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E-mail: RTD-SIS7-SHE-FIGURES-2015@ec.europa.eu

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Foreword

Working towards gender equality is an essential part of European research and innovation policy. Since 2003, the She Figures have monitored new developments related to careers, decision-making and, most recently, how the gender dimension is considered in research and innovation content.

More and more, European women are excelling in higher education, and yet, women represent only a third of researchers and around a fifth of grade A, top-level academics. Although the number of female heads of higher education institutions rose from 15.5 % in 2010 to 20 % in 2014, there is clearly still a long way to go before we reach gender equality in European research and innovation professions.

Therefore, I want to encourage research organisations to be the agents of change, taking practical steps to eliminate any remaining bias which prevent or hinder women from entering, or fulfilling their potential in research careers. To this end, this edition of the She Figures introduces new specific indicators on gender equality progress in research organisations.

I am pleased to note that political support for gender equality in European research and innovation continues to find new momentum. In December 2015, the Council of the European Union invited Member States to set targets for gender balance among full professors and in research decision-making bodies. I am therefore hopeful that the next edition of our She Figures will show further, tangible progress as a result of that clear political signal.

The She Figures 2015 now also consider new areas such as patent applications and scientific publications for the first time. For example, exploring to what extent the gender dimension is considered in scientific articles. The findings indicate that there is still much room for improvement.

After close cooperation between the European Commission, Member States and the countries associated to Horizon 2020, the She Figures 2015 contains a wealth of national and EU level data. I recommend the findings for the careful consideration of policymakers, research organisations and anyone working or interested in European research and innovation.

With the evidence before us, Europe's research and innovation community must continue to take practical steps to honour our gender equality commitments. Ultimately, we will only have the best research in Europe, when Europe provides the equal opportunities for its best researchers.

Carlos Moedas
European Commissioner
for Research, Science and Innovation

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Ana ARANO ANTELO
Head of Unit Science With and For Society
DG Research and Innovation

Executive summary

She Figures 2015 investigates the level of progress made towards gender equality in research & innovation (R&I) in Europe. It is the main source of pan-European, comparable statistics on the representation of women and men amongst PhD graduates, researchers and academic decision-makers. The data also sheds light on differences in the experiences of women and men working in research – such as relative pay, working conditions and success in obtaining research funds. It also presents for the first time the situation of women and men in scientific publication and inventorships, as well as the inclusion of the gender dimension ([1]) in scientific articles.

This publication is the fifth edition of the She Figures, which has been updated and released every three years since 2003. Despite progress, She Figures 2015 reveals that a range of gender differences and inequalities persist in research & innovation, as explained below.

In recent decades, there have been strides towards gender balance within the pool of **higher education graduates** (Chapter 2). Whilst women were once under-represented at doctoral level, in 2012 they made up 47 % of PhD graduates in the EU (EU-28), and between 40 % and 60 % of PhD graduates in all countries covered by the She Figures. At the same time, there are marked differences by sex when it comes to the most popular subjects and educational pathways. For instance, men are more than two times more likely than women to choose engineering, manufacturing and construction, whereas women are twice as likely to pursue an education degree. In 2012, women accounted for just 28 % of PhD graduates in engineering, manufacturing and construction, and only 21 % of those graduating from computing.

The under-representation of women continues to characterise participation in science & technology (S&T) occupations (Chapter 3). For instance, in more than half of the countries women are under-represented relative to men, making up less than 45 % of **scientists and engineers**. At the level of the EU-28, women scientists and engineers made up 2.8 % of the total labour force in 2013, whereas men made up 4.1 %. However, there has been some progress in this area – the number of women amongst employed scientists and engineers grew by an average of 11.1 % per year between 2008 and 2011 (at a faster rate than the number of men, which grew by 3.3 % over the same period).

Amongst **researchers** specifically, the representation of women and men also remains uneven (Chapter 4). In 2011, women in the EU accounted for only 33 % of researchers (EU-28) – a figure unchanged since 2009 (EU-27). In only eight out of 28 EU Member States did women account for more than 40 % of researchers. Women in the EU have a stronger presence amongst researchers in the higher education and government sectors. In the business enterprise sector, they make up close to one in five researchers (2011).

She Figures 2015 reveals gender differences in the **working conditions of researchers** in the higher education sector (Chapter 5). Women are generally more likely than men to work part-time and/or to have ‘precarious contractual arrangements’. In the EU in 2012, 13.5 % of women in research were in part-time employment (versus 8.5 % of men) and 10.8 % had precarious contracts (versus 7.3 % of men). However, the gender gap in part-time employment rates is far lower amongst researchers in the higher education sector than it is in the economy as a whole. The gender pay gap persists in research: in 2010, women’s average gross hourly earnings (EU-28) were 17.9 % lower than those of men in scientific research & development (R&D).

1 This means taking into account as relevant the biological characteristics and the social and cultural features of women and men.

In response to these issues, research performing organisations have a unique role to play in developing a working environment that supports gender equality, particularly when it comes to career advancement, job quality and equal representation at the top levels. The European Research Area (ERA) Survey points the way to the actions that research organisations can take, such as recruitment and promotion measures, targets to ensure gender balance in recruitment committees, flexible career trajectories (e.g. schemes after career breaks), work–life balance measures and/or support for leadership development. According to the ERA Survey of 2014, around 36 % of research performing organisations (RPOs) indicated that they had introduced **gender equality plans** in 2013.

Striking gender inequalities persist when it comes to **career advancement** and **participation in academic decision-making** (Chapter 6). In 2013, women made up only 21 % of the top-level researchers (grade A), showing very limited progress compared to 2010 (20 %). Despite significant progress in their level of education relative to men over the last few decades, women are increasingly under-represented as they move up the stages of an academic career. At grade C level, the difference with men stands at 10 percentage points, while at grade A level it reaches 58 percentage points. This effect is even more pronounced in the field of science and engineering, where women represented only 13 % of grade A staff in 2013. A generational effect exists amongst grade A researchers, in that women tend to occupy a higher proportion of positions in the youngest age group (49 %) relative to the older age groups (22 %).

In 2014, the proportion of women among **heads of higher education institutions** in the EU-28 rose to 20 % from 15.5 % in the EU-27 in 2010. Within the EU-28, women make up 28 % of **scientific and administrative board members** and only 22 % of board leaders.

Women and men in research show different patterns in terms of their research & innovation outputs (Chapter 7). Men in the EU tend to have greater success in **funding applications** in national programmes, outstripping women by 4.4 percentage points in 2013 (success rate for men = 31.8 %; rate for women = 27.4 %).

Women are less likely than men to hold the corresponding author role in scientific publications or to apply for patents. Between 2010 and 2013, just 9 % of **patent applications** in the EU registered a woman as the inventor. However, as **corresponding authors**, women and men appear to have relatively similar scores when it comes to the expected impact of their papers and their propensity to co-author papers with international partners (i.e. papers published by authors from at least two countries located within the EU and/or beyond).

In the period spanning from 2010 to 2013, the propensity to integrate a **gender dimension in research content** measured in scientific articles in the EU-28 ranged from virtually zero in agricultural sciences, engineering and technology, and natural sciences to over 6 % in the social sciences. This proportion increased in the EU faster than worldwide over the period spanning from 2002 to 2013. Although the proportion of publications with a gender dimension is highest in the social sciences, between 2002 and 2013 the growth rate was lowest in this field. Conversely, engineering and technology had one of the lowest proportions of publications with a gender dimension (0.1 % in 2010–2013), but the highest growth rate between 2002 and 2013 (14 %).

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Abbreviations

ARIF	Average of relative impact factors
AS	Agricultural sciences
BES	Business enterprise sector
CAGR	Compound annual growth rate
DG	Directorate-General
DI	Dissimilarity Index
EIGE	European Institute for Gender Equality
EPO	European Patent Office
EPO PATSTAT	EPO Worldwide Patent Statistical Database
ERA	European Research Area
ET	Engineering and Technology
EU	European Union
EUROSTAT	Statistical Office of the European Union
FOS	Field of science
FTE	Full-time equivalent
GCI	Glass Ceiling Index
GDP	Gross Domestic Product
GDRC	Gender dimension in research content
GERD	Gross domestic expenditure on R&D
GOV	Government sector
GPG	Gender pay gap
H	Humanities
HC	Head count
HEI	Higher education institutions
HES	Higher education sector
HQP	Highly qualified personnel
HR	Human resources
HRST	Human Resources in Science and Technology
HRSTC	Human Resources in Science and Technology - Core
HRSTE	Human Resources in Science and Technology - Education
HRSTO	Human Resources in Science and Technology - Occupation
ILO	International Labour Organization

IPC	International Patent Classification (by WIPO)
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
KIA	Knowledge-intensive activities
KIABI	Knowledge-intensive activities – Business industries
LFS	Eurostat Labour Force Survey
MORE	Mobility and Career Paths of Researchers in Europe
MS	Medical sciences
NACE	Nomenclature générale des activités économiques dans les communautés européennes
NACE Rev.2	Statistical Classification of Economic Activities in the European Community, Rev. 2
NS	Natural sciences
OECD	Organisation for Economic Co-operation and Development
PATSTAT	EPO Worldwide Patent Statistical Database
PhD	Doctor of Philosophy
PNP	Private non-profit
PPP	Purchasing Power Parity
PPS	Purchasing power standards
R&D	Research and development
R&I	Research and innovation
RFOs	Research funding organisations
RPOs	Research performing organisations
S&E	Scientists and engineers
S&T	Science and technology
SES	Structure of Earnings Survey
SILC	Survey on Income and Living Conditions
SS	Social sciences
UNESCO-UIS	United Nations Educational, Scientific, and Cultural Organisation Institute for Statistics
UOE	UNESCO-UIS/OECD/EUROSTAT joint data collection (UOE)
WIPO	World Intellectual Property Organization
WiS	Women in Science
WoS™	Web of Science™ database (by Thomson Reuters)

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1 Introduction

In 2012, the European Commission warned that research 'still suffers from a considerable loss and inefficient use of highly skilled women' (European Commission, 2012, p.12). As both national governments and the European Commission seek to respond to this challenge, the She Figures provides a crucial evidence base. Released every three years since 2003, the publication provides a range of pan-European statistics on gender equality in science and research, extended to innovation for this edition. It serves as a tool for measuring the impact and effectiveness of policies in this area. It is produced in close collaboration with the Helsinki Group and their Statistical Correspondents, and is recommended reading for policymakers, researchers and anybody with a general interest in these issues.

Much of the She Figures publication is dedicated to reporting back on well-established statistical indicators. Most of these indicators present and explore the following themes: i) the presence of women in research across different sectors of the economy; ii) horizontal segregation by sex across different fields of study and research occupations; and iii) vertical segregation by sex in academia, i.e. the (under-) representation of women in the highest grades/posts of research and as heads of academic institutions.

Each edition of the She Figures also aims to further understanding of these issues by introducing additional indicators, which bring critical gender-based issues to the forefront of the science and technology debate. The second, third and fourth editions of the She Figures (2006, 2009 and 2012) expanded the scope of the indicators in many ways. She Figures 2006 developed new indicators to give a more detailed picture of the labour force as a whole and the patterns of employment for women and men researchers across different sectors, such as the business enterprise sector (BES). The 2009 edition introduced indicators on the gender pay gap and began to break down some data by age group (in addition to sex disaggregation). Amongst other things, the 2012 report added indicators on the mobility of researchers and the proportion of researchers with children.

Similarly, She Figures 2015 includes new indicators to match emerging policy priorities. Some provide further insight into the working conditions of researchers, considering the degree to which they are employed on a part-time basis or on precarious contracts. Other new indicators consider what research organisations have done to promote gender equality in the workplace, as well as the relative contribution of women and men to published research and inventorships. Potentially, the most innovative indicators in the 2015 edition are those that measure the degree to which research papers integrate a sex/gender analysis into their content. These are the first to consider research content itself, as opposed to the personnel and conditions within the research community. All of the new indicators in She Figures 2015 fall in Chapter 5 or Chapter 7.

History of the She Figures

In 1999, the Council of the EU recognised that women were under-represented in the fields of scientific and technical research, describing this as a 'common concern' at the national and European level. At this time, there were virtually no pan-European statistics on what happened to women after they left university, despite fears that after graduating from their degrees, 'women frequently encounter[ed] obstacles in their career[s]', which contributed to their under-representation in scientific posts (DG Research, 2009).

In the late 1990s, the EU recognised the need for harmonised sex-disaggregated data on women in science and research if governments were to develop effective policies in this area. Meeting in 1999, the Helsinki Group on Gender in Research and Innovation appointed a sub-group of Statistical Correspondents with responsibility for collecting national data and feeding into the creation of European statistics on these topics.

The end result of this process was the She Figures, first released in 2003 and updated every three years since. By presenting statistical indicators on a wide range of topics, the report enables readers to develop a comprehensive understanding of the state of gender equality in science and research.

Data sources and coverage

Most of the She Figures indicators originate from Eurostat (the Statistical Office of the EU), which provides sex-disaggregated data on education, research and development, professional earnings and scientific employment. The Statistical Correspondents enrich this picture, by collecting primary data (broken down by sex) on senior academic staff, the heads of universities, funding applicants and beneficiaries, as well as membership on boards of national research organisations. Expansion of the She Figures since 2003 has resulted in the use of other sources, including the MORE Survey on the Mobility of Researchers, the European Research Area (ERA) Survey and the Web of Science™ database.

In the 2015 version of She Figures, data are presented at the individual country level as well as the broader EU level for the current 28 EU Member States, plus candidate countries (Iceland, the Former Yugoslav Republic of Macedonia, Montenegro, the Republic of Serbia, Turkey) and associated countries (Albania, Bosnia and Herzegovina, the Faroe Islands, Israel, Liechtenstein, the Republic of Moldova, Norway, Switzerland).

Structure of the She Figures 2015

There have been changes to the structure of the She Figures since the last edition. The structure of She Figures 2015 aims to reflect the typical 'chronological journey' of a researcher, as she/he moves from higher education, through to the initial stages of a research career, and finally into senior decision-making positions and potentially authorship.

Key definitions

ISCED 6 and PhD graduates: The International Standard Classification of Education (ISCED-97) categorises education programmes by level. ISCED-97 Level 6 (also referred to as ISCED 6) covers: 'The second stage, which leads to the award of an advanced research qualification (e.g. PhD, non-PhD programmes with an advanced research component). The programmes are devoted to advanced study and original research'. Eurostat also makes use of a distinctive PhD code, which includes only those graduates pursuing PhD programmes (excluding those pursuing non-PhD programmes with an advanced research component).

Human Resources in Science and Technology – Core (HRSTC): People who have successfully graduated from tertiary education (HRSTE) and who are also employed in S&T occupations as 'Professionals' or 'Technicians and Associate Professionals' (HRSTO).

Researchers: The OECD's Frascati Manual (2002) provides an international definition for researchers: '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.'

Scientists and engineers (S&E): Prior to 2011, scientists and engineers were those who worked in: 'physical, mathematical and engineering occupations' and 'life science and health occupations'. With the new ISCO-08 classification (in use from 2011), S&E are those who work as: 'science and engineering professionals' (ISCO-08, Code 21), 'health professionals' (ISCO-08, Code 22) and 'information and communications technology professionals' (ISCO-08, Code 25).

For more information on the definitions in use in She Figures 2015, see Annex 2.

2 The pool of graduate talent

Main findings:

- There is gender balance amongst PhD graduates in the EU. In 2012, women made up between 40 % and 60 % of graduates in all countries.
- There are differences by sex when it comes to the most popular subjects amongst top-level graduates. However, in the EU, both women and men PhD graduates are most likely to study the field of Science, Mathematics and Computing.
- Men are more than two times as likely to choose engineering, manufacturing and construction, whereas women are twice as likely to pursue an education degree.
- In some countries and fields, the over- or under-representation of women graduates is particularly acute. For instance, in the field of engineering, manufacturing and construction in 2012, women represented less than a quarter of PhD graduates in Germany (18 %), Hungary (22 %), Austria (23 %), the Czech Republic (23 %), Ireland (24 %) and Switzerland (24 %).
- Between 2002 and 2012, the number of women graduates in the sub-fields of science and engineering generally grew at a faster rate than the number of men. However, the fields in which women's presence grew most quickly between 2002 and 2012 (computing; engineering and engineering trades) were also those where women started from the lowest base.
- Despite progress, the under-representation of women continues to be a problem in all narrow fields of science and engineering, except life science.
- Women remain severely under-represented within the sub-field of computing. They made up 21 % of those pursuing PhDs in computing in 2012 (EU-28). The only country coming close to gender balance in this field was Ireland, where women made up 45 % of PhD graduates in 2012.

Pursuing postgraduate education is a first step in the career of many researchers. In 2012, the European Commission warned that 'while the proportion of women at the first two levels of tertiary education is higher than that of men, the proportion of women at PhD level is lower' (European Commission, 2012, p.35). In line with its ambition to encourage more 'research-intensive' economies, it has called for more doctoral candidates and argued that efforts must be made to tackle 'stereotyping and the barriers still faced by women in reaching the highest levels in post-graduate education and research' (European Commission, 2011, p.5).

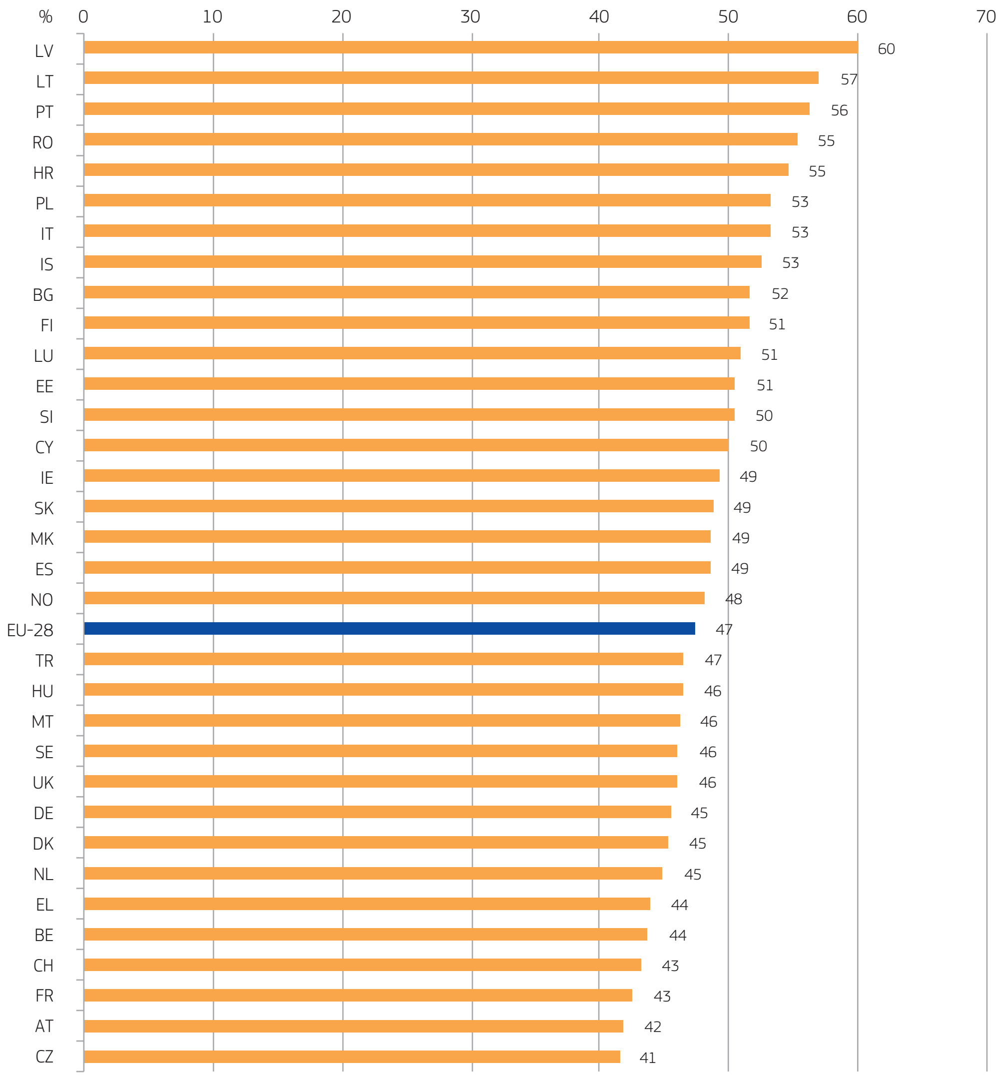
Chapter 2 investigates the level of progress women have made in undertaking postgraduate education, as well as differences in the subject choices of women and men. In particular, it considers women's representation in subjects where they have been traditionally under-represented, such as the fields of natural sciences and engineering. It considers graduates at two levels:

- 'ISCED 6' level, understood to be those taking tertiary programmes that 'lead to the award of an advanced research qualification' (UNESCO, 1997). This level encompasses Doctor of Philosophy programmes as well as other post-graduate programmes above master's level, for which the academic title of doctor is not automatically awarded.

- Doctor of Philosophy level (often abbreviated PhD, Ph.D., D.Phil., or Dphil), which encompasses only the programmes that, once attained, give the academic title of doctor.

The title of each graph/table makes clear whether the figures for ISCED 6 or PhD level are being presented. In most countries, the number of graduates at ISCED 6 and PhD level is the same (see Annexes 2.1 and 2.2). The analysis in the text focuses primarily on the PhD level.

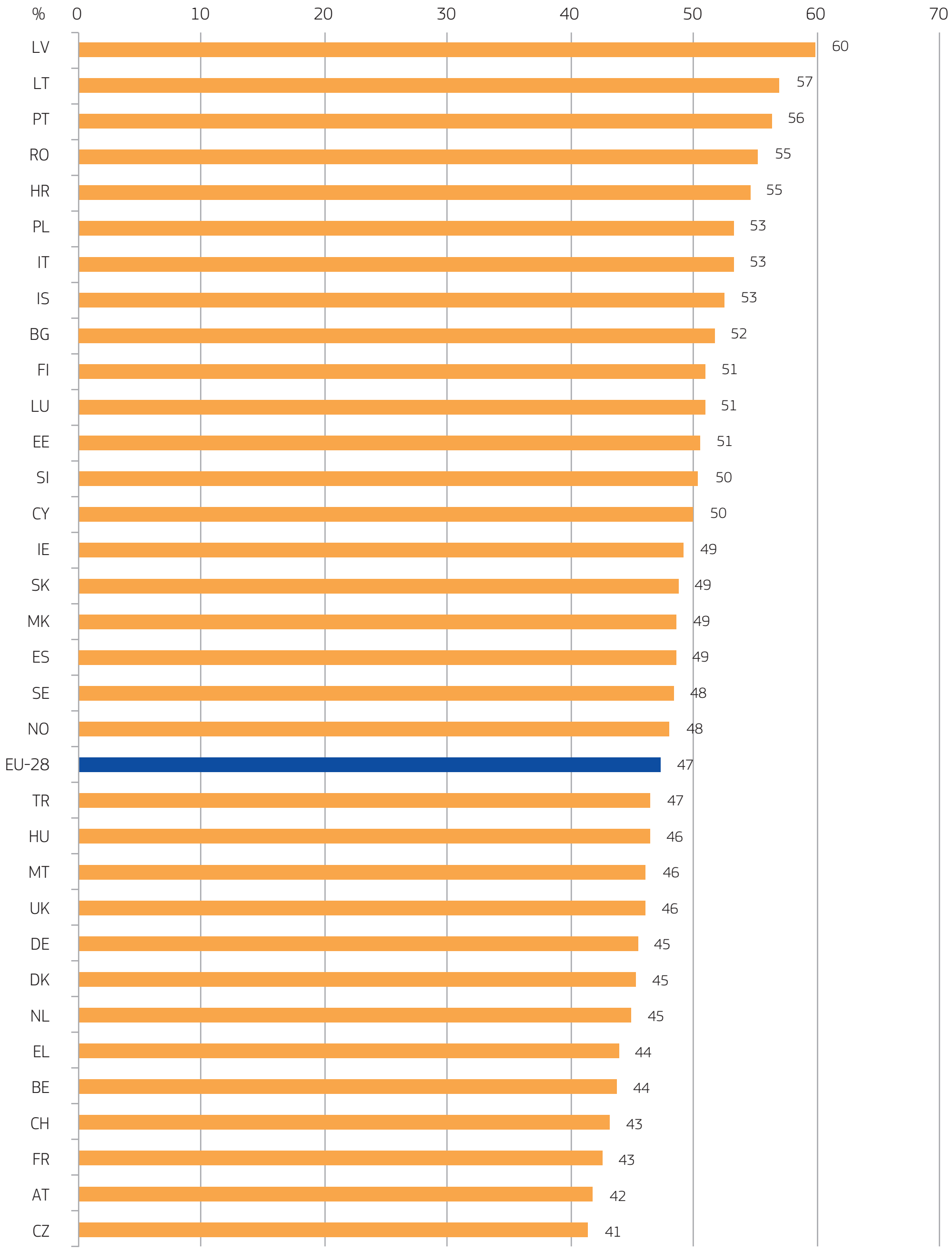
Figure 2.1. Proportion (%) of women ISCED 6 graduates, 2012



Notes: Exceptions to reference year: FR: 2011; Data unavailable for: ME, AL, RS, BA, IL, FO, MD; Data estimated for: EU-28;
Others: Total number of PhD graduates in LI and MT is low (fewer than 20); ISCED 1997 classifications are used: ISCED 6 covers tertiary programmes (above master's level) which lead to the award of an advanced research qualification, including (but not limited to) doctor of philosophy programmes; LI excluded due to low number of graduates.
Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

Figure 2.2. Proportion (%) of women PhD graduates, 2012



Notes: Exceptions to reference year: FR: 2011; Data unavailable for: ME, AL, RS, BA, IL, FO, MD; Data estimated for: EU-28;
Others: PhD (Doctor of Philosophy); CY: A large proportion (around 40 %) of Cypriot students pursue their PhD studies abroad and therefore are not reflected in these statistics; LI excluded due to low number of graduates; Total number of PhD graduates in LI and MT is low (fewer than 20); ISCED 97 classifications are used.
Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

Moves towards gender balance amongst top-level graduates at PhD level.

There are signs of progress towards gender equality amongst top-level graduates in the EU, as shown by Figure 2.1 and Figure 2.2. In 2012, women made up 47 % of PhD graduates in the EU (2). In wider Europe (3), women are between 40 % and 60 % of those graduating from PhD programmes. In 14 countries (BG, EE, HR, IT, CY, LV, LT, LU, PL, PT, RO, SI, FI, IS), women accounted for at least half of PhD graduates in 2012. In 2012, the lowest proportions of women graduates at PhD level were in the Czech Republic (41 %), Austria (42 %), France and Switzerland (43 %), and Belgium and Greece (44 %).

Table 2.1. Evolution of the proportion of women ISCED 6 and PhD graduates, 2004 and 2012

	Women ISCED 6 graduates (%)		Women PhD graduates (%)	
	2004	2012	2004	2012
EU-28	43.6	47.4	43.4	47.3
EU-27	43.6	47.3	43.4	47.2
BE	33.9	43.8	33.9	43.8
BG	50.8	51.7	50.8	51.7
CZ	35.6	41.4	35.6	41.4
DK	35.9	45.3	35.9	45.3
DE	39.0	45.4	39.0	45.4
EE	62.2	50.5	62.2	50.5
IE	45.7	49.2	45.7	49.2
EL	38.1	43.9	38.1	43.9
ES	47.5	48.6	47.5	48.6
FR	41.1	42.6	41.1	42.6
HR	42.0	54.6	42.0	54.6
IT	51.5	53.2	51.5	53.2
CY	61.5	50.0	61.5	50.0
LV	58.3	59.9	58.3	59.9
LT	57.5	57.0	57.5	57.0
LU	:	50.9	:	50.9
HU	42.9	46.5	42.9	46.5
MT	25.0	46.2	25.0	46.2
NL	39.4	44.9	39.4	44.9
AT	40.5	41.8	40.5	41.8
PL	46.9	53.2	46.9	53.2
PT	54.7	56.3	48.2	56.3
RO	49.3	55.3	49.3	55.3
SI	40.6	50.4	40.6	50.4
SK	45.0	48.7	45.0	48.7
FI	46.6	51.5	45.5	50.9
SE	42.6	46.1	44.8	48.4
UK	43.1	46.1	43.1	46.1
IS	50.0	52.5	50.0	52.5
LI	11.1	16.7	11.1	16.7
NO	39.8	48.1	39.8	48.1
CH	36.9	43.2	38.2	43.2
MK	46.4	48.6	46.4	48.6
TR	38.0	46.5	38.0	46.5

"Notes: Exceptions to the reference period: FR: 2005–2011; MT: 2006–2012

Data unavailable: LU (2005), ME, AL, RS, BA, IL, FO, MD

Data estimated: EU-28, EU-27;

Others: ':' indicates that data are unavailable; PhD (Doctor of Philosophy); ISCED 6 covers tertiary programmes (above master's level) which lead to the award of an advanced research qualification, including (but not limited to) doctor of philosophy programmes; In most countries, the number of graduates at ISCED 6 level and PhD level is the same.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

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2 In this case, applies to both EU-27 and EU-28.

3 The She Figures 2015 covers the 28 Member States of the EU, as well as 13 associated countries: Iceland (IS), Norway (NO), Switzerland (CH), Israel (IL), the Republic of Serbia (RS), the former Yugoslav Republic of Macedonia (MK), Montenegro (ME), Turkey (TR), Albania (AL), Bosnia and Herzegovina (BA), Liechtenstein (LI), the Republic of Moldova (MD) and the Faroe Islands (FO). For all figures and tables, countries missing data are indicated beneath.

Consistent with the gender balance achieved amongst top-level graduates in 2012, in most countries the proportion of women PhD graduates rose in recent years. Table 2.1 compares the proportion of women in 2004 and 2012 (covering ISCED 6 and PhD level). In all but three countries where data are available (EE, CY, LT), the proportion of women amongst PhD graduates increased in this time frame. Furthermore, in the three countries that did not experience rises, women's representation was nonetheless strong (respectively, 51 % in Estonia, 50 % in Cyprus and 57 % in Latvia in 2012).

When interpreting these results, it is important to bear in mind the number of graduates per country. In 2012, 11 countries (BG, SI, LT, LV, EE, MK, LU, CY, IS, MT, LI) ([4]) had fewer than 1 000 graduates at ISCED 6 and PhD level, and 5 of these (LU, CY, IS, MT, LI) had fewer than 100 (see Annexes 2.1 and 2.2).

Between 2002 and 2012, the number of women at ISCED 6 level generally grew at a faster rate than the number of men.

By considering the compound annual growth rate (CAGR), one can more closely analyse how the composition of top-level graduates is changing over time. Figure 2.3 presents the average percentage growth each year in the number of women and men graduates respectively (ISCED 6). It covers the period 2002–2012, with some exceptions. In general, the number of women graduates (ISCED 6) grew at a faster rate than the number of men during this time. Between 2003 and 2012, the number of women graduates in the EU-28 grew, on average, by 4.4 % each year, whereas the number of men graduates increased by 2.3 % annually. These results help to explain why all countries had achieved a gender balance by 2012.

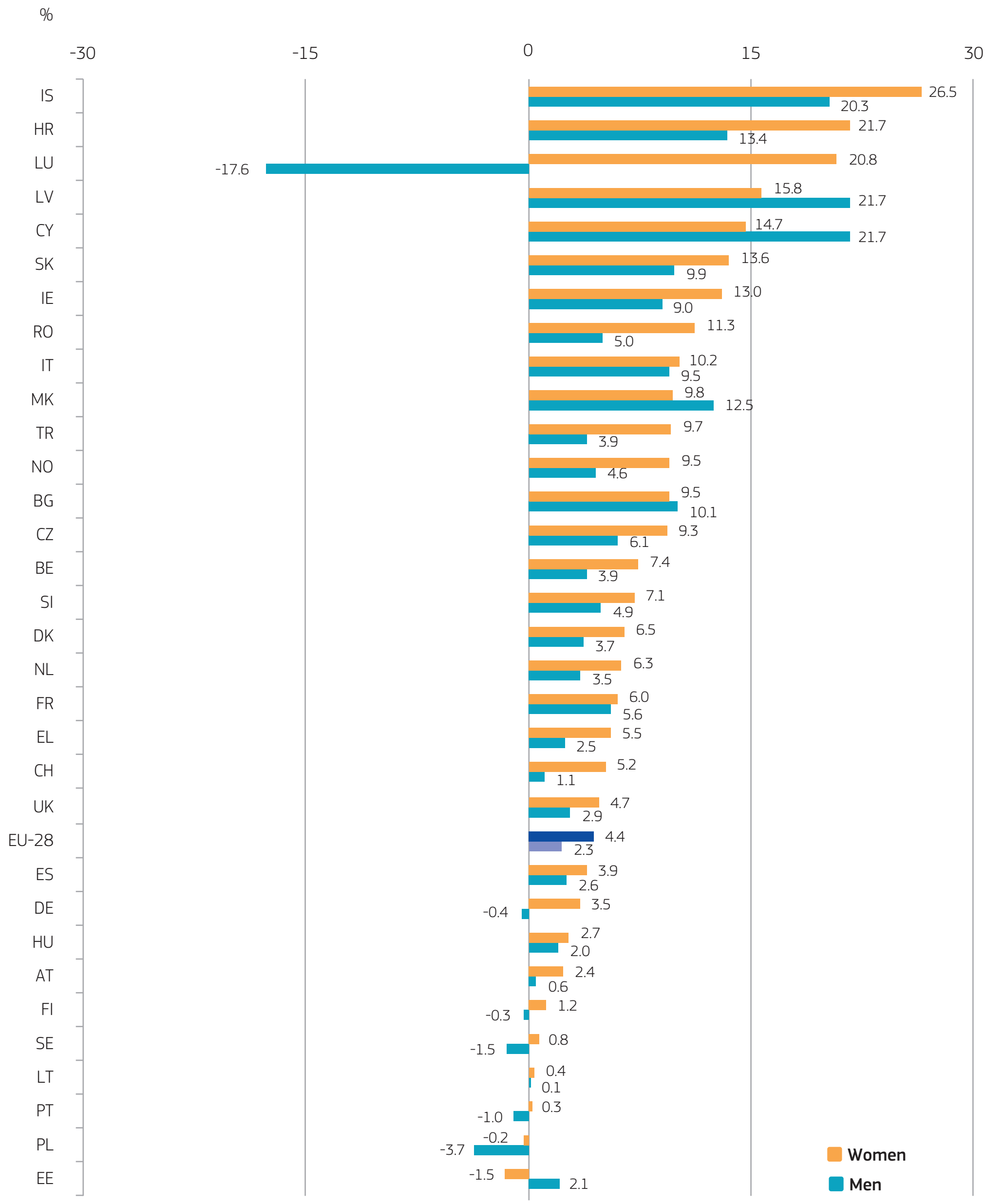
In most countries, the number of women and men graduates from ISCED 6 programmes rose between 2002 and 2012, albeit at different rates. Only two countries showed negative rates for women in this period: an average annual fall of 0.2 % in Poland and 1.5 % in Estonia. For men, it was slightly more common for CAGRs to be negative; this occurred in six countries (DE, LU, PL, PT, FI, SE) and ranging from -0.3 % in FI and -17.6% in LU. In general, the rates for women were less diverse in this period, ranging from 26.5 % annual growth in Iceland to a 1.5 % annual fall in Estonia (a difference of nearly 30 percentage points). The difference between the highest and lowest rates for men was larger, at 39.3 percentage points (21.7 % annual growth in Cyprus and Latvia; 17.6 % annual fall in Luxembourg ([5])).

Comparing the relative situation for women and men, the difference between the CAGRs in most countries was generally lower than 6 percentage points, with some exceptions in women's favour (HR, LU, RO, IS) and one in men's favour (CY). However, attention must be paid to countries with low absolute numbers of graduates, for which small changes in numbers can translate into large changes in percentage terms.

4 Countries are listed in descending order of their number of graduates.

5 However, note the low number of graduates in Luxembourg over this period.

Figure 2.3. Compound annual growth rate (%) of ISCED 6 graduates, by sex, 2002–2012



Notes: Exceptions to reference period: EU-28, HR, RO: 2003–2012; FR: 2003–2011; CY, EL, LI: 2004–2012; LU: 2011–2012; Data unavailable for: ME, AL, RS, BA, IL, FO, MD; Data estimated for: EU-28, EU-27;

Others: ISCED 97 classifications are used; LI and MT excluded due to low number of observations (fewer than 20)

ISCED 6 covers tertiary programmes (above master's level) which lead to the award of an advanced research qualification, including (but not limited to) doctor of philosophy programmes.

CY: A large proportion (around 40 %) of Cypriot students pursue their PhD studies abroad and therefore are not reflected in these statistics

Source: Eurostat – Education Statistics (online data code: educ_grad5)

Table 2.2. Proportion (%) of women ISCED 6 graduates by broad field of study, 2012

	Education	Humanities and arts	Social sciences, business and law	Science, mathematics and computing	Engineering, manufacturing and construction	Agriculture and veterinary	Health and welfare	Services
EU-28	64	55	51	42	28	56	59	44
EU-27	64	54	51	42	28	57	59	45
BE	83 (19/23)	45	51	35	31	47	59	15
BG	60	59	58	53	32	41	51	38
IE	75	60	62	45	24	47 (7/15)	55	50
EL	60	54	45	33	27	42	51	:
ES	55	52	47	47	30	56	56	30
FR	56	58	48	39	31	:	47	38
HR	50	68	60	60	34	37	53	25
IT	71	62	53	53	35	54	64	48
CY	25 (1/4)	50 (3/6)	64 (7/11)	53 (10/19)	38 (3/8)	:	:	:
LV	80 (20/25)	75 (18/24)	82	45	25	80 (4/5)	76 (16/21)	38
LT	z	76	62	53	38	55 (16/29)	74	: (z)
LU	100 (1/1)	50 (3/6)	42 (5/12)	59 (17/29)	29 (2/7)	:	50 (1/2)	:
HU	68	49	51	38	22	59	52	:
MT	:	60 (3/5)	100 (2/2)	25 (1/4)	33 (1/3)	:	50 (1/2)	: (n)
NL	z	52	54	33	26	59	67	: (z)
AT	80	51	49	35	23	58	51	36
PL	:	52	52	54	27	57	64	46
PT	77	52	55	58	38	74	70	59
RO	z	64	64	57	43	46	63	38
SI	58 (7/12)	61	64	39	28	68	61	55
SK	79	50	54	50	33	52	60	36
FI	79	61	56	44	27	60	66	51
SE	63	54	49	42	26	53	62	44
UK	62	49	56	39	25	61	57	41
IS	100 (2/2)	25 (1/4)	50 (2/4)	36 (5/14)	33 (1/3)	100 (1/1)	77 (10/13)	:
NO	71	40	57	35	x(4)	70	61	44
CH	57	51	44	37	24	72	54	48
MK	58 (7/12)	52 (12/23)	47	59 (13/22)	33 (3/9)	71 (5/7)	67	38 (3/8)
TR	45	42	43	50	34	38	72	40

Notes: For proportions based on low numbers, numerators and denominators are displayed in the table; Exceptions to reference year: MK, FR: 2011; PL: 2009; Exceptions to reference year for certain fields of study: MT (science, mathematics and computing; engineering, manufacturing and construction): 2011; IS (agriculture and veterinary): 2010; (All) data unavailable for: ME, AL, RS, BA, IL, FO, MD; Data estimated for: EU-28, EU-27; Data not significant for: DK (education), CY (agriculture and veterinary; health and welfare), ES (education), LU (education; agriculture and veterinary), MK (education), MT (agriculture and veterinary; education);

Others: ':' indicates that data are unavailable; 'z': Not applicable; 'x': Not available, so included in another category (indicated in brackets); For NO, 'science, mathematics and computing' includes the data for this field and for the field 'engineering, manufacturing and construction'; ISCED 6 covers tertiary programmes (above master's level) which lead to the award of an advanced research qualification, including (but not limited to) doctor of philosophy programmes; LI has been excluded as most data are unavailable or data are not significant; low numbers of PhD graduates in MT; CY: A large proportion (around 40 %) of Cypriot students pursue their PhD studies abroad and therefore they are not reflected under these statistics.

Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

Women and men graduates continue to be concentrated in different subjects at PhD and ISCED 6 level.

Although there is some disagreement (6), it is generally accepted that differences in the educational pathways of women and men may have some impact on the occupations they pursue at a later stage. For example, the proportion of women amongst PhD graduates in engineering and science has traditionally been low, as has their representation amongst academic staff working in these fields. By breaking down

6 For an overview of the debates, see European Commission's Expert Group on Gender and Employment (EGGE), Gender segregation in the labour market, Publications Office of the European Union, Luxembourg, 2009, pp. 38–45.

graduations into different fields of study, it is possible to analyse in more depth the extent of gender difference in subject choice amongst top-level graduates.

Table 2.2 shows the proportion of women graduates (ISCED 6) in each of the eight broad fields of study in 2012: education; humanities and arts; social sciences, business and law; science, mathematics and computing; engineering, manufacturing and construction; agriculture and veterinary; health and welfare; and services ([7]). Table 2.3 does the same, but for women graduates in PhD programmes only.

Table 2.3. Proportion of women PhD graduates by broad field of study, 2012

	Education	Humanities and arts	Social sciences, business and law	Science, mathematics and computing	Engineering, manufacturing and construction	Agriculture and veterinary	Health and welfare	Services
EU-28	63	55	51	42	28	56	59	42
EU-27	63	54	51	42	28	57	59	43
BE	83	45	51	35	31	47	59	15
BG	60	59	58	53	32	41	51	38
CZ	82	47	47	40	23	51	48	45
DK	: (n)	51	46	48	30	52	53	: (n)
DE	58	52	42	40	18	66	58	46
EE	100 (2/2)	60	48	53	27	89 (8/9)	50 (7/14)	60 (3/5)
IE	75	60	62	45	24	47 (7/15)	55	50 (8/16)
EL	60	54	45	33	27	42	51	:
ES	55	52	47	47	30	56	56	30 (3/10)
FR	56	58	48	39	31	:	47	38
HR	50	68	60	60	34	37	53	25
IT	71	62	53	53	35	54	64	48
CY	25 (1/4)	50 (3/6)	64 (7/11)	53	38 (3/8)	:	:	:
LV	80	75	82	45	25	80 (4/5)	76	38
LT	: (z)	76	62	53	38	55	74	: (z)
LU	100 (1/1)	50 (3/6)	42 (5/12)	59	29 (2/7)	:	50 (1/2)	:
HU	68	49	51	38	22	59	52	:
MT	: (n)	60 (3/5)	100 (2/2)	25 (1/4)	33 (1/3)	: (n)	50 (1/2)	: (n)
NL	: (z)	52	54	33	26	59	67	: (z)
AT	80	51	49	35	23	58	51	36 (5/14)
PT	77	52	54	58	41	72	70	52
RO	: (z)	64	64	57	43	46	63	38
SI	58 (7/12)	61	64	39	28	68	61	55 (6/11)
SK	79	50	54	50	33	52	60	36
FI	79	62	52	43	27	59	66	50
SE	60	55	50	42	26	53	62	43
UK	62	49	56	39	25	61	57	41
IS	100 (2/2)	25 (1/4)	50 (2/4)	36 (5/14)	33 (1/3)	:	77 (10/13)	:
NO	71 (10/14)	40	57	35	x(4)	70	61	44 (4/9)
CH	57	51	44	37	24	72	54	48
MK	60 (7/12)	52	52	54	33 (3/9)	71	58	38 (3/8)
TR	45	42	43	50	34	38	72	40

Notes: Exceptions to the reference period: FR: 2011 data; MK 2011 (humanities and arts; agriculture and veterinary; services); Data unavailable for: PL, IS, LI (except health and welfare), ME, AL, RS, BA, IL, FO, MD; Break in data series for: all fields of study: DK, LT, MT, NL, RO, LI: teacher training and education science; LI: humanities and arts; LI: social sciences, business and law; LI: science, mathematics and computing; LI: engineering, manufacturing and construction; FR, CY, LU, MT, IS, LI: agriculture and veterinary; CY: health and welfare; DK, EL, CY, LT, LU, HU, MT, NL, IS, LI: services; Data estimated for: EU-28;

Others: ':' indicates that data are unavailable; 'z' not applicable; 'n' not significant; 'x': not available, so included in another category (indicated in brackets); PhD (Doctor of Philosophy); LI has been excluded as most data are unavailable or not significant; For NO, 'science, mathematics and computing' includes the data for this field and for the field 'engineering, manufacturing and construction'; For proportions based on low numbers, numerators and denominators are displayed in the table.

Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

7 'Services', one of the broad fields of study in ISCED 1997, covers personal services (hotel and catering, travel and tourism, beauty treatment, etc.), transport services (nautical science, air crew, railway operations, etc.), environmental protection (conservation, control and protection, air and water pollution control, etc.) and security services (civil security, fire-protection, military, police work and related law enforcement, etc.).

As shown by Table 2.3, women made up the majority of PhD graduates in most fields in the EU in 2012, except for in science, mathematics and computing, engineering, manufacturing and construction, and services (where men were in the majority). The fields with the greatest gender balance were the social sciences, business and law (where women made up 51 % of PhD graduates in the EU-28) and the humanities and arts (where women accounted for 55 % of PhD graduates in the EU-28) ([8]).

Many fields show signs of persistent horizontal segregation by sex ([9]). For instance, in 2012 women represented only 28 % of PhD graduates in engineering, manufacturing and construction in the EU. In some countries, the under-representation of women graduates in this field is particularly acute. For instance, in the field of engineering, manufacturing and construction in 2012, women accounted for no more than a quarter of PhD graduates in Germany (18 %), Hungary (22 %), Austria and the Czech Republic (23 %), Switzerland and Ireland (24 %), and the United Kingdom and Latvia (25 %) (as shown in Table 2.3).

Women were also under-represented within science, mathematics and computing in 2012 (42 % of PhD graduates in the EU-28). In some countries, they accounted for less than 40 % of PhD graduates, including in Malta (25 %), Greece and the Netherlands (33 %), Austria, Belgium and Norway (35 %) ([10]), Iceland (36 %), Switzerland (37 %), Hungary (38 %), France, Slovenia and the United Kingdom (39 %). However, in no country did women make up less than a quarter of PhD graduates in this field. Furthermore, in 12 countries (IE, LV, ES, DK, TR, SK, IT, EE, CY, LT, BG, MK ([11])), there was a reasonable gender balance in this field (women represented between 45 % and 55 % of PhD graduates).

Conversely, men are particularly under-represented amongst education graduates in the EU, whereas women represented 63 % of PhD graduates in this field in 2012 (EU-28). In some countries, women accounted for over three quarters of PhD graduates in education, including in Portugal (77 %), Finland and Slovakia (79 %), Austria and Latvia (80 %), the Czech Republic (82 %) and Belgium (83 %). In Estonia, Luxembourg and Iceland, women made up 100 % of PhD graduates in education. However, the reliability of the data is low in these three cases given that the small population sizes involved could distort the proportions, leading to important annual fluctuations (see Annex 2.4). For instance, there was either only one graduate (LU) or two graduates (EE and IS) from this field in these countries. Similarly, men were under-represented in health and welfare in 2012, as 59 % of PhD graduates were women in the EU-28. However, the difference is not as striking as in education. In only two countries (Latvia and Iceland) did women make up more than three quarters of PhD graduates in health and welfare.

In nine countries (BG, EE, IT, LV, LT, PT, SI, FI, MK), women accounted for over 50 % of graduates from the majority of the PhD fields (i.e. in at least five out of the eight fields presented in the table). The opposite was the case in other countries (BE, CZ, FR, TR); these had more men than women graduating from the majority of the fields.

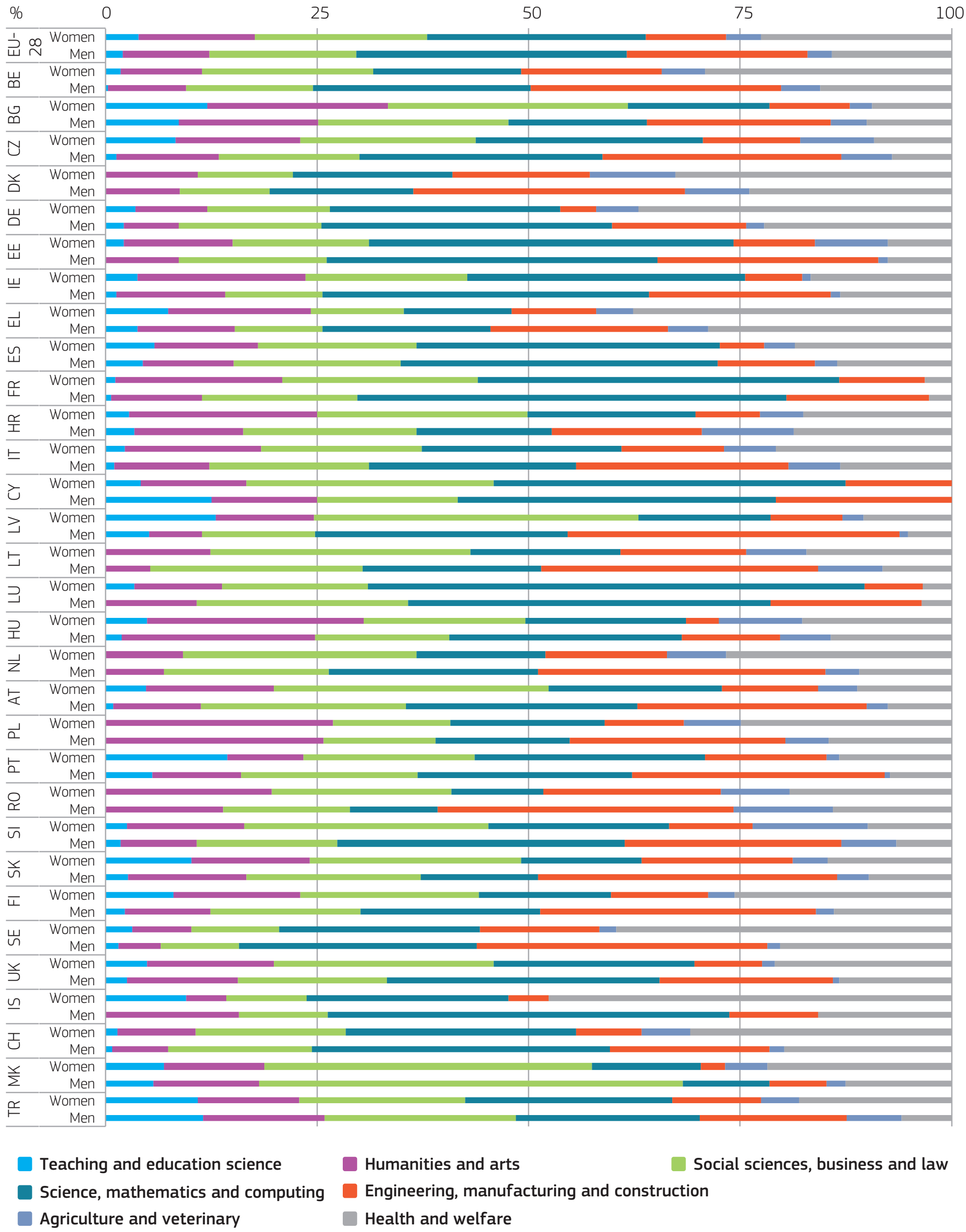
8 The figures are the same for both PhD and ISCED 6 graduates.

9 Horizontal segregation refers to the concentration of women and men in different sectors (sectoral segregation) and occupations (occupational segregation). In education, it is used to describe the over- or under-representation of one sex in particular subjects.

10 See notes beneath the table for issues relating to Norway's data.

11 In increasing order of the proportion of women.

Figure 2.4. Distribution of ISCED 6 graduates across broad fields of study, by sex, 2012



Notes: Exceptions to reference year: FR, MK: 2011; PL: 2009; Data unavailable for: MT, LI, ME, AL, RS, BA, IL, FO, MD; Data estimated for: EU-28, EU-27;
Others: ISCED 6 covers tertiary programmes (above master's level) which lead to the award of an advanced research qualification, including (but not limited to) doctor of philosophy programmes; Data not significant for: BG, DK, EE, IE, EL, HR, CY, LU, LV, MT, SI, IS, LI, NO, MK; Some fields not applicable: LU, LT, PL, RO; NO excluded due to issues with the coding of particular fields; Some fields missing: education: DK, EE, IS, LI, LU, MT, NL, PL, RO; humanities and arts: LI; science, mathematics and computing: LI; engineering, manufacturing and construction: LI; agriculture and veterinary: CY, LU, MT, IS, LI; health and welfare: CY; CY: A large proportion (around 40 %) of Cypriot students pursue their PhD studies abroad and therefore are not reflected in these statistics.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

The most popular subjects differ for women and men graduates, although the field of science, mathematics and computing is often popular amongst both sexes.

Figure 2.4 provides additional context for understanding the phenomenon of horizontal segregation. It shows the distribution of women and men graduates (ISCED 6) across the main broad fields of study in 2012. Specifically, Figure 2.4 shows how both the population of women and men graduates is spread across fields of study.

There are differences by sex when it comes to the most popular subjects amongst ISCED 6 graduates. At the EU level (EU-28), women graduates are most likely to study science, mathematics and computing (26 %), followed by health and welfare (23 %), and social sciences, business and law (20 %). In contrast, the most common field of study for men graduates is science, mathematics and computing (32 %), followed by engineering, manufacturing and construction (21 %), and social sciences, business and law (17 %). Men are more than twice as likely to choose engineering, manufacturing and construction (21 % of men graduates, against 9 % of women graduates), whereas women are twice as likely to pursue an education degree (4 % of women graduates and 2 % of men graduates).

In many countries, science, mathematics and computing is one of the most popular fields of study for both women and men graduates at ISCED 6 level. For instance, at least a quarter of men graduates pursue this subject in 18 countries (BE, CZ, DE, EE, IE, ES, FR, CY, LV, LU, HU, AT, PT, SI, SE, UK, IS, CH). For women, this finding applies in 10 countries (CZ, DE, EE, IE, ES, FR, CY, LU, PT, CH). These figures can be considered from the perspective of broader graduation rates from ISCED 6 programmes in the EU (see Annex 2.3). In 2012, science, mathematics and computing was the field with most graduates overall, followed by social sciences, business and law, and by health and welfare. The three fields with the fewest graduates are teaching and education, and agriculture and veterinary science, and services, each of which had fewer than 5 000 graduates in 2012.

Some differences at country level are particularly striking. For instance, in 16 EU Member States (BE, CZ, DK, EE, IT, LV, LT, NL, AT, PL, PT, RO, SI, SK, FI, SE), more than a quarter of men graduates (ISCED 6) take engineering, manufacturing and construction subjects. When considering women graduates (ISCED 6), this is not true of any country. By the same token, in seven EU Member States (BE, DK, DE, EL, NL, FI, SE), over 25 % of women graduates (ISCED 6) take health and welfare subjects, whereas this is true of men in Greece only.

Table 2.4. Evolution of the proportion (%) of women ISCED 6 graduates by narrow field of study in natural sciences and engineering (fields EF4 and EF5), 2004 and 2012

	Life Science (EF42)		Physical Science (EF44)		Mathematics and Statistics (EF46)		Computing (EF48)		Engineering and Engineering Trades (EF52)		Manufacturing and Processing (EF54)		Architecture and Building (EF58)	
	2004	2012	2004	2012	2004	2012	2004	2012	2004	2012	2004	2012	2004	2012
EU-28	53	58	34	37	31	35	18	21	19	25	30	36	36	38
EU-27	53	58	34	37	31	36	18	21	19	25	30	35	36	38
BE	30	57	34	31	37	32	5	9	15	30	25 (1/4)	50 (6/12)	37 (7/19)	37
BG	56 (10/18)	70	57	53	54 (7/13)	31 (4/13)	:	29 (7/24)	42	31	27 (3/11)	35 (6/17)	38 (3/8)	36 (9/25)
CZ	53	59	31	33	23	38	10	10	17	14	31	59	32	29
DK	:	:	:	:	26	48	:	:	28	30	:	:	:	:
DE	47	59	22	33	28	25	10	18	9	15	19	29	21	26
EE	48	67	27 (4/15)	52 (13/25)	80 (4/5)	100 (1/1)	33 (1/3)	14 (2/14)	38 (5/13)	29	:	:	50 (1/2)	:
IE	50	45	47	45	:	46	21	45	25	24	54 (7/13)	24	33 (1/3)	24
EL	37	37	35	37	36	24	12	31	17	23	24 (5/21)	:	38 (6/16)	40
ES	60	62	47	46	39	34	22	22	21	29	48 (11/23)	19 (3/16)	41	38
FR	50	56	31	34	24	24	18	19	27	26	63	55	32	37
IT	70	66	45	47	41	43	33	24	16	22	26	30	48	51
LV	100 (2/2)	50 (5/10)	71 (5/7)	61 (14/23)	100 (1/1)	40 (2/5)	:	20 (3/15)	30 (3/10)	18	100 (1/1)	67 (2/3)	50 (1/2)	44 (4/9)
LT	78 (18/23)	61 (17/28)	57	53	25 (2/8)	40 (4/10)	100 (2/2)	25 (1/4)	33	34	:	:	43 (3/7)	53 (10/19)
HR	79 (11/14)	71	39	54	33 (4/12)	27 (4/15)	:	33 (4/12)	17	21	44 (4/9)	63	43 (6/14)	45
HU	34	49	33	37	40 (4/10)	33 (8/24)	11 (1/9)	6	:	15	40 (8/20)	38 (11/29)	33 (4/12)	18 (2/11)
AT	56	61	34	32	9	21	8	15	14	23	30	20 (3/15)	22	23
PT	73	72	46	48	55	61	24	30	30	36	51	51	43	38
RO	46	58	:	:	:	56	:	:	27	42	:	:	33	51
SI	58	53	34	34	30 (3/10)	45 (5/11)	:	24	11	21	61 (11/18)	80 (4/5)	36 (5/14)	47 (8/17)
SK	58	63	43	43	36 (4/11)	48 (12/25)	:	13	25	28	41	51	30	49
FI	63	67	38	37	15	19	24	29	18	22	44 (11/25)	57 (13/23)	23 (6/26)	38 (8/21)
SE	54	58	35	37	31	32	28	31	22	23	35	31	44	35
UK	51	52	34	37	24	30	21	23	19	21	26	32	27	38
CH	47	51	27	33	15	25	19	9	17	21	50 (6/12)	87 (13/15)	29	27
TR	47	59	38	47	31	49	20 (4/20)	20	23	24	44	54	43	43

Notes: Exceptions to reference years: FR: 2005–2011; Data unavailable for: ME, RS, BA, IL, FO, MD; Data estimated for: EU-28 and EU-27 (2012);
Others: ':' indicates that data are not available; CY, MT, MK and IS excluded due to low number of observations (fewer than 20 for every narrow field); LU, NL, PL, LI, NO, AL excluded due to limited available data; Not applicable: LV (manufacturing and processing), RO (manufacturing and processing; computing; mathematics and statistics); ISCED 6 covers tertiary programmes (above master's level) which lead to the award of an advanced research qualification, including (but not limited to) doctor of philosophy programmes; CY: A large proportion (around 40 %) of Cypriot students pursue their PhD studies abroad and therefore are not reflected in these statistics; Note that there may be minor differences in the 2004 data presented here and in previous She Figures editions, due to Eurostat updates; For proportions based on low numbers, numerators and denominators are displayed in the table.
Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

Table 2.4 provides a more fine-grained analysis of horizontal segregation, by comparing the proportion of women graduates within certain sub-fields in two different years. By breaking down graduations by sub-field, one can assess variations within broader fields of study. Specifically, the table presents the proportion of women graduates (ISCED 6) in 2004 and 2012. It covers each of the narrow fields of study that fall under science, mathematics and computing on the one hand, and engineering, manufacturing and construction on the other. These narrow fields encompass life science, physical science, mathematics and statistics, computing, engineering and engineering trades, manufacturing and processing, and architecture and building.

Despite improvements since 2004, women remain under-represented in most narrow fields of science and engineering.

Table 2.5 presents the proportion of women graduates in the same sub-fields and in the same two years, but this time for PhD programmes only. The following analysis presents the findings from Table 2.5.

At EU level, the proportion of women PhD graduates increased in all narrow fields of science and engineering between 2004 and 2012. Nonetheless, there are persistent signs of the under-representation of women in most fields, particularly computing (21 % of PhD graduates in the EU-28 in 2012) and the engineering and engineering trades (25 % of PhD graduates in the EU-28 in 2012). The only narrow field where the presence of women exceeded 40 % in 2012 was the life sciences (58 % of PhD graduates in the EU-28).

There were some important improvements within sub-fields between 2004 and 2012. In the EU, the biggest increase in women's representation was in manufacturing and processing (from 28 % to 36 % of PhD graduates in the EU-28) and in the engineering and engineering trades (from 19 % to 25 % of PhD graduates in the EU-28). The same degree of progress as in the latter sub-field also occurred in the life sciences (from 52 % to 58 %). Out of 25 countries analysed, the proportion of women at PhD level increased in the engineering and engineering trades in 17 countries (BE, DK, DE, EL, ES, HR, IT, LT, AT, PT, RO, SI, SK, FI, UK, CH, TR). In physical science, it increased in 14 countries (CZ, DE, EE, EL, FR, HR, IT, HU, PT, FI, SE, UK, CH, TR), while in manufacturing and processing it increased in 12 countries (BE, BG, CZ, DE, HR, IT, PT, SI, SK, UK, CH, TR). In mathematics and statistics, the proportion of women at PhD level increased in 12 countries (CZ, DK, EE, IT, LT, AT, PT, SI, SK, UK, CH, TR). By 2012, there were no countries where women made up less than 25 % of PhD graduates within physical science and life science. In addition, there were only three countries where women accounted for fewer than 25 % of PhD graduates in manufacturing and processing (IE, ES, AT) and in architecture and building (IE, HU, AT).

Despite these improvements, women continue to be under-represented in most sub-fields of science and engineering. This is a particularly acute issue within computing. As mentioned above, women accounted for only 21 % of PhD graduates in this subject in 2012. In that year, women made up less than a quarter of PhD graduates in computing in 15 countries (BE, CZ, DE, EE, ES, FR, IT, LV, HU, AT, SI, SK, UK, CH, TR); in six of these (BE, CZ, EE, HU, SK, CH), women accounted for less than 15 % of computing graduates. The only country coming close to gender balance in this field was Ireland, where women made up 45 % of PhD graduates in 2012. In general, progress in the field of computing appears to have been slow, given the low starting point from which it began. In the EU, the field of computing registered an increase in women's representation of only 5 percentage points between 2004 and 2012 (at PhD level in the EU-28), and five countries saw the proportion of women graduates fall (EE, IT, LT, HU, CH). Other sub-fields also experienced a fall in women's representation, including mathematics and statistics (in ten countries – BE, BG, DE, EL, ES, LV, HR, HU, FI, SE) and the engineering and engineering trades (in six countries – BG, CZ, EE, IE, FR, LV). Overall, positive changes since 2004 were not sufficient to produce gender balance across different fields by 2012. Other than in life science, women continue to be under-represented in all narrow fields of science and engineering.

Table 2.5. Evolution of the proportion (%) of women PhD graduates by narrow field of study in natural sciences and engineering (fields EF4 and EF5), 2004 and 2012

	Science, Mathematics and Computing (EF4)								Engineering, Manufacturing and Construction (EF5)					
	Life Science (EF42)		Physical Science (EF44)		Mathematics and Statistics (EF46)		Computing (EF48)		Engineering and Engineering Trades (EF52)		Manufacturing and Processing (EF54)		Architecture and Building (EF58)	
	2004	2012	2004	2012	2004	2012	2004	2012	2004	2012	2004	2012	2004	2012
EU-28	52	58	33	37	31	35	16	21	19	25	28	36	35	39
EU-27	52	58	33	37	31	35	16	21	19	25	28	35	35	39
BE	30	57	34	31	37	32	5	9	15	30	25 (1/4)	50 (6/12)	37 (7/19)	37
BG	56(10 /18)	70	57	53	54 (7/13)	31 (4/13)	:	29 (7/24)	42	31	27 (3/11)	35 (6/17)	38 (3/8)	36 (9/25)
CZ	53	59	31	33	23	38	10	10	17	14	31	59	32	29
DK	:	:	:	:	26	48	:	:	28	30	:	:	:	:
DE	47	59	22	33	28	25	10	18	9	15	19	29	21	26
EE	48	67	27 (4/15)	52 (13/25)	80 (4/5)	100 (1/1)	33 (1/3)	14 (2/14)	38 (5/13)	29	:	:	50 (1/2)	:
IE	50	45	47	45	:	46	21	45	25	24	54 (7/13)	24	33 (1/3)	24
EL	37	37	35	37	36 (8/22)	24	12	31	17	23	24 (5/21)	:	38 (6/16)	40
ES	60	62	47	46	39	34	22	22	21	29	48 (11/23)	19 (3/16)	41	38
FR	50	56	31	34	24	24	18	19	27	26	63	55	32	37
HR	79 (11/14)	71	39	54	33 (4/12)	27 (4/15)	:	33 (4/12)	17	21	44 (4/9)	63	43 (6/14)	45
IT	70	66	45	47	41	43	33	24	16	22	26	30	48	51
LV	100 (2/2)	50 (5/10)	71 (5/7)	61 (14/23)	100 (1/1)	40 (2/5)	:	20 (3/15)	30 (3/10)	18	100 (1/1)	67 (2/3)	50 (1/2)	44 (4/9)
LT	78 (18/23)	61 (17/28)	57	53	25 (2/8)	40 (4/10)	100 (2/2)	25 (1/4)	33	34	:	:	43 (3/7)	53 (10/19)
HU	34	49	33	37	40 (4/10)	33 (8/24)	11 (1/9)	6	:	15	40 (8/20)	38 (11/29)	33 (4/12)	18 (2/11)
AT	56	61	34	32	9	21	8	15	14	23	30	20 (3/15)	22	23
PT	68	73	40	45	58	63	12	30	35	41	37	59	36	35
RO	46	58	:	:	:	56	:	:	27	42	:	:	33	51
SI	58	53	34	34	30 (3/10)	45 (5/11)	:	24	11	21	61 (11/18)	80 (4/5)	36 (5/14)	47 (8/17)
SK	58	63	43	43	36 (4/11)	48 (12/25)	:	13	25	28	41	51	30	49
FI	62	65	31	37	16 (3/19)	14	21	30	15	22	50 (10/20)	50 (9/18)	29 (4/14)	44 (7/16)
SE	57	58	30	37	25	24	29	31	22	22	39	31	36	42
UK	51	52	34	37	24	30	21	23	19	20	26	32	27	38
CH	48	51	27	33	16	25	19	9	17	21	50 (6/12)	87 (13/15)	30	27
TR	47	59	38	47	31	49	20 (4/20)	20	23	24	44	54	43	43

Notes: For proportions based on low numbers, numerators and denominators are displayed in the table; Exceptions to reference years: FR: 2005–2011; Data unavailable for: Data unavailable for: ME, RS, BA, IL, FO, MD;

Others: ':' Not available; PhD (Doctor of Philosophy); CY, MT, IS and MK excluded due to low number of observations (fewer than 20 for every narrow field); LU, NL, PL, LI, NO, AL excluded due to limited available data; Not applicable: LV (manufacturing and processing), RO (manufacturing and processing; computing; mathematics and statistics); CY: A large proportion (around 40 %) of Cypriot students pursue their PhD studies abroad and therefore they are not reflected under these statistics; Note that there may be minor differences in the 2004 data presented here and in previous She Figures editions, due to Eurostat updates.

Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

Table 2.6. Compound annual growth rates (%) of ISCED 6 graduates by narrow field of study in natural sciences and engineering, by sex, 2002–2012

	Life Science (EF42)				Physical Science (EF44)				Mathematics and Statistics (EF46)				Computing (EF48)				Engineering and Engineering Trades (EF52)				Manufacturing and Processing (EF54)				Architecture and Building (EF58)			
	Women		Men		Women		Men		Women		Men		Women		Men		Women		Men		Women		Men		Women		Men	
	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend
EU-28	3.3		1.5		4.5		2.4		6.5		4.5		10.5		8.4		10.1		4.7		4.5		2.7		5.8		2.7	
EU-27	3.2		1.5		3.8		1.2		7.4		4.7		9.5		6.4		9.3		4.5		4.7		2.4		8.0		4.3	
BE	-2.6		-6.9		3.4		3.0		-5.4		0.0		-4.6		-3.6		18.5		11.5		11.6		11.6		23.9		10.2	
BG	11.3		5.2		6.6		7.9		-2.2		11.6		28.5		41.5		7.2		9.0		11.6		8.2		24.6		12.3	
CZ	10.4		6.6		11.8		5.1		9.9		1.9		-2.6		-3.6		3.1		9.0		14.9		7.2		12.4		11.0	
DK	:		:		:		:		22.5		8.7		:		:		11.0		7.2		:		:		:		:	
DE	6.9		1.9		5.7		-0.6		2.8		1.1		14.4		6.8		9.8		1.4		-0.5		-3.9		5.6		0.5	
EE	14.9		7.2		15.8		0.9		-15.9		13.0		7.2		14.9		16.2		18.6		:		:		20.1		-4.4	
IE	-1.0		1.7		6.8		1.1		40.3		19.3		30.4		20.5		12.3		2.9		18.2		14.9		18.2		19.2	
EL	-24.0		-24.0		2.2		0.7		5.2		13.7		5.8		-9.0		17.2		11.7		:		:		20.1		18.5	
ES	5.6		4.2		5.9		4.2		4.2		5.7		6.7		8.5		8.5		6.0		-17.7		-3.7		12.3		0.9	
FR	5.7		4.4		5.1		5.4		6.2		6.2		7.3		7.0		13.5		11.1		9.9		0.7		23.3		16.8	
HR	30.0		36.9		16.0		7.4		0.0		4.1		26.0		0.0		8.4		4.5		21.5		10.4		12.1		10.7	
IT	7.8		11.3		7.2		5.8		3.8		7.8		8.7		16.7		12.2		7.4		13.9		10.1		7.4		8.1	
LV	9.6		17.5		30.2		11.6		9.1		20.1		4.6		31.8		-1.3		26.7		8.0		-7.4		18.9		19.6	
LT	5.4		10.6		1.8		-1.2		7.2		11.6		-6.7		-2.8		1.3		4.6		z		z		12.8		8.4	
HU	17.5		3.6		5.6		2.9		10.3		1.3		-8.8		14.2		-3.6		2.0		4.6		3.3		-11.8		11.6	
AT	1.2		-4.7		3.5		-0.5		1.8		6.7		10.1		7.2		9.0		4.4		-17.7		-10.9		10.5		2.7	
PT	9.7		7.8		2.1		4.1		-6.8		-7.5		7.7		3.2		5.3		2.2		0.6		2.0		-2.8		-2.6	
RO	13.5		9.5		z		z		22.4		8.8		z		z		24.7		12.5		z		z		-16.2		-20.6	
SI	0.7		10.4		-1.8		4.9		19.6		7.2		19.6		12.3		5.9		4.1		-5.4		-21.3		2.9		1.2	
SK	8.2		12.9		7.8		1.2		9.1		5.0		14.9		18.8		19.0		13.1		10.9		4.7		9.4		13.5	
FI	-0.5		-1.0		0.4		-1.3		-2.5		0.7		5.8		-2.3		1.3		1.4		-4.2		-3.3		1.3		-5.1	
SE	1.2		-2.6		0.6		-0.3		9.0		-0.6		12.7		4.7		-1.8		-2.2		2.4		1.8		1.2		3.0	
UK	-3.6		-1.6		3.3		1.1		6.4		2.6		11.0		8.7		8.1		4.4		0.3		-2.4		9.4		2.2	
CH	8.8		1.2		5.0		0.5		0.6		-4.9		7.2		10.0		9.8		2.7		29.2		-12.8		9.6		4.3	
TR	19.2		13.6		13.9		2.9		11.3		5.5		21.5		24.8		12.6		4.3		6.4		2.4		5.1		14.3	

Notes: Exceptions to reference period: EU-28: 2003–2012; BG: 2007–2012; NO: 2005–2011; FR: 2003–2011; EL, HR: 2004–2012; DK: 2004–2012 for mathematics and statistics (2002–2012 for all other narrow fields); RO: 2007–2012 for mathematics and statistics (2003–2012 for other narrow fields); Data unavailable for: PL, LI, ME, AL, RS, BA, IL, FO, MD; Data estimated for: EU-28, EU-27;

Others: ':' indicates that data are unavailable; 'z': Not applicable; CY, LU, MT, IS and MK excluded due to low number of observations (fewer than 20 in every narrow field); NL excluded due to lack of recent data; limited EE data on manufacturing and processing; data period too limited for manufacturing and processing data in EL; ISCED 6 covers tertiary programmes (above master's level) which lead to the award of an advanced research qualification, including (but not limited to) doctor of philosophy programmes; Some data not significant: BG, DK, EE, IE, EL, HR, LV, LT, HU, SI, SK, NO, CH; NO excluded due to issues with the coding of particular fields; CY: A large proportion (around 40%) of Cypriot students pursue their PhD studies abroad and therefore are not reflected in these statistics; The 'trends' column represents the actual changes in the number of women and men researchers each year (headcount). This differs from the CAGR, which shows the average yearly change over the whole period.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

Between 2002 and 2012, the number of women graduates in the sub-fields of science and engineering generally grew at a faster rate than the number of men.

The compound annual growth rate (CAGR) shows the average rate of change each year. Table 2.6 shows the CAGRs of ISCED 6 graduates, by sex, in each of the narrow fields of study within science and engineering. It covers the period between 2002 and 2012, with some exceptions (indicated beneath the chart).

At the EU level (EU-28 and EU-27), women's annual growth rates were consistently positive across all narrow fields of study, as well as being higher than those of men. This means that the number of women in these fields has been growing at a faster rate than the number of men. This helps to explain why the proportion of women in these fields rose between 2004 and 2012 (see Table 2.4).

The highest CAGRs for women in the EU-28 were in computing and the engineering and engineering trades: between 2002 and 2012, the number of women grew by 11 % each year in computing, and by 10 % annually in the engineering and engineering trades. The biggest increases for men were in computing, where the CAGR of men is trailing behind that of women by about 2 percentage points (women's CAGR of 10.5 % versus 8.4 % for men). The smallest CAGR for women occurred in life science (3.3 %). Here the difference between the rate for women and men was also the smallest, at less than 2 percentage points (the rate for women = 3.3 %; the rate for men = 1.5 %).

When considering the growth rates for women and men in different fields, it is important to take into account the baseline from which each started. For instance, the fields in which the number of women grew most quickly between 2002 and 2012 (computing and the engineering and engineering trades) were also those where women were the least represented: in 2003, women accounted for only 19 % of ISCED 6 graduates in computing, and 17 % of ISCED 6 graduates in the engineering and engineering trades. In 2012, women continued to account for a quarter or less of these graduates. For gender balance to be achieved in these sub-fields, the CAGRs for women will need to be high and sustained over time. Conversely, the field where women registered the lowest CAGR (life sciences) is also that in which they were slightly over-represented in earlier years (53 % of ISCED 6 graduates in the EU-28 in 2004).

Analysing the situation in particular fields reveals that CAGRs were more evenly distributed across countries for men graduating from the physical sciences, and particularly uneven for men graduates in the life sciences and computing. For women graduates, there were relatively uniform growth rates in the physical sciences and the engineering and engineering trades, whereas the most irregular growth rates were observed in mathematics and statistics as well as in manufacturing and processing (ranging from a 40 % annual increase in Ireland to a 16 % annual fall in Estonia). In Ireland, women made major advances in four sub-fields (mathematics and statistics, computing, manufacturing and processing, architecture and building), with CAGRs in the highest quartile of the distribution.

Growth in the number of men graduates was most pronounced in computing – the sub-field with the highest CAGR for men in the EU between 2002 and 2012. In this field, 15 countries in wider Europe showed CAGRs of 5 % or more, rising to up to 41 % in Bulgaria and 32 % in Latvia. Mathematics and statistics was another 'growth field' for men graduates, with 14 countries registering CAGRs of 5 % or more, reaching up to 20 % in Latvia. For women graduates, the sub-fields in which growth was most pronounced at national level (in wider Europe) were the engineering and engineering trades (CAGRs of at least 5 % in 19 countries), computing (CAGRs of at least 5 % in 18 countries), and architecture and building (CAGRs of at least 5 % in 1 country). However, given that the CAGR shows only the *average* rate of growth per year, it is important to also consider the 'trends' pertaining to this indicator in order to gain more sense of individual spikes and drops in the number of graduates each year.

Annex 2.1. Number of ISCED 6 graduates, by sex, 2008–2012

	2008		2009		2010		2011		2012	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
EU-28	60 031	50 990	55 180	46 854	56 572	47 613	:	:	64 080	57 646
EU-27	59 784	50 743	54 876	46 586	56 162	47 185	62 626	54 628	63 472	56 916
BE	1 090	790	1 115	787	1 221	905	1 230	935	1 332	1 036
BG	282	319	309	327	311	285	285	353	473	506
CZ	1 498	884	1 480	911	1 358	870	1 398	1 064	1 571	1 112
DK	631	471	660	503	764	624	824	679	849	703
DE	14 815	10 789	14 220	11 307	14 506	11 533	15 051	12 303	14 628	12 179
EE	85	76	86	74	83	92	119	131	94	96
IE	536	554	658	553	638	584	735	712	735	712
EL	857	549	:	:	1 100	792	1 041	644	973	761
ES	3 749	3 553	4 053	3 862	4 608	4 088	4 598	4 149	4 879	4 604
FR	6 566	4 743	6 856	5 085	7 203	5 463	7 576	5 612	:	:
HR	247	247	304	268	410	428	:	:	608	730
IT	5 996	6 595	:	:	:	:	5 277	5 993	5 359	6 099
CY	15	13	18	12	19	11	19	24	24	24
LV	57	82	73	101	53	79	104	193	107	160
LT	170	199	155	242	171	235	156	197	171	227
LU	:	:	:	:	:	:	34	24	28	29
HU	654	487	710	666	680	595	649	585	665	577
MT	7	4	8	11	9	3	17	2	7	6
NL	1 873	1 341	1 928	1 373	2 165	1 571	2 089	1 626	2 225	1 815
AT	1 268	937	1 291	993	1 436	1 064	1 378	981	1 403	1 009
PL	2 856	2 760	2 505	2 563	1 682	1 635	1 480	1 575	1 679	1 911
PT	1 969	2 894	1 664	2 712	1 111	1 816	995	1 319	1 272	1 637
RO	1 668	1 603	2 466	2 152	2 490	2 274	2 806	2 809	2 307	2 851
SI	212	193	257	209	251	214	285	238	282	287
SK	857	798	1 005	932	1 471	1 407	825	847	1 118	1 063
FI	900	1 051	921	1 028	813	937	872	984	890	944
SE	1 999	1 626	1 846	1 718	1 744	1 627	1 787	1 569	1 802	1 541
UK	9 174	7 432	9 735	7 916	10 275	8 481	10 996	9 080	11 023	9 415
IS	16	7	12	20	20	16	:	:	19	21
LI	:	:	12	3	1	:	8	4	5	1
NO	679	552	588	496	664	538	701	596	731	677
CH	2 042	1 384	2 160	1 481	2 196	1 604	2 157	1 552	2 067	1 571
MK	43	44	55	64	77	80	93	104	75	71
TR	2 147	1 607	2 400	1 853	2 591	2 093	2 550	2 103	2 410	2 096

Notes: Data unavailable for: ME, AL, RS, BA, IL, FO, MD; Data estimated for: EU-28, EU-27;

Others: Headcount (HC); Not significant: LI; Data corresponds to the indicator 'Proportion of female PhD (ISCED 6) graduates, 2012'; ISCED 6 covers tertiary programmes (above master's level) which lead to the award of an advanced research qualification, including (but not limited to) doctor of philosophy programmes. In most countries, the number of graduates at ISCED 6 level and PhD level is the same; CY: A large proportion (around 40 %) of Cypriot students pursue their PhD studies abroad and therefore are not reflected in these statistics.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

Annex 2.2. Number of PhD graduates, by sex, 2008–2012

	2008		2009		2010		2011		2012	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
EU-28	58 024	48 217	53 536	44 343	55 573	46 163	:	:	63 061	56 652
EU-27	57 777	47 970	53 232	44 075	55 163	45 735	61 807	53 752	62 453	55 922
BE	1 090	790	1 115	787	1 221	905	1 230	935	1 332	1 036
BG	282	319	309	327	311	285	285	353	473	506
CZ	1 498	884	1 480	911	1 358	870	1 398	1 064	1 571	1 112
DK	631	471	660	503	764	624	824	679	849	703
DE	14 815	10 789	14 220	11 307	14 506	11 533	15 051	12 303	14 628	12 179
EE	85	76	86	74	83	92	119	131	94	96
IE	536	554	658	553	638	584	735	712	735	712
EL	857	549	:	:	1 100	792	1 041	644	973	761
ES	3 749	3 553	4 053	3 862	4 608	4 088	4 598	4 149	4 879	4 604
FR	6 566	4 743	6 856	5 085	7 203	5 463	7 576	5 612	:	:
HR	247	247	304	268	410	428	:	:	608	730
IT	5 996	6 595	:	:	:	:	5 277	5 993	5 359	6 099
CY	15	13	18	12	19	11	19	24	24	24
LV	57	82	73	101	53	79	104	193	107	160
LT	170	199	155	242	171	235	156	197	171	227
LU	:	:	:	:	:	:	34	24	28	29
HU	654	487	710	666	680	595	649	585	665	577
MT	7	4	8	11	9	3	17	2	7	6
NL	1 873	1 341	1 928	1 373	2 165	1 571	2 089	1 626	2 225	1 815
AT	1 268	937	1 291	993	1 436	1 064	1 378	981	1 403	1 009
PL	2 856	2 760	2 505	2 563	1 682	1 635	1 480	1 575	1 679	1 911
PT	636	649	597	670	621	793	725	883	812	1 047
RO	1 668	1 603	2 466	2 152	2 490	2 274	2 806	2 809	2 307	2 851
SI	212	193	257	209	251	214	285	238	282	287
SK	857	798	1 005	932	1 471	1 407	825	847	1 118	1 063
FI	695	831	781	861	721	797	803	850	812	843
SE	1 530	1 318	1 409	1 416	1 327	1 340	1 307	1 263	1 321	1 238
UK	9 174	7 432	9 735	7 916	10 275	8 481	10 996	9 080	11 023	9 415
IS	16	7	12	20	20	16	:	:	19	21
LI	:	:	12	3	1	:	8	4	5	1
NO	679	552	588	496	664	538	701	596	731	677
CH	1 880	1 329	1 991	1 433	2 031	1 555	1 979	1 505	2 067	1 571
MK	43	44	55	64	77	80	93	104	75	71
TR	2 147	1 607	2 400	1 853	2 591	2 093	2 550	2 103	2 410	2 096

Notes: Data unavailable for: ME, AL, RS, BA, IL, FO, MD; Data estimated for: EU-28, EU-27;

Others: CY: A large proportion (around 40 %) of Cypriot students pursue their PhD studies abroad and therefore are not reflected in these statistics; Not significant: LI (2008, 2010); Headcount (HC); PhD (Doctor of Philosophy).

Source: Eurostat - Education Statistics (online data code: educ_grad5)

Annex 2.3. Number of ISCED 6 graduates by broad field of study, and by sex, 2012

	Education		Humanities and arts		Social sciences, business and law		Science, mathematics and computing		Engineering, manufacturing and construction		Agriculture and veterinary		Health and welfare		Services	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	2 159	1 207	7 420	6 232	11 020	10 649	14 138	19 587	5 164	13 054	2 211	1 699	12 327	8 642	434	546
EU-28	2 179	1 227	7 582	6 309	11 200	10 771	14 282	19 682	5 219	13 160	2 249	1 764	12 454	8 753	430	534
BE	19	4	99	121	209	198	181	338	171	388	54	61	301	205	2	11
BG	59	39	105	74	139	101	82	73	47	98	13	19	46	45	15	24
CZ	88	19	159	182	222	247	287	431	123	422	94	89	98	106	30	37
DK	:	:	77	74	79	91	132	144	114	272	71	65	230	203	:	:
DE	429	317	1 027	943	1 740	2 445	3 294	4 967	510	2 300	609	316	4 473	3 212	90	105
EE	2	:	12	8	15	16	40	36	9	24	8	1	7	7	3	2
IE	27	9	139	94	135	83	231	281	48	156	7	8	117	96	8	8
EL	56	37	129	112	83	100	97	194	76	204	33	46	287	280	:	:
ES	268	217	563	519	858	961	1 648	1 827	243	559	168	130	853	659	3	7
FR	63	50	1 102	810	1 282	1 375	2 383	3 802	560	1 268	:	:	179	202	43	69
HR	20	20	162	77	180	122	144	95	55	106	38	65	127	111	4	12
IT	137	56	963	585	1 133	990	1 416	1 277	722	1 314	370	318	1 244	692	12	13
CY	1	3	3	3	7	4	10	9	3	5	:	:	:	:	:	:
LV	20	5	18	6	59	13	24	29	13	38	4	1	16	5	6	10
LT	:	:	28	9	70	43	40	36	34	56	16	13	39	14	:	z
LU	1	:	3	3	5	7	17	12	2	5	:	:	1	1	:	:
HU	28	13	148	152	110	105	110	183	22	77	57	40	102	95	:	:
MT	:	:	3	2	2	:	:	3	:	1	:	:	1	1	:	:
NL	:	:	167	153	500	434	276	550	262	757	125	88	485	243	:	z
AT	47	12	149	143	320	332	202	377	112	372	46	34	110	104	5	9
PL	:	:	676	632	350	324	459	388	237	625	168	125	628	358	45	53
PT	222	67	139	127	314	252	421	306	221	360	23	8	206	88	91	64
RO	:	:	555	317	603	339	308	237	592	794	232	269	541	319	20	32
SI	7	5	39	25	81	46	60	94	28	71	38	18	28	18	6	5
SK	103	28	143	145	254	215	145	144	182	368	42	39	150	102	44	77
FI	74	20	138	88	195	154	144	184	106	283	28	19	237	121	22	21
SE	48	28	106	90	159	164	361	506	215	614	31	27	605	365	19	24
UK	460	278	1 406	1 447	2 446	1 934	2 229	3 547	749	2 248	142	90	1 971	1 459	11	16
IS	2	:	1	3	2	2	5	9	1	2	:	:	10	3	:	:
LI	:	:	:	:	:	3	:	:	:	:	:	:	1	2	:	:
NO	10	4	53	81	89	67	202	376	x(7)	x(8)	14	6	281	176	4	5
CH	21	16	138	130	266	338	406	698	117	375	85	33	463	393	71	76
MK	7	5	12	11	39	44	13	9	3	6	5	2	22	11	3	5
TR	225	275	250	339	407	539	507	515	216	412	95	154	373	142	23	34

Notes: Exceptions to reference year: FR, MK: 2011; PL: 2009; Data estimated for: EU-28, EU-27; Data unavailable for: ME, AL, RS, BA, IL, FO, MD;

Others: Headcount (HC); Data corresponds to the indicator 'Proportion of female PhD (ISCED 6) graduates by broad field of study, 2012'; ':' indicates that data are unavailable, 'z': Not applicable, 'x': Not available, so included in another category (indicated in brackets); Not significant: DK, EL, CY, LU, HU, MT, IS, LI; ISCED 6 covers tertiary programmes (above master's level) which lead to the award of an advanced research qualification, including (but not limited to) doctor of philosophy programmes. In most countries, the number of graduates at ISCED 6 level and PhD level is the same; CY: A large proportion (around 40 %) of Cypriot students pursue their PhD studies abroad and therefore are not reflected in these statistics; For NO, science, mathematics and computing' includes the data for this field and for the field 'engineering, manufacturing and construction'.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

Annex 2.4. Number of PhD graduates by field of study, and by sex, 2012

	Education		Humanities and arts		Social sciences, business and law		Science, mathematics and computing		Engineering, manufacturing and construction		Agriculture and veterinary		Health and welfare		Services	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-28	2 046	1 187	7 525	6 260	11 001	10 629	14 027	19 412	5 031	12 706	2 241	1 760	12 352	8 709	379	514
EU-27	2 026	1 167	7 363	6 183	10 821	10 507	13 883	19 317	4 976	12 600	2 203	1 695	12 225	8 598	375	502
BE	19	4	99	121	209	198	181	338	171	388	54	61	301	205	2	11
BG	59	39	105	74	139	101	82	73	47	98	13	19	46	45	15	24
CZ	88	19	159	182	222	247	287	431	123	422	94	89	98	106	30	37
DK	:	:	77	74	79	91	132	144	114	272	71	65	230	203	:	:
DE	429	317	1 027	943	1 740	2 445	3 294	4 967	510	2 300	609	316	4 473	3 212	90	105
EE	2	:	12	8	15	16	40	36	9	24	8	1	7	7	3	2
IE	27	9	139	94	135	83	231	281	48	156	7	8	117	96	8	8
EL	56	37	129	112	83	100	97	194	76	204	33	46	287	280	:	:
ES	268	217	563	519	858	961	1 648	1 827	243	559	168	130	853	659	3	7
FR	63	50	1 102	810	1 282	1 375	2 383	3 802	560	1 268	:	:	179	202	43	69
HR	20	20	162	77	180	122	144	95	55	106	38	65	127	111	4	12
IT	137	56	963	585	1 133	990	1 416	1 277	722	1 314	370	318	1 244	692	12	13
CY	1	3	3	3	7	4	10	9	3	5	:	:	:	:	:	:
LV	20	5	18	6	59	13	24	29	13	38	4	1	16	5	6	10
LT	:	:	28	9	70	43	40	36	34	56	16	13	39	14	:	:
LU	1	:	3	3	5	7	17	12	2	5	:	:	1	1	:	:
HU	28	13	148	152	110	105	110	183	22	77	57	40	102	95	:	:
MT	:	:	3	2	2	:	:	3	:	1	:	:	1	1	:	:
NL	:	:	167	153	500	434	276	550	262	757	125	88	485	243	:	:
AT	47	12	149	143	320	332	202	377	112	372	46	34	110	104	5	9
PL	:	:	676	632	350	324	459	388	237	625	168	125	628	358	45	53
PT	109	33	116	108	189	158	277	197	142	204	21	8	149	64	44	40
RO	:	:	555	317	603	339	308	237	592	794	232	269	541	319	20	32
SI	7	5	39	25	81	46	60	94	28	71	38	18	28	18	6	5
SK	103	28	143	145	254	215	145	144	182	368	42	39	150	102	44	77
FI	66	18	126	78	145	135	131	171	91	249	27	19	236	121	21	21
SE	36	24	84	70	135	135	263	358	121	350	26	23	561	345	12	16
UK	460	278	1 406	1 447	2 446	1 934	2 229	3 547	749	2 248	142	90	1 971	1 459	11	16
IS	2	:	1	3	2	2	5	9	1	2	:	:	10	3	:	:
LI	:	:	:	:	:	3	:	:	:	:	:	:	1	2	:	:
NO	10	4	53	81	89	67	202	376	x(7)	x(8)	14	6	281	176	4	5
CH	21	16	138	130	266	338	406	698	117	375	85	33	463	393	71	76
MK	7	5	12	11	39	44	13	9	3	6	5	2	22	11	3	5
TR	225	275	250	339	407	539	507	515	216	412	95	154	373	142	23	34

Notes: Exceptions to the reference year: FR, MK: 2011; PL: 2009; Data unavailable for: RO, ME, AL, RS, BA, IL, FO, MD; Data estimated for: EU-28, EU-27; Definition differs for: LT, NL, PL, RO (Education); LT, NL (Services);

Others: Headcount (HC); PhD (Doctor of Philosophy); ':' indicates that data are unavailable, 'x': Not available, so included in another category (indicated in brackets); Some data not significant: DK, EE, EL, CY, LU, HU, MT, IS, LI, MK; For NO, 'science, mathematics and computing' includes the data for this field and for the field 'engineering, manufacturing and construction'.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

Annex 2.5. Number of ISCED 6 graduates by narrow field of study, and by sex, in natural sciences and engineering (EF4 and EF5 fields), 2012

	Science, Mathematics and Computing (EF4)								Engineering, Manufacturing and Construction (EF5)					
	Life Science (EF42)		Physical Science (EF44)		Mathematics and Statistics (EF46)		Computing (EF48)		Engineering and Engineering Trades (EF52)		Manufacturing and Processing (EF54)		Architecture and Building (EF58)	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-28	6 462	4 590	5 474	9 204	1 220	2 218	853	3 123	3 045	9 210	732	1 318	1 168	1 869
EU-27	6 372	4 553	5 428	9 165	1 216	2 207	849	3 115	3 024	9 133	713	1 307	1 153	1 851
BE	69	53	95	210	12	25	5	50	148	353	6	6	17	29
BG	35	15	36	32	4	9	7	17	32	71	6	11	9	16
CZ	158	112	101	203	18	29	10	87	46	289	32	22	45	111
DK	:	:	:	:	132	144	:	:	114	272	:	:	:	:
DE	1 722	1 205	1 286	2 631	133	408	158	728	329	1 813	53	128	128	361
EE	24	12	13	12	1	:	2	12	9	22	:	:	:	2
IE	57	70	58	70	59	70	57	71	16	52	16	52	16	52
EL	19	33	44	74	12	39	22	48	50	165	:	:	26	39
ES	756	465	694	825	106	207	92	330	186	457	3	13	54	89
HR	90	37	46	39	4	11	4	8	21	77	19	11	15	18
IT	670	351	591	665	125	167	30	94	104	375	246	586	372	353
CY	2	1	6	3	1	1	1	4	2	4	:	:	1	1
LV	5	5	14	9	2	3	3	12	7	32	2	1	4	5
LT	17	11	18	16	4	6	1	3	24	47	:	:	10	9
LU	5	:	4	6	1	1	7	5	2	5	:	:	:	:
HU	55	57	45	76	8	16	2	34	9	50	11	18	2	9
MT	:	1	:	:	:	:	:	2	:	1	:	:	:	:
NL	:	:	:	:	:	:	:	:	:	:	:	:	:	:
AT	96	62	73	153	12	44	21	118	90	296	3	12	19	64
PT	229	91	129	140	42	27	21	48	147	262	34	33	40	65
RO	94	68	:	:	214	169	z	z	568	771	z	z	24	23
SI	30	27	15	29	5	6	10	32	16	61	4	1	8	9
SK	95	57	34	46	12	13	4	28	114	299	31	30	37	39
FI	72	36	49	83	7	29	14	34	73	252	13	10	8	13
SE	150	109	135	230	33	69	43	98	140	460	38	84	37	70
UK	906	835	952	1 623	166	392	205	697	435	1 687	98	204	216	357
IS	3	:	2	7	:	:	:	2	1	2	:	:	:	:
CH	228	217	150	308	16	48	12	125	84	318	13	2	20	55
MK	1	:	4	5	:	:	2	1	2	9	:	:	2	3
TR	209	147	202	229	82	84	14	55	82	265	65	56	69	91
FR	1 106	877	1 036	2 029	107	333	134	563	363	1 037	117	96	80	135

Notes: Exceptions to reference years: FR: 2011; NO: 2010; Data unavailable for: PL, LI, ME, AL, RS, BA, IL, FO, MD; Data estimated for: EU-28, EU-27;

Others: ':' indicates that data are unavailable; 'z': Not applicable; Headcount (HC); ISCED 6 covers tertiary programmes (above master's level) which lead to the award of an advanced research qualification, including (but not limited to) doctor of philosophy programmes. In most countries, the number of graduates at ISCED 6 level and PhD level is the same; CY: A large proportion (around 40 %) of Cypriot students pursue their PhD studies abroad and therefore are not reflected in these statistics; NO excluded due to issues with the coding of these fields and limited data; Some data not significant: DK, EE, CY, LT, LU, MT, NO, MK.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

Annex 2.6. Number of PhD graduates by narrow field of study, and by sex, in natural sciences and engineering (EF4 and EF5 fields), 2012

	Science, Mathematics and Computing (EF4)								Engineering, Manufacturing and Construction (EF5)					
	Life Science (EF42)		Physical Science (EF44)		Mathematics and Statistics (EF46)		Computing (EF48)		Engineering and Engineering Trades (EF52)		Manufacturing and Processing (EF54)		Architecture and Building (EF58)	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-28	6 367	4 539	5 379	9 088	1 184	2 182	824	3 056	2 920	8 866	693	1 258	1 144	1 819
EU-27	6 277	4 502	5 333	9 049	1 180	2 171	820	3 048	2 899	8 789	674	1 247	1 129	1 801
BE	69	53	95	210	12	25	5	50	148	353	6	6	17	29
BG	35	15	36	32	4	9	7	17	32	71	6	11	9	16
CZ	158	112	101	203	18	29	10	87	46	289	32	22	45	111
DK	:	:	:	:	132	144	:	:	114	272	:	:	:	:
DE	1 722	1 205	1 286	2 631	133	408	158	728	329	1 813	53	128	128	361
EE	24	12	13	12	1	:	2	12	9	22	:	:	:	2
IE	57	70	58	70	59	70	57	71	16	52	16	52	16	52
EL	19	33	44	74	12	39	22	48	50	165	:	:	26	39
ES	756	465	694	825	106	207	92	330	186	457	3	13	54	89
HR	90	37	46	39	4	11	4	8	21	77	19	11	15	18
IT	670	351	591	665	125	167	30	94	104	375	246	586	372	353
CY	2	1	6	3	1	1	1	4	2	4	:	:	1	1
LV	5	5	14	9	2	3	3	12	7	32	2	1	4	5
LT	17	11	18	16	4	6	1	3	24	47	:	:	10	9
LU	5	:	4	6	1	1	7	5	2	5	:	:	:	:
HU	55	57	45	76	8	16	2	34	9	50	11	18	2	9
MT	:	1	:	:	:	:	:	2	:	1	:	:	:	:
AT	96	62	73	153	12	44	21	118	90	296	3	12	19	64
PT	163	59	75	92	26	15	13	31	99	142	16	11	27	51
RO	94	68	:	:	214	169	z	z	568	771	z	z	24	23
SI	30	27	15	29	5	6	10	32	16	61	4	1	8	9
SK	95	57	34	46	12	13	4	28	114	299	31	30	37	39
FI	67	36	44	76	4	24	14	33	63	223	9	9	7	9
SE	126	90	99	169	16	50	22	49	73	265	21	47	27	38
UK	906	835	952	1 623	166	392	205	697	435	1 687	98	204	216	357
IS	3	:	2	7	:	:	:	2	1	2	:	:	:	:
CH	228	217	150	308	16	48	12	125	84	318	13	2	20	55
MK	1	:	4	5	:	:	2	1	2	9	:	:	2	3
TR	209	147	202	229	82	84	14	55	82	265	65	56	69	91
FR	1 106	877	1 036	2 029	107	333	134	563	363	1 037	117	96	80	135

Notes: Exceptions to reference years: FR: 2011; Data unavailable for: NL, PL, LI, ME, AL, BA, RS, IL, FO, MD; Data estimated for: EU-28, EU-27;

Others: ':' indicates data are unavailable; 'z': Not applicable; Headcount (HC); PhD (Doctor of Philosophy); CY: A large proportion (around 40 %) of Cypriot students pursue their PhD studies abroad and therefore are not reflected in these statistics; NO excluded due to issues with the coding of these fields and limited data; Some data not significant: DK, EE, CY, IS, LT, LU, MT, NO, MK.

Source: Eurostat – Education Statistics (online data code: educ_grad5)

3 Participation in science and technology (S&T) occupations

Main findings:

- Women are continuing to catch up with men in the category of scientists and engineers, with the number of women in this field having grown by an average of 11.1 % per year between 2008 and 2011. A gender bias nonetheless remains, as in more than half of the countries women are under-represented relative to men, making up less than 45% of scientists and engineers.
- Women working in knowledge-intensive activities (including public sectors such as education, healthcare and social work, in which women have historically been more established) out of the total number of women in all sectors of the economy is 14.8 percentage points above the corresponding proportion for men at EU-28 level. However, the large concentration of women engaged in KIA is no longer observed when the focus is on business industries; their concentration in this case is 1.3 percentage points below that of men, indicating that there is still progress to be made with regards to women's participation in innovation activities.
- The proportion of all men R&D personnel working as researchers exceeds the corresponding proportion for women across the higher education, government and business enterprise sectors and in the vast majority of EU countries, whereas the proportion of all women R&D personnel working as 'other supporting staff' exceeds that of men in all but two countries.
- Of all women researchers in the business enterprise sector, the proportion working in manufacturing activities is lower than the corresponding proportion for men in two thirds of the countries for which data were available in 2012. Relative to other economic activities in the BES, women are over-represented, relative to men, in pharmaceutical manufacturing, with the lowest proportion of women being found in the Czech Republic (33.9 %).

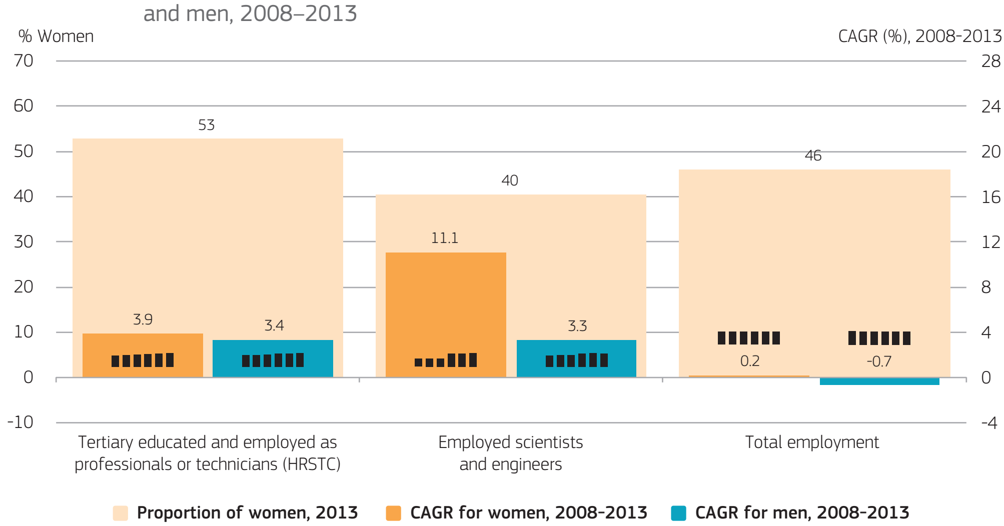
Labour market participation is the next step along the science & technology (S&T) career path, following the successful completion of postgraduate education. Despite advances that have been made with regards to the proportion of women amongst tertiary education graduates, women continue to be under-represented within some S&T occupations. The European Commission's Expert Group on Structural Change states that increasing the proportion of women in the research & innovation (R&I) workforce would lead to many benefits, such as economic growth and the increased relevance and quality of R&I outputs for society as a whole, by making greater use of the available talent pool (DG Research and Innovation, 2012, p. 13).

Chapter 3 focuses on the progress that women have made in occupying various types of positions within S&T, as well as differences that can be observed across different sectors of the economy, different economic activities and different occupations. Research & development (R&D) personnel are defined throughout according to the OECD's international definition, encompassing three categories of occupations: researchers, technicians and equivalent staff, and other supporting staff (OECD, 2002).

Limitations of headcount employment

When reading the She Figures 2015, it is important that the reader keep in mind that some data presented throughout this publication are measured in headcount and thus fail to take into account the part-time employment in the research population. Headcount data mask variation in working hours both within the population of women researchers and when comparing men and women in research. It is therefore essential to temper the positive image of women's progression in science and technology, keeping in mind their greater likelihood of holding part-time jobs.

Figure 3.1. Proportion of women in the EU-28 compared to total employment, the population of tertiary educated professionals and technicians (HRSTC) and the population of scientists and engineers, in 2013, and compound annual growth rate for women and men, 2008–2013



Notes: Proportions show percentage, whereas compound annual growth rate (CAGR) shows percentage growth; The 'trends' represent the actual changes in the number of women and men researchers each year (headcount). This differs from the CAGR, which shows the average yearly change over the whole period; Break in time series: 2005; 2011; Others: Age 25-64.

Source: Eurostat – Human resources in science and technology (online data code: hrst_st_ncat) and Eurostat – Labour Force Survey - Employment by sex, age and nationality (1 000) (online data code: lfsa_egan)

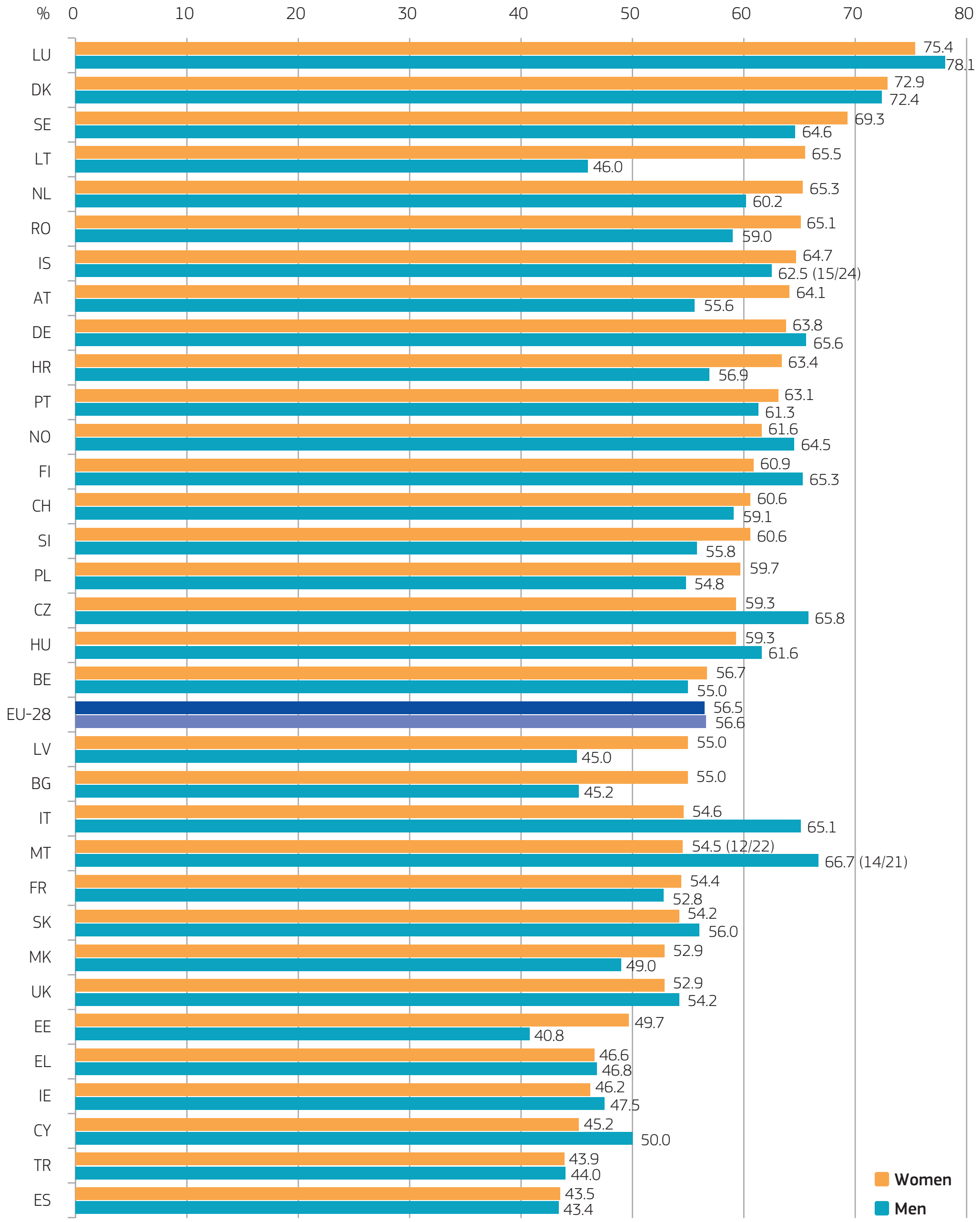
Women represent less than half of tertiary educated professionals employed as scientists and engineers (out of the total for both sexes), although progress is being made towards closing the gender gap.

In recent years, significant progress has been made towards gender equality in total employment. Interestingly, as can be seen in Figure 3.1, women with a higher level of education tend to be more successful at finding employment (53 % amongst women who are educated at a tertiary level and employed as professionals or technicians) relative to the total employed population (46 %). Inequalities persist, however, within the more specialised category of scientists and engineers, where women represent only 40 % of employees. This may be in part explained by the under-representation of women within the fields of science, mathematics and engineering in postgraduate education above master's level.

Between 2008 and 2013, women continued to catch up with men, as evidenced by the higher compound annual growth rate (CAGR) for women across all three categories. The most progress has been made within the category of scientists and engineers, where the number of women has grown by an average of 11.1 %

per year, while the number of men has grown by only 3.3 %. The difference in annual growth is much smaller for highly educated women and highly educated men employed as professionals and technicians, standing at 3.9 % and 3.4 % respectively. It appears that employment has increased much more within these two categories relative to total employment, where the number of women increased by 0.2 % while the number of men fell by 0.7 %, suggesting that higher education results in increased employment for both sexes.

Figure 3.2. Tertiary educated and employed as professionals and technicians (HRSTC), as a percentage of tertiary educated (HRSTE) population, by sex, 2013



Notes: For proportions based on low numbers, numerators and denominators are displayed in the table; Data unavailable for: LI, ME, AL, RS, BA, IL, FO, MD; Break in time series: FR, NL, AT.

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

At the level of the EU-28, highly educated women and men appear to be equally likely to be working as professionals or technicians. However, important country-level variation exists.

In analysing the situation of individual countries, it is possible to further explore the progress made by women in the category of professionals and technicians. Figure 3.2 presents the proportion of women out of the total number of tertiary educated women who are educated at tertiary level and working in a science & technology occupation, in 33 countries in 2013; it shows the same proportion for men. As can be seen, there is virtually no difference between women and men at the level of the EU-28, with 56.5 % of highly educated women and 56.6 % of highly educated men working as professionals or technicians. These statistics remain almost unchanged from 2010.

At the level of individual countries, however, the observed patterns differ, with the proportion of women being higher than that of men in just over half of the countries. The most striking differences can be observed in Lithuania (65.5 % of women compared to 46.0 % of men), Latvia (55.0 % of women compared to 45.0 % of men) and Bulgaria (55.0 % of women compared to 45.2 % of men). The opposite can also be noted in several countries, most notably in Malta (66.7 % of men compared to 54.5 % of women) and Italy (65.1 % of men compared to 54.6 % of women).

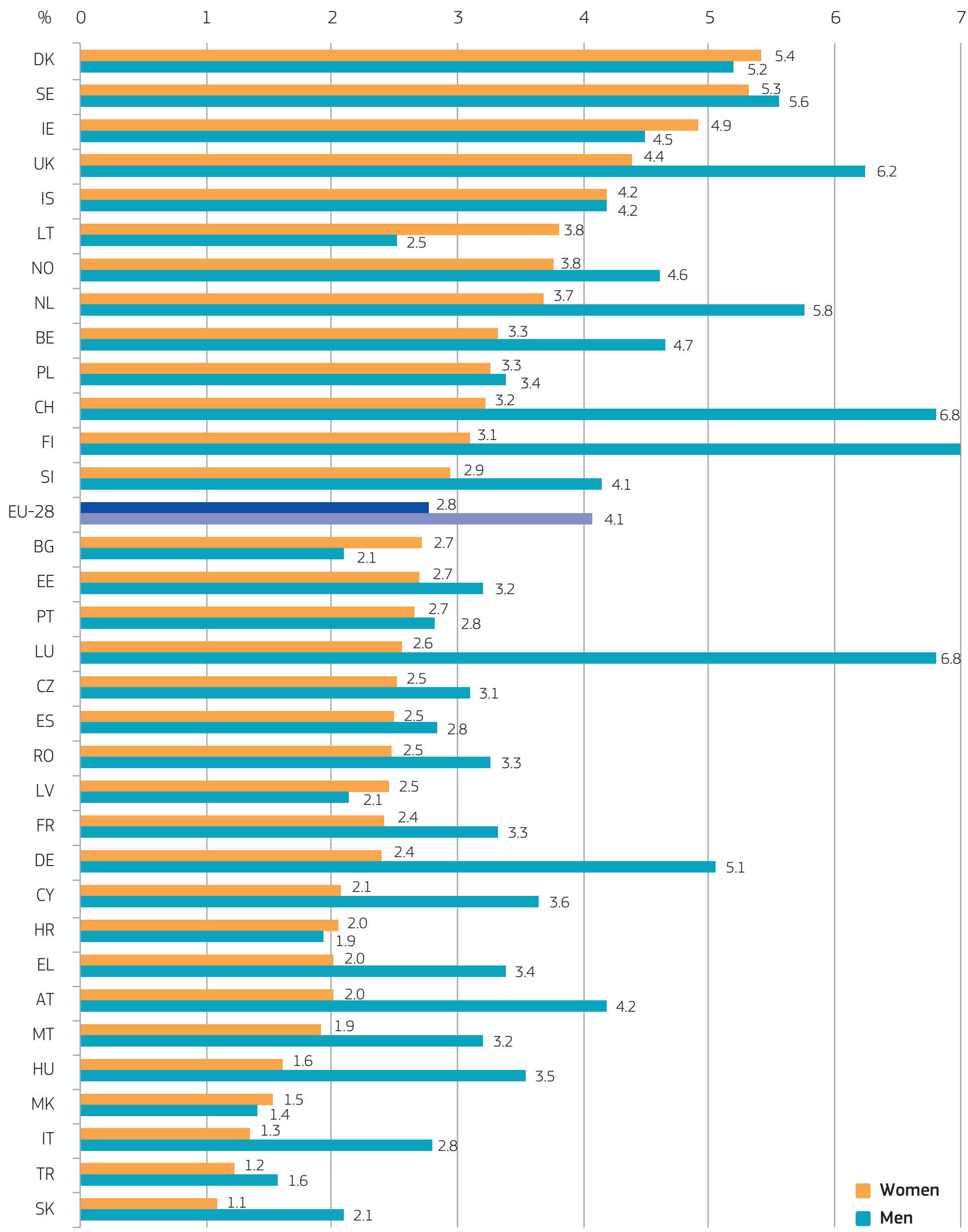
The number of women scientists and engineers in the total labour force has, in a number of countries, exceeded that of men in 2013 relative to 2010 suggesting that the gender gap in this area is decreasing. Nevertheless, a gender gap in favour of men still exists in 2013 at the level of the EU-28.

As seen in Figure 3.1, a gender imbalance still exists in employment within the professional category of scientists and engineers. In order to further explore this imbalance, Figure 3.3 presents the proportion of women in the field of science and engineering out of the total labour force (both sexes aggregated) of 33 individual countries; it shows the same proportion for men. In 2013, seven countries had a higher proportion of women scientists and engineers in the total labour force relative to men (i.e. more women than men scientists and engineers in absolute terms), namely Bulgaria, Croatia, Denmark, Ireland, Latvia, Lithuania, and the former Yugoslav Republic of Macedonia. This is a marked improvement compared to 2010, where this was the case for only one country. At the level of the EU-28, men continue to make up a greater proportion of scientists and engineers in the total labour force, exceeding the proportion of women by 1.3 percentage points. In 20 countries this gap falls below the EU-28 average, and in Finland, Luxembourg and Switzerland, the proportion of men scientists and engineers exceeds the proportion of women by over 3.5 percentage points.

Knowledge-intensive activities (KIA) and knowledge-intensive activities – business industries (KIABI)

An activity is classified as knowledge intensive if tertiary educated employees (according ISCED-97 levels 5 and 6) represent more than 33 % of the total employment in that activity. The definition is based on the average number of employed persons aged 25–64 at the aggregated EU-27 level in 2008 and 2009, according to NACE Rev. 2 (2-digit level) and using 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).

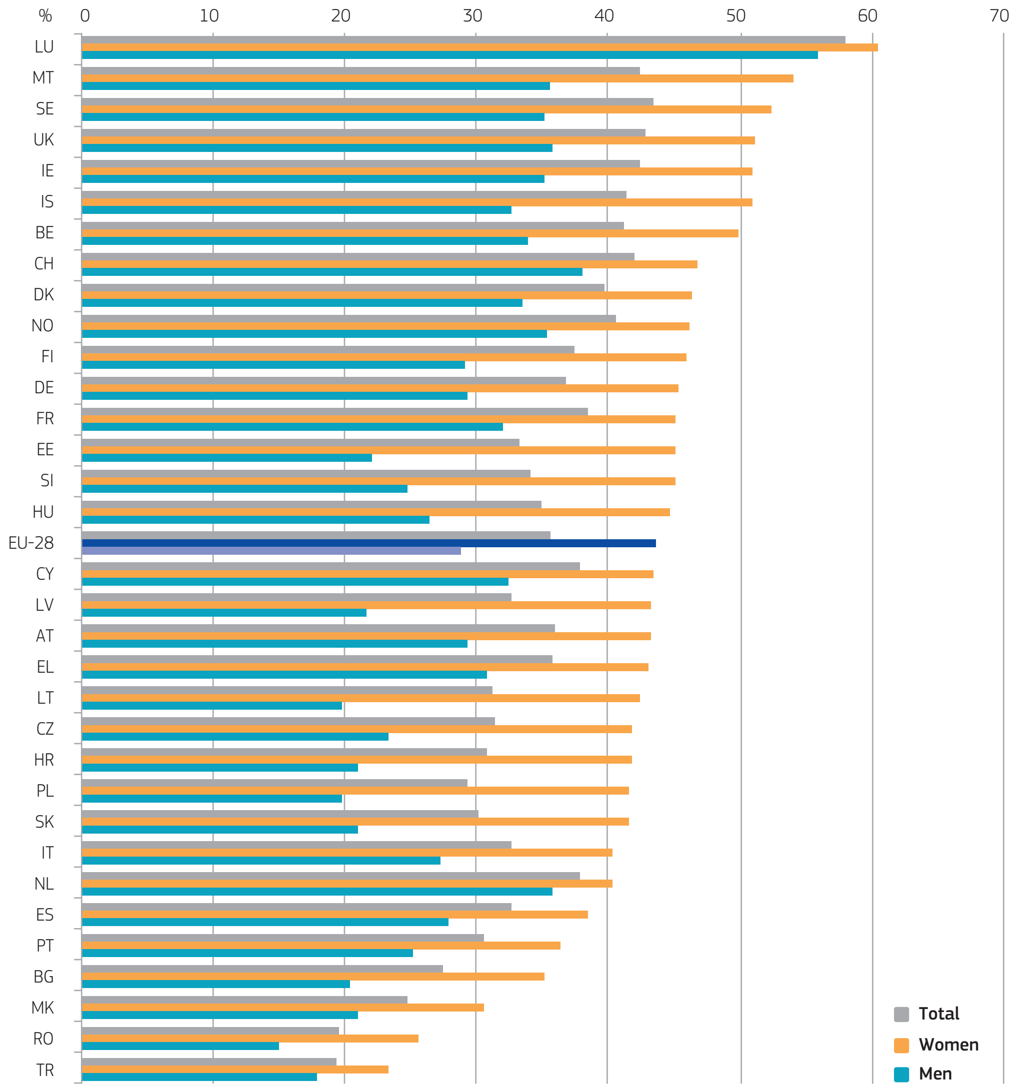
Figure 3.3. Proportion of scientists and engineers in total labour force, by sex, 2013



Notes: Data unavailable: LI, ME, AL, RS, BA, IL, FO, MD; Break in time series: FR, NL, AT.

Source: Eurostat – Human resources in science and technology and EU Labour Force Survey (online data codes: hrst_st_ncat and lfsa_agan)

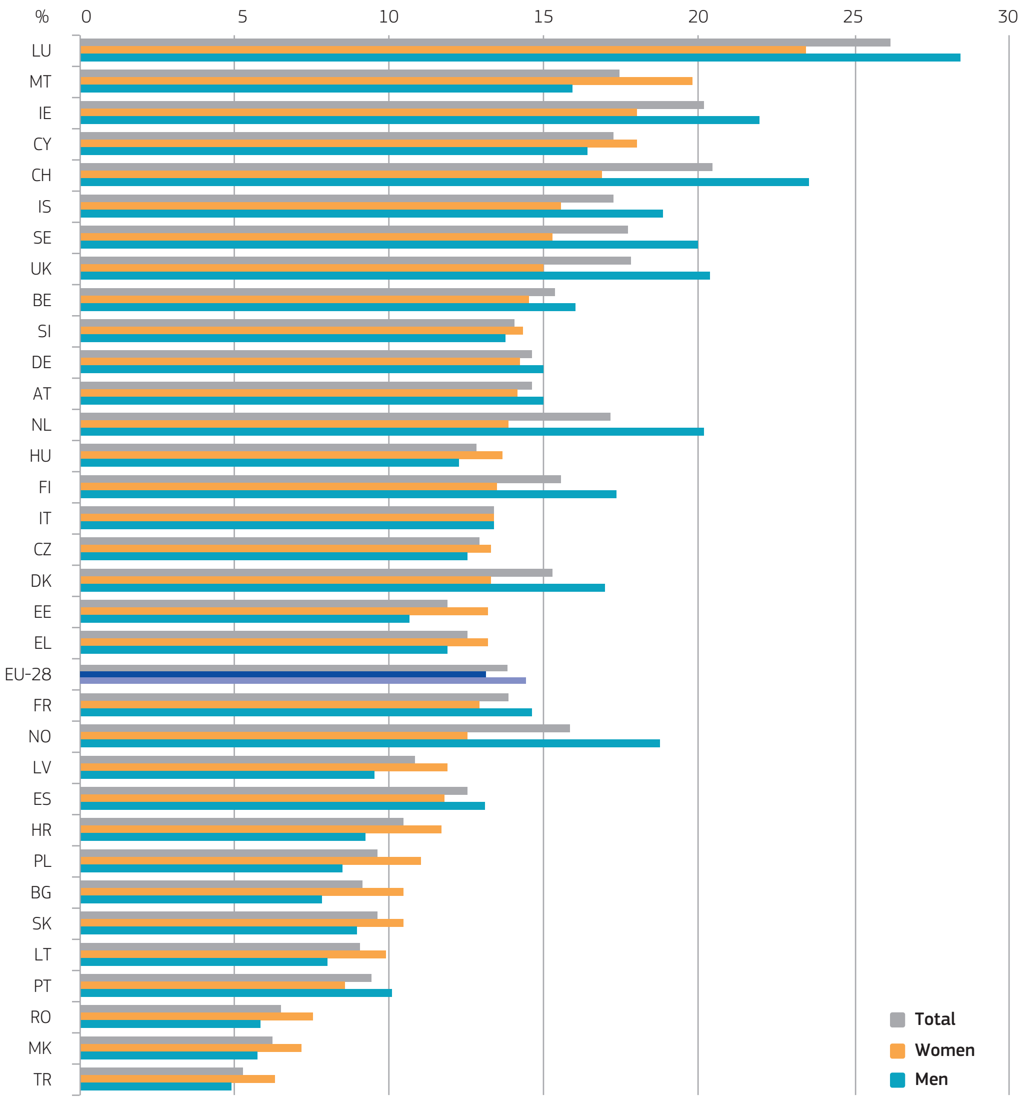
Figure 3.4. Employment in knowledge-intensive activities (KIA), 2013



Women are much more likely than men to work in knowledge-intensive activities; however, caution should be taken when interpreting this finding as it also includes public sectors such as education, healthcare and social work, where women have historically tended to have a greater presence.

Another way to investigate women's presence in S&T is to look at how likely they are to work in knowledge-intensive activities (KIA), as defined in the accompanying information box. Figure 3.4 shows the proportion of women employed in KIA out of the total number of women in all sectors of the economy; it shows the same for men as well as for both sexes aggregated. As was the case in 2010, the proportion of women in KIA, out of all women in all sectors of the economy, exceeds that of men in all countries, with an average difference of 14.8 percentage points at EU level. This difference varies widely across individual countries, ranging from 23 to 4.6 percentage points. The countries with the highest disparity in the concentration of women and men in KIA are Estonia, Lithuania, Poland, Latvia, Croatia, Slovakia and Slovenia. One explanation for the high concentration of women in KIA (compared to the previous figures in this chapter) is that knowledge-intensive activities include public sectors such as education, healthcare and social work, in which women have historically had a more established presence.

Figure 3.5. Employment in knowledge-intensive activities – business industries (KIABI), 2013



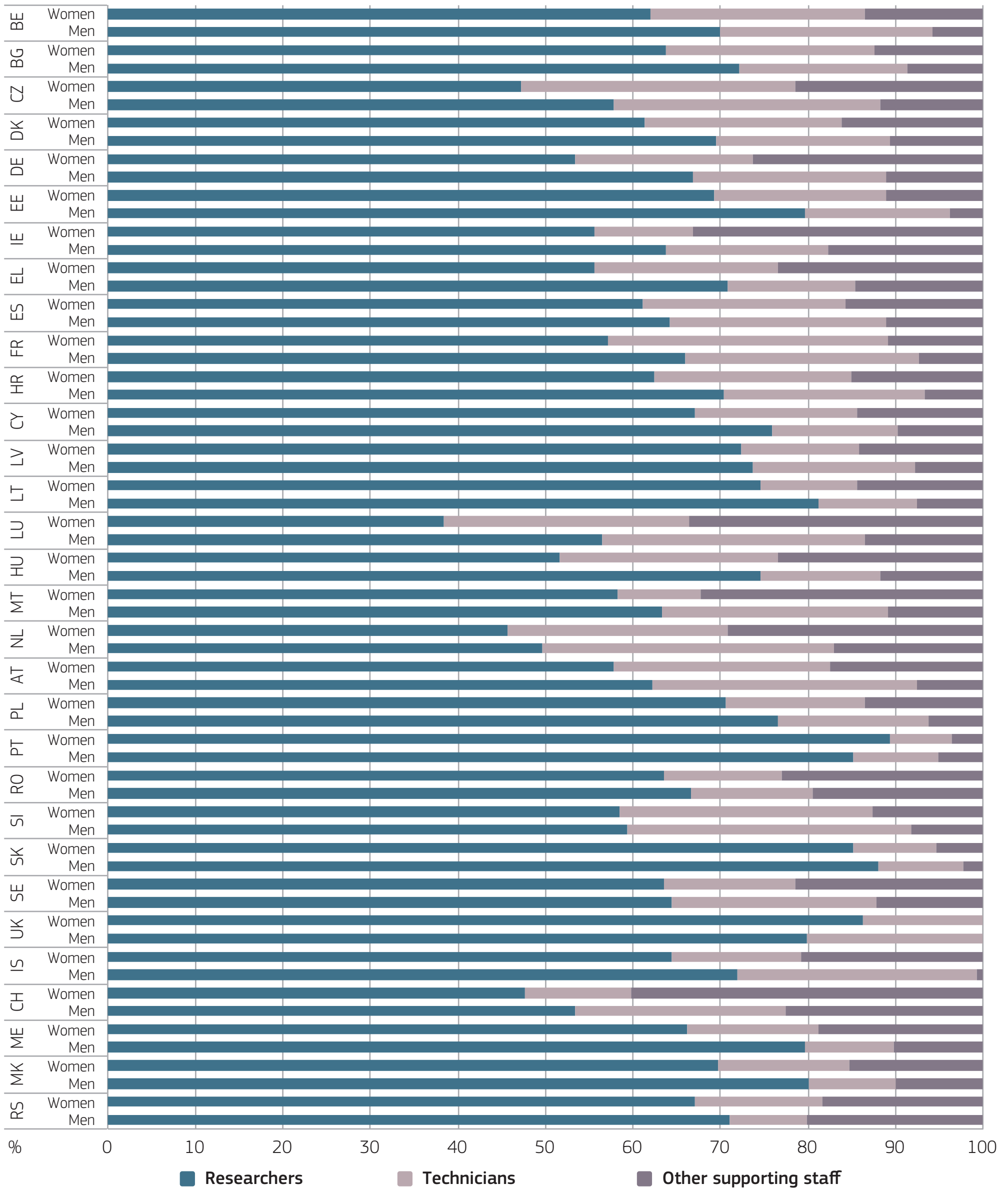
Notes: Data unavailable: LI, ME, AL, RS, BA, IL, FO, MD.

Source: Eurostat – High-tech industry and knowledge-intensive services (online data code: htec_kia_emp2)

When only the subset of business industries is considered, women are less likely than men to work in knowledge-intensive activities.

Figure 3.5 focuses specifically on business industries within the broader context of KIA, which is of particular importance given that business industries are key drivers of innovation and thus economic development. The large concentration of women engaged in KIA observed in Figure 3.4 is no longer observed when the focus is on business industries. Indeed, on average in the EU-28, the proportion of women employed in knowledge-intensive activities – business industries (KIABI) out of the total number of women in all sectors of the economy is lower than the corresponding proportion for men, although this difference is quite small (1.3 percentage points). Women still have a stronger concentration than men in 16 countries, but the gaps in favour of women are much smaller and range from only 3.9 to 0.6 percentage points. Estonia, Croatia, Latvia and Poland still feature amongst the countries with the highest concentration of women in KIABI relative to men, along with Bulgaria and Malta. At the opposite end of the spectrum, the countries with the smallest concentration of women compared to men in KIABI are Switzerland, the Netherlands, Norway and the United Kingdom (6.7, 6.3, 6.2 and 5.3 percentage points respectively).

Figure 3.6. Distribution of R&D personnel across occupations in all sectors (HES, GOV, BES), by sex, 2012



Notes: Exception to the reference year: MK: 2009; BG: 2010; BE, DK, DE, IE, EL, LV, LT, NL, AT, SE, IS, ME, RS: 2011; Data unavailable for: IT, FI, UK (Other supporting staff), LI, NO, AL, TR, BA, IL, FO, MD; Data estimated for: UK; Data provisional for: CZ; Definition differs for: FR;
Others: Headcount (HC).

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

In the vast majority of countries the proportion of men, among all men R&D personnel, working as researchers continues to exceed the proportion of women working as researchers in all sectors (HES, GOV, BES) combined.

Figure 3.6 shows the distribution of R&D personnel, by sex, across different occupations (researchers, technicians or other supporting staff) within all sectors (HES, GOV, BES) combined. The proportion of men working as researchers exceeds that of women working as researchers in all sectors combined (HES, GOV, BES) in the vast majority of EU countries, with this difference ranging from 1 to 23 percentage points. Portugal and the United Kingdom are the two exceptions, with the proportion of women working as researchers exceeding the proportion of men working as researchers by 4 and 7 percentage points respectively. The opposite pattern can be seen at the lowest occupational level, where the proportion of women working as other supporting staff exceeds the proportion of men working as other supporting staff in all sectors combined (HES, GOV, BES) in all but two countries (namely Portugal and Serbia, where the proportion for men and women differs by only 2 percentage points).

In 2012, about 40 % of the countries had a higher proportion of women than men employed as technicians, which marks a slight decrease since 2009, when the proportion of women working as technicians was higher than the corresponding proportion for men in just under half (47 %) of the countries.

In the higher education sector in most countries, men are more likely than women to be employed as researchers, whereas women are more likely than men to be employed as other supporting staff or technicians.

To further the analysis presented in the previous figure, Figure 3.7 looks at R&D personnel across different occupations only in the higher education sector. Similarly to in the previous figure, the proportion of men working as researchers among all men R&D personnel exceeded the corresponding proportion for women, with the exception of the United Kingdom. The proportion of women working as researchers is particularly high (above 90 %) in Portugal, Slovakia and the United Kingdom (although in the latter only two categories exist) and particularly low (55 % or less) in Hungary, Malta and Switzerland. Amongst the category of other supporting staff, the situation was reversed in all countries except France, where the proportion of women working in these positions was 2 percentage points lower than the corresponding proportion for men. The highest proportion of women amongst other supporting staff is found in Switzerland (45 %), Malta (42 %) and Ireland (37 %). The proportion of women amongst technicians is larger or equal to the corresponding proportion for men in most countries in the higher education sector, except in Malta, Ireland, Iceland, the United Kingdom, Switzerland and Latvia. The proportion of women working as technicians varies widely between countries, being highest in the Czech Republic (31 %) and lowest in Portugal (1.8 %) ([12]).

In most countries, the proportion of men working as researchers among all men R&D personnel exceeds the corresponding proportion for women in the government sector.

Figure 3.8 explores the distribution of different occupations of R&D personnel only in the government sector. Although the proportion of men working as researchers among all men R&D personnel continues to be higher than the equivalent proportion for women in the government sector, the average gender gap in favour of men across countries is not as pronounced as it is in the higher education sector. In particular, a gender gap in favour of women is observed in seven countries in the government sector compared to only one in the higher education sector; Malta, Turkey, Greece, Sweden, Serbia, Portugal and Latvia all have a higher proportion of women working as researchers among all women R&D personnel than men working as researchers among all men R&D personnel, with this difference ranging from 28 percentage points (Malta) to 1 percentage point (Latvia). In this sector, a larger proportion of all women R&D personnel occupy the technician and other supporting staff positions relative to men in the majority

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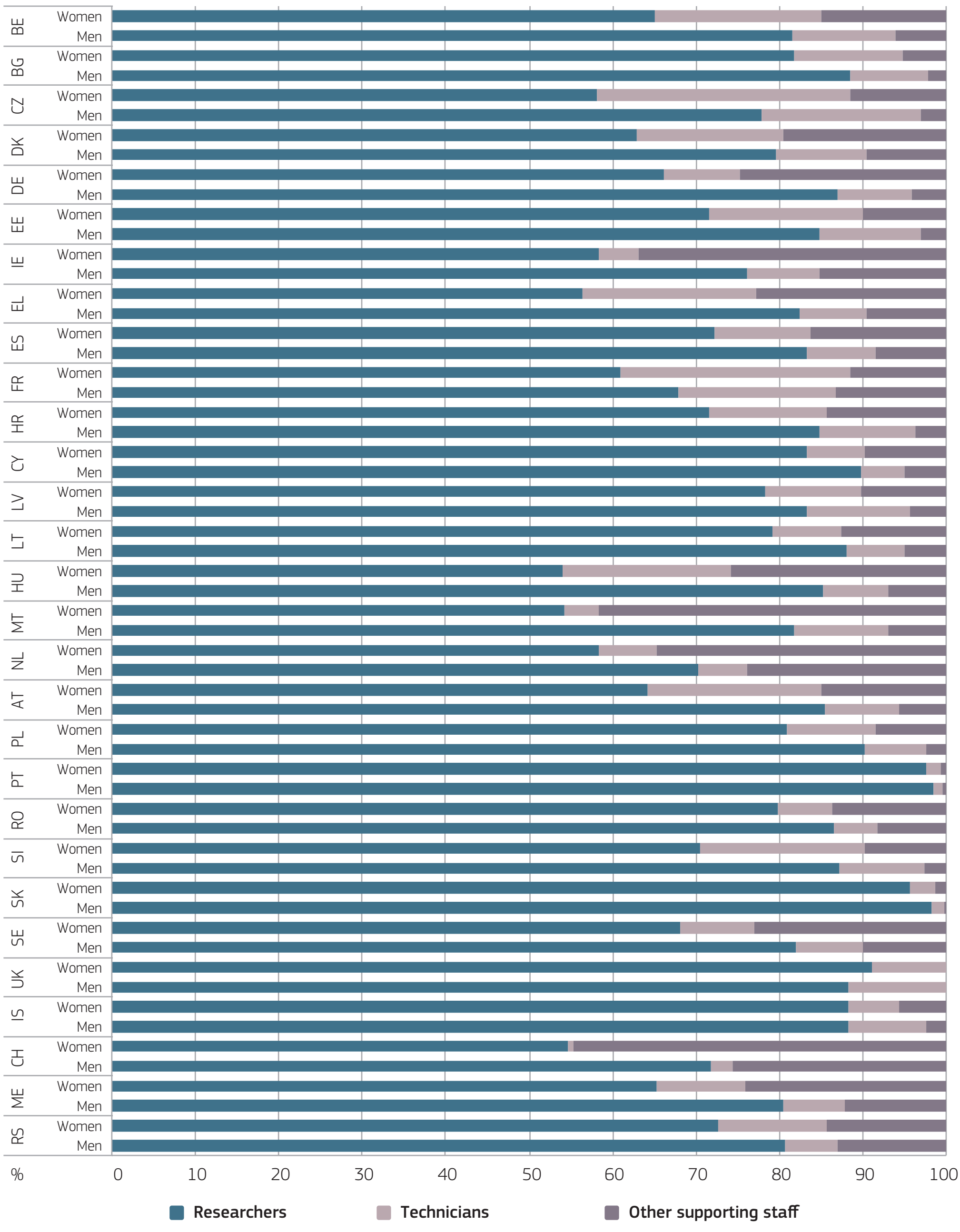
12 The proportion of technicians appears to be lowest in Switzerland, however these data are based only on information collected in research institutes (as opposed to universities) as there is no category for technicians in the higher education sector.

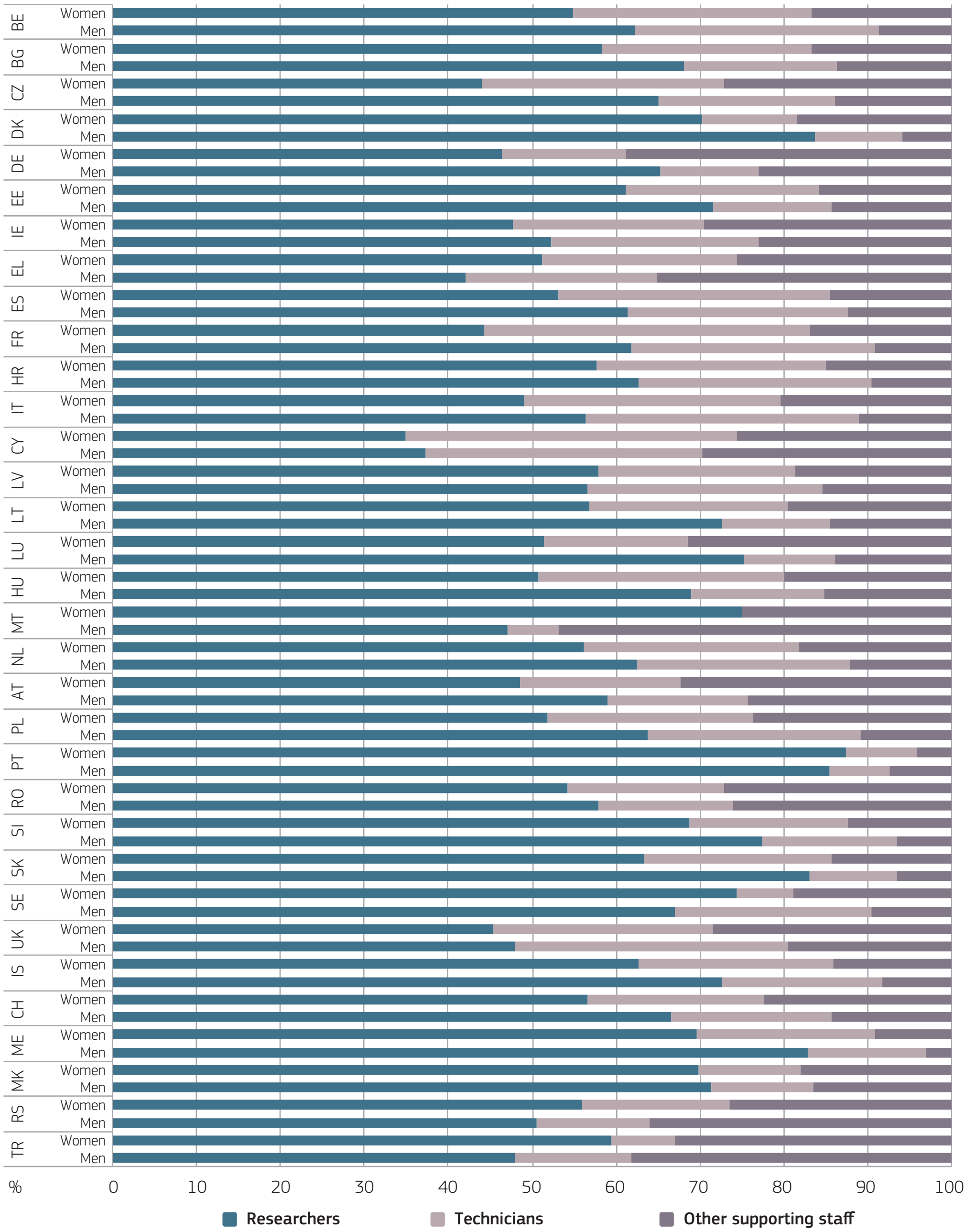
Figure 3.7. Distribution of R&D personnel across occupations for the higher education sector, by sex, 2012



Notes: Exception to the reference year: IS: 2009; BE, BG, IE, EL, LV, LT, NL, AT, SE, UK, ME, RS: 2011; Data unavailable: IT, LU, FI, UK (Other supporting staff), LI, NO, MK, AL, BA, IL, FO, MD; Data estimated for: IE, UK (Men); Definition differs for: FR, UK, TR; Provisional data for: CZ, ME;
Others: Headcount (HC); CH has no category for technicians in HES.

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

Figure 3.8. Distribution of R&D personnel across occupations for the government sector, by sex, 2012

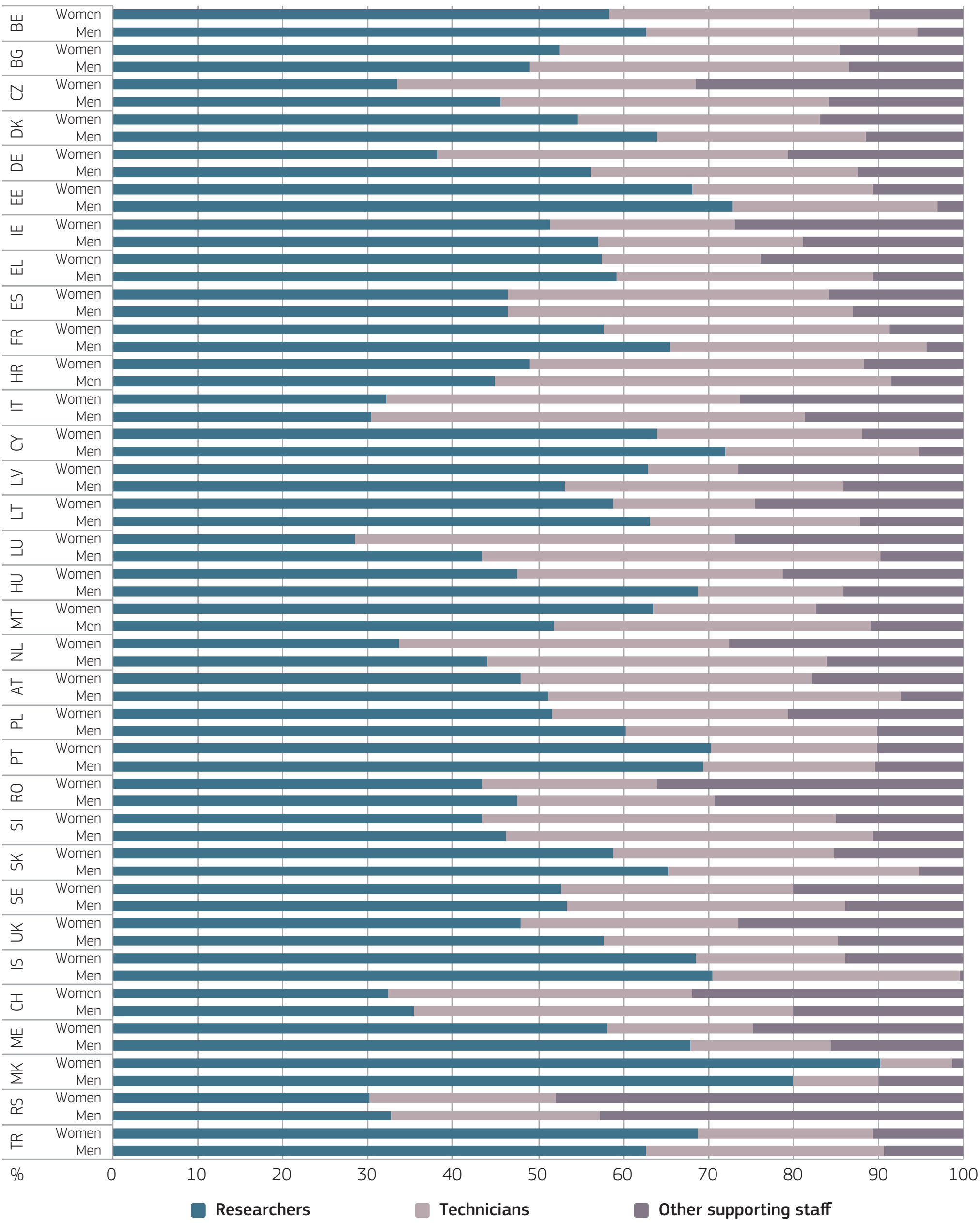


Notes: Exceptions to the reference year: MK: 2009; LU: 2010; BE, BG, EL, HR, LV, LT, NL, AT, SE IS, ME, RS: 2011; Data unavailable for: FI, LI, NO, AL, BA, IL, FO, MD; Data provisional for: CZ, LU, ME; Definition differs for: DE, FR, NL, SK, SE, CH;
Others: Headcount (HC); Low number of observations for women in Malta (N = 20).

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

of the countries surveyed. The largest proportion of women working as technicians was found in Cyprus and France (39 % each), while there were no women technicians in Malta (although there are only four male technicians in this category). The largest proportion of women working as other supporting staff can be found in Germany (39 %) and the smallest proportion in Portugal (4 %), with the largest difference between women and men being found in Malta, where the proportion of women working as other supporting staff is 22 percentage points lower than that for men.

Figure 3.9. Distribution of R&D personnel across occupations for the business enterprise sector, by sex, 2012



Notes: Exception to the reference year: MK: 2009; BG: 2010; BE, DK, DE, EL, LV, LT, NL, AT, SE, ME, IS, RS: 2011; Data unavailable for: FI, LI, NO, AL, BA, IL, FO, MD; Data provisional for: CZ;

Others: Headcount (HC); Low number of observations for men in MK (N = 20).

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

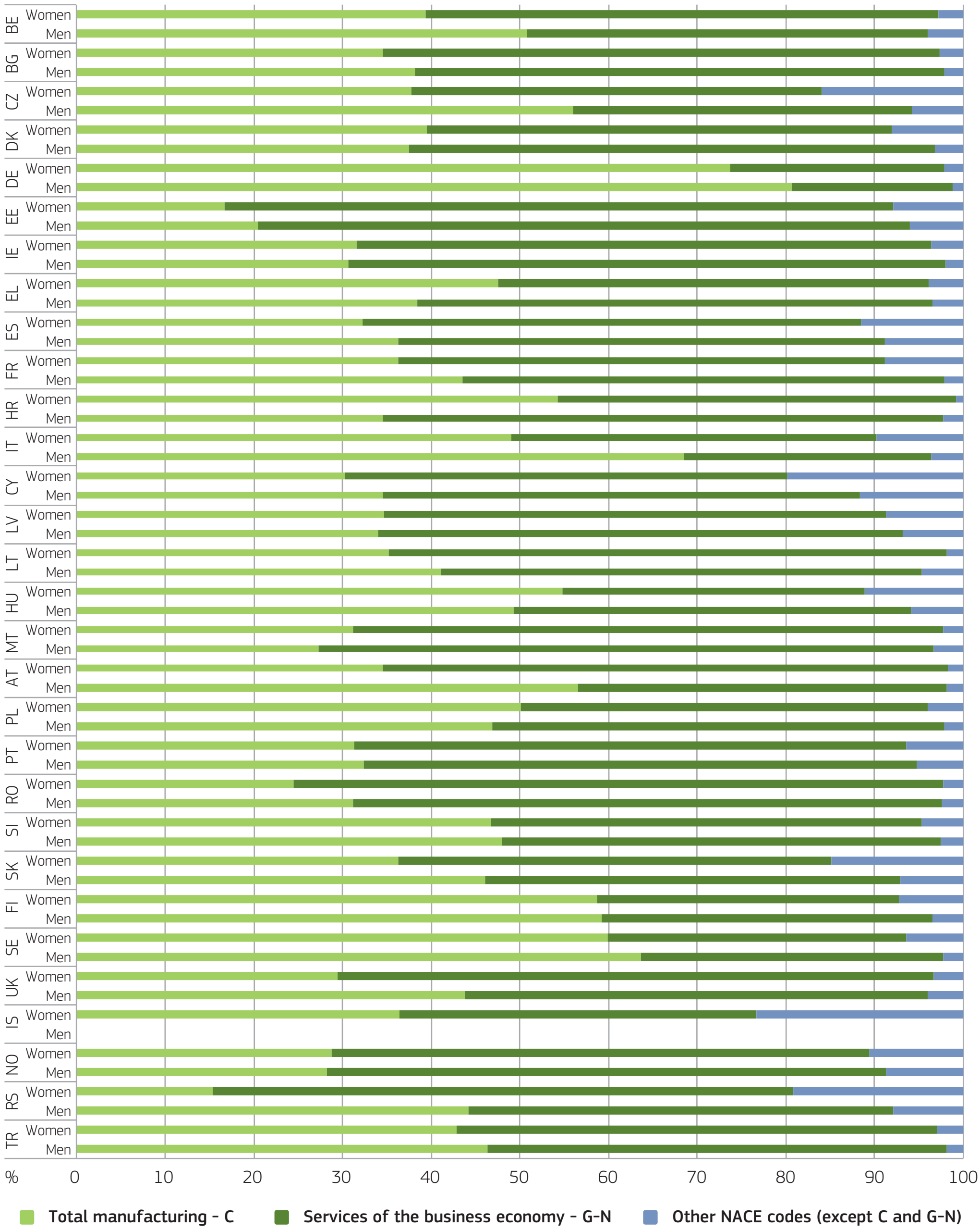
Within the business enterprise sector in almost all countries, the proportion of women occupying other supporting staff positions among all women R&D personnel is larger than the corresponding proportion for men, while the opposite is observed for researcher positions.

Figure 3.9 explores the distribution of R&D personnel in the business enterprise sector, where women have been historically under-represented. It is therefore unsurprising that the proportion of women working as researchers among all women R&D personnel is smaller than the corresponding proportion for men, with the largest differences being found in Hungary (21 percentage points) and Germany (18 percentage points). At the opposite end of the spectrum, a larger proportion of women occupy other supporting staff positions, relative to men, in all but two countries, namely in Portugal and the former Yugoslav Republic of Macedonia. The largest proportion of women supporting staff can be found in Serbia (48 %), while the lowest proportion was found in the former Yugoslav Republic of Macedonia (1 %). Within R&D personnel, a smaller proportion of women work as technicians compared to men, except in Hungary, Germany, Denmark, France, Cyprus and Montenegro.

In most countries, women are less likely than men to be employed as researchers in manufacturing activities but are more likely than men to be employed in all other economic sectors.

Within the business enterprise sector, it is possible to further divide researchers across different economic sectors. Figure 3.10 looks specifically at manufacturing and services of the business economy, comparing these two economic sectors with all the other economic activities taken together. Of all women researchers in the BES, the proportion working in manufacturing activities is lower than the corresponding proportion for men in two thirds of the countries for which data were available, with the largest discrepancy being seen in Serbia and Austria (28.9 and 22 percentage points respectively). The largest proportion of women researchers in manufacturing among all women researchers working in the BES is found in Germany (73.6 %), while the country in which the gender gap in favour of women is largest is Croatia (a difference of 19.8 percentage points). In terms of the services of the business economy sector, half the countries have a gender gap in favour of women researchers and the percentage point differences vary widely across countries. For instance, Croatia has a large gender gap in favour of men researchers (an 18.3 percentage point difference), while Austria has a large gender gap in favour of women researchers (a 22.1 percentage point difference). Interestingly, in three quarters of the countries, the proportion of all women researchers in the BES found in all other economic sectors is higher than it is for men.

Figure 3.10. Distribution of researchers across economic activities (NACE Rev. 2) in the business enterprise sector, 2012



Notes: Exceptions to reference period: BE, DK, DE, IE, EL, FR, AT, SE, IS (women), UK, RS, TR : 2011; Data unavailable for: EU-28, LU, NL, LI, CH, ME, MK, AL, BA, IL, FO, MD; Data provisional for: CZ; Data estimated for: DK; Definition differs for: NO; Break in series for: EL, NL, IS; Data missing for: IS (Men: Other NACE codes); Others: Headcount (HC); Fewer than N=20 observations: HR, CY (Other NACE codes (except C and G-N)), LT, MT, RS.

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

Table 3.1. Proportion of women researchers by economic activity (NACE Rev. 2) in the business enterprise sector, 2012

	C - Manufacturing	C20 - Manufacture of chemicals and chemical products	C21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations	G - N - Services of the business economy	Other NACE codes (except C and G - N)
BE	21.5	29.5	47.3	31.1	19.4
BG	40.4	81.4	79.3	44.1	47.4
CZ	10.7	32.8	33.9	17.7	33.0
DK	28.0	48.1	54.3	24.6	48.8
DE	13.1	23.2	41.1	18.1	22.5
EE	26.1	66.0	70.6 (12/17)	30.7	36.3
IE	22.8	39.9	41.2	21.7	34.1
EL	35.5	40.7	63.8	27.2	32.7
ES	27.0	41.8	58.9	29.9	35.2
FR	17.5	40.1	55.7	20.8	30.1
HR	54.2	74.1	80.1	34.8	21.7 (5/23)
IT	16.5	29.5	50.5	29.0	42.3
CY	26.6	31.3 (5/16)	40.6	27.7	41.3
LV	47.9	23.5 (4/17)	79.7	46.4	53.4
LT	27.7	68.7	64.3	34.3	15.4
HU	20.9	32.4	55.0	15.3	31.0
MT	29.3	20.0 (1/5)	65.7	25.8	20.0 (4/20)
NL	14.0	21.9	40.2	:	:
AT	10.7	26.5	44.1	23.0	15.9
PL	20.7	61.2	69.0	18.1	32.2
PT	32.3	45.8	62.5	32.9	37.8
RO	32.4	70.8	81.9	40.2	36.2
SI	25.5	46.1	62.0	25.5	39.4
SK	17.3	53.0	69.6	21.7	35.5
FI	16.2	41.6	63.1	15.2	29.1
SE	24.4	:	56.1	25.3	49.9
UK	13.7	31.0	45.6	23.3	16.3
IS	30.3	13.3 (2/15)	51.6	15.7	u
NO	22.4	33.6	56.4	21.5	25.7
RS	13.8	15.4 (2/13)	0 (0/1)	38.6	52.6 (10/19)
TR	21.5	45.6	62.6	23.8	31.4

Notes: Exceptions to the reference period: BE, DK, DE, IE, EL, FR, NL, AT, SE, UK, IS, RS, TR: 2011; Data unavailable for: EU-28, LU, CH, ME, MK; Data provisional for: CZ (Other NACE codes); Data confidential for: SE (C20); Definitions differ for: NO (Other NACE codes); Break in time series for: EL, NL, IS (Other NACE codes); Data missing for: NL (G-N and other NACE codes), SE (C20), RS (C21);

Others: ':' indicates data not available, 'u': low reliability; Headcount (HC); For proportions based on low numbers, numerators and denominators are displayed in the table.

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

Within the economic activities of the business enterprise sector, the highest proportion of women researchers (out of the total for both sexes) can be found in the pharmaceutical manufacturing industry.

Table 3.1 further explores the representation of women researchers in the business enterprise sector across five different economic activities within this sector [13]. In about two-thirds of the countries, women made up a greater proportion of researchers than men in the pharmaceutical manufacturing industry. Within this economic activity, the lowest proportion of women is found in the Czech Republic at 33.9 %

13 Note that the manufacturing (C) activity is presented both as an aggregate and for two of its sub-activities, namely the manufacturing of chemicals and chemical products (C20) and the manufacturing of basic pharmaceutical products and pharmaceutical preparations (C21).

(Serbia's value is lower, however this is based on a population size of one and is therefore highly volatile). Conversely, the highest proportion of women in pharmaceutical manufacturing can be found in Romania (81.9 %) and Croatia (80.1 %).

In all of the countries, men made up a larger proportion of researchers than women in the services of the business economy sector, with the highest proportion of women in Latvia (46.4 %) and Bulgaria (44.1 %) and the lowest in Finland (15.2 %) and Hungary (15.3 %).

The proportion of women researchers relative to men is also relatively low in the remaining sectors of the economy, with women making up a higher proportion than men in only seven countries in the manufacturing of chemicals and chemical products (Bulgaria, Croatia, Romania, Lithuania, Estonia, Poland and Slovakia) and two countries for other NACE codes (Latvia and Serbia).

Annex 3.1. Number of R&D personnel across occupations for the higher education sector, by sex, 2012

	Researchers		Technicians		Other supporting staff	
	Women	Men	Women	Men	Women	Men
BE	12 573	18 780	3 859	2 841	2 882	1 406
BG	3 189	3 851	508	412	206	92
CZ	7 226	13 908	3 790	3 384	1 428	565
DK	11 120	14 762	3 099	2 031	3 445	1 759
DE	92 958	158 982	12 785	16 227	34 770	7 671
EE	2 223	2 519	574	359	311	90
IE	4 593	6 321	378	717	2 906	1 263
EL	11 679	21 163	4 306	2 029	4 702	2 469
ES	50 297	72 948	8 018	7 287	11 344	7 403
FR	37 049	74 351	16 692	20 555	7 038	14 628
HR	3 364	3 785	661	511	674	170
IT	30 591	46 063	:	:	:	:
CY	480	783	41	45	56	44
LV	2 859	2 602	422	392	370	134
LT	7 534	6 130	804	488	1 193	343
LU	235	415	10	28	42	3
HU	6 251	10 300	2 331	919	2 992	854
MT	240	516	18	72	185	44
NL	9 946	14 439	1 201	1 195	5 914	4 912
AT	12 464	19 544	4 049	2 050	2 894	1 290
PL	29 385	39 538	3 792	3 243	3 122	1 050
PT	23 562	24 445	443	273	162	113
RO	7 272	8 297	590	502	1 241	798
SI	1 958	2 737	550	316	274	83
SK	8 130	9 881	256	161	107	21
FI	10 964	12 209	:	:	:	:
SE	18 162	22 693	2 405	2 232	6 135	2 795
UK	140 254	174 976	12 812	22 023	:	:
IS	619	730	43	77	40	20
NO	10 010	11 891	:	:	:	:
CH	15 037	26 358	182	938	12295	9372
ME	438	480	72	43	162	73
MK	539	549	138	52	119	36
RS	5 020	5 486	896	433	991	882
TR	44 719	63 759	:	:	:	:

Notes: Exception to the reference year: IS, MK: 2009; LU: 2010; BE, BG, IE, EL, LV, LT, NL, AT, SE, ME, RS: 2011; Data unavailable for: AL, BA, LI, IL, FO, MD; Data estimated for: IE, UK; Definition differs for: FR, TR; Data provisional for: LU, ME;
Others: Headcount (HC).

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

Annex 3.2. Number of R&D personnel across occupations for the government sector, by sex, 2012

	Researchers		Technicians		Other supporting staff	
	Women	Men	Women	Men	Women	Men
BE	1 077	2 138	557	1 004	330	297
BG	3 233	2 653	1 385	702	928	536
CZ	3 038	4 947	1 977	1 587	1 870	1 065
DK	917	1 175	149	146	241	84
DE	22 548	42 990	7 100	7 801	18 818	15 133
EE	448	278	168	54	116	56
IE	202	356	96	168	125	156
EL	2 931	3 163	1 327	1 721	1 472	2 646
ES	15 599	16 593	9 418	7 100	4 284	3 344
FR	9 920	18 079	8 689	8 526	3 775	2 654
HR	1 528	1 373	725	605	395	209
IT	11 905	14 025	7 383	8 045	4 971	2 764
CY	98	104	110	92	72	83
LV	556	359	225	176	179	98
LT	880	852	365	149	302	172
LU	252	463	85	66	154	86
HU	2 377	3 349	1 372	762	939	742
MT	15	31	0	4	5	31
NL	2 722	5 391	1 237	2 175	883	1 059
AT	1 467	1 870	574	525	979	770
PL	6 501	9 127	3 069	3 617	2 976	1 571
PT	2 910	1 874	283	156	135	162
RO	3 145	3 519	1 078	967	1 569	1 589
SI	1 042	1 127	286	234	188	94
SK	1 725	1 958	610	242	388	156
FI	2 509	3 168	:	:	:	:
SE	3 200	3 196	290	1 119	811	457
UK	3 118	5 634	1 806	3 811	1 960	2 282
IS	214	292	79	77	48	33
NO	2 783	3 433	:	:	:	:
CH	326	654	122	187	129	142
ME	281	213	86	36	37	8
MK	317	310	55	53	82	72
RS	1 636	1 293	514	348	778	921
TR	2 222	5 137	281	1 484	1 238	4 083

Notes: Exception to the reference year: MK: 2009; BE, BG, EL, FR, LV, LT, LU, NL, AT, SE, IS, ME, RS, TR: 2011; Data unavailable for: LI, AL, BA, IL, FO, MD; Data provisional for: CZ, LU, ME; Definition differs for: DE, FR, NL, SK, SE;
Others: Head count (HC).

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

Annex 3.3. Number of R&D personnel across occupations for the business enterprise sector, by sex, 2012

	Researchers		Technicians		Other supporting staff	
	Women	Men	Women	Men	Women	Men
BE	7 390	20 935	3 876	10 652	1 400	1 791
BG	731	941	458	721	204	261
CZ	2 760	15 566	2 913	13 184	2 607	5 413
DK	7 756	20 963	4 019	8 060	2 414	3 785
DE	30 638	185 682	32 959	103 648	16 586	41 169
EE	616	1 423	192	467	97	61
IE	2 370	8 248	990	3 489	1 242	2 729
EL	1 805	4 053	584	2 062	750	730
ES	17 506	42 098	14 208	36 790	5 958	11 873
FR	42 665	170 525	24 812	78 352	6 428	11 659
HR	586	780	467	810	140	148
IT	10 796	39 154	13 904	65 392	8 822	23 955
CY	96	232	36	73	18	17
LV	514	487	87	302	217	129
LT	624	1 338	176	522	260	259
LU	192	1 487	300	1 599	181	333
HU	2 825	11 917	1 867	2 965	1 267	2 457
MT	173	476	52	344	47	100
NL	7 315	43 179	8 479	39 006	6 026	15 835
AT	4 859	24 875	3 476	19 990	1 807	3 636
PL	3 717	15 165	2 002	7 415	1 491	2 591
PT	7 074	14 397	1 954	4 195	1 033	2 172
RO	2 063	3 388	980	1 659	1 709	2 084
SI	1 421	4 059	1 369	3 786	491	933
SK	688	2 592	305	1 169	177	207
FI	4 445	22 780	:	:	:	:
SE	8 317	24 196	4 319	14 936	3 157	6 299
UK	22 023	91 486	11 763	43 343	12 209	23 541
IS	352	1 026	90	422	71	8
NO	4 130	14 500	:	:	:	:
CH	4 174	13 729	4625	17331	4125	7731
ME	47	78	14	19	20	18
MK	64	16	6	2	1	2
RS	52	113	38	84	83	147
TR	9 140	30 156	2 730	13 466	1 432	4 454

Notes: Exception to the reference year: MK: 2009; BG: 2010; BE, DK, DE, IE, EL, LV, LT, LU, NL, AT, SE, IS, ME, RS: 2011; Data unavailable for: LI, AL, BA, IL, FO, MD; Data provisional for: CZ; Definition differs for: NO;
Others: Headcount (HC).

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

Annex 3.4. Number of researchers in the business enterprise sector, by economic activity (NACE Rev. 2) and by sex, 2012

	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 NACE category (except C and G - N)	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
BE	2 909	10 617	354	848	1 000	1 115	4 276	9 464	205	854
BG	353	521	35	8	119	31	642	815	27	30
CZ	1 043	8 719	163	334	78	152	1 277	5 953	440	894
DK	3 064	7 871	399	431	1 431	1 202	4 063	12 432	629	660
DE	22 564	149 851	1 835	6 067	3 244	4 657	7 437	33 638	637	2 193
EE	103	292	31	16	12	5	464	1 045	49	86
IE	749	2 531	113	170	153	218	1 534	5 549	87	168
EL	858	1 560	100	146	277	157	878	2 351	69	142
ES	5 640	15 251	838	1 166	1 290	899	9 837	23 108	2 029	3 739
FR	14 666	68 968	1 682	2 517	1 520	1 208	22 573	86 002	1 460	3 387
HR	318	269	40	14	153	38	263	493	5	18
IT	5 292	26 817	579	1 381	1 167	1 142	4 454	10 902	1 050	1 435
CY	29	80	5	11	13	19	48	125	19	27
LV	187	203	4	13	126	32	306	354	47	41
LT	222	579	90	41	27	15	397	762	12	66
HU	1 549	5 880	60	125	922	754	962	5 337	314	700
MT	54	130	1	4	44	23	115	330	4	16
NL	2 852	17 481	581	2 073	356	529	:	:	:	:
AT	1 680	14 072	181	501	223	283	3 093	10 349	86	454
PL	1 860	7 108	366	232	542	244	1 706	7 739	151	318
PT	2 220	4 661	206	244	380	228	4 402	8 992	452	744
RO	506	1 057	34	14	140	31	1 510	2 248	47	83
SI	665	1 944	100	117	227	139	689	2 012	67	103
SK	250	1 193	53	47	39	17	336	1 214	102	185
FI	2 606	13 497	281	394	267	156	1 519	8 504	320	779
SE	4 986	15 415	:	:	1 390	1 087	2 792	8 239	539	542
UK	6 109	38 512	695	1 547	736	877	13 945	45 800	691	3 558
IS	128	295	2	13	64	60	142	762	82	u
NO	1 186	4 097	176	348	127	98	2 506	9 134	438	1 269
RS	8	50	2	11	0	1	34	54	10	9
TR	3 452	12 584	554	661	408	244	4 374	14 033	235	513

Notes: Exceptions to the reference year: BE, DK, DE, IE, EL, FR, NL, AT, SE, UK, IS, RS, TR: 2011; Data unavailable for the reference year: EU-28, LU, LI, CH, ME, MK, AL, BA, IL, FO, MD; Data estimated for: DK (Other NACE codes); Data provisional for: CZ (Other NACE codes); Definitions differ for: NO (Other NACE codes); Data confidential for: SE (C20); Break in time series for: EL, NL; Data missing for: NL, SE;

Others: ':' indicates data not available, 'u': low reliability; Headcount (HC); Fewer than N=20 observations: BG, EE, HR, CY, LV, MT, RO, IS, RS.

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

4 Labour market participation as researchers

Main findings:

- Overall, women remain under-represented amongst researchers in the EU (33 % for EU-28 in 2012). In only eight Member States of the EU did they represent more than 40 % of researchers (BG, EE, HR, LV, LT, PT, RO, SK) in 2012.
- There are signs of greater gender balance within the higher education sector and the government sector, where women make up 41 % and 41.6 % of researchers respectively (EU-28, 2012).
- Despite positive growth in the number of women conducting research in the business enterprise sector, the low presence of women here is particularly acute and has changed little since 2009 (women in the EU represented 19.4 % of researchers in the BES in 2009, and 19.7 % in 2011). Women researchers are two times less likely than men to work in this sector.
- In the higher education sector (HES), nine countries in the EU are approaching gender parity in the representation of researchers, with a proportion of women researchers between 45 % and 55 %.
- There appears to be a generational effect in the higher education and the government sectors, whereby women researchers, compared to men, are more concentrated in the youngest age groups, but the opposite is observed in the oldest age groups.
- When looking at the fields of science in which women and men conduct research within the higher education sector, there still appear to be differences by sex. In 2012, women researchers in the HES were, in most countries, mostly concentrated in the social sciences or the medical sciences.
- Overall, in most countries and in most fields, the growth rate in the number of women researchers in the HES has been positive. There are also some signs of greater representation of women within ‘non-traditional’ fields such as engineering and technology. Indeed, increases in the proportion of women in the HES were registered in almost all countries between 2005 and 2012 in natural sciences, engineering and technology, where men researchers are most prone to work.
- Unlike in the HES, in the government sector women and men are both likely to work in the same fields. Natural sciences and the medical sciences are particularly popular fields for both sexes. In the government sector, most women researchers across countries work in natural sciences.
- In the business enterprise sector (BES), decreases occurred in the proportion of women researchers in some countries. Women researchers in this sector tend to be best represented in the medical sciences.

As highlighted in Chapter 2, women in the EU have made significant advances in raising their level of educational qualification, and now make up just under half (47 %) of PhD graduates (14). Despite this, the EU's researcher population has continued to be dominated by men. This chapter aims to shed light on recent developments in relation to the participation of women researchers in different sectors of the economy and fields of science.

Overall, women researchers remain under-represented.

Despite increasing gender balance amongst top level graduates and rises in the level of women's educational qualification, the under-representation of women researchers is still apparent across the EU. This contributes to a 'leaky pipeline' phenomenon, whereby an increase in the number of women graduates does not lead to an increase in the proportion of women amongst researchers (Jensen, 2005).

As illustrated by Figure 4.1, women researchers made up only 33 % of the researcher population in the EU-28 in 2011. Overall, the gender balance amongst researchers in the EU remains unchanged compared to 2009 (women represented 33 % of researchers in the EU-27 in 2009). Furthermore, significant variations remain across countries. Concerning the sex distribution of researchers at country level, most of the countries considered (EU-28 plus Associated Countries) have a proportion of women researchers that is above the 33 % EU-28 average. However, 11 countries (CZ, DE, IE, FR, LU, HU, MT, NL, AT, FI, CH) record a below-average proportion of women researchers, with the lowest proportions found in Luxembourg (24 %), the Netherlands (24.1 %), France (25.6 %) and Germany (26.8 %), At the other end of the spectrum, only in Latvia, Lithuania and the former Yugoslav Republic of Macedonia (MK) do women researchers represent more than 50 % of researchers across all sectors of the economy.

The proportion of women researchers is growing in the EU-28.

Figure 4.2 displays the compound annual growth rate (CAGR) of researchers for the period 2005–2011. Specifically, CAGRs show the average annual percentage change in the number of women and men in the research population. It should be noted that because of the lower proportion of women researchers in general, CAGRs for women will have to be large and sustained in order to constitute a significant advancement in the proportion of women researchers in the research population.

In the EU-28, on average, the CAGR of researchers was greater for women (4.8 %) than for men (3.3 %) between 2005 and 2011. With the exception of Iceland, the former Yugoslav Republic of Macedonia, Romania and Sweden, there has been a general increase in the number of both women and men researchers. In the majority of countries, the number of women researchers has been growing at a faster rate than that of men.

The gender gap between CAGRs particularly favours women researchers (by more than 4 percentage points) in Luxembourg (rate for women = 9.9 %; rate for men = 3.7 %), Germany (rate for women = 8.3 %; rate for men = 3.0 %) and Austria (rate for women = 8.7 %; rate for men = 4.7 %). The gender gap between researchers is more pronounced in countries with high growth rates than in those with comparatively low ones. However, in France, Hungary, the Czech Republic, Poland, Turkey and Portugal the growth rate of men researchers is greater than that for women researchers over this period ([15]).

Overall, Figure 4.2 suggests that women are generally becoming more represented amongst researchers over time ([16]) and across countries. However, as shown in Figure 4.1, the growth in women's representation between 2005 and 2011 was not sufficient to foster an overall gender balance in the research population in 2012.

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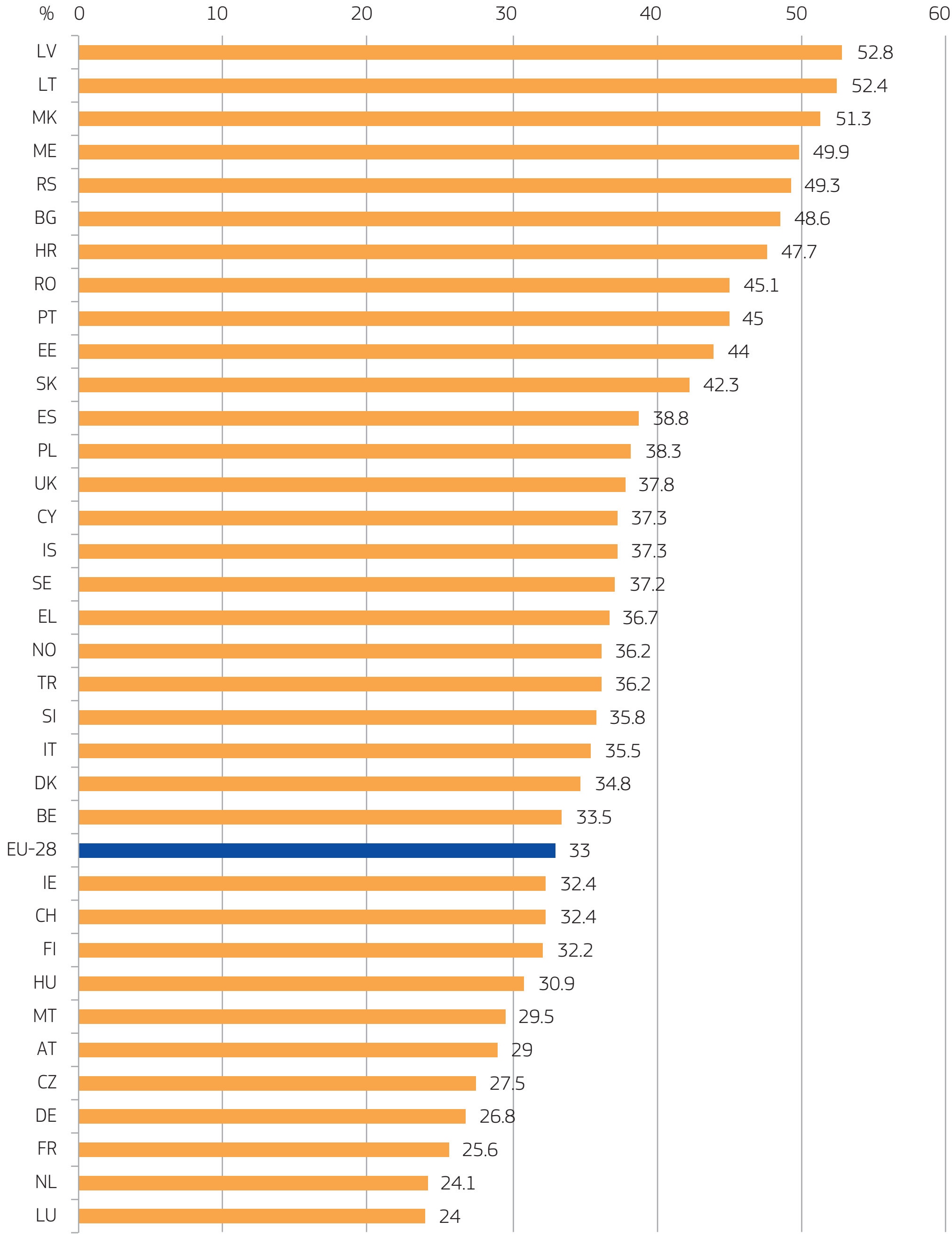
14 This covers of Doctor of Philosophy (PhD) graduates only, rather than the broader category of ISCED 6. See Chapter 2 for more details.

15 These countries are in descending order of the size of the gap. Note that in Iceland, the CAGR for men was also higher than that for women, but both were negative.

16 'Trends' tables, showing the actual year-on-year changes in the representation of women and men researchers are available on the She Figures 2015 CD.

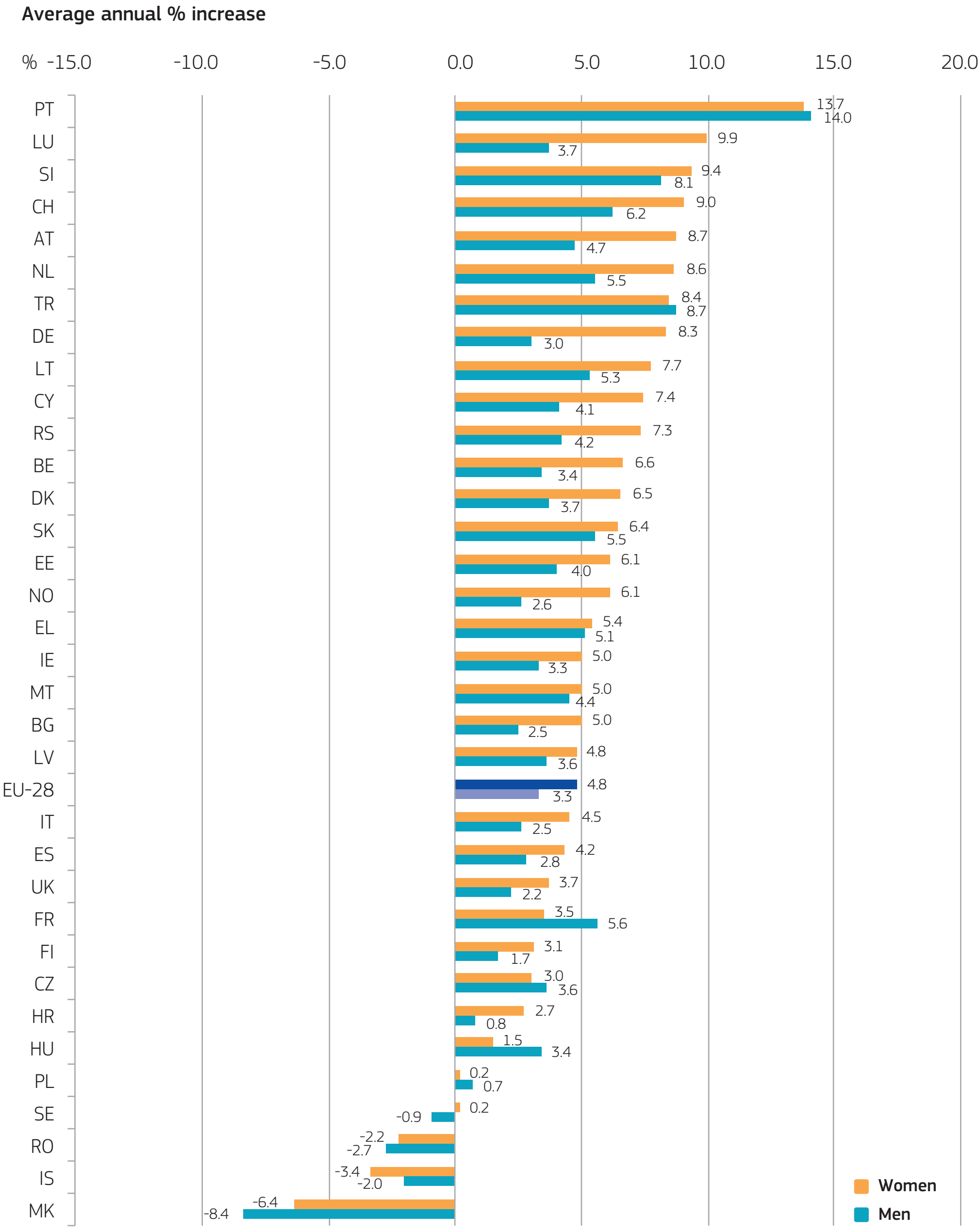
Figure 4.1. Proportion of women researchers, 2012



Notes: Exceptions to the reference year: EU-28, BE, DE, IE, EL, LU, AT, SE, IS, ME, RS: 2011; MK: 2009; Data unavailable for: LI, AL, BA, IL, FO, MD; Data provisional for: CZ; Data estimated for: DK, UK; Break in series for: EL, NL, IS; Definition differs for: FR.

Source: Eurostat – Statistics on research and development (online data code: rd_p_femres)

Figure 4.2. Compound annual growth rate for researchers, by sex, 2005–2011

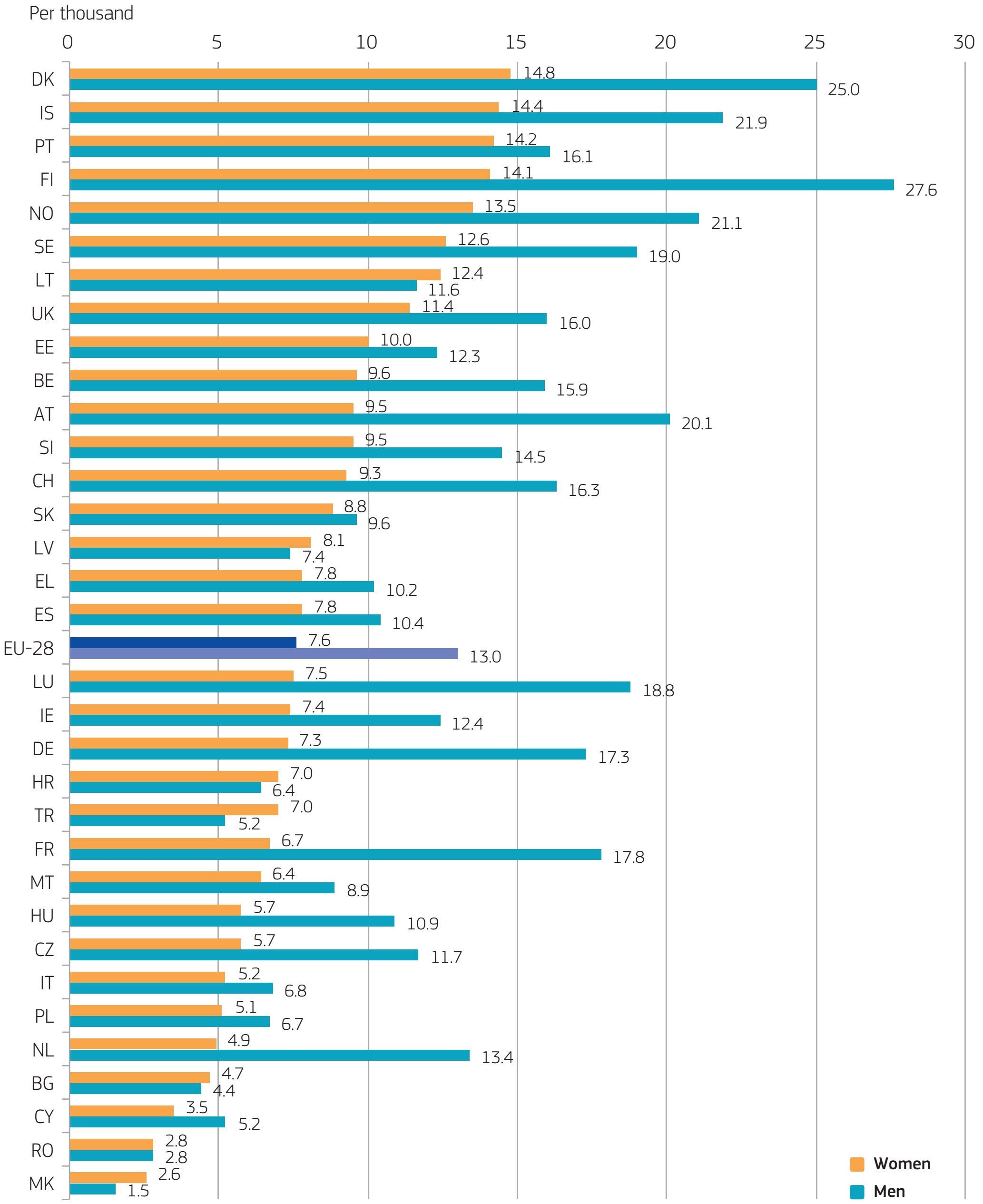


Notes: Exceptions to reference periods: AT: 2006–2011; MK: 2005–2009; CH: 2008–2012; RS: 2008–2011; Data unavailable for: LI, ME, AL, BA, IL, FO, MD; Data provisional for: CZ; Data estimated for: DK, LU, UK; Definition differs for: FR; Break in time series for: EL, MT, NL, IS, SE.

Source: Eurostat – Reseach and development statistics (online data rd_p_persocc)

Figure 4.3 reveals the number of researchers within the pool of all active women and men (per thousand). In the EU-28, there are fewer researchers amongst active women than amongst active men: a difference of 5.4 points per thousand. Specifically, 7.6 out of every thousand active women and 13 out of every thousand active men were researchers in 2011. This trend is maintained across most of the countries, with the largest differences being seen in France (11.1 points per thousand), Luxembourg (11.3 points per

Figure 4.3. Researchers per thousand labour force, by sex, 2012

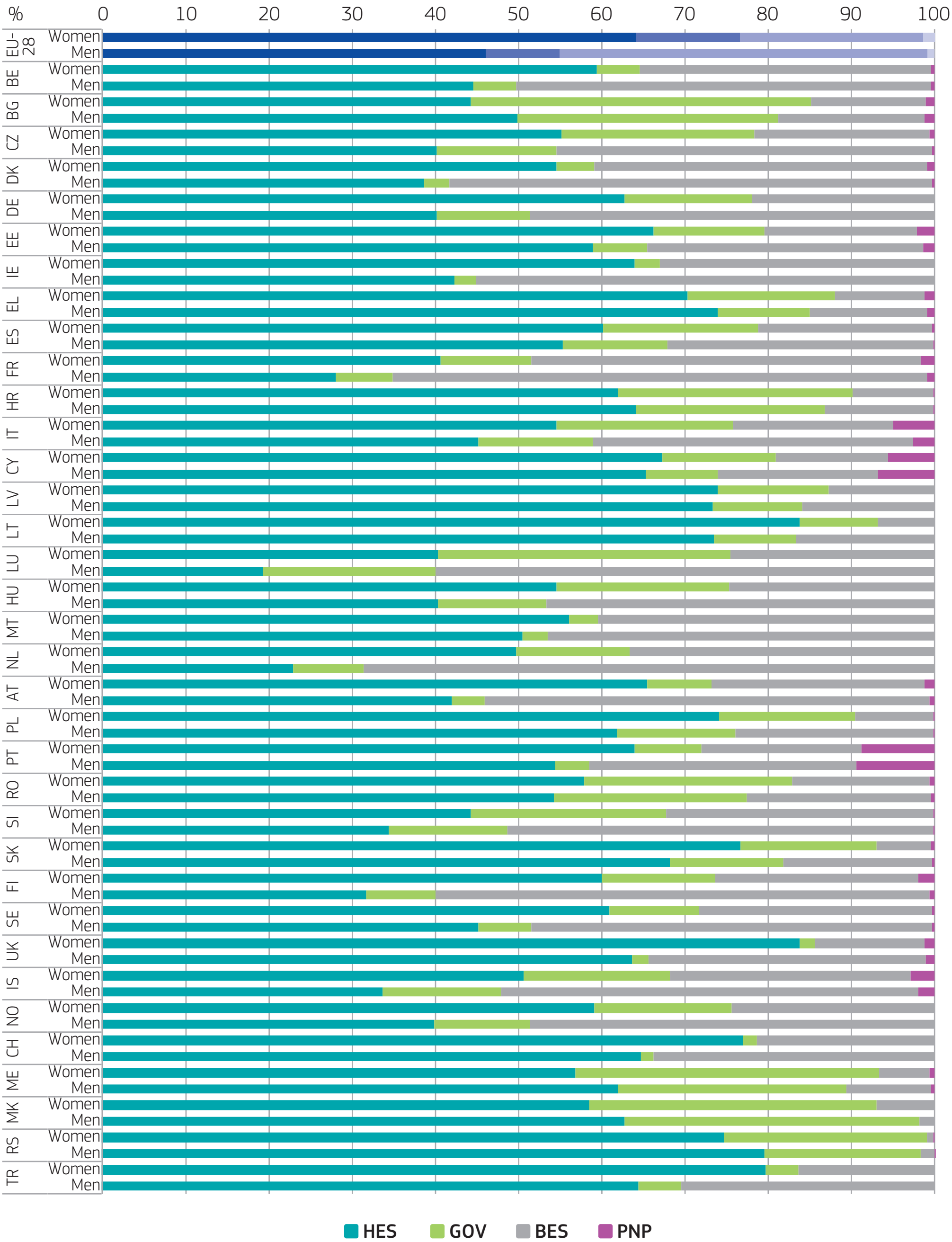


Notes: Exceptions to the reference period: MK: 2009; EU-28, BE, DE, IE, EL, LU, NL, AT, SE, IS: 2011; Data unavailable for: EU-25, LI, ME, AL, RS, BA, IL, FO, MD; Data provisional for: CZ; Data estimated for: DK, UK; Definitions differ for: FR; Break in time series for: BE, DE, EL, NL, IS.
Others: The numerator (researchers) is in headcount (HC). The denominator (labour force age 15 and over) is per 1 000.

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc) and Labour Force Survey (online data code: lfsa_agan)

thousand) and Finland (13.5 points per thousand). The proportion of researchers amongst active women is higher than the proportion amongst active men in Turkey, the former Yugoslav Republic of Macedonia, Lithuania, Latvia, Croatia and Bulgaria, although the difference is rather small, ranging from 1.8 points per thousand in Turkey to 0.3 points per thousand in Bulgaria.

Figure 4.4. Distribution of researchers across sectors by sex, 2012



Notes: Exceptions to reference year: EU-28, EU-15, BE, DE, IE, EL, HR, LU, NL, AT, SE, IS, ME, RS: 2011; MK: 2009; All data unavailable for: LI, AL, BA, IL, FO, MD; Some data unavailable for (PNP sector): DE, IE, LV, LT, LU, HU, MT, NL, NO, CH, MK, TR; Data estimated for: EU-28, EU-15, IE, DK, UK; Break in time series for: IE, EL, NL, SE; Definition differs for: FR, NL, SK, SE, NO, CH; Data provisional for: CZ.

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

Women and men researchers are concentrated in different sectors of the economy.

Figure 4.4 presents the distribution of researchers in 2012 across the business enterprise, government, higher education and private non-profit sectors (HES, GOV, BES and PNP). It presents the distribution for women and men researchers in turn.

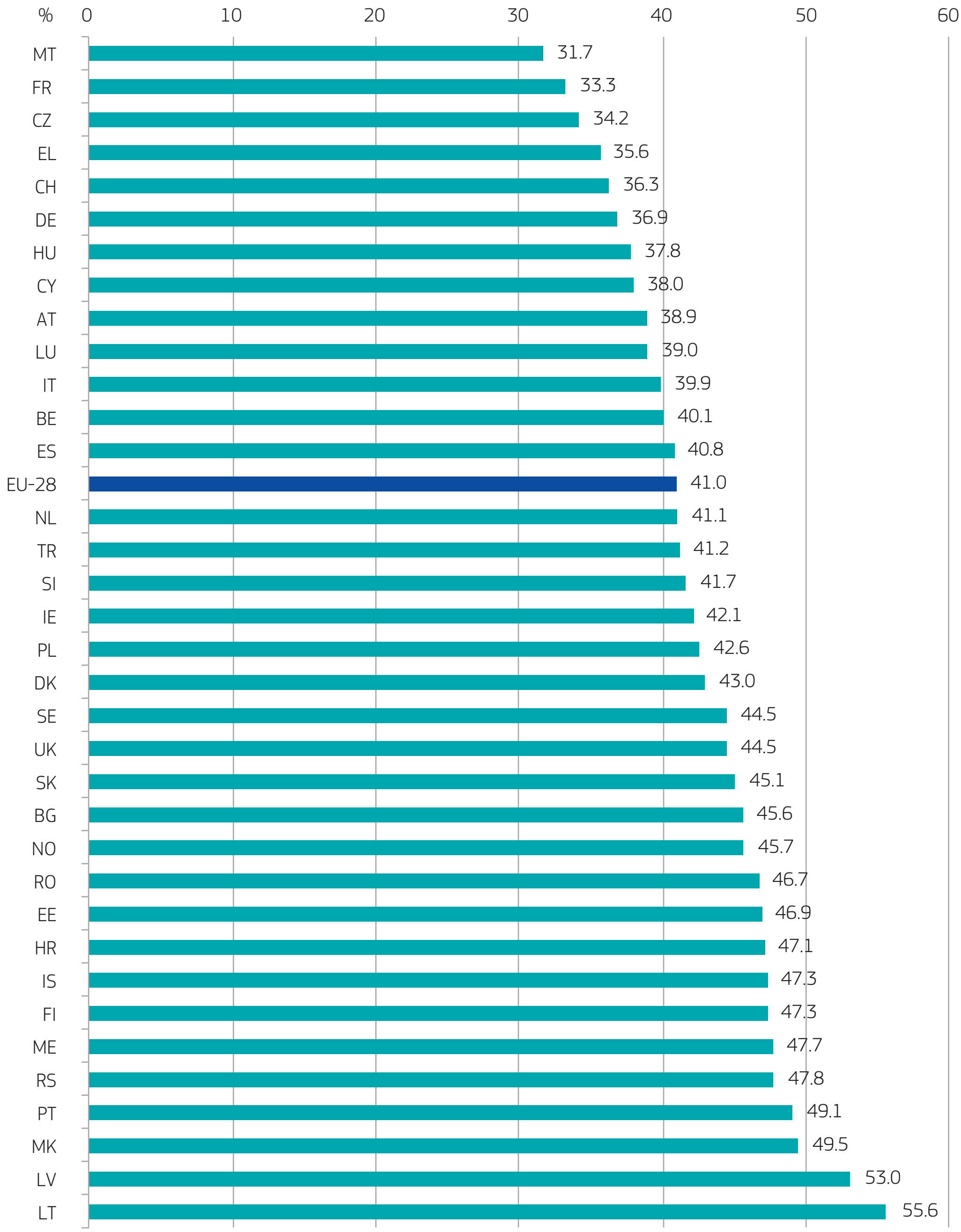
In 2011, women researchers in the EU were most likely to work in the higher education sector (approximately 64.1 % of women researchers worked in this sector), followed by the business enterprise (22 %) and the government (12.5 %) sectors. The small remaining proportion (1.4 %) was found in the private non-profit sector. Men are also most likely to work as researchers in the higher education sector, however their distribution across the sectors of the economy differs significantly to that of women. Compared to the patterns for women, a lower proportion of men researchers are employed in the HES (46.1 %), GOV (8.9 %) and PNP (0.8 %) sectors, whereas a higher proportion work in the BES (44.2 %). Indeed, Figure 4.4 shows that men researchers are more than twice as likely as women in the EU to work in the business enterprise sector. This helps explain the picture given by the subsequent figures (Figures 4.5–4.7), whereby women are better represented overall in the HES and GOV sectors than in the business enterprise sector.

Across all countries, most women researchers are found in the higher education sector, as shown in Figure 4.4. In the Czech Republic, Luxembourg, Hungary and Slovenia, the distribution of women researchers is comparatively more evenly spread out between sectors ([17]). The higher education sector remains that where women are most likely to work, although men in these countries continue to make up a majority of HES researchers overall.

The private non-profit sector employs a relatively larger proportion of both women and men researchers in Italy, Cyprus and Portugal (at least 2.6 % of each sex), when compared to the EU average. Amongst these three countries, only in Italy is the proportion of women researchers working in this sector greater than the equivalent proportion for men.

17 In these countries, at least 20% of women researchers each work in the HES, GOV and BES respectively.

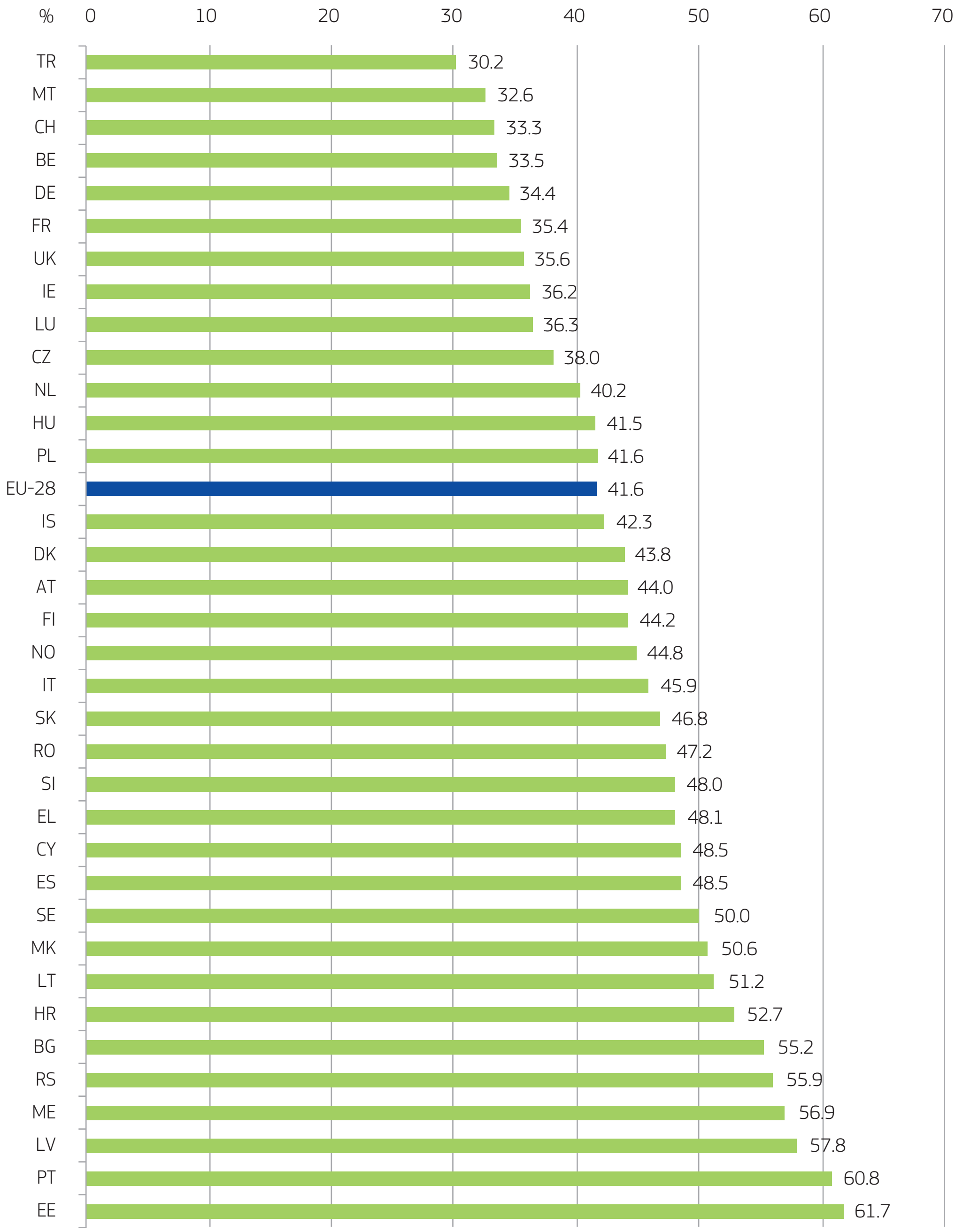
Figure 4.5. Proportion of women researchers in the higher education sector, 2012



Notes: Exceptions to reference year: BE, IE, EL, AT, SE, IS, ME, RS: 2011; MK: 2009; Data unavailable for: LI, AL, BA, IL, FO, MD; Data estimated for: EU-28, IE, UK; Break in time series for: EL, IS; Data provisional for: CZ; Definition differs for: FR.

Source: Eurostat – Statistics on research and development (online data code: rd_p_femres)

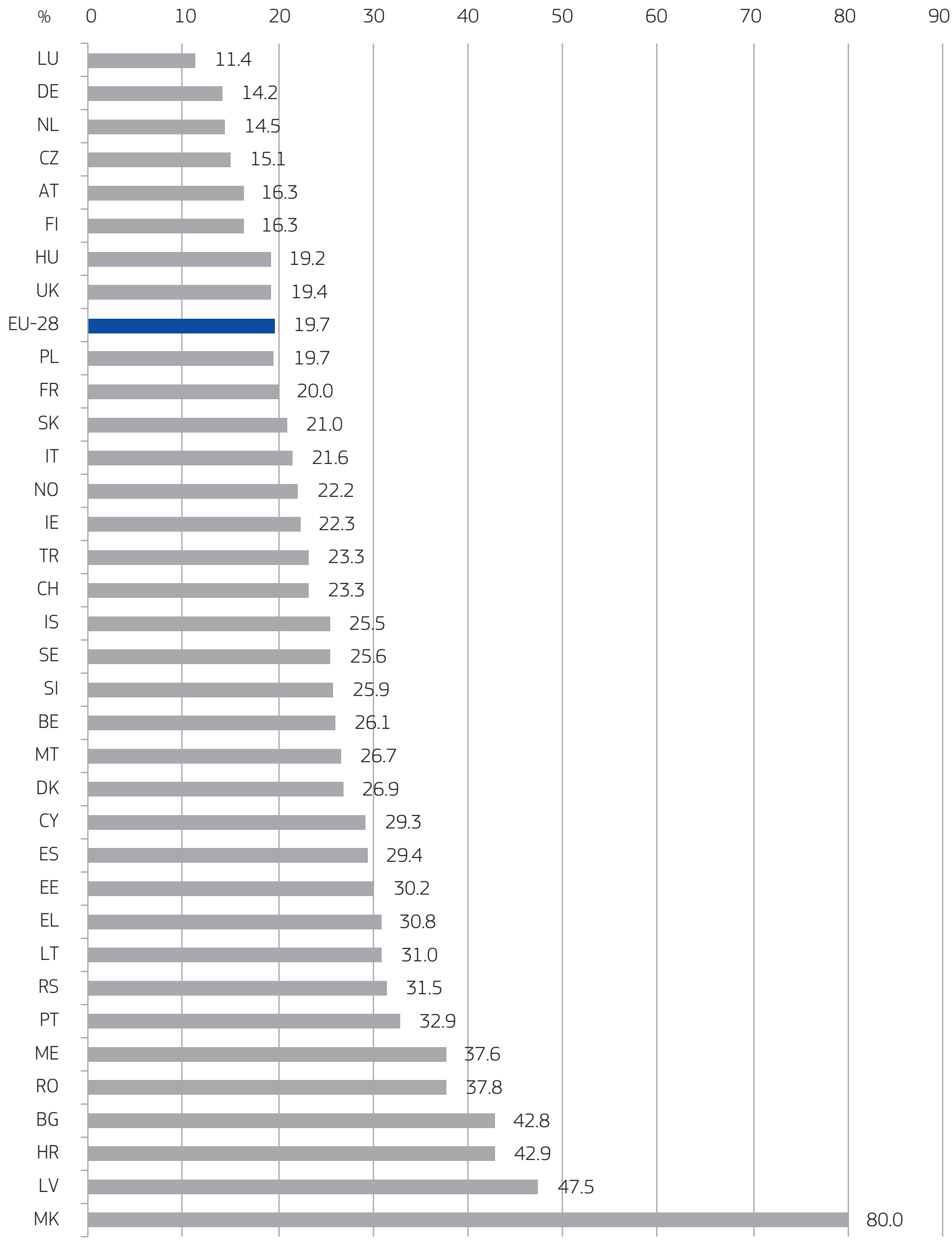
Figure 4.6. Proportion of women researchers in the government sector, 2012



Notes: Data unavailable for: LI, AL, BA, IL, FO, MD; Exceptions to reference year for: BE, EL, HR, AT, SE, IS, ME, RS: 2011; MK: 2009; Break in time series for: EL, SE, IS; Definition differs for: SE, FR, NL, SK, CH; Data estimated for: EU-28; Data provisional for: CZ.

Source: Eurostat – Statistics on research and development (online data code: rd_p_femres)

Figure 4.7. Proportion of women researchers in the business enterprise sector, 2012



Notes: Data unavailable for: LI, AL, BA, IL, FO, MD; Exceptions to reference year for: EU-28, BE, DE, IE, EL, LU, NL, AT, SE, IS, ME, RS: 2011; Break in time series for: EL, NL, IS; Data provisional for: CZ; Data estimated for: DK; Definition differs for: NO.

Source: Eurostat – Statistics on research and development (online data code: rd_p_femres)

Displaying gender segregation in the economy: Women researchers are under-represented in the business enterprise sector.

The higher education, business enterprise and government sectors of the economy employ the vast majority of all researchers in the EU (over 98 % in the EU-28 in 2011). In order to yield a more detailed picture, Figures 4.5, 4.6 and 4.7 present the proportion of women researchers, amongst both sexes, in the higher education sector, the government sector and the business enterprise sector of the economy ([18]).

In 2012, the proportion of women researchers in the EU-28 was highest in the government sector (41.6 %) and the higher education sector (41 %) respectively. In stark contrast, women researchers remained significantly under-represented in the business enterprise sector, making up a proportion of only 19.7 % in the EU-28 in 2011. To some extent, this picture is reflective of the traditionally pronounced concentration of women in public sector occupations, as compared to private sector jobs (Rubery et al, 1999). Whilst gender inequality is still a marked issue in the business enterprise sector, the proportion of women researchers in all three sectors has slightly increased since 2009 ([19]). Overall, the higher education sector now has the most countries approaching gender parity, with a proportion of researchers of between 45 % and 55 %. This is the case for the higher education sector in 13 countries ([20]), for the government sector ([21]) in 11 countries, and for the business enterprise sector in one country ([22]).

With women making up close to a fifth of the BES research population (2011 data), the business enterprise sector exhibits significant gender segregation in the economy of the EU. Furthermore, country disparities in the proportion of women researchers are most pronounced in this sector, as illustrated by Figure 4.7. Women represented less than 15 % of researchers in the business enterprise sector in Luxembourg (11.4 %), Germany (14.2 %) and the Netherlands (14.5 %). At the other end of the spectrum, women represented over 40 % of researchers in the BES in four countries: Bulgaria (42.8 %), Croatia (42.9 %), Latvia (47.5 %) and the former Yugoslav Republic of Macedonia (80 %). It is worth noting that there were only 67 researchers in the business enterprise sector in the former Yugoslav Republic of Macedonia in this year, which distorts the figure.

Investigating gender segregation in the higher education sector is also important because this sector is the main source of employment for researchers in the EU ([23]). In the higher education sector, as illustrated in Figure 4.5, country differences are not as pronounced as in the government and business enterprise sectors. A majority of countries have a proportion of women researchers that is above 40 %. Furthermore, in Latvia and Lithuania, women's presence in the higher education sector is slightly above 50 % (55.6 % in LT; 53 % in LV). In contrast, Malta, France and Czech Republic display the lowest proportions, with women representing less than 35 % of the research population in the higher education sector.

As with the higher education sector, the government sector also has a relatively strong presence of women researchers. Furthermore, as compared to the HES and BES, women make up more than half of researchers in a larger number of countries ([24]). In the government sector, a number of countries show this form of gender imbalance: the proportion of women researchers exceeds 55 %, namely Bulgaria (55.2 %), Serbia (55.9 %), Montenegro (56.9 %), Latvia (57.8 %), Portugal (60.8 %) and Estonia (61.7 %). Conversely, other countries report particularly low proportions of women in the government sector, such as Turkey (30.2 %), Malta (32.6 %), Switzerland (33.3 %), Belgium (33.5 %) and Germany (34.4 %).

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18 The other main sector of the economy, the private non-profit sector (PNP), is not covered here as it accounts for less than 2 % of the researcher population in the European Union (EU-28, 2011).

19 However, the proportion of women researchers in the BES in 2009 was 19.4 % in the EU-27 (with rise to 19.7 % in 2011). This suggests that change in this sector has been very slow.

20 In descending order of women's proportion: LV, MK, PT, RS, ME, FI, IS, HR, EE, RO, NO, BG, SK.

21 In descending order of women's proportion: HR, LT, MK, SE, ES, CY, EL, SI, RO, SK, IT.

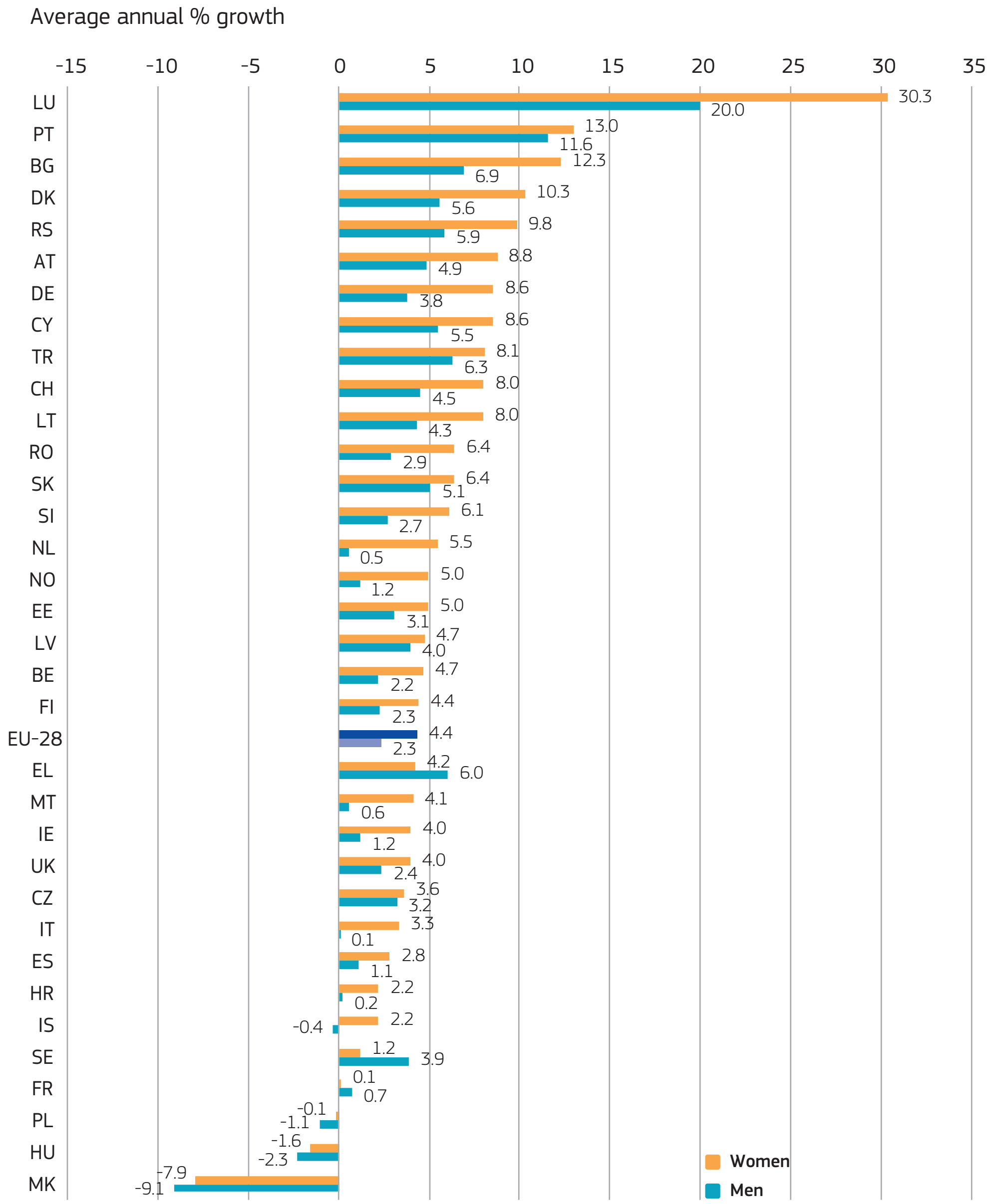
22 Latvia.

23 According to the latest available data (2013). See Eurostat, Total R&D personnel by sectors of performance, occupation and sex (rd_p_persocc).

24 Using Figures 4.5-4.7, one can see that in the government sector, women account for more than 50 % of researchers in nine countries (EE, PT, LV, ME, RS, BG, HR, LT, MK); in the HES, this is true of two countries (LT, LV) and in the BES it is true of only one country (MK).

Taking together the findings from Figures 4.5, 4.6 and 4.7, the Czech Republic and Malta are amongst the countries with the lowest gender balance in two out of the three sectors [25].

Figure 4.8. Compound annual growth rate for researchers in the higher education sector, by sex, 2005–2012

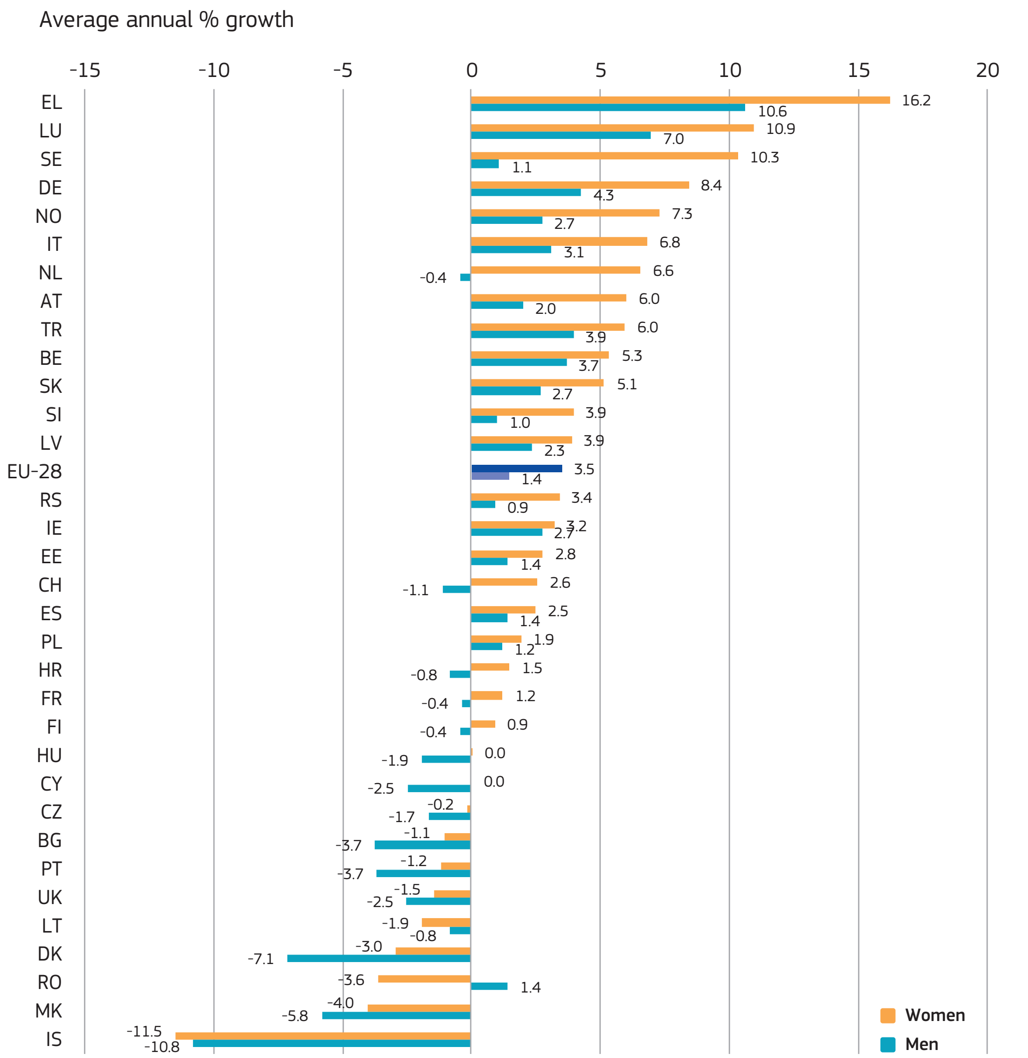


Notes: Exceptions to reference period: BE, AT: 2006–2011; MK: 2005–2009; EL, IE, SE, IS: 2005–2011; RS: 2008–2011; CH: 2006–2012; Data estimated for: EU-28, UK, IE, LU; Data provisional for: CZ; Definition differs for: FR; Break in time series for: EL, IS;
Others: ME excluded due to limited data.

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

25 Malta in the HES and GOV. The Czech Republic in the HES and BES.

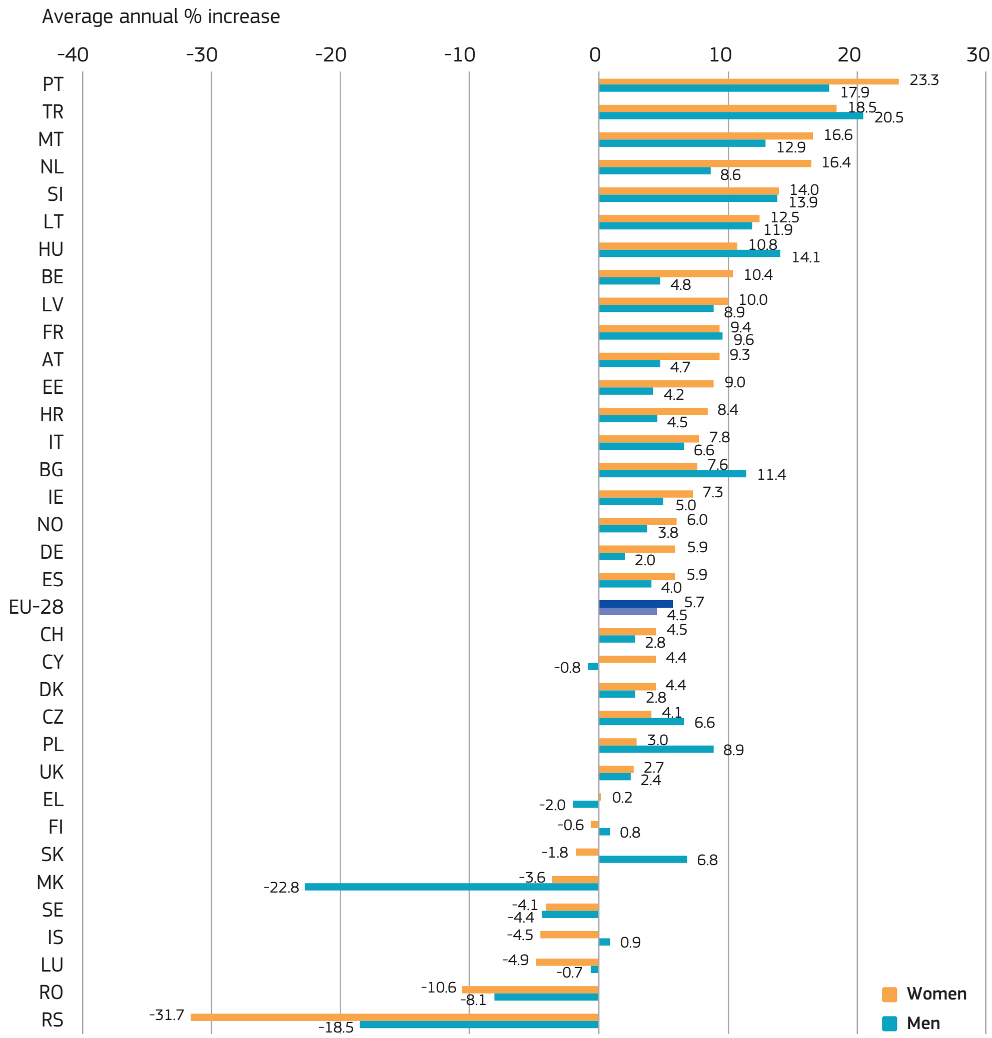
Figure 4.9. Compound annual growth rate for researchers in the government sector (GOV) by sex, 2005-2012



Notes: Exceptions to reference period: CH: 2006–2012; BE, AT: 2006–2011; EL, HR, SE, IS: 2005–2011; MK: 2005–2009; RS: 2008–2011; Data unavailable for: LI, ME, AL, BA, IL, FO, MD; Data excluded due to limited number of observations (fewer than 20 for either start or end year) for: MT; Data estimated for: EU-28: 2012; EU-28: 2003; PT: 2002; Data provisional for: CZ: 2012; Definition differs for: FR, NL, HU, SK, SE, NO, CH; Break in time series for: SE, IS: 2011; NL: 2003; DK, FR: 2002.

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

Figure 4.10. Compound annual growth rate for researchers in the business enterprise sector, 2005–2012



Notes: Exceptions to the reference period: AT: 2006–2011; MK: 2005–2009; CH: 2004–2012; EU-28, BE, DE, IE, EL, LU, NL, SE, IS: 2005–2011; Data unavailable for: LI, ME, AL, BA, IL, FO, MD; Data provisiona for: CZ: 2012; Data estimated for: PT: 2002; EU-28, LU: 2003; UK: 2005; DK: 2012; Break in series for: DK, ES: 2002; MT: 2004; EL, IS, NL: 2011; Definition differs for: NO, CH.

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

Within the three main sectors of the economy in most countries, the number of women researchers grew at a faster rate than that of men researchers between 2005 and 2012.

Figures 4.8–4.10 show the rate at which the number of women and men researchers grew each year between 2005 and 2012. Each focuses on one of the three main sectors in which researchers are employed: the higher education sector (HES), the government sector (GOV), and the business enterprise sector (BES). In the higher education sector, the CAGR for women researchers surpassed that of men researchers by 2 percentage points in the EU-28 (the rate for women = 4.4 %; the rate for men = 2.3 %). Furthermore, the women's rate was higher than the men's rate in 31 of the 34 countries for which data were available. The opposite was observed only in Greece, France and Sweden. Luxembourg has the highest CAGR for women (30.3 %). This is 10.4 percentage points above the CAGR for men in 2012 (and is also the largest difference between women and men in any country). Only three countries have had negative growth for both sexes, namely the former Yugoslav Republic of Macedonia, Hungary and Poland. Overall, these data suggest that the increase in the number of women researchers in the higher education sector is contributing to a reduction in the gender gap.

In the government sector, the annual growth rate of women researchers also surpasses that of men researchers within the EU-28, this time by 2.1 percentage points (rate for women = 3.5 %; rate for men = 1.4 %). There are only three countries where the annual growth rate for women researchers was lower than that for men, namely Iceland, Lithuania and Romania. Amongst these countries, the gap is largest in Romania, where the growth rate for men researchers was positive whereas the women researchers' growth rate was negative, with a difference of approximately 5 percentage points between the two. The difference in the other two countries is much less pronounced, at 0.7 percentage points in Iceland and 1.1 percentage points in Lithuania, where the growth was negative in both groups. It is important to note that negative growth rates are observed in more countries in this sector compared to the higher education sector, with eight countries having a negative growth rate for both sexes, one country having a negative growth rate for women only and another seven countries having a negative growth rate for men only. Overall, this data indicates that despite lower growth in this sector in general, there is an overall trend towards the reduction of the gender gap.

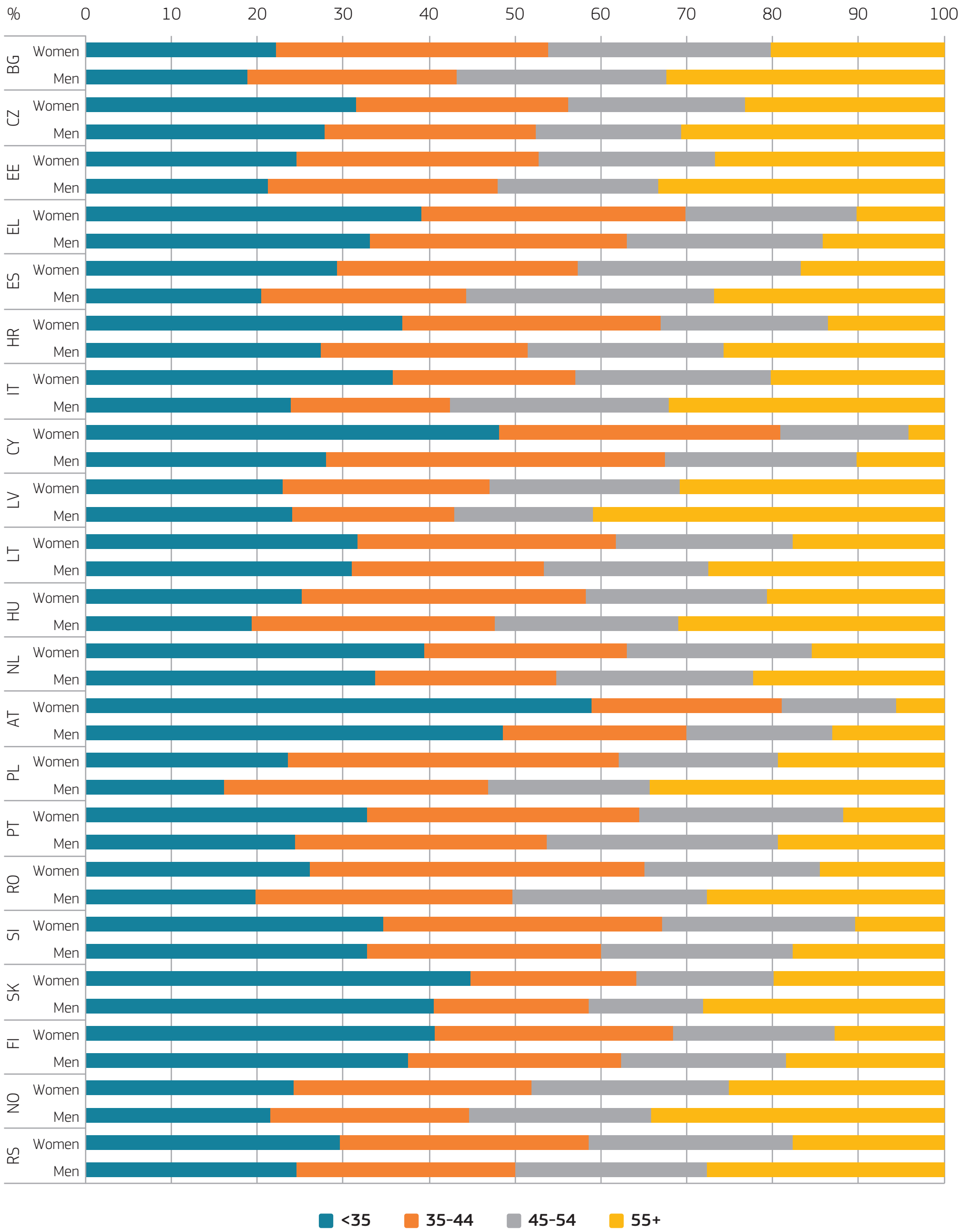
In line with the two previous figures, Figure 4.10 shows the CAGR for women and men researchers in the business enterprise sector between 2005 and 2012. In 22 of the 34 countries for which data were available, the number of women researchers in this sector grew at a faster rate than the number of men researchers. In the EU-28, the annual growth rate of women researchers surpasses that of men researchers by 1.2 percentage points (the rate for women is 5.7 %; the rate for men is 4.5 %). The overall number of researchers of both sexes has decreased in five countries (LU, RO, SE, MK, RS), with the most pronounced decrease occurring in Serbia, where the number of women researchers decreased by 31.7 % and the number of men researchers by 18.5 %. In the former Yugoslav Republic of Macedonia, on the other hand, the number of men researchers has decreased by 22.8 % whilst the number of women researchers has decreased by 3.6 %.

Taking all three Figures 4.8-4.10 together and considering the EU average, the growth rates of women and men in the HES and GOV were greater between 2002 and 2009 than between 2005 and 2012. However, the presence of both women and men researchers in the BES grew at a faster rate in more recent years (2005-2012) than between 2002 and 2009 ([26]).

Despite signs of positive growth for women researchers in the BES in many countries, it is important to note that women account for a low proportion of posts within this sector (19.7 % in the EU-28 in 2011). In order for gender balance to be achieved in this sector, CAGRs for women will need to be large and sustained. The fact that there is important variability between countries and multiple negative growth rates is a potential concern.

26 This paragraph compares Figures 4.8-4.10 of She Figures 2015 with Figures 1.11-1.13 of She Figures 2012. Note that the EU average presented in She Figures 2012 covered the EU27, whereas the average in She Figures 2015 covers the EU-28.

Figure 4.11. Distribution of researchers in the higher education sector, by sex and age group, 2012



Notes: Exceptions to reference year: CZ, EL, AT, FI, SE: 2011; Data unavailable for: EU-28, BE, DK, DE, IE, FR, LU, MT, SE, UK, IS, LI, CH, ME, MK, AL, TR, BA, IL, FO, MD;
Definitions differ for: PT; Break in time series for: EL;
Other: Headcount (HC).

Source: Eurostat – Statistics on research and development (online data code: rd_p_persage)

There are signs of a generational effect in the higher education and government sectors.

To further analyse the situation of researchers, Figure 4.11 breaks down researchers by sex and age group (under 35 years, 35–44 years, 45–54 years and 55+ years), for the higher education sector only. By considering the age distribution of researchers, one may identify differences in the career patterns of women and men. For example, according to Eurostat[27], in the overall population a higher proportion of women are inactive due to caring responsibilities, including for children. This may reduce their participation in the labour market during the key childbearing years of a particular country. On another level, by taking older age as a 'proxy' for seniority, this indicator can be used to gauge women and men's relative presence in the top research positions, against a backdrop of far-reaching under-representation of women in decision-making roles (DG Justice, Women and Men in Decision-Making database ([28])).

As with previous editions of the She Figures, there appears to be a generational effect whereby women researchers are more likely than men to be found in the youngest age groups (in all countries except Latvia), whilst the opposite is observed in the oldest age groups ([29]). In 2009, in all countries, a higher percentage of the population of women researchers was concentrated in the under-35 category as compared to men researchers. As shown by Figure 4.11, in 2012, this situation generally holds, although in Latvia the reverse is true, meaning men are more likely to work in the <35 age category compared to women. Unlike in 2009, in 2012 women were also more likely than men to be in the 35–44 years category, in all countries except Cyprus. However, in most countries men are more likely than women to be found in the 45–54 years category, with the largest difference being found in Cyprus ([30]) (7.3 percentage points). Furthermore, in all countries the proportion of men in the 55+ age group was higher than the proportion of women. The largest differences in this age group are found in Poland and Romania, where the proportion of men exceeds that of women by 14.8 and 13.1 percentage points respectively. It will be interesting to see whether the increase in the proportion of women researchers seen in the younger age groups will translate into changes in the older age groups in the future, or whether the pattern of the apparent attrition of women as they progress in their careers will persist.

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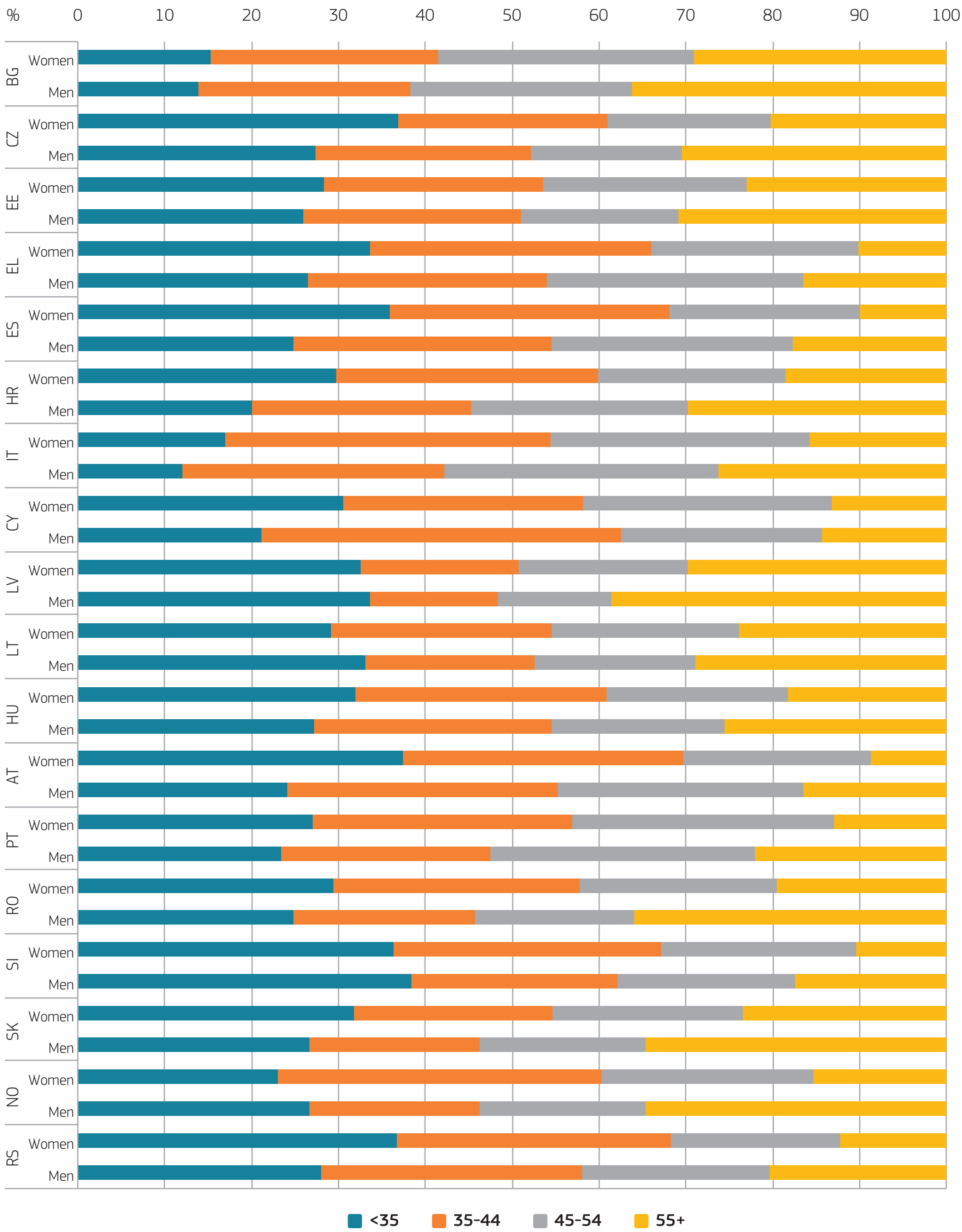
27 In 2014, 15 % of the inactive population of women were not seeking work due to looking after children or incapacitated adults. This was true of only 1.2 % of the inactive population of men. See Eurostat, 'Inactive population – Main reason for not seeking employment – Distributions by sex and age (%)', table lfsa_igar.

28 See http://ec.europa.eu/justice/gender-equality/gender-decision-making/database/index_en.htm.

29 Note that distributions should be interpreted with caution. If a higher proportion of the population of women researchers are in the under-35 age category compared to men, this does not necessarily mean that women outnumber men when it comes to the headcount. This is dependent upon the size of the population of each sex. For instance, imagine a country where there are 2 000 men and 1 000 women working in research. If 8 % of men and 14 % of women are in the under-35 category, this translates into 160 men and 140 women. In other words, men outnumber women, but it is also true that women are relatively more likely than men to be aged under 35.

30 However, it should be noted that the gender gap has decreased in Cyprus since 2009.

Figure 4.12. Distribution of researchers in the government sector, by sex and age group, 2012



Notes: Exceptions to reference period: CZ, EL, HR, AT, RS : 2011; Data unavailable for: EU-28, DE, EE, IE, FR, LU, MT, NL, PL, FI, SI, SE, UK, LI, CH, ME, MK, AL, TR, BA, IL, FO, MD; Definitions differ for: PT; Break in time series for: EL
Other: Headcount (HC).

Source: Eurostat – Statistics on research and development (online data code: rd_p_persage)

Figure 4.12 also divides women and men researchers into four age groups (under 35 years, 35–44 years, 45–54 years and 55+ years), this time specifically in the government sector. The observed trends are similar to what was seen in the higher education sector, in that there is a higher proportion of women than men in the youngest age group in the majority of the countries, whilst the opposite trend is observed in the oldest age group. In the under-35 age group, there are four countries that do not follow the general trend: Latvia, Lithuania, Slovenia and Norway. The proportion of women in the 35–44 years category also tends to be higher than the proportion of men, in all countries except the Czech Republic and Cyprus. In about 40 % of the countries, the proportion of men in the 45–54 years category is higher than for women, with the largest difference being observed in Austria (6.7 percentage points). As with the HES, in the government sector in all countries the proportion of men researchers in the 55+ age group is higher than the proportion of women. The largest differences are seen in Norway and Romania (with differences in the proportion of women and men reaching 19.3 and 16.3 percentage points respectively).

Dissimilarity Index (DI)

The Dissimilarity Index (DI) indicates the percentage of either women or men (all scientific fields combined) who would have to move across different scientific fields to ensure that the proportions of women (out of total women across all scientific fields) and men (out of total men across all scientific fields) were equal in each scientific field; note that this does not ensure parity of the sexes in each scientific field. The maximum value is 1, which indicates the presence of only either women or men in each of the scientific fields. The minimum value of 0 indicates that the frequency distribution of women across scientific fields is identical to the same distribution for men.

Table 4.1. Dissimilarity Index for researchers in the higher education sector and government sector, 2012

	Dissimilarity Index HES	Dissimilarity Index GOV
EU-28	:	:
BE	0.22	0.12
BG	0.16	0.15
CZ	0.21	0.17
DK	0.18	0.22
DE	0.23	0.20
EE	0.21	0.38
IE	0.25	0.25
EL	0.10	0.28
ES	0.03	0.11
HR	0.19	0.06
IT	0.12	0.12
CY	0.12	0.33
LV	0.25	0.19
LT	0.22	0.30
LU	0.35	0.11
HU	0.18	0.17
MT	0.27	0.13
NL	0.00	0.26
AT	0.24	0.20
PL	0.18	0.19
PT	0.13	0.08
RO	0.11	0.12
SI	0.24	0.18
SK	0.16	0.13
FI	0.30	:
SE	:	0.17
UK	0.09	0.26
IS	0.21	0.00
NO	0.17	0.19
ME	0.11	0.06
MK	0.25	0.10
RS	0.14	0.10
TR	0.09	0.12

Notes: Exceptions to the reference year: 2011: BE, IE, EL, HR, AT, SE, IS, ME, RS; 2010: DK, PL; 2009: MK; Data unavailable for: EU-28, FR, LI, CH, AL, BA, IL, FO, MD; Definition differs for: NL, SK, FI, SE; Data (HES) estimated for: UK, BE, IE; Break in time series for: EL, SE (GOV); Confidential: PL (GOV);
Others: Reference year is 2012; ':' indicates that data are unavailable.

Source: Eurostat – Statistics on research and development (online data code: rd_p_perssci)

Table 4.1 presents the values of the Dissimilarity Index in the different countries for researchers in the higher education and government sectors. Seven fields were considered in computing the DI: natural sciences; engineering and technology; medical and health sciences; agricultural sciences; social sciences; humanities; and any other field of science.

In the higher education sector, the DI ranges from 0.35 in Luxembourg to 0.00 in the Netherlands, whilst in the government sector the index ranges from 0.38 in Estonia to 0.00 in Iceland. Given that these two ranges are quite similar, it could be concluded that the disparity in gender segregation between sexes across the different scientific fields is roughly equal across these two sectors. It is interesting to note that in 2009 Finland and Poland had high dissimilarity indexes in the higher education sector (0.42 and 0.86 respectively), but that these have since been greatly reduced (0.30 and 0.18 respectively), suggesting some reduction of the disparity in gender segregation between sexes across fields of science in those countries. In 2012, the highest DI in the higher education sector was observed in Malta (0.27), Finland (0.30) and Luxembourg (0.35), suggesting these are the countries where the dissimilarity is most pronounced. The lowest DI in the HES was found in the Netherlands (0.00), Spain (0.03), the United Kingdom and Turkey (both 0.09). In the government sector, the highest DI was found in Lithuania (0.30), Cyprus (0.33) and Estonia (0.38), whilst the lowest was found in Iceland (0.00), Croatia and Montenegro (both 0.06), and Portugal (0.08).

Table 4.2. Evolution of the proportion (%) of women researchers in the higher education sector, by field of science, 2005–2012

	2005						2012					
	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
BE	30	19	47	40	43	42	33	21	53	47	49	45
BG	54	26	53	34	43	47	47	33	51	33	52	54
CZ	32	21	44	36	39	37	29	21	48	36	42	42
DK	26	16	41	50	32	45	33	24	49	51	42	43
DE	23	14	39	39	34	36	28	19	48	49	36	50
EE	38	24	57	42	55	59	40	31	58	46	58	62
IE	31	21	57	38	45	44	34	21	61	47	49	51
EL	:	:	:	:	:	:	30	31	40	33	36	48
ES	38	34	40	38	39	39	41	37	43	39	42	42
HR	41	31	55	41	45	52	44	36	58	46	55	58
IT	36	21	30	32	36	49	42	26	36	39	42	52
CY	30	18	0 (0/7)	z	38	48	34	31	56	z	40	47
LV	39	21	59	51	60	70	43	36	64	54	64	68
LT	41	27	54	47	61	62	45	35	61	53	65	65
LU	26	18	z	z	34	35	24	16	23	z	58	53
HU	27	18	44	33	41	45	27	22	46	38	45	44
MT	17	9	30	20 (1/5)	34	28	26	13	46	27 (3/11)	40	23
NL	26	21	39	34	38	42	41	41	41	41	41	41
AT	26	18	40	49	44	46	29	22	46	56	49	52
PL	39	23	53	47	47	45	39	25	55	49	47	47
PT	48	33	54	50	53	51	51	31	56	55	54	50
RO	36	34	57	43	45	33	51	41	57	42	50	49
SI	29	18	50	52	38	47	30	24	52	53	46	51
SK	38	32	55	44	53	48	46	32	56	42	52	48
FI	33	30	57	58	53	54	33	25	67	55	57	57
SE	35	22	61	56	:	:	36	25	59	47	:	:
UK	31	19	51	33	41	47	44	40	50	60	39	38
NO	26	19	49	43	42	43	33	26	56	47	48	47
MK	33 (3/9)	32	62	28	38	64	56 (14/25)	34	66	44	48	54
RS	51	31	56	45	50	50	49	34	48	57	48	57
TR	41	30	44	27	37	41	43	32	47	30	41	43

Notes: Exceptions to the reference period: EL: 2011 only; BE, DK, IE, SE: 2005–2011; AT: 2006–2011; FI, UK: 2007–2012; MK: 2005–2009; RS: 2008–2011; Data unavailable for: EU-28, EL (2005), FR, IS, LI, CH, ME, AL, BA, IL, FO, MD; Data estimated for: BE, IE, PT, UK: 2012; Break in data series for: IE, PT, RO, SI, SE: all fields of study; DK: social sciences and humanities; HU: natural and social sciences, humanities and engineering and technology; Definition of data differs for: UK (2007);
Others: ':' indicates that data are unavailable, 'z': Not applicable; For proportions based on low numbers, numerators and denominators are displayed in the table.
Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.

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

The presence of women researchers is increasing in the natural sciences and engineering and technology fields of the higher education sector.

In order to better understand the representation of women researchers in the higher education sector, it is necessary to investigate the issue of horizontal segregation, i.e. the concentration of one sex in different fields over time. Table 4.2 displays the proportion of women researchers by field of science in 2005 and 2012 respectively.

An increase in the proportion of women researchers in the higher education sector has taken place across most fields of science, as illustrated by Table 4.2. For all fields of science combined, at least 20 countries experienced increases in the proportion of women researchers between 2005 and 2012. This was particularly true of engineering and technology (26 countries) and the social sciences (26 countries) ([31]).

The trend towards a higher proportion of women researchers was experienced most strongly by a number of countries (particularly the Netherlands and the United Kingdom) in natural sciences and engineering and technology fields. In natural sciences, the highest increases in the proportion of women researchers from 2005 to 2012 were recorded in Malta (9 percentage points, from 17 % to 26 %), the United Kingdom (13 percentage points, from 31 % to 44 %), Romania (15 percentage points, from 36 % to 51 %) and the Netherlands (15 percentage points, from 26 % to 41 %). A high rise was also noted in this field in the former Yugoslav Republic of Macedonia, although one should note the low number of researchers (25 in 2009). Only Bulgaria witnessed a significant fall in the proportion of women researchers, from 54 % to 47 % (7 percentage points). Furthermore, a number of countries experienced small decreases: Poland (0.1 percentage points), Finland (1 percentage points), Serbia (2 percentage points), Luxembourg (2 percentage points) and the Czech Republic (3 percentage points).

Comparatively, more countries experienced substantial increases in the proportion of women researchers in the engineering and technology field, with both the Netherlands and the United Kingdom increasing their proportion of women researchers by approximately 20 percentage points (21 % to 41 %, and 19 % to 40 %, respectively). Furthermore, the proportion of women researchers in this field increased from 21 % to 36 % (15 percentage points) in Latvia and from 18 % to 31 % (13 percentage points) in Cyprus between 2005 and 2012. Conversely, Finland, Luxembourg, Portugal and the Czech Republic experienced decreases, ranging from 0.2 percentage points to 5 percentage points, in the proportion of women researchers in this field.

The medical sciences and social sciences display more moderate increases in the proportion of women researchers across countries. Overall, the vast majority of countries experienced a slight surge in the proportion of women researchers in those two fields. Only the United Kingdom, Sweden, Bulgaria and Serbia recorded a drop in the proportion of women researchers working in the medical sciences (ranging from 1 percentage point in the United Kingdom to 8 percentage points in Serbia). Similarly, only Slovakia, the United Kingdom and Serbia experienced a slight decrease (between 1 percentage point and 2 percentage points) in the proportion of women working in the social sciences from 2005 to 2012. Displaying slightly more mixed results, in the agricultural sciences most countries recorded a small increase in the proportion of women researchers. The United Kingdom constitutes an exception, with a sizeable increase in the proportion of women from 33 % to 60 % (27 percentage points) being recorded. Whilst a few countries recorded minor decreases in proportions of women researchers (Bulgaria, Czech Republic, Romania, Slovakia and Finland), Sweden experienced the most significant drop, from 56 % to 47 % (9 percentage points), in the proportion of women researching in this field. Compared to the other fields of science in the higher education sector, about 30 % of the countries recorded a fall in the proportion of women researchers in the humanities field. Decreases in the proportion of women researchers in this field were recorded in nine countries (CY, NL, PT, HU, LV, DK, MT, UK and MK), ranging from 1 percentage point in Cyprus to 10 percentage points in the former Yugoslav Republic of Macedonia. However, the proportion of women researchers in this field increased importantly in Germany (from 36 % to 50 %, or 14 percentage points), Romania (from 33 % to 49 %, or 16 percentage points) and Luxembourg (from 35 % to 53 %, or 18 percentage points).

31 In a few cases, the values in 2005 and 2012 appear to be the same due to rounding. However, the text here refers to true data.

Table 4.3. Compound annual growth rates (%) of women researchers in the higher education sector, by field of science, 2005–2012

	NS		ET		MS		AS		SS		H	
	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend
BE	4.9		5.6		5.2		1.6		5.2		5.6	
BG	11.8		6.0		17.6		0.7		12.0		26.4	
CZ	10.2		2.5		1.7		-2.3		1.7		11.3	
DK	11.5		20.5		13.3		9.0		23.4		-4.8	
DE	8.8		11.7		6.8		7.7		7.1		11.0	
EE	5.3		6.2		3.9		5.6		3.8		5.8	
IE	2.1		3.7		6.3		3.3		3.3		4.8	
ES	1.7		3.0		2.8		4.0		4.4		1.5	
HR	10.3		6.6		-2.1		-0.7		2.5		-0.8	
IT	3.1		5.0		3.2		4.3		4.5		1.6	
CY	1.3		25.3		:		:		6.6		8.8	
LV	2.5		25.2		16.6		-1.0		4.8		-3.7	
LT	7.0		8.0		9.9		1.6		12.5		2.0	
LU	36.0		-8.6		:		:		39.6		24.8	
HU	0.7		3.4		-0.4		2.1		-2.9		-4.7	
MT	3.0		:		2.6		:		4.7		2.5	
NL	7.5		12.6		3.0		5.1		4.2		4.5	
AT	8.4		15.3		6.4		7.9		9.8		8.6	
PL	-2.3		-0.5		-0.9		-0.7		-0.9		5.2	
PT	7.9		8.5		23.3		4.6		15.8		14.6	
RO	19.0		4.6		-6.1		-1.4		14.7		60.9	
SI	12.3		4.7		10.2		1.0		6.5		1.5	
SK	0.0		6.5		13.1		2.3		5.1		10.3	
FI	3.6		0.2		1.0		1.0		4.4		6.0	
SE	0.9		5.1		3.1		0.8		:		:	
UK	7.0		16.6		0.2		8.3		1.4		-2.3	
NO	3.0		9.2		6.4		-4.7		5.8		1.6	
MK	47.0		-2.4		-9.4		-7.1		20.1		-21.9	
RS	16.8		3.8		-27.6		53.4		10.0		29.5	
TR	6.2		8.4		7.4		3.6		9.5		9.5	

Notes: Exceptions to the reference period: BE, DK, IE, SE: 2005–2011; AT: 2006–2011; FI, UK: 2007–2012; MK: 2005–2009; RS: 2008–2011; Data unavailable for: EU-28, CY (medical and agricultural sciences), EL, FR, IS, LI, CH, ME, AL, BA, IL, FO, MD; Data not reported due to low number of observations for: CY, LU: medical and agricultural science; MT: engineering and technology and agricultural science; Data estimated for: BE, IE, PT, UK: 2012; Break in data series for: IE, PT, RO, SI, SE: all fields of study; DK: social sciences and humanities; HU: natural and social sciences, humanities and engineering and technology; Definition differs: UK (2007);

Others: ':' indicates that data are unavailable; Field of science: NS = natural science; ET = engineering and technology; MS = medical sciences; AS = agricultural sciences; SS = social sciences; H = humanities; In the trend columns, the scale is not the same across countries. Missing bars represent missing data, not zeros; The 'trends' column represents the actual changes in the number of women and men researchers each year (headcount). This differs from the CAGR, which shows the average yearly change over the whole period.

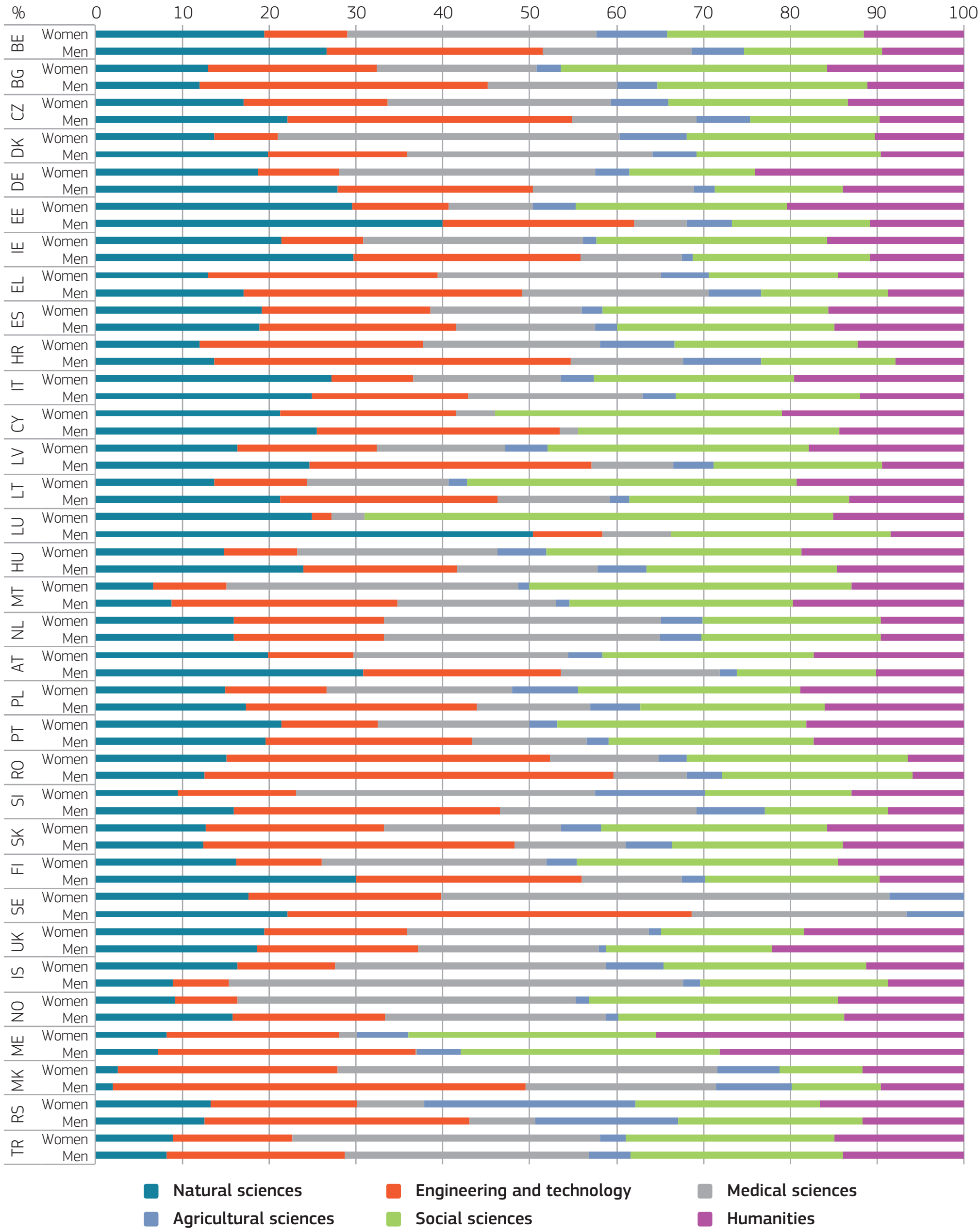
Source: Eurostat – Research and development statistics (online data code: rd_p_perssci)

Growth in the higher education sector, particularly in the natural sciences.

Table 4.3 illustrates the CAGR for women researchers in the higher education sector in the six fields of science, namely natural sciences, engineering and technology, medical sciences, agricultural sciences, social sciences and humanities. Specifically, it shows the average annual percentage change in the number of women researchers in each of these fields, in the period 2005–2012. The table can shed light on whether the number of women has been growing in the fields where they have a traditionally low presence (e.g. engineering and technology and natural sciences), and to which extent relative to other fields.

Overall, in most countries and in most fields the CAGR of women researchers has been positive. In the field of natural sciences, with the exception of Poland, all countries report positive annual compound growth rates. Equally, in engineering and technology and the social sciences, few countries record negative annual growth rates for the number of women researchers (engineering and technology: LU, PL and MK; social sciences: HU and PL). In the Humanities, Denmark, Croatia, Latvia, Hungary, the United Kingdom and the former Yugoslav Republic of Macedonia have negative compound annual growth rates, showing that overall the number of women researchers in the HES in these sectors fell between 2005 and 2012. For the Agricultural Sciences, this is the case in the Czech Republic, Croatia, Latvia, Poland, Romania, Norway and the former Yugoslav Republic of Macedonia. In the medical sciences, Croatia, Hungary, Poland, Romania, the former Yugoslav Republic of Macedonia and Serbia also record negative compound annual growth rates for women in the period 2005-2012.

Figure 4.13. Distribution of researchers in the higher education sector (HES), across fields of science, 2012



Notes: Exceptions to the reference year: BE, DK, IE, EL, AT, SE, IS, ME, RS: 2011; MK: 2009; Data unavailable for: EU-28, FR, LI, CH, AL, BA, IL, FO, MD; Data estimated for: BE, IE, UK; Break in time series for: EL; Data missing for: CY (agricultural sciences), LU (agricultural sciences), SE (social sciences and humanities); Other: Headcount (HC); Fewer than 20 observations for one or more fields: MT, ME.

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

Women researchers are most likely to work in the social sciences and medical sciences, although in 11 countries similar proportions of women and men work in traditionally male-dominated subjects, such as engineering and technology.

In 2012, women researchers made up 41 % of the research population in the higher education sector (as shown by Figure 4.5). This marks an increase from 37.8 % in 2005 to 40 % in 2009 (EU-28). Figure 4.13 offers further analytical nuance by illustrating the distribution of women and men researchers across the different fields of science in the higher education sector ([32]). Across the various fields, women researchers are most likely to work in the social sciences in 13 out of 31 countries ([33]) and in the medical sciences in 12 out of 31 countries ([34]). This is the case for natural sciences in only two countries (Estonia and Italy), and for engineering and technology in only three countries (Croatia, Greece and Romania) ([35]). Generally, the proportion of women researchers is the lowest in the agricultural sciences, with the exception of Serbia. Serbia displays the opposite trend: 24 % of women researchers in the higher education sector work in agricultural sciences.

Most countries have a sizeable proportion of women researchers working in the social sciences, although there is variation, with the percentage ranging from 54 % in Luxembourg to 14 % in Germany. In the medical sciences, the proportion of women researchers ranges from 2 % in Montenegro to 39 % in Denmark ([36]). Concerning the breakdown for each sex, in some countries women and men are concentrated in particular fields (judged here as more than 30 % of researchers of one sex working in a field ([37])). For instance, men researchers in the HES appear particularly prone to work in engineering and technology, with over 30 % working in this field in 10 countries. They are particularly unlikely to be working in the agricultural sciences (10 % or less work in this field in 31 out of 32 countries) and the humanities (10 % or less work in this field in 12 out of 32 countries). Women researchers also tend not to work in the agricultural sciences (10 % or less in this field in 30 countries), but in many countries the next least common field for women is engineering and technology (10 % or less in this field in 11 countries). In cases when women are spread unevenly across fields of science, as discussed above, the most common fields are the medical sciences and social sciences. In eight countries, over 30 % of women researchers work in the medical sciences, whilst in seven countries this is true of the social sciences.

Although the overall picture suggests women and men in the higher education sector conducting research in different fields conform to the 'traditional' divisions, it is worth pointing out exceptions. For instance, similar proportions of women and men researchers work in engineering and technology in 13 countries (DK, EL, ES, IT, CY, LU, HU, NL, RO, UK, IS, ME, TR), with less than 10 percentage points difference. In two countries (NL, UK) in particular, the proportions are very similar/the same – in the Netherlands, 17% of women researchers and men researchers respectively work in this field; in the United Kingdom, this is 16% of women and 19% of men.

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32 See Annex 4.5 for the table 'Number of researchers in the higher education sector (HES), by field of science and sex, 2012'.

33 BG, IE, ES, CY, LV, LT, LU, HU, MT, PL, PT, SK, FI. The former Yugoslav Republic of Macedonia has been excluded from this analysis, due to the early reference year (2009).

34 BE, CZ, DK, DE, EL, NL, AT, SI, UK, IS, NO, TR. Sweden has been excluded from all analysis of Figure 4.13, as data for two fields of science is missing.

35 In Greece, the same proportions of women researchers work in engineering and technology and the medical sciences (26 % in each respectively).

36 In fact, the highest proportion is observed in Sweden (51 %), but this is partly explained by the fact that for two fields of science (namely the social sciences and humanities) data are missing.

37 Note that there are six fields displayed in the figure. For an exactly even distribution across fields, 16.67 % of researchers would have to work in each field.

Table 4.4. Evolution of the proportion (%) of women researchers in the government sector, by field of science, 2005–2012

	2005						2012					
	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
BE	23	28	39	36	36	43	26	31	49	41	32	48
BG	53	34	50	52	60	64	53	34	79	62	65	65
CZ	32	18	55	45	52	44	33	21	66	38	48	45
DK	26	18	50	44	41	40	24	21 (4/19)	24	z	45	44
DE	27	18	45	35	42	46	31	23	52	43	48	54
EE	33	36	76	60	74 (14/19)	71	26	67 (18/27)	83	62	86	70
IE	29	39 (11/28)	67 (12/18)	35	45	0 (0/4)	21	19	91	35	47	z
EL	:	:	:	:	:	:	30	34	52	32	63	67
ES	42	39	49	47	45	49	43	37	54	48	46	46
HR	49	25	50	39	49	59	52	33	51	48	60	54
IT	34	25	47	42	53	55	41	37	53	46	55	51
CY	59	40 (6/15)	24 (4/17)	22	53	59 (13/22)	64	33 (1/3)	38 (3/8)	24	44	67
LV	60	24	68 (13/19)	48	64	56	58	21	56 (5/9)	68	77	83
LT	49	35	67 (6/9)	57	75	67	41	28	69	63	69	68
LU	32	22	54	30 (7/23)	37	40 (4/10)	40	27	83 (10/12)	31 (5/16)	37	30 (6/20)
HU	29	21	57	45	36	50	33	40	68	41	41	52
AT	25	33	42	25	47	49	29	41	53	30	49	56
PL	40	24	58	48	50	59	38	27	:	:	42	59
PT	62	42	57	57	57	66	65	44	62	62	63	68
RO	52	42	71	26	74	42	43	42	70	59	53	49
SI	37	33	50	41	62	53	39	44	62	48	64	52
SK	36	26	66	44	53	47	45	30	60	51	59	51
FI	39	28	:	51	52	70	43	31	:	48	57	67
SE	30	16	55	53	43	49	42	23	47	100 (1/1)	48	49
UK	27	17	44	40	51	62	29	13	45	44	57	53
NO	29	17	54	37	43	48	36	22	55	41	50	56
MK	50	44	67	43	58	44	55	49	62	48	46	56
RS	57	45	74	50	57	45	58	42	56	82	50	55
TR	24	27	30	29	41	0 (0/1)	31	23	30	36	36	16
RS	51	31	56	45	50	50	49	34	48	57	48	57
TR	41	30	44	27	37	41	43	32	47	30	41	43

Notes: Exceptions to reference period: EL: 2011 only; BE, HR: 2005–2011; AT: 2006–2011; DK: 2005–2010; FI, UK: 2007–2012; SE: 2007–2011; PL: 2005–2011 (MS, AS, SS, H); MK: 2005–2009; RS: 2008–2011; Data unavailable for: EU-28, EL (2005), FR, NL, IS, LI, CH, ME, AL, BA, IL, FO, MD; Definitions differ for: PT (NS, ET), SK (ET, NS, MS, AS), NO: 2005; NL (ET, NS, MS, AS, SS); SK, FI: 2012;

Others: ':' indicates that data are unavailable, 'z': not applicable; Fields of science: NS = natural sciences; ET = engineering and technology; MS = medical sciences; AS = agricultural sciences; SS = social sciences; H = humanities; In the trend columns, the scale is not the same across countries. Missing bars represent missing data, not zeros; DK's data unreliable in 2011 and 2012 (nearly 100% of women out of the total).

Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.

Source: Eurostat – Statistics on research and development (online data code: rd_p_perssci)

The proportion of women researchers in the government sector is growing in most fields of science.

In 2011, the government sector employed slightly more than 10 % of researchers in the EU ([38]). As Figure 4.4 (above) illustrates, in the EU-28 a higher proportion of women researchers than men worked in the government sector in 2011 (women: 12.5 %; men: 8.9 %). In the context of the economic crisis, the public sector has experienced major cutbacks across the EU. Tracing other evolutions in the government sector, Table 4.4 shows the proportion of women working in different fields of science in 2005 and 2012, by country. There have been increases in most fields of science in the government sector between 2005 and 2012. Increases were most often observed in the agricultural sciences, natural sciences and engineering and technology across countries, although most countries showed increases for all fields. The upward trend was strongest in the agricultural sciences. Only three countries, the Czech Republic, Hungary and Finland, recorded moderate drops in the proportion of women researchers in the agricultural sciences. Conversely, Romania, Sweden and Serbia recorded increases of over 30 percentage points in this field of science (note that for Sweden, the proportion is computed on one woman out of one researcher).

The picture is slightly more mixed with regards to the engineering and technology field, although there were rises in the proportion of women researchers in 20 out of 28 countries. In particular, Estonia, Hungary, Italy, and Slovenia displayed increases of more than 10 percentage points in the proportion of women researchers in the engineering and technology field. On the other hand, moderate decreases were noted in seven countries (LV, ES, RS, UK, TR, LT and CY). Most starkly, Ireland's proportion of women researchers in the engineering and technology field dropped by 20 percentage points (from 39 % to 19 %) between 2005 and 2012 (although it should be noted that the first proportion was based on a low number of observations).

In many countries, the proportion of women working in the medical sciences in the government sector was above 50 % in 2005. In 2012, the trend for women to constitute a majority in this field was consolidated (up from 16 to 21 countries). Numerous countries experienced large increases in the proportions of women working in the medical sciences, with Bulgaria, Luxembourg, Ireland, Cyprus, Slovenia, Austria, the Czech Republic, Hungary and Belgium displaying surges ranging from 29 percentage points (Bulgaria) to 10 percentage points (Belgium). In particular, the proportion of women researchers in the medical sciences increased by 29 percentage points in both Bulgaria (50 % to 79 %) and Luxembourg (54 % to 83 %). In Luxembourg, however, there were fewer than 20 researchers working in the medical sciences in 2012 (see Annex 4.6), which potentially distorts these proportions.

Moderate increases in the proportion of women researchers in the government sector were also observed in the social sciences and humanities from 2005 to 2012. In the social sciences field, the proportion of women researchers increased importantly, by more than 10 percentage points, in Croatia (49 % to 60 %), Estonia (74 % to 86 % ([39])) and Latvia (64 % to 77 %). Conversely, nine countries (CZ, BE, LT, TR, RS, PL, CY, MK, RO) recorded decreases in the proportion of women researchers in the social sciences, ranging from 3 percentage points in the Czech Republic to 22 percentage points in Romania. In the humanities, Latvia and the former Yugoslav Republic of Macedonia recorded an increase of more than 10 percentage points (from 56 % to 83 %, and 44 % to 56 %, respectively) ([40]) in the proportion of women researchers. In contrast, decreases were observed in eight countries, ranging from 0.6 percentage points in Estonia to 10 percentage points in Luxembourg (EE, SI, ES, FI, IT, HR, UK, LU).

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38 The percentage covers the EU-28 in 2011. See Eurostat, 'Total R&D personnel and researchers by sectors of performance, sex and fields of science' (rd_p_perssci).

39 However, note the small number of researchers working in the social sciences in Estonia in 2012. See Annex 4.6.

40 The same holds for Turkey, but the population size was extremely small in 2005.

Table 4.5. Compound annual growth rate (%) of women researchers in the government sector, by field of science, 2005–2012

	NS		ET		MS		AS		SS		H	
	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend
BE	13.8		5.9		0.0		4.6		-4.0		2.1	
BG	-1.3		-6.7		-5.8		3.3		8.7		-2.6	
CZ	1.8		-8.4		0.5		-9.2		-3.8		3.1	
DK	-15.8		-45.5		-13.6		:		13.5		3.8	
DE	7.9		8.6		12.4		4.9		7.7		8.8	
EE	0.3		-0.8		5.9		9.1		14.4		-0.3	
IE	-16.0		7.3		14.0		5.2		7.2		:	
ES	10.1		2.2		2.5		-3.5		2.5		0.0	
HR	1.3		7.8		1.1		5.1		0.0		3.6	
IT	5.6		12.9		9.0		10.8		-1.6		-1.7	
CY	1.0		-22.6		-4.0		0.0		-3.1		6.3	
LV	8.6		18.3		-12.8		5.7		-0.3		-13.2	
LT	-5.3		-6.5		22.6		-1.4		1.6		1.2	
LU	17.0		4.7		-8.8		-4.7		18.3		6.0	
HU	4.7		5.7		-4.2		-5.7		-4.3		0.0	
AT	11.7		-4.7		11.5		3.0		7.2		4.8	
PL	-1.0		6.3		4.2		-0.1		4.0		3.8	
PT	-3.8		-0.5		2.7		-13.9		-6.0		-5.8	
RO	-1.6		2.0		-6.8		25.8		-20.8		12.4	
SI	4.0		-7.4		2.0		9.9		9.5		2.3	
SK	8.7		4.9		-4.0		9.0		-1.8		12.0	
FI	-4.7		4.5		:		3.0		3.8		5.2	
SE	-0.8		16.8		80.0		-56.1		-5.7		-15.2	
UK	-2.2		-2.6		-4.2		-2.8		0.0		6.1	
NO	7.5		6.7		17.2		-0.2		4.1		7.5	
MK	0.0		3.9		-22.9		-12.0		32.3		-16.0	
RS	9.5		-6.8		25.8		-12.0		-16.6		31.2	
TR	6.7		5.4		-17.6		8.6		19.2		:	

Notes: Exceptions to reference period: BE, HR: 2005–2011; AT: 2006–2011; DK: 2005–2010; FI, UK: 2007–2012; SE: 2007–2011; PL: 2005–2011 (MS, AS, SS, H); MK: 2005–2009; RS: 2008–2011; Data unavailable for: EU-28, EL, FR, NL, IS, LI, CH, ME, AL, BA, IL, FO, MD; Definitions differ for: PT (NS, ET), SK (ET, NS, MS, AS), NO: 2005; NL (ET, NS, MS, AS, SS); SK, FI: 2012; MT data excluded due to low number of observations for all fields; FI data excluded in the medical sciences due to low number of observations; TR data excluded in the humanities due to low number of observations; Some data excluded due to low reliability: DK (AS); IE (H); Low number of observations (fewer than 20 for start and end year): DK (ET); EE (ET, SS); IE (NS, ET, MS); HR (ET); LU (MS, AS, H); LV (ET, MS); CY (ET, MS, AS, SS, H); SE (AS); MK (NS, ET); Others: ':' indicates data unavailable; Field of science: NS = natural science; ET = engineering and technology; MS = medical sciences; AS = agricultural sciences; SS = social sciences; H = humanities; DK's data unreliable in 2011 and 2012 (nearly 100 % of women out of the total)

Note: The 'trends' column represents the actual changes in the number of women and men researchers each year (headcount). This differs from the CAGR, which shows the average yearly change over the whole period. In the trend columns, the scale is not the same across countries. Missing bars represent missing data, not zeros.

Source: Eurostat – Statistics on research and development (online data code: rd_p_perssci)

The government sector: Mixed results by field of science in terms of increases in the number of women researchers.

Table 4.5 offers an even more detailed picture of the evolution of the government sector. It displays the CAGRs in the number of women researchers, by field of science.

Overall, CAGRs in the government sector are both positive and negative within fields of science and across countries. Nevertheless, a majority of countries recorded a positive CAGR for women in each field of science in this period (here a majority is defined as 50 % or more of the countries for which data are available ([41]) for each field of science). For instance, from 2005 to 2012, 17 countries (out of 28) had a positive growth rate in engineering and technology, natural sciences and the humanities; this was true

41 Note that it is not always the same countries showing positive growth in each field of science.

of 16 countries in the social sciences and 15 countries in the medical sciences. However, considering the reverse situation, 11 out of 28 countries recorded negative growth rates in the number of women researchers in engineering and technology and the medical sciences and social sciences. Negative growth rates were recorded in 12 countries (out of 27) for the agricultural sciences, in 10 countries for natural sciences and in 8 countries in the humanities.

In the medical sciences (government sector), comparatively high CAGRs were recorded for selected countries. Seven countries recorded a positive growth rate of 10 % and above (DE, IE, LT, AT, SE, RS, NO). Similarly, these high growth rates were experienced by four countries (BE, ES, LU, AT) in natural sciences and by five countries in the social sciences (DK, EE, LU, MK, TR). Conversely, growth rates over 10 % were recorded by only three countries in the engineering and technology field (IT, LV and SE) and the humanities field (RO, SK and RS). In the agricultural sciences, two countries (IT and RO) reported growth rates of more than 10 %.

The government sector: Women researchers are most prominent in natural sciences.

In the higher education sector, most women researchers work in the social sciences or medical sciences. In contrast, in the government sector, by far the most women researchers work in the natural sciences. Using Figure 4.14, one is able to gauge the distribution of researchers across different fields of science in the government sector ([42]). In 15 out of the 31 countries for which data are consistently available across fields of science, the highest proportion of women researchers is found in natural sciences. The percentage varies widely across countries, with 6 % of women researchers working in natural sciences in Ireland, whilst 55 % do so in Latvia. It is also worthy of mention that in seven countries (ES, HR, IT, PT, SE, NO and ME), the highest proportion of women researchers is found in the medical sciences, whilst this is the case for three countries in the agricultural (IE, MT and TR) and social sciences (DK, NL and AT). For engineering and technology, only one of the 31 countries (BE) has the highest proportion of women working in the government sector, compared to two countries where this is the case in humanities (EE and EL).

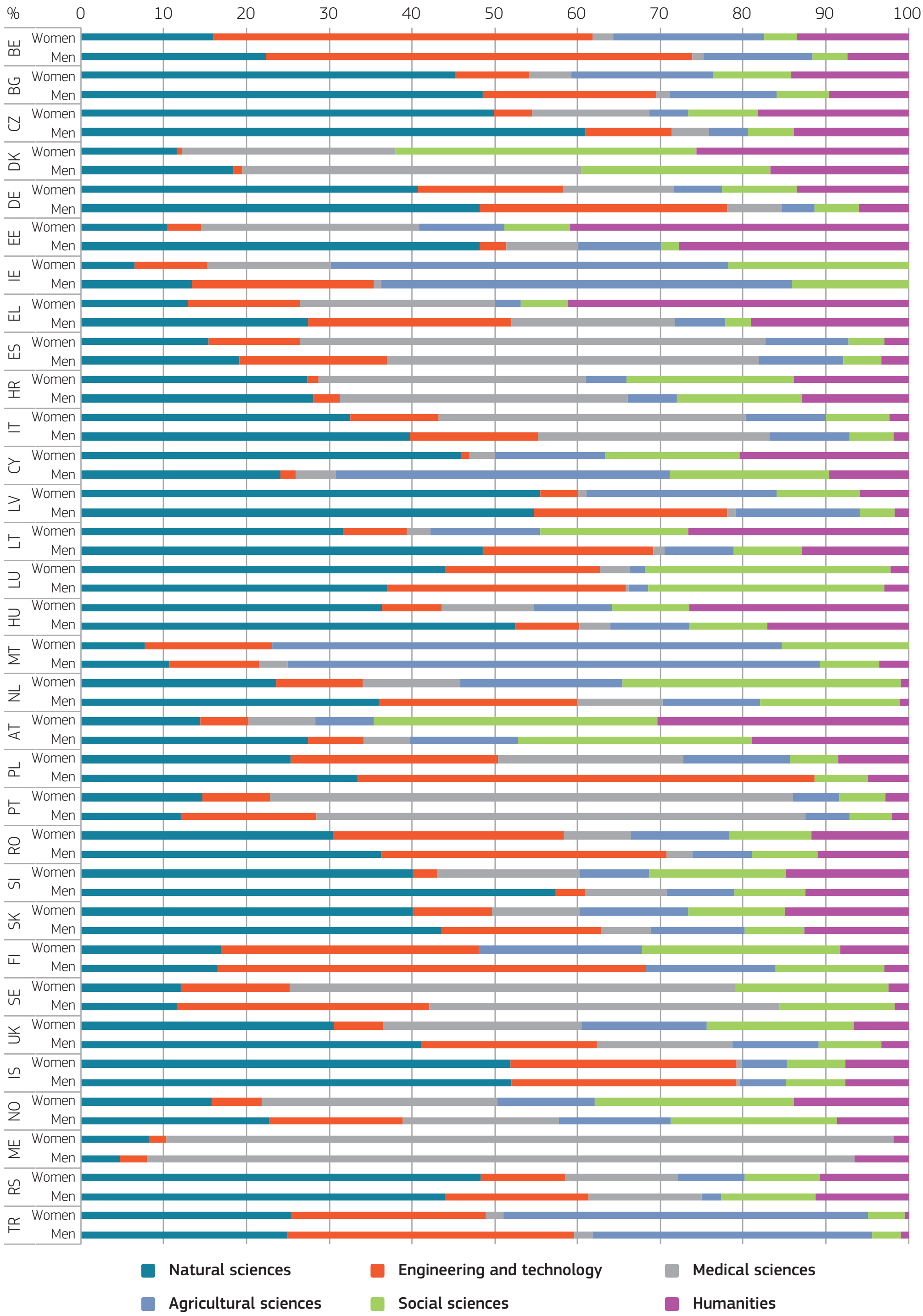
Figure 4.14 also shows that men researchers in the government sector are most likely to work in natural sciences ([43]). In 18 countries (BG, CZ, DE, EE, EL, IT, LV, LT, LU, HU, NL, RO, SI, SK, UK, IS, NO, RS), this was the field in which men researchers most commonly worked. The next most popular field for men researchers was medical sciences (in six countries: DK, ES, HR, PT, SE, ME), followed by both engineering and technology (two countries: BE, TR) and the agricultural sciences (three countries: IE, CY, MT). It thus appears that the government sector shows more similarities than the higher education sector when it comes to the fields of science in which women and men researchers most commonly work. However, there are some countries that show striking differences when it comes to the most attractive subjects for each sex. In Estonia, 48 % of men researchers in the government sector are found in natural sciences, whereas 41 % of women researchers are found in the humanities. In Cyprus, 46 % of women researchers are found in natural sciences, whilst 40 % of men researchers work in the agricultural sciences ([44]).

42 See Annex 4.6 for underlying data. Note that FI is excluded from the analysis of Figure 4.14 due to missing data for the medical sciences.

43 PL excluded from analysis of men's fields, due to missing data for two fields.

44 However, in Cyprus, there is a relatively low number of researchers in the GOV sector overall (202 in 2012), which makes the proportions more likely to fluctuate year on year. There is also a small number of other countries (EL, LT, NL, UK) with fairly large differences in the subject choices of women and men in the government sector (although not to the same degree as in Cyprus and Estonia).

Figure 4.14. Distribution of researchers in the government sector (GOV), across fields of science, 2012



Notes: Exceptions to reference period: BE, EL, HR, AT, SE, PL, IS, NO, ME: 2011; DK: 2010; Data unavailable for: EU-28, FR, CH, LI, ME, MK, AL, BA, IL, FO, MD; Definitions differ for: NL, SK, FI, SE; Some data confidential: PL (men); Break in time series for: EL, SE; Data missing for: IE (mathematics), MT (Women: medical sciences and humanities), PL (Men: agricultural and medical sciences), FI (medical sciences), ME (agricultural and social sciences);
Other: Headcount (HC); Fewer than n=20 observations for one or more fields: DK, CY, LV, LU, MT, SE, IS, ME.

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

Table 4.6. Evolution in the proportion (%) of women researchers in the business enterprise sector, by field of science, 2005–2012

	2005						2012					
	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
BG	44	45	71	62 (8/13)	48 (10/21)	z	c	31	c	60	c	c
CZ	16	11	48	42	32	45	22	9	50	36	25	31
EL	31	22	90	48	54	30	47	25	61	34	44	58 (11/19)
FR	28	15	63	41	53	62	25	14	59	45	36	45
HR	70	26	84	59	0 (0/5)	z	73	33	79	16 (3/19)	59 (10/17)	50 (1/2)
CY	36	11	22 (4/18)	13 (1/8)	32 (8/25)	z	38	14	44	0 (0/2)	35	z
HU	15	23	39	26	34	29 (2/7)	15	18	44	34	28	62 (8/13)
MT	7	16	60	0 (0/5)	38 (3/8)	z	27	19	66	0 (0/5)	44 (7/16)	75 (3/4)
PL	43	22	62	40	44	50 (1/2)	24	14	65	43	35	47
PT	35	21	58	41	56	45	26	28	70	46	44	46
RO	45	40	70	47	:	:	48	34	59	38	36	25 (1/4)
SI	32	18	56	57 (4/7)	39 (9/23)	z	40	18	58	60	44	81 (17/21)
SK	40	24	63	49	51	z	24	15	54	64	42	41
RS	49	35	78	58	60	z	31 (4/13)	21	0 (0/1)	54	80 (4/5)	z
TR	34	23	61	43	40	35	25	21	54	37	40	55

Notes: Exceptions to the reference years: BG: 2005–2010, EL: 2005–2011, FR: 2007–2011, RS: 2008–2011; Data unavailable for: EU-28, BE, DK, DE, EE, IE, ES, IT, LV, LT, LU, NL, AT, FI, SE, UK, IS, LI, NO, CH, ME, MK, AL, BA, IL, FO, MD; Data confidential for: BG (2012); Definitions differ for: PT (natural sciences and engineering and techology: 2005); Break in time series for: EL, NL: 2011;

Others: ':' indicates data unavailable, 'c': confidential, 'z': not applicable; Fewer than 20 observations for: BG, CZ, HR, CY, HU, MT, PT, RO, SI, SK, RS.

Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.

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

The proportion of women researchers in particular fields of science in the business enterprise sector has decreased in many countries.

In contrast to the higher education and the government sector, data on the proportion of women researchers in different fields of science in the business enterprise sector (in 2005 and 2012) are available for only 15 countries ([45]).

As Table 4.6 illustrates, in most countries women researchers were best represented in the medical sciences in 2012. In this field of the business enterprise sector, 13 countries have a proportion of women researchers equal to or above 40 % whilst in 11 of these countries the proportion of women researchers is equal to or above 50 % in this field. Eight countries recorded a proportion of women researchers equal to or over 40 % in the social sciences in 2012, as did seven countries in the agricultural sciences and four countries in natural sciences. The lowest result was found in engineering and technology: only three countries in 2012 have a proportion of women researchers equal to or over 30 % (and none have a proportion equal to or over 40 %).

45 Furthermore, a number of exception to the reference periods are in use. See the notes beneath the table for more information.

Mixed results were recorded when considering the evolution of the proportion of women researchers from 2005 to 2012. Increases in the proportion of women researchers in some fields generally offset decreases in other fields in the business enterprise sector. In the engineering and technology, agricultural sciences and social sciences fields, the number of countries that experienced a decrease in the proportion of women researchers outnumbered those experiencing an increase. In the engineering and technology field, the proportion of women researchers decreased in ten out of 15 countries (BG, CZ, FR, HU, PL, RO, SI, SK, RS, TR). Only in Greece, Croatia, Cyprus, Malta and Portugal did the proportion of women researchers working in this field increase.

Similarly, in the social sciences the proportion of women researchers decreased in eight countries (CZ, EL, FR, HU, PL, PT, SK, TR) and increased in only five countries (HR, CY, MT, SI, RS). For the agricultural sciences, six countries (FR, HU, PL, PT, SI, SK) recorded increases in the proportion of women researching in this field in the business enterprise sector, whilst eight countries reported decreases (BG, CZ, EL, HR, CY, RO, RS, TR). Displaying marginally better results, in natural sciences the proportion of women researchers increased in eight countries and decreased in six countries, whilst in the medical sciences the same number of countries (seven) reported increases and decreases. Although far fewer data are available for the humanities as a field of science, the results show that developments in terms of the proportion of women researchers were mixed across countries. Out of the seven countries for which data were available, four countries (EL, HU, PT, TR) increased their proportion of women researchers, whilst three countries (CZ, FR, PL) experienced decreases. Countries that experienced increases in their proportion of women researchers across most fields of science in the business enterprise sector were Cyprus, Hungary, Malta, Portugal and Slovenia (four out of six fields) ([46]).

46 Note that it is not always the same countries showing positive growth in each field of science. In other words, increases do not refer to the same fields of science for all countries.

Annex 4.1. Number of researchers, by sex, 2008–2012

	2008		2009		2010		2011		2012	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-28	:	:	765 702	1 565 171	798 617	1 630 611	834 865	1 693 829	:	:
BE	17 597	37 027	18 270	37 588	19 748	39 655	21 153	42 054	:	:
BG	6 310	7 106	7 000	7 699	6 870	7 268	7 259	7 535	7 398	7 821
CZ	12 613	31 627	12 437	30 655	12 198	31 220	12 936	32 966	13 102	34 549
DK	:	:	17 160	36 889	17 865	36 948	18 831	38 014	20 370	38 198
DE	:	:	121 631	365 611	:	:	139 879	382 131	:	:
EE	3 013	4 213	3 166	4 287	3 249	4 242	3 342	4 304	3 358	4 276
IE	6 791	14 249	7 154	13 747	7 165	13 636	7 177	14 954	:	:
EL	:	:	:	:	:	:	16 609	28 630	:	:
ES	81 599	136 117	84 352	136 962	86 053	137 947	85 237	135 017	83 643	131 901
FR	79 161	209 880	79 723	216 370	82 256	242 295	86 635	251 835	91 227	265 242
HR	5 424	6 491	5 620	6 488	5 879	6 648	5 417	6 037	5 440	5 962
IT	48 290	97 304	50 525	98 789	51 646	98 161	52 833	98 764	56 078	101 882
CY	522	1 043	603	1 093	640	1 136	714	1 223	714	1 200
LV	4 071	3 376	3 312	3 012	3 313	3 204	3 929	3 448	4 222	3 773
LT	6 954	6 564	7 081	6 801	7 203	6 853	9 038	8 320	9 255	8 422
LU	:	:	626	2 325	:	:	784	2 483	:	:
HU	11 139	22 600	11 323	23 944	11 418	24 282	11 729	25 216	11 453	25 566
MT	301	786	278	667	303	774	342	931	428	1 023
NL	:	:	14 104	40 401	:	:	19 983	63 008	:	:
AT	:	:	16 877	42 464	:	:	19 020	46 589	:	:
PL	38 509	58 965	38 794	59 371	39 383	61 551	38 908	61 815	39 681	63 946
PT	32 301	42 772	33 342	41 864	35 204	45 055	36 199	46 155	36 805	44 945
RO	13 817	17 047	13 707	16 938	13 519	17 188	11 738	13 751	12 565	15 273
SI	3 551	6 573	3 724	6 720	4 018	7 038	4 550	7 964	4 426	7 936
SK	8 383	11 431	9 272	12 560	10 192	13 857	10 530	14 181	10 595	14 474
FI	16 958	38 237	17 530	38 267	18 247	38 916	18 452	39 097	18 286	38 418
SE	:	:	25 996	46 868	:	:	29 793	50 246	:	:
UK	:	:	146 211	239 278	151 280	243 475	161 848	267 161	167 375	275 010
IS	1 574	2 584	1 599	2 155	:	:	1 221	2 049	:	:
NO	14 892	28 807	15 770	28 992	15 998	28 776	16 501	29 077	16 923	29 824
CH	13 846	32 028	:	:	:	:	:	:	19 537	40 741
ME	:	:	:	:	:	:	771	775	:	:
MK	1 056	1 000	920	875	:	:	:	:	:	:
RS	5 439	6 095	5 696	6 310	6 169	6 468	6 716	6 893	:	:
TR	38 832	67 591	41 528	72 908	44 671	80 125	48 984	88 468	56 081	99 052

Notes: Data unavailable: LI, AL, BA, IL, FO, MD; Break in time series for: PT, SI: 2008; FR: 2010; EL, NL, RO, SI, IS: 2011; Definition differs for: FR; Data estimated for: UK: 2009, 2010, 2011, 2012; EU-28: 2009, 2010; IE: 2009, 2010; DK: 2010, 2012; Data provisional for: CZ (2012);
Others: ':' indicates that data are unavailable; Headcount (HC).

Source: Eurostat – Research and development statistics (online data rd_p_persocc)

Annex 4.2. Number of researchers in the higher education sector, by sex, 2008–2012

	2008		2009		2010		2011		2012	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-28	:	:	499 220	747 923	517 961	769 821	535 217	780 616	546 593	786 597
BE	11 262	18 083	11 835	18 519	12 093	18 468	12 573	18 780	:	:
BG	2 210	3 095	2 839	3 736	2 898	3 574	3 189	3 851	3 271	3 899
CZ	6 619	12 391	6 878	12 541	6 848	13 129	7 184	13 548	7 226	13 908
DK	:	:	9 411	13 560	9 939	13 980	10 176	15 672	11 120	14 762
DE	68 686	132 296	75 936	142 214	82 610	149 251	87 734	153 677	92 958	158 982
EE	2 000	2 357	2 062	2 423	2 157	2 467	2 149	2 489	2 223	2 519
IE	4 493	7 117	4 638	6 716	4 607	6 451	4 593	6 321	:	:
EL	:	:	:	:	:	:	11 679	21 163	:	:
ES	47 689	74 478	49 790	75 340	52 015	77 681	51 537	75 548	50 297	72 948
FR	37 705	71 508	36 250	69 258	35 799	73 627	36 694	73 455	37 049	74 351
HR	3 434	4 322	3 389	4 077	3 671	4 332	3 356	3 866	3 364	3 785
IT	27 507	47 433	29 170	47 915	29 369	46 321	29 268	45 481	30 591	46 063
CY	295	580	360	626	401	680	479	781	480	783
LV	2 985	2 683	2 631	2 417	2 497	2 335	2 859	2 602	3 125	2 768
LT	5 528	4 797	5 663	4 970	5 770	4 916	7 534	6 130	7 754	6 185
LU	124	243	197	353	235	415	316	480	345	540
HU	6 840	11 741	6 644	11 751	6 274	11 058	6 267	10 792	6 251	10 300
MT	214	554	183	438	204	467	199	466	240	516
NL	7 765	13 912	8 321	14 236	8 921	14 529	9 946	14 439	10 040	14 363
AT	:	:	10 965	18 074	:	:	12 464	19 544	:	:
PL	29 379	40 992	29 744	40 848	29 804	41 025	29 590	40 645	29 385	39 538
PT	21 497	24 959	22 493	24 224	23 192	25 485	22 538	24 479	23 562	24 445
RO	7 858	9 721	8 279	9 858	8 214	10 326	7 224	7 862	7 272	8 297
SI	1 619	2 545	1 723	2 508	1 972	2 724	2 065	2 873	1 958	2 737
SK	6 381	8 002	7 359	9 126	8 044	9 782	8 303	10 060	8 130	9 881
FI	9 612	11 036	9 987	11 463	10 658	12 074	10 818	12 175	10 964	12 209
SE	:	:	16 712	20 854	:	:	18 162	22 693	:	:
UK	:	:	124 310	159 967	128 456	162 280	136 321	170 744	140 254	174 976
IS	584	734	619	730	:	:	619	691	:	:
NO	8 877	11 713	9 392	11 923	9 607	12 036	9 783	12 029	10 010	11 891
CH	11 408	22 195	:	:	13 326	24 983	:	:	15 037	26 358
ME	:	:	:	:	:	:	438	480	:	:
MK	607	582	539	549	:	:	:	:	:	:
RS	3 788	4 624	3 865	4 681	4 594	5 074	5 020	5 486	:	:
TR	32 308	47 875	33 802	49 479	35 590	52 307	38 757	56 431	44 719	63 759

Notes: Data unavailable: LI, AL, BA, IL, FO, MD; Break in time series for: PT: 2008; EL, RO, SI, IS: 2011; Data estimated for: EU-28, UK: 2009–2012; IE: 2009, 2011
Data provisional for: LU: 2010; CZ: 2012; Definition differs for: FR, TR;
Others: ':' indicates that data are unavailable; Headcount (HC).

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

Annex 4.3. Number of researchers in the government sector, by sex, 2008–2012

	2008		2009		2010		2011		2012	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-28	93 082	141 547	97 146	145 291	100 261	147 185	104 310	150 561	106 637	149 968
BE	998	2 094	1 056	2 195	1 029	2 040	1 077	2 138	:	:
BG	3 323	2 933	3 249	2 766	3 191	2 686	3 233	2 653	3 026	2 459
CZ	3 573	6 038	3 126	5 286	2 966	5 050	3 132	5 088	3 038	4 947
DK	:	:	714	1 257	684	1 346	749	1 289	917	1 175
DE	16 720	36 749	18 852	39 246	20 263	41 079	21 507	42 772	22 548	42 990
EE	455	299	444	279	455	290	443	290	448	278
IE	228	359	206	381	202	405	214	385	202	356
EL	:	:	:	:	:	:	2 931	3 163	:	:
ES	15 677	16 976	16 618	17 659	16 314	17 570	16 021	17 257	15 599	16 593
FR	10 141	19 065	10 693	19 794	9 564	17 869	9 714	17 912	9 920	18 079
HR	1 427	1 424	1 609	1 498	1 622	1 501	1 528	1 373	:	:
IT	9 008	11 377	9 080	11 667	10 035	12 301	10 925	12 790	11 905	14 025
CY	99	125	93	108	99	107	103	112	98	104
LV	529	491	447	391	453	331	556	359	557	407
LT	891	789	955	809	891	708	880	852	870	830
LU	:	:	230	418	252	463	276	516	273	479
HU	2 198	3 552	2 391	3 582	2 505	3 643	2 565	3 672	2 377	3 349
MT	23	19	22	28	22	25	21	29	15	31
NL	2 280	5 523	2 353	5 383	2 376	5 524	2 722	5 391	3 590	5 334
AT	:	:	1 355	1 790	:	:	1 467	1 870	:	:
PL	5 892	9 046	6 367	9 095	6 877	9 359	6 457	9 641	6 501	9 127
PT	2 679	1 742	2 674	1 751	3 106	1 995	3 702	2 357	2 910	1 874
RO	3 332	3 209	2 975	3 035	2 912	2 919	2 833	3 284	3 145	3 519
SI	1 090	1 372	1 124	1 348	1 118	1 339	1 031	1 122	1 042	1 127
SK	1 486	1 788	1 461	1 814	1 578	1 906	1 598	1 921	1 725	1 958
FI	2 437	3 250	2 444	3 318	2 638	3 332	2 551	3 386	2 509	3 168
SE	:	:	862	1 355	:	:	3 200	3 196	:	:
UK	3 444	6 388	3 471	6 350	3 339	6 375	2 874	5 743	3 118	5 634
IS	488	603	576	654	:	:	214	292	:	:
NO	2 264	3 256	2 511	3 471	2 581	3 469	2 729	3 476	2 783	3 433
CH	337	697	:	:	328	627	:	:	326	654
ME	:	:	:	:	:	:	281	213	:	:
MK	395	405	317	310	:	:	:	:	:	:
RS	1 480	1 258	1 507	1 275	1 465	1 201	1 636	1 293	:	:
TR	1 688	4 004	1 939	4 693	2 063	5 036	2 166	4 907	2 222	5 137

Notes: Data unavailable for: LI, AL, BA, IL, FO, MD; Data estimated for: EU-28: 2008–2012; Data provisional for: CZ: 2012; Break in time series for: FR: 2010; EL, RO, SI, SE, IS: 2011; Definitions differ for: FR, NL, SK: 2008–2012; SE: 2009, 2011; NO: 2008, 2009; CH: 2008, 2010, 2012;
Others: ':' indicates that data are unavailable; Fewer than n=20 observations: MT.

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

Annex 4.4. Number of researchers in the business enterprise sector, by sex, 2008–2012

	2008		2009		2010		2011		2012	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-28	:	:	158 638	658 420	169 868	:	183 848	748 435	:	:
BE	5 215	16 662	5 260	16 682	6 501	18 950	7 390	20 935	:	:
BG	723	1 024	878	1 146	731	941	786	961	1 022	1 366
CZ	2 386	13 085	2 359	12 691	2 302	12 882	2 541	14 157	2 760	15 566
DK	:	:	6 915	21 972	7 080	21 517	7 756	20 963	8 159	22 167
DE	:	:	26 843	184 152	:	:	30 638	185 682	:	:
EE	495	1 491	578	1 522	584	1 437	695	1 479	616	1 423
IE	2 070	6 773	2 310	6 650	2 356	6 780	2 370	8 248	:	:
EL	:	:	:	:	:	:	1 805	4 053	:	:
ES	17 942	44 299	17 588	43 528	17 401	42 313	17 441	41 950	17 506	42 098
FR	29 527	116 962	31 088	124 941	35 705	148 206	38 699	158 357	42 665	170 525
HR	561	738	619	902	583	804	528	786	586	780
IT	8 941	35 483	9 493	36 364	9 394	36 507	9 927	37 889	10 796	39 154
CY	95	282	108	287	99	278	95	259	96	232
LV	557	202	234	204	363	538	514	487	540	598
LT	535	978	463	1 022	542	1 229	624	1 338	631	1 407
LU	:	:	199	1 554	:	:	192	1 487	:	:
HU	2 101	7 307	2 288	8 611	2 639	9 581	2 897	10 752	2 825	11 917
MT	64	213	73	201	77	282	122	436	173	476
NL	:	:	3 430	20 782	:	:	7 315	43 179	:	:
AT	:	:	4 362	22 320	:	:	4 859	24 875	:	:
PL	3 221	8 909	2 675	9 419	2 674	11 124	2 827	11 472	3 717	15 165
PT	5 397	12 809	5 475	12 651	5 744	13 491	6 442	14 749	7 074	14 397
RO	2 579	4 044	2 400	3 989	2 320	3 862	1 609	2 513	2 063	3 388
SI	834	2 641	871	2 851	922	2 965	1 445	3 962	1 421	4 059
SK	514	1 628	448	1 610	502	2 040	567	2 142	688	2 592
FI	4 611	23 733	4 776	23 249	4 591	23 258	4 702	23 258	4 445	22 780
SE	:	:	8 385	24 606	:	:	8 317	24 196	:	:
UK	16 824	71 067	16 521	69 786	17 935	72 243	20 745	87 870	22 023	91 486
IS	449	1 197	358	719	:	:	352	1 026	:	:
NO	3 751	13 838	3 867	13 598	3 810	13 271	3 989	13 572	4 130	14 500
CH	2 101	9 136	:	:	:	:	:	:	4 174	13 729
ME	:	:	:	:	:	:	47	78	:	:
MK	54	13	64	16	:	:	:	:	:	:
RS	163	209	316	350	110	193	52	113	:	:
TR	4 836	15 712	5 787	18 736	7 018	22 782	8 061	27 130	9 140	30 156

Notes: Data unavailable for the reference period: LI, AL, BA, IL, FO, MD; Data estimated for: EU-28: 2009; DK: 2010, 2012; IE; 2010; UK: 2008–2010; Data provisional for: CZ: 2012; Break in time series for: EL, NL, RO, SI, IS: 2011; SI: 2008; Definitions differ for: NO: 2008–2012;
Others: ':' indicates that data are unavailable; Headcount (HC).

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc)

Annex 4.5. Number of researchers in the higher education sector, by field of science and sex, 2012

	Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences		Humanities	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
AT	2 479	6 036	1 220	4 442	3 085	3 576	489	384	3 030	3 114	2 161	1 992
BE	2 442	5 012	1 203	4 647	3 603	3 218	1 025	1 143	2 842	2 987	1 458	1 773
BG	424	471	635	1 291	603	577	90	182	1 004	943	515	435
CZ	1 232	3 087	1 199	4 538	1 861	2 001	470	846	1 492	2 075	972	1 361
DK	1 460	3 028	776	2 438	4 177	4 304	811	771	2 304	3 214	1 091	1 474
DE	17 462	44 423	8 588	35 653	27 430	29 523	3 636	3 742	13 441	23 385	22 402	22 256
EE	657	1 006	248	555	213	154	111	131	541	398	453	275
EL	1 517	3 606	3 088	6 798	2 995	4 540	640	1 283	1 744	3 074	1 695	1 862
ES	9 642	13 832	9 770	16 475	8 765	11 670	1 169	1 850	13 071	18 242	7 879	10 881
HR	404	517	867	1 553	681	488	290	341	707	588	415	298
HU	925	2 462	526	1 824	1 438	1 664	355	588	1 836	2 247	1 171	1 515
IE	983	1 877	436	1 652	1 156	737	73	82	1 218	1 284	727	689
IT	8 268	11 428	2 843	8 238	5 189	9 228	1 133	1 754	7 016	9 709	5 941	5 521
CY	102	200	97	218	22	17	0	0	158	235	101	113
LT	1 067	1 315	820	1 546	1 271	800	158	142	2 942	1 566	1 496	816
LU	86	272	8	43	13	43	0	0	186	136	52	46
LV	511	681	501	898	461	261	153	130	939	534	560	264
MT	16	45	20	133	80	93	3	8	88	131	31	101
NL	1 604	2 291	1 730	2 472	3 199	4 575	478	684	2 071	2 960	958	1 381
PL	4 383	6 860	3 427	10 479	6 301	5 183	2 220	2 277	7 519	8 381	5 536	6 356
PT	5 054	4 783	2 619	5 816	4 096	3 211	748	621	6 758	5 774	4 287	4 240
RO	1 097	1 048	2 704	3 900	913	702	238	329	1 845	1 821	475	497
SI	187	435	265	839	675	618	247	215	332	388	253	240
SK	1 037	1 226	1 668	3 539	1 648	1 272	375	516	2 117	1 954	1 285	1 374
SE	1 814	3 294	2 300	6 949	5 314	3 686	896	1 004	:	:	:	:
FI	1 777	3 669	1 073	3 160	2 839	1 416	383	316	3 296	2 465	1 596	1 183
UK	25 526	32 720	21 459	32 492	36 466	36 626	1 964	1 304	21 459	33 544	24 264	38 943
TR	4 004	5 240	6 136	13 064	15 831	17 929	1 325	3 051	10 740	15 548	6 683	8 927
NO	920	1 873	711	2 073	3 865	3 010	148	168	2 851	3 078	1 448	1 643
RS	665	690	848	1 674	387	414	1 219	904	1 064	1 162	837	642
ME	36	35	87	142	9	1	26	24	125	143	155	135
MK	14	11	136	261	236	120	38	48	52	56	63	53
IS	100	59	68	43	191	346	40	13	142	144	69	58

Notes: Exceptions to reference year: BE, DK, IE, EL, AT, SE, IS, ME, RS: 2011; MK: 2009; Data unavailable for: EU-28, FR, LI, CH, AL, BA, IL, FO, MD; Data estimated for: BE, IE, UK; Break in time series for: EL;

Others: ':' indicates that data are unavailable; Headcount (HC).

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

Annex 4.6. Number of researchers in the government sector, by field of science and sex, 2012

	Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences		Humanities	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
BE	172	478	494	1 101	27	28	196	282	43	92	145	157
BG	1 369	1 194	267	514	155	41	519	317	286	157	430	236
CZ	1 515	3 015	139	517	431	220	142	232	257	275	554	688
DK	79	247	4	15	177	552	0	0	249	307	175	225
DE	9 191	20 683	3 936	12 894	3 033	2 829	1 308	1 715	2 051	2 253	3 029	2 616
EE	47	134	18	9	118	24	46	28	36	6	183	77
IE	13	48	18	78	30	3	97	177	44	50	0	0
EL	379	870	396	774	691	626	91	192	168	99	1 206	602
ES	2 395	3 177	1 723	2 970	8 769	7 443	1 572	1 683	674	781	466	539
HR	417	385	22	45	492	476	77	83	309	207	211	177
IT	3 871	5 564	1 271	2 182	4 425	3 925	1 142	1 343	924	752	272	259
CY	45	25	1	2	3	5	13	42	16	20	20	10
LV	309	223	26	95	5	4	128	61	56	17	33	7
LT	275	403	67	171	25	11	116	69	155	69	232	107
LU	120	177	51	138	10	2	5	11	81	137	6	14
HU	866	1 758	170	260	265	125	225	320	221	314	630	572
MT	1	3	2	3	0	1	8	18	2	2	0	1
NL	845	1 922	375	1 273	426	553	703	628	1 206	902	35	56
AT	212	514	85	124	119	104	103	245	503	529	445	354
PL	1636	2621	1621	4349	1440	:	835	:	371	504	554	386
PT	427	227	237	307	1 840	1 106	160	100	165	96	81	38
RO	957	1 274	877	1 214	256	109	375	256	311	278	369	388
SI	417	648	32	41	178	110	87	93	172	97	155	141
SK	691	853	165	377	182	120	227	219	201	142	259	247
FI	394	524	725	1 649	:	:	460	497	559	417	192	95
SE	162	222	177	587	724	815	1	0	249	267	32	33
UK	954	2 313	183	1 201	748	917	471	593	555	424	207	186
IS	95	130	50	68	1	1	10	14	13	18	14	19
NO	435	759	164	570	808	657	327	470	667	680	382	297
ME	23	10	6	7	247	182	0	0	0	0	5	14
RS	791	569	165	224	223	177	133	30	148	148	176	145
TR	565	1 285	523	1 778	47	111	978	1 735	99	177	10	52

Notes: Exceptions to the reference year: BE, EL, HR, AT, PL, SE, IS, ME, RS: 2011; DK: 2010; Data unavailable for: EU-28, FR, LI, CH, MK, AL, BA, IL, FO, MD; Break in time series for: EL, SE; Definitions differ for: NL, SK, FI, SE; Data confidential for: PL;
Others: ':' indicates that data are unavailable; Headcount (HC).

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

Annex 4.7. Number of researchers in the business enterprise sector (BES), by field of science and sex, 2012

	Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences		Humanities	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
BG	c	c	294	660	c	c	81	53	c	c	c	c
CZ	879	3 126	1 064	11 344	572	570	170	302	65	197	11	25
EL	155	177	1 101	3 385	378	245	52	102	108	136	11	8
FR	13 103	39 351	16 953	107 296	4 289	2 950	1 869	2 288	945	1 653	364	441
HR	79	29	336	686	157	41	3	16	10	7	1	1
CY	49	81	17	101	14	18	0	2	16	30	0	0
HU	599	3 336	1 767	7 797	229	294	145	284	77	201	8	5
MT	76	201	48	200	23	12	0	5	7	9	3	1
PL	747	2 413	1 928	12 002	850	464	123	166	54	102	15	17
PT	1 365	3 865	3 484	8 962	1 440	604	255	302	470	591	61	71
RO	173	188	1 480	2 845	340	233	17	28	52	91	1	3
SI	544	830	654	3 034	74	54	46	31	85	107	17	4
SK	120	386	346	1 950	65	56	25	14	74	102	58	84
RS	4	9	22	83	0	1	22	19	4	1	0	0
TR	1 292	3 929	6 755	25 003	625	543	226	377	150	228	93	76

Notes: Exceptions to reference year: BG: 2010; EL, FR, RS: 2011; Data unavailable for: EU-28, BE, DK, DE, EE, IE, ES, IT, LV, LT, LU, NL, AT, FI, SE, UK, IS, LI, NO, CH, ME, MK, AL, BA, IL, FO, MD; Break in time series for: EL;
Others: ':' indicates that data are unavailable, 'c': confidential data; Headcount (HC).

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

5 Working conditions of researchers

Main findings:

- In 2012, 10.4 % of researchers in the higher education sector (HES) were working part-time. Compared to the whole economy, part-time employment amongst researchers in the HES is uncommon.
- Women researchers were more likely than men to be working part-time in 2012 (EU-28: 13.5 % of women researchers and 8.5 % men researchers working part-time), although the gender gap in part-time employment rates (women's rate minus men's rate) was much lower than that in the entire economy (where it was slightly over 20 percentage points in 2012).
- In some countries (NL, CH), the gap between the rates of women and men researchers when it comes to part-time work is over 15 percentage points (women's rate minus men's rate).
- In 2012, women researchers in the HES were more likely to have 'precarious' contractual arrangements than men, such as fixed-term contracts of one year or less, or no contract at all. This is true in all but six countries (EE, IE, CY, LV, MT, MK).
- In the early career stages of researchers in the HES, there is no clear pattern to suggest that men are more mobile than women. However, for researchers in middle and senior positions, the rate of mobility is notably higher for men.
- Some countries show high mobility rates (over 40 %) for post-PhD researchers of both sexes (BE, DK, NL, AT, CH, NO).
- The gender pay gap (in favour of men) affects the total economy of the EU, and is a particularly pronounced issue in scientific research and development.
- In 2010, women's average gross hourly earnings (EU-28) were 16.6 % lower than those of men in the entire economy, and 17.9 % lower than those of men in scientific research & development (R&D).
- Most countries (20 out of 30 countries for which data are available) showed a higher gender pay gap (GPG) in scientific R&D than in the whole economy (2010). In eight countries, women's average gross hourly earnings in scientific R&D were at least 20 % lower than those of men in 2010 (CZ, EE, IE, CY, NL, SK, SE, UK).
- At the EU level, there are signs that the GPG widens (in favour of men) as women and men get older. It is lowest for the under-35s. It is extremely rare for women to earn more than men in scientific R&D (i.e. negative gender pay gaps). There are a few exceptions for particular age groups (although never overall).
- Women's presence amongst researchers is particularly low in two of the countries where the overall level of R&D expenditure per capita researcher is highest (DE, AT).
- Around 36 % of research performing organisations (RPOs) responding to the European Research Area (ERA) Survey (2014) reported having set up gender equality plans. In 26 out of the 37 countries for which data are presented, more than half of the responding RPOs had work-life balance measures in place. However, targets for recruitment committees and support schemes for leadership were relatively unusual (in most countries, less than a quarter of RPOs had these measures in place in 2013).

Whilst earlier chapters of She Figures 2015 explored the gender balance within top-level graduate programmes and research professions, Chapter 5 moves on to consider the quality and nature of researchers' employment. Directive 2006/54/EC of 5 July 2006 lays down the principle of equal treatment for women and men in the EU when it comes to their working conditions, including pay. As part of this directive, Member States also have a role in encouraging employers to promote 'equal treatment for men and women in a planned and systematic way in the workplace, in access to employment, vocational training and promotion'. With particular relevance to this directive, the chapter explores the extent of the gender pay gap in scientific R&D, as well as the actions taken by RPOs to promote gender equality internally. Furthermore, the chapter considers the propensity of women and men researchers to be employed with certain contracts; their ability to live and work abroad; and the levels of R&D expenditure in individual countries.

Whilst this chapter gives an insight into the relative working conditions of women and men researchers, it does not provide the contextual information necessary to assess the *reasons why* individuals are working in particular conditions. Likewise, although it discusses some of the core debates, it does not offer a final value judgement as to the merits of different forms of employment.

The indicators in this chapter are based on data from various sources: the Mobility and Career Paths of Researchers in Europe (MORE) Survey, the European Research Area (ERA) Survey, and Eurostat ([47]).

Overall, it is more common for women researchers in the higher education sector to work part-time than it is for men.

The impact of part-time employment on gender equality is debated. For example, according to the Council of the European Union, part-time employment has many potential benefits, such as boosting women's employment and offering an opportunity for both sexes to improve their wellbeing and work–life balance (Council of the EU, 2014). At the same time, the Council warns of its 'potential to exacerbate gender differences in pay, working conditions and career advancement over the life cycle'. Considering the whole economy of the EU-28, the overall part-time employment rate (ages 15–74) in 2012 was 19.8 %, according to Eurostat ([48]). Women were significantly more likely to be working part-time than men: when broken down by sex, the rate was 9.2 % for men and 32.4 % for women (2012).

Figure 5.1 presents the part-time employment rate of researchers, by sex, in the HES. Here, part-time status is based on individuals' self-declaration as to whether they work part-time or not ([49]). Compared to the whole economy, part-time employment is relatively uncommon amongst researchers. Approximately 10.4 % of all researchers (EU-28) in the HES reported that they were working part-time in 2012. Women researchers were more likely to be working part-time than men (in the EU-28, 13.5 % of women researchers and 8.5 % men researchers were working part-time), although the gender gap did not reach the same level as that of the economy as a whole.

At the country level (and in keeping with the pattern at EU level), most frequently the part-time employment rate for women is higher than the rate for men. In 2012, women researchers were more prone to part-time employment than men in 18 countries ([50]). The reverse (higher part-time employment

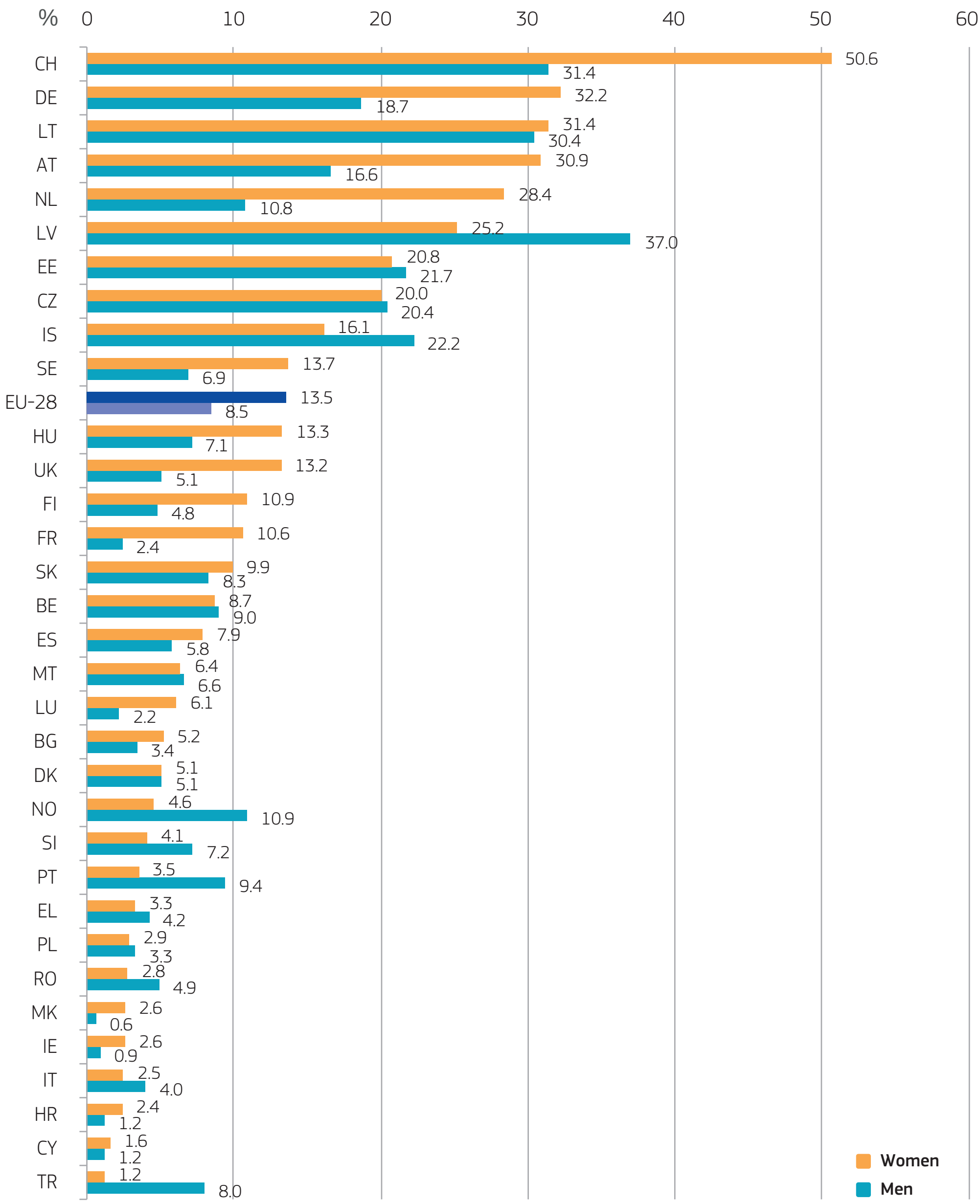
47 The MORE Survey was conducted in 2013, although the reference year for the data is 2012. Likewise, the ERA Survey was conducted in 2014, although the reference year for the data is 2013.

48 Eurostat – Labour Force Survey, 'Part-time employment as percentage of the total employment, by sex, age and nationality (%)' [lfsa_eppga].

49 Note that this is based on weighted MORE Survey data, as opposed to Labour Force Survey (LFS) data from Eurostat. In this respect, there may be some comparability issues, due to: 1) age classifications in use and 2) the part-time/full-time distinction. In terms of the first issue, the MORE Survey data cover researchers of all ages whereas the LFS data cover researchers aged 15–74. As such, there may be small differences due to the exclusion of the 75+ age group from the LFS rates. In terms of the second issue, the full-time/part-time distinction in Eurostat LFS data is made 'on the basis of a spontaneous answer given by the respondent in all countries', except for the Netherlands, Iceland and Norway, where other criteria are used relating to the usual number of hours worked. However, in the MORE Survey, the full-time/part-time distinction was made based on the spontaneous answer of respondents, regardless of their country. For more details on the metadata used in the Eurostat LFS series, see http://ec.europa.eu/eurostat/cache/metadata/en/lfsa_esms.htm.

50 BG, DE, IE, ES, FR, HR, CY, LT, LU, HU, NL, AT, SK, FI, SE, UK, MK, CH.

Figure 5.1. Part-time employment of researchers in the higher education sector out of total researcher population, by sex, 2012



Notes: Data unavailable for: LI, ME, AL, RS, BA, IL, FO, MD;
Others: This indicator compares the part-time employment rate amongst women researchers and men researchers respectively (each calculated as a percentage of the respective total number of women and men researchers). It includes researchers at all career stages and in all fields of science; Countries are defined by researchers' country of current employment; Weighting applied to increase representativeness of sample.

Source: MORE2 Survey (online database: flag WC2.2)

for men) was true in 14 countries ([51]). However, it is worth pointing out that in eight countries there is a relatively small gender gap (less than 1 percentage point difference in the rates of women and men) ([52]).

There appears to be major variation in the level of part-time employment across countries. For instance, the rate of part-time employment for women researchers ranges from 1.2 % (TR) to 50.6 % (CH). In eight countries, at least one in five women researchers work part-time (CZ, DE, EE, LV, LT, NL, AT, CH). For men researchers, the rate of part-time employment also varies, from 0.6 % in the former Yugoslav Republic of Macedonia to 37 % in Latvia. In five countries (CZ, EE, LV, LT, CH), more than one fifth of women *and* men researchers work part-time.

In countries where women researchers are more likely to be in part-time employment than men, the gender gaps appear to be particularly large. For instance, in nine countries the part-time employment rate of women was more than 5 percentage points higher than that of men (DE, FR, HU, NL, AT, FI, SE, UK, CH). In four of these countries (DE, NL, AT, CH), the gap in the part-time employment rates was more than 10 percentage points, reaching as much as 19.2 percentage points in Switzerland (rate for women = 50.6 %; rate for men = 31.4 %) and 17.6 percentage points in the Netherlands (rate for women = 28.4 %; rate for men = 10.8 %).

By way of contrast, in the 14 countries where men are more likely to be in part-time employment than women, the gender gaps appear to be smaller overall ([53]). In 2012, the gender gap exceeded 5 percentage points in only five of these countries (LV, PT, IS, NO, TR), with the highest gaps being 11.8 percentage points in Latvia (rate for women = 25.2 %; rate for men = 37 %) and 6.8 percentage points in Turkey (rate for women = 1.2 %; rate for men = 8 %).

In nearly all countries, women researchers are more likely to experience 'precarious' forms of employment than men, although the gender gaps do not reach the same levels found in part-time employment.

As with part-time work, the benefits and disadvantages of particular contracts, such as contracts of limited/fixed duration and student contracts, are still subject to debate. However, the International Labour Organization (ILO) has warned that, if not properly regulated, fixed-term contracts may be associated with low job quality, such as below-average security and wages (Aleksynska and Muller, 2015).

In the overall economy, there are not large differences when it comes to the proportion of women and men employed on contracts of limited duration. In 2012, temporary employees (aged 15 to 74) made up 13.7% of the total number of employees in the EU-28; women employees were slightly more likely to be working temporarily (14.3%) than men (13.2%) ([54]). However, this data covers all lengths of the contracts, and may mask differences when it comes to the long-term job security of temporary employees. Furthermore, one cannot gain a picture of other forms of potentially precarious employment.

Figure 5.2 explores the propensity of researchers to be employed on 'precarious working contracts' in the HES. Specifically, it compares the proportion of women and men researchers who indicated that they had one of the following types of contract in 2012: fixed-term contract of one year or less; no contract; or a type of contract described as 'other' and associated with student status ([55]). However, respondents who reported being self-employed are not included in the category of 'precarious working contracts'.

51 BE, CZ, EE, EL, IT, LV, MT, PL, PT, RO, SI, TR, IS, NO.

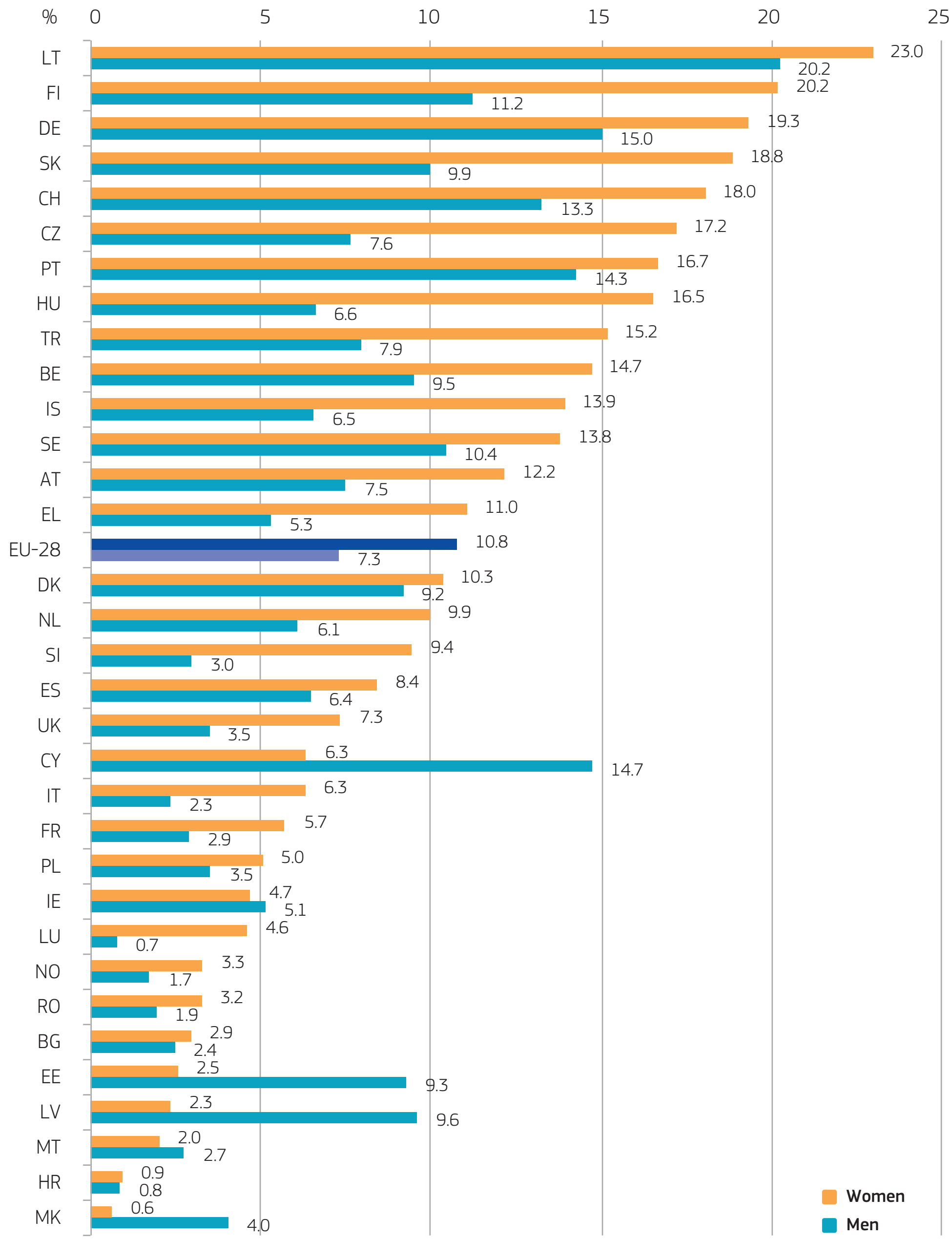
52 BE, CZ, DK, EE, EL, CY, MT, PL. NB: In Denmark there is no gender gap – the rates for women and men are 5.1 %.

53 In order of the largest to the smallest gender gap: LV, TR, NO, IS, PT, SI, RO, IT, EL, EE, PL, CZ, BE, MT.

54 Eurostat, Labour Force Survey, 'Temporary employees as percentage of the total number of employees, by sex and age (%)' [lfsa_etpga]

55 The rate of precarious employment does not include researchers who indicated that they have an 'other' contract of indefinite duration.

Figure 5.2. 'Precarious' working contracts of researchers in the higher education sector out of total researcher population, by sex, 2012



Notes: Data unavailable for: LI, ME, AL, RS, FO, MD;
Others: The indicator compares the proportion of women researchers and the proportion of men researchers on 'precarious working contracts' (each calculated as a percentage of the respective total number of women and men researchers) in the HES. Researchers with 'precarious working contracts' are those with no contracts, fixed-term contracts of up to one year, or other contracts associated with student status; Countries refer to researchers' country of current employment; BA and IL excluded due to small sample size; Weighting applied to increase representativeness of sample.

Source: MORE2 Survey (Q2, Q20, Q21)

In the EU, 8.6 % of researchers reported having such contracts in 2012. Women researchers in the HES were slightly more likely to be employed on precarious working contracts than men in 2012 (EU-28: rate for women = 10.8 %; rate for men = 7.3 %). In 14 countries, the proportion of women on such contracts exceeded the EU average ([56]), reaching a rate of 23 % of women researchers in Lithuania and 20.2 % in Finland. However, the rate of precarious employment for women varies widely and, at the opposite end of the spectrum, the rate was less than 1 % of women researchers in Croatia and the former Yugoslav Republic of Macedonia.

The situation for men researchers also varies across countries, ranging from 0.7 % employed with a precarious contract in Luxembourg to 20.2 % in Lithuania. In general, however, men researchers in the HES appear to show lower rates of precarious employment than women. In nine countries (CZ, DE, LT, HU, PT, SK, FI, TR, CH), the rate of precarious employment amongst women researchers was at least 15 %, whereas, amongst men researchers, this was true in only two countries (DE, LT).

In all but six countries (EE, IE, CY, LV, MT, MK), women researchers were more likely to be employed on precarious contracts than men in 2012. The largest gender gaps affected Hungary (10 percentage point difference: rate for women = 16.5 %; rate for men = 6.6 % ([57])) and the Czech Republic (9.6 percentage point difference; rate for women = 17.2 %; rate for men = 7.6 %). The widest gap affecting men was in Cyprus (8.4 percentage point difference: rate for women = 6.3 %; rate for men = 14.7 %). Although gender gaps are present when it comes to the rate of precarious employment amongst researchers, these are generally smaller than those observed for part-time employment. Specifically, no country shows a gap of more than 10 percentage points between the rate of precarious employment for women and for men, whereas, in part-time employment, such a gap is observed in five countries (DE, LV, NL, AT, CH).

In the early career stages of researchers, there is no clear pattern to suggest that men are more mobile than women.

Working abroad can be an important way for researchers to advance in their careers. Considering the overall labour market, there are some concerns that women may be less mobile than men at certain stages of life, particularly due to the uneven division of childcare responsibilities ([58]). According to the Gendered Innovations project, 'gender roles that limit women's mobility interfere with careers in science and engineering' (DG Research, 'Subtle bias'). For instance, many jobs in science and technology will involve relocation or travel, which may be harder for women if they have more care duties than men.

Figure 5.3 explores potential sex differences in the mobility of researchers during their early careers (i.e. 'first-stage researchers' (R1) and 'recognized researchers' (R2) ([59])). It shows the difference in the percentage of women/men researchers who – during their PhD – moved for at least three months to a country other than that where they attained (or will attain) their PhD ([60]). It is calculated by subtracting women's rate of mobility from that of men. A positive result indicates that men's rate of mobility is higher, whilst a negative result shows that women's rate is higher. Note that Annex 5.4 presents the individual mobility rates for each sex.

There is no clear pattern across countries to suggest that men researchers are more mobile than women in the early stages of their careers. Whilst at EU level (EU-27), men researchers are slightly more mobile

56 BE, CZ, DE, EL, LT, HU, AT, PT, SK, FI, SE, TR, CH, IS.

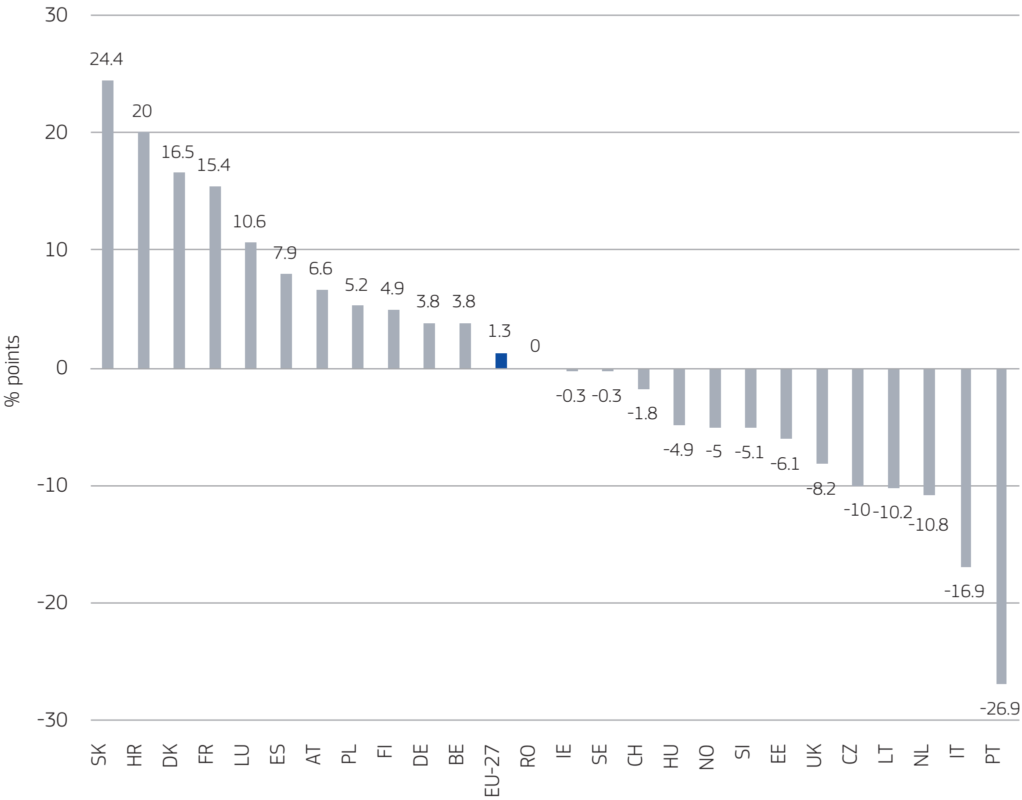
57 Due to rounding, at first sight this appears to be incorrect. However, increasing the number of decimal places shows that the figures are correct: the rates are 16.54 % for women and 6.58 % for men in Hungary, resulting in a gap of 9.96 percentage points.

58 The gap between the EU employment rate of women and men widens with the arrival of dependent children. See Eurostat, 'Employment rate of adults by sex, age groups, highest level of education attained, number of children and age of youngest child (%)' [lfst_hheredch].

59 Classified according to the European Framework for Research Careers. First-stage researchers are researchers up to the point of PhD ('R1') and recognized researchers are PhD holders (or equivalent) who are not yet fully independent ('R2').

60 Based on self-reporting.

Figure 5.3. Sex differences in the international mobility of researchers during their PhD, 2012



Notes: Data estimated for: EU-27; Data unavailable for: EU-28, BG, EL, CY, LV, MT, IS, LI, ME, MK, AL, RS, TR, BA, IL, FO, MD;
Others: The indicator is calculated by subtracting the share (%) of internationally mobile women researchers from the share (%) of internationally mobile men researchers. In other words, a positive value indicates that men are more mobile, and a negative value indicates that women are more mobile; The indicator covers researchers at career stages R1 and R2 in all fields of science. Here, 'internationally mobile' researchers are those who during their PhD have moved for three months or more to a country other than the one where they completed or will obtain their PhD. The country of the researcher is the country where they completed or will complete their PhD; Weighting applied to increase representativeness of sample.

Source: MORE2 survey (online database, flag GMD3)

(1.3 percentage point difference: mobility rate for men = 18.9 %; mobility rate for women = 17.6 % ([61])), there is major variation across countries. Indeed, at the national level it is slightly more common for the mobility rate of women to be higher than that of men. This is true of 13 countries ([62]), whereas the reverse (a higher rate for men) is true in 11 countries ([63]). The gender gaps are particularly wide in Slovakia (24.4 percentage point difference: rate for women = 24.7 %; rate for men = 49.1 %) and Portugal (-26.9 percentage point difference: rate women = 40.4 %; rate for men = 13.5 %).

The sex difference in mobility becomes more marked as researchers enter more senior career stages.

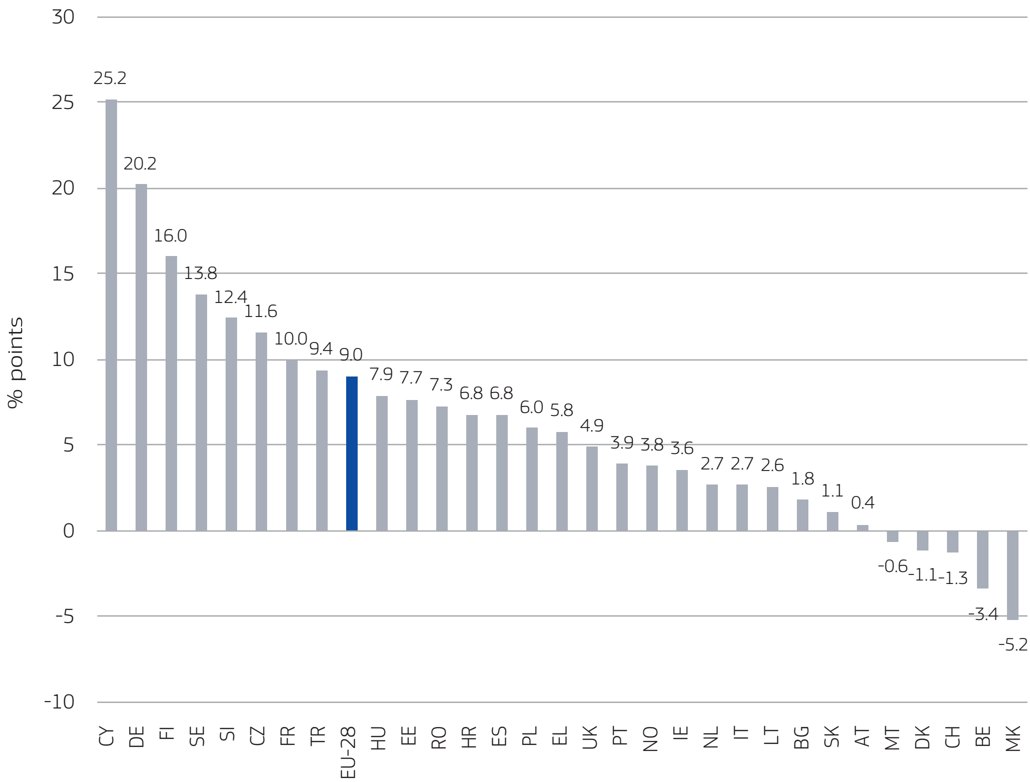
As researchers become more senior, the pattern of mobility for women and men begins to change. Figure 5.4 presents the percentage point difference in the proportion of women/men researchers who – in the

61 The EU-28 figure is not available for this indicator.

62 CZ, EE, IE, IT, LT, HU, NL, PT, SI, SE, UK, CH, NO.

63 BE, DK, DE, ES, FR, HR, LU, AT, PL, SK, FI.

Figure 5.4. Sex differences in international mobility in post-PhD careers, per country, 2012



Notes: Data estimated for: EU-27; Data unavailable for: EU-28, IL, AL, RS, ME, LI, MD, FO; Countries excluded due to fewer than 30 observations for one of the sexes: LV, LU, IS;

Others: The indicator is calculated by subtracting the share (%) of internationally mobile women researchers (out of the total number of women researchers) from the share (%) of internationally mobile men researchers (out of the total number of men researchers). In other words, a positive value indicates that men are more mobile, and a negative value indicates that women are more mobile; The indicator combines researchers at career stages R2–R4 (post-PhD) in all fields of science. 'Internationally mobile' researchers are those who have worked abroad for three months or more at least once in the last decade. The country of the researcher is their panel country (i.e. the country identified as their country of current employment during the collection of researcher contact details before the survey); Weighting applied to increase representativeness of sample.

Source: MORE2 Survey (flag GML1)

last decade – have worked abroad for at least three months in a country other than the one where they attained their highest educational degree ([64]). Unlike Figure 5.3, it focuses only on researchers in the 'post-PhD' phases of their careers ([65]). A positive result indicates that men's rate of mobility is higher, whilst a negative result shows that women's rate is higher. Note that Annex 5.5 presents the individual mobility rates for each sex.

Whilst there is no clear pattern to suggest men in the EU are more mobile than women at the start of researchers' careers, by the time they progress to middle and senior positions the situation has drastically changed. As Figure 5.4 shows, in 2012 the difference in the mobility of women and men researchers in the EU (EU-28) was approximately 9 percentage points in favour of men (rate for women = 25.1 %; rate for men = 34.2 %). In two countries, the difference exceeded 20 percentage points in favour of men, namely Cyprus (25.2 percentage point difference: rate for women = 25.3 %; rate for men = 50.5 %) and Germany

64 Based on self-reporting.

65 Using the categories defined in the European Framework for Research Careers, it focuses on recognized researchers (PhD holders or equivalent who are not yet fully independent: 'R2'); established researchers (researchers who have developed a level of independence: 'R3'); and leading researchers (researchers leading their research area or field: 'R4').

(20.2 percentage point difference: rate for women = 30.3 %; rate for men = 50.5 %). Only 5 out of 30 countries showed the reverse trend of women researchers being more mobile (BE, DK, MT, MK, CH) and here the greatest difference was -5.2 percentage points (MK).

As shown in Annex 5.5, researchers of both sexes in the middle and senior career stages are mobile, even if there are signs that men are more so. In 2012, in all but two countries (CZ and PL), at least 15 % of both women and men researchers (R2–R4 ([66])) were mobile ([67]). In 23 countries and the EU as a whole, more than a fifth of researchers of both sexes (R2–R4) ([68]) were mobile. However, women researchers were less likely to show higher rates of mobility than men. For instance, in 10 countries (BE, DK, DE, CY, NL, AT, FI, SE, CH, NO) over 2 in 5 men researchers (i.e. over 40 %) were mobile, whereas this was true of women in only six countries (BE, DK, NL, AT, CH, NO).

Overall, Figures 5.3 and 5.4 suggest that whilst researchers in the early career stages do not show clear mobility differences in favour of one sex, a large swing can be observed by the time researchers reach middle and senior positions, with men across the EU more likely to be mobile than women.

In scientific R&D women earn less on average than men, with a wider gender pay gap than in the total economy.

Salary levels are another important aspect of job quality. Tables 5.1 and 5.2 consider the extent of the gender pay gap (GPG) in 2010, both in the total economy and for those working in scientific R&D ([69]). The unadjusted GPG represents the difference between the average gross hourly earnings of paid men employees and of paid women employees, expressed as a percentage of the average gross hourly earnings of paid men employees. This indicator has been defined as unadjusted (e.g. not adjusted according to differences in individual characteristics or other observable characteristics that may explain part of the earnings difference). It gives an overall picture of the resulting gender differences in pay, due to gender discrimination, inequalities in the labour market and other factors.

The gender pay gap exists in all countries, particularly within scientific R&D. Table 5.1 shows that, in 2010, women's average gross hourly earnings (EU-28) were 16.6 % lower than those of men in the entire economy. In scientific R&D, their gross hourly earnings were 17.9 % lower than those of men (again in 2010). In this table, all the GPGs are in favour of men. In all but a few countries (BG, PL, SI), there is a gender pay gap of at least 5 % in favour of men in both the whole economy and scientific R&D. Note that GPG data are not available for scientific R&D in Malta and Iceland.

66 Again, according to European Framework for Research Careers. See previous footnote.

67 Note that in the Czech Republic over 15 % of men researchers (20.5 %) at these levels are mobile, but that women's rate of mobility is only 8.9 %.

68 In ascending order of women's proportion of mobility: EE, TR, IT, MT, PT, EU-28, UK, EU-27, CY, SI, SK, ES, HU, EL, DE, SE, FI, IE, MK, NO, NL, AT, BE, DK, CH (23 countries plus EU-28 and EU-27 aggregates).

69 All GPG data originate from the Structure of Earnings Survey, conducted every four years in the EU and available through Eurostat. Economic activities are defined using the Statistical Classification of Economic Activities in the European Community, Rev. 2 (NACE Rev. 2). Classification no 72 is used for scientific research & development; it falls under 'M. Professional, Scientific and Technical Activities'. See http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=NACE_REV2&StrLanguageCode=EN&IntPcKey=18516824&StrLayoutCode=

Table 5.1. Gender pay gap (%) in the economic activity 'Scientific research & development' and in the total economy, 2010

	Scientific research and development services statistics	Total economy
EU-28	17.9	16.6
BE	15.9	10.2
BG	4.2	13.0
CZ	24.0	21.2
DK	19.7	16.4
DE	19.3	22.3
EE	25.8	27.3
IE	25.2	13.9
EL	18.0	15.0
ES	17.7	16.2
FR	15.6	15.6
HR	11.7	5.7
IT	7.4	5.3
CY	26.7	16.8
LV	15.3	15.5
LT	16.2	11.9
LU	6.7	8.7
HU	17.7	17.6
MT	:	7.3
NL	25.1	17.5
AT	19.5	24.0
PL	10.7	4.5
PT	11.9	12.8
RO	12.7	8.1
SI	16.3	0.7
SK	20.4	19.6
FI	18.7	20.3
SE	20.1	15.6
UK	24.8	23.3
IS	:	17.7
NO	17.7	15.8
CH	19.4	17.8
MK	5.6	5.7

Notes: Reference year: 2010 (latest available data from SES);
Others: ':'indicates that data are unavailable; EU-28 calculation for scientific research & development services statistics does not include MT as no data were available; Scientific research & development services statistics ('Sci. R&D services statistics') are based on NACE Rev. 2 Division 72; Total economy is based on NACE Rev. 2 Sections B to S excluding O (public administration and defence; compulsory social security); Data were computed by Eurostat (NACE 72 data are not available online). Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.

Source: Eurostat – Structure of Earnings Survey (SES) (online data code: earn_ses10_12)

Table 5.2. Gender pay gap (%) in the economic activity 'Scientific research & development' and in the total economy, by age group, 2010

	Scientific research and development services statistics					Total economy				
	<35	35–44	45–54	55+	Total	<35	35–44	45–54	55+	Total
EU-28	7.3	14.8	17.5	23.0	17.9	7.8	17.2	20.4	20.6	16.6
BE	-2.3	14.8	24.0	26.5	15.9	3.1	9.5	12.0	16.8	10.2
BG	7.3	-5.3	2.5	3.7	4.2	9.6	19.2	17.5	4.7	13.0
CZ	19.7	35.9	23.7	24.4	24.0	13.5	30.0	24.2	17.3	21.2
DK	14.5	18.5	21.6	22.0	19.7	11.0	18.2	19.4	16.6	16.4
DE	6.9	19.9	26.7	26.0	19.3	9.8	23.6	27.2	26.6	22.3
EE	20.4	2.7	42.1	34.3	25.8	24.7	32.2	26.6	23.2	27.3
IE	2.9	25.9	5.9	c	25.2	1.9	12.0	17.6	23.0	13.9
EL	13.1	20.5	13.1	19.6	18.0	2.5	10.8	18.5	19.6	15.0
ES	6.0	14.5	18.6	13.2	17.7	8.4	13.1	18.8	24.5	16.2
FR	3.9	12.0	10.7	21.7	15.6	5.9	13.4	20.1	23.1	15.6
HR	2.6	13.8	12.3	11.9	11.7	0.2	10.0	9.1	-1.4	5.7
IT	6.6	5.1	0.4	11.3	7.4	3.3	4.8	6.1	5.6	5.3
CY	c	c	c	c	26.7	0.6	13.0	29.0	24.9	16.8
LV	15.1	2.8	23.5	18.7	15.3	13.6	18.6	12.7	16.6	15.5
LT	2.1	-0.6	26.0	27.5	16.2	8.4	17.2	12.5	8.8	11.9
LU	c	c	c	c	6.7	-3.6	6.5	14.6	21.6	8.7
HU	6.9	10.3	27.0	27.5	17.7	7.1	22.9	21.4	20.1	17.6
MT	:	:	:	:	:	4.4	10.1	6.9	1.0	7.3
NL	-6.2	13.6	33.8	43.5	25.1	3.4	17.0	24.2	21.7	17.5
AT	8.1	22.4	28.1	22.6	19.5	13.6	25.2	28.5	35.8	24.0
PL	12.2	11.3	2.0	11.3	10.7	3.6	9.0	4.0	4.0	4.5
PT	0.2	9.1	42.0	c	11.9	6.4	15.0	13.6	17.8	12.8
RO	15.8	5.8	8.9	8.1	12.7	1.3	9.7	10.4	8.2	8.1
SI	16.8	3.5	16.8	14.0	16.3	-6.0	3.9	4.5	-5.3	0.7
SK	17.1	32.7	26.3	10.0	20.4	14.2	27.5	21.5	13.3	19.6
FI	9.4	16.5	18.3	27.1	18.7	14.0	21.3	22.8	25.6	20.3
SE	12.2	17.4	22.2	27.4	20.1	10.0	16.9	18.9	17.7	15.6
UK	9.7	16.8	26.3	40.5	24.8	10.7	26.5	30.8	27.8	23.3
IS	:	:	:	:	:	9.6	20.4	22.7	20.6	17.7
NO	9.6	13.9	18.2	24.2	17.7	9.1	15.7	19.5	20.4	15.8
CH	5.1	12.1	21.9	28.7	19.4	6.9	17.1	22.4	23.1	17.8
MK	c	c	c	c	5.6	1.8	8.2	5.0	6.2	5.7

Notes: Reference year: 2010 (latest available data from SES); Data confidential: IE, PT (55+); CY, LU, MK (<35, 35-44 years, 45-54 years, 55+) [Scientific research & development services statistics];

Others: ':' indicates that data are unavailable; 'c' confidential data; EU-28 calculation for scientific research and development services statistics does not include MT as no data were available; scientific research & development services statistics is based on NACE Rev. 2 Division 72; Total economy is based on NACE Rev. 2 Sections B to S excluding O (public administration and defence; compulsory social security); Data were computed by Eurostat (NACE 72 data are not available online).

Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.

Source: Eurostat – Structure of Earnings Survey (SES) (online data code: earn_grgpg2)

Mirroring the situation at the European level, most countries (20 out of 30 countries for which data are available) showed a higher gender pay gap in scientific R&D than in the whole economy. The most extreme differences were in Ireland and Slovenia. In Slovenia, although the overall GPG was relatively small (0.7 %), it reached 16.3 % in scientific R&D (a difference of 15.6 percentage points). Likewise, whilst Ireland had a GPG of 13.9 % in the total economy, this rose to 25.2 % in R&D (a difference of 11.4 percentage points). The exceptions to this pattern – a GPG that is higher in the total economy than in scientific R&D – are the following countries: BG, DE, EE, FR, LV, LU, AT, PT, FI, and MK; note that the difference in the GPGs in FR, LV, PT and MK is very small, i.e. less than one percentage point.

In 2010 some countries showed particularly large gender pay gaps in scientific R&D activities. In eight countries, women's average gross hourly earnings were at least 20 % lower than those of men: Cyprus (26.7 %), Estonia (25.8 %), Ireland (25.2 %), the Netherlands (25.1 %), the United Kingdom (24.8 %), the Czech Republic (24 %), Slovakia (20.4 %) and Sweden (20.1 %). In only four countries was the gender pay gap less than 10 % in disfavour of women in scientific R&D (BG, IT, LU, MK). In contrast, this criterion was satisfied by slightly more countries when one considers the entire economy. In 2010 eight countries showed GPGs of below 10 % in the total economy: Luxembourg (8.7 %), Romania (8.1 %), Malta (7.3 %), Croatia (5.7 %), the former Yugoslav Republic of Macedonia (5.7 %), Italy (5.3 %), Poland (4.5 %) and Slovenia (0.7 %).

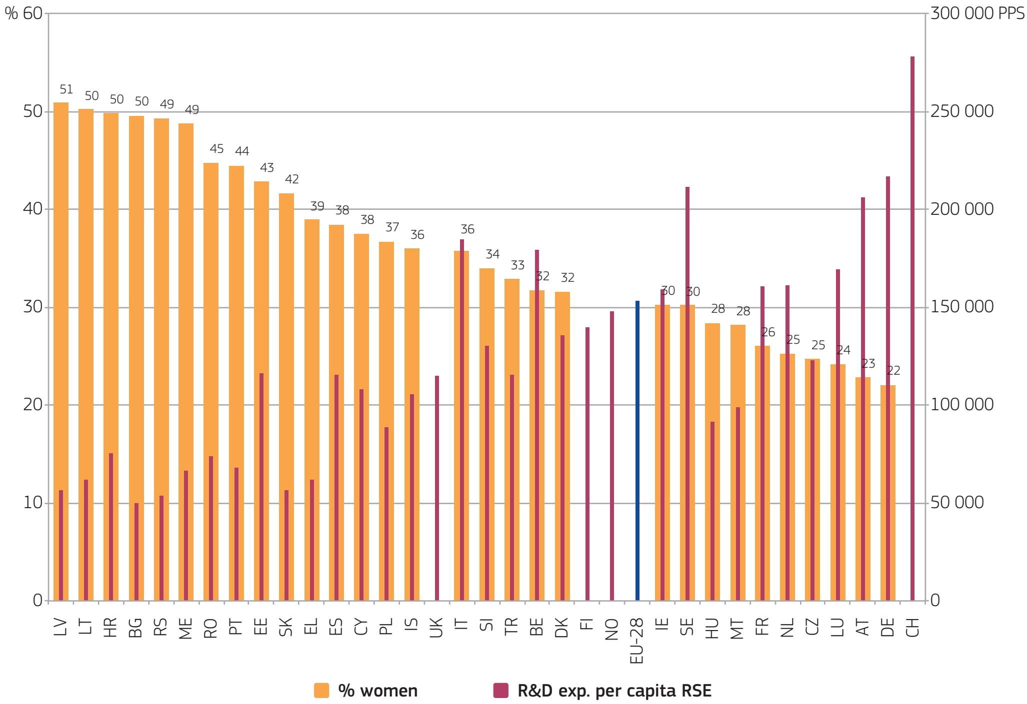
The gender pay gap widens with age.

Table 5.2 explores whether the gender pay gap changes as employees get older, by breaking down the GPG data by age group (categories: younger than 35; 35–44 years old; 45–54 years old; over 55 years old). At the EU level, both in scientific R&D and in the total economy, there are signs that the GPG widens (in favour of men) as women and men get older. In the EU-28, the average gross hourly earnings of women in scientific R&D are 7.3 % lower than those of men when they are younger than 35, but this difference rises to 14.8 % for those aged 35–44, to 17.5 % for those aged 45–54 and to 23 % for those aged 55 or more. In ten countries, the GPG in scientific R&D activities widens with each progressive increase in age (BE, DK, HU, NL, PT, FI, SE, UK, NO, CH ([70])). In some countries, the increase in the gender pay gap in scientific R&D is particularly pronounced as women and men get older: in six countries (HU, CH, LT, BE, UK, NL), the oldest age category (55+) shows a GPG that is more than 20 percentage points higher than the GPG in the youngest age category (<35). The most extreme instances of this are in the Netherlands (which moves from a GPG of -6.2 % for the under-35s – in favour of women – to a GPG of 43.5 % for the over-55s – in favour of men) and in the United Kingdom (which moves from a GPG of 9.7 % to 40.5 %, comparing the same age groups).

It is extremely unusual for women to earn more on average than men (i.e. a negative gender pay gap), although there are a few exceptions in particular age groups. In scientific R&D, these exceptions exist only in the younger two age categories (<35 and 35–44). The exceptions (negative gender pay gaps) in scientific R&D are Belgium (<35), the Netherlands (<35), Bulgaria (35–44) and Lithuania (35–44). Negative GPGs in the total economy are also rare and they occur for these age groups and countries: Luxembourg (<35), Slovenia (<35), Croatia (55+) and Slovenia (55+). Nonetheless, if one considers all age groups together, there are no negative GPGs for either scientific R&D or the economy as a whole.

70 Note that data for the 55+ group is confidential in Portugal.

Figure 5.5. Proportion of women researchers in FTE and R&D expenditure in purchasing power standards (PPS) per capita researcher, 2012



Notes: Exception to the reference years (% women): BE, DK, DE, IE, EL, LU, NL, AT, SE, IS, ME, RS: 2011; Exception to the reference years (R&D exp. Per capita RSE): IS, ME: 2011; Data unavailable for % women: EU-28, FI, UK, LI, NO, CH, MK, AL, BA, IL, FO, MD; Data unavailable for R&D exp. per capita RSE: LI, MK, AL, BA, IL, FO, MD; Break in time series: R&D exp. per capita RSE: EL, NL, SE; Both indicators: IS; Data estimated for: BE, IE, AT, SE, UK; Definition differs: FR, SE (% women only).
Other: Values shown may differ slightly from the written analysis, which was conducted on a higher level of precision than what is presented. See the section 'decimal places' in Annex 2 for further information.
Purchasing Power Standards (PPS) and Researchers (RSE)

Source: Eurostat – Statistics on research and development (online data code: rd_p_persocc and rd_e_gerdtot)

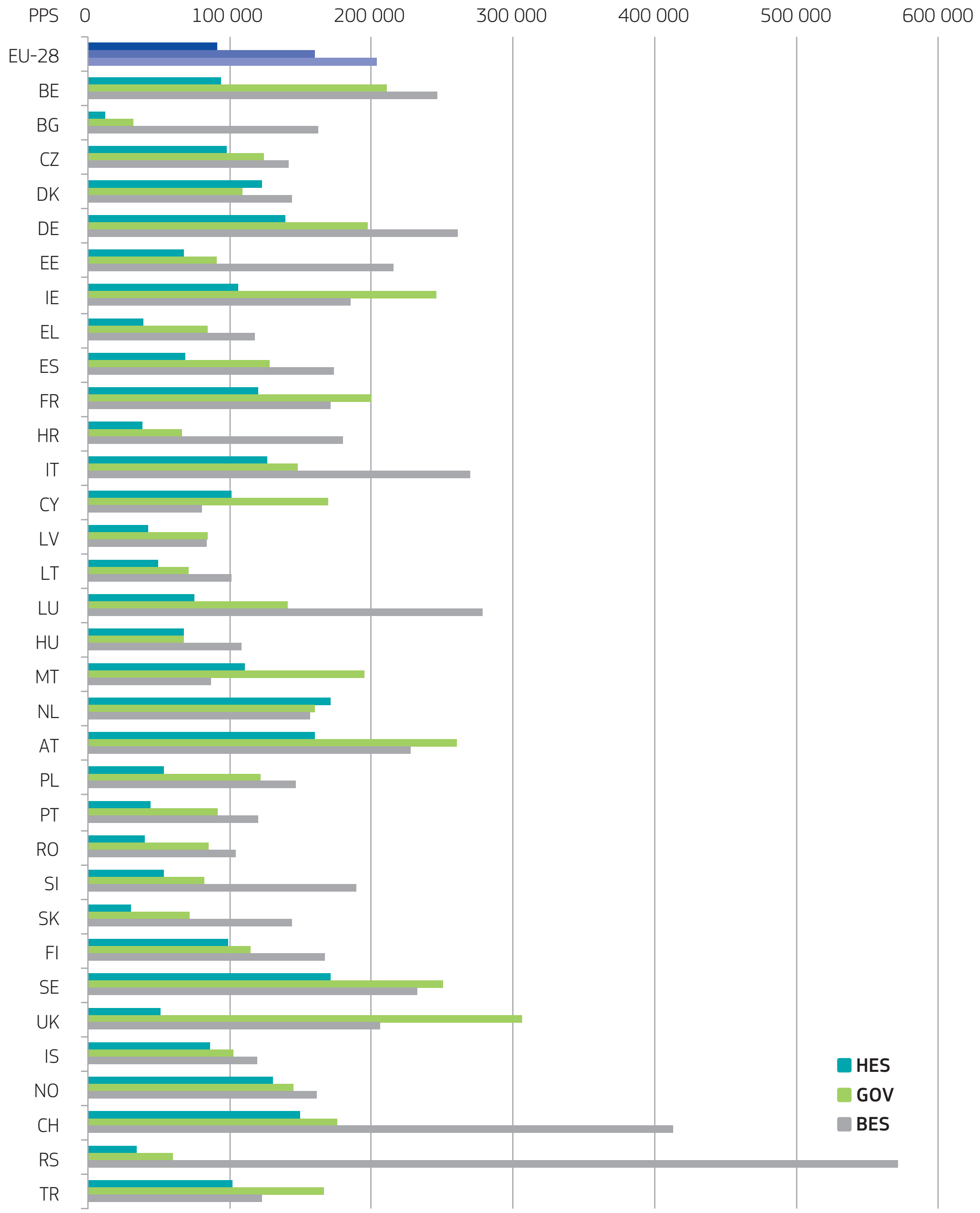
There is below-average spending on R&D per capita researcher in countries where women's representation as researchers is greatest, and poor representation of women in countries where spending per capita researcher is above average.

Figure 5.5 explores the relationship between women's presence as researchers and the wider R&D environment. Specifically, it compares the proportion of women researchers in full-time equivalent (FTE (71)) with the level of R&D expenditure per capita researcher (72). This figure covers the four sectors of the economy (higher education: HES; government: GOV; business enterprise: BES; and private non-profit: PNP). Here, the expenditure is expressed in purchasing power standards (PPS) in order to overcome the difficulty of comparing spending levels using national currencies. The purchasing power standard (PPS) is an artificial common currency used to eliminate differences in price levels between countries. National currencies are converted into PPS in order to make comparisons between the spending of different countries. One unit of PPS buys the same volume of goods and services in all countries, whereas different units of national currencies are necessary to buy the same amount in different countries. The raw data on total R&D expenditure in different sectors are found in Annex 5.3 of this chapter.

71 The Frascati Manual defines the full-time equivalent unit of measurement of personnel employed on R&D as follows (para. 333): 'One FTE corresponds to one year's work by one person on R&D.'

72 The Frascati Manual defines intramural expenditures on R&D as all expenditures on R&D performed within a statistical unit or sector of the economy during a specific period, whatever the source of funds.

Figure 5.6. R&D expenditure in purchasing power standards (PPS) per capita researcher in FTE by sector, 2012



Notes: Exception to the reference year: HR, IS: 2011; Data unavailable for: LI, ME, MK, AL, BA, IL, FO, MD; Data estimated for: AT, BE, SE (all sectors), EU-28 (GOV), IE (BES, HES); Definitions differ for: HU (ALL), NO (BES), CH, DE, NL, SK (GOV); Break in time series: IS.

Source: Eurostat – Statistics on research and development (online data code: rd_e_gerdtot)

Head count (HC) v. full-time equivalent (FTE)

The units for measuring R&D personnel are proposed by the Frascati Manual. These are:

HC (§329): ***Head count.*** The number of persons engaged in R&D at a given date **or** 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 (§333): ***Full-time equivalent.*** One FTE corresponds to one year's work by one person in R&D. The unit makes employees comparable, taking into account differences in the number of hours they work. It is calculated by dividing the average number of hours worked by an employee by the average number of full-time hours within the sector. For instance, a part-time worker who works 15 hours each week, out of a full-time week of 45 hours, is equivalent to 0.33 FTE.

Figure 5.5 does not show a consistent pattern. However, there are signs that the countries with the highest presence of women researchers are also those where the R&D expenditure per capita researcher is lowest. For example, in the eight countries where the proportion of women researchers was highest ([73]), the R&D spending per capita researcher was no greater than PPS 75 485. This is relatively low, given that in 2012 the EU-28 average for R&D expenditure per capita researcher was PPS 153 213 and, for a majority of countries in the figure, the spending exceeded PPS 100 000 ([74]).

Conversely, in some of the countries where R&D spending per capita researcher is highest, women are particularly under-represented. For example, in Germany – the country that spent the second highest amount on R&D per capita researcher in 2012 (PPS 217 076) – the proportion of women researchers was the lowest of all countries in the figure (22 %) ([75]). Similarly, in Austria, the R&D expenditure per capita researcher was PPS 205 982, but women made up only 23 % of the researcher population ([76]). In 2012, none of the countries that spent above the EU average on R&D per capita researcher had a proportion of women researchers greater than 36 % (although it should be noted that the proportion of women researchers in FTE is unavailable for Switzerland, the highest spender) ([77]).

In the EU, R&D expenditure per researcher is highest in the business enterprise sector, the sector in which women are worst represented.

Considering the situation per sector, there are clear signs that R&D expenditure per capita is highest in the BES sector, as shown by Figure 5.6 ([78]). Again, purchasing power standards are used to express spending levels. In 2012, PPS 204 022 was spent per capita researcher in the BES in the EU (EU-28), whereas the corresponding amount in the GOV and HES sectors came to PPS 160 239 and PPS 91 270 respectively. In 23 out of 33 countries in the figure ([79]), this was the sector where spending on R&D per capita researcher was highest in 2012. Another pattern that holds for most countries (30 out of 33) is that R&D expenditure per capita researcher is higher in the GOV sector than in the HES.

73 In these countries, women made up between 44 % and 51 % of researchers in 2012 (LV, LT, HR, BG, RS, ME, RO, PT, in descending order of women's presence).

74 In other words, 21 out of 34 countries in the figure (ascending order of spending: IS, CY, UK, TR, ES, EE, CZ, SI, DK, FI, NO, IE, FR, NL, LU, BE, IT, AT, SE, DE, CH).

75 In Germany, this proportion of women researchers is for 2011.

76 In Austria, this proportion of women researchers is for 2011.

77 The countries that spent above the EU-28 average in 2012 were, in ascending order of spending, Ireland (women = 30 % of researchers), France (26 %), Netherlands (25 %), Luxembourg (24 %), Belgium (32 %), Italy (36 %), Austria (23 %), Sweden (30 %), Germany (22 %) and Switzerland (percentage of women researchers not available). Note that some of these women's proportions are for 2011; see notes below the figure for more information.

78 Note that Figure 5.6 covers only these sectors: HES, GOV and BES.

79 BE, BG, CZ, DK, DE, EE, EL, ES, HR, IT, LT, LU, HU, PL, PT, RO, SI, SK, FI, IS, NO, CH, RS.

As shown in Chapter 4, women in the EU (EU-28) are poorly represented as researchers in the business enterprise sector (rate for women = 19.7 % of researchers in the BES in 2011 ([80])). Taken together, the findings from Figure 5.5 and Figure 5.6 suggest that women's presence amongst researchers is particularly low in the sector and in some of the countries where the overall level of R&D expenditure per capita researcher is highest. This corroborates the findings presented earlier in this section on the gender pay gap.

Few research organisations in Europe have undergone institutional change and set up gender equality plans.

The European Commission's Expert Group on Structural Change has identified a range of institutional barriers that may be limiting advancement of gender equality, including a lack of transparency in decision-making, institutional practices that indirectly discriminate against women, gender biases in the assessment of excellence, and gender bias in the organisation of the workplace (DG Research and Innovation, 2012).

There is much that research organisations themselves can do to promote gender equality internally. Amongst other things, the European Research Area (ERA) encourages stakeholders to pursue gender equality through institutional change in human resources (HR) management, funding, decision-making and research programmes (European Commission, 2012). More specifically, research organisations are invited to conduct impact assessments and audits of procedures and practices to identify gender bias; to implement innovative strategies to correct any bias; and to set targets and monitor progress via indicators (European Commission, 2012).

The European Commission has conducted two surveys to measure the level of progress made by research organisations in the EU Member States and associated countries in implementing the policy priorities of the ERA. The ERA surveys include questions that explore the actions taken by research organisations to encourage gender equality ([81]).

As part of the 2014 survey, research organisations were asked if they had set up gender equality plans, defined as a consistent set of measures and actions aimed at achieving gender equality. Figures 5.7 and 5.8 show the responses from the 1 200 RPOs ([82]) that responded, representing nearly 500 000 R&D personnel. According to Figure 5.7, just over a third (36 %) of the responding RPOs in the EU indicated that they had introduced gender equality plans in 2013. In some countries, more than half of the RPOs stated that they had adopted such plans (DE, MT, NL, FI, SE, UK, IS, NO). In three of these countries (DE, SE, IS), more than three quarters of respondent organisations had such plans in place. However, in 12 countries the adoption of these plans seems to be relatively uncommon, as they are reported by less than one in five of the organisations that responded ([83]).

As shown in Figure 5.8, a high proportion (70 %) of R&D personnel covered by the survey were working in responding organisations that had adopted gender equality plans. In 11 countries, at least 90 % of the R&D personnel were in such organisations (DE, FR, MT, AT, FI, SE, UK, AL, CH, IL, IS) ([84]).

80 Based on head count, not full-time equivalent.

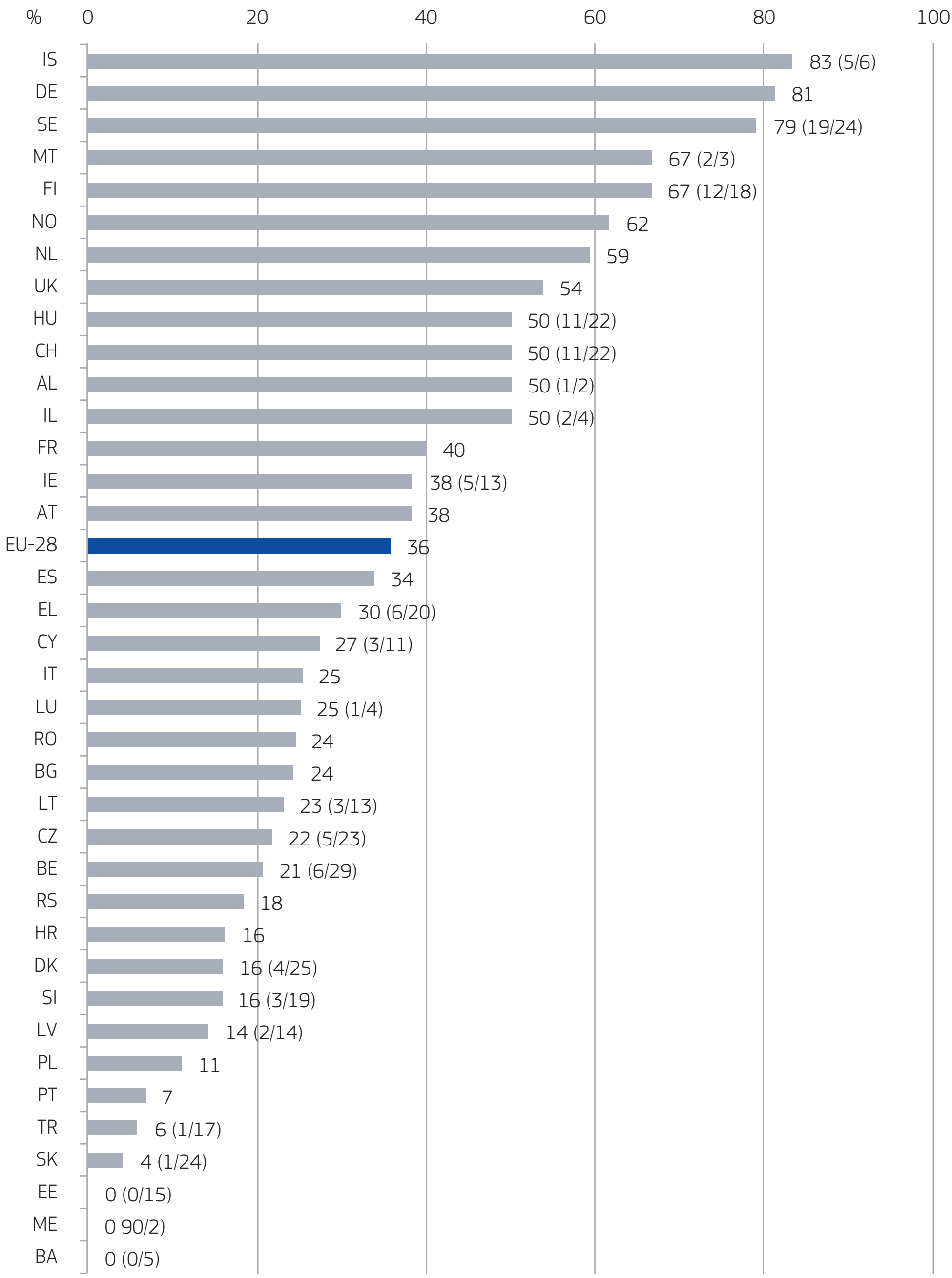
81 The survey covers the countries associated with the European Research Area, including the 28 Member States of the EU, plus Albania, Bosnia and Herzegovina, the Faroe Islands, Iceland, Israel, Montenegro, Norway, Serbia, Switzerland and Turkey.

82 According to the European Research Area (ERA), a research performing organisation (RPO) encompasses any organisation conducting public research (specifically, research 'with a public mission'). For example, RPOs could cover higher education institutions (both government-funded and private), large private research organisations and publicly funded scientific libraries. In She Figures 2015, international organisations were excluded from ERA-based indicators (i.e. those that indicated 'Yes' to Question 8 in the 2014 ERA Survey).

83 In two of these 12 countries (DK, EE, HR, LV, PL, PT, SI, SK, RS, ME, TR, BA), fewer than 10 organisations responded to the survey (ME, BA).

84 In Austria and the United Kingdom, the proportion was technically slightly below 90 %, at 89.8 %.

Figure 5.7. Proportion of RPOs that adopted gender equality plans, 2013

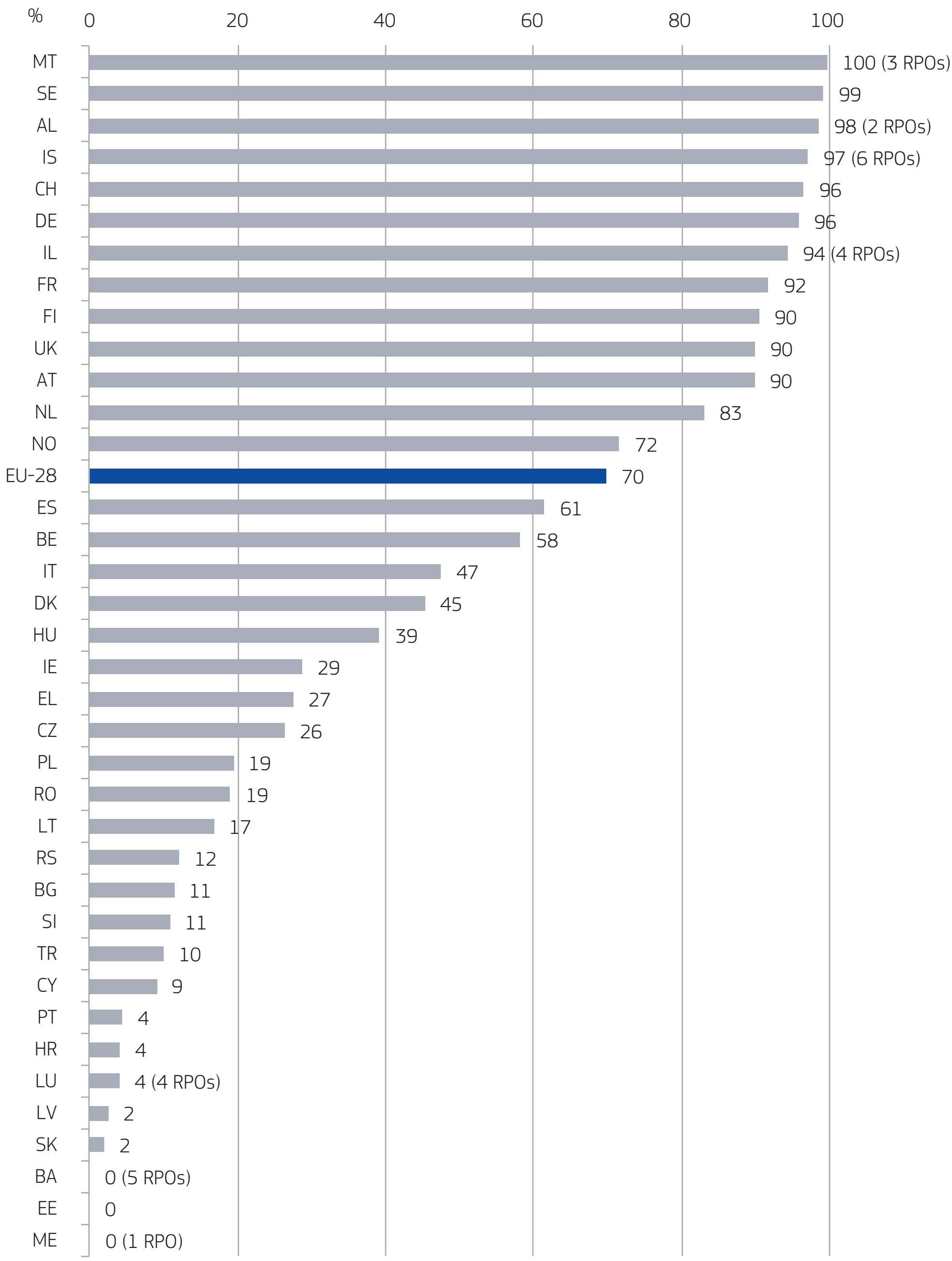


Notes: Data unavailable for: LI, MK, MD;

Others: Definition used: A Gender Equality Plan is a 'consistent set of provisions and actions aiming at ensuring gender equality'; Results representative of RPOs that responded to the ERA Survey only; FO excluded due to low number of respondent RPOs; Low number of R&D personnel covered (fewer than 50) in ME; Low number of RPOs covered (fewer than 10) in LU, MT, IS, ME, AL, BA, IL; When the population of respondent RPOs is small, the actual number is presented in parentheses next to the proportion in the chart to highlight results that are more prone to yearly fluctuations.

Source: ERA Survey 2014 (PCountry, P17, P36)

Figure 5.8. Proportion (%) of research & development personnel working in RPOs who adopted gender equality plans, 2013



Notes: Data unavailable: LI, MK, MD;
Others: Results representative of R&D personnel working in RPOs that responded to the ERA Survey; FO excluded due to low number of respondent RPOs; Low number of RPOs covered (fewer than 10): LU, MT, IS, ME, AL, BA, IL; When the population of respondent RPOs is small, the actual number is presented in parentheses next to the proportion in the chart to highlight results that are more prone to yearly fluctuations; Definition used: A gender equality plan is a 'consistent set of provisions and actions aiming at ensuring gender equality'.

Source: ERA Survey 2014 (P17, P36, PCountry)

Table 5.3. Implementation of gender equality measures in RPOs, 2013

	Reference year	Flexible career trajectory (e.g. provisions for career interruptions, returning schemes after career breaks, gender-aware conditions, provisions on dual careers)	Recruitment and promotion measures	Support for leadership development (e.g. mentoring or networking opportunities for women researchers)	Targets to ensure gender balance in recruitment committees	Work–life balance measures (e.g. parental leave, flexible working arrangements)	Other measures	Total number of respondent organisations
BE	2013	48.3	10.3	13.8	10.3	75.9	24.1	29
BG	2013	29.3	12.2	24.4	14.6	43.9	34.1	41
CZ	2013	34.8	26.1	17.4	8.7	60.9	39.1	23
DK	2013	24.0	24.0	16.0	20.0	52.0	36.0	25
DE	2013	69.9	75.6	63.4	58.5	87.0	35.0	123
EE	2013	33.3	20.0	6.7	0.0	60.0	33.3	15
ES	2013	35.5	25.8	12.1	21.0	60.5	26.6	124
IE	2013	53.8	53.8	69.2	61.5	76.9	15.4	13
EL	2013	25.0	35.0	25.0	25.0	70.0	10.0	20
FR	2013	40.0	29.2	15.4	43.1	63.1	36.9	65
HR	2013	23.3	32.6	20.9	20.9	67.4	34.9	43
IT	2013	20.3	20.3	5.1	21.5	43.0	39.2	79
CY	2013	27.3	18.2	18.2	18.2	45.5	45.5	11
LV	2013	35.7	35.7	28.6	0.0	35.7	35.7	14
LT	2013	61.5	23.1	38.5	30.8	76.9	7.7	13
LU	2013	0.0	25.0	0.0	25.0	50.0	50.0	4
HU	2013	45.5	45.5	0.0	13.6	63.6	9.1	22
MT	2013	100.0	100.0	0.0	33.3	100.0	33.3	3
NL	2013	40.6	56.3	43.8	43.8	71.9	40.6	32
AT	2013	50.6	41.6	38.2	41.6	71.9	30.3	89
PL	2013	42.6	27.8	5.6	20.4	66.7	37.0	54
PT	2013	27.1	18.6	16.9	11.9	47.5	45.8	59
RO	2013	48.9	35.6	20.0	20.0	55.6	33.3	45
SI	2013	42.1	31.6	15.8	26.3	68.4	36.8	19
SK	2013	20.8	4.2	8.3	4.2	45.8	54.2	24
FI	2013	55.6	44.4	27.8	16.7	88.9	38.9	18
SE	2013	58.3	79.2	62.5	50.0	87.5	20.8	24
UK	2013	71.8	61.5	74.4	35.9	94.9	30.8	39
IS	2013	33.3	50.0	33.3	66.7	66.7	0.0	6
NO	2013	50.0	76.5	38.2	58.8	88.2	23.5	34
CH	2013	36.4	40.9	54.5	50.0	68.2	40.9	22
ME	2013	50.0	0.0	50.0	0.0	100.0	0.0	2
AL	2013	50.0	100.0	100.0	100.0	50.0	0.0	2
RS	2013	34.2	26.3	31.6	21.1	47.4	36.8	38
TR	2013	5.9	23.5	29.4	17.6	23.5	47.1	17
BA	2013	60.0	0.0	40.0	20.0	80.0	20.0	5
IL	2013	0.0	75.0	0.0	0.0	25.0	0.0	4

Notes: Data unavailable for: LI, MK, MD;

Others: The indicator shows the share (%) of respondent RPOs which, in 2013, adopted each of the listed measures aimed at promoting gender equality internally; Results representative of RPOs that responded to the ERA Survey only; FO excluded due to low number of respondent RPOs; Organisations were able to indicate that they had adopted more than one measure; Low number of R&D personnel covered (fewer than 50): ME; Low number of RPOs covered (fewer than 10): LU, MT, IS, ME, AL, BA, IL.

Source: ERA Survey 2014 (PCountry, P37)

Work–life balance measures are a rather common practice in research performing organisations, whilst targets for gender balance and support schemes for leadership are less common.

In 2012, the Council of the European Union emphasised the need to support ‘gender equality practices’ in research organisations (Council of the EU, 2012). Using data from the 2014 ERA Survey, Table 5.3 presents the proportion of (respondent) RPOs in the European Research Area that indicated they had introduced such practices in 2013. Specifically, RPOs reported on whether they had adopted the following measures:

- flexible career trajectory (for example, provisions for career interruptions, returning schemes after career breaks, ‘gender-aware’ conditions, provisions on dual careers)
- recruitment and promotion measures
- support for leadership development (e.g. mentoring or networking opportunities for women researchers)
- targets to ensure gender balance in recruitment committees
- work–life balance measures (e.g. parental leave, flexible working arrangements)
- other measures.

All RPOs were asked to report on the introduction of gender equality measures in the survey, regardless of whether they indicated that they had not adopted a GEP. In other words, not all RPOs who have adopted gender equality measures have adopted a GEP, or vice versa.

Of these measures, work–life balance measures were by far the most common measure adopted by RPOs. Work–life balance measures include parental leave systems and flexible working arrangements. In 26 out of the 37 countries in the survey, more than half of the responding RPOs had such measures in place in 2013 ([85]). In all but two countries (TR and IL), at least a third of responding organisations had introduced work–life balance schemes.

Provisions to enable the adoption of a flexible career trajectory also appear to be a relatively widespread practice to support gender equality, although this approach is not as common as the introduction of work–life balance measures. In nine countries (DE, IE, LT, MT, AT, FI, SE, UK, BA), more than half of respondent RPOs reported that they had established a flexible career trajectory, and in a further 17 countries between a third and half of RPOs stated that this was the case ([86]). In 22 countries, at least 33 % of RPOs had introduced ‘other measures’ in 2013, although they did not provide further information as to what these were.

As Table 5.3 shows, the least common measures in RPOs are targets to ensure gender balance in recruitment committees and support for leadership development. In most countries, less than a quarter of RPOs had these measures in place in 2013 ([87]). However, the national situation varied more widely when it came to recruitment and promotion measures: in nine countries (DE, IE, MT, NL, SE, UK, AL, NO, IL), more than half of respondent RPOs had such measures in place; in 16 countries ([88]), between a quarter and half of respondents had implemented such measures; and in 12 countries, fewer than a quarter had introduced them (BE, BG, DK, EE, IT, CY, LT, PT, SK, ME, TR, BA).

85 BE, CZ, DK, DE, EE, ES, IE, EL, FR, HR, LT, HU, MT, NL, AT, PL, RO, SI, FI, SE, UK, IS, NO, CH, ME, BA.

86 BE, CZ, EE, ES, FR, LV, HU, NL, PL, RO, SI, AL, ME, RS, CH, IS, NO.

87 In 21 out of 37 countries, less than a quarter of RPOs had adopted targets to ensure gender balance in recruitment committees; in 19 out of 37 countries, less than a quarter had introduced support for leadership development.

88 CZ, ES, EL, FR, HR, LV, LU, HU, AT, PL, RO, SI, FI, CH, IS, RS.

Considered from a different perspective, some countries stand out due to the number of gender equality practices that individual RPOs report. In Germany, Ireland, Sweden and the United Kingdom, a majority of RPOs stated that they had introduced at least four of the six 'gender equality practices' under discussion. This suggests that a more consistent strategy with *multiple* gender equality practices is followed by the research organisations of these countries, in line with the concept of gender equality plans promoted in the ERA. Conversely, in other countries, introducing multiple gender equality practices may be more unusual. In six countries (BE, DK, IT, SK, TR, IL), less than a quarter of the RPOs reported the introduction of at least four of the six gender equality practices.

It is important to bear in mind that the results for Figure 5.7, Figure 5.8 and Table 5.3 cover only the RPOs that responded to the 2014 ERA Survey (approximately 1 200), rather than all organisations conducting public research across the European Research Area. Furthermore, as self-reporting forms the basis of these indicators, representativeness may be an issue here, given that some survey respondents may be unaware of internal gender equality measures and/or might have mistakenly considered that certain measures are in place. Even so, the survey suggests that many RPOs across the ERA have taken steps to support gender equality internally, particularly when it comes to work–life balance measures.

For more information about the respondents, see Annexes 5.1 and 5.2.

Annex 5.1. Number of RPOs and R&D Personnel covered by ERA Survey, 2014

	Total number of respondent RPOs	Total number of research and development Personnel in respondent organisations	Total number of organisations who adopted Gender Equality Plans, 2013	Total number of personnel covered by Gender Equality Plans, 2013
BE	29	12 098	6	7037
BG	41	4948	10	563
CZ	23	3501	5	920
DK	25	18 907	4	8 545
DE	123	116 614	100	111 636
EE	15	3 889	0	0
IE	13	2 928	5	839
EL	20	6 416	6	1 760
ES	124	40 902	42	25 130
FR	65	87 476	26	80 174
HR	43	11 700	7	476
IT	79	34 455	20	16 337
CY	11	1413	3	127
LV	14	2 166	2	54
LT	13	7 710	3	1 292
LU	4	584	1	23
HU	22	4 731	11	1 852
MT	3	1 017	2	1 013
NL	32	25 342	19	21 026
AT	89	26 781	34	24 036
PL	54	22 356	6	4 335
PT	59	17 079	4	760
RO	45	6 911	11	1 315
SI	19	2 138	3	231
SK	24	1 947	1	38
FI	18	9 509	12	8 595
SE	24	26 260	19	26 009
UK	39	21 972	21	19 736
IS	6	1 689	5	1 639
NO	34	12 773	21	9 142
CH	22	26 898	11	25 934
ME	2	15	0	0
AL	2	397	1	391
RS	38	11 318	7	1 368
TR	17	17 021	1	1 700
BA	5	528	0	0
FO	1	31	0	0
IL	4	714	2	673

Notes: Data unavailable for: LI, MK, MD.

Source: ERA Survey 2014 (P17, P36, PCountry)

Annex 5.2. Number of RPOs that adopted gender equality measures, 2013

	Flexible career trajectory (e.g. provisions for interruptions of career, returning schemes after career breaks, gender aware conditions, provisions on dual careers)	Recruitment and promotion measures	Support for leadership development (e.g. mentoring or networking opportunities for female researchers)	Targets to ensure gender balance in recruitment committees	Work-life balance measures (e.g. parental leave, flexible working arrangements)	Other measures	Total number of respondent organisations, ERA Survey 2014
BE	14	3	4	3	22	7	29
BG	12	5	10	6	18	14	41
CZ	8	6	4	2	14	9	23
DK	6	6	4	5	13	9	25
DE	86	93	78	72	107	43	123
EE	5	3	1	0	9	5	15
IE	7	7	9	8	10	2	13
EL	5	7	5	5	14	2	20
ES	44	32	15	26	75	33	124
FR	26	19	10	28	41	24	65
HR	10	14	9	9	29	15	43
IT	16	16	4	17	34	31	79
CY	3	2	2	2	5	5	11
LV	5	5	4	0	5	5	14
LT	8	3	5	4	10	1	13
LU	0	1	0	1	2	2	4
HU	10	10	0	3	14	2	22
MT	3	3	0	1	3	1	3
NL	13	18	14	14	23	13	32
AT	45	37	34	37	64	27	89
PL	23	15	3	11	36	20	54
PT	16	11	10	7	28	27	59
RO	22	16	9	9	25	15	45
SI	8	6	3	5	13	7	19
SK	5	1	2	1	11	13	24
FI	10	8	5	3	16	7	18
SE	14	19	15	12	21	5	24
UK	28	24	29	14	37	12	39
IS	2	3	2	4	4	0	6
NO	17	26	13	20	30	8	34
CH	8	9	12	11	15	9	22
ME	1	0	1	0	2	0	2
AL	1	2	2	2	1	0	2
RS	13	10	12	8	18	14	38
TR	1	4	5	3	4	8	17
BA	3	0	2	1	4	1	5
FO	0	0	0	0	0	1	1
IL	0	3	0	0	1	0	4

Notes: Data unavailable for: LI, MK, MD;

Others: Results representative of RPOs that responded to the ERA Survey only; Organisations were able to indicate that they had adopted more than one measure.

Source: ERA Survey 2014 (Pcountry, P37)

Annex 5.3. Total intramural R&D expenditure for the BES, GOV and HES sectors in million PPS, 2012

	BES	GOV	HES
EU-28	161 302	33 040	60 403
BE	5 417	690	1 711
BG	341	169	45
CZ	2 191	752	1 123
DK	3 645	132	1 752
DE	52 016	10 967	13 519
EE	307	50	171
IE	1 807	122	580
EL	513	372	598
ES	7 779	2 803	4 074
FR	26 849	5 461	8 687
HR	221	136	137
IT	11 067	3 029	5 727
CY	14	16	53
LV	50	59	110
LT	133	97	265
LU	258	98	65
HU	1 435	316	403
MT	49	7	28
NL	6 628	1 243	3 597
AT	5 577	417	2 074
PL	2 207	1 658	2 042
PT	1 432	154	1 050
RO	519	545	263
SI	876	151	129
SK	357	212	294
FI	3 886	510	1 220
SE	7 075	501	2 830
UK	18 625	2 366	7 851
IS	127	42	63
NO	2 152	676	1 289
CH	6 918	76	2 812
RS	158	182	292
TR	4 286	1 045	4 171

Notes: Exception to the reference year: IS, HR: 2011; Data unavailable for: LI, NO, CH, ME, MK, AL, RS, TR, BA, IL, FO, MD; Data estimated for: BE, AT, SE (ALL), EU-28 (GOV), IE (BES, HES); Definitions differ for: HU (ALL); DE, NL, SK, CH (GOV); Break in time series for: IS (GOV).

Source: Eurostat – Statistics on research and development (online data code: rd_e_gerdtot)

Annex 5.4. International mobility rates of HES researchers during PhD, by sex, 2012

	Women	Men
EU-27	17.6	18.9
BE	10.4	14.2
CZ	32	22
DK	38.9	55.4
DE	9.7	13.5
EE	40.7	34.6
IE	11.1	10.8
ES	35.3	43.2
FR	8.3	23.7
HR	9.7	29.7
IT	64.8	47.9
LT	27.6	17.4
LU	5.3	15.9
HU	25.3	20.4
NL	24.2	13.4
AT	8.4	15
PL	9.9	15.1
PT	40.4	13.5
RO	34.3	34.3
SI	22.7	17.6
SK	24.7	49.1
FI	17.2	22.1
SE	12.6	12.3
UK	15.6	7.4
CH	15.6	13.8
NO	22.7	17.7

Notes: Data estimated for: EU-27; Data unavailable for: EU-28, BG, EL, CY, LV, MT, IS, LI, ME, MK, AL, TR, RS, BA, IL, FO, MD;

Others: The indicator covers researchers at career stages R1 and R2 in all fields of science. Here, 'internationally mobile' researchers are those who during their PhD have moved for three months or more to a country other than the one where they completed or will obtain their PhD. The indicator is calculated by subtracting the share (%) of internationally mobile women researchers from the share (%) of internationally mobile men researchers. The country of the researcher is the country in which they are completing or completed their PhD; Weighting applied to increase representativeness of sample; The indicator shows the share of respondent RPOs that adopted each measure to promote gender equality internally in 2013.

Source: MORE2 survey (online database, flag GMD3)

Annex 5.5. International mobility rates of HES researchers in post-PhD careers, by sex, 2012

	Women	Men
EU-28	25.1	34.2
EU-27	25.2	34.2
BE	48.6	45.2
BG	17.1	18.9
CZ	8.9	20.5
DK	53.7	52.6
DE	30.3	50.5
EE	21.8	29.5
IE	34.6	38.2
EL	29.8	35.6
ES	27.8	34.6
FR	19.9	29.9
HR	15.3	22.1
IT	23.8	26.5
CY	25.3	50.5
LT	16.8	19.4
HU	29.2	37.1
MT	24.7	24.1
NL	44.3	47.0
AT	45.1	45.5
PL	5.9	11.9
PT	25.1	29.0
RO	15.7	23.0
SI	26.8	39.2
SK	26.9	28.0
FI	32.8	48.8
SE	30.9	44.7
UK	25.2	30.1
NO	40.9	44.7
CH	54.0	52.7
MK	36.4	31.2
TR	22.6	32.0

Notes: Data estimated for: EU-27; Data unavailable for: LI, ME, AL, RS, IL, FO, MD; Countries excluded due to fewer than 30 observations for one of the sexes: LV, LU, IS; Others: The indicator combines researchers in career stages R2–R4 (post-PhD) in all fields of science; 'Internationally mobile' researchers are those who have worked abroad for three months or more at least one in the last decade; The indicator is calculated by subtracting the share (%) of internationally mobile women researchers (out of the total number of women researchers) from the share (%) of internationally mobile men researchers (out of the total number of men researchers); The country of the researcher is their panel country (i.e. the country identified as their country of employment during the collection of researcher contact details before the survey); Weighting applied to increase representativeness of sample.

Source: MORE2 Survey (flag GML1)

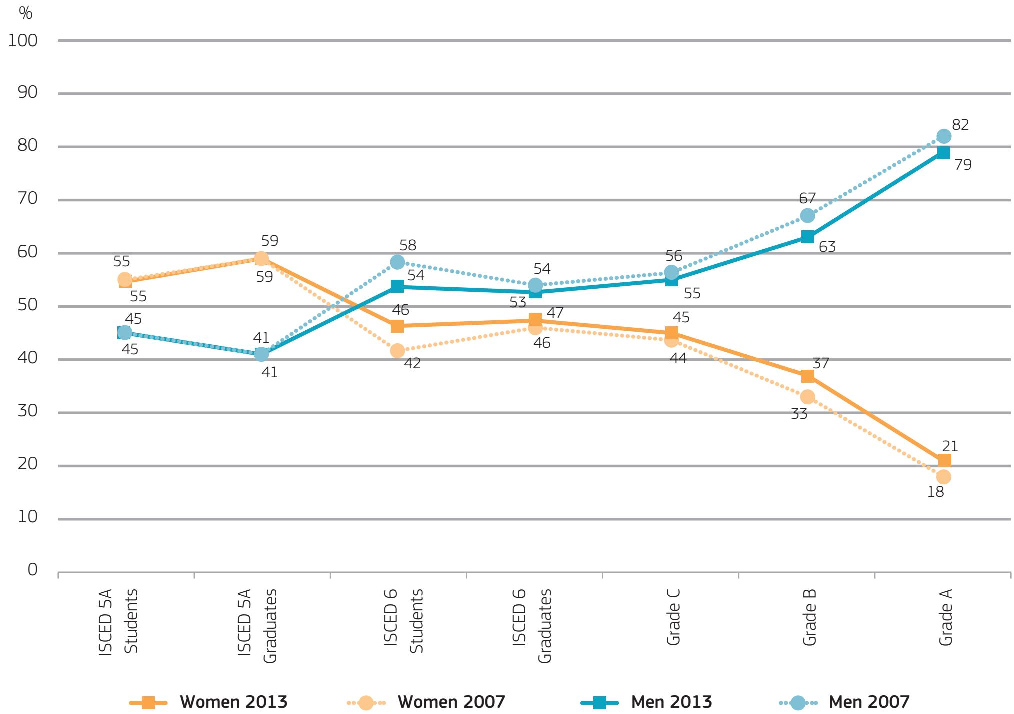
6 Career advancement and participation in decision-making

Main findings:

- The academic career of women remains markedly characterised by strong vertical segregation. In 2013, the proportion of women students (55 %) and graduates (59 %) at the first level of academic education (ISCED 5A) exceeded that of male students, but men outnumbered women at the highest level of education, with women making up 46 % and 47 % of ISCED 6 students and graduates, respectively. Furthermore, women represented only 45 % of grade C academic staff, 37 % of grade B and 21 % of grade A.
- The under-representation of women in academic careers is even more striking in the field of science and engineering, where in 2013, they made up just 31 % and 35 % of students and graduates at the ISCED 5A level, respectively, and 34 % and 37 % of students and graduates at the ISCED 6 level. The representation of women goes on to drop to 33 % at the grade C level of academic staff, 24 % at grade B and just 13 % of grade A.
- The highest proportions of women grade A staff are found in the humanities and social sciences (30 % and 23.5 %, respectively), whilst the lowest proportion is found in engineering and technology (9.8 %).
- A generational effect exists, whereby women tend to occupy a higher proportion of grade A positions (out of the total for both sexes) in the youngest age group (49 %) than in the older age groups (22 %), suggesting that the situation may improve as the number of highly educated young women entering the academic workforce increases.
- Women continue to be severely under-represented in top-level positions despite having made some progress. In 2014 women accounted for 20.1 % of the heads of institutions in the EU-28, compared to 15.5 % in the EU-27 in 2010.
- Within the EU-28, women head 15 % of institutions with the capacity to deliver PhDs, which represents an improvement from 2010, when this figure stood at 10 %.
- Within the EU-28, 28 % of board members (including leaders) are women. Out of the 29 countries for which data are available, over one quarter have at least 40 % women board members.

In 2012, the European Commission recognised that, despite accounting for nearly 60 % of all university graduates in the European Union, women were still severely under-represented at the higher levels of the academic career path and in decision-making positions (European Commission, 2013). As such, Chapter 6 focuses on the presence of women in the different grades of an academic career, within the highest academic grade (i.e. the highest post at which research is normally conducted), across the different fields of science and technology, and in top-level positions (i.e. heads of institutions or board members).

Figure 6.1. Proportion of women and men in a typical academic career, students and academic staff, EU-28, 2007–2013



Notes: Reference years Eurostat data: 2007–2012; Reference years for Women in Science (WiS) data: 2007–2013; Exceptions to the reference years (WiS): AT: 2007–2011; BE (FR), LV, RO: 2010–2013; CY, PT: 2007–2012; DK, LU (Grade A and B, C not available): 2009–2013; ES, IE: 2008–2012; BE (FL), NL, FI: 2011–2013; PL, SK: 2012–2013; FR: 2012; HR: 2014; MT: 2015; EE: 2004 (She Figures 2012); LT: 2007 (She Figures 2012); UK: 2006 (She Figures 2012); Data unavailable for: (Eurostat) ISCED 5A Students: LU (2007); ISCED 5A Graduates: FR (2012), LU (2007); ISCED 6 Students: DE (2007), LU (2007); ISCED 6 Graduates: FR (2012), LU (2007).

Source: Women in Science database, DG Research and Innovation and Eurostat – Education Statistics (online data code: educ_grad5)

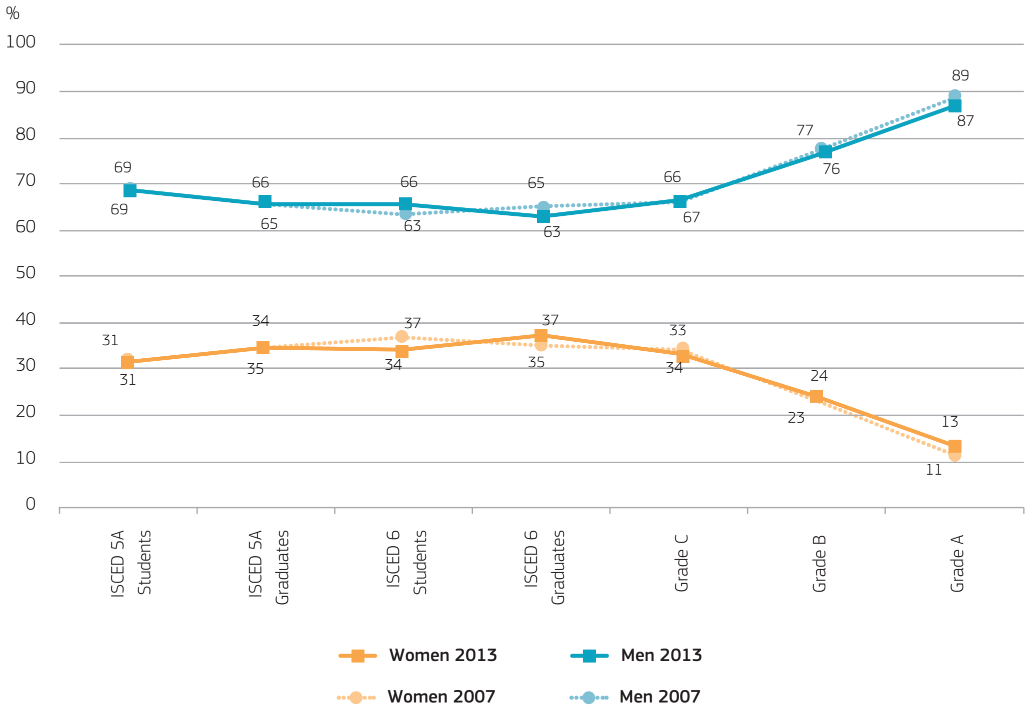
As women progress through a typical academic career path, they become increasingly under-represented compared to men.

Over the last few decades, women in all countries in Europe have caught up with or even surpassed men in terms of their level of education (European Commission, 2009). However, marked vertical segregation – defined as the under- or over-representation of a clearly identifiable group of workers in occupations or sectors at the top of an ordering based on 'desirable' attributes such as income, prestige or job stability – persists throughout women's academic career path.

In 2013, as Figure 6.1 shows, women in the EU represented 55 % of students and 59 % of graduates within the first level of academic education (largely theory-based programmes which provide sufficient qualifications to gain entry to advanced research programmes and professions with high skills requirements). These figures have remained unchanged since 2007. The trend is reversed at the level of postgraduate tertiary education (ISCED 6), where women represented 46 % of students and 47 % of graduates in 2013 (an increase of 4 percentage points and an increase of 1 percentage point compared to 2007, respectively). At this level, the gap between women and men is 8 percentage points for students and 6 percentage points for graduates. However, the gap for students appears to be volatile over time, with 2013 values equalling those of 2002 after narrowing to a 2 percentage point gap in 2010.

This gap widens further upon entry into the academic job market, with women representing 45 % of grade C academic staff in 2013, having increased their presence by only 1 percentage point since 2007 and still lagging behind men by 10 percentage points. In grade B positions, women lagged behind by 26 percentage points in 2013, having increased their proportion at this level from 33 % in 2007 to 37 % in 2010. The proportion held constant at this level in 2013. The largest gap is observed at the highest level of the academic career ladder, where women represent only 21 % of grade A staff in 2013, resulting in a 58 percentage point difference with men. Although marginal progress has been made since 2007 (a 3 percentage point increase), the very large difference which continues to be observed suggests that much work remains to be done in order to reduce the gender gap at the highest levels of the academic career pathway.

Figure 6.2. Proportions of women and men in a typical academic career in science and engineering, students and academic staff, EU-28, 2007–2013



Notes: Reference year for Eurostat data: 2007–2012; Reference year for WiS data: 2007–2013; Exceptions to the reference years (WiS): AT: 2007–2011; BE (FR): 2010–2013; BE (FL), NL, FI: 2011–2013; CZ: 2007–2008; DK: 2009–2013; IE: 2008–2012; CY, PT: 2007–2012; EL, MK: 2012; PL, SK: 2012–2013; BA, SI: 2013; HR: 2014; LT: 2007 (She Figures 2012); UK: 2006 (She Figures 2012); Data unavailable for: WiS Grade A, B and C: AT, BG, EE, FR, HU, LU, LV, RO; Eurostat: ISCED 5A Students: LU (2007), ISCED 5A Graduates: FR (2012), LU (2007), ISCED 6 Students: DE (2007), LU (2007), NL (2007), ISCED 6 Graduates: FR (2012), IT (2007), LU (2007), PL (2012);

Others: SET fields of education = Science, maths and computing + Engineering, manufacturing and construction; SET fields of science = Engineering and technology + Natural sciences.

Source: Women in Science database, DG Research and Innovation and Eurostat – Education Statistics (online data code: educ_grad5)

The gap between women and men across a typical academic career is wider in science and engineering than across all fields of study.

If one considers the situation in the field of science and engineering specifically, it becomes apparent that the significant gains made by women in education do not apply equally across different fields of study. Indeed, Figure 6.2 shows that women represent only 31 % of students and 35 % of graduates at the first level of tertiary education (in the fields of Science, maths and computing + Engineering, manufacturing and construction) and that these numbers have not changed since 2007, with the exception of a 1 percentage point increase at the graduate level. The situation is similar at the second stage of tertiary education, with women representing 34 % of students and 37 % of graduates in 2013, compared to 37 % and 35 % respectively in 2007.

At the level of academic staff the gap widens as the grade increases. Indeed, women represented 33 % of grade C staff, 24 % of grade B staff and 13 % of grade A staff in 2013 (in the fields of engineering and technology + natural sciences), with very little change since 2007 across all levels (1 to 2 percentage points). When comparing these proportions to those presented in Figure 6.1, it can be concluded that the gap is wider in science and engineering than across all fields of study taken together and that a significant amount of work will be required to rectify this situation.

Table 6.1. Proportion of women academic staff, by grade and total, 2013

	Grade A	Grade B	Grade C	Grade D	Total
EU-28	20.9	37.1	45.1	46.9	40.6
BE	15.6	30.1	35.8	48.3	41.3
BG	31.7	43.3	:	54.6	48.2
CZ	13.1	31.0	33.8	45.9	35.6
DK	19.2	31.2	42.9	50.7	43.2
DE	17.3	22.8	28.8	42.9	37.7
EE	17.2	37.1	56.6	66.6	47.4
IE	28.2	42.3	48.7	46.9	42.9
EL	19.6	29.4	35.0	41.9	32.3
ES	20.9	39.5	48.9	51.0	37.7
FR	19.3	39.6	30.2	41.3	34.3
HR	38.0	50.7	55.4	57.5	49.4
IT	21.1	35.0	45.4	50.3	39.6
CY	10.8	30.9	41.3	46.0	38.0
LV	34.4	51.5	60.9	:	56.3
LT	14.4	41.6	53.7	63.3	54.8
LU	16.5	43.1	:	:	39.0
HU	24.1	39.8	39.6	43.7	38.7
MT	44.5	27.8	34.7	28.2	31.5
NL	16.2	25.2	37.8	45.6	39.1
AT	20.3	24.8	47.1	41.8	38.7
PL	22.6	33.6	48.3	51.5	42.3
PT	25.0	39.5	47.3	53.3	49.2
RO	29.7	50.4	56.9	52.9	48.6
SI	22.5	34.6	45.5	52.6	37.9
SK	23.7	39.3	49.3	55.7	44.0
FI	26.6	47.9	47.6	47.6	44.4
SE	23.8	44.8	45.8	50.0	44.6
UK	17.5	35.7	45.6	44.2	38.7
IS	26.3	36.0	51.2	:	37.2
NO	25.2	41.0	51.0	56.8	46.5
CH	19.3	29.3	38.5	41.5	37.7
ME	:	:	:	:	55.0
MK	66.7	49.9	12.5	40.5	46.9

Notes: Exceptions to the reference year: AT: 2011; EL, CY (Grades A, B, C, D), IE, FR, LU, IS (all grades), PT, MK: 2012; ES (Grade D): 2010; HR: 2014; MT: 2015; EE: 2004 (She Figures 2012, Grades A, B, C, D); UK: 2006 (She Figures 2012); LT: 2007 (She Figures 2012, Grades A, B, C, D); Data unavailable for: LI, AL, RS, TR, BA, IL, FO, MD; Other: ':' indicates that data are unavailale; For the UK the sum across grades does not add up to the total, as data in She Figures 2012 were also reported for an additional grade (i.e. 'Other'. The UK data also differ from the data reported in Annex 3.1 of the She Figures 2012. This is because full-time equivalent instead of headcounts was used in the She Figures 2012 and this has been corrected in this edition; Grade C data for Bulgaria included under Grade B.

Source: Women in Science database, DG Research and Innovation

The proportion of women in grade A posts varies widely across countries, ranging from 11 % to 67 %.

Given that the previous figures presented the data for the EU-28 as a whole, they did not allow for a comparison of the differences observed across countries. However, due to the variability in the application of the grading definitions to national systems, it is difficult to compare the proportions observed for the lower grades of academic staff (grades B–D) across countries. Nevertheless, it is interesting to compare the data for grade A, as this level corresponds to the rank of full professor in the majority of the countries, or otherwise represents the highest post at which research is normally conducted. Table 6.1 shows that there is a large amount of variability across countries in terms of the proportion of women in grade A positions, with the proportion ranging from 11 % to 67 %. The highest proportion of women is observed in the former Yugoslav Republic of Macedonia (67 %), Malta (45 %) and Croatia (38 %), whilst the lowest proportion is found in Cyprus (11 %), the Czech Republic (13 %) and Lithuania (14 %). It is important to note that the high proportion of women observed in the former Yugoslav Republic of Macedonia represents only six women out of a total of nine grade A staff members.

In the EU-28, the proportion of women academic staff, regardless of career grade, stands at 41 % and ranges from 32 % in Malta to 56 % in Latvia. The highest proportion of women in any grade in the EU-28 is in Grade D (47 %), with values ranging from 28 % in Malta to 67 % in Estonia, although as discussed above, the direct comparability of the proportions in grades B–D between countries is hindered by variability in the grading definitions.

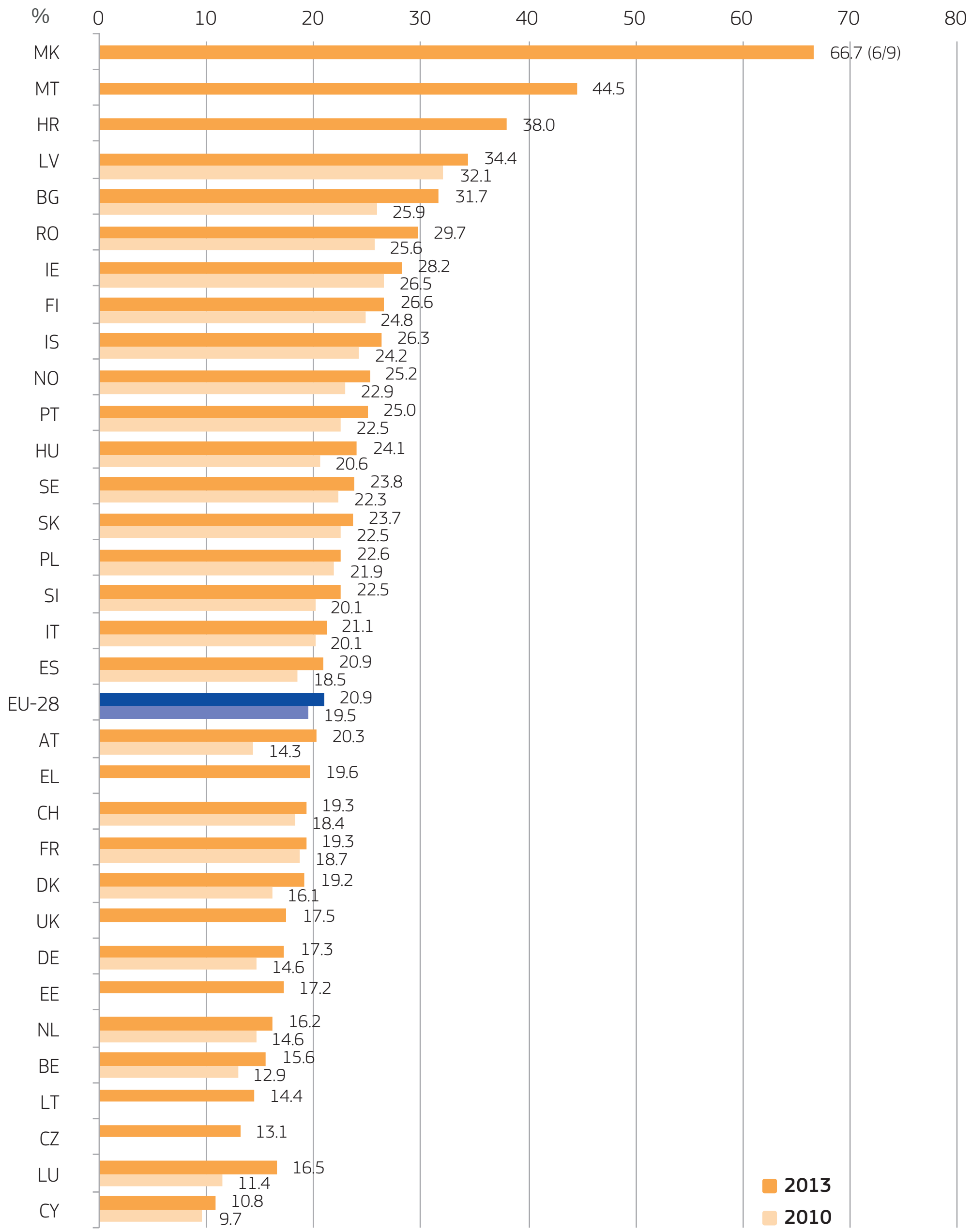
Progress towards increasing the proportion of women in grade A positions over time has been slow.

In order to further the analysis of the proportion of women in grade A positions, Figure 6.3 presents the changes in this proportion between 2010 and 2013. Within the EU-28 there has been a rather modest increase of 1.4 percentage points. Although individual countries show a wider range of change, with increases of between 0.6 and 5.9 percentage points, over the three-year period there were no large changes of the kind that would indicate a significant amount of progress towards rectifying the gender gap observed in the proportion of women in grade A positions.

Amongst academic staff, there tends to be a lower concentration of women than men in grade A positions compared to lower levels of the academic career path.

Figure 6.4 explores the concentration of women academic staff amongst grade A positions by comparing the proportion of women grade A staff within all women academic staff with the proportion of men grade A staff within all men academic staff. In 2013, the concentration of women was lower than the concentration of men in all but two countries (the former Yugoslav Republic of Macedonia and Malta). The highest proportions of women were found in Iceland (27.5 %), Malta (25.2 %) and Croatia (19.2 %), whilst the lowest proportions were found in the former Yugoslav Republic of Macedonia (0.8 %), Portugal (1.9 %), Lithuania (2.0 %), and Germany and Belgium (2.9 %). In terms of the difference between the concentration of women and men, the largest differences in favour of men by percentage point are found in Iceland (18.1 percentage points), Slovenia (17.2 percentage points), Estonia (16.6 percentage points) and France (16.3 percentage points), whilst the smallest differences are found in Portugal (3.6 percentage points), Germany (5.4 percentage points) and Hungary (6.2 percentage points). It should be noted that the large variations across countries could be partly attributable to the differences in their respective grading systems. Within the EU-28 the proportion of women sits at 6.7 % whilst the proportion of men is 17.1 %, resulting in a difference of 10.4 percentage points, as was the case in 2010. As such, it can be concluded that no progress has been made to promote women to grade A positions, and that women remain relatively more present at lower levels of the academic career path.

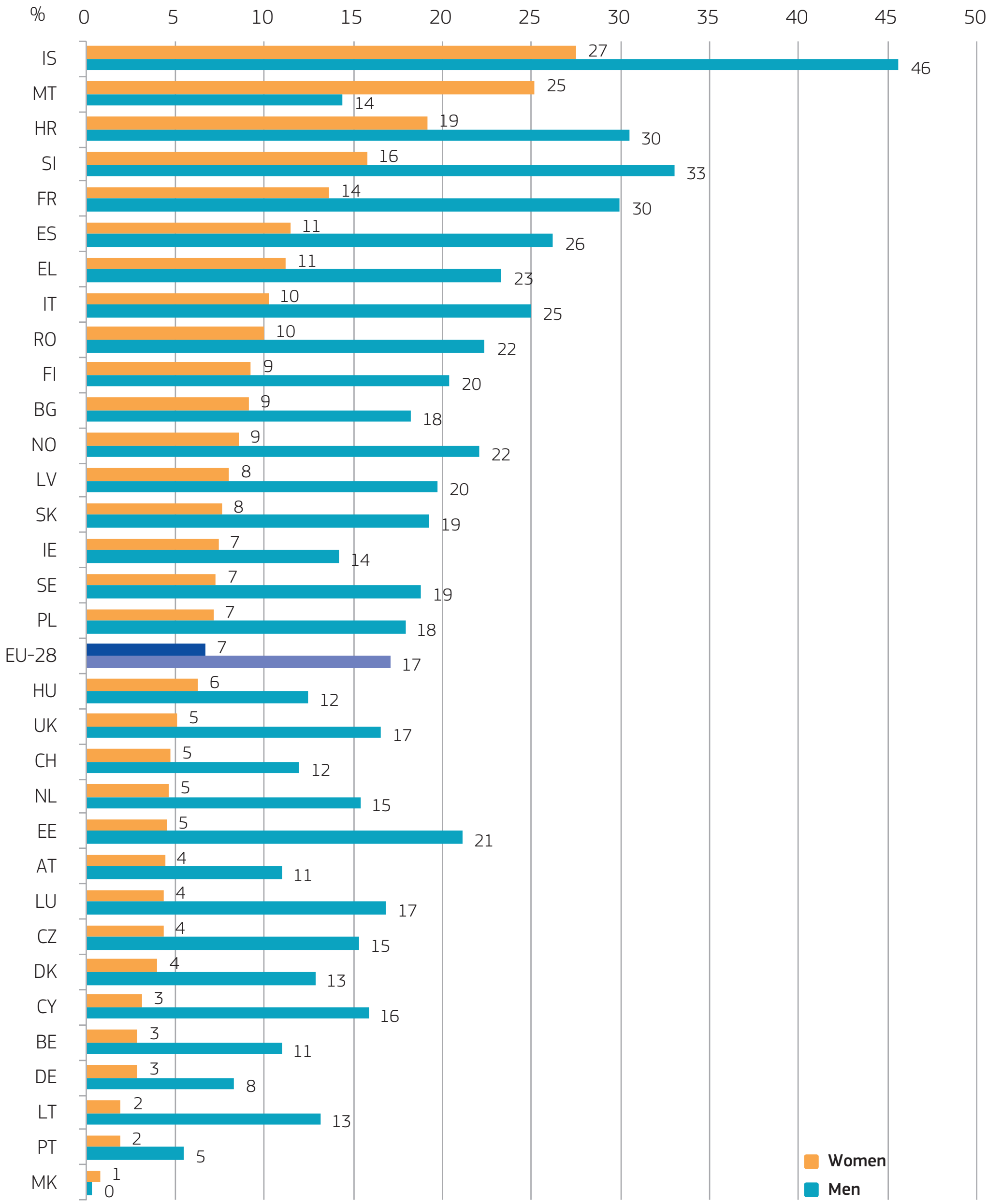
Figure 6.3. Evolution of the proportion of women in grade A positions, 2010 and 2013



Notes: Exceptions to the reference years: AT: 2006–2011; BE (FL), FI, NL, NO, SE: 2011–2013; CY, IE, IS, PT: 2010–2012; EL: 2012; LU: 2009–2013; FR: 2009 (She Figures 2012) and 2012; MK: 2012; MT: 2015; PL, SK: 2012-2013; HR: 2014; SI: 2010 (She Figures 2012) and 2013; UK: 2006 (She Figures 2012); EE: 2004 (She Figures 2012); LT: 2007 (She Figures 2012); CZ: 2008; Data unavailable for: LI, ME, AL, RS, TR, IL, FO, MD;
Others: When the population size is very small, the actual numerator and denominator are presented in parentheses next to the proportion in the chart to highlight results that are more prone to yearly fluctuations.

Source: Women in Science database, DG Research and Innovation

Figure 6.4. Percentage of grade A staff amongst all academic staff, by sex, 2013



Notes: Exception to reference years: AT: 2011; IE, EL, FR, CY, LU, IS, MK: 2012; MT: 2015; CZ: 2008; HR: 2014; EE: 2004 (She Figures 2012); LT: 2007 (She Figures 2012); UK: 2006 (She Figures 2012); Data unavailable for: LI, ME, AL, RS, TR, BA, IL, FO, MD;
Others: No data for Grade D provided for Bosnia and Herzegovina, Iceland, Spain and Latvia; No data for Grades C and D for Luxembourg; Grade C data for Bulgaria included under Grade B.

Source: Women in Science database, DG Research and Innovation

Table 6.2. Proportion of women grade A staff by main field of science, 2013

	% Women					
	NS	ET	MS	AS	SS	H
EU-28	15.8	9.8	23.3	22.7	23.5	30.0
BE	15.3	9.3	17.3	13.6	19.1	15.6
CZ	10.6	7.4	19.7	11.3	15.6	17.9
DK	11.5	8.9	21.2	22.7	22.4	27.8
DE	11.6	7.6	11.5	18.4	16.0	28.6
IE	20.7	15.9	41.1	35.7 (10/28)	42.9	28.1
EL	13.8	10.6	23.1	19.9	22.5	38.2
ES	19.5	11.5	23.9	15.9	21.9	27.5
HR	41.8	20.0	45.0	41.5	43.7	40.6
IT	21.6	10.4	13.6	15.6	24.3	35.9
CY	9.5	18.5 (5/27)	50 (1/2)	:	6.5	9.1 (2/22)
LT	6.8	4.5	22.6	10.3 (3/29)	17.8	26.5
MT	37.5 (3/8)	16.1	53.7	100 (1/1)	53.5	55.6 (15/27)
NL	9.7	9.0	16.4	7.3	19.1	25.7
AT	11.7	7.8	14.7	17.0	24.1	33.4
PL	17.5	8.4	30.8	30.2	23.6	27.1
PT	28.7	9.9	19.8	28.6	24.9	34.1
SI	10.9	11.6	30.7	35.1	23.9	29.1
SK	18.0	12.5	25.6	14.3	30.8	24.0
FI	12.2	7.9	30.4	43.2	34.4	41.3
SE	16.2	12.6	28.1	30.2	28.2	36.1
UK	9.0	7.0	23.2	12.4	22.7	10.8
NO	17.3	10.3	34.9	21.3	27.7	30.6
CH	12.9	12.0	20.0	22.2 (6/27)	24.4	33.3
MK	:	100 (2/2)	100 (1/1)	100 (2/2)	50 (1/2)	0 (0/1)

Notes: Exceptions to the reference years: IE, EL, CY, PT, IS, MK: 2012; AT: 2011; HR: 2014; MT: 2015; CZ: 2008, LT: 2007 (She Figures 2012); UK: 2006 (She Figures 2012);
Data unavailable for: BG, EE, FR, HU, LV, LU, RO, IS, LI, ME, AL, RS, TR, BA, IL, FO, MD;
Others: For proportions based on low numbers of headcounts (i.e. <30), the numerators and denominators are presented in parentheses in the table.

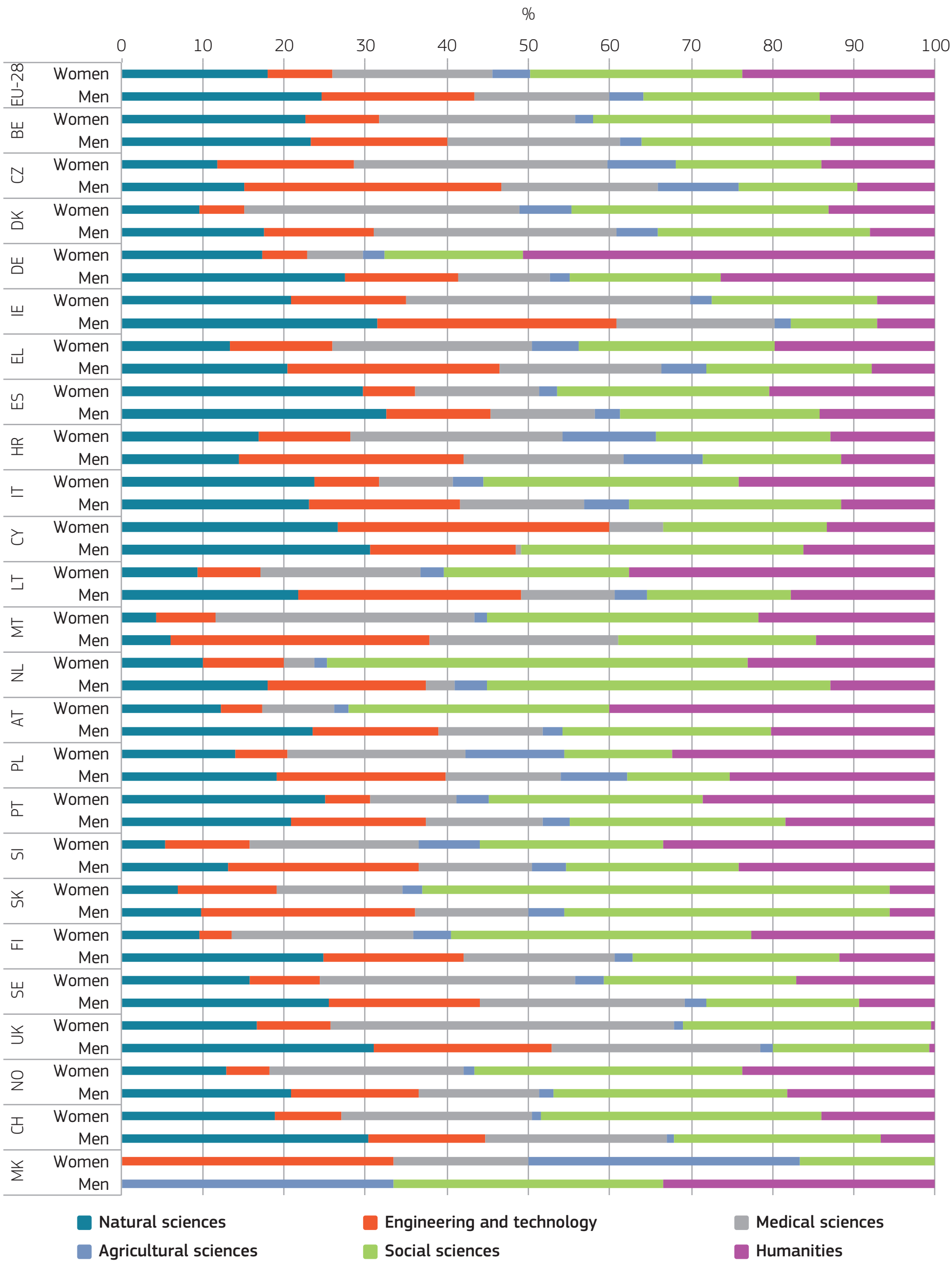
Source: Women in Science database, DG Research and Innovation

The proportion of women in grade A positions (out of the total for both sexes) is highest in the humanities and social sciences and lowest in engineering and technology.

As briefly mentioned in Figure 6.2, there can be large differences in the presence of women across different fields of science. As such, Table 6.2 shows the proportion of women in grade A positions across six different fields, namely natural sciences, engineering and technology, medical sciences, agricultural sciences, social sciences and humanities. On average, within the EU-28, the largest proportion of women grade A staff was found in the fields of the humanities and social sciences (30 % and 23.5 %, respectively). In contrast, the lowest proportion of women was found in engineering and technology, where women represent only 9.8 % of grade A staff. In the remaining three fields of science the proportion of women stood at 15.8 % (natural sciences), 22.7 % (agricultural sciences) and 23.3 % (medical sciences).

In the majority of the countries, the proportion of women is lowest in the field of engineering and technology, with the highest proportion (20.0 %) being found in Croatia (the former Yugoslav Republic of Macedonia has only two grade A staff members in this category and both are women). There is no field of science in which the proportion of women is consistently higher than the proportion of men across countries, although the highest numbers are seen in the medical sciences. The medical sciences represent the field in which women's representation is the highest in the largest number of countries inluding in the Czech Republic, Croatia, Cyprus, Poland, the United Kingdom, Norway and the former Yugoslav Republic of Macedonia.

Figure 6.5. Distribution of grade A staff across fields of science, by sex, 2013



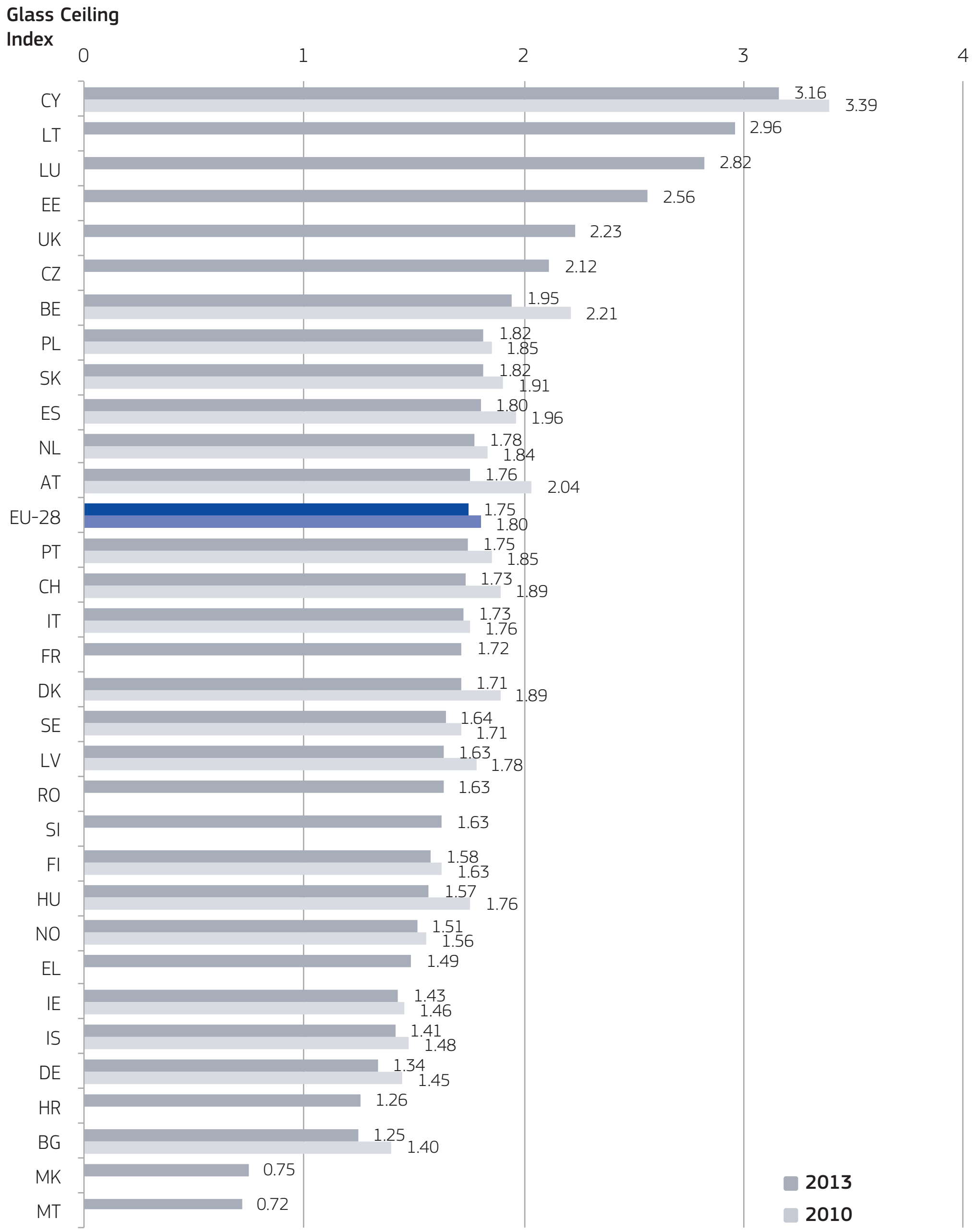
Notes: Exceptions to the reference year: IE, EL, CY, PT, IS, MK: 2012; AT: 2011; HR: 2014; MT: 2015; CZ: 2008; LT: 2007 (She Figures 2012); UK: 2006 (She Figures 2012); Data unavailable for: BG, EE, FO, FR, HU, IL, LU, LV, MD, RO, IS, LI, ME, AL, RS, TR, BA.

Source: Women in Science database, DG Research and Innovation

Across fields of science, women holding grade A positions are least likely to be working in the fields of agricultural sciences, engineering and technology and natural sciences.

In order to further analyse the presence of women amongst grade A staff in the different fields of science, Figure 6.5 shows the relative proportion of women working in each field (i.e. the number of women grade A staff working in a given field divided by the total number of women grade A staff). The figure reveals patterns similar to those presented in Table 6.2. Indeed, the proportion of women working in engineering and technology is smaller than the corresponding proportion for men in all but two countries (Cyprus, and the former Yugoslav Republic of Macedonia, which has only nine grade A staff members). The countries with the highest proportion of women grade A staff in this field of study are the former Yugoslav Republic of Macedonia and Cyprus (both at 33.3 %; however note that the former Yugoslav Republic of Macedonia calculation is based on only six women). The lowest proportion was found in Finland (4 %) and Austria (5.2 %). The proportion of women grade A staff working in natural sciences is also generally lower than the proportion of men, except in Croatia, Italy, and Portugal, with the highest proportion being found in Spain (29.7 %) and Cyprus (26.7 %) and the lowest proportion being found in Malta (4.3 %) and Slovenia (5.4 %); note that there are no women grade A staff in natural sciences in the former Yugoslav Republic of Macedonia but, again, there are only nine grade A staff members in this country. In agricultural sciences, the proportion of women is higher than the proportion of men in about 50 % of the countries. The proportion of women is also higher than the proportion of men in the majority of the countries in the three remaining fields of study, namely medical sciences, social sciences and the humanities. Within the EU-28, the field in which women grade A staff are most concentrated is the social sciences (26 %) followed by the humanities (23.8 %), whilst the lowest concentrations are found in engineering and technology (7.9 %) and agricultural sciences (4.6 %). In the latter, the concentration of women grade A staff is slightly above the concentration of men grade A staff in the same field of science (4.1 %).

Figure 6.6. Glass Ceiling Index, 2010–2013



Notes: Exceptions to the reference years: AT: 2006-2011; IE, CY, PT, IS: 2010-2012; BE (FL), NL, FI, SE, NO: 2011-2013; PL, SK: 2012-2013; EL, FR, MK: 2012; HR: 2014; MT: 2015; CZ: 2008; EE: 2004 (She Figures 2012); UK: 2006 (She Figures 2012); LT: 2007 (She Figures 2012); LU: 2009 (She Figures 2012); Data unavailable for: LI, ME, AL, RS, TR, BA, IL, FO, MD;
Other: Grade C unavailable for BG (included in Grade B).

Source: Women in Science database, DG Research and Innovation

The Glass Ceiling Index

The Glass Ceiling Index (GCI) is a relative index comparing the proportion of women in academia (grades A, B, and C) with the proportion of women in top academic positions (grade A positions; equivalent to full professors in most countries) in a given year. The GCI can range from 0 to infinity. A GCI of 1 indicates that there is no difference between women and men in terms of their chances of being promoted. A score of less than 1 means that women are more represented at the grade A level than in academia generally (grades A, B, and C) and a GCI score of more than 1 indicates the presence of a glass ceiling effect, meaning that women are less represented in grade A positions than in academia generally (grades A, B, and C). In other words, the interpretation of the GCI is that the higher the value, the stronger the glass ceiling effect and the more difficult it is for women to move into a higher position.

Women continue to be less represented in grade A positions than in academia generally (grades A, B, and C), but some progress has been made since 2010.

As described in the box above, the GCI illustrates the difficulties women face in gaining access to the highest levels of academia. Within the EU-28, the GCI stood at 1.75 in 2013 compared to 1.80 in 2010, indicating that there has been some progress towards reducing the glass ceiling effect, although women continue to be less-represented in grade A positions than in academia generally (grades A, B, and C). Focusing on the individual countries reveals that the highest GCI is found in Cyprus (3.16), Lithuania (2.96) and Luxembourg (2.82). Encouragingly, the GCI has decreased between 2010 and 2013 across all countries for which data were available, falling by as much as 0.28 in Austria, 0.27 in Belgium and 0.23 in Cyprus. Although inequalities persist and progress is generally slow, this trend suggests that women are encountering fewer difficulties in accessing higher positions. The proportion of women in grade A positions is larger than the proportion of women in academia (grade A, B, and C) in only two countries, namely the former Yugoslav Republic of Macedonia (0.75), where there are only six grade A staff members, and Malta (0.72).

Table 6.3. Proportion of women grade A staff, by age group, 2013

	<35	35–44	45–54	55+	Total
EU-28	49	30.7	25.2	22.4	24.3
BE	0 (0/1)	18.7	18.0	12.4	15.6
BG	100 (2/2)	38.5	36.2	30.8	31.7
DE	33	23.4	18.7	12.2	17.3
ES	:	17.8	22.3	20.4	20.9
HR	64 (7/11)	39.4	44.0	33.6	38.0
IT	:	19.5	20.0	21.5	21.1
CY	:	:	:	:	10.8
LV	51	61.2	61.2	46.9	53.5
HU	:	:	:	:	24.1
MT	42	50.0	42.6	36.8	44.5
NL	42	22.1	18.1	12.4	16.2
AT	30	26.7	24.7	13.7	20.3
PL	50 (1/2)	19.7	26.2	23.2	23.5
PT	33	36.0	22.9	25.8	25.0
RO	33 (1/3)	37.9	39.1	24.7	29.7
SK	0 (0/1)	24.1	26.9	22.9	23.7
FI	42	24.1	28.5	25.7	26.6
SE	0 (0/2)	21.1	25.8	23.1	23.8
IS	:	33.3	27.8	24.9	26.3
NO	0	24.2	29.6	23.3	25.2
CH	30	25.0	18.7	12.1	19.3
MK	:	:	:	:	66.7

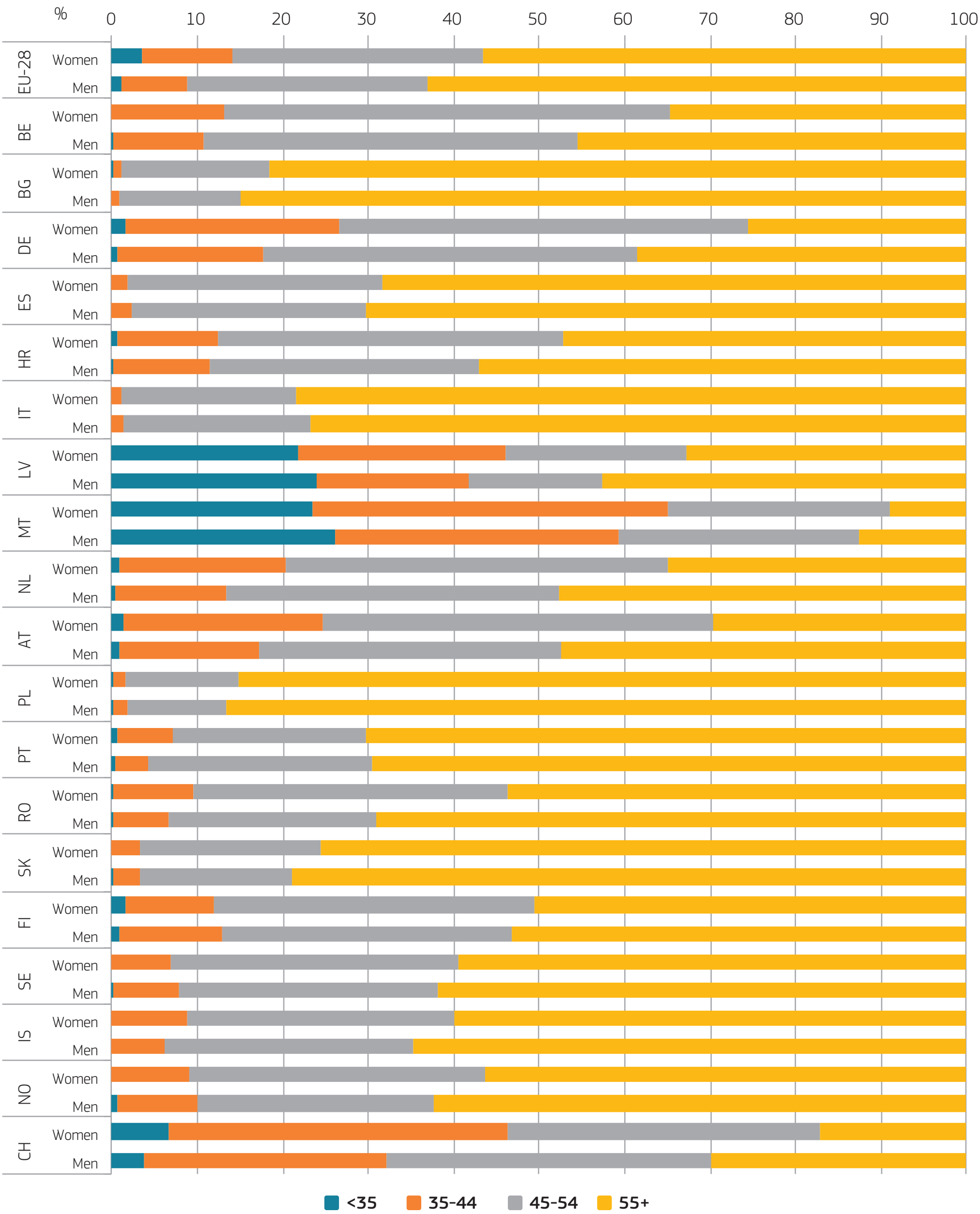
Notes: Exceptions to the reference year: CY, PT, IS, MK: 2012; HR: 2014; MT: 2015; PL: 2014; AT: 2011; Data unavailable for: CZ, DK, EE, IE, EL, FR, LT, LU, SI, UK, LI, ME, AL, RS, TR, BA, IL, FO, MD;
Others: EU-28 score for <35 is highly affected by the score of LV which accounts for more than 80 % of <35 headcounts; For proportions based on low numbers of head counts (i.e. <10), the numerators and denominators are presented in parentheses in the table.

Source: Women in Science database, DG Research and Innovation

The highest proportion of women in grade A positions can be found in the under-35 age group, suggesting that the situation is improving amongst younger generations.

As discussed in some of the previous figures, women have now caught up with or surpassed men in education. The question thus arises as to whether this increased presence in education translates into an increase of women grade A staff in the younger generations compared to the older ones. Table 6.3 presents the proportion of women grade A staff across four age groups, namely women under 35 years old, between 35 and 44 years old, between 45 and 54 years old, and 55 and older. Within the EU-28, the highest proportion of women grade A staff is found in the under-35 age group (49 %), suggesting that women's increased presence in education is indeed leading to more women grade A staff. In contrast, women represent only 22 % of grade A staff in the 55+ age group. Out of the nine countries for which statistically adequate sample sizes were obtained across all age groups, five countries confirmed this generational effect (Austria, Finland, Germany, the Netherlands and Switzerland) by having the highest proportion of women in the lowest age group. Similarly, in Latvia, Malta and Portugal, the highest proportion of women was found in the second youngest age group (35–44 years). Norway was the only country that did not confirm this generational effect, as it had no women grade A staff in the youngest age group (out of 13 grade A staff members) and the highest proportion of women was observed in the 45–54 age group. Overall, the situation appears to be improving in the younger generations in several countries. However, the gap at the grade A level continues to be disproportionate to the number of women in higher education, therefore suggesting that there are other barriers to women gaining access to higher positions.

Figure 6.7. Distribution of grade A staff across age groups, by sex, 2013



Notes: Exceptions to the reference year: PT, IS, MK: 2012; HR: 2014; MT: 2015; PL: 2014; AT: 2011; Data unavailable for: CZ, DK, EE, IE, EL, FR, HU, CY, LT, LU, SI, UK, LI, ME, MK, AL, RS, TR, BA, IL, FO, MD;

Others: EU-28 score for <35 is highly affected by the score of LV which accounts for more than 80 % of <35 headcounts.

Source: Women in Science database, DG Research and Innovation

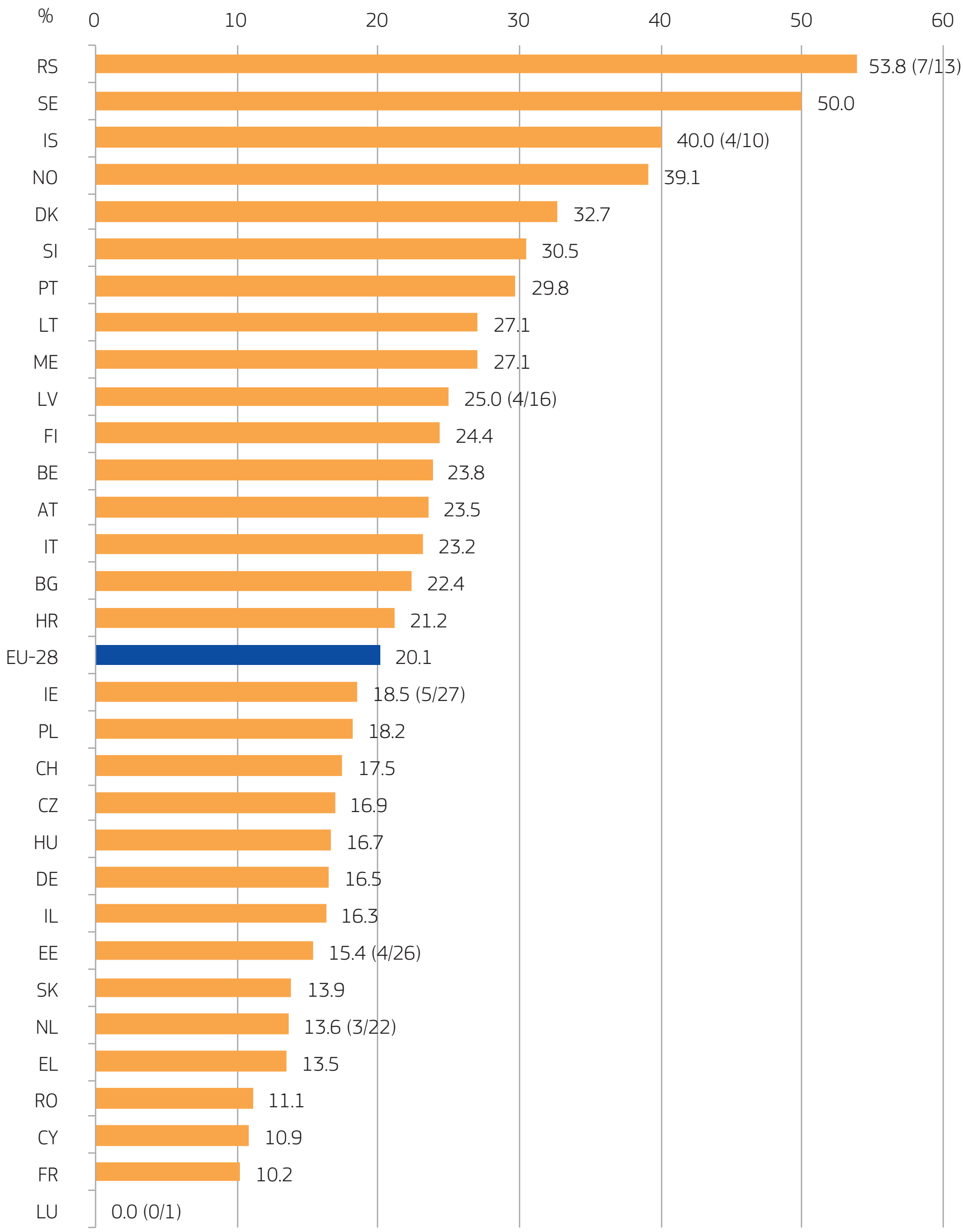
Women and men in grade A positions are more likely to fall within older age groups, yet the concentration of men is higher than that of women in the oldest age group (for grade A staff) in all but two countries.

Figure 6.7 follows on from the data presented in Table 6.3 by showing the relative distribution of women and men grade A staff (i.e. the number of women grade A staff in a given age group as a percentage of the total number of women grade A staff). Conducting the analysis in such a way reveals that, for both women and men, the proportion of grade A staff in the two lowest age groups is much lower than in the two highest age groups, with 16 of the 19 countries for which data are available having less than 5 % of their grade A staff in the under-35 category. Given that several countries have between 0 and 1 % of their grade A staff in this age group, this method of presenting the data mask some of the effects discussed in the previous table. Nevertheless, the concentration of women grade A staff in the oldest age group is lower than that of men in all but two countries, namely Italy and Portugal, as may be expected given the previously discussed generational effect. In the 35–44 and the 45–54 age groups, the opposite trend is revealed, with women being more prevalent than men in the 45–54 age group in all but four countries (Italy, Malta, Portugal and Switzerland). In the 35–44 age group, women are more prevalent than men in 11 countries. Overall, the largest differences are observed in the 55+ age group, with a difference as great as 18 percentage points observed in Austria. At EU-28 level, only in the 55+ age group is the concentration of grade A staff higher for men compared to women (by 6 percentage points), with women scoring 2 percentage points more than men in the under-35 category, 3 percentage points more than men in the 35–44 category and 1 percentage point more than men in the 45–54 category. Overall in the EU-28, the largest concentration of women grade A staff is found in the 55+ age group.

The proportion of women as heads of institutions increased from 15.5 % in 2010 to 20.1 % in 2013.

It has been postulated that the under-representation of women in higher positions within academia leads to severely reduced chances of women becoming the head of a university or a similar higher education institution. It is also postulated that the gender gap at this level could have repercussions on decisions that affect the entry and the retention of women within such higher-level positions. In other words, the under-representation of women in positions of power could serve as a deterrent to young women embarking on a scientific career and also as an obstacle to their progression to PhD level and the first stages of academia. As such, Figure 6.8 shows the proportion of the heads of institutions in the higher education sector (HES) who are women. Within the EU-28 in 2014, 20.1 % of the heads of institutions were women, compared to 15.5 % in 2010 (for EU-27). There is wide variation between individual countries in this area, ranging from 10.2 % in France (as Luxembourg has only one head of institution in total, it is not discussed in the present analysis) to 53.8 % in Serbia. This represents an improvement from 2010, where the figures ranged from 5.5 % in Turkey to 31.8 % in Norway. Indeed, whilst 31.8 % was the highest proportion observed in 2010, there are now five countries – namely Denmark, Norway, Iceland, Sweden and Serbia – which have surpassed this figure, indicating that there has been a shift towards rectifying the under-representation of women as heads of institutions.

Figure 6.8. Proportion of women heads of institutions in the higher education sector, 2014



Notes: Exceptions to the reference year: BE (FR), BG, CZ, CY, NL, RO, RS: 2013; FR: 2012; LU: 2010; Data unavailable for: ES, MT, UK, LI, MK, AL, TR, BA, FO, MD; Others: For proportions based on low numbers of institutions (i.e. <30), the numerators and denominators are presented in parentheses in the chart.

Source: Women in Science database, DG Research and Innovation

Table 6.4. Proportion of women heads of universities or assimilated institutions based on capacity to deliver PhDs, 2014

	Women	Men
EU-28	15	85
BE	9.1	90.9
BG	7.3	92.7
CZ	3.7	96.3
DK	30.8	69.2
DE	16.8	83.2
EE	14.3	85.7
EL	17.2	82.8
FR	13.4	86.6
HR	11.1	88.9
IT	7.4	92.6
CY	12.5	87.5
LV	28.6	71.4
LT	11.1	88.9
LU	0.0	100.0
HU	3.7	96.3
NL	21.4	78.6
AT	25.9	74.1
PL	8.5	91.5
PT	20.0	80.0
RO	6.1	93.9
SI	26.8	73.2
SK	14.3	85.7
FI	40.0	60.0
SE	50.0	50.0
IS	33.3	66.7
NO	37.5	62.5
CH	8.3	91.7
ME	33.3	66.7
RS	15.7	84.3
IL	12.5	87.5

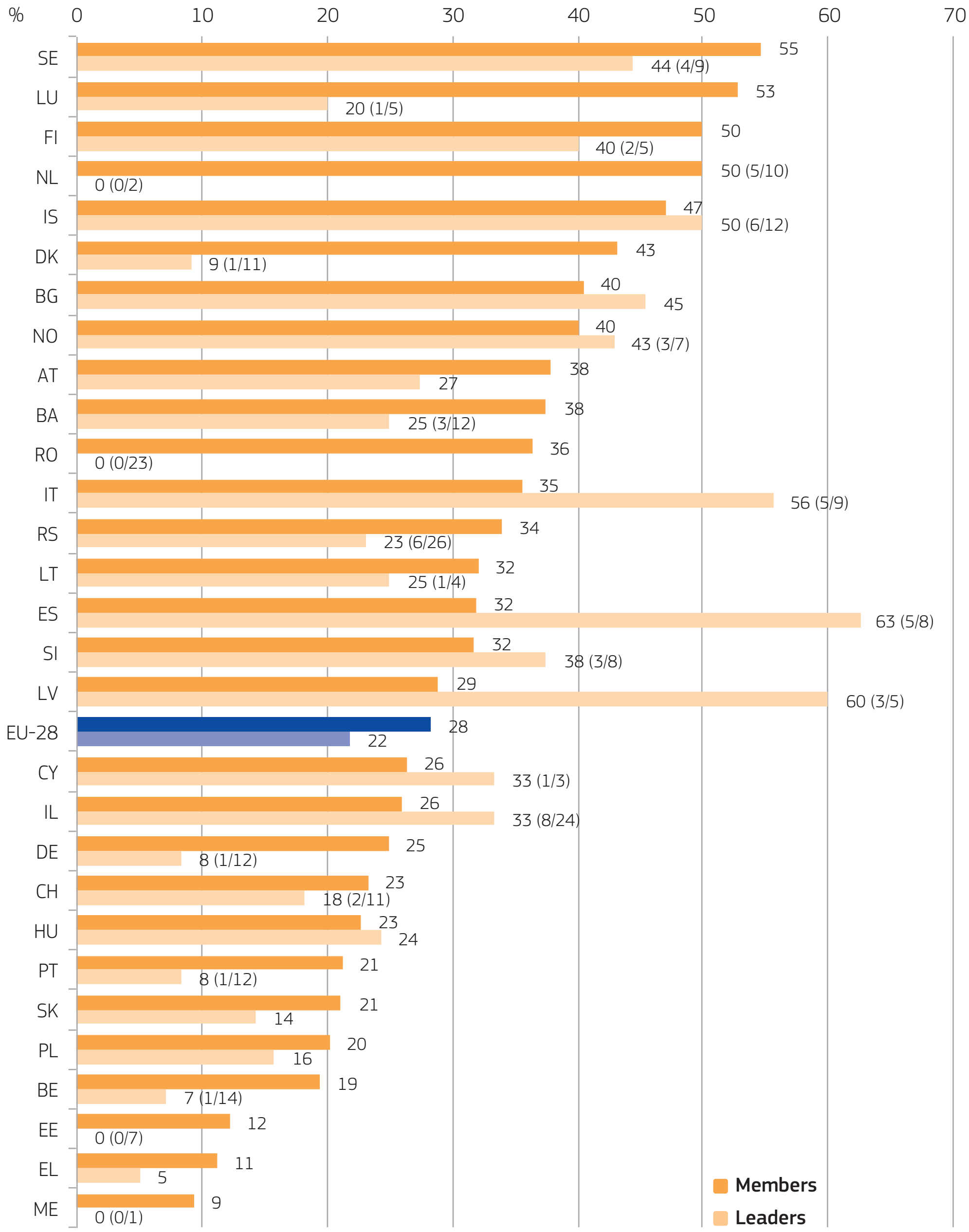
Notes: Exceptions to the reference year: BE (FR), BG, CZ, CY, NL, RS: 2013; SI: 2010; Data unavailable for: IE, ES, MT, UK, LI, MK, AL, TR, BA, FO, MD;
Others: Proportion for LU is based on a low headcount (only one university); Proportions for BE, CY, EE, IS, IL and NO are based on fewer than 10 heads of universities.

Source: Women in Science database, DG Research and Innovation

The proportion of women employed as the head of universities or institutions accredited to deliver PhDs remains low, but there are signs of improvement.

Table 6.4 illustrates the same issue as Figure 6.8, but focuses on a narrower group of women, namely women who are heads of universities or institutions that are accredited to deliver PhDs. Within the EU-28, the proportion of women heads of institutions is 15 %, which represents an improvement from 2010, when only 10 % of heads of institutions were women. Seventeen of the 26 countries for which data were available for both years have seen an increase in the number of women heads of institutions that are accredited to deliver PhDs, although the proportion of women remains lower than the proportion of men in all but one countries (Sweden) for which data are available. Only three countries have seen a decrease since 2010, namely Bulgaria, Croatia and Israel (5, 11 and 2 percentage points respectively). A few countries approach parity, such as Sweden (50 % women), Finland (40 % women) and Norway (38 % women). It is interesting to note that the countries with the highest proportion of women in these positions tend to be the Nordic countries. The countries with the lowest proportion of women heads of institutions are Hungary and the Czech Republic, where in each country only 1 of the 27 heads of institutions is a woman (there is only a single university in Luxembourg so the proportions for this country are not statistically meaningful). Overall, it can be concluded that a shift towards a reduction of the gender gap has occurred in the majority of the countries since 2010.

Figure 6.9. Proportion of women on boards, members and leaders, 2014



Notes: Exceptions to the reference year: RS, BA: 2013; Data unavailable for: BE (FL), CZ, IE, FR, HR, MT, UK, LI, MK, AL, TR, FO, MD;
Others: Headcount (leaders and members); Due to important changes in the definition of boards, no data from She Figures 2012 was used to fill gaps in She Figures 2015; For proportions based on low numbers of headcounts (i.e. <30), the numerator and denominator are presented in parentheses in the chart.

Source: Women in Science database, DG Research and Innovation

In 2014, women made up 28 % of board members (including leaders) in the EU-28.

Figure 6.9 focuses on the presence of women on boards such as scientific or R&D commissions, boards, councils, committees, foundations, academy assemblies and councils, which usually hold a large degree of decision-making power. As such, the under-representation of women on boards could have similar effects to their under-representation as heads of institutions. In the She Figures 2015, the definition of boards was revised from previous years to include only national-level boards. It should therefore be noted that the figures presented here are not directly comparable with previous editions.

In 2014, women made up 28 % of board members (including leaders) within the EU-28. Out of the 29 countries for which data are available, more than a quarter have at least 40 % women board members, suggesting that women have been included in important decision-making processes in a number of countries. In comparison, only four countries had 40 % or more women board members in 2010 ([89]). The countries with the highest women board membership (excluding leaders) are Sweden (55 %), Luxembourg (53 %), Iceland (52 %), Finland (50 %) and the Netherlands (50 %). At the other end of the spectrum, the countries with the lowest women board membership are Montenegro (9 %), Greece (11 %), Estonia (12 %) and Belgium (19 %).

Board leadership lags behind membership positions in the majority of countries, with women generally being less represented in this area than in the latter. This trend is reversed in nine countries, with women holding the leadership position on more than half the country's boards in Italy (56 %), Latvia (60 %) and Spain (63%), although these proportions and those of several of the other countries where this trend is observed are based on a low number of institutions. In Estonia, the Netherlands, Romania and Montenegro no women hold leadership positions, although as with the opposite end of the spectrum, these values are calculated on a small number of institutions. In a further eight countries, women make up less than one fifth of board leaders, indicating that there is further room for improvement at the highest level of decision-making.

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89 However, as noted in the above text, that there have been important changes in the definition of boards since the previous edition which may affect the comparability of the data.

Annex 6.1. Number of academic staff, by grade and sex, 2013

	Grade A		Grade B		Grade C		Grade D		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-28	28 895	109 099	102 523	173 573	107 774	131 425	227 940	258 335	450 364	657 639
BE	365	1 976	953	2 218	2 325	4 165	9 016	9 670	12 659	18 029
BG	1 010	2 174	2 862	3 750	z	z	7 217	5 999	11 089	11 923
CZ	286	1 899	2 755	6 141	175	342	3 403	4 009	8 166	14 791
DK	469	1 976	1 493	3 285	1 778	2 370	7 958	7 751	11 698	15 382
DE	2 527	12 077	6 897	23 396	4 838	11 978	73 611	97 935	87 873	145 386
EE	94	454	372	630	966	740	653	328	2 273	2 519
IE	357	908	2 011	2 747	367	387	2 084	2 361	4 819	6 403
EL	650	2 658	674	1 620	1 926	3 580	2 549	3 539	4 642	9 721
ES	2 339	8 858	12 401	19 006	5 689	5 937	35 116	33 749	20 429	33 801
FR	5 061	21 214	23 346	35 640	1 886	4 364	6 756	9 598	37 049	70 816
HR	1 120	1 828	2 610	2 543	977	787	1 141	842	5 848	6 000
IT	2 935	10 955	5 532	10 278	12 098	14 571	8 183	8 097	28 748	43 901
CY	15	124	56	125	219	311	190	223	480	783
LV	221	421	313	295	2 217	1 421	:	:	2 751	2 137
LT	106	628	925	1 297	1 135	979	3 246	1 879	7 632	6 304
LU	19	96	28	37	:	:	:	:	345	540
HU	388	1 224	1 317	1 994	3 474	5 302	1 016	1 308	6 195	9 828
MT	77	96	166	432	34	64	29	74	306	666
NL	519	2 689	629	1 863	2 036	3 345	8 045	9 595	11 229	17 492
AT	483	1 902	1 061	3 216	3 364	3 780	6 054	8 436	10 962	17 334
PL	2 184	7 491	4 890	9 680	19 239	20 600	4 329	4 076	30 642	41 847
PT	438	1 312	1 744	2 666	6 672	7 428	14 296	12 508	23 150	23 914
RO	1 371	3 244	8 109	7 990	3 798	2 873	437	389	13 715	14 496
SI	363	1 247	399	755	1 305	1 565	234	211	2 301	3 778
SK	419	1 352	1 077	1 661	3 491	3 593	519	412	5 506	7 018
FI	742	2 044	1 764	1 920	1 848	2 035	3 657	4 025	8 011	10 024
SE	1 452	4 651	5 765	7 114	1 326	1 567	11 386	11 394	19 929	24 726
UK	2 885	13 601	12 374	21 274	24 591	27 341	16 815	19 927	71 917	98 080
IS	80	224	80	142	131	125	:	:	291	491
NO	896	2 663	2 815	4 055	1 022	980	5 757	4 378	10 490	12 076
CH	577	2 416	589	1 421	3 853	6 165	7 207	10 177	12 226	20 179
ME	:	:	:	:	:	:	:	:	344	282
MK	6	3	554	557	1	7	208	305	769	872

Notes: Exceptions to the reference year: AT: 2011; IE, FR, CY, LU, PT, IS (Total), MK: 2012; ES (Grade D): 2010; EL (Grades A, B, C, D): 2012; HR: 2014; MT: 2015: CZ (Grades A, B, C, D): 2008; EE (Grades A, B, C, D): 2004 (She Figures 2012); Data unavailable for: LI, AL, RS, TR, BA, IL, FO, MD;

Others: ':' indicates that data are unavailable; The base reference population was that of 'Researchers' as defined in the Frascati Manual (OECD, 2002), with the exception of the following countries which used 'Academic Staff' based on the UOE Manual (UNESCO/OECD/Eurostat, 2013): BG, DE, EL, ES, IT, LV, LU, MT, NL, RO, SI, SK, SE, IS; Headcount (HC).

Source: Women in Science database, DG Research and Innovation

Annex 6.2. Number of senior academic staff (grade A), by field of science and sex, 2013

	Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences		Humanities		Unknown		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-28	3 526	18 726	1 554	14 329	3 865	12 725	909	3 103	5 093	16 588	4 659	10 871	1 125	3 930	20 731	80 272
BE	81	449	33	323	86	411	8	51	105	446	46	249	6	47	365	1 976
CZ	34	286	48	602	89	363	24	189	51	276	40	183	0	0	286	1 899
DK	45	346	26	267	158	587	30	102	148	513	62	161	0	0	469	1 976
DE	429	3 260	137	1 658	173	1 337	67	297	421	2 210	1 260	3 138	40	177	2 527	12 077
IE	74	283	50	264	123	176	10	18	72	96	25	64	3	7	357	908
EL	87	542	82	690	159	529	37	149	157	541	128	207	0	0	650	2 658
ES	695	2 873	148	1 143	357	1 134	50	265	609	2 176	480	1 264	0	3	2 339	8 858
HR	190	265	126	505	292	357	127	179	241	311	144	211	0	0	1 120	1 828
IT	694	2 514	237	2 045	261	1 657	112	607	919	2 862	712	1 270	0	0	2 935	10 955
CY	4	38	5	22	1	1	:	:	3	43	2	20	0	0	15	124
LT	10	137	8	171	21	72	3	26	24	111	40	111	0	0	106	628
MT	3	5	5	26	22	19	1	0	23	20	15	12	8	14	77	96
NL	51	475	50	508	19	97	8	102	263	1 111	117	338	11	58	519	2 689
AT	59	445	25	297	42	243	9	44	155	488	193	385	0	0	483	1 902
PL	304	1 431	141	1 537	475	1 065	261	602	289	934	702	1 891	12	31	2 184	7 491
PT	110	273	24	219	46	186	18	45	115	347	125	242	0	0	438	1 312
SI	19	156	37	283	74	167	26	48	80	255	119	290	8	48	363	1 247
SK	29	132	51	356	65	189	10	60	240	539	24	76	0	0	419	1 352
FI	71	509	30	351	165	378	35	46	273	521	168	239	0	0	742	2 044
SE	228	1 181	124	857	453	1 161	51	118	340	864	247	437	9	33	1 452	4 651
UK	309	3 126	167	2 205	784	2 596	22	155	565	1 924	10	83	1 028	3 512	2 885	13 601
NO	116	554	48	416	212	395	13	48	294	766	213	484	0	0	896	2 663
CH	105	712	46	338	132	529	6	21	193	599	78	156	17	61	577	2 416
MK	0	0	2	0	1	0	2	1	1	1	0	1	0	0	6	3

Notes: Exceptions to the reference year: IE, EL, CY, PT, IS, MK: 2012; AT: 2011; HR: 2014; MT: 2015; CZ: 2008, LT: 2007 (She Figures 2012); UK: 2006 (She Figures 2012); LU: 2009 (She Figures 2012); EE: 2004 (She Figures 2012); Data unavailable for: BG, EE, FR, HU, LV, LU, RO, IS, LI, ME, AL, RS, TR, BA, IL, FO, MD;

Others: The base reference population was that of 'Researchers' as defined in the Frascati Manual (OECD, 2002), with the exception of the following countries which used 'Academic Staff' based on the UOE Manual (UNESCO/OECD/Eurostat, 2013): BG, DE, EL, ES, IT, LV, LU, MT, NL, RO, SI, SK, SE, IS; Headcount (HC).

Source: Women in Science database, DG Research and Innovation

Annex 6.3. Number of academic staff (grade A), by age group and sex, 2013

	<35		35–44		45–54		55+		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-28	719	761	2 224	5 021	6 185	18 345	11 916	41 207	21 044	65 334
BE	0	1	48	209	190	866	127	900	365	1 976
BG	2	0	10	16	175	309	823	1 849	1 010	2 174
DE	40	83	629	2 056	1 212	5 282	646	4 656	2 527	12 077
ES	0	0	43	198	696	2 428	1 600	6 232	2 339	8 858
HR	7	4	132	203	453	577	528	1 044	1 120	1 828
IT	0	0	33	136	599	2 399	2 303	8 420	2 935	10 955
LV	625	600	702	445	614	389	943	1 069	2 884	2 503
MT	18	25	32	32	20	27	7	12	77	96
NL	5	7	100	352	232	1 050	182	1 280	519	2 689
AT	6	14	113	311	221	673	143	904	483	1 902
PL	1	1	36	147	315	887	2 020	6 702	2 372	7 737
PT	3	6	27	48	97	327	302	867	429	1 248
RO	1	2	129	211	506	787	735	2 244	1 371	3 244
SK	0	1	14	44	88	239	317	1 068	419	1 352
FI	11	15	78	246	277	696	376	1 087	742	2 044
SE	0	2	98	367	490	1 409	864	2 873	1 452	4 651
IS	0	0	7	14	25	65	48	145	80	224
NO	0	13	80	251	310	737	506	1 662	896	2 663
CH	38	90	229	688	211	917	99	721	577	2 416

Notes: Exceptions to the reference year: PT, IS, MK: 2012; HR: 2014; MT: 2015; PL: 2014; AT: 2011; Data unavailable for: CZ, DK, EE, IE, EL, FR, CY, HU, LT, LU, SI, UK, LI, ME, MK, AL, RS, TR, BA, IL, FO, MD;

Others: EU-28 score for <35 is highly affected by the score of LV which accounts for more than 80 % of <35 headcounts; The base reference population was that of 'Researchers' as defined in the Frascati Manual (OECD, 2002), with the exception of the following countries which used 'Academic Staff' based on the UOE Manual (UNESCO/OECD/Eurostat, 2013): BG, DE, EL, ES, IT, LV, LU, MT, NL, RO, SI, SK, SE, IS; Headcount (HC).

Source: Women in Science database, DG Research and Innovation

Annex 6.4. Number of heads of institutions in the higher education sector, 2014

	Women	Men	Total
EU-28	496	2 034	2 530
BE	10	32	42
BG	17	59	76
CZ	12	59	71
DK	18	37	55
DE	64	323	387
EE	4	22	26
IE	5	22	27
EL	20	128	148
FR	13	114	127
HR	1	8	9
IT	111	368	479
CY	5	41	46
LV	4	12	16
LT	13	35	48
LU	0	1	1
HU	11	55	66
NL	3	19	22
AT	24	78	102
PL	79	355	434
PT	39	92	131
RO	12	96	108
SI	32	73	105
SK	5	31	36
FI	10	31	41
SE	16	16	32
IS	4	6	10
NO	18	28	46
CH	7	33	40
ME	13	35	48
RS	7	6	13
IL	7	36	43

Notes: Exceptions to the reference year: BE (FR), BG, CZ, CY, NL, RO, RS: 2013; FR: 2012; LU: 2010; Data unavailable for: ES, MT, LI, UK, MK, AL, TR, BA, FO, MD; Others: Headcount (HC).

Source: Women in Science database, DG Research and Innovation

7 Research and innovation outputs

Main findings:

- In recent years, women in the EU-28 have been significantly under-represented in research & innovation outputs. This under-representation has been more severe in 'innovation' (patent applications for inventions) than in 'research' (scientific publications).
- In the EU-28, 31 % of publications had a woman corresponding author between 2011 and 2013, whilst a mere 8.9 % of patent applications registered a woman inventor (2010-2013).
- The proportion of scientific publications by women corresponding authors slowly increased in the EU-28 between 2007 and 2013 (with a compound annual growth rate (CAGR) of 2.1 %), including in engineering and technology (CAGR = 3.9 %). A similar increase was observed for inventorships (with an increase of 2.2 % from 2002 to 2013).
- At EU-28 level, women and men corresponding authors participate with similar frequency in international scientific co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond), although women corresponding authors account for fewer scientific publications than men.
- At EU-28 level, women and men corresponding authors publish their scientific papers in comparably influential journals. This means that even though women corresponding authors account for fewer scientific publications than men, on average they publish their results in journals of equivalent prestige.
- The gender gap in the funding success rate is decreasing at the EU-28 level, though the success rate for men is still higher than that for women in 70 % of countries for which data are available.
- Between 2010 and 2013 in the EU-28, the proportion of scientific publications with a gender dimension ranged from virtually zero in agricultural sciences, engineering and technology, and natural sciences to 6.2 % in the social sciences. The propensity to integrate a gender dimension in research content increased faster in the EU than worldwide during the period from 2002 to 2013.
- Compared to other countries, the Nordic countries often have higher shares of research output with a gender dimension. Note, however, that the gaps (in percentage points) between the Nordic and other countries are generally small.

Chapter 7 explores the comparative contribution of women and men in research (scientific publications and their quality/impact) and innovation (patents) outputs, as well as gaps in their funding success rates. It is important to highlight that all data on scientific publications (except for the gender dimension in research content (GDRC)) are based on corresponding authors ([90]) only. For patent applications, all inventors are considered. The presence of a gender dimension in the subject matter of research outputs is also mapped.

The chapter highlights six indicators, five of which relate to the gender balance in how research is conducted:

90 The corresponding author is equivalent to the reprint author.

- women to men ratio of scientific authorships (when acting as corresponding author),
- women to men ratio in the proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) (when acting as corresponding author),
- women to men ratio in terms of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author),
- women to men ratio of inventorships, and
- funding success rate differences between women and men (team leaders).

One indicator relates to the presence of a gender dimension in research content:

- proportion of scientific publications including a sex/gender dimension in their research content (GDRC).

The data for calculating these indicators are extracted from external data sources: bibliographic databases covering the peer-reviewed scientific literature (to measure the gender dimension in research output and sex disparities in scientific production); patent applications (to measure sex inequalities in innovation); and data derived from the Women in Science (WiS) database (to measure funding success rates). More specifically, data on scientific publications are extracted from the Web of Science (WoS™), which is produced by Thomson Reuters. The WoS™ includes three databases: the Science Citation Index Expanded (SCI Expanded), the Social Sciences Citation Index (SSCI), and the Arts & Humanities Citation Index (A&HCI). It indexes some 12 000 peer-reviewed journals and covers various fields of science (e.g. natural sciences and engineering (NSE), health sciences (HS) and social sciences and humanities (SSH)). The required bibliographic information for calculating the indicators is structurally available in the WoS™: authors, institutional affiliations with addresses, fields of science, and citations.

Patent data are extracted from the European Patent Office (EPO) Worldwide Patent Statistical Database (PATSTAT), which covers patent data from over 150 offices worldwide, including the US Patent and Trademark Office (USPTO), the Japan Patent Office (JPO) and the EPO. The patent-related statistics reported in the She Figures are based on EPO patent applications within PATSTAT, as the European market is one of the largest in the world. The required information for calculating the indicator is available in PATSTAT: inventor names with addresses and technology domain (sections of the International Patent Classification).

Gender gap in scientific output

Worldwide, funding agencies rely on bibliometric statistics for evaluation purposes. This can be explicit (in evaluation grids), as is the case in research assessment exercises (RAEs) ([91]), or implicit, as is often the case in grant competitions (as revealed by the relationship between bibliometric indicators and peer ratings) (Cabezas-Clavijo et al, 2013). Consequently, to increase their chances of securing funding, or to increase the amount of funding they are able to access, researchers must be very competitive in terms of their scientific productivity (number and impact of scientific papers), especially in the context of grant competitions targeted at 'excellence'.

Women have been shown to lag behind men in terms of the size and impact of their scientific production, as well as in their propensity to collaborate with colleagues in other countries (Larivière et al, 2013). As funding agencies emphasise exactly these dimensions in their evaluation of research proposals, women researchers may be disadvantaged in grant competitions relative to men researchers. This presents a risk of women becoming caught in a vicious circle: less funding reduces their capacity to produce as many

91 See, for example, http://www.rae.ac.uk/

scientific papers and garner as much attention (through citations of their papers) as men researchers. If this in turn further hinders women in improving their scientific performance, in terms of the above evaluation criteria, the resulting lower access to research funding reinforces women's disadvantage in scientific output. Furthermore, the *perceived* quality of a publication portfolio is intrinsically related to the size of that portfolio. To the extent that the two are unrelated, this is a perception bias. However, a smaller portfolio is typically perceived as being of a lower quality, hence the lower impact of smaller publication portfolios. The combination of these factors leads to a 'Matthew effect' in science (Merton, 1968), whereby as researchers' production increases or decreases, they will experience gains or losses in terms of citations that go beyond the mere gains or losses in output size (Katz, 1999). The monitoring of research outputs by gender therefore entails further investigation of the many factors that contribute to shaping the ways in which women contribute to these outputs, as well as the ways in which such factors contribute to the funding gap between women and men.

The following bibliometric indicators are relevant for investigating gaps between women and men in terms of the abovementioned aspects of scientific output. Their calculation is based on source data from WoS™ and they are mapped by country, by year and by field of science (FOS):

- women to men ratio of scientific authorships (when acting as corresponding author),
- women to men ratio in the proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) (when acting as corresponding author), and
- women to men ratio in terms of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author).

To compute these indicators, information on the sex and country of authors must first be obtained. The sex is obtained using the name of authors, whilst the country is obtained using the affiliation address of authors as indicated in scientific publications. For the sex, one must have access to the complete name of an author, including his or her full given name (not just the initials) and surname. For the country, one must have access to a link associating each author of a paper with their corresponding affiliation address. Unfortunately, these two pieces of information are not systematically available in the WoS™. For example, the share of papers for which the full given name of authors is available – along with the links towards their respective affiliation address – is in the order of 50 % in the WoS™ for the period considered in this chapter (2007-2013; it is even smaller in 2007). To circumvent this limitation in the data, the approach implemented for the She Figures 2015 publication relies on the corresponding author only. This choice increased the proportion of papers that could be used in computing the indicators to at least three quarters of the population of scientific publications indexed in the WoS™; it ranges between 75 % in 2007 and 83 % in 2013.

This approach also presents some benefits in comparison with one that uses all the authors of a publication. Firstly, the corresponding author is often the author with the leading position – that is, the principal investigator. The principal investigator is usually the researcher to whom a research grant was awarded and his or her name may appear in different positions in a publication. In some fields, the corresponding author will appear as the last author of a publication, whereas in other fields he or she will appear as the first author. In other circumstances, the investigator who made the most significant contribution to the publication, which might not be the principal investigator, can appear as the corresponding author. In this case, the investigator will often appear as the first author of a publication and he or she may be a graduate student, although this is less likely to be the case as the corresponding author should ideally have a stable address. Finally, in the case of single-author publications, the question is irrelevant and it can be assumed that the author is well established and in some kind of leading position. Consequently, by limiting the analysis to the corresponding author, graduate students and other types of contributors who may not ultimately pursue a research career are, to some extent, discarded from the analysis. This leaves us with those researchers, women and men, who are more likely to apply for funding, and this is the population of interest if one is to measure the gender gap in scientific performance that could fuel the gender gap in funding success rate.

Other researchers have made use of the first author instead of the corresponding author in producing similar statistics on the leading author. Although the approach using the corresponding author is imperfect, in that graduate students can sometimes appear as corresponding authors, this is also the case with first authors and this latter approach is prone to other biases. For example, in some fields, authors are listed alphabetically. In such cases, the first author does not relate at all to a leading position, either as the team leader or as the main contributor. Additionally, the team leader often appears as the last author when the main contributor, placed as first author, is a graduate student. From a methodological standpoint, the use of the first author is also less desirable since the share of publications for which it is possible to assign a sex and a country to the first author is smaller than it is with the corresponding author. For the countries considered in this chapter, the corresponding author is, on average, the first author in 76 % of publications and the last author in on average 30 % of publications ([92]).

As the proportion of papers for which enough information ([93]) was available to compute these indicators varied importantly across scientific disciplines, an approach was devised to eliminate the estimation biases that would result from such coverage issues, and margins of error are reported to highlight the level of confidence associated with each estimate ([94]).

Women to men ratio of scientific authorships (when acting as corresponding author)

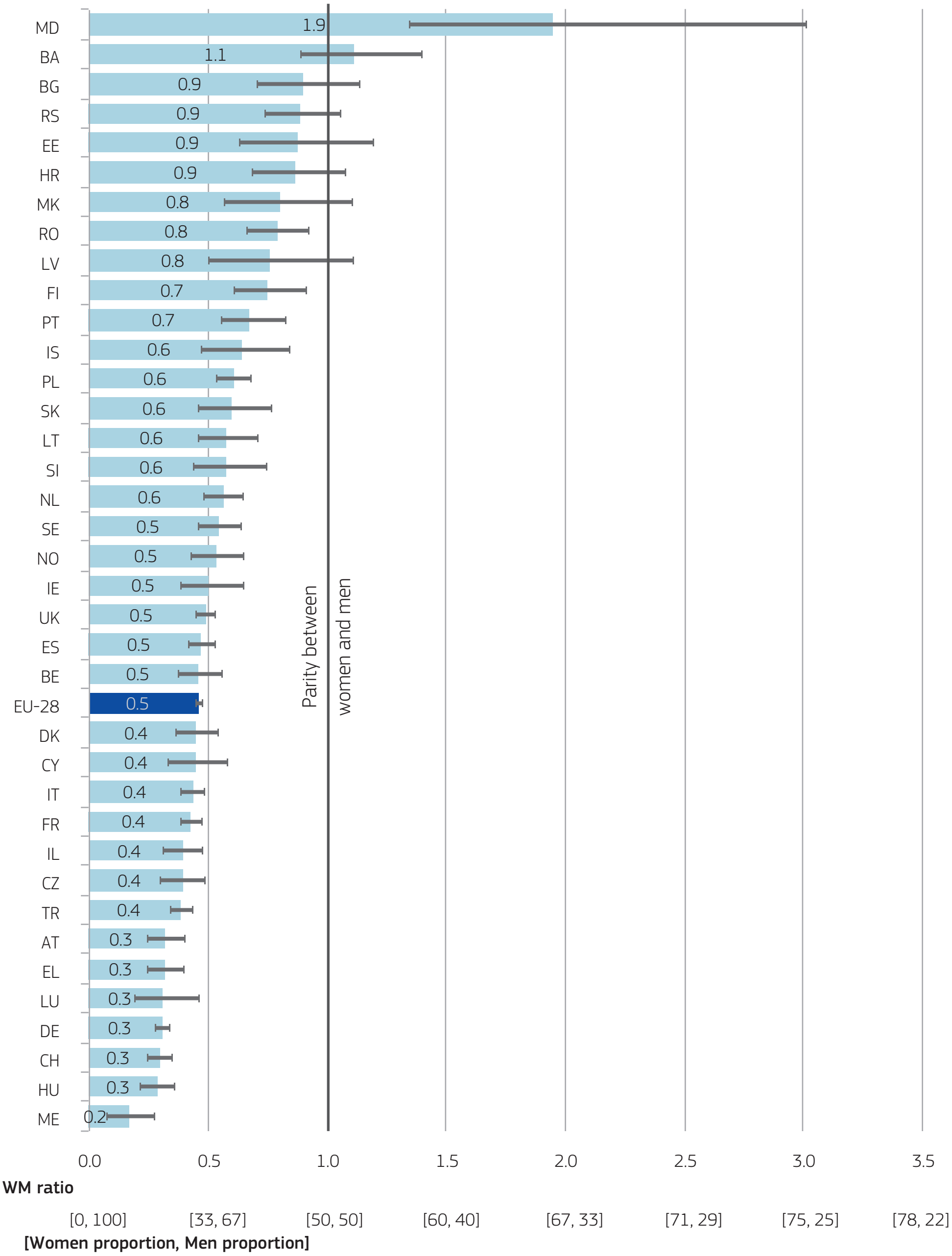
This indicator is the ratio between the number of publications produced by women (women authorships) over the corresponding number for men (men authorships), or equivalently, the ratio of the proportion of women authorships (in total authorships) over the corresponding proportion for men. It is based solely on the corresponding author of peer-reviewed scientific publications. A score above 1 indicates that women in a given country produced a larger share of the country's scientific publications than men, when acting as the corresponding author, whereas a score below 1 means the opposite.

92 The sum of shares for first and last position adds up to more than 100 % since – in the case of single-author publications – the corresponding author is both in first and last position.

93 That is to say, the information necessary to identify the sex of the corresponding author and his or her affiliation country. The GendRE API (NamSorTM) tool was used to assign a sex to the corresponding authors. Its accuracy is high.

94 For more information on the methods, see Science-Metrix (2015), She Figures 2015: Comprehensive Methodology – New Research & Innovation Output Indicator, report prepared for DG Research and Innovation.

Figure 7.1. Women to men ratio of authorships (when acting as corresponding author) in all fields of science, 2011–2013



Notes: Exceptions to the reference period: MK, MD: 2007–2013; Data not applicable for: LI, MT, FO, AL;
Others: Error bars represent the 90 % confidence interval, accounting for potential biases due to: 1) the inability to infer the sex of corresponding authors on some scientific papers (i.e. because of the lack of information on their full given name), and 2) the unrepresentative coverage of the various fields of science within the WoSTM (e.g. the social sciences and humanities as well as the computer and engineering sciences are known to be under-represented). It assumes that the attribution of a sex to author names is 100 % accurate (i.e. that the gender attributed to a given author name using the GendRE API (NamsorTM) is always the correct one; in other words, that there are no misattributions). Manual validation showed that it was indeed highly accurate (the lowest accuracies are actually quite high and are observed for LV (91 %), IS (92 %), EE (93 %) and TR (93 %); the asymmetry in the accuracy rates between women and men in these three countries combined with the predominance of men is such that gender assignment errors should have a very limited impact on their women to men (WM) ratio).

Source: Computed by Science-Metrix using WoS™ data (Thomson Reuters)

Women are under-represented as corresponding authors in scientific publications.

Figure 7.1 shows the ratio of women to men authorships in the latest three years of available data (2011-2013). Data are presented for three-year periods instead of every year in order to increase the accuracy of the estimates. The corresponding author in scientific publications is more often a man than a woman. This is a worldwide phenomenon, with the exception of the Republic of Moldova, where women produce more papers than men, and a number of countries where both genders appear to contribute somewhat equally (i.e. between 40 % and 60 % of either sexes) ([95]).

More specifically for the EU-28, 31 % of publications have a woman corresponding author. This corresponds to a ratio of women to men authorships of 0.5, which is smaller than the women to men ratio in the number of researchers in the higher education sector (HES) (0.7 for the EU-28, see Chapter 3). For an accurate interpretation, it should be once again noted that the women to men ratio of scientific authorships does not denote individual productivity. Rather, it is a comparison of collective productivity between women and men researchers, and more specifically of their production of scientific articles as corresponding authors. The smaller ratio in authorships may suggest that – in addition to being under-represented in research staff – women researchers produce, on average per researcher, fewer papers than men researchers when acting as corresponding authors. However, other observations dispute such an assertion. For instance, women are more present in scientific areas (e.g. in the social sciences and humanities, see Chapter 3) in which researchers, both women and men, are known to publish less frequently as well as in which the relevant literature is not as well covered in the WoS™. Indeed, researchers in the social sciences and humanities tend to publish more frequently in books, which take longer to produce than journal articles (Archambault et al, 2006); books are also not as well covered as peer-reviewed scientific papers in the WoS™. Consequently, the gap between the above ratios (i.e. authorships versus HES researchers) might not be an adequate reflection of existing differences in the average output (i.e. number of papers per researcher) of women and men researchers across fields of science. Additional data on the women to men ratio in the number of HES researchers by field of science are necessary to assess if women researchers produce, on average, less than men, or if the smaller share of publications attributable to women corresponding authors simply reflects their smaller representation in the researcher population.

Looking more closely at country differences, Figure 7.1 shows that in east European countries the gap between women and men as corresponding authors is smaller than amongst many of the larger and well-established Member States such as Germany, Spain, France, Italy and the United Kingdom. A closer look at potentially underlying field differences is given in Table 7.1.

95 This is true for BG, EE, HR, LV, PT, RO, FI, MK, RS and BA not accounting for the confidence intervals.

Table 7.1. Women to men ratio of scientific authorships (when acting as corresponding author), by field of science, 2007–2009 and 2011–2013

	Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences		Humanities	
	07-09	11-13	07-09	11-13	07-09	11-13	07-09	11-13	07-09	11-13	07-09	11-13
EU-28	0.3	0.3	0.2	0.3	0.5	0.5	0.6	0.7	0.5	0.6	0.6	0.6
BE	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.6	0.5	0.6	0.5	0.5
BG	0.7	0.7	0.8	1.0	1.6	2.7	z	z	z	z	1.6	z
CZ	0.3	0.3	0.2	0.2	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.5
DK	0.3	0.3	0.2	0.2	0.6	0.7	0.6	0.7	0.3	0.4	0.4	0.3
DE	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.5	0.4	0.5	0.4	0.4
EE	0.6	0.6	0.2	0.5	0.4	z	1.0	1.4	z	1.5	1.3	1.2
IE	0.2	0.2	0.2	0.2	0.6	0.7	0.4	0.5	0.6	0.8	0.7	0.6
EL	0.2	0.2	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.9	0.7
ES	0.3	0.3	0.3	0.3	0.4	0.5	0.7	0.8	0.5	0.6	0.6	0.6
FR	0.3	0.3	0.2	0.3	0.4	0.5	0.6	0.6	0.5	0.6	0.7	0.6
HR	0.8	0.8	0.3	0.4	1.3	1.0	0.6	0.7	0.8	0.9	1.0	1.4
IT	0.4	0.4	0.2	0.3	0.4	0.4	0.7	0.8	0.4	0.5	0.6	0.5
CY	0.1	0.1	z	0.1	z	z	z	z	0.7	0.7	z	z
LV	z	z	z	z	z	1.4	z	0.9	z	z	z	z
LT	0.3	0.3	0.5	0.5	1.9	1.8	1.1	1.6	0.6	0.7	z	z
LU	z	z	z	z	z	z	z	z	z	0.4	z	z
HU	0.3	0.3	0.2	0.2	0.4	0.3	0.4	0.5	0.3	0.3	1.2	1.3
NL	0.3	0.3	0.2	0.3	0.6	0.8	0.5	0.5	0.5	0.6	0.5	0.6
AT	0.2	0.2	0.1	0.2	0.3	0.4	0.8	0.7	0.3	0.5	0.5	0.5
PL	0.4	0.4	0.3	0.3	0.9	1.0	1.0	1.0	0.8	0.7	0.7	0.6
PT	0.6	0.6	0.4	0.4	1.0	1.0	0.9	1.1	0.5	0.6	1.0	0.7
RO	0.8	0.8	0.8	0.7	1.5	1.2	z	1.9	0.9	0.9	0.4	0.7
SI	0.4	0.4	0.3	0.3	0.8	0.9	0.6	0.8	1.0	0.8	0.9	0.7
SK	0.4	0.4	0.4	0.5	0.9	1.3	0.9	0.7	0.9	0.9	0.3	0.4
FI	0.6	0.6	0.4	0.4	1.2	1.2	1.0	0.9	0.9	1.1	0.5	0.6
SE	0.3	0.3	0.3	0.3	0.8	0.9	0.8	0.8	0.6	0.7	0.7	0.6
UK	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.6
IS	0.5	0.5	z	z	1.1	1.1	0.2	0.3	z	z	z	z
NO	0.3	0.3	0.3	0.3	0.7	0.9	0.7	0.6	0.5	0.6	0.5	0.5
CH	0.2	0.2	0.1	0.2	0.3	0.3	0.4	0.5	0.3	0.4	0.4	0.4
ME	z	z	z	z	z	z	z	z	z	z	z	z
MK	1.6	1.6	z	z	z	z	z	z	z	z	z	z
RS	0.7	0.7	0.7	0.7	1.2	1.3	1.2	1.2	1.8	0.7	z	z
TR	0.3	0.3	0.2	0.2	0.4	0.4	0.3	0.4	0.5	0.5	0.7	0.7
BA	z	z	z	z	1.6	2.0	z	z	0.7	0.6	z	z
IL	0.2	0.2	0.2	0.2	0.4	0.5	0.5	0.3	0.6	0.7	0.5	0.5

Notes: Data systematically not applicable for: MT, LI, AL, FO, MD;
Others:Colouring of cells is relative to parity (defined mathematically at 50 %–50 %): Blue = Fewer women than men; White = Parity; Orange = More women than men; z = not applicable (due to insufficiently large population size); Wide margins of error in absolute (≥±0.25) and relative (margin of error/ratio ≥±0.25) terms denote less reliable data points (margins of error are based on a 90% confidence interval and are not shown in this table). At least one of the two data points (2007–2009, 2011–2013) are characterised by such a margin of error for the following: Agricultural sciences: EE, LV, PT, SK, RS; Engineering and technology: BG; Humanities: BG, EE, IE, EL, HR, HU, PT, SI, SE, TR; Medical sciences: BG, LV, SK, IS; Natural sciences: MK; Social sciences: EE, IE, CY, PL, SI, SK, FI, RS, BA.

Source: Computed by Science-Metrix using WoS™ data (Thomson Reuters)

The breakdown by field of science in Table 7.1 shows that the prevalence of men as corresponding authors is most pronounced in engineering and technology and in natural sciences. For the other fields of science, the under-representation of women in scientific output is smaller, but generally still obvious. Mostly in medical sciences, but also in agricultural sciences and sometimes in the humanities, there are cases where the opposite holds true: women corresponding authors are more prevalent than men corresponding authors. This is generally the case in Bulgaria, Estonia, Lithuania and Romania.

A comparison between both time periods is represented in Table 7.1 and suggests fairly stable trends or modest increases at the EU-28 level. At the same time, considerable differences become visible at the level of individual countries and field of science.

Table 7.2 provides a more detailed picture of the differences presented in Table 7.1, displaying trends in the proportion of women authorships by country and by field of science (2007–2013).

The figures for the EU-28 show that the proportion of scientific publications by women corresponding authors is slowly increasing overall in all but one field of science, namely the humanities, where this proportion is decreasing (1.4 % annual decrease in the three-year proportion). In agricultural sciences, this proportion remains stable over the time period considered. For the EU-28, the largest growth in women's representation as corresponding authors is in social sciences (4.3 %). The growth rate for engineering and technology in the EU-28 (3.9 %) is also relatively high (compared to the other fields of science). This is good news in view of the currently low proportion of women authorships within this field (see Table 7.1). It should be noted, however, that because of these low starting values the growth rate will have to be sufficiently high and sustained to constitute a significant advancement in the future proportion of women authorships.

At the same time, country differences are apparent when looking at all fields of science together. The increases for Greece, Austria and the Netherlands are notably higher than the increase at EU-28 level. In Greece, this increase is driven primarily by the humanities. In Austria, it stems primarily from a large growth in women's authorship in the social sciences. In the Netherlands, the growth is spread more evenly across the fields of social sciences, medical sciences and engineering and technology. Few countries show a decline in women's proportion of authorship, but Cyprus and – to a lesser extent – Hungary are noteworthy in this respect.

Women and men engage similarly frequently in international scientific co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond).

Women to men ratio in the proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) (when acting as corresponding author)

This indicator is the ratio of the proportion of publications by women corresponding authors involving authors from at least two countries (e.g. an author from France and one from Spain, or an author from France and one from the United States, or an author from France, one from Spain and one from the United States) to the equivalent proportion for men corresponding authors. A score above 1 indicates that women publish their publications more frequently through involvement in international teams (both within the EU and beyond) than men, when acting as a corresponding author, whereas a score below 1 means the opposite.

Table 7.2. Compound annual growth rate (%) of the three-year proportion of scientific publications by women corresponding authors, by field of science, 2007–2013

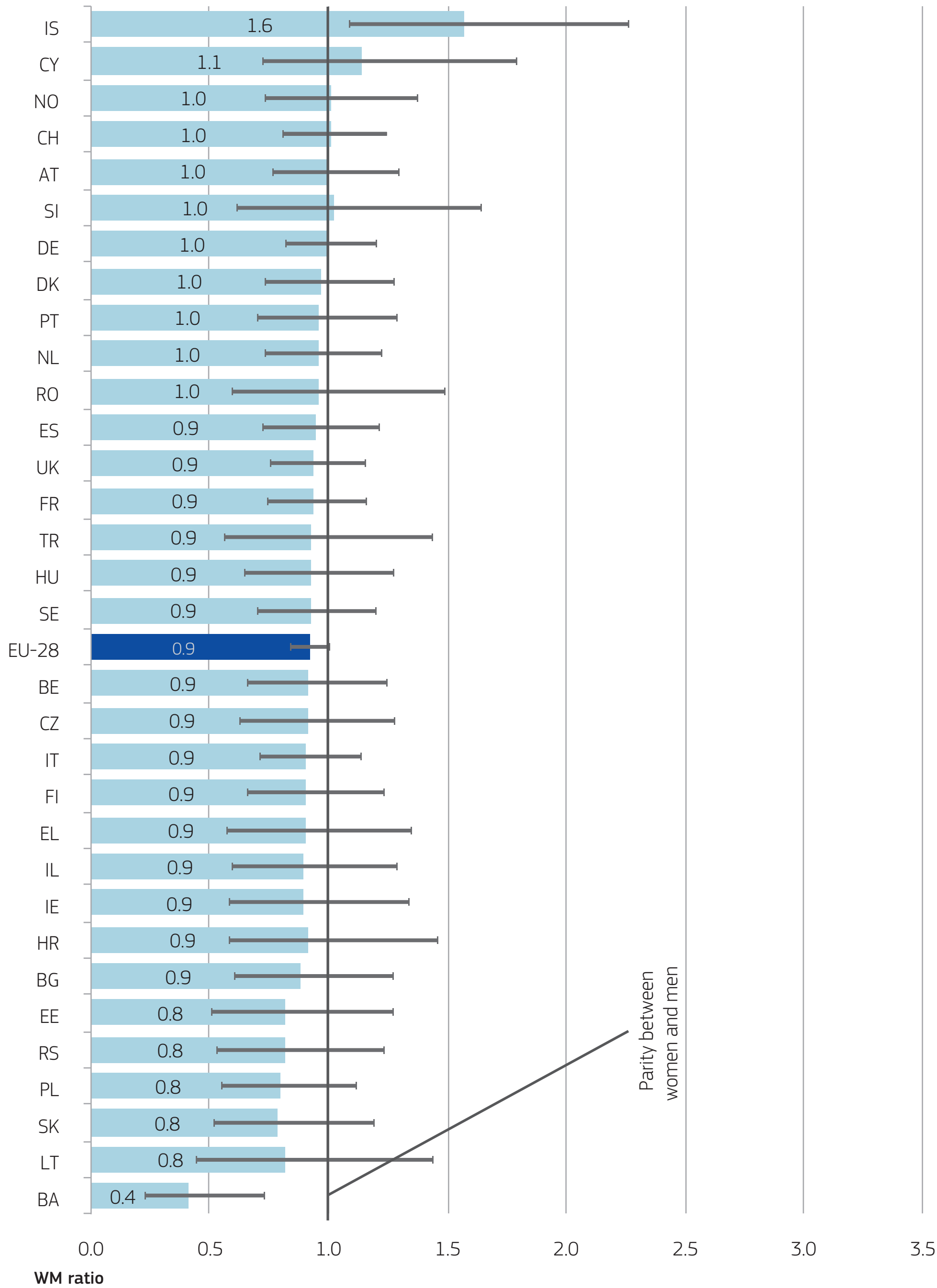
	All fields		NS		ET		MS		AS		SS		H	
	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend
EU-28	2.1		1.0		3.9		2.9		0.3		4.3		-1.4	
BE	2.9		-1.3		2.9		3.0		-1.1		10.8		1.2	
BG	-0.7		6.4		6.1		15.4		z	z	z	z	z	z
CZ	3.3		-0.4		4.7		-1.1		-6.9		2.0		16.0	
DK	2.3		0.2		2.9		1.7		-1.9		8.4		-3.6	
DE	3.3		2.0		5.9		3.3		-0.3		7.6		-1.7	
EE	3.9		-1.9		18.7		z	z	-1.9		z	z	-5.9	
IE	2.4		2.3		11.9		6.2		4.5		7.5		-8.9	
EL	4.7		1.6		1.2		3.0		2.0		6.7		19.9	
ES	2.2		0.5		6.0		3.2		-1.1		5.3		-1.6	
FR	0.4		2.2		6.4		2.4		-2.4		3.1		-6.8	
HR	0.3		2.6		12.8		3.3		5.3		0.6		-7.2	
IT	1.9		-1.2		3.3		2.0		-1.8		6.4		2.6	
CY	-4.3		-5.3		z	z	z	z	z	z	-6.1		z	z
LT	0.5		9.0		-3.2		-7.3		0.3		0.7		z	z
HU	-2.2		-5.1		4.0		2.7		1.3		-3.9		-16.6	
NL	4.2		1.3		4.4		5.2		-3.6		6.3		-1.7	
AT	4.6		3.0		6.3		3.1		-3.8		15.0		2.6	
PL	2.3		3.2		3.0		6.8		7.4		6.2		-22.2	
PT	0.4		-4.8		-0.2		7.0		-3.3		12.9		5.1	
RO	1.2		-4.0		-4.2		3.7		z	z	-5.4		20.3	
SI	-1.2		-0.4		3.7		7.2		18.9		-8.1		-5.4	
SK	2.0		5.5		4.6		3.4		-3.1		-11.3		-0.4	
FI	0.6		-2.4		4.9		-2.3		-5.7		8.5		3.1	
SE	0.8		-2.0		3.2		-0.6		-3.1		7.0		-4.8	
UK	2.5		0.2		1.3		1.8		-1.3		3.4		2.1	
IS	1.0		-6.6		z	z	2.2		12.6		z	z	z	z
NO	2.5		-0.8		3.7		3.8		-3.2		5.0		-3.4	
CH	2.4		1.0		5.3		3.8		-6.4		5.1		-3.6	
RS	0.6		-6.6		6.1		-0.1		8.5		32.2		z	z
TR	1.7		2.7		1.6		-0.4		-2.4		9.8		1.1	
BA	-0.4		z	z	z	z	-2.0		z	z	4.0		z	z
IL	1.2		-0.7		2.3		3.4		-6.2		6.4		-5.6	

Notes: Data systematically not applicable for: LV, LU, MT, LI, ME, MK, AL, FO, MD;

Others: Fields of science: NS = Natural sciences; ET = Engineering and technology; MS = Medical sciences; AS = Agricultural sciences; SS = Social sciences; H = Humanities; CAGR: The compound annual growth rate of the proportion of women authorships computed on three-year moving periods (e.g. 2007–2009, 2008–2010, 2009–2011, and so on); Trend: Shows the trend in the proportion of women authorships using three-year moving periods (the scale is not the same across countries); z = Not applicable (due to insufficiently large population size); Wide margins of error in absolute (≥ ±0.25) and relative (margin of error/ratio ≥ ±0.25) terms denote less reliable data points (margins of error are based on a 90% confidence interval and are not shown in this table). At least one of the data points in the time series is characterised by such a margin of error for the following: All fields: BG, EE, LV, MK, BA, MD; NS: IS, MK, MD; ET: BG; MS: BG, LV, SK, IS; AS: EE, LV, PT, RO, SI, SK, RS; SS: EE, IE, CY, HU, PL, SI, SK, FI, RS, BA; H: BG, EE, IE, EL, HR, HU, AT, PT, SI, SE, TR.

Source: Computed by Science-Metrix using WoS™ data (Thomson Reuters)

Figure 7.2. Women to men ratio in the proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) (when acting as corresponding author), all fields of science, 2011–2013



Notes: Exceptions to the reference period: HR, CY, LT, SI: 2007–2013; Data not applicable for: LV, LU, MT, FO, AL, ME, MK, LI, MD;
Others:Error bars represent the 90 % confidence interval, accounting for potential biases due to: 1) the inability to infer the sex of corresponding authors on some scientific papers (i.e. because of the lack of information on their full given name), and 2) the unrepresentative coverage of the various fields of science within the WoS™ (e.g. the social sciences and humanities as well as the computer and engineering sciences are known to be under-represented). It assumes that the attribution of a sex to author names is 100 % accurate (i.e. that the gender attributed to a given author name using the GendRE API (NamsorTM) is always the correct one; in other words, that there are no misattributions). Manual validation showed that it was indeed highly accurate (the lowest accuracies are actually quite high and are observed for IS (92 %), EE (93 %) and TR (93 %); the asymmetry in the accuracy rates between women and men in these three countries combined with the predominance of men is such that gender assignment errors should have a very limited impact on their women to men (WM) ratio).

Source: Computed by Science-Metrix using WoS™ data (Thomson Reuters)

Figure 7.2 reveals that the observed gap between women and men in terms of authorship (as a corresponding author) (see Figure 7.1) is almost non-existent in terms of their international co-publication rates (i.e. proportions of papers published by authors from at least two countries located within the EU and/or beyond). For the EU-28, the women to men ratio is only marginally smaller than 1. This means that even if women are represented less than men as corresponding authors in scientific publications, their propensity to co-publish their scientific papers with foreign partners is comparable.

Looking more closely at country differences, Figure 7.2 shows that the women to men ratio in the proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) is near parity in almost all countries. However, it is hard to conclude to the nearly systematic absence of a gender gap at the level of individual countries due to the rather large confidence intervals of the estimated scores; in other words, had the estimates been more accurate, some would likely have shown a significant gap (e.g. all countries below Bulgaria in Figure 7.2). An exception is Iceland, where women corresponding authors co-publish with foreign partners significantly more frequently than men corresponding authors. In Bosnia and Herzegovina, on the other hand, the movement away from parity is in the opposite direction: the proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) is considerably lower for women than for men. Potentially relevant field differences are presented in Table 7.3.

At the EU-28 level, the relatively equal proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) between women and men corresponding authors is a general phenomenon, observed across all fields of science & technology.

A comparison between both time periods represented in Table 7.3 suggests stable trends at the aggregated EU-28 level: parity between women and men is observed in both time periods. The picture becomes more dispersed at the level of individual countries. In Greece, Romania and Israel, women corresponding authors co-publish with foreign partners more frequently than men in the agricultural sciences (while the gender gap is less pronounced in other fields of science in these countries). In Lithuania, women have higher international co-publication rates (i.e. proportions of papers published by authors from at least two countries located within the EU and/or beyond) than men in the medical sciences regardless of the time period. In the most recent time period, it is lower in all other fields of science. The lower collaboration propensity of women in the social sciences in the Czech Republic contrasts with parity in the natural sciences, engineering and technology and medical sciences in this country.

More detailed figures of growth rates are presented in Table 7.4. For the EU-28, the growth pattern in the women to men ratio in the proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) is generally stable, with sustained near parity in all fields. For the agricultural sciences in the EU-28, however, a minor decline (-0.9 %) is observed, and a modest increase (0.5 %) is visible for engineering and technology. Moreover, it seems that women corresponding authors in the EU-28 are slightly losing ground in the field of the social sciences (-0.2 %) and the medical sciences (-0.3 %).

At the individual country level, the 'largest' – although still modest – growth in the women to men ratio in the proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) is observed in Romania (5.8 % for all fields combined). This growth reflects increased international collaboration (i.e. papers published by authors from at least two countries located within the EU and/or beyond) by women corresponding authors, relative to men, in all fields except engineering and technology, where an opposite trend manifests itself. Ireland also experienced growth in this respect, though to a lesser extent (3.4 % for all fields combined); this growth seems mostly driven by the international co-publication rates (i.e. proportions of papers published by authors from at least two countries located within the EU and/or beyond) of women corresponding authors in the medical sciences; indeed, decreasing shares are observed in other fields of science. Decreasing shares (with a threshold of CAGR <-4 %) – for all fields combined – are observed for Croatia, Lithuania, Slovenia and Bosnia and Herzegovina.

Table 7.3. Women to men ratio in the proportion of international (i.e. both within EU and beyond) co-publications (when acting as corresponding author), by field of science, 2007–2009 and 2011–2013

Country	Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences	
	07–09	11–13	07–09	11–13	07–09	11–13	07–09	11–13	07–09	11–13
EU-28	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9
BE	0.9	0.9	0.9	0.7	1.0	1.0	0.8	0.7	0.8	1.0
BG	0.9	0.9	z	0.9	z	z	z	z	z	z
CZ	0.9	0.9	0.9	1.0	0.9	0.9	1.6	0.7	0.7	0.5
DK	0.9	1.1	1.1	1.0	0.9	1.0	1.0	0.8	1.0	0.8
DE	1.0	1.0	1.1	1.0	0.9	1.0	1.1	0.9	1.1	1.0
EE	0.9	0.8	z	z	z	z	z	z	z	z
IE	0.9	0.8	z	1.0	0.6	1.0	1.1	1.0	1.2	0.7
EL	0.9	1.0	1.1	1.2	0.8	0.7	2.2	1.0	0.7	0.6
ES	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.8	1.0	0.9
FR	0.9	1.0	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9
HR	1.2	0.8	0.3	0.8	0.9	1.2	1.0	1.0	1.7	0.9
IT	0.9	0.9	1.0	1.0	0.9	0.8	0.8	0.9	0.8	1.0
CY	z	z	z	z	z	z	z	z	z	1.0
LT	0.5	0.6	1.7	0.7	1.4	1.7	0.7	0.6	z	z
HU	1.1	0.9	z	z	0.7	0.8	0.7	0.8	z	z
NL	1.1	1.0	0.9	1.0	0.8	0.9	0.8	1.1	1.0	0.9
AT	0.9	1.1	z	1.1	1.0	0.9	1.1	1.0	z	1.2
PL	0.8	0.8	1.0	1.0	0.7	0.7	1.1	0.8	1.1	1.2
PT	0.9	1.0	0.9	1.0	0.8	0.9	0.9	1.1	1.3	0.8
RO	0.7	0.9	1.0	0.9	0.8	1.2	z	2.7	0.8	1.2
SI	1.4	1.0	1.3	1.3	0.8	1.7	z	1.6	0.6	0.9
SK	0.6	0.8	0.7	0.8	0.8	0.9	z	z	1.1	0.6
FI	0.9	1.0	0.8	0.8	1.0	0.8	0.9	0.8	0.8	0.9
SE	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.9	0.9	1.0
UK	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8
NO	1.0	1.1	0.9	1.0	0.9	1.0	0.9	0.9	0.8	0.8
CH	1.1	1.0	1.1	1.1	1.1	1.0	1.4	0.9	1.2	1.0
RS	0.7	0.8	1.0	0.9	0.5	0.8	z	0.6	z	0.8
TR	0.9	0.8	1.0	1.1	1.0	1.0	0.9	0.9	1.1	1.2
BA	z	z	z	z	1.1	0.4	z	z	z	z
IL	1.1	1.0	0.9	0.8	0.9	0.9	3.7	z	0.9	0.7

Notes: Data not applicable for: LV, LU, MT, IS, LI, ME, MK, AL, FO, MD;

Others:Colouring of cells is relative to parity (defined mathematically at 50 %–50 %): Blue = Fewer women than men; White = Parity; Orange = More women than men; z = Not applicable (due to insufficiently large population size); For this indicator, the margins of error are generally wide (≥ ±0.25 both in absolute and relative terms) for all countries except the EU-28; the margins of error were too large to present data for the Humanities (margins of error are based on a 90 % confidence interval and are not shown in this table).

Source: Computed by Science-Metrix using WoS™ data (Thomson Reuters)

Table 7.4. Compound annual growth rate (%) of the three-year women to men ratio in the proportion of international (i.e. both within EU and beyond) co-publications (when acting as corresponding author), by field of science, 2007–2013

	All fields		NS		ET		MS		AS		SS	
	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend
EU-28	0.0		0.2		0.5		-0.3		-0.9		-0.2	
BE	-0.3		1.6		-5.8		-2.0		-1.9		6.4	
BG	-2.0		-1.3		z	z	z	z	z	z	z	z
CZ	0.4		1.1		4.5		-0.3		-18.4		-6.4	
DK	2.0		4.2		-4.3		2.8		-6.2		-7.2	
DE	-0.3		0.4		-0.9		0.8		-5.6		-4.4	
EE	-3.0		-3.4		z	z	z	z	z	z	z	z
IE	3.4		-2.9		z	z	14.7		-1.2		-12.4	
EL	-0.2		4.0		1.7		-4.3		-17.3		-1.7	
ES	-0.8		-0.6		-0.3		0.2		-0.1		-0.8	
FR	0.4		0.0		1.5		-0.4		0.5		-1.1	
HR	-6.9		-9.9		31.0		7.1		1.5		-16.0	
IT	0.0		-0.3		-0.1		-1.1		1.8		5.8	
LT	-5.2		5.4		-20.4		3.7		-5.1		z	z
HU	-1.9		-4.5		z	z	5.1		4.0		z	z
NL	0.6		-1.0		2.9		0.3		9.6		-1.4	
AT	1.8		5.0		z	z	-1.3		-2.0		z	z
PL	1.3		1.0		0.6		0.6		-7.9		2.1	
PT	0.9		0.8		0.7		3.6		5.5		-12.8	
RO	5.8		6.0		-1.8		11.4		z	z	9.5	
SI	-4.2		-7.6		0.4		18.2		z	z	10.5	
SK	0.9		10.3		2.7		1.9		z	z	-15.0	
FI	0.0		2.2		-0.6		-4.2		-0.3		3.3	
SE	-0.4		0.4		-1.7		-2.1		2.0		2.8	
UK	0.1		-0.1		0.9		0.3		-0.5		-0.8	
NO	0.6		1.1		4.5		2.0		-0.4		-0.4	
CH	-2.7		-2.9		0.7		-2.5		-11.1		-4.0	
RS	4.0		3.4		-2.4		14.3		z	z	z	z
TR	-0.8		-3.3		1.6		-1.3		0.4		1.6	
BA	-21.5		z	z	z	z	-21.5		z	z	z	z
IL	-2.3		-2.2		-1.9		-1.0		z	z	-7.7	

Notes: Data systematically not applicable for: CY, LV, LU, MT, IS, LI, ME, MK, AL, FO, MD;

Others:Fields of science: NS = Natural sciences; ET = Engineering and technology; MS = Medical sciences; AS = Agricultural sciences; SS = Social sciences; H = Humanities; CAGR: The compound annual growth rate of the women to men ratio in the proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) computed on three-year moving periods (e.g. 2007–2009, 2008–2010, 2009–2011, and so on); Trend: Shows the trend in the women to men ratio in the proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) using three-year moving periods (the scale is not the same across countries); z = Not applicable (due to insufficiently large population size); For this indicator, the margins of error are generally wide (≥ ±0.25 both in absolute and relative terms) for all countries except the EU-28; the margins of error were too large to present data for the Humanities (margins of error are based on a 90% confidence interval and are not shown in this table).

Source: Computed by Science-Metrix using WoS™ data (Thomson Reuters)

Overall, the observations about gender differences in international co-publication rates (i.e. proportions of papers published by authors from at least two countries located within the EU and/or beyond) reveal that – as corresponding authors – women are able to grasp the same opportunities as men to collaborate with foreign scientific partners. It should be noted, however, that women researchers might face more barriers than men in acceding to the role of corresponding author when working within research teams. If that is the case, this indicator, which is based on the corresponding author of publications, carries the risk of focusing on those women who stand out from the average population of women scientists by virtue of their more established collaboration networks. Because of this potential selection bias, this indicator may provide a more positive picture than is truly the case in the whole population of researchers with regards to gender parity.

Women to men ratio in terms of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author)

This indicator is the ratio of the average of relative impact factors (ARIF) of the papers whose corresponding author is a woman, over the ARIF of the papers whose corresponding author is a man in the same country. A score above 1 indicates that women in a given country produced publications that were published, on average, in higher-impact journals than men, whereas a score below 1 means the opposite.

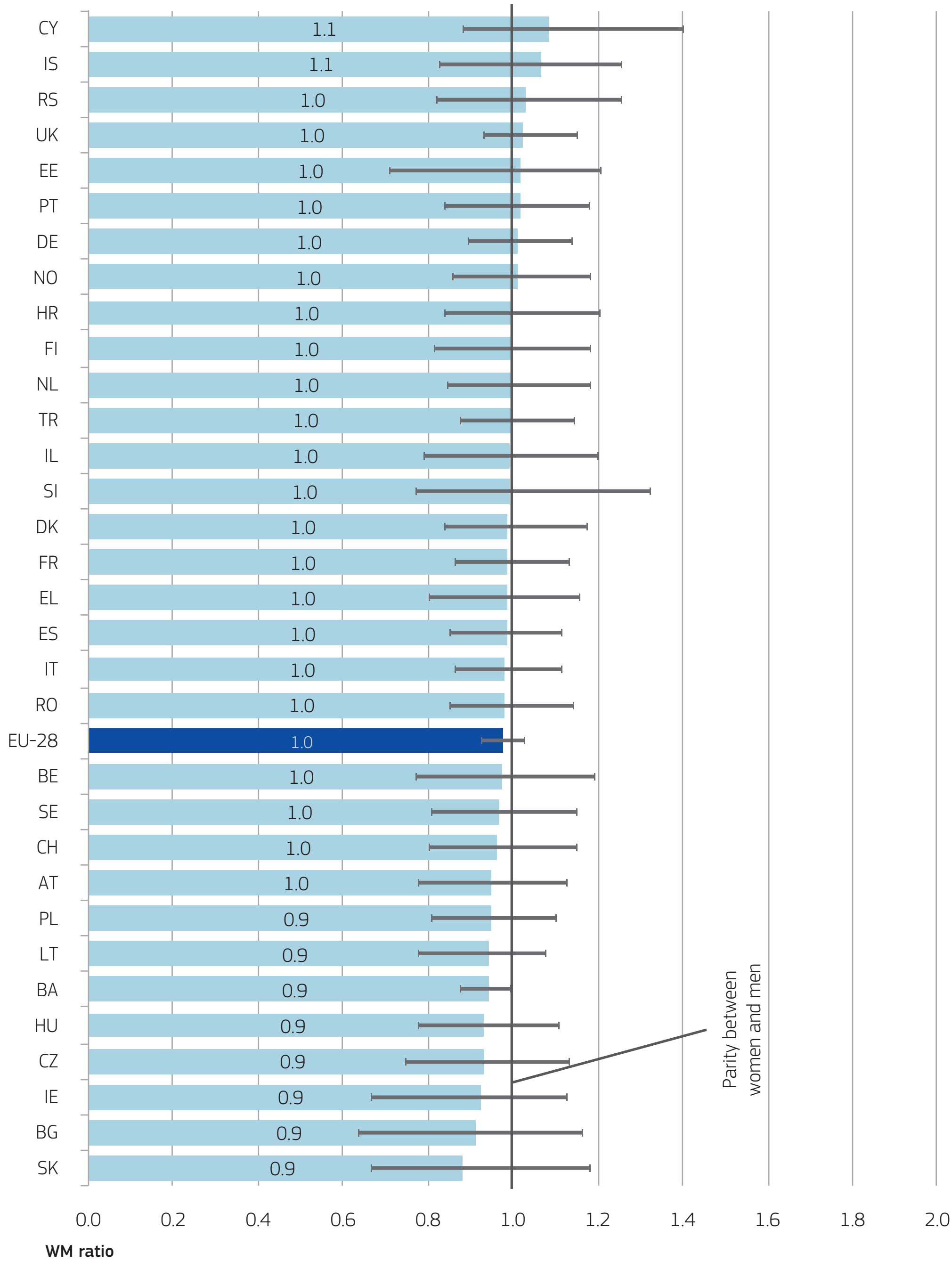
The ARIF is a measure of the scientific impact of papers produced by a given entity based on the impact factors of the journals in which they were published. The annual impact factor (IF) of a journal is computed as the ratio of the number of citations it received in the previous five years relative to the number of papers it published in the previous five years. The IF of publications is then obtained by ascribing to them the IF of the journal in which they are published for the year in which they are published. Subsequently, to account for different citation patterns across scientific sub-fields (e.g. there are more citations in biomedical research than mathematics), each paper's IF is divided by the average IF of all papers that were published the same year in the same sub-field to obtain a Relative Impact Factor (RIF). The ARIF of a given entity is the average of its RIFs (e.g. the average of the RIFs of the papers whose corresponding author is a woman in France).

Because the ARIF is based on the publication venue instead of the actual publications of an entity, it is regarded as an *indirect* impact metric. Additionally, as the journals with the highest impact factors are cited more often, more researchers want to publish in them, leading to higher rejection rates. As such, the ARIF is also an indicator of *prestige*.

Although it would have been interesting to look at a *direct* impact metric based on the actual citations received by the papers published by women and men corresponding authors, the women to men ratio in terms of the ARIF of their respective publications was retained as it provides more timely data. Indeed, the ARIF is a backward-looking citation metric, whereas *direct* impact metrics are forward-looking. This means that a certain number of years must pass before computing the latter type of metrics to allow for citations to accumulate following publication. Additionally, Cabezas-Clavijo et al. (2013, see footnote 3) found that 'the two main bibliometric indicators that explain the granting of research proposals in most cases are the output (number of published articles) and the number of papers published in journals that belong to the first quartile ranking of the Journal Citations Report', thereby highlighting the relevance of the ARIF.

In this context, the **impact metric** presented here **should be interpreted** in terms of the **capacity of women** corresponding authors **to publish** their results **in journals of equivalent prestige as** those in which **men researchers** publish their papers – i.e. in terms of whether women corresponding authors face stronger barriers than men authors in publishing their papers in high-impact journals – **rather than** in terms of the **actual citation impact of their publications** relative to those of men.

Figure 7.3. Women to men ratio in terms of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author), all fields of science, 2011–2013



Notes: Exceptions to the reference period: CY, LT, HU, BA, IS: 2007–2013; Data not applicable for: LV, LU, MT, ME, MK, FO, AL, LI, MD;
Others:Error bars represent the 90 % confidence interval, accounting for potential biases due to: 1) the inability to infer the sex of corresponding authors on some scientific papers (i.e. because of the lack of information on their full given name), and 2) the unrepresentative coverage of the various fields of science within the WoS™ (e.g. the social sciences and humanities as well as the computer and engineering sciences are known to be under-represented). It assumes that the attribution of a sex to author names is 100 % accurate (i.e. that the gender attributed to a given author name using the GendRE API (NamsorTM) is always the correct one; in other words, that there are no misattributions). Manual validation showed that it was indeed highly accurate (the lowest accuracies are actually quite high and are observed for IS (92 %), EE (93 %) and TR (93 %); the asymmetry in the accuracy rates between women and men in these three countries combined with the predominance of men is such that gender assignment errors should have a very limited impact on their women to men (WM) ratio).

Source: Computed by Science-Metrix using WoS™ data (Thomson Reuters)

The scientific impact of women and men is similar.

The gap between women and men that was observed in terms of scientific output does not translate into a gap in scientific impact at the EU-28 level; indeed, the women to men ratio in scientific impact approaches parity (nearly 1.0, with a very small 90 % confidence interval, see Figure 7.3). This means that even if women account for fewer scientific publications than men (as a corresponding author), they publish their scientific papers in journals with a similar impact factor as men, or equivalently, in journals of equivalent prestige.

At the individual country level, no exceptions to this phenomenon are observed: the women to men ratio is usually close to parity in all countries. However, it is not possible to conclude with a high degree of confidence that the gender gap is absent in all countries, due to the rather large confidence intervals in the estimated scores.

Note that the absence of a gender gap using an *indirect* impact metric such as the average of relative impact factors presented here does not mean that one would not observe such a gap using a *direct* impact metric as was found in another study ([96]). Indeed, an impact indicator based on *direct* citation counts to an entity's papers (e.g. papers by women corresponding authors in a given country) measures the citation impact of the corresponding entity, or equivalently its influence on the scientific community, whereas an indirect impact indicator based on the publication venue measures the ability of an entity to publish in prestigious journals. In fact, *indirect* and *direct* impact metrics are complementary measures providing different views on the scientific impact of scientists (see above box on the women to men ratio in terms of the average of relative impact factors).

Table 7.5 shows the breakdown of these statistics by field of science. The women to men ratio in scientific impact approaches parity at the EU-28 level for all fields of science. For the humanities, and especially in the most recent period, women corresponding authors appear to be slightly overtaking their men colleagues in terms of the relative impact of their scientific publications. At the level of individual countries, further variation between fields of science is observed. On the one hand, the higher impact of women in the humanities, compared to near parity in other fields, is especially evident in Austria, Finland, Norway, Germany and Poland. In the Netherlands, Slovenia and Sweden, on the other hand, the higher impact of women in the humanities appears to be lessening when one compares both time periods. In Slovenia, moreover, an opposite trend is apparent for the medical sciences and the social sciences: for both fields, women appear to be catching up with their men colleagues in terms of scientific impact. Similarly to the humanities in the Netherlands, Slovenia and Sweden, the higher impact of women in engineering and technology in Slovakia and Switzerland also appears to be fading when comparing both time periods. A more detailed view of the changes over time is provided in Table 7.6.

Table 7.6 reveals growth figures of near zero for the women to men ratio in scientific impact, implying that the difference in scientific impact between women and men, when acting as corresponding authors, remains rather small. However, at the EU-28 level, there is an increase in the position of women in terms of scientific impact in the humanities, and a slightly lower increase in the social sciences. There are slight decreases in the agricultural sciences and engineering and technology. In Slovenia, a notable decrease is apparent when all fields are combined: this stems primarily from a decrease in the humanities and a (smaller) decrease in engineering and technology. Note, however, that there are notable increases in the medical sciences and the social sciences.

Overall, the observations about gender differences in scientific impact reveal that, as corresponding authors, women and men are able to publish in journals with similar impact factors. In the field of the humanities, women authors even have a slightly higher impact than men authors in a number of countries. As such, women's 'disadvantage' in their qualification as corresponding author is not translated into any disadvantage in terms of the prestige of the journals in which they publish their research results. However, as stated earlier with regards to the indicator on international co-publications (i.e. papers published by

96 See footnote 4 above.

Table 7.5. Women to men ratio in terms of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author), by field of science, 2007–2009 and 2011–2013

	Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences		Humanities	
	07–09	11–13	07–09	11–13	07–09	11–13	07–09	11–13	07–09	11–13	07–09	11–13
EU-28	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1
BE	1.0	0.9	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1
BG	0.8	1.0	z	0.8	z	z	z	z	z	z	z	z
CZ	0.9	0.9	0.8	0.9	1.0	1.0	0.9	1.0	0.9	0.8	z	0.8
DK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	z	1.0	z	1.2
DE	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.3
IE	1.0	1.0	z	1.0	0.9	0.9	0.9	0.9	1.2	0.8	z	1.0
EL	0.9	1.0	1.1	1.0	0.9	1.0	1.1	1.0	1.0	1.1	z	0.9
ES	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.1	1.1
FR	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	0.8	1.0	1.0	0.9
HR	0.9	1.0	z	0.9	1.1	1.1	1.3	1.0	1.0	1.0	z	z
IT	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.0
LT	0.8	0.8	0.7	0.9	1.0	1.0	1.0	1.0	0.9	1.0	z	z
HU	0.9	0.9	z	z	0.8	0.8	1.0	0.9	z	z	z	z
NL	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.5	1.0
AT	1.0	1.0	z	0.8	1.0	0.9	0.8	0.9	z	1.0	z	1.7
PL	0.9	0.9	1.1	1.0	0.9	0.9	1.1	1.0	0.9	0.8	1.3	1.3
PT	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	z	1.2	z	z
RO	0.8	0.9	1.0	1.0	z	0.9	z	1.0	0.9	1.0	1.2	1.0
SI	1.0	1.0	1.1	0.9	0.6	1.2	z	1.2	0.6	1.0	1.4	0.9
SK	0.7	0.8	1.3	1.1	0.9	1.1	z	z	0.8	0.9	1.0	1.0
FI	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.1	1.0	1.5	1.6
SE	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0	1.0	1.0	1.3	1.0
UK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1
NO	1.0	1.0	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	z	1.5
CH	1.0	1.0	1.4	1.0	1.0	1.0	1.1	1.0	0.9	1.0	z	1.2
RS	0.8	1.0	1.0	1.1	0.8	1.0	z	0.9	z	1.0	z	z
TR	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	1.1	1.0	1.1	1.1
BA	z	z	z	z	0.6	0.8	z	z	z	z	z	z
IL	1.0	1.0	1.1	1.0	1.0	1.0	1.1	z	1.1	1.0	0.9	1.0

Notes: Data systematically not applicable for: EE, CY, LV, LU, MT, IS, LI, ME, MK, AL, FO, MD;

Other:Colouring of cells is relative to parity (defined mathematically at 50 %–50 %): Blue = Fewer women than men; White = Parity; Orange = More women than men; z = Not applicable (due to insufficiently large population size); Wide margins of error in absolute (≥ ±0.25) and relative (margin of error/ratio ≥ ±0.25) terms denote less reliable data points (margins of error are based on a 90% confidence interval and are not shown in this table). At least one of the two data points (2007–2009 and 2011–2013) is characterised by such a margin of error for the following: Agricultural sciences: CZ, IE, HR, LT, HU, PL, SI, CH; Engineering and technology: BE, BG, EL, RO, SI, SK, CH, RS; Medical sciences: IE, HR, SI, SK, RS, BA; Natural sciences: LT, SI; For the Social sciences and Humanities, the margins of error are usually wide for all countries except the UK and EU-28.

Source: Computed by Science-Metrix using WoS™ data (Thomson Reuters)

Table 7.6. Compound annual growth rate (%) of the three-year women to men ratio in the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author), by field of science, 2007–2013

	All fields		NS		ET		MS		AS		SS		H	
	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend
EU-28	0.3		0.0		-0.6		-0.4		-0.7		0.7		2.2	
BE	-0.3		-0.9		-1.0		-0.9		-1.5		-0.3		2.0	
BG	1.9		4.1		z	z	z	z	z	z	z	z	z	z
CZ	0.3		0.7		1.7		-1.0		1.6		-4.0		z	z
DK	-0.2		1.0		-0.1		-1.0		0.7		z	z	z	z
DE	0.6		0.4		0.3		-0.5		-0.9		0.7		5.0	
IE	-0.3		0.0		z	z	0.4		-1.5		-8.3		z	z
EL	0.6		1.8		-2.2		0.7		-2.6		0.3		z	z
ES	-0.3		-0.3		-0.7		-0.1		-0.9		-1.7		0.3	
FR	-0.5		-0.9		-0.2		0.4		0.3		4.0		-1.8	
HR	0.0		0.6		z	z	-0.6		-5.6		0.1		z	z
IT	0.0		0.1		-1.0		0.0		-0.2		-0.5		2.4	
LT	4.4		-1.1		6.6		0.0		-1.7		4.5		z	z
HU	-0.2		0.0		z	z	-0.7		-1.5		z	z	z	z
NL	-0.5		0.9		0.4		0.0		0.1		0.8		-8.1	
AT	-0.7		0.8		z	z	-1.7		3.3		z	z	z	z
PL	-0.3		0.2		-1.8		1.2		-3.4		-3.5		1.1	
PT	0.3		0.4		-1.2		0.8		0.2		z	z	z	z
RO	1.7		1.7		-0.5		z	z	z	z	3.7		-3.0	
SI	-4.5		0.1		-3.9		17.0		z	z	11.1		-9.4	
SK	-0.2		3.6		-3.5		4.0		z	z	2.3		0.7	
FI	-0.1		0.2		0.9		-0.6		-2.0		-1.3		2.6	
SE	-0.4		-0.1		0.4		-1.3		1.2		0.4		-5.5	
UK	1.1		0.9		0.5		-0.2		0.5		0.6		2.5	
NO	0.5		-0.1		-1.4		0.8		0.4		0.6		z	z
CH	-0.9		-0.9		-8.0		-0.5		-0.6		3.2		z	z
RS	4.1		5.5		3.2		4.2		z	z	z	z	z	z
TR	0.1		0.0		-0.7		0.8		1.1		-2.2		0.5	
BA	7.3		z	z	z	z	7.3		z	z	z	z	z	z
IL	0.6		0.2		-1.6		-0.6		z	z	-1.0		5.2	

Notes: Data systematically not applicable for: EE, CY, LV, LU, MT, IS, LI, ME, MK, AL, FO, MD;

Others: Fields of science: NS = Natural sciences; ET = Engineering and technology; MS = Medical sciences; AS = Agricultural sciences; SS = Social sciences; H = Humanities; CAGR: The compound annual growth rate of the ARIF of women corresponding authors computed on three-year moving periods (e.g. 2007–2009, 2008–2010, 2009–2011, and so on); Trend: Shows the trend in the proportion of women authorships using three-year moving periods (the scale is not the same across countries); z = Not applicable (due to insufficiently large population size); Wide margins of error in absolute (≥ ±0.25) and relative (margin of error/ratio ≥ ±0.25) terms denote less reliable data points (margins of error are based on a 90 % confidence interval and are not shown in this table). At least one of the data points in the time series is characterised by such a margin of error for the following: All fields: BE, BG, IE, CY, AT, SI, SK, BA, IL; NS: BG, HR, LT, AT, SI, SK; ET: BE, BG, EL, HR, AT, RO, SI, SK, CH, RS; MS: IE, HR, PT, SI, SK, RS, BA; AS: CZ, IE, HR, LT, HU, PL, SI, CH, RS; For the Social sciences and Humanities, the margins of error are usually wide for all countries except the UK and EU-28.

Source: Computed by Science-Metrix using WoS™ data (Thomson Reuters)

authors from at least two countries located within the EU and/or beyond), women researchers might face more barriers than men in acceding to the role of corresponding author when working within research teams. If this is the case, because this indicator relies on the corresponding author of publications, it might focus on those women who stand out from the average population of women scientists as having more influence on the research community. Such a selection effect implies that the indicator may provide a more positive picture than is truly the case in the whole population of researchers with regards to gender parity.

Gender gap in patent output

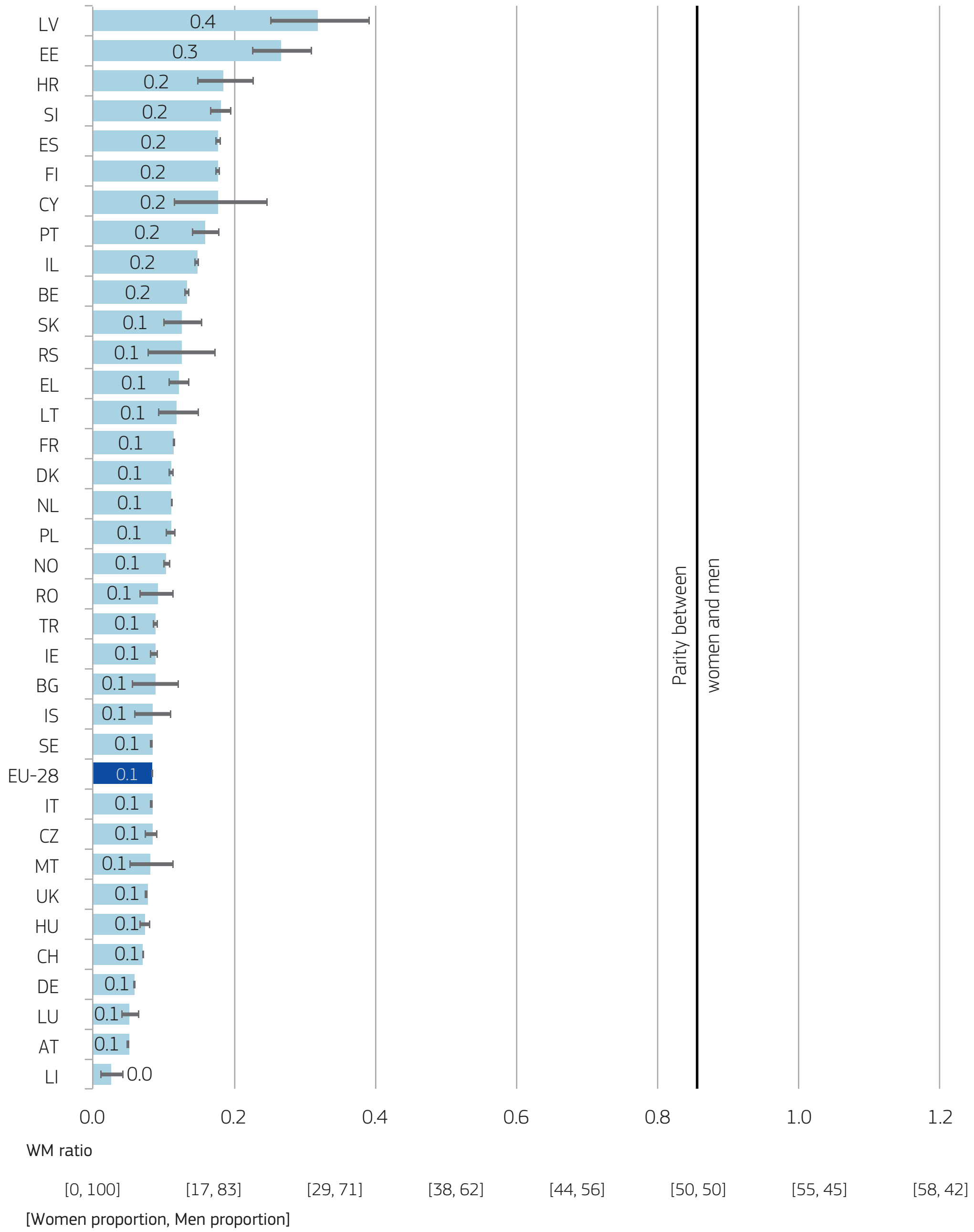
In the wake of known gender disparities in patenting (Sugimoto et al, 2015), it is relevant to monitor this gap by using patent-based indicators. In order to do so, the contribution of women and men to the production of inventions (i.e. the women to men ratio in patent inventorships) is mapped by country, by year and by technological field (i.e. section of the International Patent Classification (IPC)).

To compute this indicator, information on the sex and country of all inventors on EPO patent applications must first be obtained using PATSTAT. The country information is readily available from the addresses of inventors, whereas information on the sex of inventors must be determined using their full given name/surname combination, as detailed above for corresponding authors in scientific publications. To achieve this, the GendRE API (NamSor™) tool was used.

Women to men ratio in inventorships

This indicator is the ratio between the number of inventions produced by women (women inventorships) over the corresponding number for men (men inventorships), or equivalently, the ratio of the proportion of women inventorships (in total inventorships) over the corresponding proportion for men. The absolute number of inventorships used in computing this indicator is based on fractionalised counts of patent applications between their corresponding inventors: for example, if a patent application involves 10 inventors, each inventor is attributed an equal fraction of the inventorships (i.e. 1/10 of the invention). A score above 1 indicates that women in a given country produced a larger share of the country's inventions than men, whereas a score below 1 means the opposite.

Figure 7.4. Women to men ratio of inventorships, all International Patent Classification (IPC) sections, 2010–2013



Notes:Data not applicable for: MT, FO, AL, ME, MK, BA, MD; Exceptions to the reference period: MT: 2002–2013;
Other:Error bars represent the 90 % confidence interval, accounting for potential biases due to the inability to infer the sex of inventors on some patent applications. It assumes that the attribution of a sex to inventor names is 100 % accurate (i.e. that the gender attributed to a given inventor name using the GendRE API (NamsorTM) is always the correct one; in other words, that there are no misattributions). Manual validation showed that it was indeed highly accurate (the accuracy was at least 90 % for all countries).

Source: Computed by Science-Metrix using European patent applications in PATSTAT

Women are heavily under-represented as patent inventors.

Figure 7.4 shows that men figure much more prominently than women as patent inventors. The strong under-representation of women as inventors is observed at the aggregate EU-28 level and for all individual countries considered. Specifically for the EU-28, a mere 8.9 % of patent applications between 2010 and 2013 registered a woman inventor. This observation partly reflects the under-representation of women amongst researchers in the business enterprise sector (BES). Nevertheless, the gap in inventorship (women to men ratio of 0.1 for the EU-28) is more pronounced than would be expected based on the under-representation of women researchers (see Chapter 3) in the BES (women to men ratio of 0.2 for the EU-28). This may suggest that besides being under-represented amongst BES researchers, women produce, on average, fewer inventions than their men colleagues.

Table 7.7. Women to men ratio of inventorships, by IPC section, 2002–2005 and 2010–2013

	A		B		C		D		E		F		G		H	
	02–05	10–13	02–05	10–13	02–05	10–13	02–05	10–13	02–05	10–13	02–05	10–13	02–05	10–13	02–05	10–13
EU-28	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
BE	0.2	0.3	0.1	0.1	0.2	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
CZ	0.2	0.2	0.1	0.1	0.1	0.2	z	0.1	z	0.0	0.0	0.1	0.1	0.1	0.1	0.1
DK	0.2	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DE	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
EE	z	0.4	z	z	z	0.6	z	z	z	z	z	z	z	0.3	z	0.4
IE	0.1	0.1	0.1	0.1	0.2	0.2	z	z	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0
EL	0.2	0.3	0.1	0.1	0.3	0.3	z	z	z	0.0	0.0	0.0	0.2	0.2	0.2	0.1
ES	0.2	0.4	0.1	0.1	0.3	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1
FR	0.2	0.3	0.1	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
HR	0.4	0.5	z	z	0.6	z	z	z	z	z	z	z	z	z	z	z
IT	0.1	0.2	0.0	0.1	0.2	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1
LV	z	0.5	z	z	z	0.4	z	z	z	z	z	z	z	z	z	z
LU	z	z	0.1	0.1	0.0	0.1	z	z	z	z	0.0	0.0	0.1	0.0	0.0	0.0
HU	0.2	0.2	0.1	0.0	0.3	0.2	z	z	z	0.1	0.0	0.1	0.1	0.0	0.0	0.0
NL	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
AT	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
PL	0.3	0.3	0.1	0.1	0.3	0.4	z	0.3	z	0.0	0.0	0.0	0.1	0.1	0.0	0.1
PT	0.4	0.3	0.2	0.1	0.7	0.4	z	z	z	0.0	z	0.1	z	0.1	z	0.1
RO	z	z	z	z	z	z	z	z	z	z	z	z	z	0.1	z	0.0
SI	0.3	0.3	0.1	0.1	0.4	0.4	z	z	z	0.1	z	0.0	z	0.1	0.1	0.1
SK	z	z	z	0.1	z	z	z	z	z	z	z	z	z	0.1	z	z
FI	0.3	0.3	0.1	0.2	0.3	0.4	0.2	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
SE	0.2	0.2	0.1	0.1	0.2	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1
UK	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
IS	0.2	0.1	z	z	0.3	0.2	z	z	z	z	z	z	0.2	z	z	z
LI	0.0	0.1	0.0	0.0	z	z	z	z	z	z	z	z	z	z	z	z
NO	0.1	0.3	0.1	0.1	0.2	0.2	z	z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
CH	0.1	0.2	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
TR	0.1	0.1	0.1	0.1	z	0.2	z	0.1	z	0.0	0.1	0.1	z	0.1	z	0.2
IL	0.2	0.2	0.1	0.1	0.4	0.4	0.1	z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Notes: Data systematically not applicable for: BG, CY, LT, MT, ME, MK, AL, RS, BA, FO, MD;

Others: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;

Colouring of cells is relative to parity (defined mathematically at 50 %–50 %): Blue = Fewer women than men; White = Parity; Orange = More women than men; z = Not applicable (due to insufficiently large population size).

Source: Computed by Science-Metrix using European patent applications in PATSTAT

Table 7.7 considers whether these observations are domain-specific. Although the gap between women and men in producing patentable inventions is somewhat smaller in several countries (Estonia, Spain, Croatia and Portugal), for some sections of the IPC (chemistry & metallurgy and human necessities), the severe under-representation of women inventors is a general phenomenon, observed across all IPC sections, for all countries, and across time periods. Although the comparison of these low figures across two time periods suggests that little change has occurred, the detailed picture of growth trends in Table 7.8 is more revealing in this respect.

Modest growth is apparent in the proportion of women inventorships for all technology domains (combined) at the EU-28 level, whilst the growth figures are fairly similar across technology domains (Table 7.8). More variation becomes apparent when considering growth figures at the level of individual countries. The proportion of women inventors is growing more sharply in some countries, particularly in Austria (mostly due to a strong increase in women inventorships in the textiles & paper IPC sector), as well as in Germany, Spain and Switzerland. On the other hand, stronger decreases in the proportion of women inventorships are observed for Bulgaria, Hungary and Iceland. The general decrease in Hungary is observed in spite of a very high growth of women inventorships in the domains of mechanical engineering, lighting, heating, weapons & blasting.

Overall, the observations about gender differences in patent inventions reveal that women are heavily under-represented as patent inventors, and that growth figures in this respect are modest. The under-representation of women in research & innovation activities and outputs is therefore more severe in 'innovation' (patent inventions) than in 'research' (scientific publications).

Funding success rate differences

The following indicators examine the success rate of women and men in grant competitions as this may have an impact on scientific performance as well as on career progression.

Funding success rate difference between women and men

This indicator presents the gender gap in research funding as the success rate of men minus the same rate for women. A positive difference means that men have a higher success rate, whereas a negative difference means that women have a higher success rate.

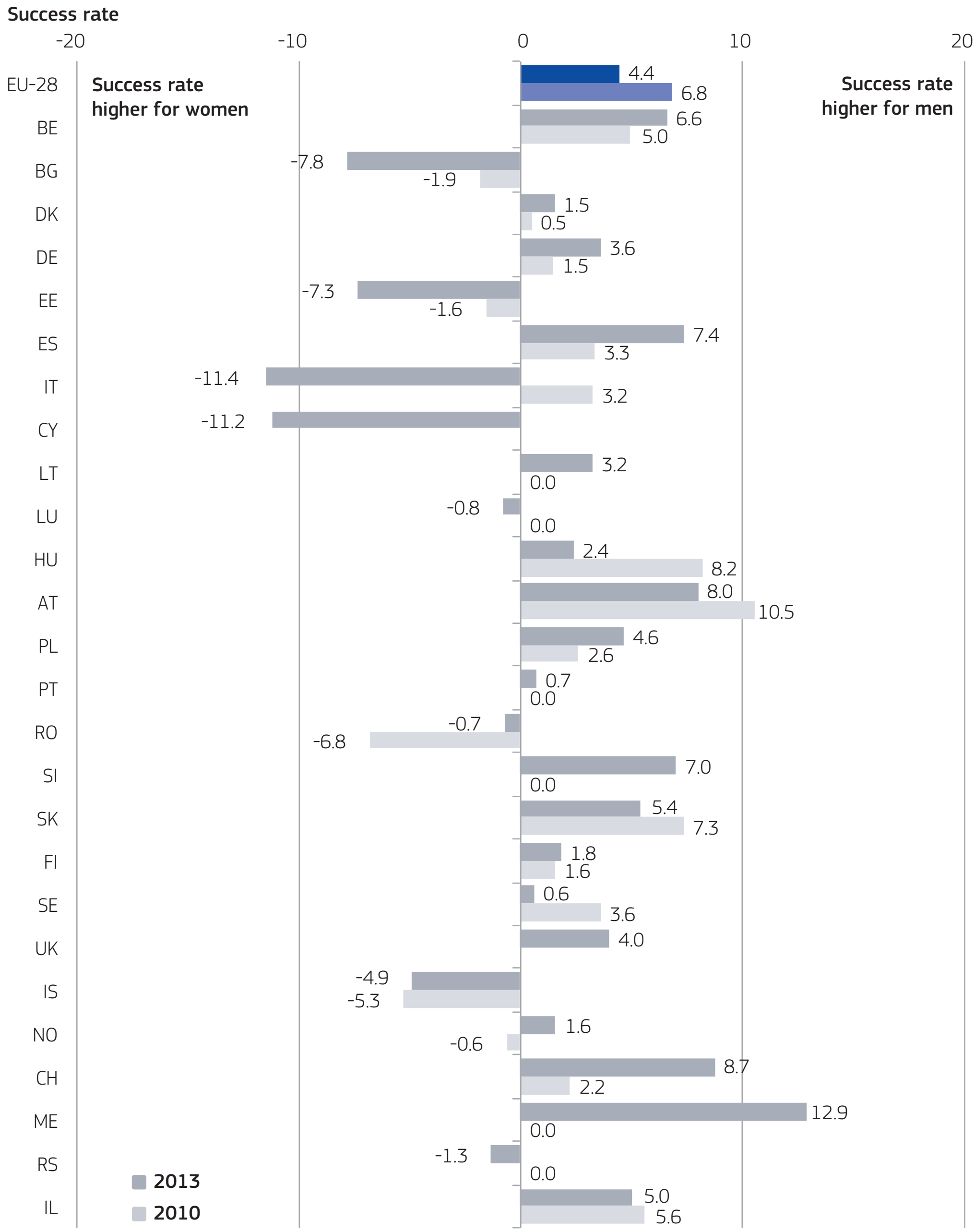
Table 7.8. Compound annual growth rate (%) of the four-year proportion of women inventorships, by IPC section, 2002–2013

	All IPC sections		A		B		C		D		E		F		G		H	
	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend
EU-28	2.2		1.3		2.3		2.8		2.1		2.4		3.9		1.8		1.0	
BE	1.8		0.3		2.5		2.9		3.6		-0.8		0.4		-1.4		-1.2	
BG	-7.0		z	z	z	z	z	z	z	z	z	z	z	z	z	z	z	z
CZ	0.5		0.1		2.2		2.1		z		z	z	5.6		-6.3		0.6	
DK	1.4		2.3		4.2		2.9		1.7		-1.8		4.1		3.2		0.9	
DE	3.5		2.5		2.5		3.7		1.0		1.1		6.6		2.8		3.3	
IE	2.3		2.1		2.5		-0.5		z	z	4.0		-13.3		8.4		-10.7	
EL	0.4		1.0		-5.4		-1.2		z	z	z	z	z	z	-0.3		-5.6	
ES	5.5		4.2		3.9		3.6		-3.5		6.5		7.8		7.9		5.0	
FR	1.2		0.5		2.5		0.7		1.6		0.8		2.0		0.8		1.4	
HR	0.3		1.9		z	z	z	z	z	z	z	z	z	z	z	z	z	z
IT	2.3		1.5		0.7		2.1		7.8		3.4		1.5		3.9		-0.6	
LT	-2.0		z	z	z	z	z	z	z	z	z	z	z	z	z	z	z	z
LU	2.1		z	z	3.3		5.3		z	z	z	z	-16.6		-9.5		-3.9	
HU	-5.1		-2.6		-3.0		-1.1		z	z	z	z	42.1		-6.0		-13.4	
NL	1.8		1.3		0.8		1.8		-1.1		2.6		-2.2		1.0		-0.7	
AT	6.3		4.9		7.3		8.3		27.5		4.0		0.6		5.0		3.2	
PL	-1.5		1.2		0.7		3.2		z	z	z	z	-10.4		-6.6		6.4	
PT	0.1		-3.5		-0.8		-4.5		z	z	z	z	z	z	z	z	z	z
RO	3.2		z	z	z	z	z	z	z	z	z	z	z	z	z	z	z	z
SI	1.8		-0.4		-1.3		1.1		z	z	z	z	z	z	z	z	3.5	
SK	-2.9		z	z	z	z	z	z	z	z	z	z	z	z	z	z	z	z
FI	-0.1		0.8		1.0		1.7		4.5		1.8		2.6		-0.4		-1.1	
SE	-0.3		-1.4		0.1		0.6		1.1		5.2		1.1		2.6		2.3	
UK	0.8		0.5		1.2		1.1		-1.1		5.0		0.6		-0.9		3.1	
IS	-6.7		-10.9		z	z	-8.0		z	z	z	z	z	z	z	z	z	z
LI	1.8		34.4		z	z	z	z	z	z	z	z	z	z	z	z	z	z
NO	1.6		6.4		0.7		-0.4		z	z	1.3		0.5		-1.8		3.1	
CH	4.1		4.0		1.0		3.5		-3.1		0.6		0.0		0.8		1.1	
TR	-0.8		-0.3		-6.2		z	z	z	z	z	z	-6.5		z	z	z	z
IL	0.8		-0.3		-0.1		0.3		z	z	10.3		2.2		2.1		1.6	

Notes: Data systematically not applicable for: EE, CY, LV, MT, ME, MK, AL, RS, BA, FO, MD;
Others: 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;
CAGR: The compound annual growth rate of the proportion of women inventorships computed on four-year moving periods (e.g. 2002–2005, 2003–2006, 2004–2007, and so on);
Trend: Shows the trend in the proportion of women inventorships using four-year moving periods (the scale is not the same across countries);
z = Not applicable (due to insufficiently large population size).

Source: Computed by Science-Metrix using European patent applications in PATSTAT

Figure 7.5. Evolution of the funding success rate differences between women and men, 2010–2013



Notes: Data unavailable for: CZ, IE, EL, FR, HR, LV, MT, NL, UK, FO, AL, MK, TR, BA, LI, MD; Exceptions to the reference years: BG: 2010–2012; SK: 2012–2013; EE, PL, RO: 2011–2013; IT: 2009–2013; LT, LU: 2007 (She Figures 2012); PT: 2009 (She Figures 2012);
Others:Low number of applicants (<30) for either men or women: 2013: CY, LU, ME; 2010: CY;
Funding success rate difference = men's success rate minus women's success rate (left from zero-line = women more successful; right from zero-line = men more successful).

Source: Women in Science database/DG Research and Innovation

The gender gap in the funding success rate is decreasing at the EU-28 level, yet men still have a higher success rate than women.

Figure 7.5 shows the difference in the funding success rate of women and men and how this difference has evolved between 2010 and 2013. Within the EU-28, the gap, computed as men's success rate minus women's success rate, has decreased by 2.4 percentage points since 2010, although men continue to have a higher success rate than women, as observed in approximately 70 % of the countries for which data were available, with the difference ranging from 12.9 to 0.6 percentage points. The largest funding success rate differences in favour of men are found in Montenegro (12.9 percentage points), Switzerland (8.7 percentage points) and Austria (8.0 percentage points). The funding success rate differences favour women in eight of the countries and range from 11.4 to 0.7 percentage points. The countries in which women have the largest funding success rate advantage are Italy (11.4 percentage points), Cyprus (11.2 percentage points) and Bulgaria (7.8 percentage points). There was no clear pattern of change between 2010 and 2013 as there has been an increase in the funding success rate difference in about 50 % of the countries. The largest changes were observed in Italy, where the success rate of men was higher in 2010 but lower in 2013 (a shift from 3.2 percentage points to - 11.4 percentage points ([97])), Switzerland, where the bias in favour of men increased by 6.5 percentage points, and Romania, where the bias in favour of women observed in 2010 had been rectified by 2013.

As shown in Figure 7.5, there is a funding success rate difference that favours men across the majority of the countries for which data were available.

To further analyse the trend presented above, Table 7.9 examines funding success rate differences between women and men across different fields of science. Generally, the data show that a systematic bias exists in favour of men across all fields of science. However, it should be noted that there are several countries/fields of science for which the number of women applicants is below five (e.g. Cyprus in all fields, Montenegro in all fields and Italy in half of the fields). This reduces the reliability/robustness of the indicator at this aggregation level. For instance, the largest differences favouring men are found in engineering and technology in Estonia, Lithuania, and Montenegro, in medical sciences in Montenegro, and in agricultural sciences in Estonia and Israel, although the number of women applicants is below 30 in all these cases. The largest differences favouring women are found in the agricultural sciences in Lithuania and in engineering and technology and the medical sciences in Cyprus, although the number of women applicants is below five in all these cases. Given the low number of women applicants and beneficiaries, it is difficult to draw any robust conclusions from Table 7.9.

Gender dimension in research content (GDRC)

Globally, there is an increasing interest in integrating the gender dimension in research content (GDRC). This means taking into account as relevant the biological characteristics and the social and cultural features of both women and men in research content (European Commission, 2014). As a first step towards monitoring progress in the propensity to integrate the gender dimension in research content, a new indicator has been developed – the *proportion of a country's scientific publications integrating a gender dimension in their subject matter.* The identification of scientific publications integrating a gender dimension in their research content is based on a keyword-based query covering both sex-related terms (biological characteristics of both women and men) and gender-related terms (social/cultural factors of both women and men). This identification is a proxy which detects the existence of a gender dimension but does not provide information about its quality. Based on this indicator, the following figures reveal the extent to which a gender dimension is present and/or growing in national research outputs over time and by field of science. It is important to note that this is a newly developed indicator and that, as such, any reference or target point about appropriate levels of the indicator is lacking. The figures presented should hence be considered as baseline levels, allowing their evolution to be monitored in the future.

97 Note that, the accuracy of the computed indicator in 2013 might have been affected by the important drop in the number of applicants for Italy in 2013 relative to 2010 (98 % drop for men and 94 % drop for women).

Table 7.9. Research funding success rate differences between women and men by field of science, 2013

	Difference in success rate					
	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
BE	:	:	:	:	:	:
BG	-18.0	-7.7	-9.5	1.7	-0.4	:
DK	1.5	-3.2	5.4	-19.3	9.7	-4.9
DE	2.9	7.3	5.1	:	-2.7	:
EE	-11.9	84.8	-6.8	70.0	-11.6	-12.4
ES	9.6	6.6	5.2	9.3	7.9	3.0
IT	15.0	-22.5	:	:	-31.7	:
CY	3.6	-71.4	-66.7	0.0	-5.2	0.0
LT	5.4	23.7	7.1	-100.0	1.8	-4.6
HU	3.1	13.6	11.3	-1.9	-7.0	0.7
AT	2.7	4.0	4.0	-5.4	2.5	3.4
PL	6.9	0.9	1.3	1.9	5.9	3.2
PT	1.6	-0.9	2.3	7.7	0.8	-1.9
RO	-8.3	-3.6	-4.9	10.4	5.8	:
SI	4.9	13.3	5.7	-4.9	3.5	10.9
SK	9.0	4.7	-0.2	3.1	10.0	9.5
FI	-0.2	4.3	3.0	5.8	1.9	1.3
SE	1.5	-3.5	-1.2	-0.1	0.7	-1.2
UK	:	1.4	-1.3	4.5	5.4	1.4
IS	12.7	-2.6	4.4	5.2	-10.7	10.6
NO	-0.1	-6.7	3.2	-8.9	-2.3	5.7
CH	14.7	0.4	3.2	-41.7	6.6	5.0
ME	:	20.0	20.0	0.0	:	:
RS	:	:	:	:	:	:
IL	3.3	-6.3	2.5	19.2	9.2	5.4

Notes: Exceptions to the reference years: BG: 2012; LT: 2007; PT: 2009; Data unavailable for: CZ, IE, EL, FR, HR, LV, LU, MT, NL, UK, LI, MK, AL, RS, TR, BA, FO, MD; Others: Low number of applicants (<30) for either men or women: Natural sciences: IT, CY, RO, ME; Engineering and technology: EE, IT, CY, LT, HU, ME, IL; Medical sciences: EE, IT, CY, ME; Agricultural sciences: DK, DE, EE, IT, CY, LT, AT, FI, UK, CH, ME, IL; Social sciences: IT, CY, LT, ME; Humanities: BG, DE, IT, CY, LT, RO, IS, ME.

Source: Women in Science database/DG Research and Innovation

Proportion of a country's scientific publications integrating a gender dimension in their research content

This indicator consists of a country's number of peer-reviewed scientific papers (those with at least one author from the said country) in which a gender dimension has been identified in the research content, divided by the total number of peer-reviewed scientific papers from the corresponding country. The countries of all authors of a publication are considered (the analysis is not restricted to the corresponding author for this indicator). Papers are counted using full counting: that is, each publication is counted only once for a given country, even if more than one author from the said country are listed as authors in the publication.

Table 7.10. Proportion of a country's scientific publications including a gender dimension in their research content, by field of science, 2002–2005 and 2010–2013

	Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences		Humanities	
	02–05	10–13	02–05	10–13	02–05	10–13	02–05	10–13	02–05	10–13	02–05	10–13
World	0.1	0.2	0.0	0.1	2.8	3.9	0.0	0.0	6.8	7.2	3.9	3.9
EU-28	0.1	0.2	0.0	0.1	2.5	3.8	0.0	0.0	5.6	6.2	2.7	3.2
BE	0.2	0.2	0.0	0.1	2.4	3.5	0.0	0.0	4.3	5.1	1.6	2.4
BG	0.1	0.1	0.0	0.2	1.7	2.5	0.0	0.0	8.8	1.6	6.3	6.3
CZ	0.1	0.1	0.0	0.1	1.6	3.1	0.1	0.0	5.5	5.5	2.9	2.5
DK	0.3	0.3	0.1	0.1	4.5	5.3	0.0	0.0	2.6	4.6	2.5	3.6
DE	0.1	0.1	0.0	0.1	1.9	3.0	0.0	0.0	4.6	5.1	2.0	1.4
EE	0.3	0.1	0.0	0.3	3.8	7.3	0.0	0.0	8.1	6.8	0.0	1.7
IE	0.1	0.2	0.0	0.0	2.9	4.8	0.0	0.0	8.5	7.0	2.5	5.0
EL	0.1	0.3	0.0	0.1	2.6	4.3	0.0	0.0	3.8	4.9	4.4	3.0
ES	0.1	0.2	0.0	0.1	2.6	4.1	0.0	0.0	4.2	6.5	0.7	2.4
FR	0.1	0.1	0.0	0.0	1.9	2.8	0.0	0.0	3.2	4.1	1.6	1.9
HR	0.1	0.3	0.0	0.1	3.5	4.3	0.0	0.0	8.7	8.5	0.0	3.5
IT	0.1	0.2	0.0	0.1	2.3	3.1	0.0	0.0	3.5	4.4	1.4	1.6
CY	0.2	0.2	0.0	0.0	7.2	7.2	0.0	0.0	6.0	6.7	0.0	1.0
LV	0.1	0.3	0.0	0.0	1.2	2.5	0.0	0.0	16.7	3.5	0.0	7.7
LT	0.1	0.1	0.2	0.4	4.5	5.5	0.0	0.0	6.7	3.6	10.5	0.0
LU	0.4	0.0	0.0	0.0	4.2	5.2	0.0	0.0	3.6	5.4	0.0	2.9
HU	0.1	0.1	0.0	0.1	2.1	4.1	0.0	0.0	5.6	4.2	3.4	2.2
MT	2.2	1.3	0.0	0.0	4.4	7.1	0.0	0.0	6.7	3.7	0.0	0.0
NL	0.2	0.4	0.1	0.1	3.2	4.3	0.0	0.0	5.4	5.5	2.8	2.6
AT	0.1	0.2	0.1	0.2	2.1	3.4	0.0	0.0	4.4	6.6	4.2	1.8
PL	0.0	0.1	0.0	0.0	2.0	3.7	0.0	0.0	4.7	4.9	3.9	2.5
PT	0.1	0.2	0.0	0.1	2.3	5.6	0.0	0.0	3.8	4.7	1.6	2.0
RO	0.0	0.2	0.1	0.0	2.6	3.1	0.0	0.0	6.1	4.2	11.7	2.1
SI	0.0	0.2	0.0	0.1	2.8	4.6	0.4	0.0	7.0	7.1	5.2	2.1
SK	0.0	0.2	0.0	0.2	2.4	3.7	0.0	0.0	5.1	6.1	3.3	0.9
FI	0.2	0.4	0.0	0.1	4.5	6.0	0.0	0.0	8.3	8.5	1.2	4.0
SE	0.2	0.4	0.1	0.1	5.0	6.5	0.0	0.2	7.6	8.8	3.3	7.6
UK	0.2	0.3	0.1	0.1	2.6	3.8	0.0	0.1	6.6	7.0	3.9	4.9
IS	0.1	0.5	0.0	0.4	8.8	8.6	0.0	0.0	9.5	12.4	0.0	4.6
LI	0.0	0.0	0.0	0.0	0.0	9.2	z	z	0.0	0.0	z	z
NO	0.3	0.3	0.1	0.1	6.0	7.6	0.1	0.0	7.6	6.8	4.4	3.8
CH	0.1	0.2	0.0	0.1	2.4	3.5	0.0	0.0	5.8	4.8	2.5	2.7
ME	0.0	0.0	0.0	0.0	z	5.8	0.0	0.0	0.0	6.1	z	0.0
MK	0.0	0.4	0.0	0.0	2.1	4.4	0.0	0.0	0.0	5.4	33.3	16.7
AL	0.0	0.5	0.0	0.8	7.0	7.0	0.0	0.0	0.0	0.0	0.0	25.0
RS	0.0	0.1	0.0	0.1	0.0	5.0	0.0	0.0	z	4.3	z	3.1
TR	0.1	0.4	0.0	0.5	2.8	5.3	0.0	0.0	9.3	9.8	1.9	3.0
BA	0.0	0.3	0.0	0.0	7.9	7.6	0.0	0.0	11.5	5.3	z	7.7
FO	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	z	0.0	0.0	0.0
IL	0.1	0.2	0.0	0.1	3.4	4.6	0.0	0.0	9.6	8.0	2.2	2.6
MD	0.0	0.0	0.0	0.0	2.0	5.5	0.0	0.0	25.0	0.0	z	0.0

Notes: All proportions are underestimated to a similar extent across countries for literature written in English. Care was taken not to bias the recall (i.e. the fraction of GDRC-relevant literature that was effectively retrieved and measured) in favour of specific countries. This is because it is very difficult to extract 100 % of the relevant literature using text-mining techniques without compromising accuracy (i.e. the percentage of retrieved papers that are GDRC-relevant). This is especially true for GDRC as the terminology used in the social sciences and humanities is more generic than in other scientific areas. The recall of relevant literature (all fields combined) is estimated at about 60 %, and the accuracy at 97 %.

Source: Computed by Science-Metrix using WoS™ data (Thomson Reuters)

The propensity of integrating a gender dimension into research content is increasing.

Table 7.10 shows the proportion of scientific publications that include a gender dimension in their content, by country and by field of science & technology. Two time periods are considered (2002–2005 and 2010–2013). A comparison between the figures worldwide and those in the EU-28 reveals that the propensity to include a gender dimension in research subject matter is similar to the world average within the EU-28 Member States. For all fields of science & technology, the Member States display a share of GDRC similar to or slightly lower than the world share. The breakdown of the indicator in fields of science & technology shows that the gender dimension is most prevalent in the social sciences in 2010–2013 (6 % and 7 % in the EU-28 and the world respectively). The humanities and the medical sciences display a more modest share of publications with a gender dimension in 2010–2013 (3 % to 4 %). In agricultural sciences, engineering and technology, and natural sciences the gender aspect is generally lacking or very minor.

There is considerable country variation in the extent to which the gender dimension is addressed in national research outputs if one considers the percentage of positive or negative departure from EU-28 or world level; however, note that these departures (in percentage points) are generally small. The following countries have shares slightly above the EU-28 average (at least 10% larger; based on a higher level of precision [decimal points] than is presented in the table) across the largest number of fields of science & technology and periods: Denmark, Finland, Sweden, the United Kingdom, Iceland and Norway. This holds true for Denmark, Finland, Sweden, Iceland and Norway when using the world as a reference. In fact, Nordic countries are well represented in this top group, which shows that they frequently integrate the gender dimension in their research topics compared to other nations, especially in the medical sciences and social sciences. The United Kingdom is close to or slightly above the EU-28 average, but other large players such as Germany, France and Italy are below the EU-28 average.

Although it is hard to set a target point for what could be considered ‘adequate’ representation of the gender dimension in research content, the observed shares generally appear low ([98]), implying that there is room for further increases in the future.

The overall small differences between both discrete time periods suggest that no major advances have been made in terms of addressing the gender dimension in research. The small differences nevertheless point to increases rather than decreases. A closer look at the trends is provided in the next figure.

Considering the generally modest presence of a gender dimension in research output, it becomes all the more relevant to monitor trends. Increases may lead to cautious optimism and decreases may urge further action. The comparison of both time periods in Table 7.10 suggested minor but mostly increasing trends.

98 Note that this remains true even if the GDRC dataset, constructed to compute this indicator, captures only roughly 60 % of the relevant literature.

Table 7.11. Compound annual growth rate (%) of the four-year proportion of a country's scientific publications with a gender dimension in their research content, by field of science, 2002–2013

	All fields		NS		ET		MS		AS		SS		H	
	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend
World	3.9		6.2		8.5		4.1		5.3		0.7		0.2	
EU-28	5.7		6.1		14.0		5.0		6.6		1.3		2.1	
BE	6.4		3.4		Z	Z	5.3		Z	Z	2.0		5.0	
BG	4.4		-1.2		Z	Z	5.1		Z	Z	-19.0		0.0	
CZ	8.3		2.4		Z	Z	8.4		Z	Z	0.0		-2.2	
DK	3.5		1.1		-1.4		2.2		-2.9		7.4		4.4	
DE	6.3		6.7		16.7		5.9		-2.2		1.3		-4.4	
EE	5.2		-10.7		Z	Z	8.5		Z	Z	-2.3		Z	Z
IE	6.2		10.5		Z	Z	6.5		Z	Z	-2.5		9.2	
EL	8.1		13.8		Z	Z	6.4		Z	Z	3.2		-4.4	
ES	8.4		5.8		Z	Z	6.0		0.4		5.8		17.0	
FR	5.4		5.8		Z	Z	4.9		Z	Z	3.2		2.3	
HR	3.5		19.3		Z	Z	2.5		Z	Z	-0.4		Z	Z
IT	5.5		4.8		21.8		3.7		2.0		2.8		1.1	
CY	3.0		1.4		Z	Z	0.1		Z	Z	1.5		Z	Z
LV	3.7		11.8		Z	Z	9.9		Z	Z	-17.6		Z	Z
LT	2.5		-6.7		9.6		2.5		Z	Z	-7.5		Z	Z
LU	0.3		Z	Z	Z	Z	2.6		Z	Z	5.3		Z	Z
HU	9.2		1.5		Z	Z	8.8		Z	Z	-3.4		-5.2	
MT	1.2		Z	Z	Z	Z	6.0		Z	Z	-7.2		Z	Z
NL	4.9		6.2		8.0		3.9		Z	Z	0.3		-1.0	
AT	5.9		9.0		6.3		6.0		Z	Z	5.1		-10.1	
PL	13.1		13.8		Z	Z	8.0		-7.6		0.5		-5.6	
PT	15.6		16.4		Z	Z	11.6		Z	Z	2.9		2.9	
RO	10.6		34.8		-18.0		1.9		Z	Z	-4.5		-19.2	
SI	9.1		17.2		Z	Z	6.5		Z	Z	0.1		-10.4	
SK	6.9		Z	Z	Z	Z	5.8		Z	Z	2.4		-14.7	
FI	3.5		5.2		Z	Z	3.8		Z	Z	0.4		16.5	
SE	4.6		8.9		4.2		3.3		Z	Z	1.8		10.9	
UK	4.8		3.1		6.2		4.8		Z	Z	0.7		2.8	
IS	0.7		17.8		Z	Z	-0.3		Z	Z	3.4		Z	Z
NO	2.9		2.8		-4.9		3.0		-4.2		-1.3		-1.9	
CH	5.5		11.7		20.5		4.8		Z	Z	-2.4		0.8	
MK	7.3		Z	Z	Z	Z	9.9		Z	Z	Z	Z	-8.3	
AL	1.0		Z	Z	Z	Z	0.0		Z	Z	Z	Z	Z	Z
TR	8.3		25.1		34.2		8.5		Z	Z	0.6		5.7	
BA	2.5		Z	Z	Z	Z	-0.5		Z	Z	-9.3		Z	Z
IL	3.0		6.4		Z	Z	3.7		Z	Z	-2.2		2.3	
MD	8.4		Z	Z	Z	Z	13.7		Z	Z	Z	Z	Z	Z

Notes: Fields of science: NS = Natural sciences; ET = Engineering and technology; MS = Medical sciences; AS = Agricultural sciences; SS = Social sciences; H = Humanities; CAGR: The compound annual growth rate of the proportion of GDRC literature computed on four-year moving periods (e.g. 2002–2005, 2003–2006, 2004–2007, and so on); Trend: Shows the trend in the proportion of GDRC literature using four-year moving periods (the scale is not the same across countries); z = Not applicable (due to insufficiently large population size).

Source: Computed by Science-Metrix using WoS™ data (Thomson Reuters)

Table 7.11 provides a more detailed picture of trends in terms of the presence of a gender dimension in research output (2002–2013). It displays the compound annual growth rate of the GDRC indicator by country and by field of science & technology, using a four-year moving window over the period 2002–2013. The micro-charts further indicate the actual trends in the GDRC indicator over the period 2002–2013.

The figures worldwide and for the EU-28 generally show an increase in the propensity to include a gender dimension in the subject matter of research, though the average growth rate for the EU-28 is larger than the growth rate worldwide for all fields except the natural sciences. Growth is very limited in the social sciences and humanities (between 0.2 % and 2 %), whereas the largest growth by field is taking place in engineering and technology (8.5 % worldwide and 14 % for the EU-28). At the same time, there are once again considerable country differences. Although worldwide and for the EU-28 no declining trend is apparent in any field, the propensity to include a gender dimension in the subject matter of research is decreasing markedly in some countries in specific fields. This is particularly the case in Bulgaria, Latvia, Romania and Slovakia (with the exception of the natural sciences field, where considerable growth is visible for Romania). It should be noted, however, that because of the very low GDRC values to start with, any growth rate will have to be sufficiently large and sustained to constitute a significant advancement in the future presence of a gender dimension in research content.

Annex 7.1. Number of applicants and beneficiaries of research funding, by sex, 2010-2013

Country Code	Reference Year for 2013	Reference Year for 2010	Beneficiaries				Applicants			
			2010		2013		2010		2013	
			Women	Men	Women	Men	Women	Men	Women	Men
EU-28			5 203	13 097	6 215	14 398	18 988	38 280	26 363	47 838
BE	2013	2010	338	518	353	589	1 273	1 644	1 393	1 845
BG	2012	2010	41	63	159	207	143	235	355	560
DK	2013	2010	164	371	142	312	913	2 012	775	1 572
DE	2013	2010	798	2 997	701	2 821	1 946	7 054	2 474	8 838
EE	2013	2011	115	200	143	279	204	365	172	368
ES	2013	2010	1 269	1 594	1 705	2 874	4 168	4 719	6 752	8 814
IT	2013	2009	107	438	35	38	929	2 967	52	68
CY	2013	2010	1	2	6	13	1	4	24	94
LT	2007 (SF2012)	-	:	:	51	96	:	:	172	292
LU	2007 (SF2012)	-	:	:	6	29	:	:	16	79
HU	2013	2010	51	157	98	261	216	494	368	900
AT	2013	2010	841	4 250	870	3 647	1 701	7 089	2 137	7 491
PL	2013	2011	800	1 124	1 043	1 483	3 470	4 379	4 908	5 730
PT	2009 (SF2012)	-	:	:	1 408	1 276	:	:	1 485	1 336
RO	2013	2011	106	134	145	231	586	1 189	854	1 421
SI	2013	2010	:	:	98	260	:	:	664	1 195
SK	2013	2012	46	193	115	411	223	690	650	1 781
FI	2013	2010	161	335	181	332	880	1 687	1 469	2 347
SE	2013	2010	365	721	421	640	2 335	3 752	3 316	4 814
IS	2013	2010	169	288	161	276	379	732	377	730
NO	2013	2010	276	628	425	812	1 021	2 380	1 715	3 079
CH	2013	2010	818	2 022	632	1 520	1 467	3 487	1 478	2 952
ME	2013	-	:	:	0	4	:	:	8	31
RS	2013	-	:	:	261	516	:	:	292	586
IL	2013	2010	190	642	219	681	688	1 935	899	2 317

Exceptions to the reference years: BG: 2010-2012; SK: 2012-2013; EE, PL, RO: 2011-2013; IT: 2009-2013; LT, LU: 2007 (She Figures 2012); PT: 2009 (She Figures 2012
Data unavailable: CZ, IE, EL, FR, HR, LV, MT, NL, UK, LI, MK, AL, TR, BA, FO, MD
Other: Only funding data for team leaders are presented (data for team members was sparce and limited and are thus not presented)
‘i’: low number of head counts
Head count (HC)

Source: Women in Science database/DG Research and Innovation

Annex 7.2. Number of applicants and beneficiaries of research funding, by sex, and by field of science, 2013

		Women								Men							
		Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Unknown	TOTAL	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Unknown	TOTAL
BE	Beneficiaries	:	:	:	:	:	:	353	353	:	:	:	:	:	:	589	589
	Applicants	:	:	:	:	:	:	1 393	1 393	:	:	:	:	:	:	1 845	1 845
BG	Beneficiaries	16	17	23	17	86	0	0	159	36	47	21	22	81	0	0	207
	Applicants	34	41	66	36	178	0	0	355	124	139	83	45	169	0	0	560
DK	Beneficiaries	31	11	45	6	24	25	0	142	105	31	98	2	45	31	0	312
	Applicants	187	62	253	25	161	87	0	775	581	213	422	43	183	130	0	1 572
DE	Beneficiaries	100	59	286	0	256	0	0	701	711	662	975	0	473	0	0	2 821
	Applicants	315	221	1 168	0	770	0	0	2 474	2 053	1 945	3 294	0	1 546	0	0	8 838
EE	Beneficiaries	53	0	16	0	35	39	0	143	139	39	24	7	39	31	0	279
	Applicants	62	4	19	2	37	48	0	172	189	46	31	10	47	45	0	368
ES	Beneficiaries	457	368	253	120	211	296	0	1 705	934	876	235	164	303	362	0	2 874
	Applicants	1 874	1 451	1 042	558	941	886	0	6 752	2 750	2 744	797	532	998	993	0	8 814
IT	Beneficiaries	15	12	0	0	8	0	0	35	15	15	0	0	8	0	0	38
	Applicants	25	18	0	0	9	:	:	52	20	34	0	0	14	0	0	68
CY	Beneficiaries	0	1	4	0	1	0	0	6	1	8	3	0	1	0	0	13
	Applicants	5	1	4	3	9	2	0	24	28	28	9	11	17	1	0	94
LT	Beneficiaries	8	1	25	2	7	8	0	51	29	19	38	0	7	3	0	96
	Applicants	31	11	89	2	20	19	0	172	93	58	108	6	19	8	0	292
HU	Beneficiaries	33	1	13	14	18	19	0	98	112	17	50	20	30	32	0	261
	Applicants	118	10	64	52	54	70	0	368	361	72	158	80	114	115	0	900
AT	Beneficiaries	101	4	37	3	21	57	647	870	297	15	70	4	27	70	3 164	3 647
	Applicants	359	36	212	14	140	222	1 154	2 137	963	99	327	25	154	241	5 682	7 491
PL	Beneficiaries	291	152	175	84	184	157	0	1 043	561	320	132	50	230	190	0	1 483
	Applicants	1 215	658	912	381	1 024	718	0	4 908	1 820	1 336	643	209	963	759	0	5 730
PT	Beneficiaries	354	192	207	60	259	336	0	1 408	312	415	121	31	184	213	0	1 276
	Applicants	381	198	219	65	274	348	0	1 485	330	432	125	31	193	225	0	1 336

		Women								Men							
		Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Unknown	TOTAL	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Unknown	TOTAL
RO	Beneficiaries	3	90	17	18	17	0	0	145	8	158	12	30	23	0	0	231
	Applicants	4	490	94	152	114	0	0	854	12	1 072	91	135	111	0	0	1 421
SI	Beneficiaries	24	13	17	12	20	12	0	98	73	93	31	10	33	20	0	260
	Applicants	142	108	130	70	117	97	0	664	335	367	165	82	160	86	0	1 195
SK	Beneficiaries	26	21	29	18	16	5	0	115	123	148	31	46	43	20	0	411
	Applicants	136	130	125	106	116	37	0	650	438	711	135	229	181	87	0	1 781
FI	Beneficiaries	82	8	26	1	44	20	0	181	185	25	42	2	50	28	0	332
	Applicants	535	72	233	21	394	210	4	1 469	1 224	162	297	19	383	258	4	2 347
SE	Beneficiaries	85	21	108	31	144	32	0	421	249	65	121	37	139	29	0	640
	Applicants	623	138	656	241	1 389	269	0	3 316	1 649	557	794	291	1 251	272	0	4 814
UK	Beneficiaries	275	75	114	0	167	140	0	771	1 217	520	274	0	196	166	0	2 373
	Applicants	1 042	215	567	0	558	413	0	2 795	3 834	1 435	1 114	0	626	509	0	7 518
IS	Beneficiaries	26	21	35	16	45	18	0	161	68	63	60	39	27	19	0	276
	Applicants	56	92	67	54	83	25	0	377	115	312	106	112	62	23	0	730
NO	Beneficiaries	70	89	46	45	128	41	6	425	185	288	81	42	154	56	6	812
	Applicants	238	223	458	99	469	211	17	1 715	632	868	610	115	616	223	15	3 079
CH	Beneficiaries	179	41	115	3	163	131	0	632	663	191	222	1	252	191	0	1 520
	Applicants	400	85	288	4	410	291	0	1 478	1 115	393	515	3	544	382	0	2 952
ME	Beneficiaries	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4
	Applicants	0	4	1	3	0	0	0	8	1	15	5	3	7	0	0	31
RS	Beneficiaries	:	:	:	:	:	:	261	261	:	:	:	:	:	:	516	516
	Applicants	:	:	:	:	:	:	292	292	:	:	:	:	:	:	586	586
IL	Beneficiaries	67	3	38	1	61	26	23	219	286	25	87	12	106	60	105	681
	Applicants	242	8	180	19	282	74	94	899	923	80	368	49	344	148	405	2 317

Exceptions to the reference year: BG: 2012; LT: 2007 (SF2012); PT: 2009 (SF2012)
Data unavailable: CZ, IE, EL, FR, HR, LV, LU, MT, NL, LI, MK, AL, TR, BA, FO, MD
Other: Head count (HC)

Source: Women in Science database/DG Research and Innovation

Appendix 1. Correspondence table between different editions of the She Figures

Name of indicator	SF2015 label	SF2012 label
Proportion (%) of women ISCED 6 graduates, 2012	Figure 2.1	n/a
Proportion (%) of women PhD (Doctor of Philosophy) graduates, 2012	Figure 2.2	Figure 2.1
Evolution of the proportion of women ISCED 6 and PhD (Doctor of Philosophy) graduates, 2004 and 2012	Table 2.1	n/a
Compound annual growth rate (%) of ISCED 6 graduates, by sex, 2002-2012	Figure 2.3	n/a, although PhD data was presented in Figure 2.2
Proportion (%) of women ISCED 6 graduates by broad field of study, 2012	Table 2.2	n/a
Proportion of female PhD (Doctor of Philosophy) graduates by broad field of study, 2012	Table 2.3	Table 2.1
Distribution of ISCED 6 graduates across the broad fields of study by sex, 2012	Figure 2.4	n/a, although PhD data was presented in Figure 2.3
Evolution of the proportion (%) of women ISCED 6 graduates by narrow field of study in natural science and engineering (fields EF4 & EF5), 2004 and 2012	Table 2.4	n/a
Evolution of the proportion (%) of women PhD (Doctor of Philosophy) graduates by narrow field of study in natural science and engineering (fields EF4 & EF5), 2004 and 2012	Table 2.5	Table 2.3
Compound annual growth rates (%) of ISCED 6 graduates by narrow field of study in natural science and engineering, by sex, 2002-2012	Table 2.6	n/a, although PhD data was presented in Table 2.2
Number of ISCED 6 graduates by sex, 2008-2012	Annex 2.1	n/a
Number of PhD (Doctor of Philosophy) graduates by sex (2008-2012)	Annex 2.2	Annex 2.1
Number of ISCED 6 graduates by broad field of study and sex, 2012	Annex 2.3	n/a
Number of PhD (Doctor of Philosophy) graduates by sex and field of study, 2012	Annex 2.4	Annex 2.2
Number of ISCED 6 graduates by narrow field of study and sex in natural science and engineering (EF4 and EF5 fields), 2012	Annex 2.5	n/a
Number of PhD (Doctor of Philosophy) graduates by narrow field of study and sex in natural science and engineering (EF4 and EF5 fields), 2012	Annex 2.6	Annex 2.3
Proportion of women in the EU-28 for total employment, tertiary educated and employed as professionals and technicians (HRSTC) and scientists and engineers in 2013, compound annual growth rate for men and women, 2008 – 2013	Figure 3.1	Figure 1.1
Tertiary educated and employed as professionals and technicians (HRSTC), as a percentage of tertiary educated (HRSTE), by sex	Figure 3.2	Figure 1.2
Proportion of scientists and engineers (aged 25-64) in the total labour force by sex, 2013	Figure 3.3	Figure 1.3
Employment in knowledge-intensive activities (KIA) (age 25-64), by sex, 2013	Figure 3.4	Figure 1.4
Employment in knowledge-intensive activities - Business Industries (KIABI), 2013	Figure 3.5	Figure 1.5
Distribution of R&D personnel across occupations in all Sectors (HES, GOV, BES), by sex, 2012	Figure 3.6	Figure 3.9
Distribution of R&D personnel across occupations for the Higher Education Sector (HES), by sex, 2012	Figure 3.7	Figure 3.10

Name of indicator	SF2015 label	SF2012 label
Distribution of R&D personnel across occupations for the Government Sector (GOV), by sex, 2012	Figure 3.8	Figure 3.11
Distribution of R&D personnel across occupations for the Business Enterprise Sector (BES), by sex, 2012	Figure 3.9	Figure 3.12
Distribution of researchers across economic activities (NACE Rev 2) in the Business Enterprise Sector (BES), 2012	Figure 3.10	Figure 2.6
Proportion (%) of women researchers by economic activity (NACE Rev.2) in the Business Enterprise Secotr (BES), 2012	Table 3.1	Table 2.8
Number of R&D personnel across occupations for the Higher Education Sector (HES), by sex, 2012	Annex 3.1	Annex 3.4.
Number of R&D personnel across occupations for the Government Sector (GOV), by sex, 2012	Annex 3.2	Annex 3.5.
Number of R&D personnel across occupations for the Business Enterprise Sector (BES) by sex, 2012	Annex 3.3	Annex 3.6.
Number of researchers in the Business Enterprise Sector (BES), by economic activity (NACE Rev.2) and sex, 2012	Annex 3.4	Annex 2.6
Proportion of women researchers, 2012	Figure 4.1	Figure 1.6
Compound annual growth rate (%) for researchers by sex, 2005-2011	Figure 4.2	Figure 1.7
Researchers per thousand labour force by sex, 2012	Figure 4.3	Figure 1.8
Distribution of researchers across sectors by sex, 2012	Figure 4.4	Figure 1.10
Proportion (%) of female researchers in the Higher Education Sector (HES), 2012	Figure 4.5	Figure 1.9
Proportion (%) of female researchers in the Government Sector (GOV), 2012	Figure 4.6	Figure 1.9
Proportion (%) of female researchers in the Business Enterprise Sector (BES), 2012	Figure 4.7	Figure 1.9
Compound annual growth rate (%) for researchers in the Higher Education Sector (HES) by sex, 2005-2012	Figure 4.8	Figure 1.11
Compound annual growth rate (%) for researchers in the Government Sector (GOV) by sex, 2005-2012	Figure 4.9	Figure 1.12
Compound annual growth rate (%) for researchers in the Business Enterprise Sector (BES) by sex, 2005-2012	Figure 4.10	Figure 1.13
Distribution of researchers in the Higher Education Sector (HES) by sex and age group, 2012	Figure 4.11	Figure 1.14
Distribution of researchers in the Government Sector (GOV) by sex and age group, 2012	Figure 4.12	Figure 1.15
Dissimilarity index for researchers in Higher Education Sector (HES) and Government Sector (GOV)	Table 4.1	Table 2.10
Evolution of the proportion (%) of women researchers in the Higher Education Sector (HES), by field of science, 2005-2012	Table 4.2	Table 2.5
Compound annual growth rates (%) of women researchers in the Higher Education Sector (HES) by field of science, 2005-2012	Table 4.3	Table 2.4
Distribution of researchers in the Higher Education Sector (HES), across fields of science, 2012	Figure 4.13	Figure 2.4
Evolution of the proportion (%) of women researchers in the Government Sector (GOV) by field of science, 2005-2012	Table 4.4	Table 2.7
Compound annual growth rates (%) of women researchers in the Government Sector (GOV), by field of science, 2005-2012	Table 4.5	Table 2.6
Distribution of researchers in the Government Sector (GOV), across fields of science, 2012	Figure 4.14	Figure 2.5
Evolution of the proportion (%) of women researchers in the Business Enterprise Sector (BES), by field of science, 2005-2012	Table 4.6	Table 2.9
Number of researchers by sex, head count, 2008-2012	Annex 4.1	Annex 1.1
Number of researchers in the Higher Education Sector (HES) by sex, head count, 2008-2012	Annex 4.2	Annex 1.2
Number of researchers in the Government Sector (GOV), by sex, head count, 2008-2012	Annex 4.3	Annex 1.3
Number of researchers in the Business Enterprise Sector (BES) by sex, 2008-2012	Annex 4.4	Annex 1.4

Name of indicator	SF2015 label	SF2012 label
Number of researchers in the Higher Education Sector (HES), by field of science and sex, 2012	Annex 4.5	Annex 2.4
Number of researchers in the Government Sector (GOV), by field of science and sex, 2012	Annex 4.6	Annex 2.5
Number of researchers in the Business Enterprise Sector (BES), by field of science and sex, 2012	Annex 4.7	n/a
Part-time employment of researchers in the HES out of total researcher population, by sex, 2012	Figure 5.1	n/a
'Precarious' working contracts of researchers in the HES out of total researcher population, by sex, 2012	Figure 5.2	n/a
Sex differences for international mobility of researchers during PhD, 2012	Figure 5.3	n/a, although see (non-comparable) Figure 1.16 for reference
Sex differences for international mobility in post-PhD career stages per country, 2012	Figure 5.4	n/a, although see (non-comparable) Figure 1.16 for reference
Gender pay gap (%) by country across economic activities (NACE Rev. 2)	Table 5.1	n/a, although see She Figures 2009
Gender pay gap (%) by age group across economic activities (NACE Rev. 2)	Table 5.2	n/a, although see She Figures 2009
Proportion of women researchers in FTE and R&D expenditure in Purchasing Power Standards (PPS) per capita researcher, 2012	Figure 5.5	Figure 4.4
R&D Expenditure in Purchasing Power Standards (PPS) per capita researcher in FTE by sector, 2012	Figure 5.6	Figure 4.5
Share of Research Performing Organisations (RPOs) that adopted GE Plans, 2013	Figure 5.7	n/a
Share (%) of Research & Development (R&D) Personnel working in RPOs who adopted Gender Equality Plans, 2013	Figure 5.8	n/a
Implementation of gender equality measures in Research Performing Organisations (RPOs), 2013	Table 5.3	n/a
Number of RPOs and R&D Personnel covered by ERA Survey, 2014	Annex 5.1	n/a
Number of RPOs that adopted gender equality measures, 2013	Annex 5.2	n/a
Total intramural R&D expenditure (GERD) for all sectors (BES, GOV, HES) in million PPS, 2012	Annex 5.3	Annex 4.4
International mobility rates, by sex, of HES researchers during PhD, 2012	Annex 5.4	n/a
International mobility rates, by sex, of HES researchers in post-PhD career, 2012	Annex 5.5	n/a
Proportion of men and women in a typical academic career, students and academic staff, EU-28, 2007-2013	Figure 6.1	Figure 3.1
Proportion of men and women in a typical academic career in science and engineering, students and academic staff, EU-28, 2007-2013	Figure 6.2	Figure 3.2
Proportion of women academic staff by grade and total, 2013	Table 6.1	Table 3.1
Evolution of the proportion of women in Grade A, 2010 vs. 2013	Figure 6.3	Figure 3.3
Percentage of grade A among all academic staff by sex, 2013	Figure 6.4	Figure 3.4
Proportion of women grade A staff by main field of science, 2013	Table 6.2	Table 3.2
Distribution of grade A staff across fields of science by sex, 2013	Figure 6.5	Figure 3.5
Glass Ceiling Index, 2010-2013	Figure 6.6	Figure 3.6
Proportion of women grade A staff by age group, 2013	Table 6.3	Table 3.3
Distribution of grade A staff across age groups, by sex, 2013	Figure 6.7	Figure 3.7
Proportion of women heads of institutions in the Higher Education Sector (HES), 2014	Figure 6.8	Figure 4.1
Proportion of women heads of universities or assimilated institutions based on capacity to deliver PhDs, 2014	Table 6.4	Table 4.1
Proportion of women on boards, 2014	Figure 6.9	Figure 4.2
Number of academic staff by grade and sex, 2013	Annex 6.1	Annex 3.1

Name of indicator	SF2015 label	SF2012 label
Number of senior academic staff (Grade A) by field of science and sex, 2013	Annex 6.2	Annex 3.2
Number of academic staff (Grade A) by age group and sex, 2013	Annex 6.3	Annex 3.3
Number of heads of institutions in the Higher Education Sector (HES), 2014	Annex 6.4	Annex 4.1
Women to men ratio of authorships (when acting as corresponding author) in all fields of science, 2011–2013	Figure 7.1	n/a
Women to men ratio of scientific authorships (when acting as corresponding author), by field of science, 2007–2009 and 2011–2013	Table 7.1	n/a
Compound annual growth rate (%) of the three-year proportion of scientific publications by women corresponding authors, by field of science, 2007–2013	Table 7.2	n/a
Women to men ratio in the proportion of international co-publications (i.e. papers published by authors from at least two countries located within the EU and/or beyond) (when acting as corresponding author), all fields of science, 2011–2013	Figure 7.2	n/a
Women to men ratio in the proportion of international (i.e. both within EU and beyond) co-publications (when acting as corresponding author), by field of science, 2007–2009 and 2011–2013	Table 7.3	n/a
Compound annual growth rate (%) of the three-year women to men ratio in the proportion of international (i.e. both within EU and beyond) co-publications (when acting as corresponding author), by field of science, 2007–2013	Table 7.4	n/a
Women to men ratio in terms of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author), all fields of science, 2011–2013	Figure 7.3	n/a
Women to men ratio in terms of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author), by field of science, 2007–2009 and 2011–2013	Table 7.5	n/a
Compound annual growth rate (%) of the three-year women to men ratio in the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author), by field of science, 2007–2013	Table 7.6	n/a
Women to men ratio of inventorships, all International Patent Classification (IPC) sections, 2010–2013	Figure 7.4	n/a
Women to men ratio of inventorships, by IPC section, 2002–2005 and 2010–2013	Table 7.7	n/a
Compound annual growth rate (%) of the four-year proportion of women inventorships, by IPC section, 2002–2013	Table 7.8	n/a
Evolution of the funding success rate differences between women and men, 2010–2013	Figure 7.5	Figure 4.3.
Research funding success rate differences between women and men by field of science, 2013	Table 7.9	Table 4.2
Number of applicants and beneficiaries of research funding by sex, 2010-2013	Annex 7.1	Annex 4.2
Number of applicants and beneficiaries of research funding by sex and field of science, 2013	Annex 7.2	Annex 4.3
Women to men ratio of authorships (when acting as corresponding author) in Agricultural sciences (2011-2013)	Annex 7.3	n/a
Women to men ratio of authorships (when acting as corresponding author) in Engineering and technology (2011-2013)	Annex 7.4	n/a
Women to men ratio of authorships (when acting as corresponding author) in the Humanities (2011-2013)	Annex 7.5	n/a
Women to men ratio of authorships (when acting as corresponding author) in the Medical sciences (2011-2013)	Annex 7.6	n/a
Women to men ratio of authorships (when acting as corresponding author) in the Natural sciences (2011-2013)	Annex 7.7	n/a
Women to men ratio of authorships (when acting as corresponding author) in the Social sciences (2011-2013)	Annex 7.8	n/a
Women to men ratio of the proportion of international co-authorships (i.e. papers published by authors from at least two countries located within the EU and/or beyond) (when acting as corresponding author) in Agricultural sciences (2011-2013)	Annex 7.9	n/a

Name of indicator	SF2015 label	SF2012 label
Women to men ratio of the proportion of international co-authorships (i.e. papers published by authors from at least two countries located within the EU and/or beyond) (when acting as corresponding author) in Engineering and technology (2011-2013)	Annex 7.10	n/a
Women to men ratio of the proportion of international co-authorships (i.e. papers published by authors from at least two countries located within the EU and/or beyond) (when acting as corresponding author) in the Medical sciences (2011-2013)	Annex 7.11	n/a
Women to men ratio of the proportion of international co-authorships (i.e. papers published by authors from at least two countries located within the EU and/or beyond) (when acting as corresponding author) in the Natural sciences (2011-2013)	Annex 7.12	n/a
Women to men ratio of the proportion of international co-authorships (i.e. papers published by authors from at least two countries located within the EU and/or beyond) (when acting as corresponding author) in the Social sciences (2011-2013)	Annex 7.13	n/a
Women to men ratio of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author) in Agricultural sciences (2011-2013)	Annex 7.14	n/a
Women to men ratio of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author) in Engineering and technology (2011-2013)	Annex 7.15	n/a
Women to men ratio of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author) in the Humanities (2007-2013)	Annex 7.16	n/a
Women to men ratio of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author) in the Medical sciences (2011-2013)	Annex 7.17	n/a
Women to men ratio of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author) in the Natural sciences (2011-2013)	Annex 7.18	n/a
Women to men ratio of the average of relative impact factors (ARIF) of their respective publications (when acting as corresponding author) in the Social sciences (2011-2013)	Annex 7.19	n/a
Women to men ratio of inventorships in Chemistry & metallurgy (2010-2013)	Annex 7.20	n/a
Women to men ratio of inventorships in Human necessities (2010-2013)	Annex 7.21	n/a
Women to men ratio of inventorships in Textiles & paper (2010-2013)	Annex 7.22	n/a
Women to men ratio of inventorships in Physics (2010-2013)	Annex 7.23	n/a
Women to men ratio of inventorships in Electricity (2010-2013)	Annex 7.24	n/a
Women to men ratio of inventorships in Performing operations & transporting (2010-2013)	Annex 7.25	n/a
Women to men ratio of inventorships in Mechanical engineering, lighting, heating, weapons & blasting (2010-2013)	Annex 7.26	n/a
Women to men ratio of inventorships in Fixed constructions (2010-2013)	Annex 7.27	n/a
Proportion of a country's scientific publications (%) in all fields of science including a gender dimension in their research content (2010–2013)	Annex 7.28	n/a
Proportion of a country's scientific publications (%) in Agricultural sciences including a gender dimension in their research content (2010–2013)	Annex 7.29	n/a
Proportion of a country's scientific publications (%) in Engineering and technology including a gender dimension in their research content (2010–2013)	Annex 7.30	n/a
Proportion of a country's scientific publications (%) in Humanities including a gender dimension in their research content (2010–2013)	Annex 7.31	n/a
Proportion of a country's scientific publications (%) in Medical sciences including a gender dimension in their research content (2010–2013)	Annex 7.32	n/a
Proportion of a country's scientific publications (%) in Natural sciences including a gender dimension in their research content (2010–2013)	Annex 7.33	n/a
Proportion of a country's scientific publications (%) in Social sciences including a gender dimension in their research content (2010–2013)	Annex 7.34	n/a

Appendix 2. Methodological notes

These notes are intended to provide the reader with a brief reference guide concerning 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 She Figures 2015 please access the She Figures 2015 Handbook, available at:

http://ec.europa.eu/research/swafs/index.cfm?pg=library&lib=gender_equality

Data sources

The majority of She Figures data comes from Eurostat (the statistical office of the European Union) and is publicly available. This includes the indicators on ISCED 97 level 6 graduates, knowledge-intensive activities and 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: **http://ec.europa.eu/eurostat/web/education-and-training/data/database**
- Science, Technology and Innovation: **http://ec.europa.eu/eurostat/web/science-technology-innovation/data/database**
- Labour Market (earnings): **http://ec.europa.eu/eurostat/web/labour-market/earnings/database**

The Statistical Correspondents of the Helsinki Group on Gender in Research and Innovation report data on academic staff (see Seniority grades/Academic staff below), on the applicants and beneficiaries of research funding, the sex-composition of boards and heads of Institutions in the HES and in universities or assimilated institutions by sex to the Women in Science (WiS) database on a goodwill basis. A complete list of the source institutions can be found at the end of this Appendix.

Statistics on inventorships were produced using data from the EPO Worldwide Patent Statistical Database (PATSTAT). Statistics on authorship, scientific quality/impact and the sex/gender dimension in research content were produced using data from the Web of Science™ (WoS).

Data concerning the mobility and employment status (part-time/precarious employment) of researchers come from the Mobility Patterns and Career Paths of the EU Researchers (MORE2) Survey (European Commission, 2013). The results and the methodological notes are available online at:

http://www.more-2.eu/www/index.php?option=com_content&view=article&id=120&Itemid=126

Data concerning the gender equality actions of Research Performing Organisations (RPOs) come from the European Research Area Survey 2014: **http://ec.europa.eu/research/era/eraprogress_en.htm**

Throughout She Figures 2015, the data source of each indicator is presented below the corresponding figure/table.

Statistical terms & classification

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 2015 have been collected in line with ISCED 1997 classifications (UNESCO, 1997). Tertiary Education or Higher Education involves 2 stages: the first includes largely theoretically-based programmes to provide sufficient qualifications for gaining entry to advanced research programmes and professions with high skills requirements (ISCED 5A) and programmes generally more practical/technical/occupationally-specific than ISCED 5A (ISCED 5B).

The second stage leads to the award of an advanced research qualification (e.g. PhD, non-PhD programmes with an advanced research component). The programmes are devoted to advanced study and original research (ISCED 6). In some countries, France and Portugal, for example, non-PhD programmes with an advanced research component are included in ISCED 6.

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.

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 light of experience gained in using ISCO-88. The update did not change the basic principles and top structure of ISCO-88 (i.e. the nine major groupings). However, significant sub-structural changes were made in some areas. The updated classification is known as ISCO-08. The International Labour Office (2012) provides a correspondence table linking ISCO-08 to ISCO-88 (ILO, 2012).

The International Standard Classification of Occupations (ISCO-88)

‘Professionals’ are subdivided into four sub-major groups: physical, mathematical and engineering science professionals; life science and health professionals; teaching professionals; and other professionals.

‘Technicians and associate professionals’ are subdivided in four sub-major groups: physical and engineering science associate professionals; life science and health associate professionals; teaching associate professionals; and other associate professionals.

The International Standard Classification of Occupations (ISCO-08)

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, in order to approximate Human Resources in Science and Technology (HRST). The types of HRST presented in this publication are:

- HRSTC: HRST Core – People who are both HRSTE and HRSTO.
- HRSTE: HRST Education – People who have successfully completed tertiary education in any field of study (see S&T fields of study below).
- HRSTO: HRST Occupation – People who are employed in S&T occupations as 'Professionals' or 'Technicians and Associate Professionals' (see ISCO definitions for explanation of S&T occupations).
- HRSTC: HRST Core – People who are both HRSTE and HRSTO.

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

http://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF

Knowledge-intensive activities (KIA and KIABI)

An activity is classified as knowledge-intensive if tertiary-educated persons employed in this activity (according to ISCED-97, levels 5+6) represent more than 33% of the total employment in the activity. The definition is built based on the average number of employed persons aged 25-64 at aggregated EU-28 level, according to NACE Rev. 2 (2-digit). EU Labour Force Survey data are used.

There are two aggregates in use based on this classification: total Knowledge-Intensive Activities (KIA) and Knowledge-Intensive Activities – Business Industries (KIABI)

Science and Technology (S&T) fields of study

ISCED-97 distinguishes twenty-one main fields of study.

For macro-measurement of HRST, it is recommended that they are regrouped into the following seven broad fields of study in S&T: natural sciences; engineering and technology; medical sciences; agricultural sciences; social sciences; humanities; other fields (Canberra manual §71). In other words, the HRST population analysed in this publication covers all fields of study.

Scientists and Engineers (S&E) in employment

Prior to 2011, scientists and engineers (S&E) were defined as people who worked in:

- Physical, mathematical and engineering occupations (ISCO-88, Code 21)
- Life science and health occupations (ISCO-88, Code 22)

With the new ISCO-08 classification (in use from 2011), 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, 2002) provides an international definition for R&D personnel (§294): 'All persons employed directly on R&D should be counted, as well as those providing direct services such as R&D managers, administrators, and clerical staff'.

R&D personnel is composed of three categories:

- Researchers §301:'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 §306: '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 (Others) §309: 'Other supporting staff includes skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with such projects'.

Main fields of science

The Frascati Manual (OECD, 2002) defines six main fields of science for classifying researchers' fields. These are adhered to in this publication, unless indicated otherwise. The following abbreviations have been used:

- NS: Natural sciences
- ET: Engineering and technology
- MS: Medical sciences
- AS: Agricultural sciences
- SS: Social sciences
- H: Humanities

The breakdown of researchers by field of science is according to the field in which they work and not according to the field of their qualification.

Statistics based on peer-reviewed scientific publications were also produced by the above fields of science. All publications indexed in the WoS are classified by Science-Metrix into six large domains (applied sciences, arts & humanities, economic & social sciences, general, health sciences and natural sciences), which are further divided into 22 fields and 176 subfields. This classification is mutually exclusive (i.e. each article is classified into one and only one set of domain, field and subfield) and was developed for the European Commission within the context of the Analysis and Regular Update of Bibliometric Indicators study (RTD 2009_S_158-229751). Using information derived from the Frascati Manual (§Table 3.2, OECD 2002) and the revised classification (OECD 2007), the subfields in Science-Metrix's classification were matched to their corresponding field of science as defined in the Frascati Manual using their 2007 description.

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), subclasses (level 3), main groups (level 4) and subgroups (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 & lasting
- G: Physics
- H: Electricity

Sectors of the economy

The Frascati Manual (OECD, 2002) identifies and defines four sectors of the economy (§156):

- HES (§206): the higher education sector includes all universities, colleges of technology and other institutes of post-secondary education, whatever their source of finance or legal status. It also includes all research institutes, experimental stations and clinics operating under the direct control of or administered by or associated with higher education institutions.
- GOV (§184): the government sector includes all departments, offices and other bodies, which offer but normally do not sell to the community those common services, other than higher education, which cannot otherwise be conveniently and economically provided and administer the state and

the economic and social policy of the community (public enterprises are included in the business enterprise sector) as well as non-profit institutes (NPIs) controlled and mainly financed by government.

- BES (§163): the business enterprise sector includes all firms, organisations and institutions whose primary activity is the market production of goods or services (other than higher education) for sale to the general public at an economically significant price. It includes private non-profit institutes mainly serving them.

- PNP (§194): the private non-profit sector covers non-market, private non-profit institutions serving households (i.e. the general public) but also private individuals or households.

The sector entitled 'Abroad' is not referred to in this publication.

Units – Head Count & Full-Time Equivalent

The units of measurement of personnel employed on R&D as proposed by the Frascati Manual (OECD 2002) are:

- HC (§329): Head count. The number of persons engaged in R&D at a given date or 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 (§333): Full-time equivalent. One FTE corresponds to one year's work by one person.

Data in this publication are presented in HC, unless indicated otherwise.

R&D expenditure

The Frascati Manual (OECD 2002) defines Intramural expenditures on R&D (§358) as all expenditures for R&D performed within a statistical unit or sector of the economy during a specific period, whatever the source of funds. It recommends using purchasing power parities (PPP) to express R&D statistics in monetary terms (§36).

PPPs are defined as currency conversion rates that both convert to a common currency and equalise the purchasing power of different currencies. They eliminate the differences in price levels between countries because economic indicators expressed in a national currency are converted into an artificial common currency, called the Purchasing Power Standard (PPS).

Compound Annual Growth Rates

The average annual rate of growth g of I between an initial year (year a) and a final year (year b) in percent is given by: $g = [(Ib/Ia)^{1/(b-a)} - 1] \times 100$.

Seniority grades of researchers/academic staff

Statistics on researchers/academic staff have been collected by sex, grade, main field of science and age group (for latest 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 of She Figures 2015—that is for researchers in the HES as defined by the Frascati Manual (OECD, 2002)—some countries provided data for an alternative reference population, namely 'academic staff' (see definition as per the UOE 2010 manual) 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: Should include 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 2015 indicators present the mobility rates of researchers, based on data from the MORE 2 Survey of Higher Education Institutions (European Commission, 2013). One focuses on mobility during PhD for researchers in the early career stages (R1 and R2 combined) and another focuses on mobility in the last 10 years for researchers in the post-PhD phases (R2–R4).

The precise categories of mobility are as follows:

- 'International mobility during PhD' applies to researchers who have moved abroad for at least three months during their PhD to a country other than the one where they completed (or will obtain) their PhD. In She Figures 2015, the derived indicator is based on a direct question in the MORE2 Survey (Q42 in the 2012 questionnaire).
- 'International mobility in the post-PhD career stages' applies to researchers who have worked abroad for more than three months at least once in the last 10 years, since obtaining their highest educational qualification (PhD or other). In She Figures 2015, the derived indicator is based on a direct question in the MORE2 Survey of Higher Education Institutions (Q47 in the 2012 questionnaire).

It is worth noting that She Figures 2012 also included an indicator on mobility, based on the MORE Survey (2009): 'Share of mobile researchers by gender'. Due to changes in the design of the MORE Survey, this indicator uses a different definition of mobility to those in She Figures 2015, and does not distinguish between the career stages of researchers. This limits the comparability of the mobility indicators in the 2012 and 2015 editions of She Figures.

The MORE2 also asks researchers to classify their career stage, using the categories defined in the European Framework for Research Careers. These are:

R1: First Stage Researcher (up to the point of PhD);

R2: Recognised Researcher (PhD holders or equivalent who are not yet fully independent);

R3: Established Researcher (researchers who have developed a level of independence); and

R4: Leading Researcher (researchers leading their research area or field).

The MORE2 Survey applies the Frascati Manual (OECD 2002) definition of researchers (see above).

Part-time and precarious employment

Two indicators based on the MORE2 Survey focus on the employment status of researchers in the higher education sector (HES).

'Part-time employment' covers respondents who self-reported any of these three statuses: 'part-time: more than 50 %', 'part-time: 50 %', 'part-time: less than 50 %'.

'Precarious employment' includes:

- Researchers who indicated they have a fixed-term contract of one year or less;
- Researchers who indicated they have no contract ([99]);
- Researchers who indicated they have an 'other' type of contract (often associated with student status), unless they stated explicitly that they had a contract of indefinite duration.

Gender equality plans

In line with the European Research Area Survey 2014, a gender equality plan (GEP) is defined as a 'consistent set of provisions and actions aiming at ensuring gender equality' at organisational level.

Other 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 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 reported. 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 disaggregated data, in particular for Cyprus, the former Yugoslav Republic of Macedonia, Liechtenstein, Luxembourg and Malta, and, in some cases, for Estonia, Iceland, Latvia and Serbia.

99 This category is separate from that of the self-employed, who are not included in this indicator. Further information is not available on the individual circumstances of researchers with no contracts.

EU estimates

EU totals estimated by DG Research and Innovation (as noted in the footnotes) 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 by DG Research and Innovation only when at least 60% of the EU population on a given indicator was available. These estimates are not official, but are intended 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 some figures have been calculated at the precision levels of one or two decimals. However, the values have been rounded in the figures to let them fit.

Cut-off date

Data from Eurostat's dissemination database were downloaded between December 2014 and January 2015, with the exception of data on the total intramural R&D expenditure by sectors of performance (rd_e_gerdtot) and structure of earnings survey (earn_ses10_212), which occurred in April and August 2015, respectively. The planned data collection period of the WiS questionnaire was from January to mid-April 2015, however data were not finalised until the end of September 2015.

Country codes

Country names available in this publication have been abbreviated in accordance with the ISO Alpha-2 codes, with the exceptions of Greece and the United Kingdom, in the tables, figures, and footnotes, as follows:

EU Member States	
BE	Belgium
BG	Bulgaria
CZ	Czech Republic
DK	Denmark
DE	Germany
EE	Estonia
IE	Ireland
EL	Greece
ES	Spain
FR	France
HR	Croatia
IT	Italy
CY	Cyprus
LV	Latvia
LT	Lithuania
LU	Luxembourg
HU	Hungary
MT	Malta
NL	Netherlands
AT	Austria
PL	Poland
PT	Portugal
RO	Romania
SI	Slovenia
SK	Slovakia
FI	Finland
SE	Sweden
UK	United Kingdom
European Free Trade Association (EFTA)	
IS	Iceland
LI	Liechtenstein
NO	Norway
CH	Switzerland
EU Candidate Countries	
ME	Montenegro
MK	The former Yugoslav Republic of Macedonia
AL	Albania
RS	Serbia
TR	Turkey
Other	
BA	Bosnia and Herzegovina
IL	Israel
FO	Faroe Islands
MD	Republic of Moldova

Countries listed in the tables and figures throughout this publication are displayed in one of the following ways:

- Ranked according to the data on women.
- Country codes listed as presented above by following the above order, whereby the countries are listed alphabetically based on the original written form of the short name of each country.

Flags

The following flags have been used, where necessary:

– = data item not applicable

0 = real zero or < 0.5 of the unit

: = data not available

x = data included in another cell

c = confidential data

z = not applicable

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 2015 by country. When available, the preferred reference population was researchers in the HES as defined by the Frascati Manual (OECD, 2002). Otherwise, data on academic staff in the HES as defined by the UOE 2010 manual were used instead.

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
DUTCH-SPEAKING COMMUNITY IN BELGIUM	Researchers	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)	-	-
Comments		classification provided by VLIR			

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
FRENCH-SPEAKING COMMUNITY IN BELGIUM	Researchers	A	Ordinary and extraordinary professors	PhD	-
		B	Other professors	PhD	-
		C	Assistant professors (or equivalent, including "Chargé de cours")	PhD	-
		D	Scientific staff : Postdoctoral researchers Scientific Research Workers Teaching assistants Research Fellows (or equivalent)	PhD	-
Comments		Regarding T1 (head count), one single researcher who holds different positions with different categories (A, B, C, D) could be counted several times.			
BULGARIA	Academic staff	A	Professors	ISCED 6	Teaching and Research
		B	Associate professors	ISCED 6	Teaching and Research
		C	-	-	-
		D	Assistants, Lecturers, Science assistants	ISCED 5	Teaching
Comments		Data on Researchers by grades are not available.			
CZECH REPUBLIC	Researchers	A	-	-	-
		B	-	-	-
		C	-	-	-
		D	-	-	-
Comments		No comments.			
DENMARK	Researchers	A	Professor	PhD	-
		B	Associate professorts Senior researchers	PhD	-
		C	Assistant professors Post docs	PhD	-
		D	PhD, other researchers (R&D advisors, research assistants and other VIPs	PhD	-
Comments		No comments.			
GERMANY	Academic staff	A	-	Habilitation or equivalent	Teaching and Research
		B	-	PhD + professional experience outside the academia (universities of applied sciences) or habilitation or equivalent (universities)	Teaching and Research
		C	-	PhD	Normally both; some staff is only involved in research, some only in teaching
		D	-	-	Normally both; some staff is only involved in research, some only in teaching
Comments		No comments.			
ESTONIA	Academic staff	A	Seniority data unavailable		
		B			
		C			
		D			
Comments		No comments.			
IRELAND	Researchers	A	-	-	-
		B	-	-	-
		C	-	-	-
		D	-	-	-
Comments		No comments.			

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
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	Academic staff	A	Full professor and emeritus professor	-	-
		B	Tenured professor and visiting professor	-	-
		C	Assistant professor (Phd holder) and Lecturer (phd holder)	-	-
		D	Phd students	-	-
Comments		Grade D: From 2011/12 data are not available. For the academic year 2013/14 data will be collected according to royal degree 99/2011.			
FRANCE	Researchers	A	-	-	-
		B	-	Teaching and Research	Teaching and Research
		C	-	-	Research
		D	-	-	Teaching and Research
Comments		No comments.			
CROATIA	Researchers	A	-	-	-
		B	-	-	-
		C	-	-	-
		D	-	-	-
Comments		No comments.			
ITALY	Academic staff	A	FULL PROFESSORS (permanent employment)	Since 2010, a reform of the University (Law 240/2010) has reorganized 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.	Teaching and Research
		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)	cfr. A - Minimum level of education required	Research. N.B. The system of engagement of university professors and researchers can be full-time or fixed time (but are not yet available on part-time). The last reform of the university system has quantified the annual activities as follows: full-time university professors are required to devote each year to teaching not less than 23 % of their work (teachers definite time not less than 33 %), where the full-time university researchers are required to devote each year to teaching not more than 23 % of their activity (researchers defined period not more than 33 %)

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
ITALY	Academic staff	D	FELLOWSHIP RESEARCHERS	Research fellows may take from one to three years, renewable for a further year. The PhD or equivalent is an advantage to the attribution of grants.	Research
Comments		Data on grade D available since 2007.			
CYPRUS	Researchers	A	Professors	PhD	Teaching and Research
		B	Associate Professors	PhD	Teaching and Research
		C	Assistant Professors Lecturers & Teaching Support Staff	PhD MSc	Teaching and Research
		D	Research Associates & Other Staff	From other post-secondary diplomas to PhD	Research
Comments		Academic staff usually do a mixture of teaching and research. The data reported cover only the academic staff that engage (fully or partly) in research. However, there exist cases (especially in ISCED level 5B) where staff only engages in teaching; this staff is not included. In essence, the academic staff reported in the WiS questionnaire corresponds to Higher Education Researchers, as defined in the Frascati Manual. Research associates working in certain projects only undertake research.			
LATVIA	Academic staff	A	Full professors	-	-
		B	Associate professors	-	-
		C	Assistant Professors Assistants Lecturers Researchers	-	-
		D	-	-	-
Comments		No comments.			
LITHUANIA	Researchers	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 a higher education qualification equivalent	Teaching and Research
		D	Assistants - teaching staff; Junior Researchers - research staff.	At least a Master's qualification degree or a higher education qualification equivalent	Teaching and Research
Comments		No comments.			
LUXEMBOURG	Academic staff	A	-	-	-
		B	-	-	-
		C	-	-	-
		D	-	-	-
Comments		Please note that recent R&D surveys collect only data that follow Eurostat requirements. All these data are via Eurostat database. The remark apply to Table 1 & Table 2.			
HUNGARY	Researchers	A	Professors	-	-
		B	Assistant Professor	-	-
		C	Lecturers	-	-
		D	-	-	-
Comments		No comments.			

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
MALTA	Academic staff	A	-	-	-
		B	-	-	-
		C	-	-	-
		D	-	-	-
Comments		No comments.			
NETHERLANDS	Academic staff	A	Full professor	-	Teaching and Research
		B	Associate professor	-	-
		C	Assistant professor	-	-
		D	Other scientific personnel Postgraduates	-	Depends on the subcategory. Some subcategories within “other scientific personnel” are oriented to education, some to research. Postgraduades have a small educational task.
Comments		No comments.			
AUSTRIA	Researchers	A	Universitätsprofessor/in, Stiftungsprofessor/in, Gastprofessor/in nur mit F&E-Tätigkeit, Emeritierte/r Universitätsprofesor/in und Professor/in im Ruhestand nur mit F&E-Tätigkeit	-	Teaching and Research
		B	Assozierte/r Professor/in, Dozent/in, Assistenzprofessor/in	-	Teaching and Research
		C	Universtitätsassitent/in, Vertragsassistent/in, Staff Scientist, Senior Scientist/Artist, Assistenzarzt, -ärztin, Arzt, Ärztin, Assistent/in in Ausbildung (wiss./künstl. Mitarbeiter/in)	-	Teaching and Research
		D	Projektmitarbeiter/in, Senior Lecturer, Bundes- und Vertragslehrer/in, Wissenschaftliche Beamte, Wissenschaftliche Vertragsbedienstete, Studienassisten/in, Studentische/r Mitarbeiter/in, Demonstrator/in, Sonstiges wissenschaftliches Personal.	-	Teaching and Research
Comments		T1 and T2_Researchers (Frascati Manual) and T1 and T2_Academic Staff (UOE) are not comparable. Grade C and Grade D: large deviation of the cagegories of staff between T1 and T2_Researchers and T1 and T2_Academic Staff			
POLAND	Researchers	A	Profesor (Professor)	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	MSc	Teaching and Research
Comments		Responsibilities of scientists does not depend on their grade, but on job title. 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
PORTUGAL	Researchers	C	Professor Auxiliar Professor Adjunto Investigador Auxiliar	PhD	Teaching and Research
		D	Assistentes Leitor Monitor Outros	PhD and others	Teaching and Research
Comments		We made some adjustments to the grades to include other profissional carreers of the researchers.			
ROMANIA	Academic staff	A	Full Professors	ISCED8 (PhD)	Teaching and Research
		B	Associate professors/ Lecturers	ISCED8 (PhD)	Teaching and Research
		C	Assistant Professors	ISCED8 (new qualified PhD)	Teaching and Research
		D	Research assistant/post-graduate students not yeld holding a PhD	ISCED7	Research
Comments		No comments.			
SLOVENIA	Academic staff	A	Full professors	-	-
		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” , success-ful completion of appoint-ment 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) - ma-jority 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 space for education leading to “PhD” (lector - second or first level)	Assistant lecturer - Teaching and Research, lector - Teaching
Comments		Data cover both full and part time academic staff.			
FINLAND	Researchers	A	Research career model, 4th stage: professorship (Previ-ously: Professors)	-	-
		B	Research career model, 3rd stage: independent research and education professionals capable of academic lead-ership (Previously: Lecturers, senior assistants)	-	-
		C	Research career model, 2nd stage: career phase of re-searchers who have recently completed their doctorate (Previously: Assistants, full-time teachers)	-	-

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
FINLAND	Researchers	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
		C	Assistent professor Post.Doc fellowshipholders	PhD	Teaching and Research
		D	Graduate students junior lecturers other academic staff without doctoral degree	Generally requires ISCED 5 Degree	Teaching and Research
Comments		The mapping of national grades to the ABCD definition has been redone for a better compliance with the guidelines /manual. Data is therefore not comparable with previously transmitted data. This is especially true for grades B and D.			
ICELAND	Academic staff	A	Full professors	-	Requirements: Teaching 48 %; research 40 %; administration 12 %.
		B	Associate professors	-	Requirements: Teaching 52 %; research 42 %; administration 6 %.
		C	Assistant professors	-	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.			
MONTENEGRO	Researchers	A	-	-	-
		B	-	-	-
		C	-	-	-
		D	-	-	-
Comments		Data collected in the survey are not processed - not available for analysis			
MACEDONIA (FYR)	Researchers	A	-	-	-
		B	-	-	-
		C	-	-	-
		D	-	-	-
Comments		No comments.			
SWITZERLAND	Researchers	A	-	-	-
		B	-	-	-
		C	-	-	-
		D	-	-	-
Comments		No comments.			
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

Country	Reference population	Grade	National classification	Minimum level of education required	Responsibilities of the post
NORWAY	Researchers	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		We have revised our classification from 2011 and onwards. This is mainly based on more detalied division of personnel regarding when they received a PhD. Number of researchers at A level is the same, 354 less researchers at level B, 63 less at level C and 417 more at level D. This also influenses the share of female researhcers: For Grade A it is the same. The share of female researchers within grade B is 30 % (32 % with the old classification). For grade C the share is unchanged. The share of female researchers within grade C is now 45 % (43 % with old classification).			
ISRAEL	Academic staff	A	Full Professor	PhD and post doctorate abroad.	Teaching and Research
		B	Associate Professor	PhD and post doctorate abroad.	Teaching and Research
		C	Senior Lecturer	PhD and post doctorate abroad.	Teaching and Research
		D	Lecturer	PhD and post doctorate abroad.	Teaching and 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. For the funding success rate, only those funds that have data available for both applicants and beneficiaries have been used in the calculation.

Country	Research Funds
DUTCH-SPEAKING COMMUNITY IN BELGIUM	Fund for scientific research Flanders (FWO) Funds for industrial research (IWT)
FRENCH-SPEAKING COMMUNITY IN BELGIUM	Fonds de la Recherche Scientifique (FNRS)
BULGARIA	National Science Fund
CZECH REPUBLIC	Grant Agency of the Czech Republic
DENMARK	DCIR Danish council for Independet Research
GERMANY	Funds from Deutsche Forschungsgemeinschaft (DFG)
ESTONIA	Estonian Science Fund and Estonian Research Council
GREECE	National Funding (National Strategic Reference Programme)
SPAIN	Funds from National R&D plan - DGIC INNCORPORA Funds from National R&D plan - DGICT Granted Research Projects: Non-guided fundamental research projects (2011-2012) & R&D projects (2013) Funds from National R&D plan - DGICT Ramón y Cajal, Torres Quevedo, Juan de la Cierva, FPI, and Técnicos de apoyo
CROATIA	ASO LJUBLJANA Bilateral project MSES Croatian Science Foundation ESF European Commision CULTURE Fondation BERNARD VAN LEER-E.A.D.P-ERATO FP7 Ministry of Agriculture, Fisheries and Rural development Ministry of Culture of Croatia MSES PHARE UKF
ITALY	FIRB - Investment Fund for Basic Research (MIUR + Universities or Research Institutes) PRIN - Research Programs of Relevant National Interest (MIUR + Universities)
CYPRUS	Research Promotion Foundation (RPF)
LITHUANIA	State buget allocations from Lithuaniana State Science and Studies Foundation State buget allocations from Ministry of Education and Science State buget from State scientific institutes
LUXEMBOURG	bourses de formation-recherche (BFR) Fonds National de la Recherche
HUNGARY	The Hungarian Scientific Research Fund Office (OTKA)
AUSTRIA	FFG (Austrian Research Promotion Agency FwF (Fonds zur Förderung der wissenschaftlichen Forschung - Austian Science Fund) ÖAW (Österreichische Akademie der Wissenschaften - Austrian Academy of Sciences)
POLAND	Diamond Grant (government grant programme) Iuventus Plus (government grant programme) Mobility Plus (government grant programme) National Science Centre (NCN)
PORTUGAL	Programmes of Advanced Training of Human Resources

Country	Research Funds
ROMANIA	BILATERAL CO_OPERATION COMPETITIONS - Bilateral Co-operation Romania-Austria BILATERAL CO_OPERATION COMPETITIONS - Bilateral Co-operation Romania-Cyprus BILATERAL CO_OPERATION COMPETITIONS - Bilateral Co-operation Romania-France (CNRS) BILATERAL CO_OPERATION COMPETITIONS - Research stages in Japan HUMAN RESOURCES - Postdoctoral Research Projects HUMAN RESOURCES - Research projects to stimulate the establishment of young independent research teams IDEAS PROGRAMME - Exploratory Research Complex Projects IDEAS PROGRAMME - Exploratory Research Projects INNOVATION - Development of products-systems-technologies PARTNERSHIPS PROGRAMME- Collaborative Applied Research Projects
SLOVENIA	F1 F2 Ministry of Education: State R&D programme Ministry of Education: State order Slovak Research and Development Agency Ministry of Education, Science, Research and Sport: Incentives for Research and Development
FINLAND	Academy of Finland-Academy Professor Academy of Finland-Academy Research Fellow Academy of Finland-Postdoctoral Researcher Academy of Finland-Research project funding team leaders
SWEDEN	Swedish Council for Forestry and Agricultural Research Swedish Council for for Planning and Coordination of Research Swedish Council for for Research in the Humanities and Social Sciences Swedish Medical Research Council Swedish Natural Science Research Council Swedish Research Council Swedish Research Council for Health, Working Life and Welfare Swedish Research Council Formas
ICELAND	Total funds 1996-2004 (Funds with data on applicants and beneficiaries. (see MetadataT3) Programme for Environmental Sciences The Research Fund of the University of Iceland The Christianity Millennium Fund (2001-2005) The Research Fund (as of 2004) The Technology Development Fund (as of 2004) AVS R&D Fund of Ministry of Fisheries (and Agriculture) in Iceland (as of 2003) Fund for Research Equipment (as of 2004 - replaced by Infrastructure Fund 2013) The Research Fund of the University of Akureyri (as of 2004) Programme for Post Genomic Biomedicine and Nanotechnology Research Fund of the University of Education (discontinued 2008) Strategic Research programme for Centres of Excellence and Research Clusters (as of 2009) The Science Fund The Graduate Research Fund (merged with Research Fund 2013) The Technology Fund (Discontinued 2003) Programme for Information Technology Infrastructure Fund (as of 2013)
NORWAY	The Research Council of Norway
SWITZERLAND	Ambizione Doc.CH Fellowship Advanced Researcher Fellowship Prospective Researcher Fellowships Marie Heim-Vögtlin-Beiträge Professorship Project Funding Basic Research
SERBIA	Budget of the Republic of Serbia
ISRAEL	Bilateral (US-Israel) Science foundation (BSF) BSF - ISF German-Israeli Foundation for Scientific Research and Development (GIF) Israel Science Foundation (ISF)

Boards

She Figures 2015 introduced new definitions of 'boards' as part of the Women in Science questionnaire, based on consultation with the European Commission and the Statistical Correspondents. These distinguish more clearly between the functions of different boards, by focusing on 'scientific boards' and 'administrative/advisory boards':

Scientific boards of research organisations: '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.'

Country	Boards
FRENCH-SPEAKING COMMUNITY IN BELGIUM	FNRS
BULGARIA	Scientific boards
	Bilateral Cooperation
DENMARK	DCIR
	DCRIP
	DNRF
	IFD
	DCRP
	DSSRC
	DRCTP
	DRCH
	DNR
	DMR
GERMANY	DFG - Executive Committee
	DFG - Joint committee
	DFG - Review Boards
	FHG - Executive Board
	HFG - Executive Committee
	WGL - Executive Board
	MPG - Executive Committee
	HFG - Senate
	FHG - Senate
	MPG - Senate
ESTONIA	Research Policy Committee of the Estonian Ministry of Education and Research
	The Research and Development Council
	Centres of Excellence COUNCIL
	General Assembly of the Estonian Academy of Sciences
	Board of Estonian Research Council
	Evaluation committee of the Estonian Research Council
	Archimedes Council
	Public universities and their research centers
GREECE	National Council for Research and Technology (NCRT)
	Special Permanent Committee on Research and Technology
	Sectorial Scientific Councils
	Interministerial Committee for Research, Technology and Innovation
SPAIN	SPANISH INSTITUTE OCEANOGRAPHY (Scientific board)
	INTA (National Institute of Aerospace Techonolgy) Scientific board
	CIEMAT
	Directive Board Instituto Geológico y MInero de España (IGME)

Country	Boards
SPAIN	INSTITUTE OF HEALTH CARLOS III (ISCIII) SPANISH NATIONAL CANCER RESEARH CENTRE (CNIO) SPANISH NATIONAL CENTRE FOR CARDIOVASCULAR RESEARCH (CNIC) SPANISH NATIONAL CENTRE IN NEUROLOGICAL DISEASES (CIEN) BIOMEDICAL RESEARCH NETWORKING CENTRES (CIBER): CIBER-BBN; CIBERNED; CIBERER; CIBERSAM; CIBERES; CIBERESP; CIBEDEM; CIBEOBN; CIBEREHD
	CSIC
ITALY	Senato Accademico (Università statali)
CYPRUS	Agricultural Research and Development Board
	Cyprus Scientific Council (CySC)
	Research Promotion Foundation (RPF) Board of Directors
	University of Cyprus (UCY) Council
	University of Cyprus (UCY) Research Committee
	University of Cyprus (UCY) Senate
	Cyprus University of Technology (CUT) Council
	Cyprus University of Technology (CUT) Research Committee
	Cyprus University of Technology (CUT) Senate
	Cyprus University of Technology (CUT) Governing Board
	European University Cyprus (EUC) Council
	European University Cyprus (EUC) Research Committee
	European University Cyprus (EUC) Senate
	University of Nicosia (UNIC) Council
	University of Nicosia (UNIC) Research Committee
	University of Nicosia (UNIC) Senate
	Frederick University (FU) Council
	Frederick University (FU) Research Committee
	Frederick University (FU) Senate
	Neapolis University Paphos Council
	Neapolis University Paphos Research Committee
	Neapolis University Paphos Senate
	Neapolis University Paphos Interim Govening Body
	Neapolis University Paphos EU Projects Committee
	Open University Cyprus (OUC) Research Committee
	Open University Cyprus (OUC) Governing Board
	University of Central Lancashire (UCLAN) Cyprus Research Committee
LATVIA	Expert commission on natural sciences and mathematics/Latvian Council of Science
	Expert comission on engeneering and computer science /Latvian Council of Science
	Expert comission on biology and medical sciences /Latvian Council of Science
	Expert comission on agricultural, environmental, and forest sciences /Latvian Council of Science
	Expert comission on humaritan and social sciences/Latvian Council of Science
LITHUANIA	Research Council of Lithuania
	Board of Biomedical and Agricultural sciences
	Board of Physical and Technological sciences
HUNGARY	OTKA
NETHERLANDS	Royal Netherlands Academy of Arts and Sciences (KNAW in Dutch)
	The Netherlands Organisation for Scientific Research (NWO in Dutch)
AUSTRIA	Council for Research and Technology Development
	Scientific Advisory Boards of OeAW-Institutes
	Research Board of OeAW - Austrian Academy of Sciences
	Austrian Science Board
	Board (Kuratorium)
	International START-/Wittgenstein Jury
	PEEK Board (Programme for Arts-based Research)
	WissKomm Jury (Science Communication Programme)
	KLIF-Jury (Programme Clinical Research)

Country	Boards
POLAND	Board of the National Centre for Research and Development
	Board of the National Science Centre
	Central Commission for Academic Degrees and Titles
	Presidium of the Polish Academy of Sciences
PORTUGAL	Conselho Diretivo da FCT (RFO)
	Conselhos de Direção/Gestão/Executivos das universidades e Institutos Politécnicos (RPO)
ROMANIA	NATIONAL AUTHORITY FOR SCIENTIFIC RESEARCH AND INNOVATION-MINISTRY OF EDUCATION AND SCIENTIFIC RESEARCH
SLOVENIA	Scientific Council of the Slovenian Research Agency
	Scientific research councils for individual fields (inside expert system of the Slovenian Research Agency)
SLOVAKIA	The Council of Government of the Slovak Republic for Science, Technology and Innovation
	The Presidium of the Slovak Research and Development Agency
	Scientific Council of the Slovak Academy of the Sciences
FINLAND	Scientific board, Academy of Finland
	Reseach council for Biosciences and Environment
	Research council for Culture and Society
	Research Council for Natural Sciences and Engineering
	Research Council for Health
SWEDEN	Board of the Swedish Research Council
	Scientific Council for Humanities and Social Sciences of the Swedish Research Council
	Scientific Council for Medicine and Health of the Swedish Research Council
	Scientific Council for Natural and Engineering Sciences of the Swedish Research Council
	Committee for Educational Sciences of the Swedish Research Council
	Council for Research Infrastructures of the Swedish Research Council
	Board of the Swedish Research Council for Health, Working Life and Welfare
	Board of the Swedish Research Council Formas
	Board of VINNOVA, Sweden's innovation agency
ICELAND	Council for Science and Technology Policy (as of April 2003)
	Science Board (as of April 2003)
	Tecnhology Board (as of April 2003)
NORWAY	The Research Council of Norway (RCN) Executive Board
	The Research Council of Norway (RCN) Division for Science
	The Research Council of Norway (RCN) Division for Innovation
	The Research Council of Norway (RCN) Division for Energy, Resources and the Environment
	The Research Council of Norway (RCN) Division for Society and Health
SWITZERLAND	The Commission for Technology and Innovation (Appointed)
	SNSF National Research Council
	SNSF Presidency of National Research Council
MACEDONIA (FYR)	Board for Scientific-Research Activity (National)
SERBIA	Specialised Scientific Boards
	Commission for Acquiring Scientific Titles
BOSNIA AND HERZEGOVINA	Board for Economic Sciences
	Board for Pedagogical Sciences
	Board for Legal Sciences
	Board for Social Sciences
	Board for History Sciences
	Board for Psychiatric and neurological research
	Board for Cardiovascular Pathology
	Board for the study of antimicrobial resistance
	Board for the Malignant diseases
	Board for the Natural resourses
ISRAEL	Chief Scientist Forum
	Scientific Leading Forum
	The Israel Academy of Sciences and Humanities
	The Israeli Council for the Advancement of Women in Science and Technology
	Israel National Council for Research & Development

Administrative/advisory boards of research organisations: '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, amongst other things, administering research activities, consulting and coordinating different actors and taking a general advisory role.'

Where boards fall into both categories, this was indicated by Statistical Correspondents. She Figures includes only research boards of **national** research organisations, as opposed to all research organisations operating in a particular country.

Country	Boards
BULGARIA	Executive board (National Science Fund)
DENMARK	DCIR
	DCRIP
GERMANY	German Science Council
	HRK - Executive Board
	HRK - Senate
	WGL - Senate
ESTONIA	Public universities and their research centers
GREECE	Hellenic Universities Rectors
	Hellenic Technological Insitutes Presidents' Synod
	Hellenic Research Institutes Presidents
SPAIN	SPANISH INSTITUTE OCEANOGRAPHY (Administrative / advisory board)
	INTA (National Institute of Aerospace Techonolgy)(Administrative / advisory board)
	CIEMAT (Administrative / advisory board)
	INSTITUTE OF HEALTH CARLOS III (ISCIII)
	Comité de Bioética de España; Comisión Técnica del Banco Nacional de Líneas Celulares;....
	DIRECTION AND ADMINISTRATION
	CNIO Board of Trustees
ITALY	CEPR (Comitato di Esperti per la Politica della Ricerca)
	CNGR (Comitato Nazionale dei Garanti per la Ricerca)
	CUN (Consiglio Universitario Nazionale)
	MIUR
	MISE
CYPRUS	Agricultural Research and Development Board
	Cyprus Scientific Council (CySC)
	Research Promotion Foundation (RPF) Board of Directors
	University of Cyprus (UCY) Council
	University of Cyprus (UCY) Research Committee
	University of Cyprus (UCY) Senate
	Cyprus University of Technology (CUT) Council
	Cyprus University of Technology (CUT) Research Committee
	Cyprus University of Technology (CUT) Senate
	Cyprus University of Technology (CUT) Governing Board
	European University Cyprus (EUC) Council
	European University Cyprus (EUC) Research Committee
	European University Cyprus (EUC) Senate
	University of Nicosia (UNIC) Council
	University of Nicosia (UNIC) Research Committee
	University of Nicosia (UNIC) Senate
	Frederick University (FU) Council
	Frederick University (FU) Research Committee
	Frederick University (FU) Senate
	Neapolis University Paphos Council
	Neapolis University Paphos Research Committee
	Neapolis University Paphos Senate

Country	Boards
CYPRUS	Neapolis University Paphos Interim Govening Body
	Neapolis University Paphos EU Projects Committee
	Open University Cyprus (OUC) Research Committee
	Open University Cyprus (OUC) Governing Board
	University of Central Lancashire (UCLAN) Cyprus Research Committee
LITHUANIA	Board of Social science
	Board of Biomedical and Agricultural sciences
	Board of Physical and Technological sciences
HUNGARY	OTKA
AUSTRIA	Council for Research and Technology Development - Administrative board
	Administrative / advisory board OeAw
	Administrative board / Austrian Science Board ÖWR
	FWF Executive Board (Präsidium)
	FWF Managing Director (Geschäftsführung)
	FWF Supervisory Board (Aufsichtsrat)
POLAND	Main Council of Science and Higher Education
	Board of the National Centre for Research and Development
	Board of the National Science Centre
	Main Council of Research Institutes
	The Comitee for Science Policy
	The Commitee of Evaluation of Scientific Research Institutions
	Council of Young Scientists
	Board of the National Programme for the Development of Humanities
	The Polish Accreditation Committee
	Presidium of the Polish Academy of Sciences
PORTUGAL	Conselhos Científicos da Fundação para a Ciência e a Tecnologia - FCT (RFO)
	Conselhos Científicos das universidades (RPO)
	Conselhos Técnico-Científicos dos Institutos/Escolas Politécnicas (RPO)
ROMANIA	National Council for Scientific Research (CNCS)
	Consulting Council for RD&I (CCCDI))
	National Council for Ethics of Scientific Research, Technological Development and Innovation (CNECSDTI)
	Romanian Academy (AR)
	Academy of Agricultural Sciences (ASAS)
	Academy of Medical Sciences (ASM)
SLOVENIA	Administrative / advisory board
	Board of SAS Assembly (Výbor Snemu SAV)
	The Presidium of the Slovak Academy of the Sciences
	Council of Universities of the Slovak Republic (Rada vysokých škôl)
	Slovak Rectors' Conference (Slovenská rektorská konferencia)
ICELAND	Infrastructure Fund board (as of 2013)
	Infrastructure Fund advisory board
	Technology Development Fund Board
	Technology Development Fund advisory boards
	AVS Fund board
	AVS Fund Advisory boards
	Icelandic Research Fund board
	Icelandic Research Fund advisory boards

Country	Boards
NORWAY	The Norwegian Association of Higher education Institutions
	The Norwegian Academy of Science and Letters
SWITZERLAND	Swiss Academies of Arts and Sciences (Elected)
	Swiss Academy of Sciences (SCNAT), Swiss Academy of Engineering Sciences (SATW), Swiss Academy of Medical Sciences (SAMS) , Swiss Academy of Humanities and Social Sciences (SAHS) (Elected)
	Swiss Science and Innovation Council SSIC (Appointed)
	swissuniversities (Elected)
	SNSF (Executive Committee of the Foundation Council)
MACEDONIA (FYR)	Assembley of the Montenegrin Academy of Sciences and Arts
	Presidential Board of the Montenegrin Academy of Sciences and Arts
	Senate of the University of Montenegro
SERBIA	National Council for Scientific and Technological Development
	Committee for Accreditation of Scientific Research Organisations
BOSNIA AND HERZEGOVINA	Council for Science BiH
	The Commission

Heads of institutions in the higher education sector - Heads of universities or assimilated institutions

An institution is assimilated to a university if it is accredited to deliver PhD degrees.

Appendix 3. List of Statistical Correspondents of the Helsinki Group on Gender in Research and Innovation

Country	Title	Statistical Correspondent	Department	Organisation	Email	Website
Belgium	Ms	Elena PHALET	STIS (Scientific and Technical Information Service)	Belgian Science Policy	elena.phalet@belspo.be	www.belspo.be
Belgium	Mr	Jeoffrey MALEK MANSOUR	STIS (Scientific and Technical Information Service)	Belgian Science Policy	jeoffrey.malekmansour@belspo.be	www.belspo.be
Bulgaria	Ms	Svetoslava GRANCHAROVA-FILIPOVICH	Structural Business Statistics Department	National Statistical Institute	SFilipovich@nsi.bg	www.nsi.bg
Czech Republic	Mr	Daniel CHYTIL	Unit Labour Forces, Migration and Equal Opportunities	Czech Statistical Office	daniel.chytil@czso.cz	www.czso.cz
Czech Republic	Mr	Marek REZANKA		Czech Statistical Office	marek.rezanka@czso.cz	
Denmark	Ms	Malene STRØMBERG RASMUSSEN	Danish Agency for Science, Technology and Innovation	Ministry of Higher Education and Science	msra@fi.dk	
Germany	Ms	Andrea LÖTHER	Center of Excellence Women and Science	GESIS	andrea.loether@gesis.org	http://www.gesis.org/en/cews/cews-home/cews-team/loether/
Estonia	Ms	Yvyan MERZIN	Analysis Department	Ministry of Education and Research	Yvyan.Merzin@hm.ee	
Ireland	Mr	Jonathan HEALY	Survey Unit	"Department of Jobs, Enterprise & Innovation"	jonathan.healy@djei.ie	www.diei.ie
Ireland	Ms	Helena CONNELLAN	Survey Unit	"Department of Jobs, Enterprise & Innovation"	helena.connellan@djei.ie	www.diei.ie
Ireland	Ms	Deborah QUINN	Survey Unit	"Department of Jobs, Enterprise & Innovation"	deborah.quinn@djei.ie	www.djei.ie
Greece	Ms	Maria SAMARA	RDI services & Metrics Department	National Documentation Center/ NHRF	samara@ekt.gr	http://www.ekt.gr/en/index.html, http://metrics.ekt.gr/
Greece	Ms	Eleni MALLIOU	RDI services & Metrics Department	National Documentation Center/ NHRF	nmalliou@ekt.gr	http://www.ekt.gr/en/index.html, http://metrics.ekt.gr/
Spain	Mrs	Sagrario CALVO LÓPEZ	Subd. Gral. de Estadísticas de Turismo y Ciencia y Tecnología	Instituto Nacional de Estadística	sagrario.calvo.lopez@ine.es	www.ine.es
Spain	Ms	Marta CANGAS FERNÁNDEZ	Subd. Gral. de Estadísticas de Turismo y Ciencia y Tecnología	Instituto Nacional de Estadística	marta.cangas.fernandez@ine.es	www.ine.es
France	Ms	Claudette-Vincent NISSLE	Département des études statistiques	Ministère de l'enseignement supérieur et de la recherche	claudette-vincent.nissle@recherche.gouv.fr	http://www.enseignementsup-recherche.gouv.fr/
Croatia	Ms	Romana JERKOVIC	Education, Science and Culture Committee	Croatian parliament	romana.jerkovic@sabor.hr; romana.jerkovic@medri.uniri.hr	
Italy	Ms	Simonetta SAGRAMORA	Ufficio di Statistica	MIUR, Ministero Istruzione, Università e Ricerca	simonetta.sagramora@miur.it	http://statistica.miur.it/
Italy	Ms	Maria Teresa MORANA	Ufficio di Statistica	MIUR, Ministero Istruzione, Università e Ricerca	mariateresa.morana@miur.it	http://statistica.miur.it/
Cyprus	Mr	Pantelis PROTOPAPAS	STI Statistics Section	Statistical Service of Cyprus	pprotopapas@cystat.mof.gov.cy	www.cystat.gov.cy

Country	Title	Statistical Correspondent	Department	Organisation	Email	Website
Cyprus	Mr	Georgios DOGORITIS	STI Statistics Section	Statistical Service of Cyprus	gdogoritis@cystat.mof.gov.cy	www.cystat.gov.cy
Latvia	Ms	Inga PRIBITOKA	Central Statistical Bureau of Latvia	Central Statistical Bureau of Latvia,	Inga.Pribitoka@csb.gov.lv	www.csb.gov.lv
Lithuania	Ms	Kristina MASEVIČIŪTĖ	Research Policy Monitoring Unit	Research and Higher Education Monitoring and Analysis Centre	kristina.maseviciute@mosta.lt	www.mosta.lt
Lithuania	Mr	Vilius JAUJININKAS	Research Policy Monitoring Unit	Research and Higher Education Monitoring and Analysis Centre	vilius.jaujininkas@mosta.lt	www.mosta.lt
Luxembourg	Mr	Vincent DAUTEL		Liser (Luxembourg Institute of So-cio-Economic Research)	vincent.dautel@liser.lu	www.liser.lu
Hungary	Ms	Zsuzsanna SZUNYOGH	Living Conditions, Labour Market and Education Statistics Department	Hungarian Central Statistical Office	zsuzsanna.szunyogh@ksh.hu	www.ksh.hu
Malta	Ms	Jacqueline BARBARA		Malta Council for Science and Technology	jacqueline.b.barbara@gov.mt	
Malta	Ms	Marion ZAMMIT MANGION	Faculty of Medicine and Surgery	University of Malta	marion.zammit-mangion@um.edu.mt	
Netherlands	Mr	Jan VAN STEEN	Science System Assessment	Rathenau Instituut	j.vansteen@rathenau.nl	http://www.rathenau.nl/en
Netherlands	Ms	Catherine CHIONG MEZA	Science System Assessment	Rathenau Instituut	c.chiongmeza@rathenau.nl	http://www.rathenau.nl/en
Austria	Ms	Gabriele SPÖRKER	Science, Technology & Education Statistics	Statistics Austria	gabriele.spoerker@statistik.gv.at	www.statistik.at
Austria	Mr	Dieter BAUMANN	Science, Technology & Education Statistics	Statistics Austria	dieter.baumann@statistik.gv.at	
Poland	Ms	Anna KNAPINSKA	National Information Processing Institute	Laboratory of Statistical Analysis and Evaluation	anna.knapinska@opi.org.pl	www.opi.org.pl
Poland	Mr	Marek MLODOZENIEC	National Information Processing Institute	Laboratory of Statistical Analysis and Evaluation	marek.mlodozeniec@opi.org.pl	www.opi.org.pl
Poland	Mr	Krzysztof WILINSKI	National Information Processing Institute	Information Resources Department	krzysztof.wilinski@opi.org.pl	www.opi.org.pl
Portugal	Mr	Joao OLIVEIRA BAPTISTA	Divisão de Estatísticas da Ciência e Tecnologia	Direcao-Geral de Estatisticas da Educacao e Ciencia- DGEEC	joao.baptista@dgeec.mec.pt	
Portugal	Ms	Filomena OLIVEIRA	Divisão de Estatísticas da Ciência e Tecnologia	Direção-Geral de Estatísticas da Educação e Ciência - DGEEC	filomena.oliveira@dgeec.mec.pt	www.dgeec.mec.pt
Romania	Ms	Rodica DUMITRIU	Directorate for Economical Indicators on Short Terms	National Institute of Statistics	Rodica.Dumitriu@insse.ro	www.insse.ro
Romania	Ms	Camelia COSCA	Directorate for Economical Indicators on Short Terms	National Institute of Statistics	Camelia.Cosca@insse.ro	www.insse.ro
Slovenia	Ms	Urska ARSENJUK	Social Services Statistics Section	Statistical Office, Republic of Slovenia	urska.arsenjuk@gov.si	www.stat.si
Slovak Republic	Ms	Marta MOSNA	Division of Higher Education, Science and Research	Ministry of Education, Science, Research and Sport of the Slovak Republic	marta.mosna@minedu.sk	www.minedu.sk

Country	Title	Statistical Correspondent	Department	Organisation	Email	Website
Finland	Ms	Marjut PIETILAINEN	Population and Social Statistics	Statistics Finland	marjut.pietilainen@stat.fi	http://tilastokeskus.fi/index_en.html http://tilastokeskus.fi/tup/tasaarvo/index_en.html
Finland	Mr	Ari LEPPÄLAHTI	Business Statistics	Statistics Finland	ari.leppalahti@stat.fi	http://www.tilastokeskus.fi/index_en.html
Sweden	Ms	Anna JONSSON	Economic Statistics Department	Statistics Sweden	Anna.jonsson@scb.se	www.scb.se
Sweden	Mr	Carl JACOBSSON	Senior Advisor, PhD	Swedish Research Council	carl.jacobsson@vr.se	www.vr.se
United Kingdom	Ms	Hülya HOOKER	Head of Research and Innovation Statistics	Department of Business, Innovation & Skills	Hulya.Hooker@bis.gsi.gov.uk	https://www.gov.uk/government/organisations/department-for-business-innovation-skills
Montenegro	Ms	Branka ZIZIC	Directorate for National Programmes	Ministry of Science	branka.zizic@mna.gov.me	www.mna.gov.me
Iceland	Ms	Sigridur VILHJALMSDOTTIR	Labour market, living conditions and demography	Statistics Iceland	sigridur.vilhjalmsdottir@hagstofa.is	www.statice.is
Iceland	Mr	Gudjon HAUKSSON	Labour market, living conditions and demography	Statistics Iceland	Gudjon.Hauksson@hagstofa.is	
Former Yugoslav Republic of Macedonia	Ms	Stanka PETKOVSKA		Ministry of Education and Science	stanka.petkovska@mon.gov.mk	
Serbia	Ms	Suncica STEFANOVIC-SESTIC	Unit for statistics of education, science, culture and other social statistics	Statistical Office	suncica.stefanovic@stat.gov.rs	www.stat.gov.rs
Serbia	Mr	Nikola TANIC		Ministry for Education, Science and Technology	nikola.tanic@mpn.gov.rs	
Turkey	Mr	H. Mehment TASCI	Iktisadi ve Idari Bilimer Fakültesi	Erciyes univerity	hmtasci@erciyes.edu.tr	
Bosnia and Herzegovina	Ms	Sevala KORAJCEVIC	Environment,Energy and Regional Statistics Department	Agency for Statistics of Bosnia and Herzegovina	sevala.korajcevic@bhas.ba	www.bhas.ba
Switzerland	Ms	Elisabeth PASTOR	Federal Department of Home Affairs	Swiss Federal Statistical Office	elisabeth.pastor@bfs.admin.ch	http://www.bfs.admin.ch/bfs/portal/en/index.html
Switzerland	Ms	Katja BRANGER	Federal Department of Home Affairs	Swiss Federal Statistical Office	katja.branger@bfs.admin.ch	
Norway	Ms	Kaja WENDT	Statistics and indicators	NIFU The Nordic Institute for Studies in Innovation, Research and Education	kaja.wendt@nifu.no	www.nifu.no
Norway	Mr	Bo SARPEBAKKEN	Statistics and indicators	NIFU The Nordic Institute for Studies in Innovation, Research and Education	bo.sarpebakken@nifu.no	www.nifu.no
Israel	Ms	Nurit YIRMIYA	Chief Scientist Office	Ministry of Science Technology & Space	nurityirmiya@most.gov.il	http://most.gov.il/Pages/HomePage.aspx
Israel	Ms	Ela STRAUSS	Chemistry, Energy, Materials & Nanotechnology department	Ministry of Science Technology & Space	Elas@most.gov.il	http://most.gov.il/Pages/HomePage.aspx

References

Aleksynska, M. and Muller, A., *Nothing more permanent than temporary? Understanding fixed-term contracts,* International Labour Office, Geneva, 2015, available at **http://www.ilo.org/travail/info/fs/WCMS_357403/lang--en/index.htm.**

Archambault, É., Vignola-Gagné, É., Côté, G., Larivière, V., and Gingras, Y., 'Benchmarking scientific output in the social sciences and humanities: The limits of existing databases', *Scientometrics*, Vol. 68, No. 3, 2006, pp. 329–342.

Cabezas-Clavijo, A., Robinson-García, N., Escabias, M., and Jiménez-Contreras, E., 'Reviewers' ratings and bibliometric indicators: Hand in hand when assessing over research proposals?', *PLoS ONE*, Vol. 8, No. 6, 2013, e68258. doi:10.1371/journal.pone.0068258.

Council of the European Union, Council Conclusions on 'A reinforced European Research Area partnership for excellence and growth', 2012, available at **http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/intm/134168.pdf.**

Council of the European Union, Council Conclusions on 'Women and the economy: Economic independence from the perspective of part-time work and self-employment', 2014, available at **http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/lsa/143269.pdf**

Council of the European Union, *The gender pay gap in the Member States of the European Union: quantitative and qualitative indicators – Belgian Presidency report 2010*, 2010, available at http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2016516%202010%20ADD%202.

DG Research and Innovation, *Researchers' Report 2012*, prepared for the Directorate-General for Research and Innovation by Deloitte Consulting, 2012, available at **http://ec.europa.eu/euraxess/pdf/research_policies/121003_The_Researchers_Report_2012_FINAL_REPORT.pdf.**

DG Research and Innovation, *She Figures 2012*, Publications Office of the European Union, Luxembourg, 2032, available at **http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf.**

DG Research and Innovation, *Structural change in research institutions: Enhancing excellence, gender equality and efficiency in research and innovation*, Publications Office of the European Union, Luxembourg, 2012, available at **http://ec.europa.eu/research/science-society/document_library/pdf_06/structural-changes-final-report_en.pdf.**

DG Research and Innovation, *Towards a European Framework for Research Careers,* Brussels, 2011, available at **http://ec.europa.eu/euraxess/pdf/research_policies/Towards_a_European_Framework_for_Research_Careers_final.pdf.**

DG Research, 'Subtle bias', available at **http://ec.europa.eu/research/swafs/gendered-innovations/index_en.cfm.**

DG Research, *Women in science and technology: Creating sustainable careers*, Office for Official Publications of the European Communities, Luxembourg, 2009, available at **http://ec.europa.eu/research/science-society/document_library/pdf_06/wist2_sustainable-careers-report_en.pdf.**

European Commission, 'A reinforced European Research Area partnership for excellence and Growth', COM(2012)392 final, Brussels, 2012, available at **http://ec.europa.eu/euraxess/pdf/research_policies/era-communication_en.pdf.**

European Commission, 'Supporting growth and jobs – an agenda for the modernisation of Europe's higher education systems', COM(2011)567 final, Brussels, 2011, available at http://ec.europa.eu/education/library/policy/modernisation_en.pdf.

European Commission, *Gender equality in Horizon 2020*, 2014, available at **http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/gender/h2020-hi-guide-gender_en.pdf.**

European Commission, *MORE2 Survey: Final report,* European Commission, Brussels, 2013.

European Commission's Expert Group on Gender and Employment (EGGE), *Gender segregation in the labour market*, Publications Office of the European Union, Luxembourg, 2009.

ILO, *International classification of occupations (ISCO-08)*, 2012, available at **http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_172572.pdf.**

Jensen K. S. H., *Women Working in Science, Engineering and Technology, Higher Education and Industry: A Literature Review*, IRIS (Informatics Research Institute), Salford University, Manchester, 2005.

Katz, J.S., 'The self-similar science system', *Research Policy,* Vol. 28, No. 5, 1999, pp. 501–517.

Larivière, V., Ni, C., Gingras, Y., Cronin, B., and Sugimoto, C. R., 'Bibliometrics: Global gender disparities in science', *Nature,* Vol. 504, No. 7479, 2013, pp. 211–213. doi:10.1038/504211a.

Merton, R.K., 'The Matthew effect in science', *Science,* Vol. 159, No. 3810, 1968, pp. 56-63.

National Science Foundation (NSF), *Women, minorities, and persons with disabilities in science and engineering: 2000*, (NSF 00-327), Arlington, USA, 2000, available at **http://www.nsf.gov/statistics/nsf00327/.**

OECD, *Frascati Manual: Guidelines for collecting and reporting data on research and experimental development*, Organisation for Economic Co-operation and Development (OECD), Paris, 2015.

OECD, *Frascati Manual*: *Proposed standard practice for surveys on research and experimental development*, Organisation for Economic Co-operation and Development (OECD), Paris, 2002.

OECD, *Working Party of National Experts on Science and Technology Indicators: Revised field of science and technology (FOS) classification in the Frascati manual,* 2007, available at http://www.oecd.org/science/inno/38235147.pdf.

Rubery, J., Smith, M. and Fagan, C., *Women's Employment in Europe: Trends and Prospects*, Routledge, London, 1999.

She Figures Team, *She Figures 2015: Comprehensive methodology – New research & innovation output indicator*, report prepared for the Directorate-General for Research and Innovation, 2015.

Sugimoto, C. R., Ni, C., West, J. D., and Larivière, V., 'The academic advantage: Gender disparities in patenting', *PLoS ONE,* Vol. 10, No. 5, 2015, e0128000. doi:10.1371/journal.pone.0128000

UNESCO, *International Standard Classification of Education*, 1997, repr. 2006, available at **http://www.uis.unesco.org/Library/Documents/isced97-en.pdf.**

UNESCO-UIS/OECD/EUROSTAT (UOE), *Data collection on education statistics manual,* 2010.

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