA-07-015

Units – Head Count & Full Time Equivalent

The units of measurement of personnel employed on R&D as proposed by the Frascati Manual (OECD, 2015) are:

- HC (§5.58): Head count. The number of persons engaged in R&D at a given date, the average number of persons engaged in R&D during the (calendar) year, or the total number of persons engaged in R&D during the (calendar) year.
- FTE (§5.49): Full time equivalent. It is defined as the ratio of working hours spent on R&D during a specific reference period (usually a calendar year) divided by the total number of hours conventionally worked in the same period by an individual or by a group.

Data in this publication are presented in HC, unless indicated otherwise.

R&D expenditure

The Frascati Manual (OECD 2015) defines intramural expenditures on R&D (§4.10) as all current expenditures plus gross fixed capital expenditures for R&D performed within a statistical unit during a specific reference period, whatever the source of funds.

Seniority grades of researchers/academic staff

Statistics on researchers/academic staff have been collected by sex, grade, main field of R&D and age group (for latest reference year only) using the Women in Science (WiS) questionnaire. The statistics on the seniority of researchers/academic staff are collected at the national level through Higher Education and R&D Surveys or directly from higher education institutions as part of their own monitoring systems and from administrative records. It is important to note that these data are not always completely cross country comparable as the seniority grades have not yet been implemented following the publication of the revised Frascati Manual guidelines (OECD 2015). Furthermore, since it was not always possible for countries to provide data on the preferred reference population in the She Figures 2024 – that is for researchers in the HES as defined by the Frascati Manual (OECD, 2015) – some countries provided data for an alternative reference population, namely 'academic staff' (see definition in UNESCO – Institute for Statistics et al, 2017) in the HES.

The grades presented in this publication 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 graduate would normally be recruited within the institutional or corporate system;
- D: Either postgraduate students not yet holding a PhD degree who are engaged as researchers (on the payroll) or researchers working in posts that do not normally require a PhD.

Internationally mobile researchers

Two ‘She Figures 2024’ indicators present the mobility rate differences between women and men PhD graduates and women and men authors, based on Eurostat and bibliometric data respectively. In previous editions, indicators on the international mobility of researchers used data from the MORE Survey, which has now been discontinued.

Part-time and precarious employment

Two indicators focus on part-time employment and precarious contracts for researchers in the HES, using data from Eurostat. In previous editions, indicators on the international mobility of researchers used data from the MORE Survey, which has now been discontinued.

Following Eurostat definition, a person in a part-time job is assumed to work less than a comparable full-time worker having a job in the same occupation and in the same organisation ('local unit'). Whereas precarious employment is defined as working contracts with a length of three years or less.

This definition of ‘precarious’ employment differs from that of the Labour Market and Labour Force Statistics which describes as ‘precarious’ contracts with a duration of three months or less (https://ec.europa.eu/eurostat/web/ labour-market/quality-of-employment).

Actions and measures taken towards Gender Equality

One indicator in She Figures 2024 refers to the implementation of actions and measures towards Gender Equality by research-performing organisations, based on web-scraping data. The search phrases that were used to indicate that organisations had taken actions and measures to promote Gender Equality include but are not limited to:

- Gender Equality Plan
- Equal opportunities officer
- Equal participation officer
- Eliminate/Prevent sex discrimination
- Eliminate/Prevent harassment
- Harassment policy
- Gender diversity committee
- Gender diversity office
- Gender diversity task force
- Gender equality policy

More details on how these and other search phrases were created and the process of web-scraping techniques are presented in the She Figures 2024 Handbook.

Technological fields (IPC sections)

Statistics on inventorships were produced by using data from the EPO Worldwide Patent Statistical Database (PATSTAT). All EPO patent applications are classified based on the International Patent Classification (IPC) of the World Intellectual Property Organization (WIPO) in PATSTAT. This hierarchical classification is divided into eight sections (level 1), which are further divided into classes (level 2), sub-classes (level 3), main groups (level 4) and sub-ingroups (lower level). This classification is not mutually exclusive (i.e. each patent application is classified into one or more sections, classes, subclasses, main groups and subgroups). Thus, a given patent application can contribute to the scores of more than one of the eight sections for which statistics on inventorships were calculated:

- A: Human necessities
- B: Performing operations & transporting
- C: Chemistry & metallurgy
- D: Textiles & paper
- E: Fixed constructions
- F: Mechanical engineering, lighting, heating, weapons & blasting
- G: Physics
- H: Electricity

Additional data considerations

Age groups

Data referring to the labour force refer to all persons aged 15+ living in private households and include the employed and the unemployed. Data referring to research personnel, to the working conditions of researchers in the HES (or to a target population used as a proxy) and to human resources in science and technology (HRST) refer to the age group 25–64.

Small numbers

For some countries with small populations, raw data relating to small numbers of people have been compiled. The percentages and indicators have not always been included (mostly growth rates) and this is identified in the footnotes to the indicators. The reader is therefore asked to bear this in mind when interpreting the most data at their most disaggregated level.

EU estimates

Estimated EU totals are based upon existing data for the reference year in combination with the next available year if the reference year is unavailable, in the following sequence (n-1, n+1, n-2, n+2 etc.).

The aggregates were estimated only when at least 60 % of the EU population on a given indicator was available. These estimates are intended only as an indication for the reader.

Rounding error

In some cases, the row or column totals do not match the sum of the data. This may be due to rounding error.

Decimal places

All the data in the figures have been calculated at the precision levels of one or two decimals. However, the values have been rounded in the figures (typically to one decimal place) and in text (to two significant figures) to support comprehension.

Cut-off date

The cut-off date for data downloaded from Eurostat's dissemination database (Eurostat) was the 29th of November 2023. Due to the large variety of data sources and variability in data availability, some other cut-off dates were used in order to gather all the required data. The other cut-dates used were as follows:

- Education statistics downloaded from Eurostat's dissemination database (Eurostat) and OECD's database: 31 July 2023;
- EU Labour Force Survey data downloaded from Eurostat's dissemination database (Eurostat): 5 September 2023;
- Human resources in science and technology data downloaded from Eurostat's dissemination database (Eurostat) and ILO's database: 31 July 2023;
- High-tech industry and knowledge-intensive services data downloaded from Eurostat's dissemination database (Eurostat): 31 July 2023;
- R&D statistics downloaded from Eurostat's dissemination database (Eurostat) and OECD's database: 27 October 2023;
- Structures of Earnings Survey data downloaded from Eurostat's dissemination database (Eurostat): 29 February 2024;
- Web-scraping: 1 February 2024;
- Scopus data: 1 September 2023 (at which point data for the previous year (2022) can be considered complete);
- Horizon 2020 and Horizon Europe data: 1 November 2023 (this means that Horizon Europe data is not complete); and,
- PATSTAT data: 1 September 2023.

Country codes

EU Member States			
BE	Belgium	**LT**	Latvia
BG	Bulgaria	**LU**	Luxembourg
CZ	Czechia	**HU**	Hungary
DK	Denmark	**MT**	Malta
DE	Germany	**NL**	Netherlands
EE	Estonia	**AT**	Austria
IE	Ireland	**PL**	Poland
EL	Greece	**PT**	Portugal
ES	Spain	**RO**	Romania
FR	France	**SI**	Slovenia
HR	Croatia	**SK**	Slovakia
IT	Italy	**FI**	Finland
CY	Cyprus	**SE**	Sweden
LV	Latvia		

European Free Trade Association (EFTA) ([651])	
IS	Iceland
NO	Norway

EU Candidate Countries			
BA	Bosnia and Herzegovina	**AL**	Albania

([651]) Note that Switzerland was not associated to Horizon Europe at the time of the preparation for the study and is therefore not included.

ME	Montenegro	**RS**	Serbia
MD	Moldova	**TR**	Türkiye
MK	North Macedonia	**UA**	Ukraine
GE	Georgia		

Potential candidate	
XK	Kosovo ([652])

Other Countries			
AM	Armenia	**JP**	Japan
AR	Argentina	**KR**	South Korea
AU	Australia	**MX**	Mexico
BR	Brazil	**TN**	Tunisia
CA	Canada	**RU**	Russia
CN_X_HK	China except Hong Kong	**UK**	United Kingdom
FO	Faroe Islands	**US**	United States
HK	Hong Kong	**ZA**	South Africa
IL	Israel		
IN	India		

([652]) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

Flags

The following flags have been used, where necessary, and are explained in a footnote beneath each figure/table:

z = not applicable

: = data not available or data excluded due to the small number of statistical units

: = (only for indicators about R&D personnel by occupation) data are available for more detailed occupation groups but not for the aggregate groups displayed in the results

: = (only for the numbers of applicants and beneficiaries of research funding, by field of R&D) the field of R&D is not applicable

d = definition differs

p = (not for bibliometric indicators) provisional

p = (bibliometric indicators only) count of publications in the category was less than 100

e = estimated

r = revised

f = forecast

u = low reliability

c = confidential

b = break in time series

n = not significant

- = data not available

- = (not for bibliometric indicators) the denominator that should be used for the calculation of proportions or ratios is zero

- = (bibliometric indicators only) the value at the beginning or end of the period was unavailable for CAGR calculations, either because the value at the beginning of the period was zero or because the number of publications at the beginning was zero

Researchers/academic staff

The following list provides country-specific metadata for the reference population used in producing statistics on the seniority of researchers/academic staff using the Women in Science (WiS) questionnaire. The first column identifies the reference population used in producing She Figures 2024 by country. The preferred reference population was researchers in the HES as defined by the Frascati Manual. Otherwise, data on academic staff in the HES as defined by the 2022 UOE manual ([653]) were used instead.

([653]) UNESCO-UIS / OECD / EUROSTAT, *UOE Data Collection on formal education, Manual on concepts, definitions and classifications, version of July 2022*, 2022. MONTREAL, PARIS, LUXEMBOURG

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
BELGIUM	Researchers	Dutch-speaking community			
		A	ZAP1 - “Gewoon/buitengewoon hoogleraar” + ZAP2 - “Hoogleraar”	-	-
		B	ZAP3 - “Hoofddocent” + ZAP4 - “Docent” + ZAP5 - “Other”	-	-
		C	AAP2 - Doctor-assistant + WP3 - Postdoctoral of unlimited duration + WP4 - Postdoctoral of limited duration + Unpaid researchers (postdoctoral)	-	-
		D	AAP1 - Assistant + AAP3 - Other + WP1 - Predoctoral of unlimited duration + WP2 - Predoctoral of limited duration + Unpaid researchers (predoctoral)	-	-
		French speaking community			
		A	Ordinary and extraordinary professors, Research Directors (F.R.S.-FNRS)	PhD	-
		B	Other professors, Senior Research Associates (F.R.S.-FNRS)	PhD	-
		C	Assistant professors (or equivalent, including “Chargé de cours”), Lecturers (Maîtres de conférence), Research Associates (F.R.S.-FNRS)	PhD	-
		D	Scientific staff : Postdoctoral researchers, Scientific Research Workers, Teaching assistants, Research Fellows (or equivalent)	MSc	-
Comments		Dutch-speaking community: Classification provided by VLIR (Flemish Interuniversity Council). French-speaking community: With respect to T1 (head counts), a researcher who holds different positions within different Grade categories (A, B, C, D) could be counted several times.			

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
BULGARIA	Academic staff	AD	Professors	ISCED 8	Teaching and Research
		B	Associate professors	ISCED 8	Teaching and Research
		C	-	-	-
		D	Assistants, Lecturers, Science assistants	ISCED 7	Teaching and Research
Comments		No comments			
CZECHIA	Researchers	A	-	-	-
		B	-	-	-
		C	-	-	-
		D	-	-	-
Comments		No comments			
DENMARK	Researchers	A	Professor	PhD	-
		B	Associate professors, Senior researchers	PhD	-
		C	Assistant professors, Post docs	PhD	-

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		D	PhD Students, other researchers (R&D advisors, research assistants and other VIPs)	MSc	-
Comments		No comments			
GERMANY	Academic staff	A	Professors: W3/C4	Habilitation or equivalent	Teaching and Research
		B	C3, C2 auf Dauer, C2 auf Zeit, W2, Juniorprofessuren W1, Gastprofessuren (hauptberuflich), Hochschuldozenten, Universitätsdozenten, Oberassistenten, Oberingenieure, wissenschaftliche und künstlerische Mitarbeiter (höchster Abschluss: Habilitation)	PhD + professional experience outside the academia (universities of applied sciences) or habilitation or equivalent (universities)	Teaching and Research
		C	Hochschulassistenten, Wissenschaftliche und künstler- ische Assistenten, Akademische (Ober)Räte-auf Zeit, wissenschaft- liche und künstlerische Mitarbeiter (höchster Abschluss: Promotion), Lehrkräfte für besondere Aufgaben (höchster Abschluss: Promotion oder Habilitation)	PhD	Normally both; some staff is only involved in research, some only in teaching
		D	Wissenschaftliche und künstlerische Mitarbeiter (höchster Abschluss: Master/ Diplom oder Äquivalent), Lehrkräfte für besondere Aufgaben (höchster Abschluss: Master/ Diplom oder Äquivalent)	MA	Normally both; some staff is only involved in research, some only in teaching

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
Comments		Break of time series in 2016 because data on the highest qualifications of staff have been provided since 2016, and the mapping of the national classification (salary groups) to grades B, C, and D was changed.			
ESTONIA	Researchers	A	-	-	-
		B	-	-	-
		C	-	-	-
		D	-	-	-
Comments		No comments			
IRELAND	Academic staff	A	Full Professor on appropriate salary (€101,404 – €136,276). Grade A staff members are found in the universities. While there are some staff members who are in the IoTs who are styled as professors, these are not returned as academic staff in the HEA returns, and therefore do not fit the definition of Grade A staff (the highest grade/post at which research is normally conducted).	Varies depending on institution and date of appointment.	Teaching and Research
		B	Senior Lecturer (all grades), Associate Professor, (it would be expected that once the staff database is established Grade B staff will also include Lecturer 'above the bar', as these positions are held by those 'more senior than newly qualified PhD holders').	Varies depending on institution and date of appointment.	Teaching and Research

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		C	Lecturer (and 'Assistant Lecturer' in the IoTs)	Varies depending on institution and date of appointment.	Teaching and Research
		D	-	-	-
Comments		No comments			
GREECE	Academic staff	A	Professor	ISCED 6	Teaching and Research
		B	Deputy Professor	ISCED 6	Teaching and Research
		C	Assistant Professor, Lecturer	ISCED 6	Teaching and Research
		D	other academic staff	ISCED 5 & ISCED 6	Teaching and Research
Comments		No comments			
SPAIN	Researchers	A	Full professor	-	-
		B	Associate Professor (civil servant and non-civil servant permanent) and Post-Doc contract for outstanding research careers (non-permanent)	-	-
		C	Assistant Professor (PhD holder), Other researchers in non- permanent positions that require a PhD	-	-

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		D	PhD Candidate engaged as researcher and Researchers in non-permanent post that do not require a PhD	-	-
Comments		Non-research teachers and researchers without assigned grades can not be assigned to a grade. Therefore, the total does not equal the sum of the breakdown by grades. We suggest including another field for this staff.			
FRANCE	Researchers	A	-	ISCED8	Teaching and Research
		B	-	ISCED7/8	Teaching and Research
		C	-	ISCED7/8	Research
		D	-	ISCED8	Teaching and Research
Comments		No comments			
CROATIA	Researchers	A	Researchers with highest scientific title	PhD	Research
		B	Researchers with highest scientific title	PhD	Research
		C	Researchers without scientific title	PhD	Research
		D	Researchers (Postgraduate students without PhD)	Postgraduate level that is no PhD	Teaching and Research
Comments		No comments			
ITALY	Academic staff	A	FULL PROFESSORS (permanent employment)	Since 2010, a reform of the University (Law 240/2010) has	Teaching and Research

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
				reorganised the recruitment procedures of the academic staff and has established a “national scientific qualification” which is a necessary prerequisite for access to grades A and B. Before then, it was enough to hold a degree and passing a specific public competition.	
		B	ASSOCIATE PROFESSORS (permanent employment - lower level)	cfr. A - Minimum level of education required	Teaching and Research
		C	ACADEMIC RESEARCHERS (permanent employment and fixed-term employment)	Since 2010, ISCED 8 level (PhD) attainment. ISCED 7 level attainment before 2010.	Teaching and Research but they are more involved in research activities than in teaching.
		D	FELLOWSHIP RESEARCHERS	PhD or equivalent is an advantage to the attribution of grants.	Research
Comments		No comments			

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
CYPRUS	Researchers	A	Professors	PhD	Teaching and Research
		B	Associate Professors	PhD	Teaching and Research
		C	Assistant Professors, Lecturers & Teaching Support Staff	PhD (for Assistant Professors); MSc and/or PhD (for Lecturers & Teaching Support Staff)	Teaching and Research
		D	Research Associates & Other Staff	Other post-secondary diplomas to PhD	Research
Comments					
LATVIA	Researchers	A	Full Professors	PhD	Teaching and Research
		B	Associate Professors	PhD	Teaching and Research

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		C	Assistant Professors, assistants, lecturers, researchers	MSc	-
		D	-	-	-
Comments		No comments			
LITHUANIA	Academic staff	A	Professor - teaching staff, Chief Researcher - research staff	PhD	Teaching and Research
		B	Associate professor - teaching staff, Senior Researchers - research staff	PhD	Teaching and Research
		C	Lecturers - teaching staff, Researchers - research staff	At least a Master's qualification degree or higher education qualification equivalent	Teaching and Research
		D	Assistants - teaching staff, Junior Researchers - research staff.	At least a Master's qualification degree or higher education qualification equivalent	Teaching and Research
Comments		No comments			
MALTA	Researchers	A	Associate Professor/Professor	University of Malta (UM): PhD, Malta College of Arts, Science & Technology (MCAST): EQF 8	University of Malta (UM): Teaching and Research, Malta College of Arts, Science & Technology (MCAST): Research

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		B	Lecturer/Senior Lecturer	University of Malta (UM): PhD, Malta College of Arts, Science & Technology (MCAST): EQF 8	University of Malta (UM): Teaching and Research, Malta College of Arts, Science & Technology (MCAST): Teaching and Research
		C	Assistant Lecturer	University of Malta (UM): First Degree, Malta College of Arts, Science & Technology (MCAST): EQF 8	University of Malta (UM): Teaching and Research, Malta College of Arts, Science & Technology (MCAST): Teaching and Research
		D	Junior College Lecturer	University of Malta (UM): First Degree, Malta College of Arts, Science & Technology (MCAST): EQF 5	University of Malta (UM): Teaching, Malta College of Arts, Science & Technology (MCAST): Teaching and Research
Comments		No comments			
NETHERLANDS	Academic staff	A	Full professor	-	Teaching and Research
		B	Associate Professor	-	Teaching and Research
		C	Assistant professor	-	Teaching and Research

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		D	Other scientific personnel and Postgraduates	-	Depends on the subcategory. Some subcategories within “other scientific personnel” are oriented to education, some to research. Postgraduates have a small educational task.
Comment		Grade D includes PhD students currently working on their PhD, who have an employment contract with the university and thus form a part of the academic staff. This is quite common in the Netherlands.			
AUSTRIA	Researchers	A	Universitätsprofessor:in, Stiftungsprofessor:in, Gastprofessor:in nur mit F&E-Tätigkeit, Emeritierte:r Universitätsprofessor:in und Professor:in im Ruhestand nur mit F&E-Tätigkeit	-	Teaching and Research
		B	Assoziierte:r Professor:in, Universitätsdozent:in, Vertragsdozent:in, Assistenzprofessor:in	-	Teaching and Research
		C	Ass.Professor:in (KV), Universtitätsassistent:in mit PhD, Staff Scientist, Senior Scientist/Artist, Assistenzärzt:in, Ärzt:in, Projektmitarbeiter:in und Sonstiges wissenschaftliches Personal mit PhD	-	Teaching and Research
		D	Universitätsassistent:in ohne PhD Projektmitarbeiter:in und Sonstiges wissenschaftliches Personal ohne PhD, Senior Lecturer, Bundes- und Vertragslehrer:in, Wissenschaftliche Beamt:innen,	-	Teaching and Research

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
			Wissenschaftliche Vertragsbedienstete, Studentische Mitarbeiter:innen (mit F&E-Tätigkeit).		
Comments		Projektmitarbeiter/innen and Sonstiges wissenschaftliches Personal with PhD: Grade C, without PhD Grade D (separated since 2013); Studentische/r Mitarbeiter/in without R&D are not included (since 2013). Since 2021 only persons with FTE for R&D > 0,01 are included in A, B, C and D.			
POLAND	Researchers	A	Profesor	Doctor habilis with the title of professor	Teaching and Research
		B	Doktor habilitowany (Doctor habilis / Habilitated PhD)	Habilitation	Teaching and Research
		C	Doktor (PhD)	PhD	Teaching and Research
		D	Magister	Masters Degree	Teaching and Research
Comments		Responsibilities of scientists does not depend on their grade, but on job title and the scope of duties. For most scientists, both research and teaching are obligatory.			
PORTUGAL	Researchers	A	Professor Catedrático Professor Coordenador Principal (from 2010) Investigador Coordenador	PhD	Teaching and Research
		B	Professor Associado (com e sem agregação) Professor Coordenador (com e sem agregação) Investigador Principal	PhD	Teaching and Research

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		C	Professor Auxiliar Professor Adjunto Investigador Auxiliar	PhD	Teaching and Research
		D	Assistentes Leitor Monitor Outros	PhD and others	Teaching and Research
Comments		Not all the researchers are classified by grades in the national R&D survey			
ROMANIA	Researchers	A	Principal scientist 1	ISCED 8 (PhD)	Research
		B	Principal scientist 2	ISCED 8 (PhD)	Research
		C	Principal scientist	ISCED 8 (new qualified PhD)	Teaching and Research
		D	Research assistant/postgraduate students not yet holding a PhD/ Researcher who works in positions that do not require the title of doctorate holder	ISCED7	Research
Comments		No comments			
SLOVENIA	Researchers	A	Full professors, research advisors	-	-

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		B	Associate professors	-	-
		C	Assistant professors, senior lecturers, lecturers, lectors	-	-
		D	Young researchers	-	-
Comments		No comments			
SLOVAKIA	Academic staff	A	Full professor (“profesor”)	degree of “docent”, successful completion of appointment procedure	Teaching and Research
		B	Associate professor (“docent”)	higher education of the third level, habilitation	Teaching and Research
		C	Lecturer (“odborný asistent”)	higher education of the third level (or second level) - majority of them has “PhD”, if not they educate themselves to receive it	Teaching and Research
		D	Assistant lecturer, lector (“asistent”, “lektor”)	higher education of the second level, HE Institution creates for assistent lecturer	Assistant lecturer: Teaching and Research, lector: teaching

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
				space for education leading to “PhD” (lector - second or first level)	
Comments		Data cover both full and part time academic staff			
FINLAND	Researchers	A	Research career model, 4th stage: professorship (Previously: Professors)	-	-
		B	Research career model, 3rd stage: independent research and education professionals capable of academic leadership (Previously: Lecturers, senior assistants)		
		C	Research career model, 2nd stage: career phase of researchers who have recently completed their doctorate (Previously: Assistants, full-time teachers)		
		D	Research career model, 1st stage: young researchers working on their Doctoral dissertation (Previously: researchers)		
Comments		No comments			
SWEDEN	Academic staff	A	Professor	PhD	Teaching and Research
		B	Associate professor, senior researcher, other academic staff with a Doctoral degree	PhD	Teaching and Research

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		C	Assistant professor, Post.Doc fellowship holders	PhD	Teaching and Research
		D	Graduate students, junior lecturers, other academic staff without Doctoral degree	Generally requires ISCED 5 Degree	Teaching and Research
Comments		No comments			
ICELAND	Academic staff	A	Full professors	-	Teaching and Research (Requirements: Teaching 48%; research 40%; administration 12%)
		B	Associate professors	-	Teaching and Research (Requirements: Teaching 52%; research 42%; administration 6%)
		C	Assistant professors	-	Teaching and Research (Requirements: Teaching 52%; research 42%; administration 6%)
		D	-	-	-
Comments		Other staff at tertiary level include other teachers than ABC (large group of part time teachers), professionals and managers e.g.			

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
NORWAY	Researchers	A	Full professor	-	Teaching and Research
		B	Associate professor, college reader, senior lecturer, dean, head of department, researchers with a doctorate awarded more than five years ago, senior physicians and senior researchers at university hospitals	Requires a PhD or equal competence. For researchers employed in temporary positions (related to projects), only those with a PhD older than 5 years are included in Grade B	Teaching and Research
		C	Post doctor, researcher with a doctorate awarded less than six years ago, junior physician and clinical psychologist at university hospitals with a Doctoral degree	Post doctor positions, and researchers with a doctorate less than 6 years ago	Research
		D	Lecturer, research fellow, research assistant, other positions not requiring Doctoral competence	MSc	Teaching and Research
Comments		Classification from 2011 and onwards is revised. This is mainly based on more detailed division of personnel regarding when they received a PhD.			
SERBIA	Researchers	A	-	MA, MSc	Teaching and Research
		B	-	PhD	Teaching and Research

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		C	-	PhD	Teaching and Research
		D	-	PhD	Teaching and Research
Comments		No comments			
BOSNIA AND HERZEGOVINA	Researchers	A	-	ISCED 8	
		B	-	ISCED 8	
		C	-	ISCED 8	
		D	-	ISCED6, ISCED 7	
Comments		No comments			
HUNGARY	Researchers	A	Professor, scientific advisors	-	-
		B	Associate professors , senior research fellows	-	-

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		C	Lecturers, teachers, scientific associates	-	-
		D	Research assistants, other researchers	-	-
Comments		No comments			
TÜRKIYE	Researchers	A	Professor	-	Teaching and Research
		B	Associate professor	-	Teaching and Research
		C	Assistant Professor, lecturer that has a PhD, Research Assistant that has a PhD	PhD	Teaching and Research
		D	Lecturer (Bachelor's Degree), Lecturer (Master's Degree), Research Assistant (Bachelor's Degree), Research Assistant (Maters Degree)	BSc, MSc (depending on the case)	-
Comments		No comments			
ISRAEL	Academic staff	A	Full Professor	PhD and post doctorate abroad	Teaching and research

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
		B	Associate Professor, senior lecturer	PhD and post doctorate abroad	Teaching and research
		C	Lecturer	PhD and post doctorate abroad	Teaching and research
		D	Junior staff, research fellows	MSc	Teaching and/or research
Comments		No comments			

Research funds

The following list details each of the national funding bodies which have provided data for both applicants and beneficiaries of research funds.

Country	Research Funds
BELGIUM	• Fonds de la Recherche Scientifique (FNRS) • Funds from Flanders Innovation & Entrepreneurship (VLAIO) • Funds from Research Foundation Flanders (FWO)
BULGARIA	• Ministry of Education and Science
CZECHIA	• Grant Agency of the Czech Republic • Academy of Science - Grant Agency of Academy of Science
DENMARK	• Independent Research Fund Denmark (IRFD; former reported as DCIR - Danish Council for Independent Research) • Innovation Fund Denmark (IFD) • The Danish National Research Foundation (DNRF)
GERMANY	• Funds from Deutsche Forschungsgemeinschaft (DFG; German Research Foundation) • Funds from BMBF
ESTONIA	• Estonian Science Fund • Estonian Research Council
GREECE	• Managing Authority (MA) of the Operational Programme ‘‘Development of Human Resources, Education and Lifelong Learning’’ of the Greek Ministry of Economy and Development (MED)
SPAIN	• Spanish Science, Technology and Innovation Information System (SICTI), Ministry of Science and Innovation • National R&D Plan (Directorate General for Innovation and Competitiveness - DGIC). State Secretariat for Research, Development and Innovation. Ministry of Economy, Industry and Competitiveness
FRANCE	• ANR (French National Research Agency)

Country	Research Funds
ITALY	• FIRST-PRIN (Research Projects of National Interest) - (Co-financing MIUR+Universities+RPO) • FIRST-FARE (Framework per l'Attrazione e il Rafforzamento delle Eccellenze per la ricerca in Italia) - (Co-financing MIUR+Universities+RPO) • FFO - Programma "Rita Levi Montalcini" (Programme for the recruitment of young researchers "Rita Levi Montalcini") - (funded by MIUR) • FIRB (Investment Fund for Basic Research) • FIRST-SIR (Scientific Independence of young Researchers) - (Co-financing MIUR+Universities+RPO) • FIRST-FIR (Program "Futuro in Ricerca")- (Co-financing MIUR+Universities+RPO)
CYPRUS	• Research and Innovation Foundation (RIF)
LATVIA	• Latvian Council of Sciences
LITHUANIA	• State budget allocations from Ministry of Education and Science • State budget allocations from Lithuaniana State Science and Studies Foundation
HUNGARY	• National Research, Development and Innovation Fund
MALTA	• National Research and Innovation Programme • National Internationalisation funds • REACH HIGH Scholars Programme – Postdoctoral Grants • The Research And Innovation in Energy and Water
NETHERLANDS	• NWO - programmes/ thematic research • NWO - individual talent programmes • NWO - free competition • NWO - research facilities • NWO – other • ZonMW (Medical research funding)
AUSTRIA	• FwF (Fonds zur Förderung der wissenschaŠlichen Forschung - Austrian Science Fund)

Country	Research Funds
	• ÖAW (Österreichische Akademie der WissenschaŠen - Austrian Academy of Sciences) • FFG (Austrian Research Promotion Agency) • CDG (Christian Doppler Research Association)
POLAND	• National Science Centre
PORTUGAL	• R&D Projects (funded by, Fundação para a Ciência e a Tecnologia (FCT)) • R&D Units (funded by, Fundação para a Ciência e a Tecnologia (FCT))
ROMANIA	• HUMAN RESOURCES - Researcher Mobility Projects (MC) • HUMAN RESOURCES - Postdoctoral Research Projects (PD) • HUMAN RESOURCES - Young Research Teams Projects (TE) • HUMAN RESOURCES - "Spiru Haret" fellowships • HUMAN RESOURCES - Mobility Projects for Experienced Researchers from Diaspora (MCD) • HUMAN RESOURCES - Mobility Projects for Young Researchers from Diaspora (MCT) • RESEARCH,DEVELOPMENT AND INNOVATION Solutions (SOL) • RESEARCH,DEVELOPMENT AND INNOVATION-Experimental demonstration project (PED) • RESEARCH,DEVELOPMENT AND INNOVATION-Transfer to Economic Operator Projects (PTE) • EUROPEAN AND INTERNATIONAL COOPERATION - Awarding the participation in Horizon 2020 • EUROPEAN AND INTERNATIONAL COOPERATION - Romania-Belgium Mobility projects • Fundamental and Frontier Research - Exploratory projects PCE • Fundamental and Frontier Research - "ERC - like" research projects
SLOVENIA	• F1 (Slovenian Research Agency) • F2 (Slovenian Research Agency)

Country	Research Funds
	• F3 (Slovenian Research Agency)
SLOVAKIA	• Funds from Slovak Research and Development Agency • Funds from Ministry of Education, Science, Research and Sport: Incentives for Research and Development
FINLAND	• Academy of Finland-Research project funding team leaders • Academy of Finland-Academy Professor • Academy of Finland-Academy Research Fellow • Academy of Finland-Postdoctoral Researcher • Academy of Finland–Career grants
SWEDEN	• Funds from Swedish Research Council • Funds from Swedish Research Council for Health, Working Life and Welfare • Funds from Swedish Research Council Formas
ICELAND	• F1 The Research Fund - Administered by ICR (Rannís) • F2 The Technology Development Fund - Administered by ICR (Rannís) • F3 The Fund for Research Equipment to end of 2012/ replaced by Infrastructure Fund in 2013 - Administered by ICR (Rannís) • F5 Climate fund (since 2020) - Administered by ICR (Rannís) • F6 The Research Fund of the University of Iceland • F7 The Research Fund of the University of Akureyri • F8 AVS R&D Fund of Ministry of Industries and Innovation (previously Ministry of Fisheries) in Iceland - Administered by the Icelandic Regional Development Institute
NORWAY	• The Research Council of Norway
SERBIA	• SFRS - Science Fund of the Republic of Serbia
MOLDOVA	• Moldo-Beloruse / Moldovan-Belarusian - NARD • Open-Since • Innovation and Technological Transfer - NARD

Country	Research Funds
	• Water Works JPI ERA-NET • FP7 ERA.Net RUS Plus • AXIS -013 • JPIAMR HARISSA • TUBITAK Moldo-Turc / TUBITAK Moldovan-Turkish - NARD • Infrastructura de inovare / Innovation infrastructure - NARD • Program de Stat / State Programme - NARD • Postdoctorat / Postdoctorate - NARD
TÜRKIYE	• 1512 - TECHNO-ENTREPRENEURSHİP SUPPORT PROGRAM (TÜBİTAK) • 2214-A International Research Fellowships for PhD Students • 2218- National Postdoctoral Research Scholarship Programme • 2219- International Postdoctoral Research Fellowship Program for Turkish Citizens • 2232- International Fellowship for Outstanding Researchers Program • 2221 Fellowships for Visiting Scientists and Scientists on Sabbatical Leave • 1505 - UNIVERSITY – INDUSTRY COLLABORATION SUPPORT PROGRAM
ISRAEL	• ISF

Boards

A **scientific** board of a research organisation is defined as 'A publicly or privately managed and financed group of elected or appointed experts that exists to implement scientific policy by, amongst other things, directing the research agenda, resource allocation and management within scientific research'.

An **administrative/advisory** board of a research organisation is defined as 'A publicly or privately managed and financed group of elected or appointed experts that exists to support the research agenda in a non-executive function by, among other things, administering research activities, consulting and coordinating different actors and taking a general advisory role'.

Country	Boards
BELGIUM	• Federal Science Policy Department • F.R.S. - FNRS
BULGARIA	• Bulgarian Science Fund • Bulgarian Academy of Sciences • Agricultural Academy
CZECHIA	• Czech Academy of Sciences • Technology Agency of the Czechia • Grant Agency of the Czech Republic (Czech Science Foundation (GACR))
DENMARK	• IRFD (formerly reported as DCIR) • DCRIP • DNRF • IFD • IRFD | Social Sciences (formerly reported as DSSRC) • IRFD | Technology and Production (formerly reported as DRCTP) • IRFD | Humanities (formerly reported as DRCH) • IRFD | Natural Sciences (former reported as DNR) • IRFD | Medical Sciences (former reported as DMR)
GERMANY	• DFG (German Research Foundation) • German Federal Environmental Foundation • German Foundation for Peace Research • German Federation of Industrial Research Associations

Country	Boards
ESTONIA	• Estonian Academy of Sciences • Estonian Research Council
IRELAND	• Science Foundation Ireland (SFI) • Irish Research Council (IRC) • Health Research Board (HRB)
GREECE	• Hellenic Foundation for Research and Innovation
SPAIN	• The Spanish National Research Council (CSIC) • Institute of Health Carlos III (ISCIII) • Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT) • The Canarian Institute of Astrophysics (IAC) • National Institute of Aerospace Technology (INTA) • State Research Agency (AEI) • Centre for the Development of Industrial Technology (CDTI) • National Institute for Agricultural and Food Research and Technology (INIA) • Spanish Institute of Oceanography (IEO) • ANR (French National Research Agency)
FRANCE	• ANR (French National Research Agency)
CROATIA	• Croatian Science Foundation • The National Council for Science, Higher Education and Technological Development
ITALY	• Ministry of University and Research (MUR) • Consiglio Nazionale delle Ricerche (CNR) – National Research Council • Istituto Nazionale di Fisica Nucleare (INFN) – National Institute for Nuclear Physics • Agenzia Nazionale per le nuove tecnologie, l'Energia e lo Sviluppo economico sostenibile (ENEA) – National Agency for New Technologies, Energy and Sustainable Economic Development

Country	Boards
	• Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA) – Agricultural Research Council • Agenzia Spaziale Italiana (ASI) - Italian Space Agency
CYPRUS	• Agricultural Research Institute • National Board for Research and Innovation (NBRI) • Cyprus Scientific Council (CySC) • Research and Innovation Foundation (RIF)
LATVIA	• Latvian Council of Sciences
LITHUANIA	• Research Council of Lithuania
HUNGARY	• National Research, Development and Innovation Office
NETHERLANDS	• The NetherlandsMinistrysation for Scientific Research (NWO) • Royal Netherlands Academy of Arts and Sciences (KNAW) • ZonMw
AUSTRIA	• OeAW (Austrian Academy of Sciences) • Christian Doppler Forschungsgesellschaft/ Christian Doppler Research Association (CDG) • FWF Austrian Science Fund • Austrian Research Promotion Agency (FFG)
POLAND	• National Centre for Research and Development • National Science Centre • Central public administration body, reports to Prime Minister • Ministry of Education and Science • Independent body, operating on the basis of the Law of 20 July 2018 on Higher Education and Science
PORTUGAL	• Fundação para a Ciência e a Tcnologia (Foundation of Science and Technology) • IAPMEI - Agência para a Competitividade e Inovação, I. P. (Agency for Competitiveness and Innovation)

Country	Boards
	• ANI - Agência Nacional de Inovação, S.A. (National Innovation Agency) • COMPETE 2020 - Autoridade de Gestão do Programa Operacional Temático Competitividade e Internacionalização (Managing Authority of the Operational Thematic Competitiveness and Internationalization Programme)
SLOVENIA	• Slovenian Research and Innovation Agency (ARIS)
SLOVAKIA	• Government of the Slovak Republic • Slovak Academy of the Sciences (Slovenská akadémia vied) • Ministry of Economy of the Slovak Republic • Ministry of Education, Science, Research and Sport of the Slovak Republic • Research Agency
FINLAND	• Scientific board, Academy of Finland • Research council for Biosciences and Environment • Research council for Culture and Society • Research Council for Natural Sciences and Engineering • Research Council for Health • Finnish Funding Agency for Innovation • Business Finland • FIRI (Finnish Research Infrastructure Committee) • Strategic Research Council
SWEDEN	• Swedish Research Council • Sw Res Counc Formas • Sw Res Counc for Health Work life Welfare • VINNOVA, Sw innovation agenc. • Swedish Foundation for Strategic Research Stiftelsen för strategisk forskning (SSF) Foundation for Strategic Environmental Research • Knowledge Foundation • Bank of Sweden Tercentenary Foundation

Country	Boards
	• Swedish Foundation for International • Cooperation in Research and Higher Education
ICELAND	• (Council for Science and Technology Policy)
NORWAY	• The Research Council of Norway
SERBIA	• Ministry of Education, Science and Technological Development of Republic of Serbia
BOSNIA AND HERZEGOVINA	• Academy of Sciences and Arts of BiH.
TÜRKIYE	• Turkish Academy of Sciences (TÜBA) • International Union of Academies • International Science Council • AASSA-WIS • Scientific and Technological Research Council of Turkey as Funding Organization (TÜBİTAK) • Small and Medium-Sized Enterprises Development Organisation • Technology Development Foundation of Turkey
ISRAEL	• ISF • Ministry of Science Technology and Space

APPENDIX 3 – LIST OF STATISTICAL CORRESPONDENTS

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