



# She Figures 2012

## Gender in Research and Innovation

*Statistics and Indicators*



**EUROPEAN COMMISSION**

Directorate-General for Research and Innovation  
Directorate B — European Research Area  
Unit B.6 — Ethics and Gender

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European Commission  
B-1049 Brussels



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Innovation

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Cataloguing data can be found at the end of this publication.

Luxembourg: Publications Office of the European Union, 2013

ISBN 978-92-79-27642-2

doi 10.2777/38520

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PRINTED ON ELEMENTAL CHLORINE-FREE BLEACHED PAPER (ECF)

## Foreword

This is the fourth issue of She Figures since the Commission first published it in 2003, and I must say that the analyses presented show that we are far from achieving gender equality in research. This is regretful for women researchers and bad for Europe.

I note that women are still under-represented in both the public and private research sectors, where only one third of European researchers are women, and this proportion falls to less than one fifth in the business sector. In the higher education sector, where initially women graduates outnumber their male colleagues, women represent only ten per cent of the rectors of universities. Furthermore, we still have an unbalanced representation of women and men in decision making bodies with on average only one woman for every two men on scientific and management boards across the EU.



This is not just a 'numbers game' in terms of unused potential. The under-representation of women deprives them of the opportunity to contribute towards research and innovation on an equal footing; and, given the different perspectives that women bring, the quality of research and innovation suffers as well.

The figures do show us that some gaps have been reducing slowly over recent years, but gender imbalance in research is not a self-correcting phenomenon and so we must redouble our efforts. This is why I have pushed hard to ensure that the promotion of gender equality is an integral part of the EU's strategy to establish the European Research Area. In this context, I am delighted that European stakeholder networks representing universities, research organisations and funding agencies have recently signed Memoranda of Understanding affirming their commitment to promote gender equality.

We need She Figures to inform us what the current situation is and to remind us of our obligations. I am convinced, however, that together — citizens, policy makers, stakeholders, researchers and their employers — we can make a difference and turn our ambition into reality!

A handwritten signature in black ink, reading "Maire Geoghegan-Quinn". The signature is written in a cursive style.

Maire GEOGHEGAN-QUINN

## Acknowledgements

She Figures 2012 is the outcome of a coordinated effort by many people whose assistance is gratefully acknowledged. I would particularly like to thank the following for their important contributions to this publication:

- The Helsinki Group on Women and Science for providing scientific advice;
- The Statistical Correspondents of the Helsinki Group on Women and Science for providing data and technical advice ;
- Sile O'Dorchai and Danièle Meulders at the Department of Applied Economics of Université Libre de Bruxelles (DULBEA, ULB) for drafting the text and analysing the data for the She Figures 2012 leaflet and booklet;
- Doina Parvan, Jelle Bosch and Frédéric Stibling at Sogeti Luxembourg S.A. for the data collection, layout and production of the She Figures 2012 leaflet and booklet;
- Veijo Ritola, Silvia Crintea-Rotaru and Bernard Felix at Eurostat for support with data quality and methodological issues;
- Michèle Magermans and Peter Whitten from the Directorate-General for Research and Innovation for scientific and practical support;
- Roberta Pattono, Viviane Willis-Mazzichi, Vera Fehnle, Gergana Guncheva and Carmen Ianos from the Gender sector of the Directorate-General for Research and Innovation for the impetus and overall co-ordination of this project.

GILLES LAROCHE  
Head of Unit Ethics and Gender,  
DG Research and Innovation

## Executive summary

She Figures 2012 is the fourth publication of a key set of indicators that are essential to understand the situation of women in science and research. The She Figures data collection is undertaken every three years since 2003 by the Directorate-General for Research and Innovation of the European Commission, in cooperation with the Helsinki Group and its sub-group of Statistical Correspondents. Over time, the list of indicators has evolved into rich and multi-faceted approach that describes the participation of women at all levels and in all scientific disciplines.

The major findings and trends of the She Figures 2012 can be summarised as follows:

In terms of scientific employment, as further explained in Chapter 1:

- In 2010, the share of women in total employment reached 45%, but women made up 53% of tertiary educated people who were employed as professionals or technicians. However, that same year in the EU-27, only 32% of scientists and engineers were women.
- In 2010, in the EU-27, the share of women in knowledge-intensive activities stood at 44% and thus largely exceeded that of men at 28%. However, restricting the scope to Business Industries puts forth a different picture: 13% of women and 14% of men.
- In 2009, in the EU-27, women in research remained a minority, accounting for only 33% of researchers.
- In the EU-27, the proportion of female researchers has been growing faster than that of men (5.1% annually over 2002–2009 compared with 3.3% for men); the same holds true for the proportion of women among scientists and engineers (up 5.4% annually between 2002 and 2010, compared with 3.1% for men).
- On average in the EU-27, women represented 40% of all researchers in the Higher Education Sector, 40% in the Government Sector and 19% in the Business Enterprise Sector, but in all three sectors the number of female researchers has been witnessing higher growth rates than the number of male researchers. Between 2002 and 2009, some countries have been characterised by a negative growth in the number of researchers working in the Government and the Business Enterprise sectors.
- A 'generation effect' is at work as the gender imbalance in the research population increases with age.
- Female researchers may be more likely to work part-time which may explain the gender differences in scientific employment.

In terms of scientific fields, as further outlined in Chapter 2:

- In 2010, in the EU-27, 46% of all PhD graduates were women. Over the period 2002–2010, the average number of female PhD graduates increased at a rate of 3.7% per year, compared to 1.6% for male PhD graduates.
- In 2010, female PhD graduates equalled or outnumbered men in all broad fields of study, except for science, mathematics and computing (40%), as well as engineering, manufacturing and construction (26%), the two fields with the highest overall number of PhD graduates.
- Over the period 2002–2009, female researchers were generally gaining ground in all fields of science in Higher Education, although at a very different pace in the different countries. In particular, the humanities as well as in engineering and technology; these fields were attracting more and more women. Contrary to the relatively uniform distribution of female researchers across science fields in Higher Education, the situation in the Government Sector is much more diverse and disparate, and the way the number of female researchers evolved over time in the different fields of science was highly country-specific. In most countries the medical sciences accounted for the highest share of female researchers in the Business Enterprise Sector, whereas again it was in engineering and technology where they were most absent.
- In 2010 the levels of occupational segregation were only slightly lower in Higher Education than in the Government Sector, as shown by the Dissimilarity Index.

In terms of career development, as further described in Chapter 3:

- In 2010 the levels of occupational segregation were only slightly lower in Higher Education than in the Government Sector, as shown by the Dissimilarity Index.
- Women's academic career remains markedly characterised by strong vertical segregation. In 2010, the proportion of female students (55%) and graduates (59%) exceeded that of male students, but men outnumbered women among PhD students and graduates (the proportion of female students stood at 49% and that of PhD graduates at 46%). Furthermore, women represented only 44% of grade C academic staff, 37% of grade B academic staff and 20% of grade A academic staff.
- The under-representation of women is even more striking in the field of science and engineering. The proportion of women increased from just 31% of the student population at the first level to 38% of PhD students and 35% of PhD graduates, but stood at 32% of academic grade C personnel, 23% of grade B and just 11% of grade A.
- The proportion of women among full professors was highest in the humanities and the social sciences, respectively 28.4% and 19.4%, and lowest in engineering and technology, at 7.9%.
- The glass ceiling index stood at 1.8 in the EU-27 in 2010, pointing towards slow progress since 2004 when the index stood at 1.9 (the higher the score, the thicker the ceiling).
- In 2010, researchers were more likely to have children than the working population, and this holds true for both men and women.
- In all three sectors (Higher Education Sector, Government Sector and Business Enterprise Sector) and in nearly all EU countries studied, the proportion of male researchers exceeds that of female researchers.
- The proportion of women among technicians varies between the three sectors. It was systematically higher than that of men in Higher Education, except in four countries. In the Government Sector, there were exceptions to this overall pattern; and in the Business Enterprise Sector, the countries are divided in two groups of roughly equal size, one where there were more female than male technicians, and one where the opposite is observed.

In terms of decision making, as further outlined in Chapter 4:

- In 2010, on average throughout the EU-27, 15.5% of institutions in the Higher Education Sector were headed by women, and just 10% of universities had a female rector.
- On average in the EU-27, 36% of board members were women in 2010, whereas in 2007 they represented only 22%, an increase which is influenced to a certain extent by changes in the computing methods for the EU average.
- Out of the 22 countries for which 2010 data are available, 17 countries reported higher success rates for men in obtaining research funding, whereas five countries (three EU members, Iceland and Norway) reported higher success rates for women. Between 2002 and 2010, on average in the EU-27, a closing of the gender gap in success rates seems to have taken place, many individual countries deviated from this overall pattern and gaps became greater in 11 countries.
- There is no clear relationship between gender segregation across fields of science and gender differences with respect to success rates towards obtaining research funding.
- The proportion of female researchers was negatively correlated with the level of R&D expenditure. Whereas women are least present in Business Sector research, it is this sector that on average spends the largest budget on research.

The policy implications of the results analysed in *She Figures 2012* are numerous.

Although the situation appears more favourable for the youngest generations of female academics in a subset of countries, the gender gap is still disproportionately high compared with the increase in the proportion of women students and thus casts doubt on the hypothesis that women will automatically 'catch up' to their male counterparts. Proactive policies are thus essential to significantly reduce these gaps.



The work-life issue remain a key element in achieving gender equality and current indicators only take part of this into account. The fact that researchers are more likely to have children than the working population in general underscores the centrality of work-life balance issues for women and men scientists. There is not just a 'glass ceiling' but also a 'maternal wall' hindering the career of female researchers. Although work-life and work-family balance, in principle, concern both female and male scientists and researchers, women are usually more affected given that they still carry the main burden of care and domestic work. Besides general policies affecting women's entry into the labour market and their employment conditions, policies specifically targeted at research organisations are needed to support women in their career advancement.

A gender-mixed composition of nominating commissions, an increase in the objectivity of the applied selection criteria, tutoring of women, or even the fixing of quotas, are all policies that are generally evoked, and in some countries already implemented, to balance out the unequal situation that continues to prevail in the academic sector and works against the discriminatory snowball effect.

There is no evidence of spontaneous reduction of gender inequality over time. All these policies, and many more, are needed to ensure that constant progress is made towards gender-equality in research and scientific careers.

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# ***General introduction***

The She Figures is a collection of available data related to the situation of women in science and research. This data collection has evolved over time and has widened its perspective by exploring issues such as innovation, mobility or work-life balance. It also reflects a clear ambition to develop pan-European harmonised statistics facilitating cross-national comparisons and to build a base of gender-disaggregated data available at the EU-level. The She Figures provides valuable knowledge to a wide audience of research stakeholders, ranging from policy makers to researchers themselves.

She Figures 2012 follows in the footsteps of She Figures 2003, 2006 and 2009. In general, chapters 1 and 2 are concerned with horizontal segregation, and chapters 3 and 4 with vertical segregation. Chapter 1 assesses the presence of women in knowledge-intensive activities, scientific and technological employment and research from a cross-country perspective. In particular, while it highlights the progression of women in science, engineering and technology and research, it also draws the broad lines of the problem of gender segregation across fields of science, fully analysed in chapter 2. Chapter 3 on seniority illustrates the workings of a glass ceiling that women hit during their ascent in the academic hierarchy. Moreover, data show that there is no spontaneous reduction of vertical segregation over time and particularly over recent years women's catching up appears to have slowed down, at least at the PhD level. Finally, chapter 4 shows that women's under-representation at the highest hierarchical levels of the academic career severely cuts their chances of influencing the scientific agenda, it makes it hard for young women in academia to find female role models, and it might bias all decisions that are taken at these high ranks regarding scientific policies, research subjects and credits and nominating rules and criteria.

She Figures 2012 goes further than previous editions by introducing new sets of additional data. In chapter 1, the proportion of women and men employed in knowledge-intensive activities in general and in business industries in particular completes the overall picture of women's presence in scientific employment. Another new indicator in this chapter is the one on researchers' mobility. In chapter 3, the proportions of male and female researchers with children were analysed in comparison with the proportions of parents in the total working population in order to get some notion of the extent to which researchers are affected by work/life balance issues. Unfortunately, She Figures 2012 is not able to update the information on the gender pay gap in public and private enterprise as it was first presented in the previous edition, She Figures 2009, because updated data from the European Structure of Earnings Survey were not out in time.

She Figures 2012 reveals that women in scientific research remain a minority (33% of researchers in the EU-27 in 2009). Their proportion is growing faster than that of men but not enough to indicate that the gender imbalance in science is self-correcting. Positive trends can be observed such as the considerable growth in the proportion of female scientists and engineers or in the share of women graduating at PhD level in sciences although since 2006 the pace at which women have been catching up with men at the PhD level has slackened. However, horizontal gender segregation across different economic sectors and fields of science persists. Female researchers are far more likely to be employed in the higher education and the government sectors than in the business enterprise sector. Female researchers feature in higher proportions in social sciences, agricultural sciences, medical sciences, and humanities than in engineering and technology. Despite an increase in the percentage of women at the different stages of a typical academic career between 2002 and 2010, vertical segregation of women in science is persistent.

Although women's entry and progression in science is bringing about a more equal representation of men and women in all fields of science and at all stages of the academic career, it still fails to give them an equal opportunity to participate in decision-making concerning scientific policies, research subjects and grants, and so forth. Their presence is essential to promote women in science, because diversity fosters excellence in research and innovation.

### **Data sources**

Most of the statistics used in this publication are drawn from Eurostat, the statistical office of the European Union.

Data on researchers' mobility come from the MORE Survey carried out in 2009–2010 on behalf of the Directorate-General for Research and Innovation. New data from the MORE2 survey should be available in June 2013.



In addition, Statistical Correspondents from all EU Member States and Associated Countries provided data on the seniority of academic staff by sex and age group, differences between men and women for funding success rates, proportion of women on scientific boards and number of female heads of universities and other institutions in higher education. The Statistical Correspondents form a sub-group of the Helsinki Group on Women and Science, the advisory board set up in 1999 by the European Commission. The list of the Statistical Correspondents can be found in Annex 6.

## Eurostat

The data from Eurostat originate from a variety of different surveys conducted at national level:

- Researchers and R&D expenditure data are collected through the R&D Survey, which since 2004 has been carried out as a joint data collection between Eurostat and the OECD. R&D data for Japan and the United States come from the OECD's Main Science and Technology Indicators (MSTI).
- Human Resources in Science and Technology (HRST) data and data on women's and men's presence in Knowledge-intensive activities (KIA and KIABI) are collected through the European Union Labour Force Survey (EU LFS).
- Education data are collected through the UOE (UNESCO-UIS, OECD, Eurostat) questionnaire.
- Data on parenthood come from the European Statistics on Income and Living Conditions (EU-SILC 2010).

## Statistical Correspondents

The statistics on the seniority of academic staff, research funding success rates, membership of scientific boards and heads of institutions are collected at the national level through Higher Education and R&D Surveys, Ministries and Academies of Science, Research Councils and Universities as part of their own monitoring systems and administrative records. It should be noted that these data are not always ready for cross-country comparison at EU level. Technical details relating to adherence to standards and categorisation and data sources can be found in Annex 5.

## Key definitions

**PhD/Doctorate or equivalent graduates:** The International Standard Classification of Education (ISCED) identifies a specific level – ISCED 6 – as “tertiary programmes which lead to the award of an advanced research qualification” (UNESCO, 1997). Education programmes such as PhDs and their equivalents are included in this level for all countries, as well as some post-doctoral programmes and, in a few cases, some shorter post-graduate programmes that are a pre-requisite for the Doctorate (for example the D.E.A. in France).

**Human Resources in Science & Technology — Core (HRSTC):** This section of the workforce is defined as those who are both qualified tertiary educated graduates from an S&T field of study and working in professional or technician occupations not formally qualified as above.

**Scientists and Engineers (S&E):** Data for this group are also drawn from the European Union Labour Force Survey, more specifically from the professional occupations category, but are restricted to “physical, mathematical and engineering occupations” and “life science and health occupations” and therefore exclude scientists in other occupational fields, such as social or agricultural sciences.

**Researchers:** According to the common definition in the Frascati Manual (OECD, 2002), “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”.

More detailed information on these definitions can be found in Annex 5.



# ***1. Setting the scope***

The purpose of this chapter is to assess the presence of women in research in a cross-country perspective and set the context for the chapters that follow. It analyses the relative shares of women and men engaged in various forms of scientific employment.

### Tertiary educated women more successful in finding a job

The employment participation, both as a snapshot for the year 2010, and as a dynamic process of change over the period 2002–2010, has been analysed by comparing the proportion of women in total employment with their share among the highly educated working in a science and technology occupation as professionals or technicians and among those working only as professionals (scientists and engineers) for the year 2010.

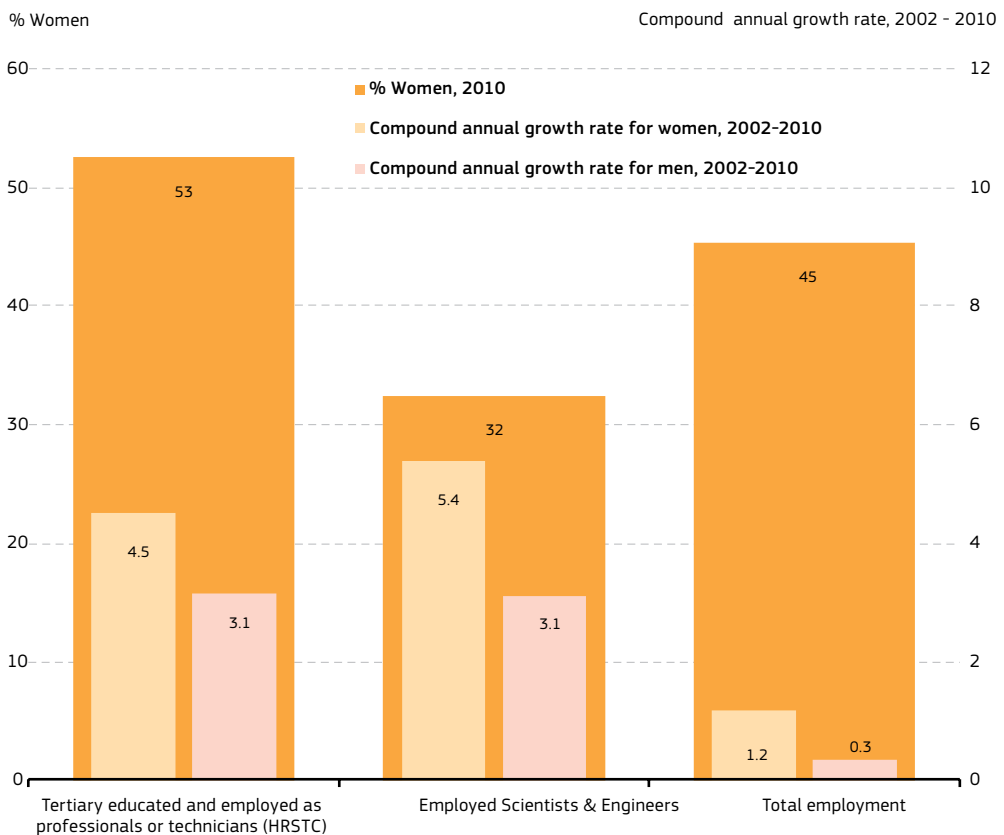
#### The limitations of headcount employment

*When reading She Figures 2012, one important consideration needs to be kept in mind. For reasons of data limitations, all data presented throughout the different chapters of this publication are measured in headcount and thus fail to take into account the prevalence of part-time employment in the female research population. Headcount data mask substantial variation in working hours both within the population of female researchers and when comparing men and women in research. It is therefore essential to temper the positive image of women's progression in science keeping in mind their greater likelihood of holding part-time jobs.*

As shown in Figure 1.1, the fact that the proportion of women is higher among highly educated people employed as professionals or technicians (53% among HRSTC – Human Resources in Science and Technology Core) than in total employment (45%) illustrates that tertiary educated women are more successful in finding a job than their counterparts with a lower level of education. However, their proportion drops to 32% among employed scientists and engineers, a narrower category of employment than highly educated people working as professionals or technicians (HRSTC), which in turn exemplifies the problem of gender segregation in education. Women and men are oriented towards gender-typical fields of study which are in turn associated with unequal opportunities on the labour market.

Between 2002 and 2010, women have been catching up with men as women's compound annual growth rate has exceeded that of men both in total employment and in the two more precise sub-groups. The difference is largest among scientists and engineers, where the share of women has grown by an average of 5.4% per year between 2002 and 2010 compared with a male growth rate of just 3.1%. These growth rates are respectively 4.5% and 3.1% for highly educated women and men working as professionals or technicians. Employment in these subcategories thus seems to be expanding much more rapidly over recent years for both men and women than total employment. The growth in total employment was limited to 1.2% on average per year for women and to 0.3% for men over the period considered.

**Figure 1.1:** Proportion of women in the EU-27 for total employment, tertiary educated and employed as professionals and technicians (HRSTC) and scientists and engineers in 2010, compound annual growth rate for women and men, 2002–2010

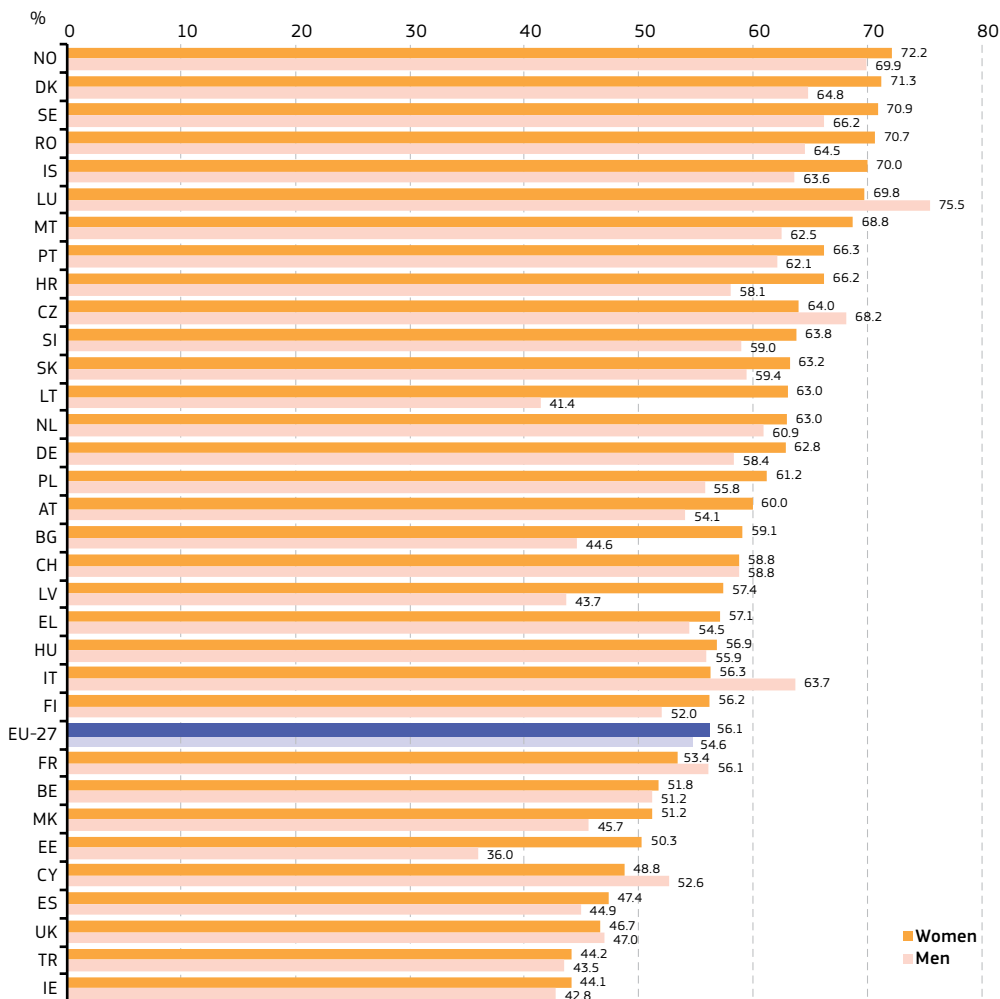


Source: Eurostat - Human Resources in Science & Technology (online data code: [hrst\\_st\\_ncat](#)); Labour Force Survey main indicators (online data code: [lfsi\\_emp\\_a](#)).

### An overall pattern of more highly-educated women working in a science and technology occupation

These general trends should be further explored in light of what happens at the level of the individual countries. Figure 1.2 presents the proportions of highly educated men and women who are employed as professionals or technicians for 33 countries, the EU-27 and Norway, Iceland, Switzerland, Macedonia, Croatia and Turkey and Figure 1.3 shows the proportions of male and female scientists in the total labour force of each of these countries. Figure 1.2 does not present a high degree of discrepancy between men and women. For the year 2010, throughout the EU-27, on average 56% of highly educated women in an S&T field were working as professionals or technicians compared with 55% of men. A slightly higher percentage of women was indeed observed in most countries. Lithuania, Bulgaria, Latvia and Estonia are exceptions to this overall pattern as the share of highly educated women in an S&T field who are working as professionals or technicians is much higher than that of men in these countries (22 percentage points in Lithuania and 14 percentage points in Estonia, Latvia and Bulgaria). The opposite was noted in just five countries. In Italy, France, Cyprus, Luxembourg and the Czech Republic, more highly educated men than women were employed as professionals or technicians. Finally, in the UK and Switzerland, there seems to be no gender dimension to the probability of the highly educated in an S&T field to work as professionals or technicians.

**Figure 1.2:** Tertiary educated in an S&T field and employed as professionals and technicians (HRSTC), as a percentage of tertiary educated in an S&T field (HRSTE), by sex, 2010

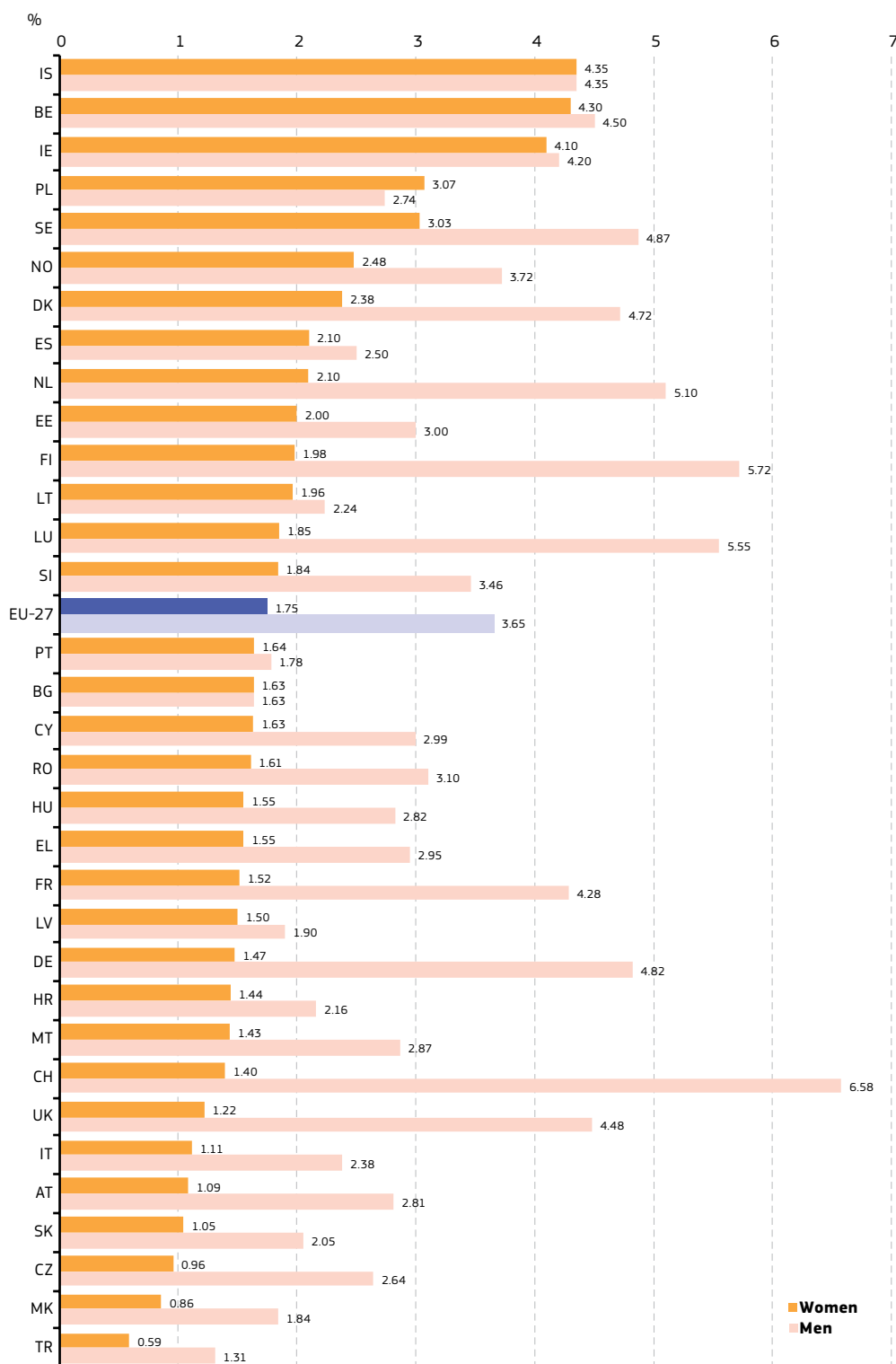


Data unavailable: EU-25, EU-15, IL, JP, US.

Source: Eurostat – Human Resources in Science & Technology (online data code: [hrst\\_st\\_ncat](#)).

In most EU countries, gender differences stand out more in the field of science and engineering, a subgroup of the highly qualified working as professionals or technicians in the previous figure. Figure 1.3 shows the proportion of male and female scientists and engineers in the total labour force. When the proportion of female scientists in the total labour force is equal to the proportion of male scientists in the total labour force then we can say that 50% of scientists and engineers are women. In 2010, there were only three countries where the proportion of female scientists and engineers was at 50% or more: Iceland (50%), Bulgaria (50%), and Poland (53%). On average 32% of scientists and engineers were women in the EU-27. In many countries, the share of women among scientists and engineers was at a much lower level still. Switzerland is at the very bottom of the country ranking with just 18% of women in this category.

Higher education proves to be a useful social investment as women climb up from 45% in total employment to 53% among the highly educated in an S&T field and who are employed as professionals or technicians...but science and technology keep on being male-dominated despite higher growth rates for women.

**Figure 1.3:** Proportion of scientists and engineers in the total labour force, by sex, 2010

Exceptions to the reference year: CH: 2009.

Data unavailable: EU-25, EU-15, IL, JP, US.

Others: The labour force is defined as the sum of employed and unemployed persons.

Source: Eurostat - Human Resources in Science & Technology (online data code: [hrst\\_st\\_ncat](#)).

## Uniform image in Knowledge-Intensive Activities (KIA), differentiation in Knowledge-Intensive Activities – Business Industries (KIABI)

Another way of illustrating how women's representation lowers as the population studied is narrowed down or becomes more specialised is by comparing the indicators on women's and men's relative presence in knowledge-intensive activities (KIA) or in knowledge-intensive activities – Business Industries (KIABI) as they are presented in Figures 1.4 and 1.5.

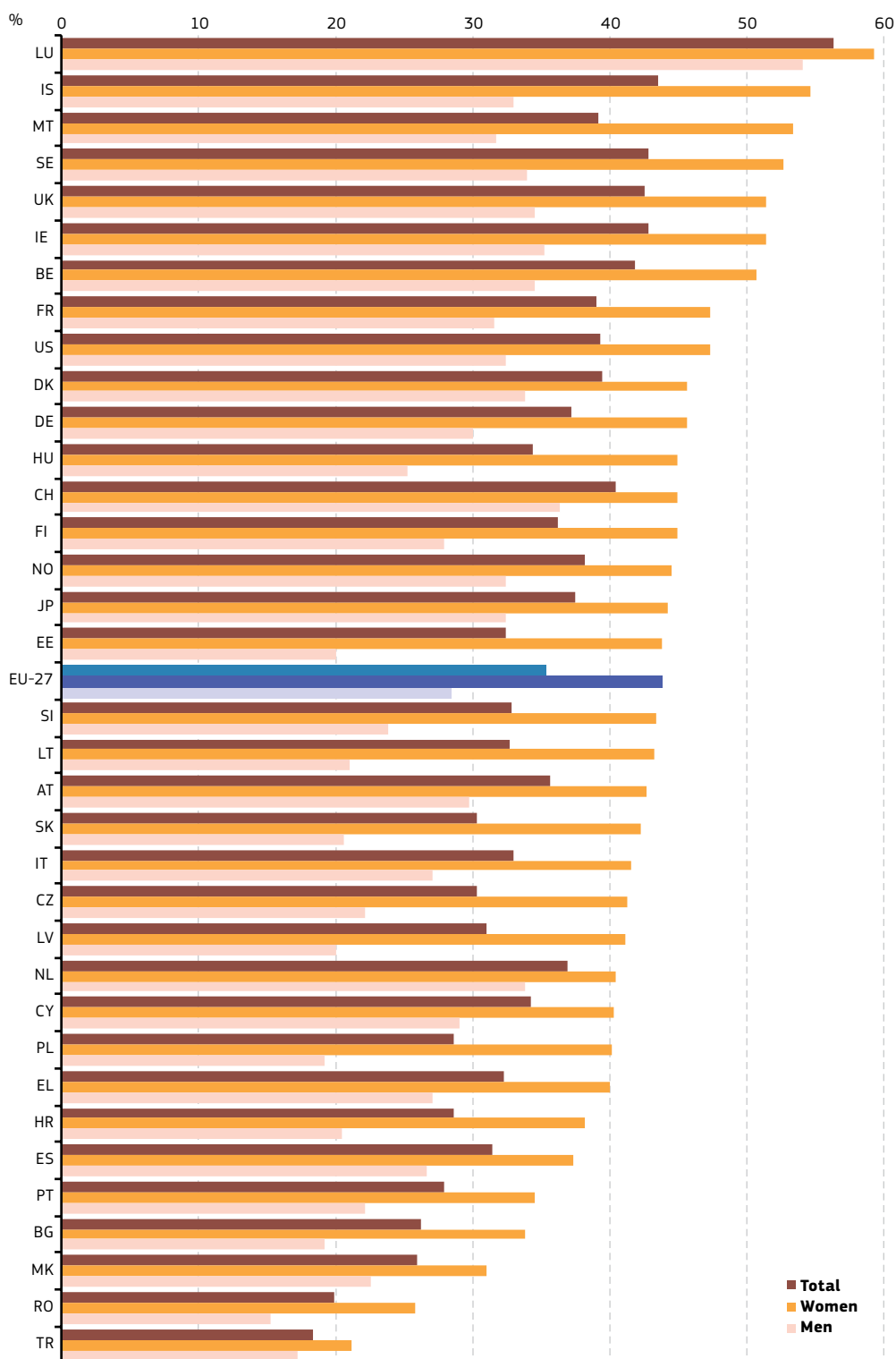
### KIA and KIABI:

*KIA definition: An activity is classified as knowledge-intensive if tertiary educated persons employed (according ISCED97, levels 5+6) represent more than 33% of the total employment in that activity. The definition is built based on the average number of employed persons aged 25-64 at the aggregated EU-27 level according to NACE Rev. 2 at 2-digit, using EU Labour Force Survey data. There are two aggregates in use based on this classification: Knowledge-Intensive Activities (KIA) in total and Knowledge-Intensive Activities – Business Industries (KIABI).*

Figure 1.4 shows the relative presence of women and men in knowledge-intensive activities (activities where more than one third of the workforce is tertiary-educated). In all countries, the share of women in knowledge-intensive activities exceeds that of men and the gap is above 20 percentage points in 6 new member states (Estonia, Lithuania, Latvia, Slovakia, Poland and Malta) and Iceland. The highest shares of women in knowledge-intensive activities are observed in Luxembourg, Iceland, Malta, Sweden, the UK, Ireland and Belgium. This predominance of women in KIA should be attributed to the fact that KIA in this figure (as opposed to in Figure 1.5) include highly feminised public sectors such as education, health care, social work, and so forth.

Restricting the scope to Business Industries – KIABI (Figure 1.5) – changes the picture of women's and men's relative presence in knowledge-intensive activities. Whereas the gender gap was systematically in favour of women in Figure 1.4, when only Business Industries are concerned, the countries are divided in two groups of roughly equal size: in the first group, the share of women in knowledge-intensive business industries is still higher than that of men whereas in the second group, the inverse is observed. The highest shares of women are still to be found in Luxembourg, Malta, Ireland and Iceland but Sweden, the UK, and especially Belgium have fallen down in the ranking. It is also striking to see that when the focus is on Business Industries, the gaps between the shares of men and women in knowledge-intensive activities are much smaller in absolute value than when all sectors of economic activity are analysed.



**Figure 1.4:** Employment in knowledge-intensive activities (KIA), 2010 (%)

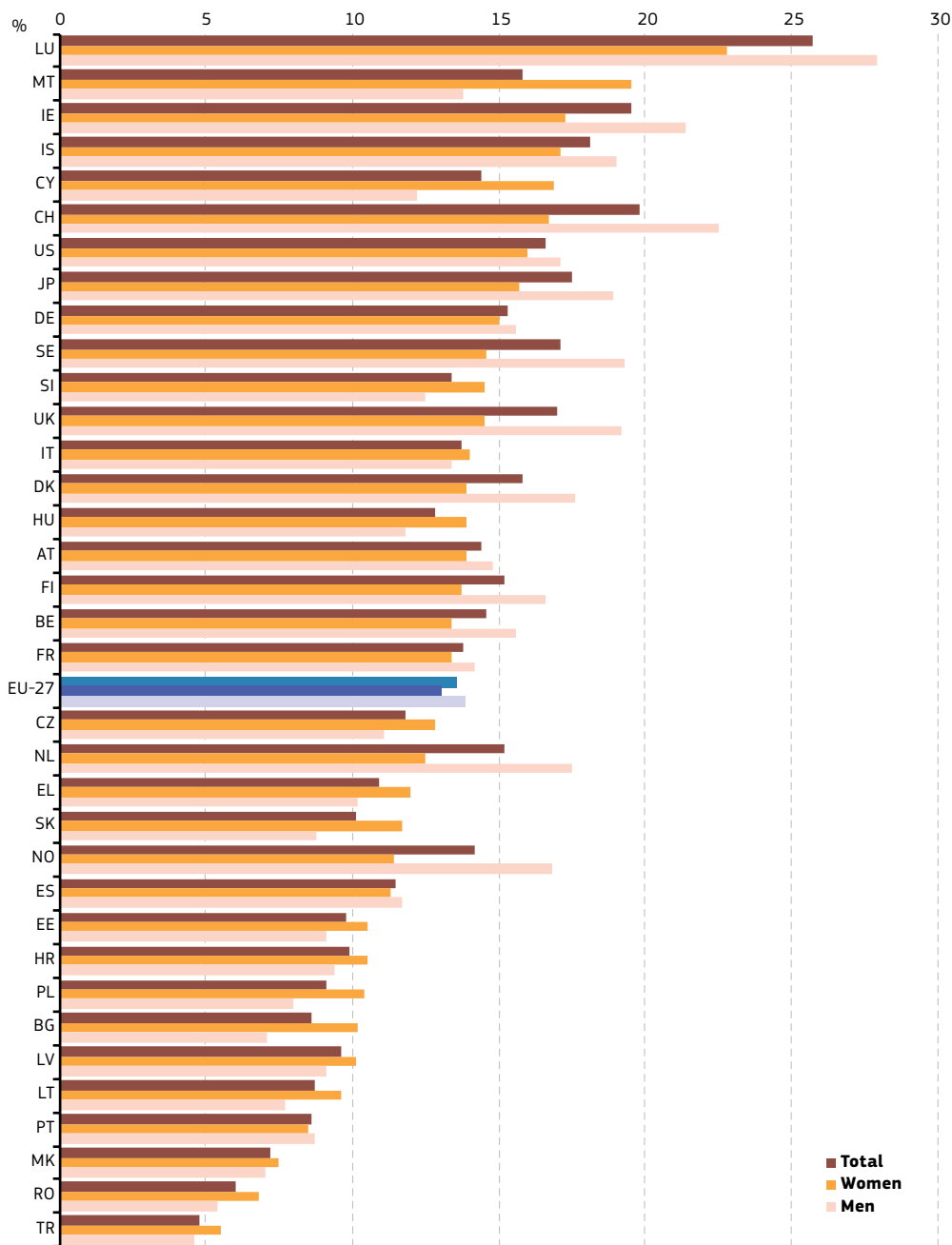
Exceptions to the reference year: MK: 2011.

Data unavailable: EU-25, EU-15, IL.

Others: US data: US Current Population Survey; JP data: JP Labour Force Survey.

Source: Eurostat - High-tech industry and knowledge-intensive services (online data code: [htec\\_kia\\_emp2](https://ec.europa.eu/eurostat/tgm/table.do?code=htec_kia_emp2)).

**Figure 1.5:** Employment in knowledge-intensive activities — Business Industries (KIABI), 2010



Exceptions to the reference year: MK: 2011.

Data unavailable: EU-25, EU-15, IL.

Others: US data: US Current Population Survey; JP data: JP Labour Force Survey.

Source: Eurostat - High-tech industry and knowledge-intensive services (online data code: [htec\\_kia\\_emp2](#)).

**In all countries, the share of women in knowledge-intensive activities exceeds that of men. However, restricting the scope to Business Industries puts forth a different picture: in half of the countries, men are overrepresented in knowledge-intensive business industries.**

## Female researchers: underrepresented at EU level, but slowly catching up

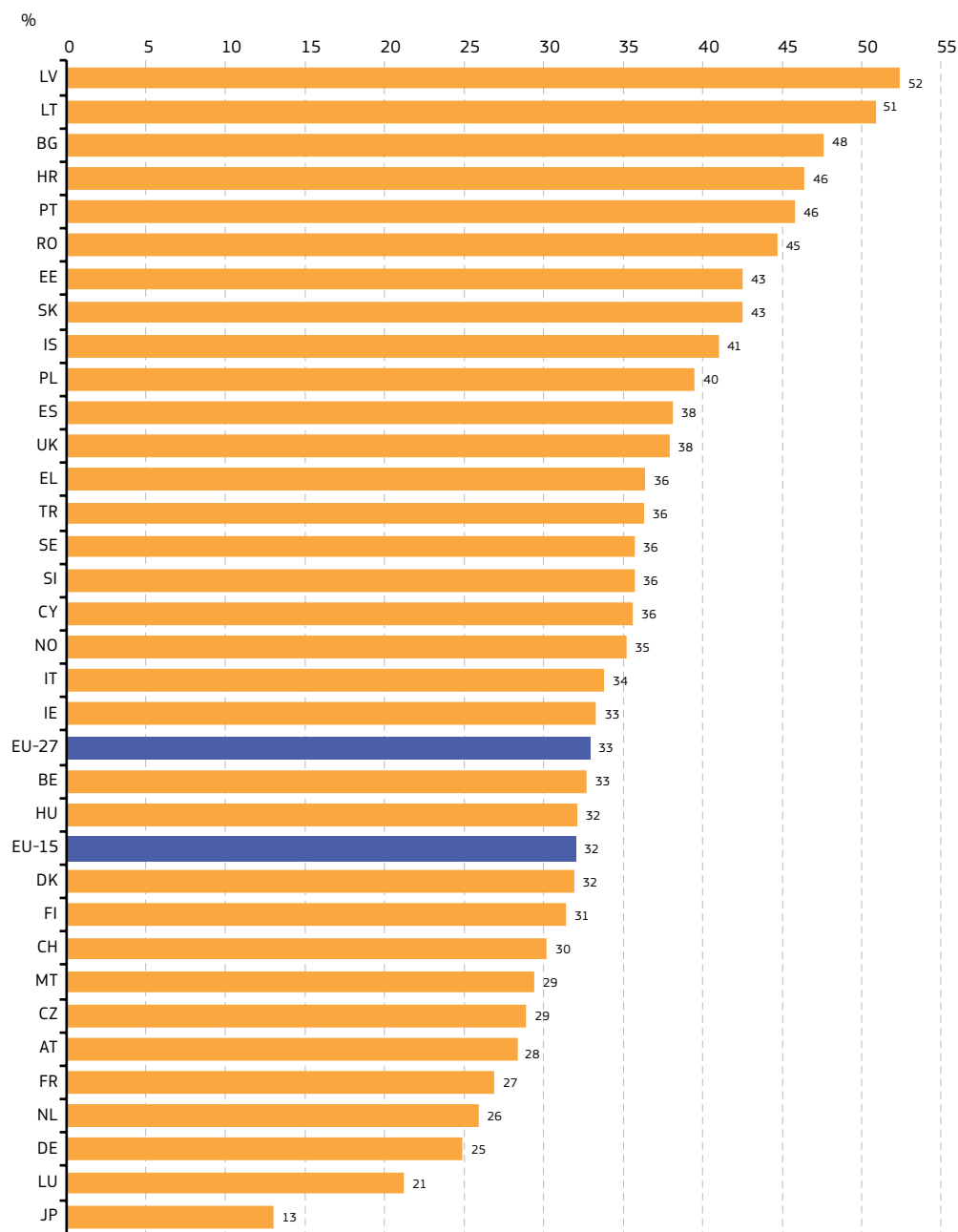
The gender distribution in the population of scientists and engineers as it was illustrated by Figures 1.1 and 1.3 is almost replicated in the population of researchers (Figure 1.6) which covers a broader base of subject domains than scientists and engineers, although the occupational function is defined more narrowly than human resources in science and technology. There is a clear pattern of female under-representation. The average proportion of female researchers in the EU-27 stood at 33% in 2009 but wide variations were noted between countries: whereas Luxembourg, Germany and the Netherlands respectively have just 21%, 25% and 26% of female researchers, at the top of the country ranking according to the proportion of women in research, there are two Baltic States, Latvia and Lithuania, where there are more women than men in research, but also Bulgaria, Portugal, Romania, Estonia, Slovakia, and Poland, all of which have at least 40% of women in their researchers population.

The compound annual growth rate of the numbers of female and male researchers over the period 2002-2009 is shown in Figure 1.7. Again women seem to be catching up with men over time as their share of the total research population has been growing at a faster rate over the period considered although it must be remembered that the growth rate for women is on a smaller base than that for men so that if it is merely sustained and not radically increased, it will still take a long time to significantly improve the gender balance in research. Exceptions are the Czech Republic, Hungary, Greece and France where the number of male researchers has grown at a faster rate. In the EU-27 on average, the number of female researchers has increased at a rate of 5.1% per year compared with 3.3% for male researchers. The gap between the average annual growth rates of female and male researchers increased between 2006 and 2009 due to an important slowdown in the male growth rate, from 3.9% over the period 2002-2006 to 2.4% between 2006 and 2009. Given that the mean growth rate for women is higher in the EU-15 than in the EU-27 whereas both geographical entities put forth the same growth rate for male researchers, it appears that in the EU's most recent Member States, the share of women in research is increasing at a slower pace than in the older Member States. An important exception is Cyprus where the compound annual growth rate of female researchers was as high as 11% between 2002 and 2009. Moreover, from Figure 1.7 it appears that the gender gap in growth rates is generally smaller in countries where the growth rates for researchers have been lowest and it is higher in countries where the numbers of researchers have grown most rapidly. It is the widest in Austria, Malta, the Netherlands and Germany.

## Male researchers represent 12‰ of the labour force, females 7‰

This positive trend over time should not mask the pattern of female under-representation as shown in Figure 1.6 (proportion of female researchers). A similar pattern was also noted in the analysis of the number of researchers in the total labour force by sex. Figure 1.8 plots these results per thousand for the year 2009. Six exceptions aside (Lithuania, Turkey, Latvia and Bulgaria where the share of female researchers among active women is higher than the share of male researchers among active men; and Croatia and Romania where there are equal shares of researchers for both sexes), there are considerably fewer female researchers among active women than there are male researchers among active men. The male rates were 10 or more points per thousand higher than the female rates in Finland, Luxembourg, Denmark, and Austria. On average across the EU-27, 12‰ of the male labour force were researchers in 2009 compared with 7‰ of women on the labour market.

**The research population in general is also up to two thirds a male population again despite women catching up over the last decade.**

**Figure 1.6:** Proportion of female researchers, 2009

Exceptions to the reference year: CH, JP: 2008. EL: 2005.

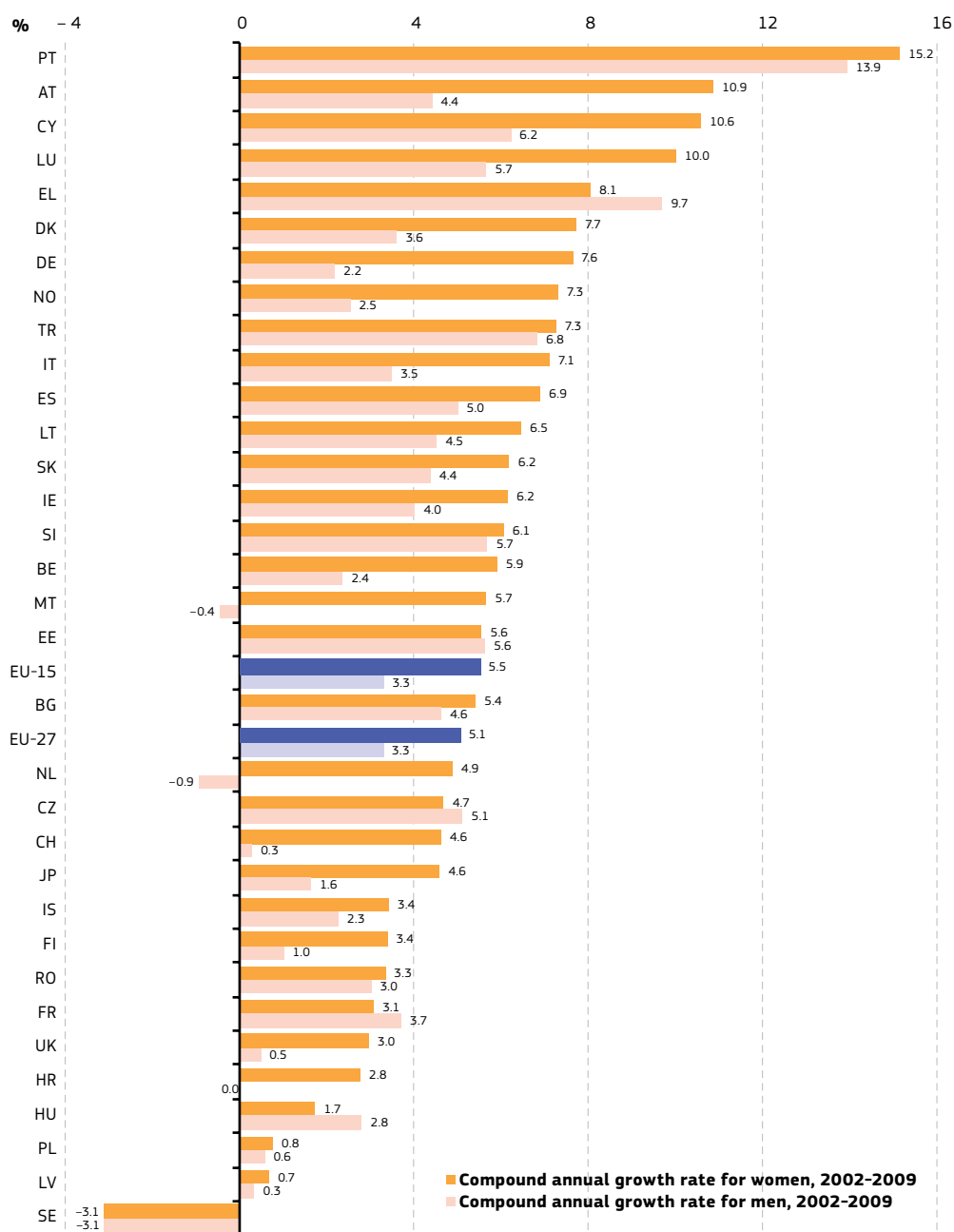
Data unavailable: EU-25, IL, US.

Provisional data: NL.

Data estimated: EU-27, EU-15, IE and UK.

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_femres](#)).

**Figure 1.7:** Compound annual growth rate for researchers, by sex, 2002–2009

Exceptions to the reference years: JP: 2002-2008; EL: 2003-2005; DE, LU, NL, PL, IS, NO: 2003-2009; CH: 2004-2008; MT, FI: 2004-2009; SE, UK: 2005-2009.

Data unavailable: EU-25, MK, IL, US.

Break in series: DK: 2002; FR: 2002; SE: 2005.

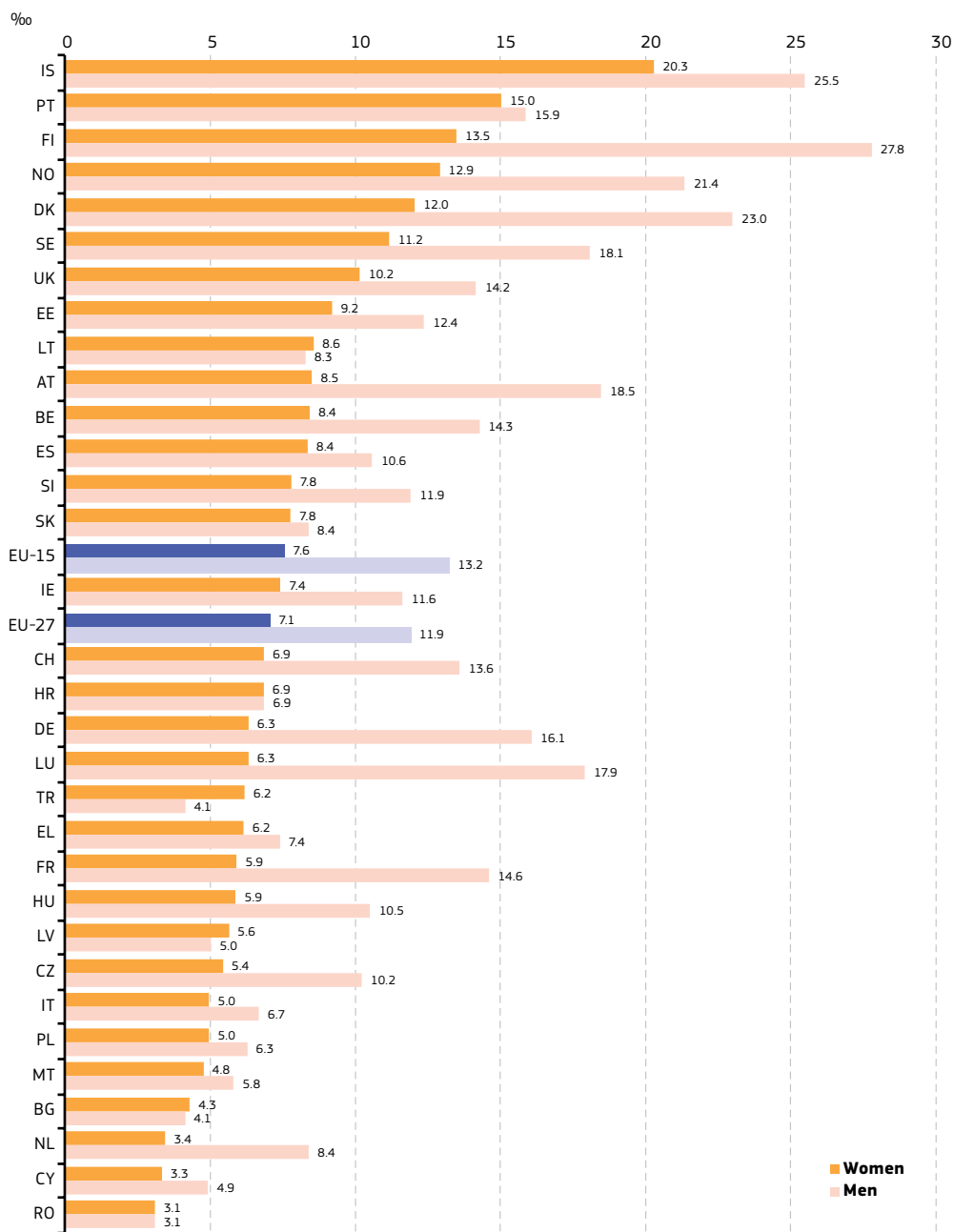
Provisional data: NL: 2005.

Data estimated: EU-27, EU-15, UK; DK, FR: 2002; MT: 2004; NL: 2003; SE: 2005.

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).

**Figure 1.8:** Researchers per thousand labour force, by sex, 2009



Exceptions to the reference year: CH: 2008; EL: 2005.

Data unavailable: EU-25, MK, IL, JP, US.

Data estimated: EU-27, EU-15, IE, UK.

Others: Head count.

LU: results for men and women may be overestimated due to commuters excluded from the denominator.

The labour force is defined as the sum of employed and unemployed persons (15 years and over).

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).

**Summary of key findings regarding women's relative representation in various forms of scientific employment**

In static terms, a clear pattern of female underrepresentation is still observed in scientific employment in 2009-2010 but since 2002, women have been catching up with men. Women's underrepresentation worsens as the analysis is narrowed down from the population working in knowledge-intensive activities, to the population of people educated and employed in a science and technology occupation, to researchers and finally, to employed scientists and engineers. On average throughout the EU-27, 53% of people educated and employed in a science and technology occupation are women and there are 44% of women and 28% of men active in knowledge-intensive activities. However, in the EU-27 women on average make up just 33% of the population of researchers and 32% of all employed scientists and engineers.

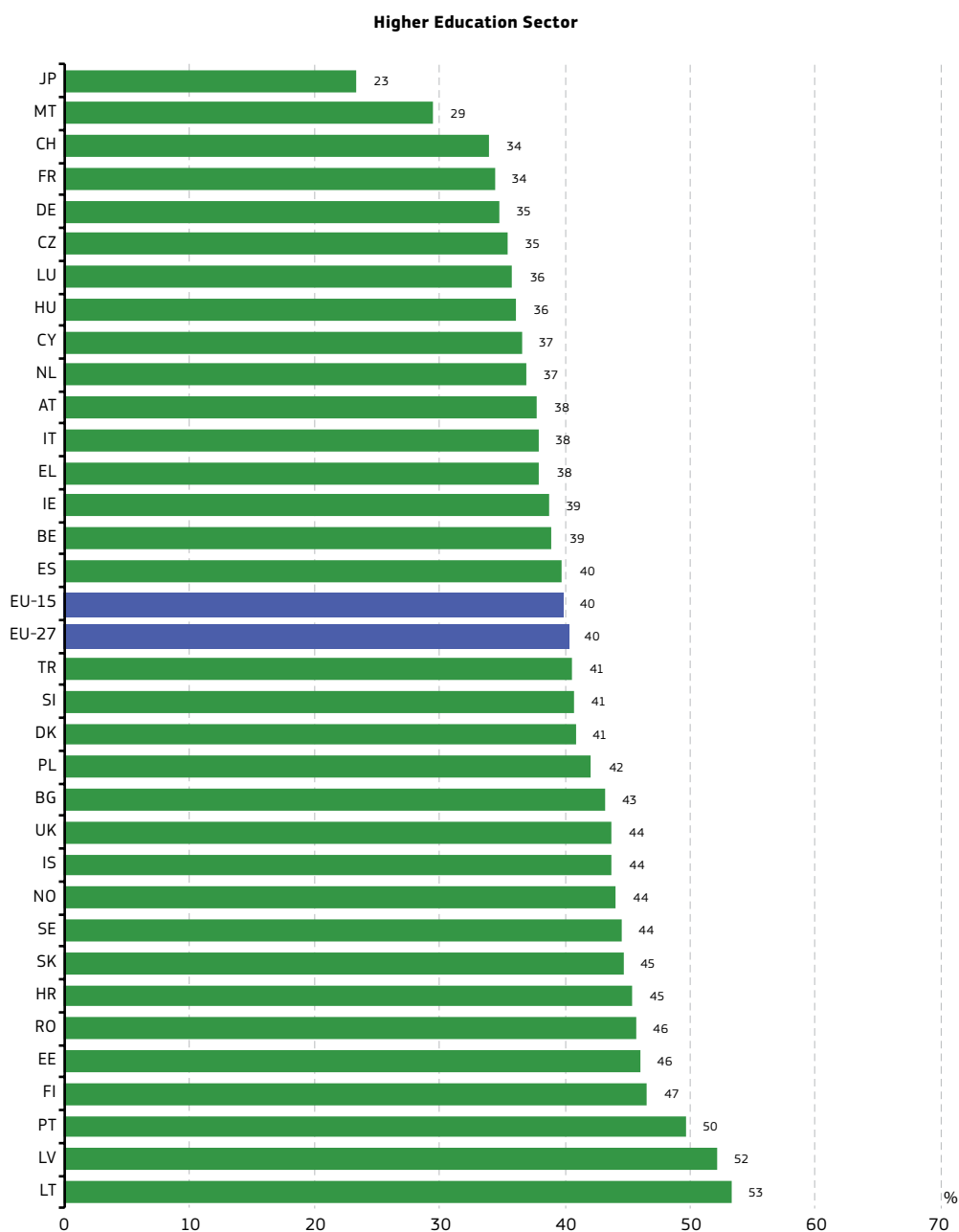
## Women researchers in broad economic sectors: different perspectives

Figure 1.9 allows for a more detailed analysis of the proportions of female researchers as they were presented in Figure 1.6 for the year 2009. It yields the proportion of female researchers in three broad economic sectors: Higher Education, the Government Sector and the Business Enterprise Sector.

Whereas women's presence appears to be relatively similar in the Government Sector and in Higher Education, it is considerably weaker in the Business Enterprise Sector. On average in the EU-27, women represent 40% of all researchers in the Higher Education Sector, 40% in the Government Sector but merely 19% in the Business Enterprise Sector. The degree of cross-country disparity is larger in the Business Enterprise Sector than in the Higher Education and Government Sector. In the Higher Education Sector, just one EU-27 country has a proportion of women in research that is below 30% (Malta). On the contrary, female proportions of 50% or more are found in Portugal, Latvia and Lithuania. In the Government Sector, no EU-27 member state has a proportion of female researchers below 30% (but this is the case for Japan and Turkey); and 50% or more of all researchers are women in Romania, Lithuania, Latvia, Bulgaria, Portugal and Estonia. In the Business Enterprise Sector, the country distribution in terms of the size of the proportion of female researchers is skewed downwards compared with the previous two sectors. Women represent less than 15% of the research population in three EU-27 countries (the Netherlands, Germany, and Luxembourg). Leaving aside Latvia where 53% of researchers in the Business Enterprise Sector are women, their share is highest, although only around 40%, in Romania, Bulgaria and Croatia. In sum, regardless of the sector, Japan systematically shows the lowest proportion of female researchers and within the EU-27 it is Germany that systematically reports among the lowest shares of female researchers. Latvia, Lithuania, Portugal, and Romania (but also Croatia for the non EU-27 members) are always among the countries with the highest proportions of women in research.

**On average in the EU-27, women represent 40% of all researchers in the Higher Education Sector, 40% in the Government Sector but merely 19% in the Business Enterprise Sector and the degree of cross-country disparity is largest in the Business Enterprise Sector.**



**Figure 1.9:** Proportion of female researchers by sector, 2009

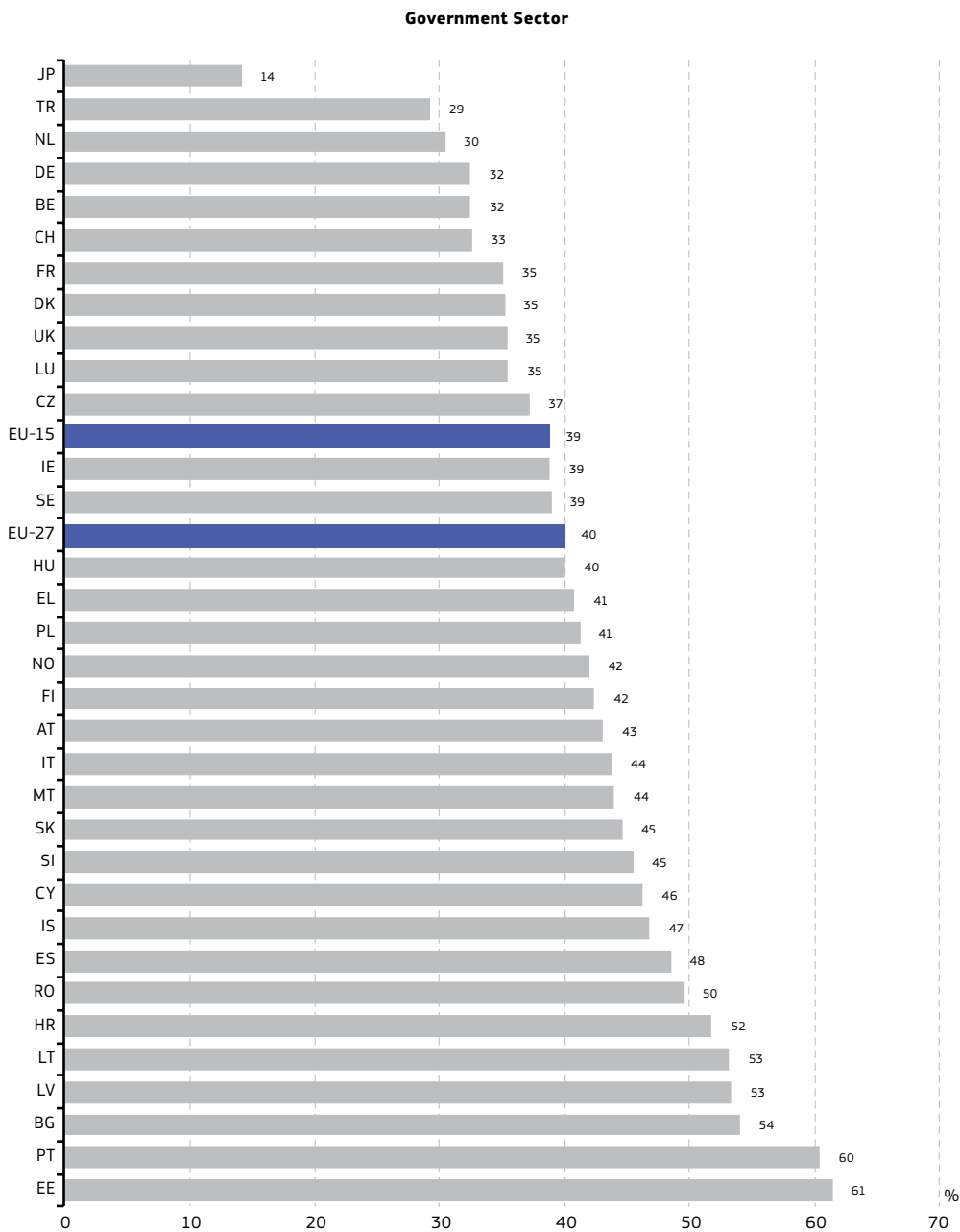
Exceptions to the reference year: CH, JP: 2008; EL: 2007 (BES); EL: 2005 (HES & GOV).

Data unavailable: EU-25, MK, IL, US.

Data estimated: EU-27, EU-15; UK (BES); IE (HES).

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_femres](#)).

**Figure 1.9:** Proportion of female researchers by sector, 2009 (continued)

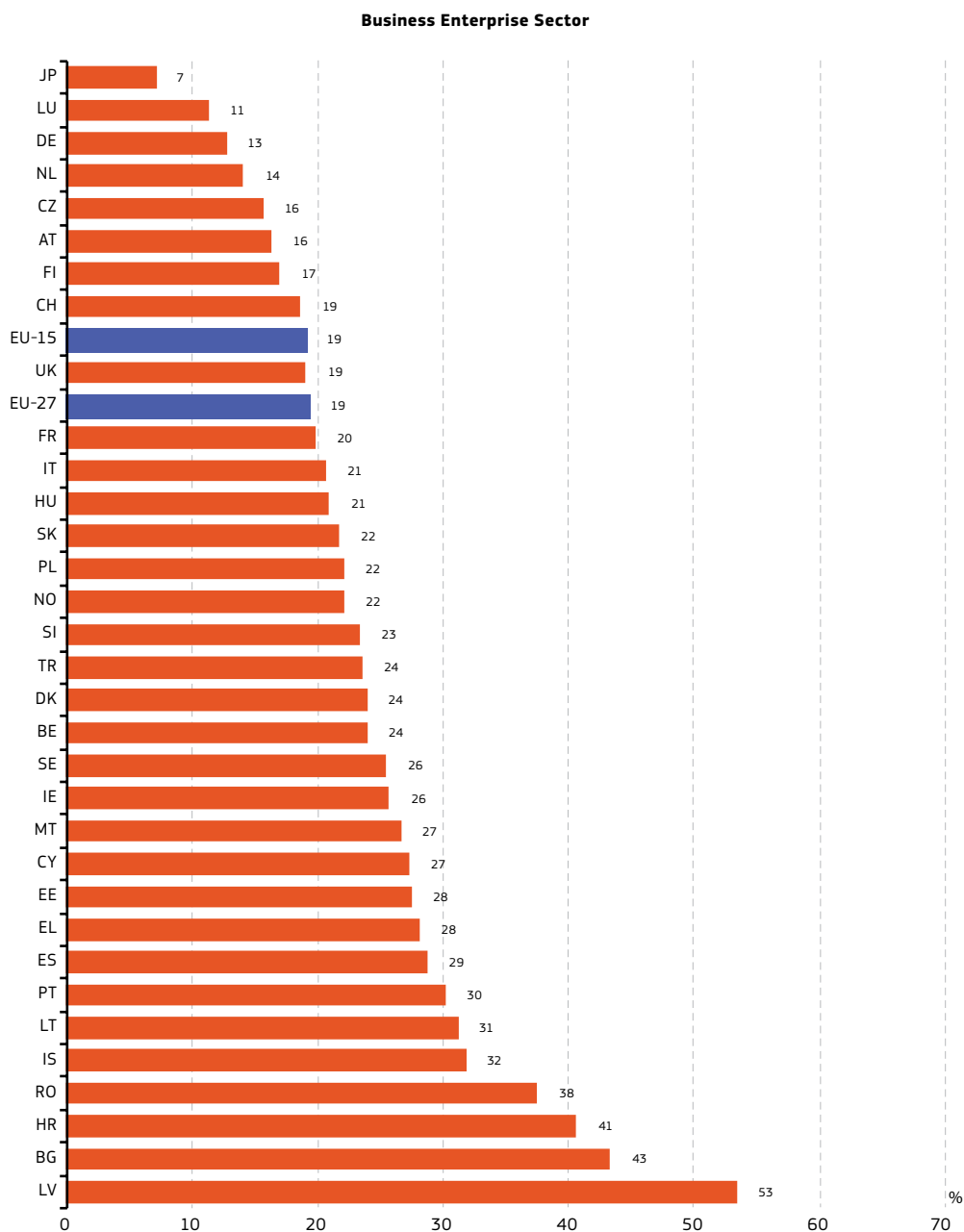
Exceptions to the reference year: CH, JP: 2008; EL: 2007 (BES); EL: 2005 (HES & GOV).

Data unavailable: EU-25, MK, IL, US.

Data estimated: EU-27, EU-15; UK (BES); IE (HES).

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_femres](#)).

**Figure 1.9:** Proportion of female researchers by sector, 2009 (continued)

Exceptions to the reference year: CH, JP: 2008; EL: 2007 (BES); EL: 2005 (HES & GOV).

Data unavailable: EU-25, MK, IL, US.

Data estimated: EU-27, EU-15; UK (BES); IE (HES).

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_femres](#)).

## Private Non-Profit Sector has a certain importance only in Italy, Portugal and Cyprus

Figure 1.10 presents the distribution of male and female researchers across four broad sectors of activity for the year 2009: the Higher Education Sector, the Government Sector, the Business Enterprise Sector and the Private Non-Profit Sector. It confirms the trends highlighted by Figure 1.9 and compares the share of female and male researchers across the economic sectors. Figures 1.11, 1.12 and 1.13 add valuable information as they show the rate at which the numbers of male and female researchers have been increasing (or decreasing) on an average annual basis between 2002 and 2009 in each of three broad economic sectors (HES, GOV and BES). Both Figure 1.9 and 1.10 show that, in most countries, women are more likely than men to opt for employment in the Higher Education and Government Sectors. These sectors are in contrast with the Business Enterprise Sector, which is more likely to be chosen by men. On average throughout the EU-27, the respective shares of female and male researchers in the Higher Education Sector stood at 66% and 48% in 2009. In the EU-27, 12% of female researchers and 9% of male researchers were employed in the Government Sector. As mentioned above, in the EU-27, the Business Enterprise Sector employed a higher proportion of male researchers than female researchers, with an average of 42% and 21% respectively in 2009. The Private Non-Profit Sector employs a share of researchers that is worth mentioning only in Italy, Portugal, and Cyprus with 6-7% of female researchers and 3-7% of male researchers in 2009.

## Gender imbalance across broad economic sectors has been levelling out over recent years

As shown in Figures 1.11, 1.12 and 1.13, it appears that gender imbalance in the research population in three broad economic sectors, HES, GOV and BES, has been levelling out over recent years.

## The Higher Education Sector: Higher growth in the number of female researchers contributes to closing the gender gap

In the Higher Education Sector, where 40% of researchers are women in 2009, the compound annual growth rate in the number of female researchers has been stronger than that of men over the period 2002–2009 in most countries (31 out of 33). The opposite was observed only in 2 countries, Luxembourg and Latvia, but with almost identical growth rates for women and men in the latter country. In Luxembourg, the compound annual growth rate over 2002–2009 of male researchers stood at 53% and that of female researchers at 45%. These extremely high figures should be interpreted in light of the creation of the University of Luxembourg in 2003. Throughout the EU-27, the average annual growth rate for female researchers has stood at 5.5%, compared with 3.5% for male researchers. Growth rates for both female and male researchers are extremely variable between countries: Luxembourg aside, they range from 19% for women and 16% for men in Portugal to levels close to zero for women or negative even for men in Hungary, Sweden and Poland. We may nevertheless conclude that there is a move towards a more gender-balanced research population in higher education: the proportion of female researchers in the Higher Education Sector increased from 35% in 2002 to 37% in 2006 and to 40% in 2009.

## The Government Sector: negative growth in the number of researchers in five countries but an overall trend towards a narrowing gender gap

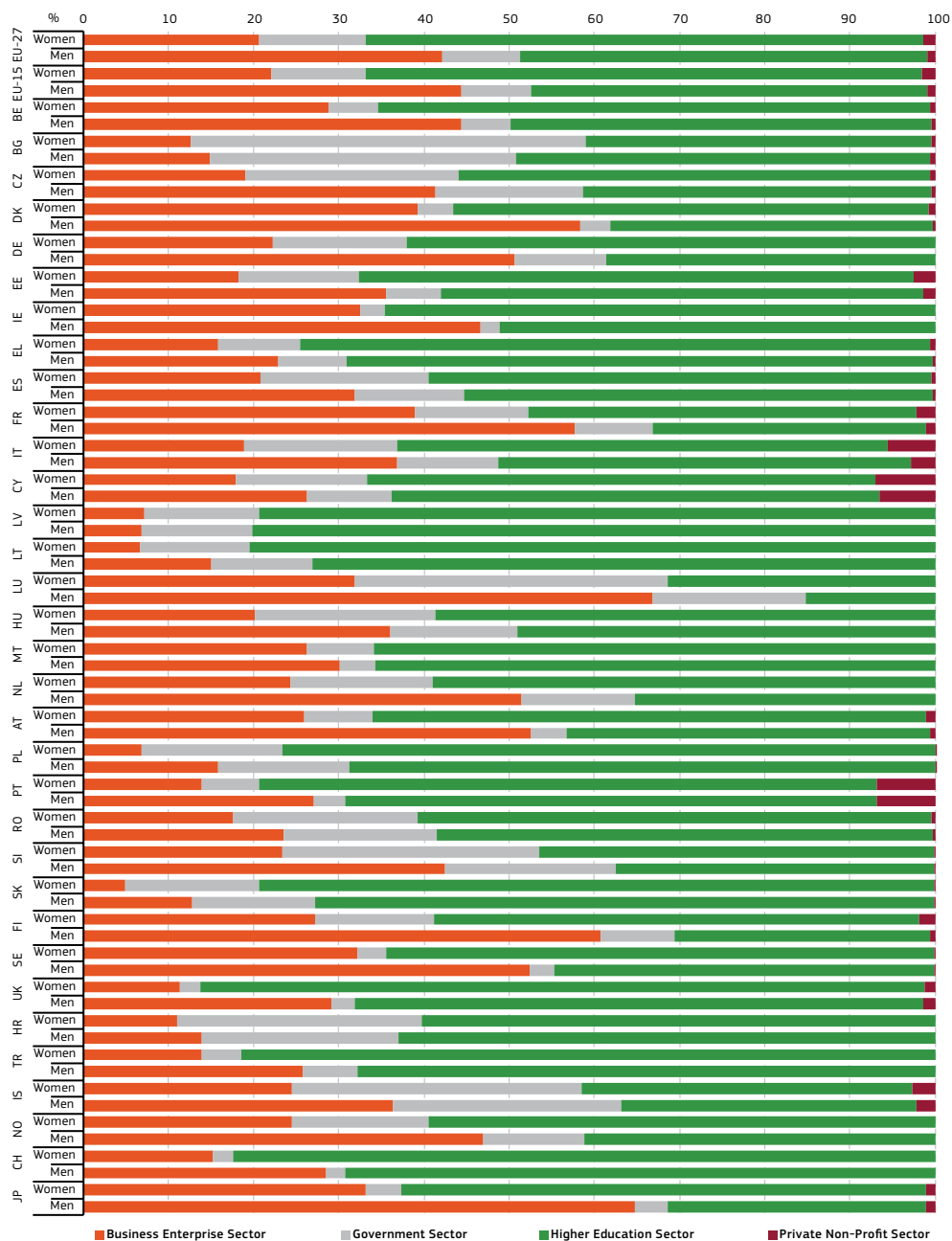
In the Government Sector the total number of researchers has decreased in a number of countries. This has been the case in Sweden, Denmark, Portugal, Croatia and Romania. However, the compound annual growth rate of female researchers has on average been higher than that of male researchers so that the share of female researchers in the government sector has increased from 36% in 2002 to 39% in 2006 and 40% in 2009. On average, in the EU-27, the number of female researchers has been growing at a pace of 4.3% per year compared with 1.7% for men. There are just two exceptions to this overall pattern. In Latvia, the growth rate of male researchers is marginally higher than that of women whereas in Malta the gap in favour of men is more sizable at 4.6 percentage points. Again, the cross-country distribution of growth rates is very wide, ranging from 12% for female researchers in Spain to –6% in Denmark and Sweden and from 10% for male researchers in Luxembourg to –7.5% in Sweden.

## Women in the Business Enterprise Sector moving towards greater equality in just over half of the countries

A decrease in the overall number of researchers was also observed in the Business Enterprise sector in five countries: Latvia, Romania, Switzerland, Slovakia and the UK. In this sector, where the proportion of female researchers is generally lower than that of men, the compound annual growth rate of female researchers has been stronger than that of men over the period 2002-2009 in 18 of the 33 countries under review. However, the closing of the gender gap is much slower in this sector as the share of female researchers increased by just one percentage point between 2002 (18%) and 2009 (19%). There is a high level of cross-country disparity in the pace at which the balancing out is taking place. For example, whereas in Portugal the respective compound annual growth rates for female and male researchers stood at 19.8% and 18.7% over the period 2002-2009, in Latvia, the number of female researchers decreased at a slower pace than the number of male researchers (-11.5% and -14.1% respectively). The opposite was observed in 14 countries, pointing towards a widening over time of the gender gap in the research population of the Business Enterprise Sector. These countries are Turkey, Poland, Hungary, France, Slovenia, the Czech Republic, Bulgaria, Romania, Switzerland, Luxembourg, Iceland, Greece, Lithuania, and Slovakia. Finally, in the UK, identical negative growth rates were noted for the male and female research populations.

**In the three broad economic sectors, although women still form a minority in 2009, the number of female researchers has increased more rapidly over the last decade than the number of male researchers.**

Figure 1.10: Distribution of researchers across sectors, by sex, 2009



Data unavailable: EU-25, MK, IL.

Exceptions to the reference year: EU-25, CH, JP: 2008; EL:2005; EL: 2007(BES).

Data estimated: EU-27, EU-15, UK (BES&PNP); IE (HES).

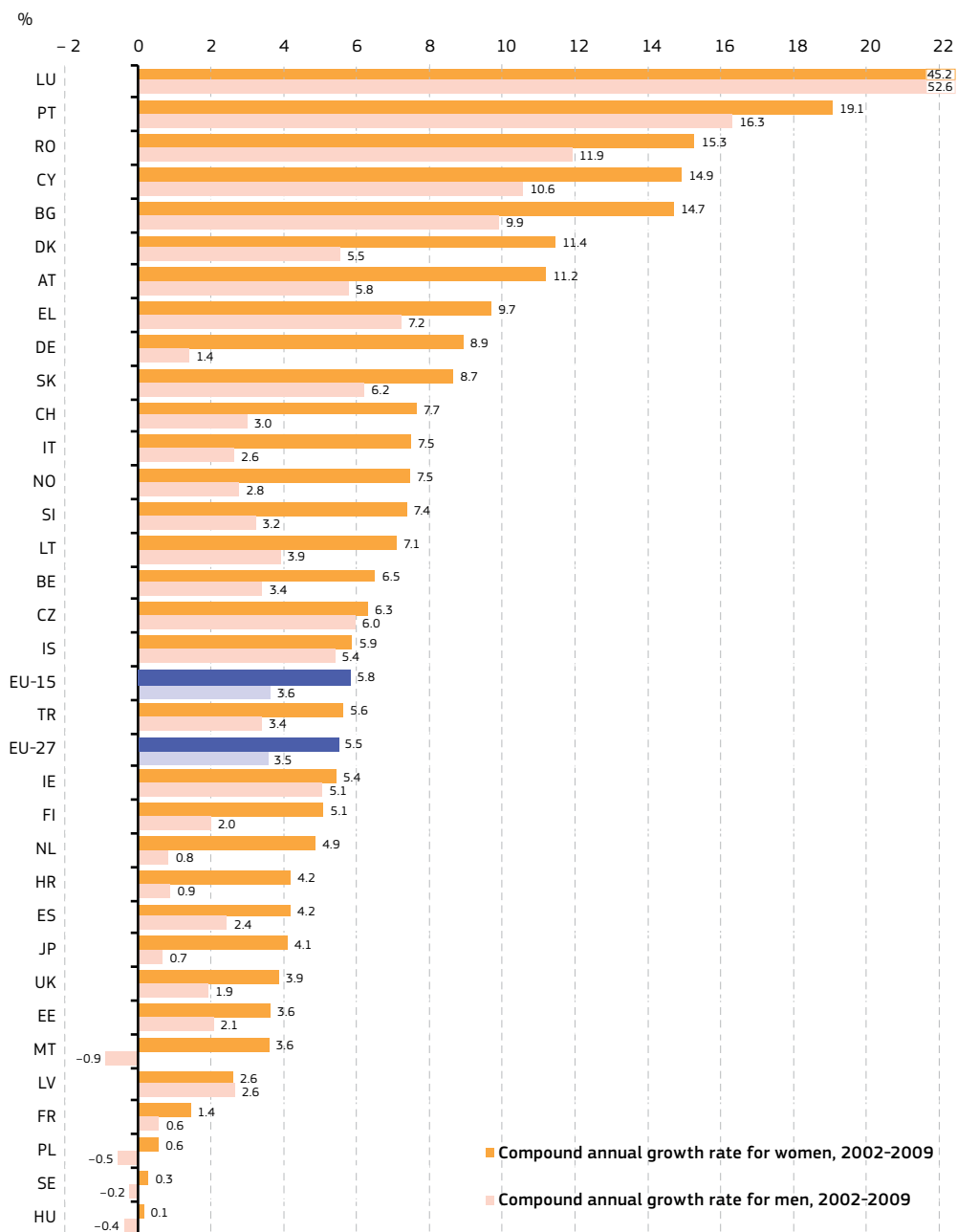
Confidential data: HR (PNP).

Others: Head count.

DE, IE, LV, LT, LU, HU, NL, TR, NO, CH: the distribution of researchers was calculated between HES, BES and GOV. No data available for PNP sector.

Source: Eurostat - Statistics on research and development (online data code: rd\_p\_persocc).

**Figure 1.11:** Compound annual growth rate for researchers in the Higher Education Sector (HES), by sex, 2002–2009



Exceptions to the reference years: CH, JP: 2002-2008; DE, LU, PL, SE, IS, NO: 2003-2009; EL: 2003-2005; FI: 2004-2009; UK: 2005-2009.

Data unavailable: EU-25, MK, IL, US.

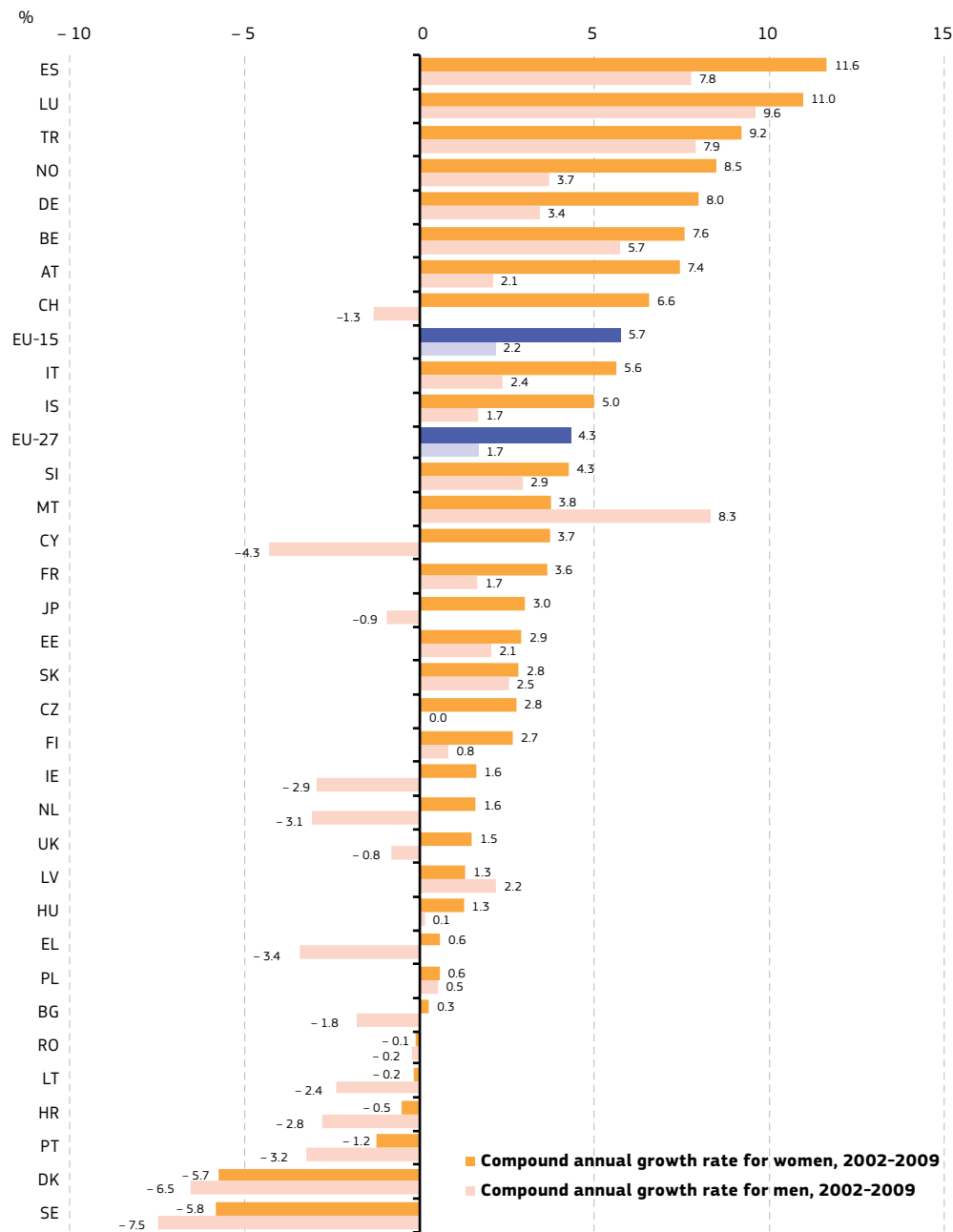
Break in series: DK, FR (2002).

Data estimated: EU-27, EU-15; PT, CH: 2002; LU: 2003; IE: 2009.

Others: Head count.

Source: Eurostat – Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).

**Figure 1.12:** Compound annual growth rate for researchers in the Government Sector (GOV), by sex, 2002–2009



Exceptions to the reference years: CH, JP: 2002-2008; DE, NL, PL, SE, IS, NO: 2003-2009; EL: 2003-2005; FI: 2004-2009.

Data unavailable: EU-25, MK, IL, US.

Break in series: DK, FR: 2002; NL: 2003.

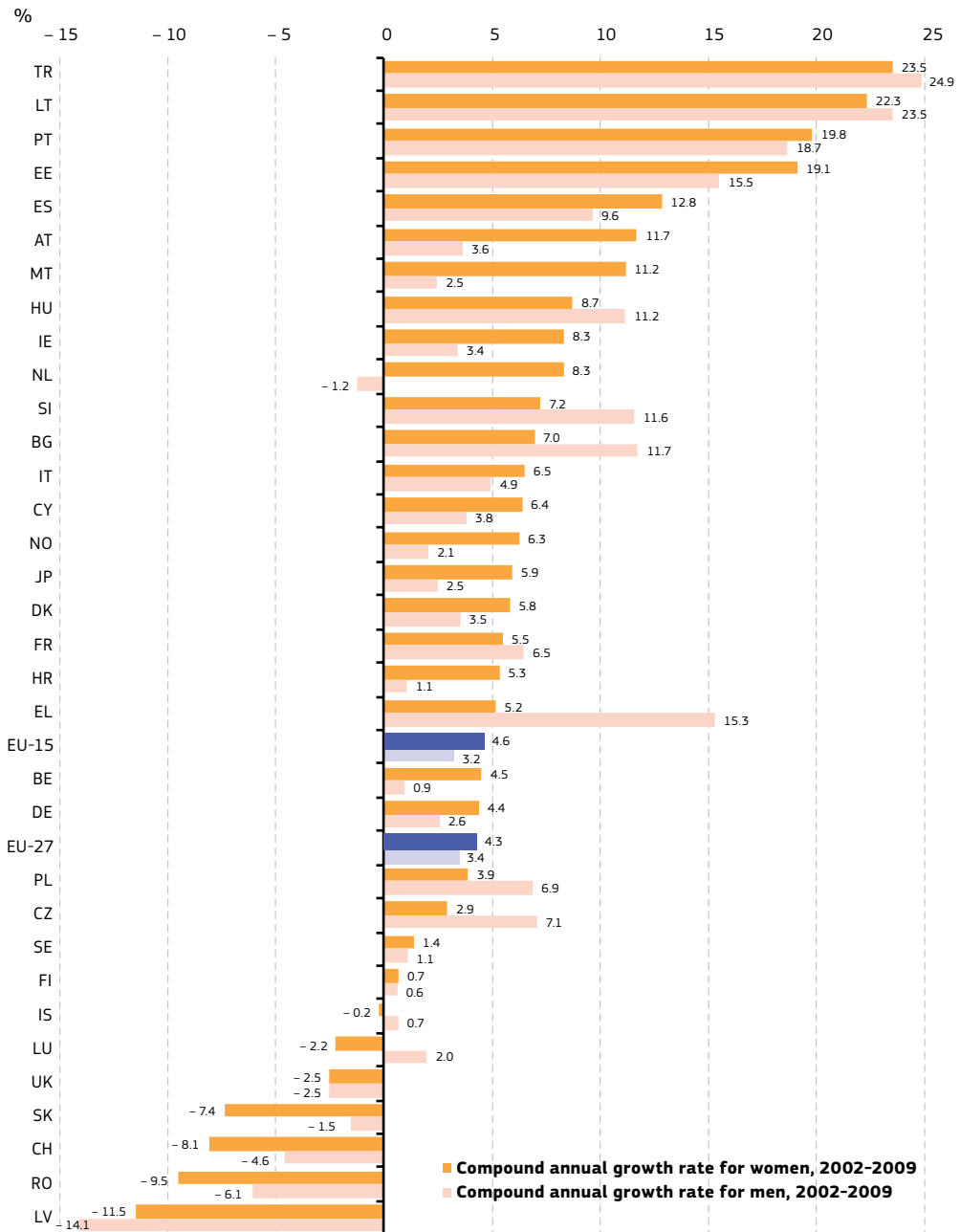
Data estimated: EU-27, EU-15; PT: 2002.

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: rd\_p\_persocc).



**Figure 1.13:** Compound annual growth rate for researchers in the Business Enterprise Sector (BES), by sex, 2002–2009



Exceptions to the reference years: JP: 2002-2008; DE, LU, NL, PL, SE, IS, NO: 2003-2009; EL: 2003-2007; MT, FI, CH: 2004-2008; UK: 2005-2009.

Data unavailable: MK, IL, US.

Break in series: DK, ES: 2002; MT: 2004.

Data estimated: EU-27, EU-15, UK; LU: 2002; PT: 2002.

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).

## The gender gap in the research population by age group: highest for the under 35s and over 55s

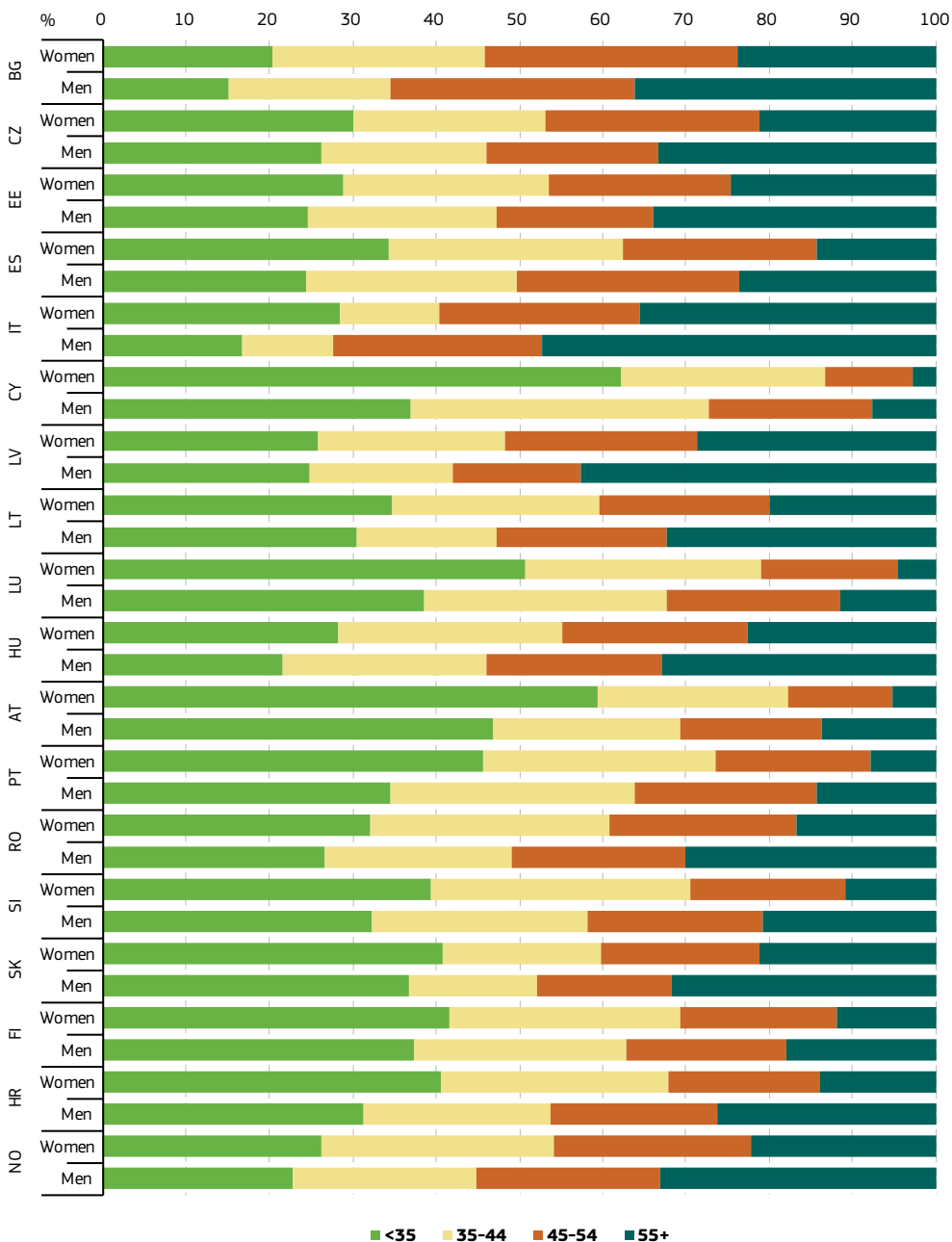
The picture of women in research is further completed by Figures 1.14 and 1.15, which analyse male and female researchers according to their belonging to 4 different age groups (<35 years, 35-44 years, 45-54 years, and 55+ years). Figure 1.14 does this for the Higher Education Sector and Figure 1.15 for the Government Sector. In both of these large economic sectors, the greatest gender differences are in most countries observed in the two extreme age classes, among the youngest researchers aged under 35 and among those above 55 years of age. Women outnumber men in the youngest age group, with the exception of Cyprus and Latvia in the Government sector, while the opposite was observed for researchers above 55 years of age. Clearly, these figures illustrate the workings of a generation effect.

**A generation effect is at work as the gender imbalance in the research population increases with age**

### Part-time often prevents advancing in careers

Because of data limitations the analysis carried out in this chapter is based on headcount measures of employment, so that variations in working hours are not accounted for. However, part-time employment could be a major determinant of the high level of gender segregation that characterises the research population and that is further analysed in chapters 2 and 3. In particular, part-time jobs are often behind vertical segregation as they slow down or prevent women from advancing their careers and getting promoted to high-responsibility positions in research.

**Figure 1.14:** Distribution of researchers in the Higher Education Sector (HES), by sex and age group, 2009



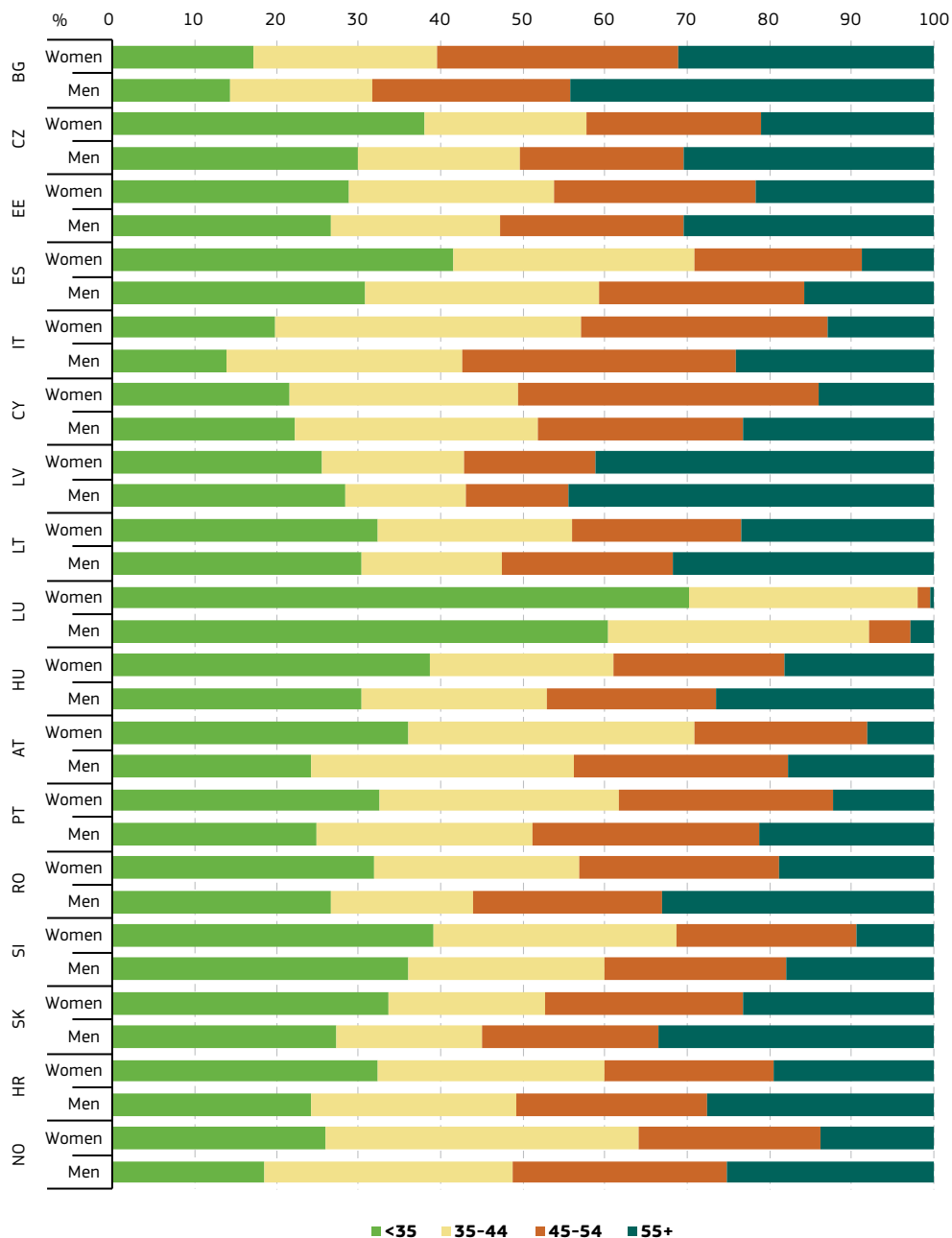
Exceptions to the reference year: CZ, LU: 2006; PL: 2005.

Data unavailable: EU-27, EU-25, EU-15, BE, DK, DE, IE, EL, FR, MT, NL, PL, SE, UK, MK, TR, IS, CH, IL, JP, US.

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_page](#)).

**Figure 1.15:** Distribution of researchers in the Government Sector (GOV), by sex and age group, 2009



Exceptions to the reference year: LU: 2007; CZ: 2006.

Data unavailable: EU-27, EU-25, EU-15, BE, DK, DE, IE, EL, FR, MT, NL, PL, FI, SE, UK, MK, TR, IS, CH, IL, JP, US.

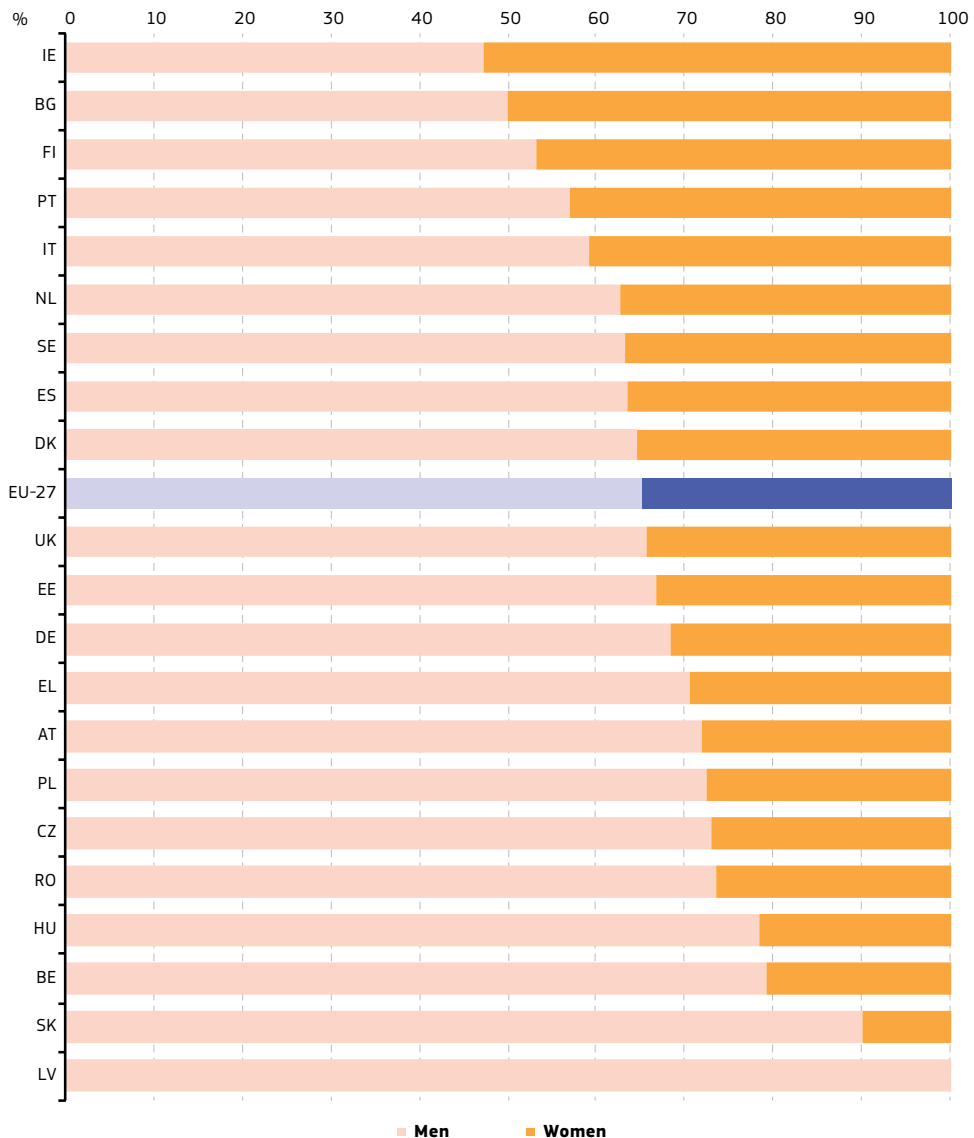
Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_persage](#)).

## Researchers' mobility: women more mobile only in Ireland

Another important requirement associated with scientific employment is mobility. Figure 1.16 shows that between 2006 and 2009 female researchers have generally been less mobile than male researchers, mobility being defined as having moved abroad for a period of at least three months in the last three years. The only exceptions are Ireland, where the share of mobile researchers in the female population was 5 percentage points above that of male mobile researchers, and Bulgaria, where equal shares of female and male researchers have moved abroad for at least three months over the period 2006–2009. The gender gap in mobility varies widely in the remaining countries, from 7 percentage points in Finland to 100 percentage points in Latvia where mobility of the female research population has been zero over recent years.

**Figure 1.16:** Share of mobile researchers<sup>(1)</sup> by gender, 2009



Data unavailable: EU-25, EU-15, FR, CY, HR, TR, IS, NO, CH, IL, JP, US.

Others: LT, LU, MT, SI: data not shown due to the small sample size (less than 40 respondents).

<sup>(1)</sup> Mobile researchers are defined as those who have moved from the country of their highest graduation to work as a researcher for at least three months in the last three years in another country.

Source: MORE Survey (Mobility Patterns and Career Paths of EU Researchers).

**Summary of key findings regarding women's relative representation in research**

On average in the EU-27, women represent 40 % of all researchers in the Higher Education Sector, 40 % in the Government Sector but merely 19 % in the Business Enterprise Sector. The degree of cross-country disparity is larger in the Business Enterprise Sector than in the Higher Education and Government Sector. The Private Non-Profit Sector employs a share of researchers that is worth mentioning only in Italy, Portugal, and Cyprus in 2009.

The gender imbalance across broad economic sectors has been levelling out over recent years. There is a straightforward move towards a more gender-balanced research population in the higher education sector. In the Government Sector, the total number of researchers has decreased in a number of countries but in most countries women's presence has been strengthening over recent years. A decrease in the overall number of researchers was also observed in the Business Enterprise sector in five countries. In this sector, where the proportion of female researchers is generally lower than that of men, there also seems to be a move towards greater equality in the majority of countries under review although there is a high level of cross-country disparity in the level at which this balancing out is taking place.

A generation effect is at work as the gender imbalance in the research population increases with age. Besides age, part-time jobs and mobility are possible explanations for gender differences in scientific employment.

**Annex 1.1:** Number of researchers by sex, 2002–2009

	2005		2006		2007		2008		2009	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
BE	14 413	34 344	15 098	34 155	15 927	35 351	17 597	37 027	18 270	37 588
BG	5 429	6 491	5 367	6 666	6 120	6 970	6 310	7 106	7 000	7 699
CZ	10 827	26 715	11 295	28 381	12 034	30 504	12 613	31 627	12 437	30 655
DK	12 908	30 552	:	:	12 990	30 002	:	:	16 747	35 821
DE	86 733	319 520	:	:	101 696	336 084	:	:	120 511	364 055
EE	2 337	3 397	2 636	3 585	3 027	3 799	3 013	4 213	3 166	4 287
IE	5 349	12 304	5 809	12 783	6 210	13 170	6 819	14 261	7 122	14 271
EL	12 147	21 249	:	:	:	:	:	:	:	:
ES	66 418	114 605	70 830	122 194	76 289	129 901	81 599	136 117	84 352	136 962
FR	70 347	181 252	73 763	195 181	77 439	201 086	79 161	210 131	79 557	216 139
IT	40 610	84 924	45 729	91 434	47 082	94 796	:	:	50 525	98 789
CY	464	960	482	1 015	500	1 032	522	1 043	603	1 093
LV	2 963	2 785	3 418	3 782	4 101	3 722	4 071	3 376	3 312	3 012
LT	5 798	6 120	5 926	6 087	6 754	6 639	6 954	6 564	7 035	6 792
LU	445	1 998	:	:	595	1 875	:	:	626	2 325
HU	10 731	20 676	10 973	21 813	11 077	21 982	11 139	22 600	11 323	23 944
MT	255	717	274	774	250	746	301	786	278	667
NL	12 150	45 632	:	:	13 828	46 278	:	:	14 104	40 401
AT	:	:	12 541	37 056	14 172	39 418	:	:	16 877	42 464
PL	38 426	59 449	38 065	58 309	38 802	58 487	38 509	58 965	38 794	59 371
PT	16 757	21 012	19 554	25 052	22 350	29 093	32 301	42 772	39 563	46 806
RO	13 409	16 199	12 682	15 955	13 745	16 995	13 817	17 047	13 707	16 938
SI	2 659	4 985	2 918	5 352	3 049	5 693	3 551	6 573	3 724	6 720
SK	7 268	10 258	7 856	10 960	8 188	11 187	8 383	11 431	9 272	12 560
FI	15 349	35 424	16 808	36 465	16 824	36 596	16 958	38 237	17 530	38 267
SE	29 494	53 002	:	:	24 942	46 113	:	:	25 984	46 708
UK	130 074	234 733	:	:	138 634	238 576	:	:	146 211	239 278
HR	4 619	5 748	4 595	5 833	4 954	6 155	5 424	6 491	5 620	6 488
TR	30 239	53 617	32 686	57 432	37 401	64 560	38 832	67 591	41 528	72 908
IS	1 501	2 320	1 654	2 636	1 506	2 473	1 574	2 584	1 694	2 440
NO	11 560	24 995	:	:	13 858	27 469	14 892	28 807	15 770	28 992
CH	:	:	:	:	:	:	13 846	32 028	:	:
JP	102 948	758 953	108 547	766 143	114 942	768 444	116 106	774 563	:	:

Data unavailable: EU-27, EU-25, EU-15, MK, IL, US.

Break in series: DK: 2007; SI: 2008; SE: 2005, 2007.

Data estimated: IE: 2007 (men), 2009; LU: 2007; PT: 2006; UK: 2005, 2007, 2009.

Others: ':' not available.

Head count.

Source: Eurostat – Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).

**Annex 1.2:** Number of researchers in the Higher Education Sector (HES), by sex, 2002–2009

	2005		2006		2007		2008		2009	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
BE	9 437	16 622	9 998	16 831	10 580	17 422	11 262	18 083	11 835	18 519
BG	1 451	2 443	1 446	2 463	2 022	2 895	2 210	3 095	2 839	3 736
CZ	5 633	11 148	5 949	11 222	6 493	12 175	6 619	12 391	6 878	12 541
DK	5 591	10 091	5 919	10 151	6 106	10 222	:	:	9 359	13 569
DE	52 272	122 351	57 968	126 404	62 675	128 936	67 381	130 470	74 816	140 658
EE	1 583	2 035	1 763	2 183	1 987	2 333	2 000	2 357	2 062	2 423
IE	3 630	5 870	3 862	6 216	4 070	6 530	4 493	7 117	4 605	7 295
EL	9 106	14 878	:	:	:	:	:	:	:	:
ES	41 376	67 447	43 318	69 757	45 959	72 810	47 689	74 478	49 790	75 340
FR	36 704	70 652	37 538	71 225	37 425	71 003	37 705	71 508	36 250	69 258
IT	24 311	45 876	25 721	46 683	26 482	47 257	27 507	47 433	29 170	47 915
CY	270	537	276	554	293	578	295	580	360	626
LV	2 259	2 109	2 533	2 412	2 889	2 523	2 985	2 683	2 631	2 417
LT	4 524	4 600	4 632	4 604	5 412	4 783	5 528	4 797	5 663	4 970
LU	54	151	67	192	75	212	124	243	197	353
HU	6 979	12 107	6 928	12 000	6 857	11 688	6 840	11 741	6 644	11 751
MT	181	495	191	523	179	530	214	554	183	438
NL	6 917	13 837	7 124	13 728	7 292	13 731	7 765	13 912	8 321	14 236
AT	:	:	8 190	15 419	9 465	16 502	:	:	10 965	18 074
PL	29 652	42 609	29 171	41 160	29 607	41 116	29 379	40 992	29 744	40 848
PT	10 025	11 359	11 383	12 661	12 741	13 962	21 497	24 959	28 715	29 166
RO	4 701	6 791	6 436	8 161	7 417	9 093	7 858	9 721	8 279	9 858
SI	1 291	2 273	1 374	2 235	1 348	2 275	1 619	2 545	1 723	2 508
SK	5 268	6 981	5 832	7 547	6 177	7 741	6 381	8 002	7 359	9 126
FI	8 088	10 407	9 226	11 141	9 471	11 099	9 612	11 036	9 987	11 463
SE	16 882	18 060	:	:	15 510	19 652	:	:	16 712	20 854
UK	106 839	148 210	:	:	116 018	155 342	:	:	124 310	159 967
HR	2 884	3 724	2 857	3 727	3 214	4 102	3 434	4 322	3 389	4 077
TR	25 968	41 536	27 770	43 249	31 654	47 466	32 308	47 875	33 802	49 479
IS	543	706	606	775	559	702	584	734	658	846
NO	7 121	10 966	:	:	8 349	11 463	8 877	11 713	9 392	11 923
CH	:	:	9 455	20 185	:	:	11 408	22 195	:	:
JP	63 407	232 069	66 584	234 609	68 738	233 754	71 402	234 445	:	:

Data unavailable: EU-27, EU-25, EU-15, MK, IL, US.

Break in series: DK: 2007; IT: 2005; SE: 2005.

Data estimated: IE: 2007 (men), 2009; LU: 2007; PT: 2006.

Others: ':' not available.

Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).



**Annex 1.3:** Number of researchers in the the Government Sector (GOV), by sex, 2002–2009

	2005		2006		2007		2008		2009	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
BE	789	1 722	780	1 787	820	1 833	998	2 094	1 056	2 195
BG	3 263	3 209	3 308	3 185	3 417	3 023	3 323	2 933	3 249	2 766
CZ	3 073	5 566	3 374	5 919	3 398	5 886	3 573	6 038	3 126	5 286
DK	1 131	1 973	1 256	2 026	703	1 266	:	:	697	1 284
DE	12 795	32 103	14 223	33 560	15 093	34 416	16 720	36 749	18 852	39 246
EE	370	252	443	293	444	296	455	299	444	279
IE	162	295	204	341	211	327	256	371	207	326
EL	1 190	1 726	:	:	:	:	:	:	:	:
ES	13 135	15 077	13 019	14 938	14 080	16 184	15 677	16 976	16 618	17 659
FR	9 112	18 559	9 094	18 347	9 720	18 989	10 141	19 065	10 693	19 794
IT	7 500	11 318	10 207	12 964	9 442	12 128	9 008	11 377	9 080	11 667
CY	98	124	99	135	99	126	99	125	93	108
LV	427	346	569	693	620	758	529	491	447	391
LT	997	881	934	825	908	786	891	789	909	800
LU	132	299	167	315	199	344	:	:	230	418
HU	2 371	3 842	2 367	3 850	2 304	3 637	2 198	3 552	2 391	3 582
MT	15	19	21	26	11	14	23	19	22	28
NL	2 299	5 501	2 363	5 721	2 425	5 619	2 280	5 523	2 353	5 383
AT	:	:	1 095	1 694	1 094	1 689	:	:	1 355	1 790
PL	5 691	8 403	6 002	8 509	6 228	8 728	5 892	9 046	6 367	9 095
PT	3 168	2 434	2 950	2 155	2 731	1 876	2 679	1 742	2 673	1 751
RO	4 077	3 190	2 923	2 941	3 063	3 037	3 332	3 209	2 975	3 035
SI	795	1 051	858	1 115	945	1 249	1 090	1 372	1 124	1 348
SK	1 215	1 630	1 262	1 677	1 460	1 839	1 486	1 788	1 461	1 814
FI	2 356	3 266	2 443	3 260	2 463	3 251	2 437	3 250	2 444	3 318
SE	1 775	2 996	:	:	1 149	1 694	:	:	862	1 355
UK	3 456	6 732	3 149	6 587	3 451	6 530	3 444	6 388	3 471	6 350
HR	1 399	1 442	1 426	1 499	1 357	1 377	1 427	1 424	1 609	1 498
TR	1 481	3 919	1 606	3 862	1 656	4 130	1 688	4 004	1 939	4 693
IS	446	580	502	637	467	577	488	603	576	654
NO	1 699	2 843	:	:	2 188	3 277	2 264	3 256	2 511	3 471
CH	:	:	280	700	:	:	337	697	:	:
JP	4 600	32 075	4 791	31 477	4 928	30 690	4 946	30 138	:	:

Data unavailable: EU-27, EU-25, EU-15, MK, IL and US.

Break in series: DK: 2007; SE: 2005, 2007.

Data estimated: DE: 2007 (men); IE: 2007 (men); PT: 2006 (men).

Others: ':' not available.

Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).

**Annex 1.4:** Number of researchers in the Business Enterprise Sector (BES), by sex, 2002-2009

	2005		2006		2007		2008		2009	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
BE	4 080	15 847	4 204	15 381	4 408	15 934	5 215	16 662	5 260	16 682
BG	611	640	551	949	612	979	723	1 024	878	1 146
CZ	2 083	9 939	1 942	11 158	2 114	12 357	2 386	13 085	2 359	12 691
DK	6 048	18 216	:	:	5 988	18 331	:	:	6 571	20 868
DE	21 666	165 066	:	:	23 927	172 733	:	:	26 843	184 152
EE	338	1 064	358	1 042	527	1 099	495	1 491	578	1 522
IE	1 557	6 139	1 743	6 226	1 929	6 313	2 070	6 773	2 310	6 650
EL	1 780	4 577	:	:	1 939	4 946	:	:	:	:
ES	11 712	31 915	14 190	37 083	15 960	40 545	17 942	44 299	17 588	43 528
FR	22 747	89 519	25 266	103 108	28 578	108 561	29 527	117 213	30 922	124 710
IT	6 392	25 093	6 904	28 446	8 380	32 402	:	:	9 493	36 364
CY	71	246	76	269	77	267	95	282	108	287
LV	277	329	316	676	592	441	557	202	234	204
LT	277	639	360	658	434	1 070	535	978	463	1 022
LU	259	1 548	:	:	321	1 319	:	:	199	1 554
HU	1 381	4 727	1 678	5 963	1 916	6 657	2 101	7 307	2 288	8 611
MT	59	203	62	225	60	202	64	213	73	201
NL	2 934	26 294	:	:	4 111	26 928	:	:	3 430	20 782
AT	:	:	3 109	19 806	3 505	21 110	:	:	4 362	22 320
PL	3 029	8 374	2 830	8 578	2 937	8 599	3 221	8 909	2 675	9 419
PT	1 636	4 550	2 986	7 336	4 335	10 122	5 397	12 809	5 475	12 651
RO	4 515	6 129	3 269	4 767	3 193	4 778	2 579	4 044	2 400	3 989
SI	569	1 634	680	1 980	751	2 150	834	2 641	871	2 851
SK	782	1 632	759	1 723	549	1 595	514	1 628	448	1 610
FI	4 630	21 492	4 849	21 817	4 606	22 002	4 611	23 733	4 776	23 249
SE	10 701	31 775	:	:	8 245	24 687	:	:	8 373	24 446
UK	18 312	77 349	18 336	77 453	17 507	73 950	16 824	71 067	16 521	69 786
HR	333	573	311	605	383	676	561	738	619	902
TR	2 790	8 162	3 310	10 321	4 091	12 964	4 836	15 712	5 787	18 736
IS	464	975	492	1 166	430	1 145	449	1 197	414	888
NO	2 740	11 186	:	:	3 321	12 729	3 751	13 838	3 867	13 598
CH	:	:	:	:	:	:	2 101	9 136	:	:
JP	33 791	485 569	35 976	491 124	40 017	495 104	38 443	501 148	:	:

Data unavailable: EU-27, EU-25, EU-15, MK, IL, US.

Break in series: DK: 2007; FR: 2006; SI: 2008; SE: 2005, 2007.

Data estimated: UK; LU: 2007.

Others: ':' not available.

Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).



## ***2. Scientific fields***

Girls are more successful at school as they obtain higher grades and are less likely than boys to repeat a year (European Commission 2008). In this sense, boys, not girls, are falling behind. However, sex segregation in fields of study persists despite the female advantage in graduation rates at all levels of study (Meulders et al. 2010; Barone 2011)<sup>(1)</sup>. Girls less frequently engage on science, engineering and technology paths, while boys opt less often for education, health and welfare and the humanities. This would not be a major issue were it not that male-dominated study fields are also generally those that offer more stable and rewarding professional opportunities (Xie and Shauman 2003; OECD 2006; Caprile and Vallès 2010)<sup>(2)</sup>. It is a striking fact that most studies focus on women and science whereas research aimed at a better understanding of the underrepresentation of men in education, health and the humanities is almost non-existent. However, the gendered pattern of study choice needs to be addressed by considering both sexes equally. The reasons why study field choices are gendered include stereotypes often found in children's books and school manuals; gendered attitudes of teachers, gendered advice and guidance on courses to be followed; different parental expectations regarding the future of girls and boys; and so forth (Xie and Shauman 2003; Meulders et al. 2010; Ecklund, Lincoln and Tansey 2012). As a result, some study fields but also some professions are thought of as feminine, others as masculine. If the aim is to change these trends and introduce more of a gender balance in all study fields as a basis for more gender equality on the labour market, then it is with respect to the entire set of factors upstream of the study orientations that genuine theoretical and political questioning should take place, and while doing so equal attention should be given to both girls' and boys' choices.

### Moving towards gender equality at the PhD level

In 2010, on average in the EU-27, 46% of all PhD graduates were women (Figure 2.1). In 9 countries, women accounted for more than half of all PhD graduates, reaching a maximum of 62% in Portugal. The lowest proportions of women among PhD graduates stretch down to 25% for Malta and 28% for Japan.

A second positive image is set forth by the growth rates as shown in Figure 2.2. In most countries the compound annual growth rate of female PhD graduates has exceeded that of men between 2002 and 2010. The only exceptions are the Former Yugoslav Republic of Macedonia, Latvia and Bulgaria. On average in the EU-27, the number of female PhD graduates increased at a rate of 3.7% per year compared with 1.6% for male PhD graduates.

The data for the period 2002-2010 mask the fact that the number of PhD graduates has followed a very different growth pattern in the two sub-periods 2002-2006 and 2006-2010. When we compute the compound annual growth rate between 2006 and 2010, a picture of negative growth or stagnation comes out. On average in the EU-27, between 2006 and 2010, the number of female PhDs has stagnated as the mean annual growth rate stood at 0.0% whereas the number of male PhDs has declined at an average annual rate of -0.8%. This is a very important finding that asks for a close monitoring over time. The slowdown in the growth rates of PhD graduates may possibly be an effect of the recent financial and economic crisis. Only future statistics will allow to ascertain or invalidate this assumption.

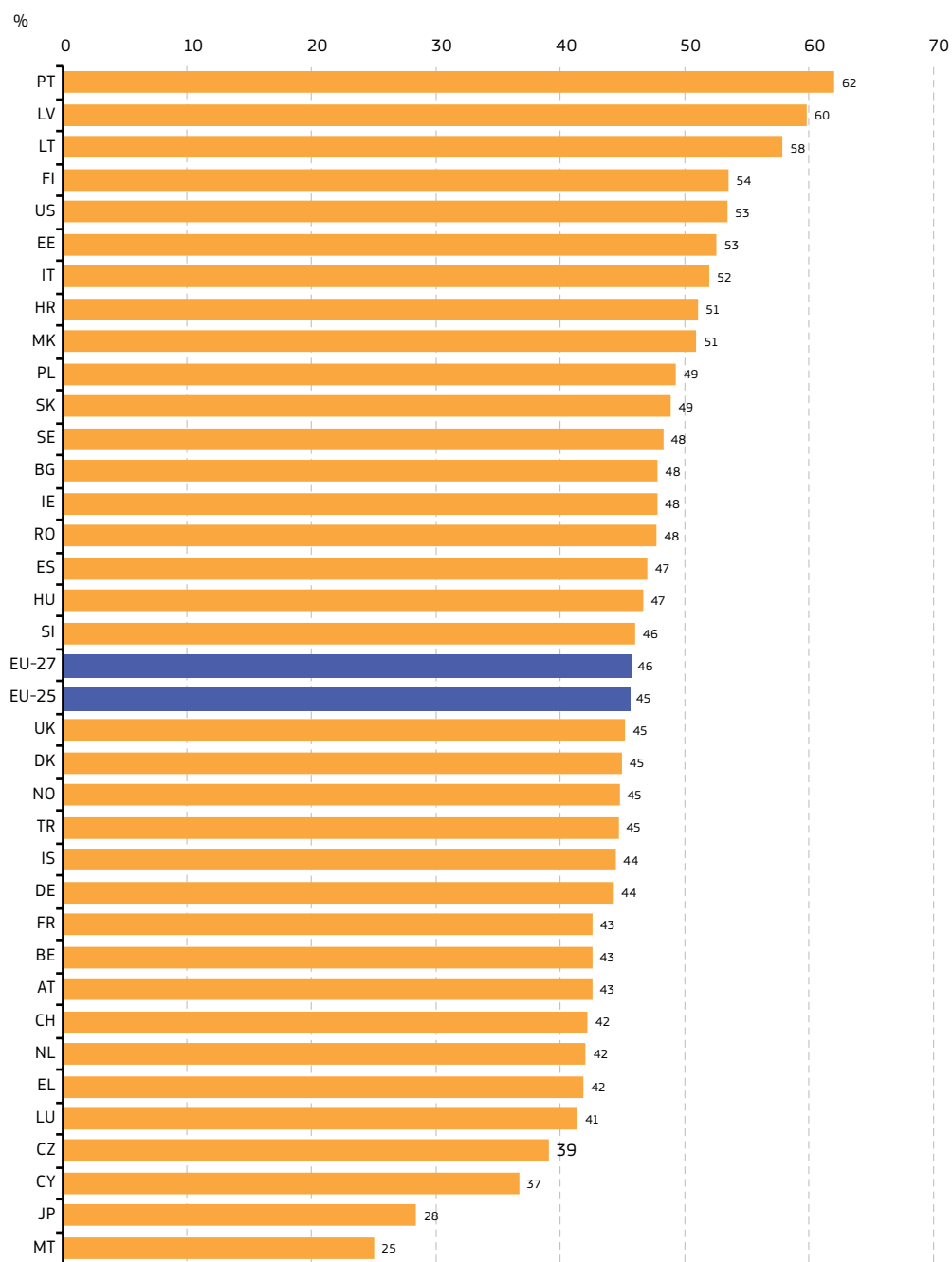
In Germany, Portugal, Sweden and Finland, the number of male PhD graduates has decreased over the whole period, between 2002 and 2010, whereas that of female PhDs has increased. Poland is the only country where the compound annual growth rate of female PhD graduates has been negative between 2002 and 2010.

Whereas the growth rates of PhD graduates between 2002 and 2010 were rather low (under 10%) in three quarters of the countries, they were much higher, especially for women, in Slovakia, Croatia, Makedonia, Ireland, Italy, Turkey, Estonia and Romania.

**At the PhD level, women are catching up with men in most countries although the pace has slowed down substantially since 2006.**

<sup>(1)</sup> Meulders, Danièle, Plasman, Robert, Rigo, Audrey and O'Dorchai, Síle (2010) "Horizontal and vertical segregation", Meta-analysis of gender and science research – Topic report, 123p., [http://www.genderandscience.org/doc/TR1\\_Segregation.pdf](http://www.genderandscience.org/doc/TR1_Segregation.pdf)  
Barone, Carlo (2011) "Some Things Never Change Gender Segregation in Higher Education across Eight Nations and Three Decades", *Sociology of Education*, vol. 84, n° 2, pp.157-176.

<sup>(2)</sup> Caprile, Maria and Vallès, Nuria (2010) "Science as a labour activity", Meta-analysis of gender and science research – Topic report, 89p., [http://www.genderandscience.org/doc/TR4\\_Labour.pdf](http://www.genderandscience.org/doc/TR4_Labour.pdf)  
Ecklund, Elaine Howard, Lincoln, Anne E. and Tansey, Cassandra (2012) "Gender Segregation in Elite Academic Science", *Gender & Society*, vol. 26, n° 5, pp. 693-717.  
OECD (2006) *Women in Scientific Careers: Unleashing the Potential*. OECD Publishing, 2006.  
Xie, Yu and Shauman, Kimberlee A. (2003) *Women in Science: Career Processes and Outcomes*. Cambridge, MA: Harvard University Press.

**Figure 2.1:** Proportion of female PhD (ISCED 6) graduates, 2010

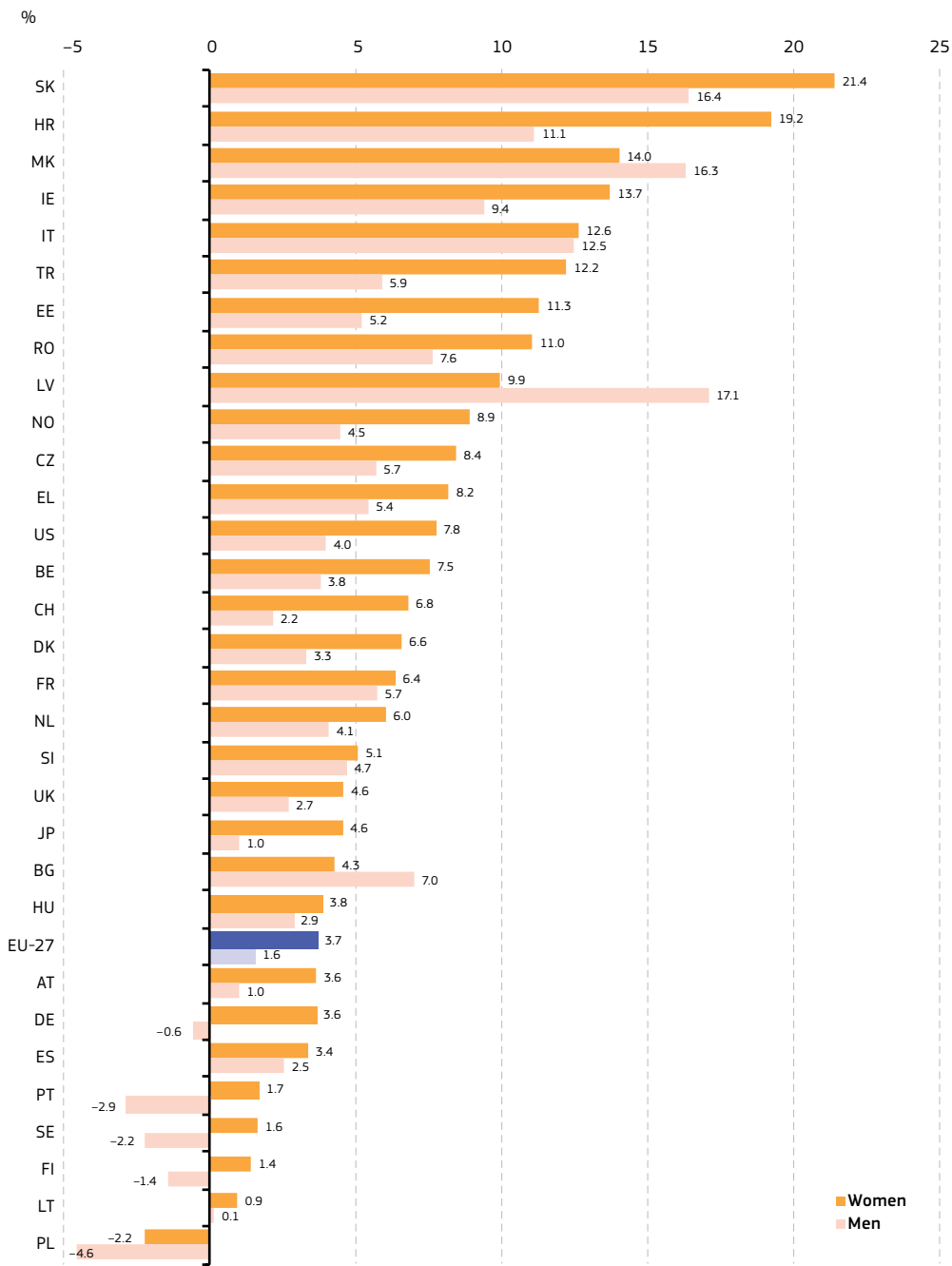
Exceptions to the reference year: FR: 2009.

Data unavailable: EU-15, IL.

Data estimated: EU-27, EU-25.

Source: Eurostat - Education Statistics (online data code: [educ\\_grad5](#)); IT - MIUR-Italian Ministry of Education (2009-2010).

**Figure 2.2:** Compound annual growth rate of PhD (ISCED 6) graduates, by sex, 2002-2010



Exceptions to the reference years: EE: 2007-2010; EL: 2004-2010; FR: 2003-2009; RO, HR: 2003-2010.

Data unavailable: EU-25, EU-15, IL.

Data estimated: EU-27.

Others: Compound annual growth rates not presented for countries with less than 30 graduates: CY, MT, IS.

LU: data available only for 2010.

Source: Eurostat - Education Statistics (online data code: [educ\\_grad5](#)); IT - MIUR-Italian Ministry of Education (2010).

## Male and female PhD graduates are unevenly distributed across the different fields of study

Table 2.1 shows that in 2010, on average throughout the EU-27, women accounted for 64% of all PhD graduates in education, 56% in health and welfare and 54% in the humanities. A more or less balanced gender composition is observed only in social sciences, business and law with 49% of women and in agricultural and veterinary sciences with 52% of women.

On the contrary, the fields of science, mathematics and computing and especially of engineering, manufacturing and construction are characterised by a strong gender imbalance. In the former, women constitute just 40% of PhD graduates and in the latter their share drops even lower to 26%. Anno 2010, science and engineering thus remains a very male-dominated study field.

The average figures for the EU-27 level out some very important cross-country variations. Although at first sight, the field of education appears to be entirely feminised in Iceland and Estonia, this is only due to very small sample sizes of PhD graduates in this field in these countries. Feminisation of the field of education is very pronounced also in Latvia, Portugal, Slovenia and Finland where only less than one in four PhD graduates in this field is male. When comparing the degree of masculinisation of engineering, manufacturing and construction cross-nationally, it appears that less than one in five PhD holders in this field is a woman in Japan (12%), Germany (15%), Slovenia (15%), and Luxembourg (17%). On the contrary, in Portugal, a gender balance characterises the field of engineering, with 50% of female PhD graduates. Portugal is clearly an exceptional case as all other countries have a long way to go still before reaching an equal share of women and men in engineering, manufacturing and construction. The proportion of female PhDs in this field is above 35% only in three countries: Latvia (36%), Lithuania (38%) and Turkey (39%).

**Education, health and welfare and the humanities remain female-dominated fields whereas science, mathematics and computing and especially engineering, manufacturing and construction continue to host mainly male PhDs**

**Table 2.1:** Proportion of female PhD (ISCED 6) graduates by broad field of study, 2010

	Education	Humanities & arts	Social sciences, business & law	Science, mathematics & computing	Engineering, manufacturing & construction	Agriculture & veterinary	Health & welfare
<b>EU-27</b>	64	54	49	40	26	52	56
<b>EU-25</b>	64	54	49	40	25	53	56
BE	56	41	47	37	30	48	58
BG	47	57	51	58	32	80	43
CZ	72	45	45	41	21	46	41
DK	0	53	46	35	29	55	58
DE	54	52	42	38	15	62	56
EE	100	76	57	43	32	67	59
IE	58	60	55	44	23	57	59
EL	52	54	47	35	27	45	49
ES	60	51	49	48	34	42	56
FR	55	58	46	39	27	54	47
IT	68	60	52	52	35	53	63
CY	50	100	17	42	0	0	0
LV	89	75	66	45	36	70	75
LT	:	59	69	62	38	69	53
LU	60	45	63	19	17	0	50
HU	66	52	47	40	35	40	56
MT	0	0	50	25	0	0	100
NL	:	48	47	35	22	46	53
AT	61	49	47	36	27	65	52
PL	:	52	52	54	27	57	64
PT	82	68	60	58	50	51	69
RO	30	53	54	45	30	49	62
SI	82	68	47	50	15	65	47
SK	74	59	51	49	31	39	58
FI	77	64	60	44	29	61	70
SE	71	54	53	41	31	56	63
UK	65	52	56	38	22	53	56
HR	50	59	52	56	32	50	54
MK	59	45	57	58	27	0	77
TR	38	36	40	49	39	50	62
IS	100	0	0	37	33	100	71
NO	0	44	41	33	33	71	56
CH	63	48	42	35	23	76	49
JP	49	49	38	23	12	29	30
US	67	49	58	41	24	44	74

Exceptions to the reference year: FR: 2009; IT: 2006; PL: 2009; RO: 2006 (Education).

Data unavailable: EU-15, IL.

Data estimated: EU-27, EU-25.

Others: ': not available.

Most tertiary students study abroad and are not included : CY.

Most PhD (ISCED 6) graduates study abroad and are not included: IS.

Source: Eurostat - Education Statistics (online data code: [educ\\_grad5](#)).



## In which study fields is it most common for men and women to obtain their PhD?

Figure 2.3 shows the distribution of female and male PhD graduates across these broad study fields for the year 2010. Whereas science, mathematics and computing is a field where the gender imbalance in PhD graduates is among the largest, alongside engineering (cfr. Table 2.1), it is interesting to see that it is also the field with the highest numbers of both male and female PhD graduates (32% of men and 26% of women).

The second largest share of female PhD graduates was found in health and welfare (24%), whereas the second largest share of male PhD graduates was found in engineering, manufacturing and construction (20%).

One fifth of female PhD graduates studied social sciences, business and law, 14% took humanities and arts, 8% were in engineering, manufacturing and construction, and 4% in agricultural and veterinary sciences. Whereas the proportion of female PhD graduates is highest in the field of education, at 64% on average in the EU-27 in 2010 (cfr. Table 2.1), only 4% of all female PhDs graduate in this field.

For the remaining male PhD graduates, the distribution is as follows: 17% in social sciences, business and law, 15% in health and welfare, 10% in humanities and arts, 3% in agricultural and veterinary sciences and 2% in education.

**The greatest gender imbalance characterises those science fields with the highest number of PhD graduates.**

### Country-specific distributions of female and male PhDs across fields of science

Large cross-country differences between the shares of male and female PhD graduates are observed in all fields except for agriculture and veterinary and education.

In the field of engineering, manufacturing and construction, compared with the EU-27 average (8.4%), the proportion of female PhD graduates was much lower in many countries; there are no female PhDs in this field in Malta and Cyprus, just 0.4% of all female PhDs in Norway and only 3–4% in the Former Yugoslav Republic of Macedonia, Germany and Luxembourg. Conversely, up to 17% of female PhD holders graduated in this field of study in Belgium and Portugal.

There is even more cross-country disparity in the proportion of female PhDs in health and welfare. Although the EU-27 average stood at 24%, it ranged from a low of 3.7% in France to more than 50% of all female PhDs in this field in Norway. Except for Lithuania and Bulgaria, the share of male PhDs in the field of health and welfare is systematically below that of women.

Across the countries, the share of female PhDs in science, mathematics and computing ranges from below 10% in Romania and Macedonia to above 40% in France, Cyprus and Iceland. The share of male PhDs in this field is also lowest in the former two countries whereas it exceeds 40% in Estonia, France, Iceland and Norway.

A few countries form exceptions to the overall picture of more balance between the proportions of male and female PhDs in the social sciences, business and law. In six countries, the proportion of female PhDs in this field was substantially larger than that of men. Indeed, the gender gap was above 5 percentage points in Austria, Latvia, the United Kingdom, and Lithuania and reached a high of 22% in Malta and 24% in Luxembourg. It should be noted that an inverse gender gap with more male than female PhDs in this field of science characterises Norway, Germany, Turkey, Iceland and to a greater extent Cyprus.

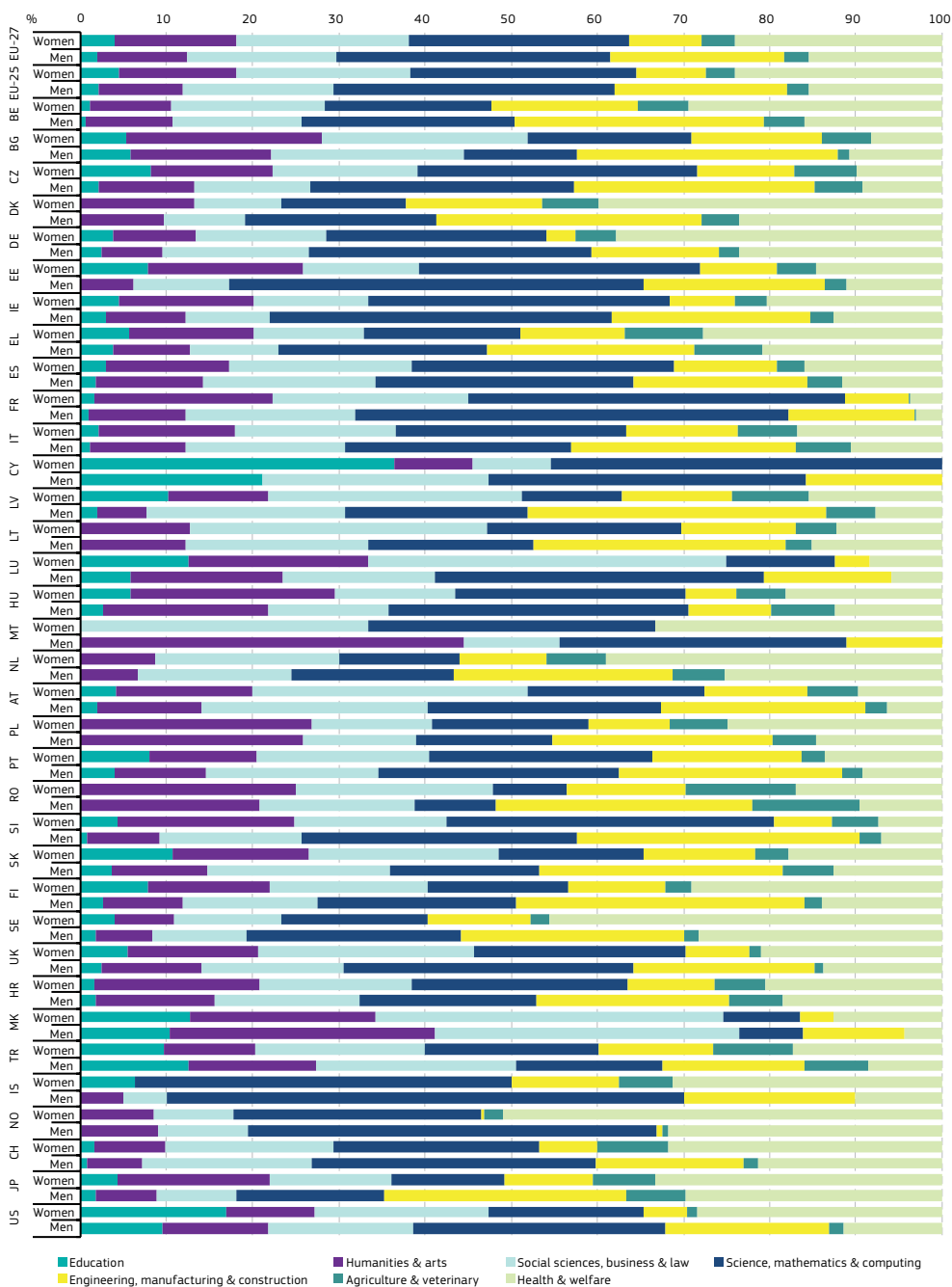
For the humanities and arts, the exceptional cases of the United States, Turkey, Iceland, Macedonia and Malta deserve special attention. In these countries the general trend was reversed and a higher share of male PhD graduates than female PhD graduates were in this field of study.

Finally, agricultural and veterinary sciences and education accounted for only a small share of male and female PhD graduates in most countries.

Although on average science, mathematics and computing hosts the largest shares of both female and male PhD graduates, these shares vary greatly between countries. In engineering, manufacturing and construction, the share of female PhDs is systematically below that of men but the opposite characterises the field of health and welfare. Overall, there was more of a gender balance in the social sciences, business and law. The US, Turkey, Iceland, Macedonia and Malta deviate from the general pattern observed for the humanities and arts, as the share of male PhD graduates exceeds that of female PhDs in this field of study.



**Figure 2.3:** Distribution of PhD (ISCED6) graduates across the broad fields of study by sex, 2010



Exceptions to the reference years: FR, PL: 2009.

Data unavailable: EU-15, IL.

Data estimated: EU-27, EU-25.

Others: Most tertiary students study abroad and are not included: CY.

Most PhD (ISCED 6) graduates study abroad and are not included: IS.

Countries with small numbers of PhD graduates: CY, IS, MT.

LT, NL, PL: the field "Education" was not taken into account due to missing data.

Source: Eurostat - Education Statistics (online data code: educ\_grad5).

## Engineering: a male field of science but female PhDs are gaining ground

The gender imbalance in the PhD population in the field of engineering, manufacturing and construction is studied over time in Tables 2.2 and 2.3. Table 2.2 shows the compound annual growth rate of the number of male and female PhD graduates within subfields of natural science and engineering over the period 2002-2010. These subfields are: life science, physical science, mathematics and statistics, computing, engineering and engineering trades, manufacturing and processes and architecture and building. For each of these subfields, Table 2.3 shows the evolution in the proportion of female PhDs between 2002 and 2010. Both tables allow for similar conclusions to be drawn. First of all, from Table 2.3, we learn that, in absolute terms, the highest share of female PhD graduates was observed in life science (57% in 2010) whereas female PhD graduates were least well represented in computing (19% in 2010) and engineering and engineering trades (23% in 2010). The proportion of female PhD graduates ranged between 32% and 42% in all other subfields. Between 2002 and 2010, the number of female PhD graduates has increased the most in the two fields where they are least well represented (cfr. Table 2.2): their compound annual growth rate stood at 8% (compared with 7% for male PhDs) in computing and at 9% (compared with 4% for male PhDs) in engineering and engineering trades. As a result, between 2002 and 2010, the proportion of female PhD graduates has increased from 17% to 23% in this latter field (cfr. Table 2.3). In the other subfields, the period 2002-2010 has also witnessed an increase in the share of female PhD graduates: in manufacturing and processing (+11 percentage points), in architecture and building (+4 percentage points) but also in life science (+3 points), physical science (+3 points), mathematics and statistics (+2 points), and computing (+2 points). In all fields, the number of female PhD graduates has increased much more rapidly than the number of male PhD graduates (cfr. Table 2.2), even in life science where women already form a majority. In manufacturing and processing, we should speak of a slower decrease in the number of female PhD graduates rather than of a faster increase: on average in the EU-27, the compound annual growth rate of female PhD graduates stood at -1% between 2002 and 2010 in this field compared with -7% for male PhD graduates.

**Between 2002 and 2010, the number of female PhD graduates has increased at a faster pace than the number of male PhD graduates in all subfields of engineering, manufacturing and construction but the most in the two subfields where they are least well represented: computing and engineering and engineering trades**

**Table 2.2:** Compound annual growth rates of PhD (ISCED6) graduates by narrow field of study in natural science and engineering, by sex, 2002-2010

	Science, Mathematics & Computing (EF4)								Engineering, Manufacturing & Construction (EF5)					
	Life science (EF42)		Physical science (EF44)		Mathematics & statistics (EF46)		Computing (EF48)		Engineering & engineering trades (EF52)		Manufacturing & processing (EF56)		Architecture & building (EF58)	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	2	1	1	-1	5	4	8	7	9	4	-1	-7	3	1
BE	-3	-5	1	0	2	3	-4	-5	22	13	19	33	29	9
BG	10	5	0	2	0	4	-	-	10	13	9	2	19	-3
CZ	13	6	13	5	11	8	-2	-8	1	10	15	0	11	8
DK	-	-	-	-	-	-	-	-	12	7	-	-	-	-
DE	8	3	4	-2	4	1	14	8	7	1	0	-6	5	0
EE	13	8	18	5	-	9	9	16	12	16	-	-	-	-
IE	5	2	9	3	15	-1	17	23	22	10	-13	-	0	6
EL	-22	-38	10	7	5	19	12	0	31	21	-	-	28	30
ES	7	6	-5	-3	3	0	4	6	19	13	13	8	17	6
FR	7	6	5	5	5	5	11	7	13	12	-3	-10	25	15
IT	22	27	16	17	10	19	26	55	37	20	28	21	20	27
CY	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LV	0	9	22	11	-	-	-	-	-16	19	-	-	-	-
LT	9	9	4	-1	15	5	15	3	0	3	:	:	16	15
HU	26	4	14	8	18	10	4	22	3	0	3	3	3	13
MT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NL	:	:	-2	3	:	:	:	:	19	1	:	:	:	:
AT	4	-5	1	0	12	6	6	9	12	4	-22	-19	19	4
PT	5	6	-4	-3	-10	-14	4	-2	2	-5	-5	-16	4	-5
RO	14	10	:	:	14	15	:	:	21	15	:	:	-31	-29
SI	8	15	4	6	-	4	-	4	-1	5	-4	4	-20	-12
SK	15	21	17	10	25	14	30	34	23	16	16	11	12	22
FI	0	0	-2	-2	1	1	7	-2	3	1	-8	-8	0	-9
SE	-1	-4	1	-2	9	0	12	2	2	-2	4	-2	-3	-7
UK	-5	-3	4	1	5	3	10	11	7	5	1	-3	8	2
HR	32	44	19	6	4	0	-	12	13	3	18	10	7	12
MK	-10	0	-19	-18	-	-	-	-	-8	9	-	-	9	15
TR	14	10	19	4	12	3	36	31	13	4	16	10	10	19
IS	9	-	-	-	-	-	-	-	-	-	-	-	-	-
NO	-	-	-	-	-	-	-	-	-	-	-	-	0	-8
CH	9	0	5	1	-8	-7	7	9	11	2	25	-	9	4
US	9	5	6	3	7	6	9	10	5	1	-	-	20	24

Exceptions to the reference years: EU-25, EL, HR: 2004-2010; FR: 2003-2009; IT: 2002-2006; RO: 2003-2010 (EF42, EF52, EF58); RO: 2007-2010 (EF46); NL: 2002-2004 (EF52).

Data unavailable: EU-15, PL, IL, JP.

Others: "-": not applicable; ":" not available.

LU data available only for 2010.

Source: Eurostat - Education Statistics (online data code: [educ\\_grad5](#)).

**Table 2.3:** Evolution of the proportion of female PhD (ISCED6) graduates by narrow field of study in natural science and engineering (fields EF4 & EF5), 2002-2010

	Science, Mathematics & Computing (EF4)								Engineering, Manufacturing & Construction (EF5)						
	Life science (EF42)		Physical science (EF44)		Mathematics & statistics (EF46)		Computing (EF48)		Engineering & engineering trades (EF52)		Manufacturing & processing (EF56)		Architecture & building (EF58)		
	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010	2002	2010	
EU-27	54	57	31	34	30	32	17	19	17	23	31	42	30	34	
EU-25	53	57	34	34	31	31	18	19	19	22	30	42	36	34	
BE	45	50	30	33	46	44	10	11	18	30	50	29	15	41	
BG	57	66	56	51	63	56	-	57	35	30	29	40	17	50	
CZ	50	61	21	32	23	26	9	15	22	12	42	69	26	31	
DK	37	-	-	-	-	35	-	-	23	29	-	-	-	-	
DE	47	57	21	30	22	26	10	14	8	12	23	32	18	24	
EE	50	59	21	41	-	-	25	17	33	28	-	-	-	43	
IE	52	57	32	41	14	35	27	20	11	22	19	-	25	18	
EL	37	70	35	39	36	22	12	21	17	25	24	-	38	36	
ES	59	60	42	40	37	42	25	22	24	33	53	61	17	31	
FR	53	55	34	34	24	24	19	22	23	24	38	49	28	39	
IT	72	69	44	43	52	44	39	22	15	23	23	27	53	48	
CY	-	-	-	67	-	50	-	17	-	-	-	-	-	-	
LV	67	50	25	42	-	-	-	50	73	14	-	75	-	33	
LT	71	71	45	55	50	67	33	55	41	36	:	:	43	45	
HU	22	56	31	40	18	26	36	14	24	29	35	36	70	53	
MT	-	33	-	-	-	-	-	-	-	-	-	-	-	-	
NL	-	-	40	38	-	-	-	-	18	23	-	-	-	-	
AT	46	64	24	25	30	41	12	10	17	26	36	30	13	30	
PT	68	66	53	51	59	68	22	31	30	44	54	76	38	56	
RO	50	55	:	:	41	41	:	:	23	30	:	:	39	35	
SI	74	63	50	46	-	20	-	13	18	12	39	25	43	25	
SK	72	64	28	39	38	56	17	13	19	26	37	44	58	40	
FI	66	67	33	33	25	26	16	28	23	25	59	59	24	41	
SE	48	54	35	41	16	28	17	30	23	28	30	40	39	48	
UK	57	53	32	36	23	26	19	18	15	18	27	34	23	33	
HR	79	69	39	55	33	38	-	16	17	26	44	55	43	36	
MK	88	75	69	67	50	-	-	40	67	33	33	-	33	25	
TR	47	53	24	48	36	53	25	31	13	22	44	56	64	47	
IS	-	40	-	36	-	-	-	50	-	50	-	33	-	-	
NO	-	-	-	-	-	-	-	33	13	-	-	-	20	33	
CH	34	51	24	30	16	16	11	10	12	21	-	60	18	24	
US	44	53	28	33	29	30	23	22	17	22	-	25	36	30	

Exceptions to the reference years: EU-25, EL, HR: 2004-2010; FR: 2003-2009; IT: 2002-2006; RO: 2003-2010 (EF42, EF52, EF58); RO: 2007-2010 (EF46); NL: 2002-2004 (EF52).

Data unavailable: EU-15, PL, IL, JP.

Others: '-': not applicable; ':': not available.

Most tertiary students study abroad and are not included: CY.

Most PhD (ISCED 6) graduates study abroad and are not included: IS.

Source: Eurostat - Education Statistics (online data code: [educ\\_grad5](#)).

## The distribution of female and male researchers across fields of science in the higher education sector

Although on average in the EU-27, in 2009, women made up 40% of all researchers in the higher education and the government sector, female researchers were noticeably less present in the business enterprise sector where their share stood at 19% (cfr. Chapter 1). Compared with 2006, this means that the share of female researchers has remained stable in the business enterprise sector, it has increased slightly from 39% in 2006 in the government sector and it increased most in higher education where in 2006 it stood at 37%.

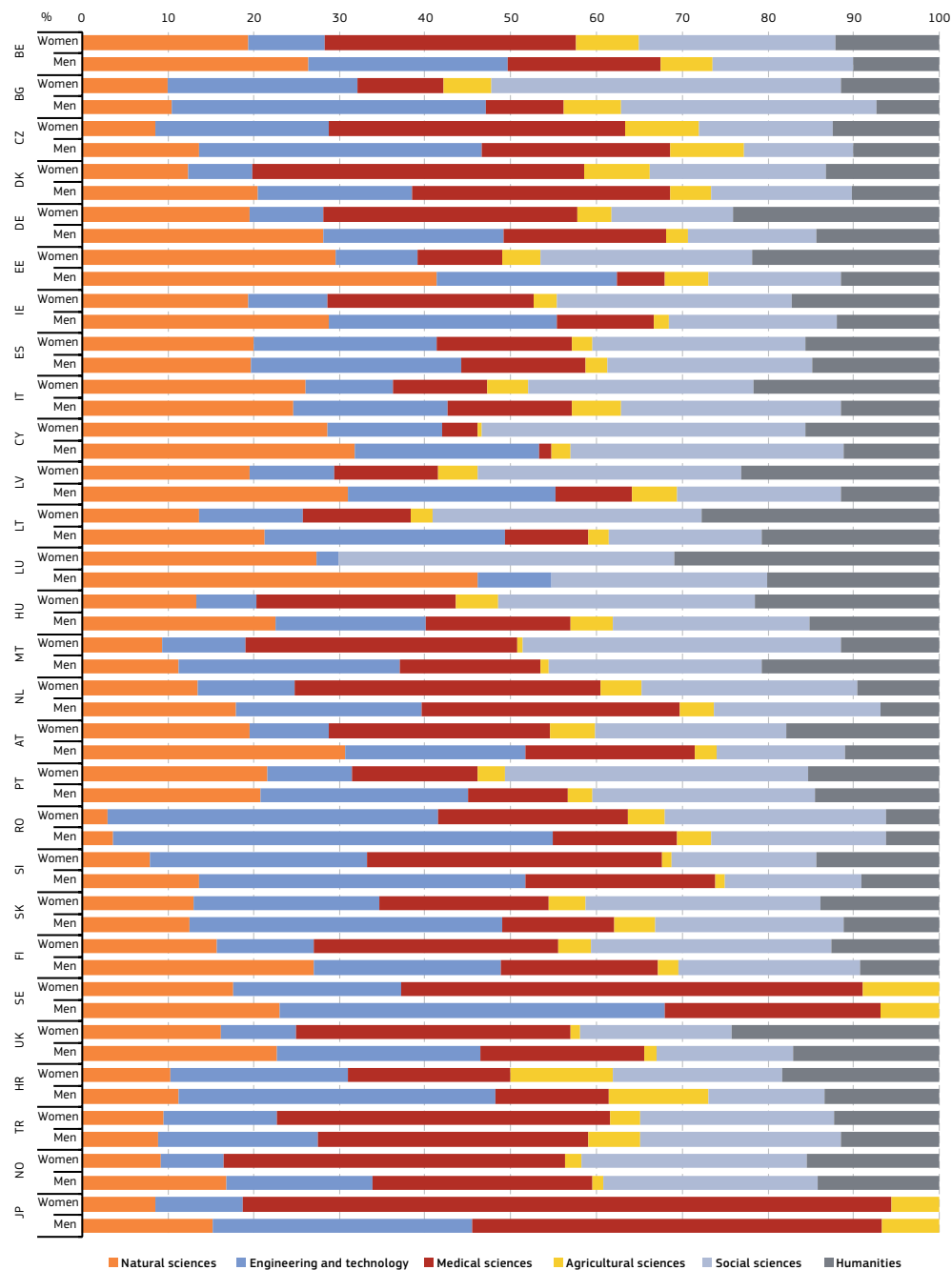
Figure 2.4 focuses on the Higher Education Sector showing the distribution of male and female researchers across the different fields of science in 2009. In the Higher Education Sector, female researchers were best represented in the social sciences in 12 of the 28 countries and these are mainly the Southern European countries and the most recent EU members. Female researchers are most present in the medical sciences in 11 of the 28 countries, mainly former EU-15 member states as well as Japan. The share of female researchers is lowest in agriculture in all countries except Croatia and Romania.

In the large majority of countries (20 out of 28), the widest gender gap was observed in engineering whereas, leaving agriculture aside, the smallest gap is most often found in the humanities.

There are many cross-country differences in the relative importance of each of the fields of science. Just 3% of female researchers were in the natural sciences in Romania, compared with 30% in Estonia. In engineering and technology, the low proportions of female researchers observed in Luxembourg (3%), Hungary (7%), Norway (7%) and Denmark (8%) contrast sharply with the much higher shares of female engineers in Romania (39%) and Slovenia (25%). Such contrasting national patterns characterise the medical sciences also with particularly high shares of female researchers in medicine in Sweden (54%) and Japan (76%) and particularly low shares (of at most 10%) in Cyprus, Estonia and Bulgaria. Women accounted for only 6% of researchers in the humanities in Romania, compared with 31% in Luxembourg. Although the share of female researchers is highest in the social sciences in 12 of the 28 countries, it varies between 0% in Sweden and Japan and 41% in Bulgaria. Finally, the lowest cross-country variation in the proportions of researchers was observed in agriculture but the overall share of research in this field is very small everywhere, with the exception of Croatia, which still counts a sizeable proportion of researchers in this field (12%).

**In higher education, the social and medical sciences attract the largest shares of female researchers.**

**Figure 2.4:** Distribution of researchers in the Higher Education Sector (HES), across fields of science, 2009



Exceptions to the reference year: JP: 2008; FI, UK: 2007.

Data unavailable: EU-27, EU-25, EU-15, EL, FR, PL, MK, CH, IS, IL, US.

Provisional data: MT.

Data estimated: BE, IE.

Others: Head count.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_perssci](#)).



## How has the distribution of female and male researchers across fields of science evolved over the last decade in the HES?

Table 2.4 completes this picture by showing the evolution of the number of female researchers in the Higher Education Sector by fields of science between 2002 and 2009. It shows that in most countries and in most subfields of science, the compound annual growth rate of female researchers in the Higher Education Sector over the period 2002-2009 has been positive. But again, the situation varies widely across European countries. In the humanities, the growth in the number of female researchers has been positive in all countries but Hungary and their number has risen at an annual rate of between 1% in Poland and Latvia and 53% in Luxembourg. Given the severe under-representation of female researchers in engineering and technology, the extremely high growth rates observed in this field in some countries are most encouraging. For example, the number of female researchers in engineering and technology has increased by 22% annually over 2002-2009 in Denmark, by 29% in Malta, by 35% in Cyprus and by 45% in Poland. It should nevertheless be noted that negative growth rates were observed in three countries (Luxembourg, Sweden and Hungary). In Luxembourg the number of female researchers in engineering and technology declined by 24% annually between 2002 and 2009. Remarkably, in this country, the number of female researchers in the natural sciences grew much faster than in the other countries (52%). Malta comes in second with a compound annual growth rate of 28% but in all other countries the number of female researchers in the natural sciences was much more modest and negative values were observed in six countries (the Czech Republic, Spain, Latvia, Romania, Poland and Sweden). In the medical sciences, which host the largest shares of female researchers in many countries, their number has also grown fast over the period 2002-2009, the growth rate was above 20% in the Czech Republic, Slovenia and Portugal. A negative trend characterises five countries and especially Poland where the number of female researchers in this field drastically decreased at an annual rate of -46%. In the social sciences, apart from the negative rates for Poland and Slovenia, the growth rates of female researchers were comprised between 0% in the Czech Republic and 44% in Luxembourg. Finally, although sizable growth rates (above 10%) in the number of female researchers in agriculture were observed in Bulgaria, Ireland, Italy, Austria and Denmark between 2002 and 2009 and although particularly in Romania this field has been attracting many female researchers (the annual growth rate stood at 56%), the number of women has generally grown very slowly or it has decreased in this field.

**Female researchers are generally gaining ground in all fields of science in higher education although at a very different pace in the different countries. Especially the humanities and engineering and technology are attracting more and more women.**

**Table 2.4:** Compound annual growth rates of female researchers in the Higher Education Sector (HES), by field of science, 2002-2009

	Natural sciences	Engineering and technology	Medical sciences	Agricultural Sciences	Social sciences	Humanities
BE	5.5	7.0	6.5	-0.5	6.8	6.7
BG	14.3	11.7	8.5	12.8	19.8	14.1
CZ	-7.7	3.4	21.0	4.1	0.2	22.2
DK	8.7	21.7	15.5	16.2	22.0	2.6
DE	11.4	11.7	6.2	8.3	6.9	11.4
EE	7.3	-0.4	0.1	-0.8	4.0	3.9
IE	2.1	6.7	6.8	13.2	5.0	7.1
ES	-5.0	6.1	6.0	-8.1	11.6	14.7
IT	3.2	10.0	-6.2	13.7	10.3	4.4
CY	13.3	34.6	:	:	14.7	6.9
LV	-4.4	7.1	9.9	-	9.6	1.2
LT	1.1	6.1	-0.5	-0.2	8.9	9.9
LU	52.4	-24.0	:	:	43.8	53.5
HU	3.0	-1.5	3.0	-	6.9	-7.7
MT	28.1	29.2	-1.6	:	3.6	4.9
NL	3.3	6.2	4.3	3.6	6.4	4.9
AT	11.4	18.7	8.0	15.0	13.1	9.9
PL	-1.3	44.7	-45.6	-17.3	-4.9	0.6
PT	12.4	16.3	26.0	9.0	23.5	21.9
RO	-1.8	13.8	13.2	56.3	18.7	32.6
SI	8.4	15.5	21.1	-24.0	-2.4	4.6
SK	-0.0	7.8	13.6	-1.6	12.0	16.4
SE	-1.0	-5.1	10.2	0.1	:	:
HR	6.1	3.7	-0.7	5.5	1.1	17.9
TR	4.3	5.6	6.8	3.7	6.9	3.8
NO	3.6	13.3	10.9	0.9	6.6	3.3
JP	3.4	6.1	5.4	4.0	:	:

Exceptions to the reference years: BE: 2004-2009; DK, DE, LV, LT, SE, TR, NO: 2003-2009; IT, LU: 2005-2009; JP: 2002-2008; MT: 2004-2009 (Agricultural sciences).

Data unavailable: EU-27, EU-25, EU-15, EL, FR, MK, IS, CH, IL, US.

Data estimated: PT: 2002; BE, IE: 2009.

Others: ': not available; '-': not applicable.

Head count.

FI, UK : data available only for 2007.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_perssci](#)).

Given this overall picture of positive growth in the number of female researchers between 2002 and 2009, it is not surprising that the share of female researchers has generally grown or at least stabilised in most fields of science in the Higher Education Sector between 2002 and 2009 (Table 2.5). In all countries, the share of female researchers has grown or remained almost stable in the social sciences between 2002 and 2009. In agriculture, it was only in the Czech Republic that the proportion of women witnessed a fall from 44% in 2002 to 35% in 2009. Perhaps more importantly, there were also only two exceptions to the overall increase in the share of female researchers in engineering and technology: Luxembourg where their share dropped from 18% in 2002 to 14% in 2009 (a decrease by 22%) and Sweden where it plummeted from 44% in 2002 to 24% in 2009 (a decrease by 45%). In the natural sciences, the picture was less positive: although the share of female researchers evolved favourably in most countries, it declined between 2002 and 2009 in Sweden (by 9 percentage points), the Czech Republic (by 7 points), Lithuania (by 5 points), and in Latvia and Romania (by 3 points). In the humanities, the share of female researchers has decreased in three countries (Bulgaria, Latvia and Hungary), but remained stable or increased in the other countries. The same holds true for female researchers in the medical sciences (the share of female researchers decreased noticeably only in Bulgaria, Ireland and Slovenia).

**A few exceptions aside, the proportion of female researchers has grown or at least stabilised in all fields of science in the Higher Education Sector.**

**Table 2.5:** Evolution of the proportion of female researchers in the Higher Education Sector (HES), by field of science, 2002-2009

	2002						2009					
	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	29	18	46	38	42	41	32	20	51	44	47	43
BG	43	22	52	33	44	62	42	31	45	39	51	54
CZ	33	25	48	44	42	45	26	25	46	35	41	40
DK	23	14	37	46	30	38	29	22	47	53	46	48
DE	18	12	35	32	31	31	27	18	45	46	34	47
EE	35	26	62	42	53	62	38	28	60	43	58	62
IE	31	18	74	30	43	41	30	18	58	49	47	48
ES	38	32	40	36	38	38	40	37	42	38	41	41
IT	36	21	30	32	36	49	39	26	32	34	38	54
CY	26	13	-	-	33	43	34	26	63	13	41	44
LV	44	30	62	42	59	85	41	31	60	49	64	69
LT	47	28	70	48	54	52	42	33	60	54	67	60
LU	26	18	-	-	34	35	25	14	-	-	46	46
HU	27	18	44	29	33	47	25	18	44	36	43	44
MT	6	5	30	-	31	17	26	14	45	20	39	19
NL	24	19	37	32	35	39	30	24	41	41	43	45
AT	22	13	36	41	36	43	28	21	44	56	47	50
PT	49	29	51	46	49	50	50	29	56	52	57	51
RO	43	34	53	29	47	30	40	39	56	48	51	46
SI	25	17	57	40	43	43	28	31	52	41	42	52
SK	39	31	50	42	49	50	46	32	55	42	50	50
SE	44	44	44	44	44	44	35	24	60	48	-	-
HR	43	27	49	41	48	42	43	32	54	46	55	53
TR	40	29	43	26	36	41	42	33	46	29	40	42
NO	26	17	47	39	41	42	30	25	55	53	45	46
JP	10	6	24	14	-	-	13	8	29	18	-	-

Exceptions to the reference years: BE: 2004-2009; DK, DE, LV, LT, SE, TR, NO: 2003-2009; IT, LU: 2005-2009; JP: 2002-2008.

Data unavailable: EU-27, EU-25, EU-15, EL, FR, PL, MK, IS, CH, IL, US.

Data estimated: PT: 2002; BE, IE: 2009.

Others: '-': not applicable.

Head count.

FI, UK: data available only for 2007.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_perssci](#)).

## The distribution of female and male researchers across fields of science in the Government Sector: a different picture

An analysis similar to the previous one can be carried out for the Government Sector, starting with the distribution of researchers across the different fields of science in 2009 (Figure 2.5), and then looking at their growth rates in the different fields between 2002 and 2009 (Table 2.6) to illustrate the way these affected their relative proportions in these fields (Table 2.7).

In the EU-27, women accounted for 40% of all researchers in the Government Sector in 2009 compared with 39% in 2006.

Unlike in the Higher Education Sector where in most countries the highest shares of female researchers were either in the social or the medical sciences, in the Government Sector, the fields that host the largest shares of female researchers differ greatly between the countries. In 13 of the 28 countries, the highest shares of female researchers are to be found in the natural sciences, in five countries in the medical sciences, in four countries in the social sciences, in three countries in agriculture, in two countries in engineering and in one country in the humanities.

On the contrary, the smallest shares of female researchers are found in engineering in eight countries, in the humanities in seven countries, in agriculture in six countries, in medical science in four countries and in the social sciences also in four countries.

**Opposed to the relatively uniform distribution of female researchers across science fields in higher education, in the government sector the picture is much more diverse and disparate.**

A very wide gender gap marks the research population in two extreme science fields, the one hosting the smallest share of female researchers, engineering and technology, and the one hosting the largest share of female researchers in 13 countries, the natural sciences. In 15 of the 28 countries, the gap between the shares of female and male researchers was largest in the field of engineering and technology. In eight countries the gender gap was largest in the natural sciences. Just like in higher education, when we leave agriculture aside, in the government sector the gap is most often smallest in the humanities (in 13 countries).

**Large gender gaps characterise the research population in engineering and technology and the natural sciences in the Government Sector**

The way female researchers in the government sector are distributed across the different fields of science is subject to a high degree of cross-national disparity. The share of female researchers in the natural sciences varies from a low of 11% in Estonia and Austria to more than 40% in Cyprus, Bulgaria, Poland, Luxembourg, the Czech Republic and Latvia. The spread in the shares of female researchers is largest in the medical sciences as it is comprised between 0% in Luxembourg and Finland and 57% in Spain. In Spain more than half of all female researchers are thus active in this field. In half of all countries, less than 10% of all female researchers are in agriculture but this field hosts one third to one half of all female researchers in Turkey, Japan and Ireland. Compared with higher education, we find much larger shares of female researchers in agriculture in the government sector. In the other scientific subfields, the range of the share of female researchers is similar, between 0% and approximately 40% are in the humanities, the social sciences and engineering and technology. Denmark and Cyprus are two countries with the lowest shares of female researchers in engineering but with the highest shares in the humanities. Whereas Luxembourg has one of the highest shares of female researchers in engineering, it is among the countries with the smallest share in the humanities. Besides Luxembourg, in Belgium engineering also attracts an important proportion of female researchers and besides Denmark and Cyprus, large shares of female researchers are in the humanities in Estonia, Austria and Hungary.

As regards the social sciences, these host very small shares of female researchers in Japan and Belgium and large shares in Malta and Sweden. The case of Sweden deserves special attention as in higher education we found there to be no female researchers in the social sciences.

**The distribution of female researchers across fields of science in the Government Sector is very country-specific, no general patterns come out of the analysis.**

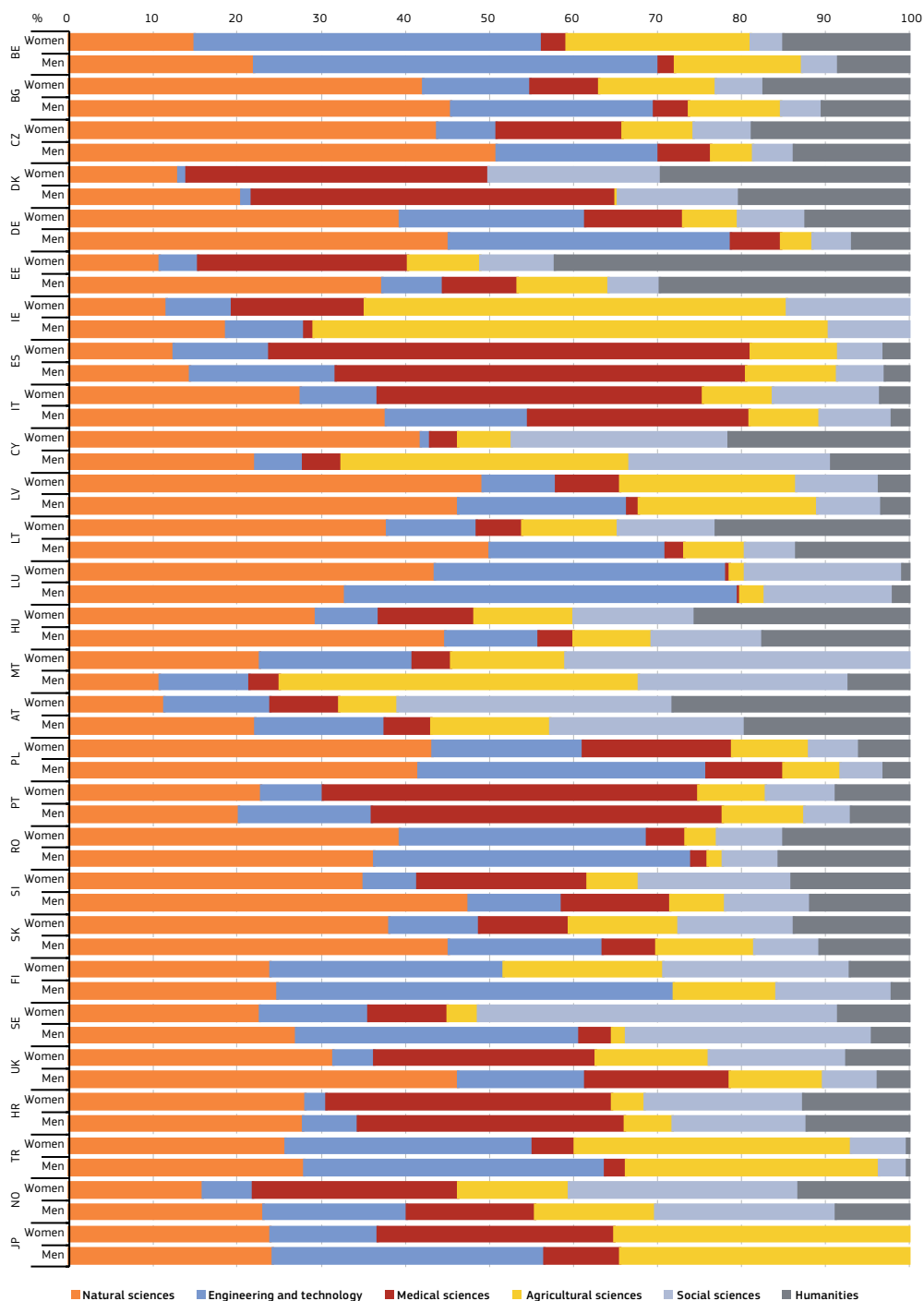
Tables 2.6 and 2.7 complete this picture by informing on the evolution of the number of female researchers in the Government Sector by fields of science between 2002 and 2009. In general, between 2006 and 2009 the proportion of female researchers increased from 39% to 40% in this sector. Although in higher education, the compound annual growth rate of female researchers was systematically positive in all fields of science, Table 2.6 shows that in the Government Sector over the period 2002–2009 these growth rates put forth a very mixed pattern, they were more or less positive in some fields and countries, more or less negative in other fields and countries. A very encouraging finding is that the growth rate in the number of female researchers was generally positive in engineering and technology given that in this field female researchers are severely under-represented. Indeed, in engineering and technology, although negative growth rates were found in Denmark (–37%), Sweden (–33%), Cyprus (–21%), the United Kingdom (–10%) and the Czech Republic (–2%), the growth in the number of female researchers has been positive in all other countries and the annual rate has reached a high of 49% in Ireland and 39% in Croatia. In the medical sciences, the trend in the number of researchers has been quite different with ten out of 27 countries having witnessed negative growth. Nevertheless, these negatives rates have generally been very modest, with the exception of Luxembourg, whereas the growth rates were positive in the 17 remaining countries, above 20% even in Latvia, Lithuania and Norway. In the other subfields of science, Table 2.6 shows that whereas women have strengthened their share among researchers in some countries, their number has decreased in others.

**The way the number of female researchers evolved over time in the different fields of science is highly country-specific. There is no general pattern. In some fields and countries, there are positive signals, in others negative ones, but, on the whole, the number of female researchers in the Government Sector has slowly increased from 39% in 2006 to 40% in 2009.**

These growth rates in the number of female researchers between 2002 and 2009 have affected their relative proportions in the different fields of science in the Government Sector (Table 2.7). The overall picture is promising as the share of women has increased in most fields and countries. Of the 27 countries for which the data allow for a 2002–2009 comparison, only three countries reported a decrease in the proportion of female researchers in the medical sciences (Denmark, Luxembourg and Romania). A close number of countries experienced a decrease in the share of female researchers in the agricultural sciences (Denmark, Luxembourg, Malta and Spain). In engineering and technology, five countries reported a decrease in the proportion of female researchers, namely Cyprus, Slovenia, Sweden, the United Kingdom and Turkey. Reductions were around 1–2 percentage points except for Sweden, where the share of female researchers decreased from 36% in 2002 to 16% in 2009, and Cyprus, where it witnessed a decline from 21% to 14%. In the natural sciences, there were also five exceptions to the general pattern of a rising share of female researchers (Denmark, Estonia, Ireland, Latvia and Sweden). The largest decrease was noted in Ireland, where the share of female researchers in this field dropped by 17 percentage points between 2002 and 2009. On the contrary, ten countries reported a decrease in the share of female researchers in the field of the social sciences (of up to –9 percentage points in Latvia and –8 percentage points in Romania) and nine countries reported a decrease in the humanities (of up to –20 percentage points in Luxembourg, –14 percentage points in Latvia and –12 percentage points in Slovakia).

**In most scientific disciplines and countries, the proportion of female researchers in the Government Sector has increased over the last decade.**

**Figure 2.5:** Distribution of researchers in the Government Sector (GOV), across fields of science, 2009



Exceptions to the reference year(s): JP:2008; FI, SE:2007.

Data unavailable: EU-27, EU-25, EU-15, EL, FR, NL, MK, IS, CH, IL, US.

Break in series: SE.

Others: Head count.

Source: Eurostat - Research and development statistics (online data code: rd\_p\_perssci).

**Table 2.6:** Compound annual growth rates of female researchers in the Government Sector (GOV), by field of science, 2002-2009

	Natural sciences	Engineering and technology	Medical sciences	Agricultural Sciences	Social sciences	Humanities
BE	17	8	2	8	-3	5
BG	-1	3	0	0	0	1
CZ	4	-2	7	-3	3	3
DK	-16	-37	2	-	5	3
DE	8	12	10	4	4	4
EE	-2	4	9	6	5	1
IE	4	49	9	-3	6	:
ES	-2	20	15	10	20	15
IT	2	14	6	6	2	8
CY	5	-21	-4	-6	5	12
LV	-1	30	23	10	-4	6
LT	-1	11	28	1	7	-3
LU	26	21	-52	-13	15	-16
HU	5	6	-6	2	5	-1
MT	26	22	:	17	-7	-
AT	8	18	2	-1	10	7
PL	-16	:	-3	-7	7	-2
PT	1	0	0	-11	-6	10
RO	1	5	-14	3	-11	8
SI	8	5	-5	12	1	50
SK	3	6	-3	9	-6	34
SE	3	-33	-6	22	-4	-8
UK	1	-10	-1	-7	1	30
HR	-2	39	-2	0	5	-1
TR	11	5	14	4	30	31
NO	8	6	23	1	6	8
JP	0	7	4	4	:	:

Exceptions to the reference years: DK, DE, IT, LV, LT, PL, TR, NO: 2003-2009; JP: 2002-2008; MT, PL: 2004-2009 (Medical and health, Agricultural sciences & Humanities).

Data unavailable: EU-27, EU-25, EU-15, EL, FR, NL, MK, IS, CH, IL, US.

Others: ':': not available; '-': not applicable.

Head count.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_perisci](#)).



**Table 2.7:** Evolution of the proportion of female researchers in the Government Sector (GOV), by field of science, 2002-2009

	2002						2009					
	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	20	25	38	35	36	47	25	29	42	41	30	46
BG	51	33	54	51	62	65	52	38	70	60	57	66
CZ	31	15	50	50	49	44	34	18	59	50	46	45
DK	28	23	44	41	35	44	26	27	31	0	43	44
DE	24	17	42	35	41	47	30	24	48	45	45	47
EE	36	36	71	54	78	73	32	50	82	56	70	69
IE	45	7	51	30	29	0	28	35	89	34	49	:
ES	41	31	44	48	46	51	45	38	53	47	47	49
IT	32	22	46	39	52	52	36	30	53	44	54	56
CY	44	21	25	14	52	47	62	14	38	14	48	67
LV	58	19	53	50	68	69	55	33	87	53	59	55
LT	44	27	55	60	69	69	46	37	73	64	69	66
LU	32	22	54	30	37	40	42	29	50	25	40	20
HU	26	21	63	40	40	48	30	31	64	46	42	49
MT	50	14	-	33	63	25	63	57	50	20	56	0
AT	22	26	39	26	42	45	28	38	53	27	52	52
PL	39	-	56	49	47	58	42	27	58	49	44	58
PT	60	37	59	54	67	62	63	41	62	56	70	66
RO	46	43	70	43	62	43	52	43	69	67	54	48
SI	37	34	47	34	53	35	38	33	57	44	60	50
SK	40	30	56	45	53	63	40	32	57	48	58	51
SE	36	36	37	35	36	37	30	16	55	53	43	49
UK	27	17	44	40	51	62	27	15	46	40	58	52
HR	44	18	53	30	48	54	52	29	53	43	56	53
TR	26	26	45	30	48	17	28	25	46	31	46	25
NO	28	17	49	36	42	48	33	20	54	40	48	52
JP	12	4	31	10	:	:	13	6	33	14	:	:

Exceptions to the reference years: DK, DE, IT, LV, LT, PL, TR, NO: 2003-2009; SE: 2003-2007; UK: 2007-2009; JP: 2002-2009; MT, PL: 2004-2009 (Medical Sciences); MT: 2003-2009 (Agricultural sciences & Humanities); PL: 2004-2009 (Agricultural sciences & Humanities).

Data unavailable: EU-27, EU-25, EU-15, EL, FR, NL, MK, IS, IL, US.

Others: ': not available; '-': not applicable.

Head count.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_perssci](#)).

## The distribution of female and male researchers across fields of science in the Business Enterprise Sector: economic activities matter

In the Business Enterprise Sector, researchers can be distributed across fields of science but also across different economic activities. In Figure 2.6, two sectors of activity are singled out, manufacturing on the one hand and services of the business economy on the other. These two economic sectors are compared with all other economic activities taken together. Figure 2.6 thus shows the distribution of male and female researchers across manufacturing, business services and all other economic activities for the year 2009. It is clear that most research activities are indeed conducted within these two specific sectors (manufacture and business services) as all other sectors of economic activity taken together account for merely 5% of female researchers and 3% of male researchers on average in the EU-27 (at the national level the proportions are highest at 24% of female and 21% of male researchers in Romania). The highest shares of both male and female researchers were found in manufacturing in half of all the countries (13 out of 26). At EU-27 level, the share of women in this sector stood at 49% (compared with 45% in business services) and that of men at 61% (compared with 36% in business services) in 2009. Despite the fact that at the EU-27 level the largest shares of both female and male researchers are in manufacturing, the opposite is thus observed in 13 of the 26 countries. The share of female researchers was the highest in business services rather than in manufacturing in Belgium, Bulgaria, the Czech Republic, Denmark, Estonia, Ireland, Spain, France, Cyprus, Lithuania, Austria, Portugal and Norway. The share of male researchers was also the highest in this sector of economic activity in 11 countries (the same as those for women plus Latvia and Croatia and minus Belgium, the Czech Republic, France and Austria).

**There is a divide between the countries according to the predominance of female researchers in manufacturing or services of the business economy.**

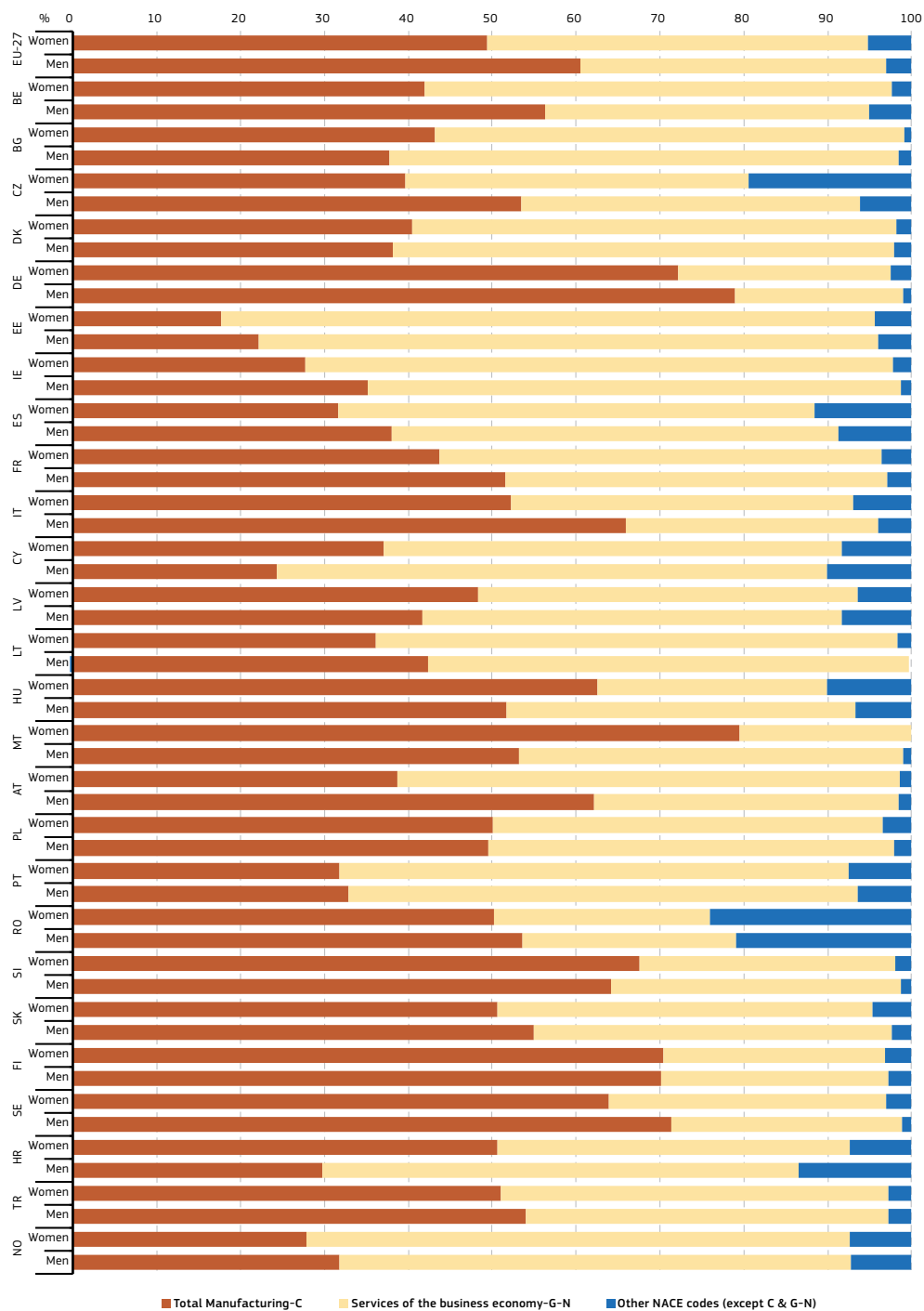
Table 2.8 shows that if one focuses on pharmaceuticals as a subgroup of the overall manufacturing sector, the proportion of female researchers at the level of the EU-27 moves up from 15% in the broad sector of manufacturing to 45% in the specific subsector of pharmaceuticals. This illustrates that, in the Business Enterprise Sector, women are relatively better represented in the manufacture of pharmaceuticals than in that of other products. Besides manufacturing, the proportion of female researchers in business services stood at 19% in the EU-27 in 2009 and at 27% in all other economic sectors taken together.

**Female researchers more frequently specialise in pharmaceuticals than in other manufacturing activities.**

As it was done for the Higher Education and Government Sectors, the evolution in the proportion of female researchers in different scientific subfields can be analysed in the Business Enterprise Sector between 2002 and 2009 (Table 2.9). However, such a comparison through time is possible for just a subset of 14 countries. First of all, it should be noted that in most countries the medical sciences accounted for the highest shares of female researchers in the Business Enterprise Sector. Women accounted for 70% of researchers in this field in Romania, 76% in Croatia and 81% in Greece. In the humanities, at least three quarters of all researchers were women in Croatia, Greece and Poland. High shares of female researchers also characterise the social sciences (e.g. 59% in Romania, 61% in Greece), the natural sciences (e.g. 60% in Bulgaria, 67% in Croatia) and agriculture (e.g. 51% in Slovakia, 60% in Poland) in many countries. As in the other sectors, the lowest shares of female researchers in the Business Enterprise Sector were found in engineering and technology. In most countries, around one fifth of all researchers in this field are women, with the exception of Romania, Croatia and Portugal where their share is much higher at 35%, 33% and 26% respectively. In Japan, the Czech Republic and Poland women accounted for 15% or less of researchers in engineering and technology.

**In terms of scientific fields, in most countries the medical sciences accounted for the highest shares of female researchers in the Business Enterprise Sector whereas again it is in engineering and technology where they are most absent.**

**Figure 2.6:** Distribution of researchers across economic activities (NACE Rev 2) in the Business Enterprise Sector (BES), 2009



Data unavailable: EU-25, EU-15, EL, NL, UK, MK, IS, CH, IL, JP, US.

Estimated value: EU-27 (by DG Research and Innovation).

Confidential data: LU.

Others: Head count.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_bempocr2](#)).

**Table 2.8:** Proportion of female researchers by economic activity (NACE Rev. 2) in the Business Enterprise Sector (BES), 2009

	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 & G-N)
<b>EU-27</b>	14.6	26.9	45.4	19.3	26.7
BE	19.0	29.4	46.8	31.2	12.8
BG	46.7	51.4	71.1	41.3	32.0
CZ	12.1	31.1	51.4	15.9	36.8
DK	25.0	42.6	43.4	23.3	21.3
DE	11.8	25.8	39.9	15.5	27.6
EE	23.2	52.9	c	28.7	29.1
IE	21.5	37.3	40.5	27.7	36.7
ES	25.2	37.3	59.6	30.1	34.8
FR	17.4	40.0	55.5	22.3	23.5
IT	17.1	28.8	52.3	26.2	30.9
CY	36.4	41.2	50.0	23.9	23.7
LV	57.1	72.2	81.9	51.0	46.9
LT	27.7	67.4	80.0	32.8	33.5
LU	c	21.7	:	c	c
HU	24.3	31.2	52.7	14.9	28.5
MT	35.2	:	69.0	14.0	0.0
AT	10.9	24.4	45.9	24.3	15.1
PL	22.3	57.1	68.8	21.5	31.8
PT	29.5	49.4	60.9	30.2	33.8
RO	36.0	48.2	67.3	37.9	40.9
SI	24.3	43.8	60.1	21.3	31.5
SK	20.4	59.8	c	22.5	35.6
FI	17.1	41.4	68.5	16.7	18.9
SE	23.5	c	55.9	29.2	46.6
HR	53.8	72.9	75.9	33.7	27.5
TR	22.6	44.3	63.8	24.9	22.9
NO	20.0	c	58.1	23.2	22.6

Data unavailable: EU-25, EU-15, EL, UK, MK, IS, CH, IL, JP, US.

Data estimated: EU-27 (by DG Research & Innovation).

Others: ':' : not available; 'c': confidential data.

Head count.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_bempoccr2](#)).

**Table 2.9:** Evolution of the proportion of female researchers in the Business Enterprise Sector (BES), by field of science, 2002-2009

	2002						2009					
	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	46	48	63	59	86	-	60	c	c	c	c	c
CZ	19	11	46	35	35	53	22	9	48	44	35	27
EL	57	27	65	53	47	54	39	18	81	36	61	78
CY	35	11	29	21	27	-	33	17	28	0	42	-
HU	27	22	33	30	28	69	13	22	36	34	35	17
MT	7	16	60	0	38	-	27	19	67	0	0	-
PL	35	-	60	37	71	44	45	15	65	60	45	83
PT	50	20	53	38	43	57	28	26	67	46	41	42
RO	53	42	79	53	29	43	38	35	70	43	59	21
SI	55	21	60	29	49	67	37	17	40	41	53	50
SK	33	24	68	34	52	-	49	17	51	51	45	0
HR	64	21	83	39	33	-	67	33	76	32	27	75
TR	36	22	43	54	41	44	25	22	51	32	35	41
JP	9	4	24	16	:	:	11	4	27	22	:	:

Exceptions to the reference years: EL: 2003-2007; PL, TR: 2003-2009; MT: 2005-2009; JP: 2002-2008; HR: 2004-2009 (Social Sciences); PL: 2004-2009 (Agricultural sciences); RO: 2006-2009 (Humanities).

Data unavailable: EU-27, EU-25, EU-15, BE, DK, DE, EE, IE, ES, FR, IT, LV, LT, LU, NL, AT, FI, SE, UK, MK, IS, NO, CH, IL, US.

Data estimated: PT: 2002.

Others: ': not available; '-': not applicable; 'c': confidential data.

Head count.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_perssci](#)).

## The higher education and the government sector compared in terms of segregation

Gender segregation refers to a situation where women and men are unequally distributed across sectors of economic activity (horizontal segregation) or across occupational categories (vertical segregation). When interested in gender segregation in science, horizontal segregation refers to an unequal distribution of women and men across scientific fields. Different indices exist to quantify the degree of inequality in these distributions of women and men. A commonly used index is the Dissimilarity Index (cfr. Technical box below).

### The Dissimilarity Index (DI)

*The Dissimilarity Index (DI) provides a theoretical measurement of the percentage of women and men in a given field who would have to move to an occupation in another field of science to ensure that the proportions of women were the same across all fields. It can therefore be interpreted as the hypothetical distance from a balanced gender distribution across fields of science. In order to interpret this index correctly, it is important to know which gender is in the majority overall. The maximum value is 1, which indicates the presence of only either women or men in each of the occupations, depending on the majority gender. The minimum value of 0 indicates a distribution of women and men within each occupation which is equal to the overall average proportion of women and men. Therefore the closer the index is to 1 the higher the level of dissimilarity and thus the more men and women would have to move across science fields in order to achieve a balanced gender distribution.*

Table 2.10 presents the 2009 values of the dissimilarity index in the different countries for two sectors: Higher Education and Government. Seven occupational 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. Two outliers aside, the DI in Higher Education was comprised between 0.03 in Spain and 0.28 in Malta. The two outlier values were observed in Finland (0.42) and Poland (0.86). In the government sector, the DI showed no such outlier values, it ranged between 0.06 in Croatia and 0.36 in the Netherlands. This may point towards slightly less gender segregation across occupations in Higher Education as the DI's value is in a lower range, closer to zero. Apart from Poland and Finland, in Higher Education, the level of segregation was the highest (at or above 0.25) in the UK (0.25), Luxembourg (0.25), Latvia (0.26), Ireland (0.27), and Malta (0.28). It was the lowest in Spain (0.03) and Turkey (0.09). In the Government Sector, the countries that appeared to be the furthest from a gender balanced distribution of researchers across the different scientific fields of occupation were Estonia (0.32), Finland (0.32), Cyprus (0.34) and the Netherlands (0.36). Croatia, Romania, Turkey and again Spain reported the lowest levels of gender segregation (0.06 in Croatia, 0.09 in Turkey, Romania and Spain).

**Levels of occupational segregation are only slightly lower in higher education than in the government sector.**

**Table 2.10:** Dissimilarity index for researchers in Higher Education Sector (HES) and Government Sector (GOV), 2009

	Dissimilarity Index HES (DI)	Dissimilarity Index GOV (DI)
<b>EU-27</b>	:	:
BE	0.21	0.14
BG	0.16	0.15
CZ	0.19	0.20
DK	0.19	0.15
DE	0.22	0.17
EE	0.23	0.32
IE	0.27	0.20
ES	0.03	0.09
IT	0.12	0.18
CY	0.13	0.34
LV	0.26	0.12
LT	0.24	0.22
LU	0.25	0.14
HU	0.20	0.19
MT	0.28	0.36
NL	0.15	-
AT	0.23	0.21
PL	0.86	0.16
PT	0.14	0.10
RO	0.13	0.09
SI	0.18	0.17
SK	0.16	0.15
FI	0.42	0.32
SE	0.19	0.29
UK	0.25	0.25
HR	0.17	0.06
TR	0.09	0.09
NO	0.17	0.19
JP	0.16	0.19

Exceptions to the reference year: PL, JP: 2008; FI, UK: 2007.

Data unavailable: EU-27, EU-25, EU-15, EL, FR, MK, IS, CH, IL, US.

Data estimated: BE, IE.

Others: '-' not available, '-' not applicable.

Head count.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_perssci](#)).

### Summary of key findings regarding women's presence in the different fields of science

To sum up, the substantial rise in women's level of education that has marked the last 20 years and women's massive flow into all educational levels is now also very clearly visible at the PhD level. In 2010, on average in the EU-27, 46% of all PhD graduates were women. Moreover, the growth rate in the number of female PhD graduates is systematically higher than that of men in all fields and subfields of science between 2002 and 2010. However, a narrower focus on the period 2006–2010 reveals a picture of negative growth or stagnation for the EU-27 on average and for many individual member states. Women's catching up movement seems to have come to a halt. Moreover, there is a persisting problem of gender segregation. Given that the absence of a balanced gender composition in all study fields is equally due to the traditional choices boys make as to those girls make, policy-makers should give balanced attention to both boys' and girls' choices. Policies can work to improve a number of biases, such as stereotypes and gendered images conveyed by children's books and school manuals; gendered attitudes of teachers, gendered advice and guidance on courses to be followed; and so forth.

## Annex 2.1: Number of ISCED 6 graduates by sex, 2006-2010

	2006		2007		2008		2009		2010	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-27	43 519	55 163	46 754	57 196	47 970	57 777	44 075	53 232	45 381	54 850
EU-25	41 723	53 196	44 926	55 420	46 048	55 827	41 596	50 457	42 822	52 049
BE	656	1 062	671	1 045	790	1 090	787	1 115	905	1 221
BG	309	274	340	281	319	282	327	309	285	311
CZ	722	1 301	842	1 430	884	1 498	911	1 480	870	1 358
DK	397	513	397	576	471	631	503	660	624	764
DE	10 284	14 662	10 379	14 060	10 789	14 815	11 307	14 220	11 533	14 506
EE	82	61	79	74	76	85	74	86	92	83
IE	455	524	476	559	554	536	553	658	584	638
EL	:	:	973	1 463	549	857	:	:	792	1 100
ES	3 347	3 812	3 405	3 745	3 553	3 749	3 862	4 053	4 088	4 608
FR	4 067	5 751	4 450	6 200	4 743	6 566	5 085	6 856	:	:
IT	5 228	4 960	5 521	5 057	6 595	5 996	6 514	5 801	5 966	5 512
CY	19	10	11	5	13	15	12	18	11	19
LV	54	52	87	59	82	57	101	73	79	53
LT	191	135	220	147	199	170	242	155	235	171
LU	:	:	:	:	:	:	:	:	24	34
HU	448	564	446	613	487	654	666	710	595	680
MT	1	3	3	6	4	7	11	8	3	9
NL	1 157	1 836	1 321	1 839	1 341	1 873	1 373	1 928	1 571	2 165
AT	896	1 262	883	1 202	937	1 268	993	1 291	1 064	1 436
PL	2 931	2 986	2 997	3 075	2 760	2 856	2 563	2 505	1 635	1 682
PT	574	520	612	657	649	636	670	597	793	621
RO	1 487	1 693	1 488	1 495	1 603	1 668	2 152	2 466	2 274	2 490
SI	196	199	190	225	193	212	209	257	214	251
SK	576	642	636	735	798	857	932	1 005	1 407	1 471
FI	660	749	772	754	831	695	861	781	797	721
SE	1 204	1 456	1 810	2 094	1 318	1 530	1 416	1 409	1 340	1 327
UK	7 134	9 332	7 745	9 800	7 432	9 174	7 916	9 735	8 481	10 275
HR	213	226	243	223	247	247	268	304	428	410
MK	49	36	43	39	44	43	64	55	80	77
TR	1 049	1 545	1 391	1 966	1 607	2 147	1 853	2 400	2 093	2 591
IS	8	7	6	4	7	16	20	12	16	20
NO	357	525	414	566	552	679	496	588	538	664
CH	1 257	1 941	1 245	1 991	1 329	1 880	1 433	1 991	1 555	2 031
JP	4 272	11 707	4 472	12 338	4 499	11 797	4 496	11 980	4 508	11 359
US	27 433	28 634	30 365	30 251	32 497	31 215	35 437	32 279	37 175	32 395

Exceptions to the reference years: EL: 2003-2007; PL, TR: 2003-2009; MT: 2005-2009; JP: 2002-2008; HR: 2004-2009 (Social Sciences); PL: 2004-2009 (Agricultural sciences); RO: 2006-2009 (Humanities).

Data unavailable: EU-27, EU-25, EU-15, BE, DK, DE, EE, IE, ES, FR, IT, LV, LT, LU, NL, AT, FI, SE, UK, MK, IS, NO, CH, IL, US.

Data estimated: PT: 2002.

Others: ":": not available; "c": confidential data.

Head count.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_perssci](#)).



## Annex 2.2: Number of ISCED 6 graduates by broad field of study and sex, 2010

	Education		Humanities & arts		Social sciences, business & law		Science, mathematics & computing		Engineering, manufacturing & construction		Agriculture & veterinary		Health & welfare	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
<b>EU-27</b>	1 904	1 081	6 342	5 490	8 996	9 271	11 197	16 787	3 784	10 850	1 701	1 556	10 438	8 080
<b>EU-25</b>	1 889	1 064	5 719	4 938	8 419	8 768	10 954	16 519	3 433	10 039	1 400	1 251	10 035	7 815
BE	10	8	85	122	161	180	175	301	152	349	53	58	266	193
BG	15	17	63	47	67	65	53	38	42	88	16	4	23	31
CZ	68	26	116	143	139	171	269	392	93	356	60	71	82	118
DK	0	0	83	74	62	72	91	170	98	235	41	33	249	180
DE	432	366	1 104	1 016	1 735	2 432	2 920	4 734	388	2 126	544	336	4 324	3 382
EE	7	0	16	5	12	9	29	39	8	17	4	2	13	9
IE	25	18	86	57	73	59	194	242	41	141	21	16	112	77
EL	45	41	114	99	101	112	144	267	97	264	71	88	220	229
ES	113	76	540	521	801	841	1 151	1 254	446	850	123	169	603	483
FR	81	65	1 044	766	1 145	1 346	2 210	3 420	376	1 003	7	6	187	207
IT	114	53	819	546	970	907	1 390	1 290	679	1 280	356	313	872	520
CY	4	4	1	0	1	5	5	7	0	3	0	0	0	0
LV	8	1	9	3	23	12	9	11	10	18	7	3	12	4
LT	:	:	30	21	81	36	53	33	31	50	11	5	29	26
LU	3	2	5	6	10	6	3	13	1	5	0	0	2	2
HU	35	18	141	130	83	95	159	237	35	65	34	50	108	85
MT	0	0	0	4	1	1	1	3	0	1	0	0	1	0
NL	:	:	137	146	336	384	217	409	159	550	108	129	614	547
AT	43	27	164	172	331	372	211	381	124	337	62	34	100	91
PL	:	:	676	632	350	324	459	388	237	625	168	125	628	358
PT	257	58	269	129	483	322	259	190	201	198	23	22	175	77
RO	:	:	560	505	510	438	190	230	309	723	285	301	380	234
SI	9	2	42	20	36	40	78	77	14	79	11	6	15	17
SK	144	51	216	153	297	290	229	240	175	389	51	80	242	174
FI	77	23	134	74	203	135	143	185	108	266	23	15	231	98
SE	59	24	103	89	185	164	323	456	258	585	33	26	665	397
UK	469	254	1 280	1 188	2 120	1 684	2 081	3 458	618	2 152	113	102	1 785	1 419
HR	7	7	81	56	75	68	106	83	43	91	25	25	87	75
MK	10	7	17	21	32	24	7	5	3	8	0	0	10	3
TR	201	322	218	380	406	600	415	437	273	420	191	191	358	221
IS	1	0	0	1	0	1	7	12	2	4	1	0	5	2
NO	0	1	42	54	45	64	141	291	2	4	10	4	250	195
CH	25	15	138	152	297	411	360	665	99	339	129	41	488	511
JP	185	190	763	802	612	1 019	561	1 897	445	3 124	314	759	1 434	3 310
US	6 210	3 023	3 747	3 972	7 412	5 357	6 550	9 370	1 881	6 100	391	500	10 430	3 678

Exceptions to the reference year: FR: 2009; IT: 2006; PL: 2009; RO: 2006 (Education).

Data unavailable: EU-15, IL.

Others: ': not available.

Most tertiary students study abroad and are not included: CY.

Most PhD (ISCED 6) graduates study abroad and are not included: IS.

Source: Eurostat - Education Statistics (online data code: [educ\\_grad5](#)).

**Annex 2.3:** Number of ISCED 6 graduates by narrow field of study and sex in natural science and engineering (EF4 & EF5 fields), 2010

	Science, Mathematics & Computing (EF4)								Engineering, Manufacturing & Construction (EF5)							
	Life science		Physical science		Mathematics & statistics		Computing		Engineering & engineering trades		Manufacturing & processing		Architecture & building			
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men		
EU-27	5 511	4 161	3 942	7 517	861	1 854	645	2 823	2 506	8 324	428	599	670	1 325		
EU-25	5 413	4 088	3 923	7 499	739	1 680	641	2 820	2 172	7 540	424	593	657	1 304		
BE	72	71	73	151	24	31	6	48	129	307	8	20	15	22		
BG	25	13	19	18	5	4	4	3	34	78	4	6	4	4		
CZ	152	96	90	187	16	45	11	64	36	271	24	11	33	74		
DK	0	0	0	0	91	170	0	0	98	235	0	0	0	0		
DE	1 629	1 230	1 041	2 391	134	391	116	722	224	1 659	56	121	108	346		
EE	16	11	11	16	0	2	2	10	5	13	0	0	3	4		
IE	95	71	58	82	6	11	14	57	24	84	1	0	3	14		
EL	38	16	67	106	11	40	28	105	70	215	:	:	27	49		
ES	728	485	269	412	86	120	68	237	333	686	54	34	59	130		
FR	1 070	867	909	1 785	87	270	144	498	275	868	45	47	56	88		
IT	691	310	539	703	127	161	33	116	116	385	181	480	382	415		
CY	1	0	2	1	1	1	1	5	0	2	0	0	0	1		
LV	2	2	5	7	0	0	2	2	2	12	6	2	2	4		
LT	20	8	21	17	6	3	6	5	21	38	:	:	10	12		
LU	0	4	1	0	0	2	2	7	1	5	0	0	0	0		
HU	69	55	72	107	11	31	7	44	17	41	9	16	9	8		
MT	1	2	0	1	0	0	0	0	0	1	0	0	0	0		
NL	0	0	188	311	0	0	0	0	113	370	0	0	0	0		
AT	118	66	55	163	25	36	13	116	93	265	3	7	28	65		
PT	131	69	76	72	38	18	14	31	106	134	22	7	73	57		
RO	73	60	:	:	117	170	:	:	300	706	:	:	9	17		
SI	50	30	25	29	1	4	2	14	8	61	5	15	1	3		
SK	136	76	56	88	29	23	8	53	103	289	36	45	36	55		
FI	78	39	40	80	10	29	14	36	82	240	10	7	7	10		
SE	123	106	140	205	28	71	32	74	192	498	40	59	26	28		
UK	884	784	912	1 599	135	382	151	692	353	1 616	105	202	161	334		
HR	59	27	39	32	5	8	3	16	23	66	11	9	9	16		
MK	3	1	2	1	0	0	2	3	1	2	0	0	2	6		
TR	103	90	218	232	71	64	23	51	66	230	118	91	89	99		
IS	2	3	4	7	0	1	1	1	1	1	1	2	0	1		
NO	0	0	0	0	0	0	141	291	0	0	0	0	2	4		
CH	202	198	140	331	8	43	10	93	77	285	6	4	16	50		
US	4 066	3 600	1 659	3 404	476	1 116	349	1 250	1 375	4 765	222	682	284	653		

Exceptions to the reference year: FR: 2009; IT: 2006; NL: 2004.

Data unavailable: EU-15, IL, JP.

Others: ':' not available.

Most tertiary students study abroad and are not included: CY.

Most PhD (ISCED 6) graduates study abroad and are not included: IS.

Source: Eurostat - Education Statistics (online data code: [educ\\_grad5](#)).

**Annex 2.4:** Number of researchers in the Higher Education Sector (HES), by field of science and sex, 2009

	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	2 284	4 901	1 074	4 294	3 458	3 302	878	1 118	2 716	3 049	1 425	1 855
BG	285	390	629	1 369	283	342	158	245	1 160	1 115	324	275
CZ	592	1702	1391	4144	2375	2751	586	1091	1083	1589	851	1264
DK	1 150	2 775	705	2 459	3 627	4 078	712	644	1 919	2 236	1 246	1 377
DE	14 593	39 655	6 440	29 557	22 220	26 715	2 943	3 495	10 608	21 042	18 012	20 193
EE	609	1004	197	506	205	138	91	123	511	374	449	278
IE	891	2 098	424	1 948	1 113	819	119	123	1 265	1 434	793	873
ES	9 971	14 862	10 603	18 440	7 862	10 929	1 198	1 980	12 383	17 971	7 772	11 159
IT	7 549	11 724	2 963	8 654	3 215	6 902	1 407	2 712	7 611	12 304	6 301	5 447
CY	103	199	48	135	15	9	2	14	136	199	56	70
LV	512	749	262	584	319	216	123	129	806	461	609	278
LT	776	1 059	684	1 392	713	483	142	121	1 780	885	1 568	1 030
LU	54	163	5	30	0	0	0	0	77	89	61	71
HU	886	2 661	465	2 055	1 546	1 973	322	581	1 993	2 693	1 432	1 788
MT	17	49	18	112	58	71	1	4	68	108	21	90
NL	1 115	2 559	948	3 073	2 968	4 289	398	578	2 093	2 750	798	987
AT	2 135	5 540	1 018	3 821	2 825	3 563	587	465	2 438	2 704	1 962	1 981
PT	6 181	6 068	2 848	7 078	4 229	3 376	916	841	10 148	7 568	4 393	4 235
RO	240	362	3 198	5 050	1 827	1 423	364	399	2 132	2 010	518	614
SI	135	341	438	956	592	556	19	27	292	400	247	228
SK	957	1143	1597	3323	1450	1197	314	432	2023	2012	1018	1019
FI	1 490	2 994	1 063	2 435	2 702	2 029	365	264	2 662	2 359	1 190	1 018
SE	1 719	3 168	1 897	6 153	5 235	3 457	875	933	:	:	:	:
UK	18 203	40 387	9 966	42 178	36 071	34 023	1 320	2 645	19 999	28 483	27 283	30 226
HR	350	456	700	1 511	644	538	402	475	669	550	624	547
TR	3 184	4 358	4 522	9 218	13 096	15 641	1 217	2 982	7 626	11 593	4 157	5 686
NO	860	2 002	678	2 030	3 716	3 031	180	159	2 453	2 965	1 436	1 692
JP	3 265	22 740	3 811	44 859	28 737	71 051	2 113	9 893	:	:	:	:

Exceptions to the reference year: JP: 2008; FI, UK: 2007.

Data unavailable: EU-27, EU-25, EU-15, EL, FR, PL, MK, IS, CH, IL, US.

Provisional data: MT.

Data estimated: BE, IE.

Others: ':' not available.

Head count.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_perssci](#)).

**Annex 2.5:** Number of researchers in the Government Sector (GOV), by field of science and sex, 2009

	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	157	483	437	1 058	31	43	232	332	41	94	158	185
BG	1 367	1 256	416	670	268	113	451	304	182	135	565	288
CZ	1371	2688	221	1024	467	327	266	266	216	253	585	728
DK	91	263	6	16	251	556	0	3	143	186	206	260
DE	7 417	17 716	4 169	13 201	2 198	2 340	1 215	1 475	1 523	1 869	2 331	2 643
EE	48	104	20	20	111	25	38	30	40	17	187	83
IE	24	61	16	30	33	4	104	200	30	31	:	:
ES	2 077	2 531	1 877	3 063	9 540	8 624	1 718	1 914	907	1 015	500	511
IT	2 502	4 399	831	1 971	3 518	3 074	760	975	1 160	1 007	309	241
CY	39	24	1	6	3	5	6	37	24	26	20	10
LV	220	181	39	79	34	5	94	83	44	30	16	13
LT	344	400	97	168	49	18	104	58	106	48	209	108
LU	100	137	80	196	1	1	4	12	43	64	2	8
HU	702	1 606	179	394	271	152	283	332	345	471	611	627
MT	5	3	4	3	1	1	3	12	9	7	0	2
AT	154	396	170	277	111	100	95	252	443	414	382	351
PL	2 753	3 784	1 144	3 117	1 124	828	589	620	378	476	379	270
PT	611	355	196	277	1 194	731	215	169	225	97	232	122
RO	1 172	1 103	874	1 144	136	61	110	54	239	200	444	473
SI	394	641	72	149	227	174	70	88	204	138	157	158
SK	556	821	156	331	158	117	190	210	200	142	201	193
FI	500	775	583	1 477	:	:	397	386	464	428	149	65
SE	167	393	95	490	69	57	27	24	315	425	62	65
UK	1 093	2 941	168	960	913	1 089	469	706	567	415	261	239
HR	452	418	40	96	547	476	64	86	302	239	204	183
TR	499	1 313	572	1 683	96	114	638	1 416	129	152	5	15
NO	399	801	152	596	612	526	332	498	684	749	332	301
JP	1 042	6 800	555	9 086	1 227	2 539	1 524	9 684	:	:	:	:

Exceptions to the reference year: JP: 2008 FI, UK: 2007.

Data unavailable: EL, FR, PL, MK, IS, CH, IL, US.

Provisional data: IE, MT.

Others: ':' not available.

Head count.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_perssci](#)).

**Annex 2.6** Number of researchers in the Business Enterprise Sector (BES), by economic activity (NACE Rev. 2) and sex, 2009

	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 category (except C&G-N)	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
<b>EU-27</b>	67 662	397 235	7 077	19 184	13 221	15 905	60 591	253 014	29 185	5 988
BE	2 209	9 389	360	863	716	813	2 928	6 454	123	839
BG	379	432	19	18	86	35	491	697	8	17
CZ	934	6 790	150	332	131	124	966	5 113	459	788
DK	2 657	7 966	346	467	1 198	1 560	3 793	12 456	121	446
DE	19 384	145 289	1 799	5 183	2 861	4 307	6 784	37 089	675	1 774
EE	102	338	27	24	:	:	451	1 123	25	61
IE	641	2 340	72	121	210	309	1 618	4 222	51	88
ES	5 573	16 542	765	1 285	1 355	919	9 980	23 167	2 035	3 819
FR	13 513	64 305	1 659	2 493	1 541	1 234	16 315	56 850	1 094	3 555
IT	4 957	23 987	541	1 338	1 167	1 066	3 879	10 911	657	1 466
CY	40	70	7	10	15	15	59	188	9	29
LV	113	85	13	5	77	17	106	102	15	17
LT	167	436	60	29	20	5	288	589	8	-3
LU	c	c	5	18	:	:	c	c	-	-
HU	1 431	4 457	88	194	832	746	625	3 573	232	581
MT	58	107	0	:	40	18	15	92	0	2
AT	1 690	13 863	164	507	245	289	2 613	8 125	59	332
PL	1 340	4 671	225	169	450	204	1 243	4 551	92	197
PT	1 743	4 163	166	170	287	184	3 322	7 684	410	804
RO	1 204	2 139	159	171	74	36	620	1 018	576	832
SI	588	1 829	89	114	215	143	266	985	17	37
SK	227	884	61	41	:	:	200	688	21	38
FI	3 363	16 310	302	428	300	138	1 262	6 289	151	650
SE	5 349	17 457	:	:	1 401	1 106	2 767	6 695	257	294
HR	313	269	51	19	132	42	260	512	46	121
TR	2 953	10 132	266	334	291	165	2 678	8 079	156	525
NO	1 080	4 326	:	:	162	117	2 500	8 288	287	984

Data unavailable: EU-25, EU-15, EL, UK, MK, IS, CH, IL, JP, US.

Others: ':' : not available; '-' : not applicable; 'c': confidential data.

Head count.

Source: Eurostat - Research and development statistics (online data code: [rd\\_p\\_bempoccr2](#)).



# ***3. Seniority***

## Climbing up the ladder, loosing women at each step

One of the main characteristics of contemporary labour markets is the remarkable increase in women's education. In all countries, women have caught up or even surpassed men in terms of level of education (European Commission 2009). Nevertheless, in most European countries women's academic career remains markedly characterised by strong vertical segregation.

### Horizontal and vertical segregation

*Gender segregation refers to the tendency of women and men to work in different sectors and occupations.*

*Two types of segregation can be distinguished:*

- *Horizontal segregation is understood as under (over) representation of a certain group in occupations or sectors not ordered by any criterion (Bettio and Verashchagina, 2009). Horizontal segregation refers to the concentration of women and men in professions or sectors of economic activity. Horizontal segregation in science refers to the unequal distribution of women and men across scientific fields.*
- *Vertical segregation refers to the under (over) representation of a clearly identifiable group of workers in occupations or sectors at the top of an ordering based on 'desirable' attributes – income, prestige, job stability etc, independent of the sector of activity. Under-representation at the top of occupation-specific ladders was subsumed under the heading of 'vertical segregation', whereas it is now more commonly termed 'hierarchical segregation' (Bettio and Verashchagina, 2009, p. 32). In the literature, vertical segregation is referred to by the "glass ceiling" which points towards the existence of visible or invisible obstacles that lead to a scarcity of women in power and decision-making positions in public organizations, enterprises but also in associations and trade unions (Laufer, 2002). This phenomenon of barriers that prevent the ascension of women is complemented by the concept of "sticky floor". This concept describes the forces that tend to maintain women at the lowest levels in the organisational pyramid (Maron and Meulders, 2008).*

Vertical segregation in the academic world is illustrated by Figure 3.1. At the first two levels of university education (students and graduates of largely theoretically-based programmes to provide sufficient qualifications for gaining entry to advanced research programmes and professions with high skills requirements), respectively 55% and 59% of enrolled students are female in 2010. However, men outnumber women as of the third level (students in programmes leading to the award of an advanced research qualification such as the PhD that are devoted to advanced study and original research) at which the proportion of female students enrolled drops back to 49%. At this level of education, where the total number of students has already fallen back substantially as compared with the first level, men are more numerous among enrolled students and the gender gap widens at the PhD level. Indeed, women comprise only 46% of PhD graduates. The PhD degree is often required to embark on an academic career, which means that the attrition of women at this level will have a knock-on effect on their relative representation at the first stage of the academic career. Whereas 46% of PhD graduates are women, they account for only 44% of grade C academic staff (the first grade/post into which a newly qualified PhD graduate would normally be recruited). The take-off phase in the academic career is consequently also more hazardous for women, as shown by the fact that their proportion drops to 37% among grade B academics (researchers working in positions not as senior as top position but more senior than newly qualified PhD holders). These figures illustrate the workings of a sticky floor, a metaphor to illustrate the difficulties graduate women face when trying to gain access to the first levels of the academic career. Although women are more successful than men in completing tertiary education programmes (European Commission, 2008), they are less successful in entering the PhD level and the lowest steps of the academic career. The question is thus to know why women fall victim to such rarefaction: is it because of direct discrimination that derives from choices and decisions made by selection committees that are composed mainly of men, because of indirect discrimination that operates through gender-biased selection criteria or because of self-censuring rooted in gender stereotypes? The proportion of women is the smallest at the top of the academic hierarchy, falling back to just 20% of grade A academic staff in 2010 (the highest grade/post at which research is normally conducted). This figure clearly indicates the existence of a Glass Ceiling composed of



difficultly identifiable obstacles that hold women back from accessing the highest positions in the hierarchy.

A comparison between 2002 and 2010 shows an improvement in women's relative position at the PhD level and at the different stages of the academic career, as captured by grades A, B and C.

This positive progress is nevertheless slow and should not mask the fact that, in the absence of proactive policies, it will take decades to close the gender gap and bring about a higher degree of gender equality.

Off the starting blocks, girls do well, they form a majority in the population of ISCED 5A students and graduates, but the scissors cross once one reaches the doctoral preparation stage and the other levels that open the way to academic and research careers, the pipeline leaks, and at the very top, at grade A, we are left with just 20% of women. Although women's share increases over time at all levels, policies are needed to fasten the pace of women's catching-up.

### Grade explanations

*Academic staff (or academia) can be broken down by grades in research activity. 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.*

*B: Researchers working in positions not as senior as top position (A) but more senior than newly qualified PhD holders (ISCED 6).*

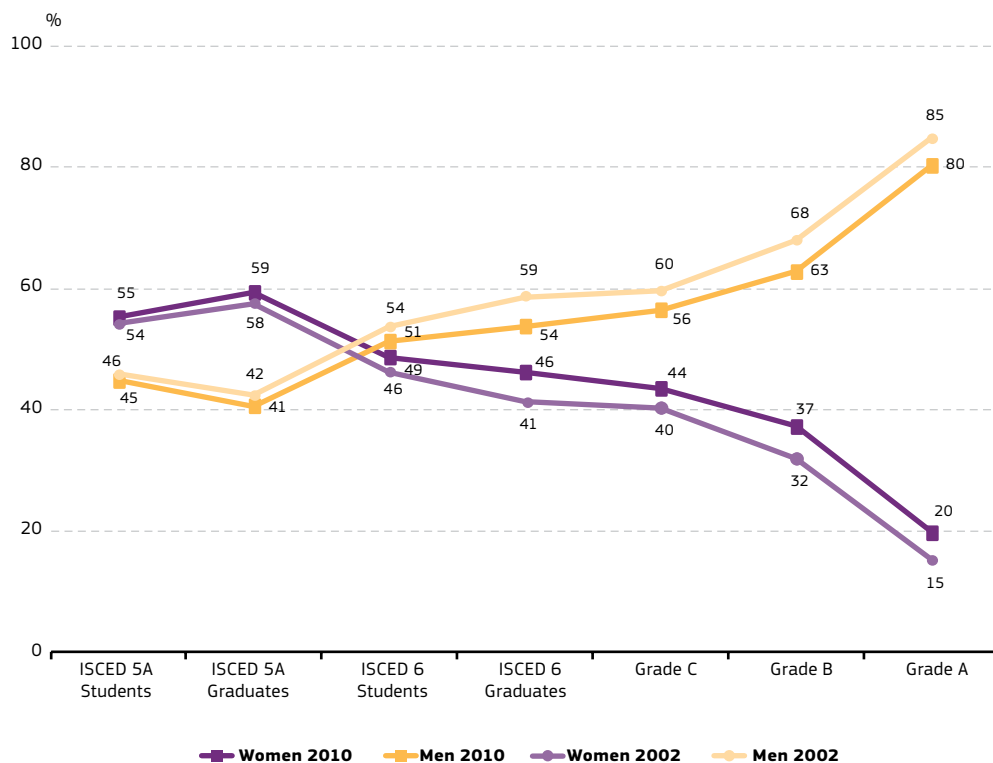
*C: The first grade/post into which a newly qualified PhD graduate would normally be recruited.*

*D: Either postgraduate students not yet holding a PhD degree who are engaged as researchers, or researchers working in posts that do not normally require a PhD.*

*A complete list of the grades reported for each country is included in the Annex 5.*

This positive progress is nevertheless slow and should not mask the fact that, in the absence of proactive policies, it will take decades to close the gender gap and bring about a higher degree of gender equality.

**Off the starting blocks, women do well, they form a majority in the population of ISCED 5A students and graduates, but the scissors cross once one reaches the doctoral preparation stage and the other levels that open the way to academic and research careers, the pipeline leaks, and at the very top, at grade A, we are left with just 20% of women. Nonetheless women's share slowly increases over time at all levels; policies and incentives are needed to fasten the pace of women's catching-up.**

**Figure 3.1:** Proportions of men and women in a typical academic career, students and academic staff, EU-27, 2002–2010

Exceptions to the reference years: **ISCED 5A Graduates:** DK: 2003-2010; FR:2003-2009; **ISCED 6 Students:** IT, LU, RO: 2003-2010; SI: 2005-2010; **ISCED 6 Graduates:** DK; RO: 2003-2010; FR: 2003-2009; **WiS:** CZ: 2002-2008; EE: 2002-2004; LT: 2002-2007; DK, FR, CY, AT, PT, RO, SE: 2002-2009; SK: 2002-2011; NL: 2003-2010; UK: 2003-2006.

Data unavailable: **ISCED 6 students:** DE; **ISCED 5A and 6 Graduates:** LU; **WiS:** EL, IE, MT, PL.

Data estimated: EU-27 (by DG Research and Innovation) for WiS, ISCED 6 students and ISCED 5A-6 graduates.

Others: Head count (Grades A, B, C).

NO: before 2007 biannual data; Grade C unavailable: BG, RO (included in B); LU only 2010 data for ISCED 5A and 6 graduates.

Source: Eurostat - Education Statistics (online data codes: [educ\\_enr1tl](#) and [educ\\_grad4](#)); WiS database (DG Research and Innovation); IT - MIUR-Italian Ministry of Education (2010).

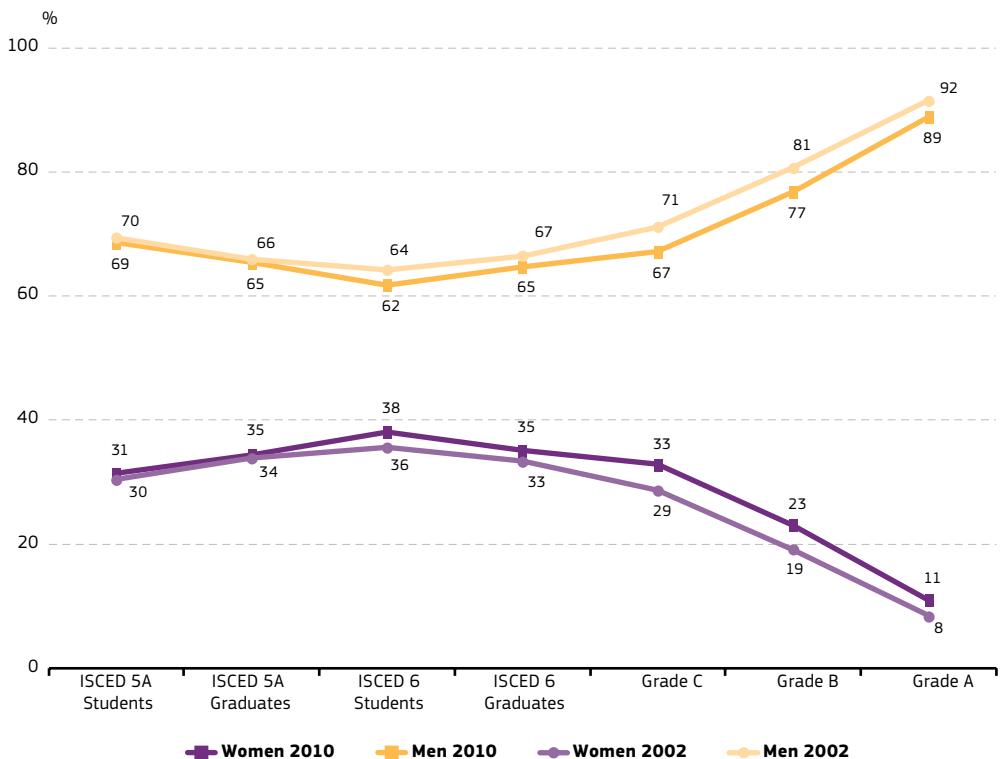
### A wider opening scissors in science and engineering

Although a picture of strong vertical segregation transpires through the analysis of the overall situation in the academic world, the situation can vary considerably according to the field of science considered. Despite girls' impressive gains in education, progress has been uneven, science and engineering remain an overwhelmingly male field. As shown by Figure 3.2, in science and engineering, women account for only 31% of the student population at the first level. In contrast with what was observed for all fields of study taken together, the proportion of women increases throughout the first hierarchical echelons to reach 38% at the level of PhD students and 35% at the level of PhD graduates. The lack of appeal of science and engineering studies for young women is particularly problematic at the earliest stage of a typical academic career in this field, as women tend to be better represented among PhD students and graduates. However, the problem of horizontal gender segregation in education is almost always presented from the perspective of the educational choices made by young women, even though gender segregation is also due to young men's preferences for certain fields of study: why are there so few young men in disciplines such as history, philosophy, and so forth? The absence of a mixed gender composition in the different fields of study can already be observed in secondary education and is in turn reflected in higher education.

The same pattern was noted for academic careers in science and engineering as in all fields of study. From 35% of female PhD graduates, the proportion of women drops to 32% in grade C academic staff, 23% in grade B and just 11% in grade A. Women's attrition in science and engineering is thus comparable to all study fields taken together. A comparison between 2002 and 2010 points towards an improvement in the proportion of female scientists and engineers that is slightly less pronounced than for all study fields taken together.

**In science and engineering, the scissors do not cross, among students and academics, women form a minority. However, as for all science fields together, in the particular field of science and engineering, the attrition of women sharpens at each stage up above the PhD level and improvement over time is small and slow.**

**Figure 3.2:** Proportions of men and women in a typical academic career in science and engineering, students and academic staff, EU-27, 2002–2010



Exceptions to the reference years: **ISCED 6 students:** FR: 2006-2010; IT: 2002-2007; RO: 2003-2010; SI: 2005-2010; **Wis:** CZ: 2002-2008; DK, CY, AT, PT, SE: 2002-2009; ES: 2007-2010; LT: 2005-2007; NL: 2003-2010; SK: 2001-2011; UK: 2003-2006.

Data unavailable: **ISCED 6 students:** DE, LU, NL; **Wis:** BG, EE, EL, FR, IE, LV, LU, HU, MT, PL, RO.

Data estimated: EU-27 (by DG Research and Innovation) for Wis and ISCED 6 students.

Others: Head count (grades A, B, C).

NO: before 2007 biannual data.

SET fields of education = Science, maths and computing + Engineering, manufacturing and construction.

SET fields of science = Engineering and Technology + Natural Sciences.

Source: Eurostat - Education Statistics (online data codes: [educ\\_enr15](#) and [educ\\_grad5](#)); Wis database (DG Research and Innovation).

### In the new Member States there is a tendency to have more women at grade A than in the former EU-15 countries

The above results refer to the EU-27 average and as such mask important cross-country disparities. Given the variation in nationally applied classifications of academic grades, hereafter the analysis essentially concerns the issue of women's presence at grade A of the academic career; in most countries, grade A corresponds to Full Professors. Table 3.1 and Figure 3.3 indicate that female representation is on average higher in the new EU Member States than in the EU-15, where there are on average 18% of women at grade A level, compared with 20% throughout the EU-27. The two EU Member States where the share of women among grade A academic staff is the highest (above 30%) are Romania and Latvia. In contrast, the proportion of women was the lowest in Luxembourg, Cyprus, Belgium, and the Netherlands. Their proportions ranged from 36% in Romania to 9% in Luxembourg. Between 2002 and 2010, women's presence at grade A level has strengthened in all countries except Estonia.

**Table 3.1:** Proportion of female academic staff by grade and total, 2010

	Grade A	Grade B	Grade C	Grade D	Total
EU-27	20	37	44	46	40
EU-25	18	36	45	44	39
EU-15	18	36	43	45	39
BE	12	27	34	:	38
BG	26	40	x	54	46
CZ	13	31	34	46	35
DK	15	29	38	47	37
DE	15	21	27	41	36
EE	17	37	57	67	49
IE	:	:	:	:	39
ES	17	38	49	52	45
FR	19	40	30	42	34
IT	20	34	45	51	39
CY	11	21	49	34	37
LV	32	47	63	:	57
LT	14	42	53	63	53
LU	9	29	31	:	26
HU	21	36	40	37	36
MT	:	:	:	:	32
NL	13	21	34	45	37
AT	17	22	44	42	38
PT	22	37	45	47	43
RO	36	51	x	59	46
SI	20	31	46	51	38
SK	23	37	49	54	43
FI	24	52	52	45	44
SE	20	48	43	50	45
UK	17	37	47	46	42
HR	26	43	45	56	47
TR	28	35	48	48	40
IS	24	36	49	:	36
NO	21	37	48	55	44
CH	26	26	39	46	36
IL	14	26	36	48	28

Exceptions to the reference year: CZ: 2008; EE: 2004; DK, FR, CY, MT, AT, PT, RO, SE: 2009; IE: 2008; LT: 2007; SK:2011; UK: 2006.

Data unavailable: EL, PL, MK, JP, US.

Data estimated: EU-27, EU-25, EU-15 (by DG Research and Innovation), SI.

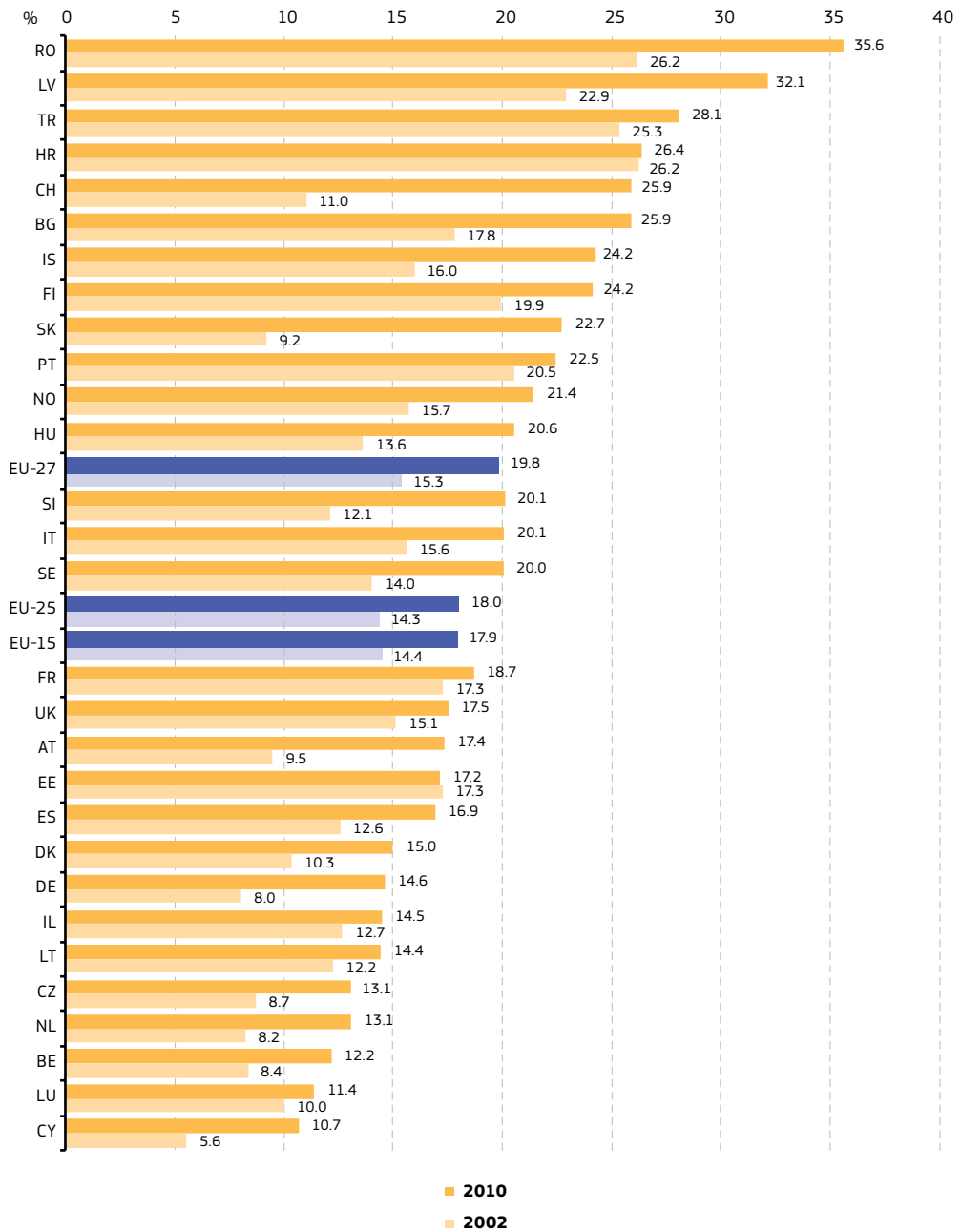
Others: 'x': data included in another cell; ':' not available;

Head count.

Some differences exist in coverage and definitions between countries.

Grade C unavailable: BG, RO (included in B); Grade D unavailable: BE (French-speaking community).

Source: WiS database (DG Research and Innovation).

**Figure 3.3:** Proportion of women in grade A academic positions, 2002–2010

Exceptions to the reference years: **2002:** NL, UK, NO: 2003; HR: 2008; IL: 2006; **2010:** CZ: 2008; DK, FR, CY, AT, PT, RO, SE: 2009; EE: 2004; LT: 2007; SK: 2011; UK: 2006.

Data unavailable: EL, IE, MT, PL, MK, JP, US.

Data estimated: EU-27, EU-25, EU-15 (by DG Research and Innovation), SI.

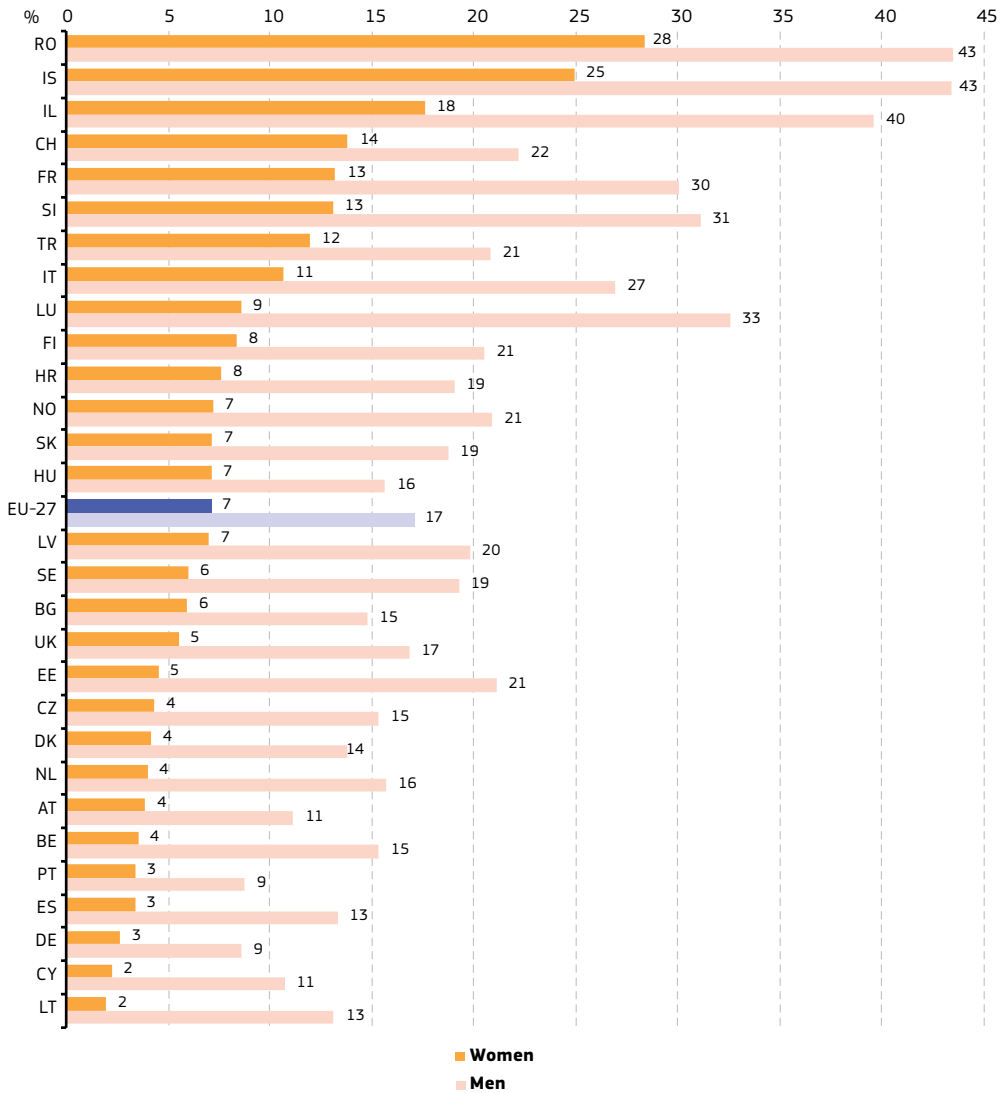
Others: Head count.

NO: before 2007 biannual data.

Source: WIS database (DG Research and Innovation).

As shown in Figure 3.4, in 2010, the share of female grade A staff among female academic staff is always lower than the share of male grade A staff among male academic staff. On average, throughout the EU-27, 7% of women and 17% of men working in the academic sector are at grade A in 2010. Women are thus relatively more present at the lower levels of the academic career. The share of female grade A staff among female academic staff varies between 28% and 2%, with the highest proportions being recorded in Romania, France, Slovenia and Italy. Conversely, the lowest shares were reported by Lithuania, Cyprus, Germany, Spain and Portugal. However, the gap between the proportions of women and men at grade A level remains sizeable even in those countries where the share of female academics to have reached this level is highest. Differences between national grading systems may partly explain the variations between countries.

**Figure 3.4:** Percentage of grade A among all academic staff by sex, 2010



Exceptions to the reference year: CZ: 2008; DK, FR, CY, AT, PT, RO, SE: 2009; EE: 2004; UK: 2006; SK: 2011.

Data unavailable: EL, IE, MT, PL, MK, JP, US.

Data estimated: EU-27 (by DG Research and Innovation), SI.

Others: Head count.

Some differences exist in coverage and definitions between countries.

Source: WIS database (DG Research and Innovation).

## Female grade A academics are least well represented in engineering and technology

When looking at the different fields of study separately (Table 3.2), it can be noted that, in 2010, on average throughout the EU-27, the proportion of women among grade A academic staff was the highest in the humanities and social sciences (respectively 28.4 % and 19.4%). In contrast, in engineering and technology, the under-representation of women was most striking, with on average 7.9% of women among academic personnel at grade A and particularly small shares of women (under 6%) in Lithuania and Germany. The proportion of women stood in between these two extremes in the natural, agricultural and medical sciences, respectively at 13.7%, 15.5% and 17.8%. At the level of the EU Member States, the share of female grade A academics is consistently lowest in engineering and technology (it is highest in Slovakia at 12%), but there is a high level of disparity between the countries as to the science field where grade A women are best represented. The medical sciences score better than the social sciences and/or humanities in the Czech Republic, Finland, Lithuania, Slovakia, Slovenia, and the United Kingdom, pointing towards a stronger presence of female grade A staff in medicine in these countries. Agricultural science attracts considerably more female grade A academics in Cyprus, Slovenia and Finland than in the other countries. Portugal stands out from the other EU members with a very high share of female grade A staff in the natural sciences (33.2%). The pattern set forth by Figure 3.5 confirms these trends.

**Although women are relatively more present at the lower levels of the academic career, the proportion of women among grade A academics has generally strengthened over the last decade: in 2010, it ranged from 36% in Romania to 9% in Luxembourg. It consistently remains lowest in engineering and technology in all EU Member States.**

**Table 3.2:** Proportion of female grade A staff by main field of science, 2010

	Natural sciences	Engineering and technology	Medical sciences	Agricultural science	Social sciences	Humanities
<b>EU-27</b>	13.7	7.9	17.8	15.5	19.4	28.4
BE	11.4	6.3	12.3	8.5	15.4	15.2
CZ	10.6	7.4	19.7	11.3	15.6	17.9
DK	9.8	6.3	15.6	17.8	17.3	27.6
DE	9.8	5.9	9.2	13.5	12.6	25.2
ES	16.0	7.9	16.3	12.9	17.8	25.5
IT	19.8	9.5	12.2	15.0	20.1	36.5
CY	16.7	-	-	33.3	12.5	-
LT	6.8	4.5	22.6	10.3	17.8	26.5
NL	8.5	6.8	10.2	8.3	15.7	20.4
AT	7.6	7.7	14.4	18.2	20.9	28.1
PT	33.2	7.0	17.5	28.1	19.5	29.6
SI	7.5	8.7	28.1	32.3	18.8	28.7
SK	17.9	12.0	25.2	12.9	30.1	24.2
FI	11.8	7.4	27.0	32.9	30.5	39.5
SE	14.3	10.1	20.2	19.6	23.0	30.2
UK	9.0	7.0	23.2	12.4	22.7	10.8
HR	36.0	24.2	28.8	26.4	25.5	19.4
TR	25.7	19.1	35.4	19.5	27.1	25.5
NO	14.9	10.0	27.6	17.5	23.2	28.2
CH	11.8	15.2	26.3	11.3	35.6	32.0
IL	9.9	6.7	19.7	12.0	16.9	31.1

Exceptions to the reference year: CZ: 2008; DK, CY, AT, PT, SE: 2009; LT: 2007; SK: 2011.

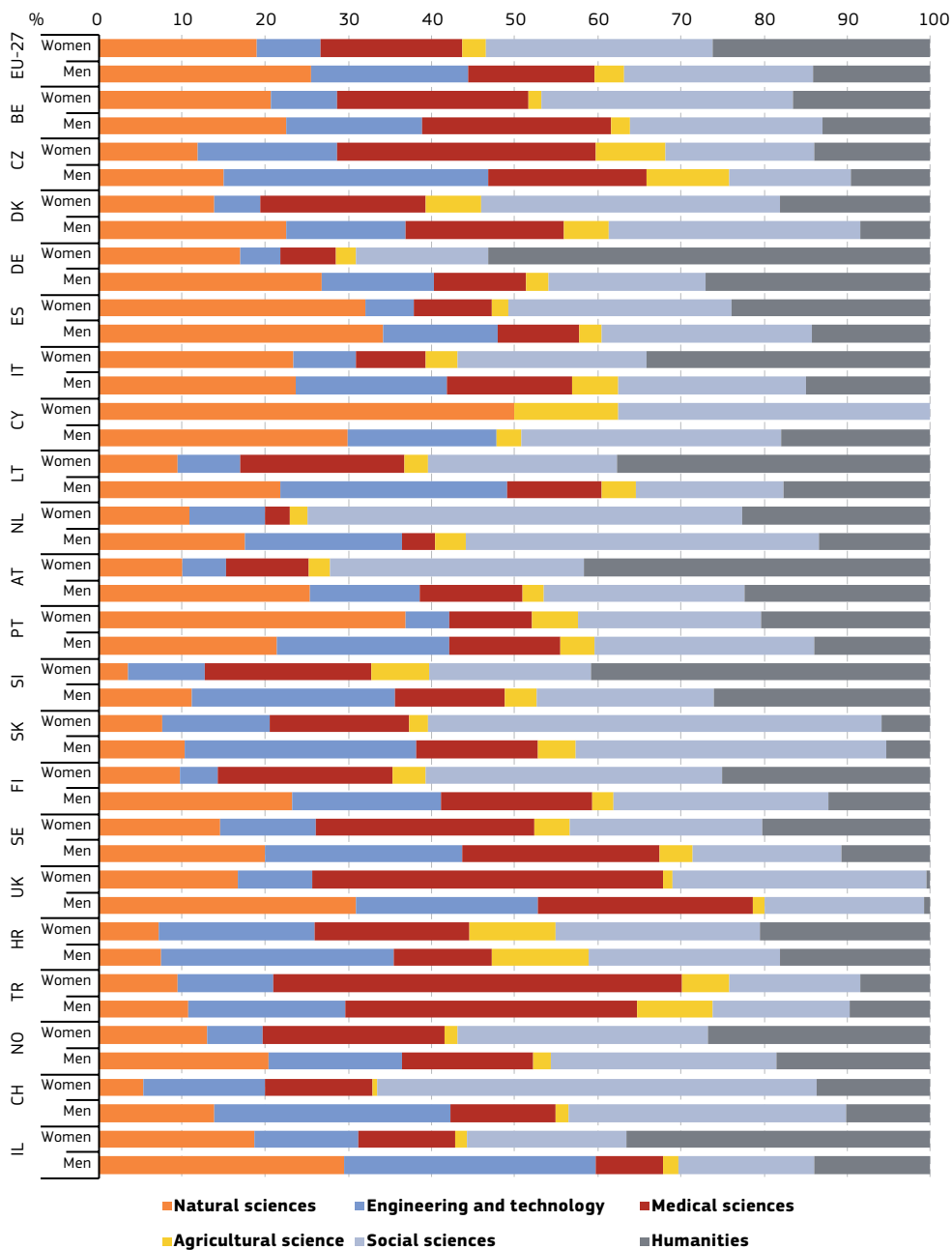
Data unavailable: BG, EE, EL, FR, IE, LV, LU, HU, MT, PL, RO, MK, IS, JP, US.

Data estimated: EU-27 (by DG Research and Innovation) and SI.

Others: '-': not applicable; Head count; Some differences exist in coverage and definitions between countries; Medical sciences exclude female professors at university hospitals for Denmark.

Source: WiS database (DG Research and Innovation).

**Figure 3.5:** Distribution of grade A staff across fields of science by sex, 2010



Exceptions to the reference year: CZ: 2008; DK, CY, AT, PT, SE: 2009; UK: 2006; LT: 2007; SK: 2011.

Data unavailable: BG, EE, EL, FR, IE, LV, LU, HU, MT, PL, RO, MK, IS, JP, US.

Data estimated: EU-27 (by DG Research and Innovation), SI.

Others: Head count.

Some differences exist in coverage and definitions between countries.

Source: WiS database (DG Research and Innovation).



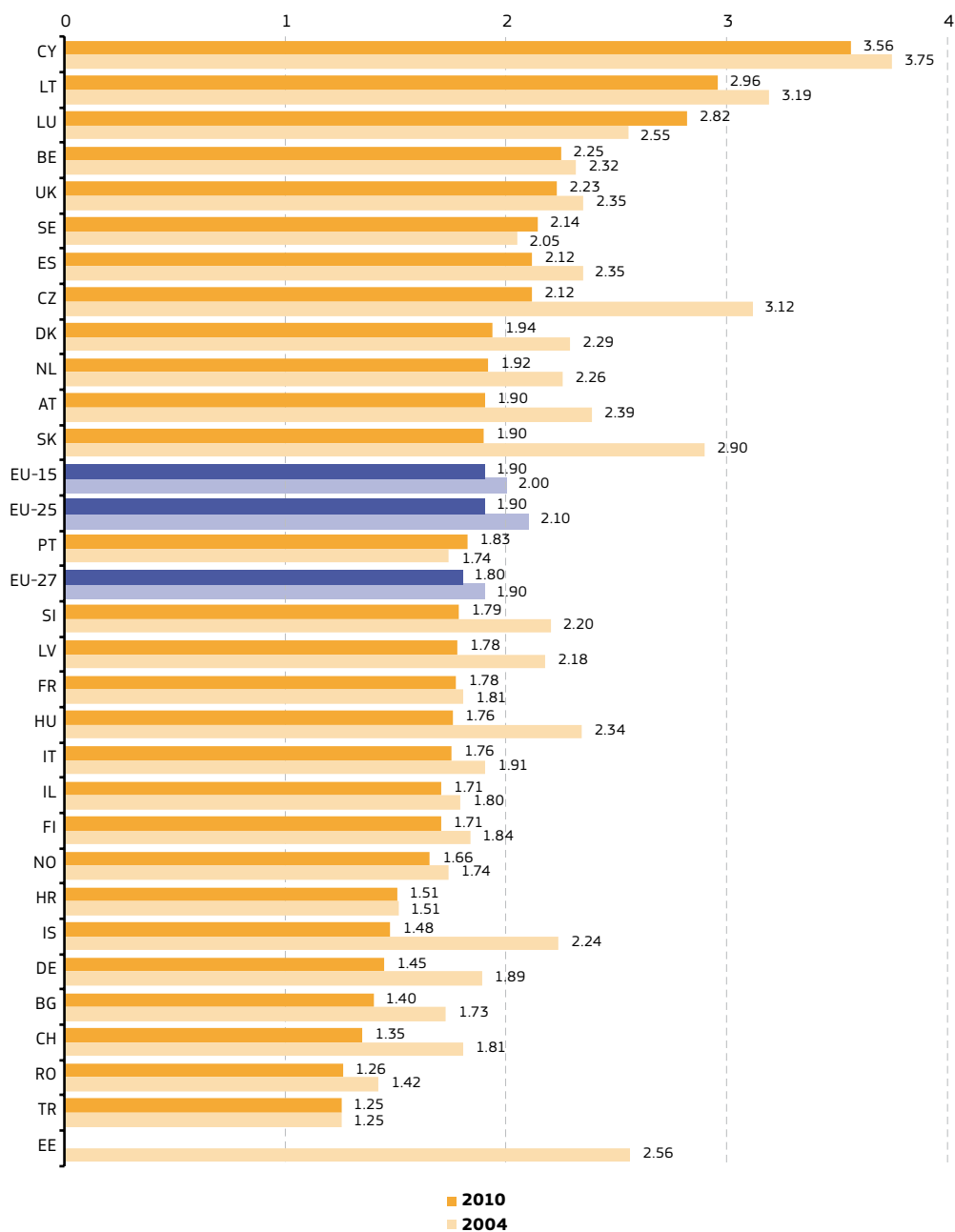
## Summarising vertical segregation: the Glass Ceiling Index

The Glass Ceiling Index (GCI) synthetically illustrates the difficulties women have in gaining access to the highest hierarchical levels.

### The Glass Ceiling Index (GCI)

*The GCI measures the relative chance for women, as compared with men, of reaching a top position. The GCI compares the proportion of women in grade A positions (equivalent to Full Professors in most countries) to the proportion of women in academia (grade A, B, and C), indicating the opportunity, or lack of it, for women to move up the hierarchical ladder in their profession. A GCI of 1 indicates that there is no difference between women and men being promoted. A score of less than 1 means that women are over-represented at grade A level and a GCI score of more than 1 points towards a Glass Ceiling Effect, meaning that women are under-represented in grade A positions. In other words, the interpretation of the GCI is that the higher the value, the thicker the Glass Ceiling and the more difficult it is for women to move into a higher position. It is important to note that differences between national grading systems may partly explain variations of the GCI between countries.*

On average, throughout the EU-27, the GCI equals 1.8 in 2010 (Figure 3.6) which means that slow progress has been made since 2004 when the index stood at 1.9. In 2010, in no country is the GCI equal to or below 1. Its value ranges from 3.6 in Cyprus to 1.3 in Romania (and Turkey). Aside from Cyprus, the highest GCI was reported in Lithuania and Luxembourg. Between 2004 and 2010, the GCI has decreased in most countries. It remained stable in Sweden and France (also in Norway, Croatia and Turkey). However, the Glass Ceiling thickened over this period in Luxembourg and Portugal. Proactive policies need to be implemented in order to balance out the unequal situation that continues to prevail in the academic sector.

**Figure 3.6:** Glass Ceiling Index, 2004-2010

Exceptions to the reference years: CZ: 2004-2008; DK, FR, CY, AT, RO, SE: 2004-2009; UK: 2004-2006; LT: 2004-2007; LU: 2005-2009; PT: 2003-2009; HR: 2008-2010; NO: 2005-2010; IL: 2006-2010; SK: 2004-2011; EE: 2004.

Data unavailable: EL, IE, MT, PL, MK, JP, US.

Data estimated: EU-27, EU-25, EU-15 (by DG Research and Innovation), SI.

Others: Head count.

Some differences exist in coverage and definitions between countries.

Country with small numbers of academic staff: CY, MT, LU, IS.

NO: before 2007 biannual data.

Grade C unavailable for BG, RO (included in B).

Source: WiS database (DG Research and Innovation).

## Do younger generations of women in academia face fewer obstacles on their career path?

A possible explanation for women's under-representation at the highest hierarchical level could be that a generation effect is at work, meaning that women who are currently at grade A only accounted for a very small proportion of female students at the different study levels when they were young. To test this hypothesis, it would have been necessary to use data on cohorts of women in order to monitor their progression in the academic career at different points in time. Such data are unfortunately not available. To assess this potential generation effect, Table 3.3 presents the proportion of women at grade A level for the different age groups (<35 years, 35-44 years, 45-54 years, and +55 years). The existence of a generation effect could be exemplified by the fact that the proportion of female grade A academics is larger in the younger age groups. There are only four countries where sample sizes in the youngest age group are large enough to be meaningful: Germany, Austria, Romania and Finland. However, in Germany and Austria, the shares of female grade A staff are highest in this group of under 35 year-olds, and in Romania, the shares of female grade A staff are almost identical in the two youngest age groups. Only Finland does not confirm this generation effect. In the remaining countries, for which we have no reliable information concerning the youngest age group, the share of female grade A academics is highest in the group of 35 to 44 year olds in Slovakia and Iceland, which are thus two more countries to point towards a generation effect. The remaining countries show different patterns and provide no evidence in this sense. To sum up, the situation appears more favourable for the youngest generations of female academics in a subset of countries but still the gender gap is disproportionately high compared with the increase in the proportion of women among students and thus casts doubt on the hypothesis that women will automatically catch up.

**The data currently available by age group are not sufficiently convincing to acknowledge the hypothesis of a spontaneous movement towards gender equality at the highest rank of a typical academic career.**

**Table 3.3:** Proportion of female grade A staff by age group, 2010

	<35	35-44	45-54	55+	Total
BE	i	15	15	9	12
BG	:	i	33	25	26
DE	23	20	16	10	15
IT	i	19	20	20	20
AT	39	25	23	10	17
PT	i	15	25	22	22
RO	46	47	40	27	36
SK	i	27	24	22	23
FI	15	22	26	24	24
SE	i	16	20	21	20
IS	i	35	28	21	24
NO	i	20	24	20	21

Exceptions to the reference year: AT, PT, RO, SE: 2009; SK: 2011.

Data unavailable: EU-27, EU-25, EU-15, CZ, DK, EE, IE, EL, ES, FR, CY, LV, LT, LU, HU, MT, NL, PL, SI, UK, HR, MK, TR, CH, IL, JP, US.

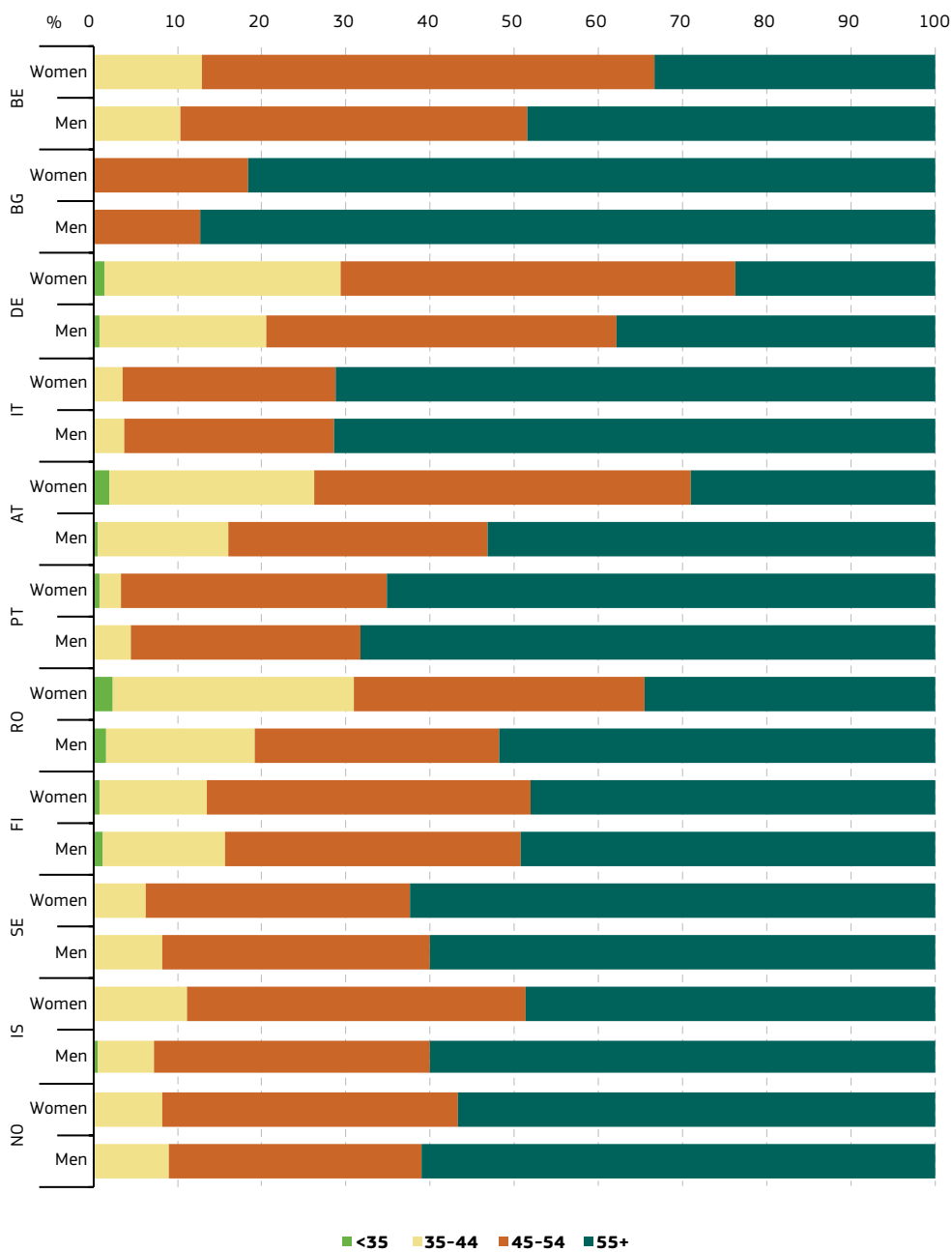
Others: 'i' not available.

'i': less than 10 members of academic staff.

Head count.

Source: WiS database (DG Research and Innovation).

**Figure 3.7:** Distribution of grade A staff across age groups, by sex, 2010



Exceptions to the reference year: AT, PT, RO, SE: 2009.

Data unavailable: EU-27, EU-25, EU-15, CZ, DK, EE, IE, EL, ES, FR, CY, LV, LT, LU, HU, MT, NL, PL, SI, SK, UK, HR, MK, TR, CH, IL, JP, UK.

Others: Head count.

Source: WiS database (DG Research and Innovation).



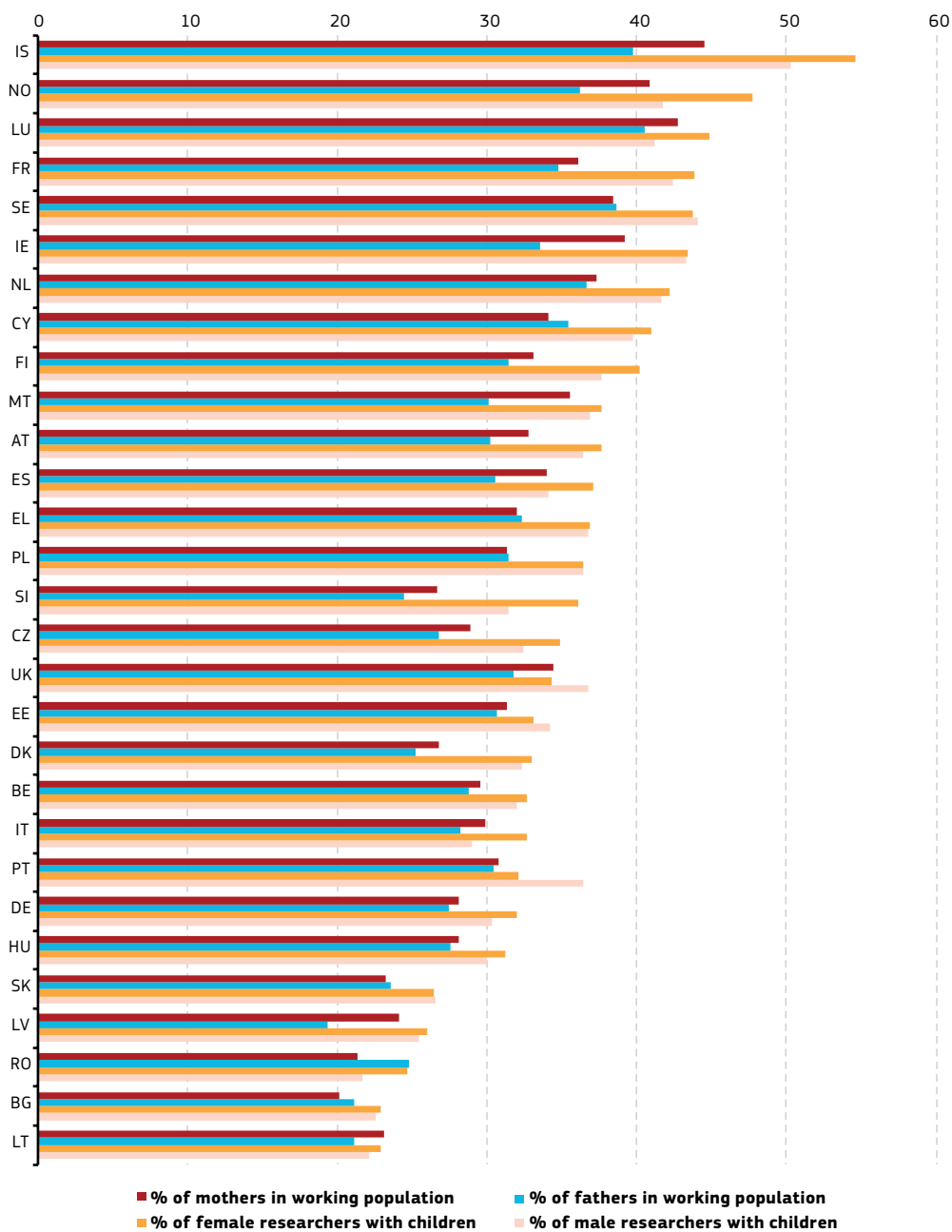
### Parenthood and/or a scientific career

To get some idea on the parenthood status of researchers, the EU-SILC data for 2010 were used. In this dataset, researchers cannot be identified as precisely as in R&D surveys. We approximated researchers by looking at people aged 25-64 belonging to ISCO'88 occupational groups 1, 2 or 3 (which include legislators, senior officials and managers, professionals and technicians and associate professionals) and with ISCED 5A, ISCED 5B or ISCED 6 level of education. They are considered parents in case there is a child under 15 in their household.

Researchers are more likely to have children than the working population in general and this holds true for men and women (Figure 3.8). The shares of parents in the research population tend to be correlated with the shares of parents in the working population so that those countries with the highest/lowest shares of researchers with children are also those with the highest/lowest shares of parents in the working population. These findings underscore the centrality of work-life balance issues for women and men scientists. There is not just a Glass Ceiling; the English-speaking literature uses the term “maternal wall” to refer to the multiple constraining barriers that women scientists with family responsibilities face. Although work-life and work-family balance in principle concern both female and male scientists and researchers, women are usually more affected given that they still carry the main burden of care and domestic work. Besides general policies affecting women's entry into the labour market and their employment conditions, policies specifically targeted at women in science are needed to prevent that motherhood precludes women from advancing in their academic career.

**Work/life balance issues are of particular concern to researchers as they are more likely to have children than the working population in general regardless of their sex.**

**Figure 3.8:** The proportion of men/women researchers with children, 2010



Exceptions to the reference year: CY, IE, RO: 2009.

Data unavailable: EU-27, HR, MK, TR, CH, IL, JP, US.

Source: Computations by ULB/DULBEA, based on 2010 SILC data.



## Occupational gender segregation marks R&D personnel

Given that the grade system applies to the Higher Education sector only, it is hazardous to study the hierarchical position of female scientists in the other broad sectors of economic activity.

Available data refer to the distribution of R&D personnel by sex within different occupations (researchers, technicians and others) for 2009 in the three broad economic sectors taken together (Figure 3.9) and then separately in each of these three sectors: the Higher Education Sector (Figure 3.10), the Government Sector (Figure 3.11), the Business Enterprise Sector (Figure 3.12).

### Occupations in research

*According to the Frascati Manual, R&D personnel can be broken down by occupation:*

- *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 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”;* and
- *other supporting staff includes “skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with such projects”.*

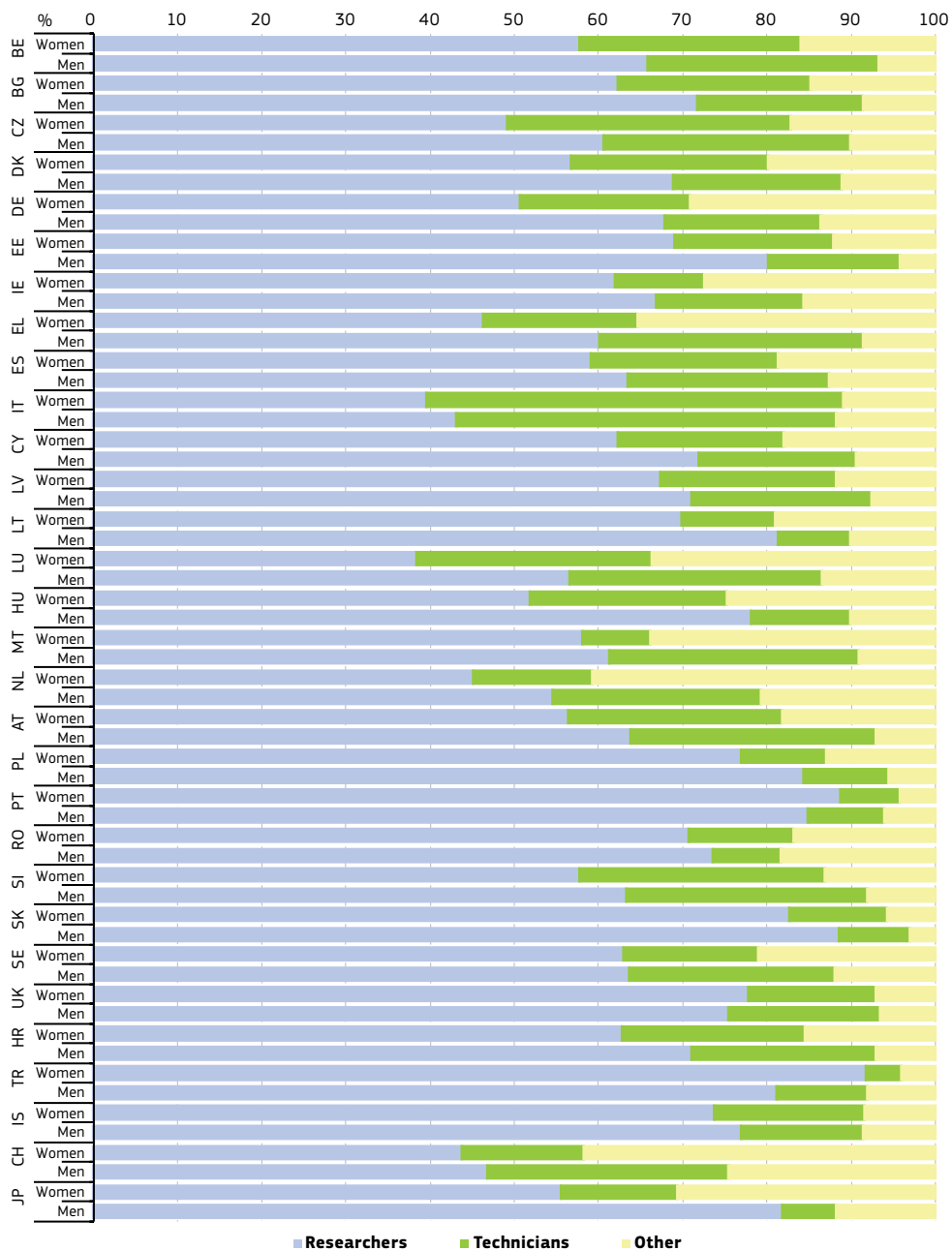
*For the purpose of describing these indicators, a hierarchy can be defined with researchers placed highest, followed by technicians and other supporting R&D personnel.*

In all three sectors and in nearly all EU countries studied, the proportion of male researchers exceeds that of female researchers (the UK forms an exception in the Higher Education Sector; Ireland, Greece, Malta and Sweden are exceptions in the Government Sector; Bulgaria, Italy, Latvia, Malta and Portugal are exceptions in the Business Enterprise Sector). The reverse pattern marks the lowest occupational level of other supporting staff, where the proportion of women tends to exceed that of men in most countries in the three broad economic sectors. The proportion of women among technicians is also systematically higher than that of men in Higher Education (there are just 4 exceptions, Ireland, Luxembourg, Malta and the UK where the share of men among technicians exceeds that of women by between 3 and 8 p.p.); in the Government Sector, there are already more exceptions to this overall pattern (the most noteworthy are Malta and Sweden where the share of women technicians is respectively 26 p.p. and 18 p.p. below that of men); and in the Business Enterprise Sector, the countries are divided in two groups of roughly equal size, one where there are more female than male technicians and one where the opposite is observed. Again Malta stands out from the others with a particularly large gap between the shares of women and men among technicians, the share of women being 27 p.p. below that of men.

In the Higher Education Sector, the proportion of female R&D personnel working as researchers is particularly high (above 90%) in Slovakia and Portugal and it is particularly low (at 51–55%) in Greece, Hungary and Malta (and also in Switzerland). The highest shares of female technicians are observed in the Czech Republic (29.5%) and Greece (26.1%). Women in R&D are particularly likely to perform supporting tasks in Malta (41.4%), Ireland (29.1%), Hungary (28.4%) and Germany (27.8%). In the Government and the Business Enterprise Sectors, Figures 3.10 and 3.11 show that in most countries a lower share of women are occupied as researchers than in the Higher Education Sector but instead relatively more women work as technicians. The higher share of women in relation to men among other supporting staff is also more pronounced in the Government and the Business Enterprise Sector than in Higher Education.

**In the three broad economic sectors, more male than female R&D personnel work as researchers, more female than male R&D personnel performs research-supporting activities. Larger shares of women than of men work as technicians in higher education and the government sector in most EU Member States but in the business enterprise sector, the countries are divided.**

**Figure 3.9:** Distribution of R&D personnel across occupations in all Sectors (HES, GOV, BES) by sex, 2009



Exceptions to the reference year: EL: 2007; CH, JP: 2008.

Data unavailable: EU-25, FR, FI, MK, NO, IL, US.

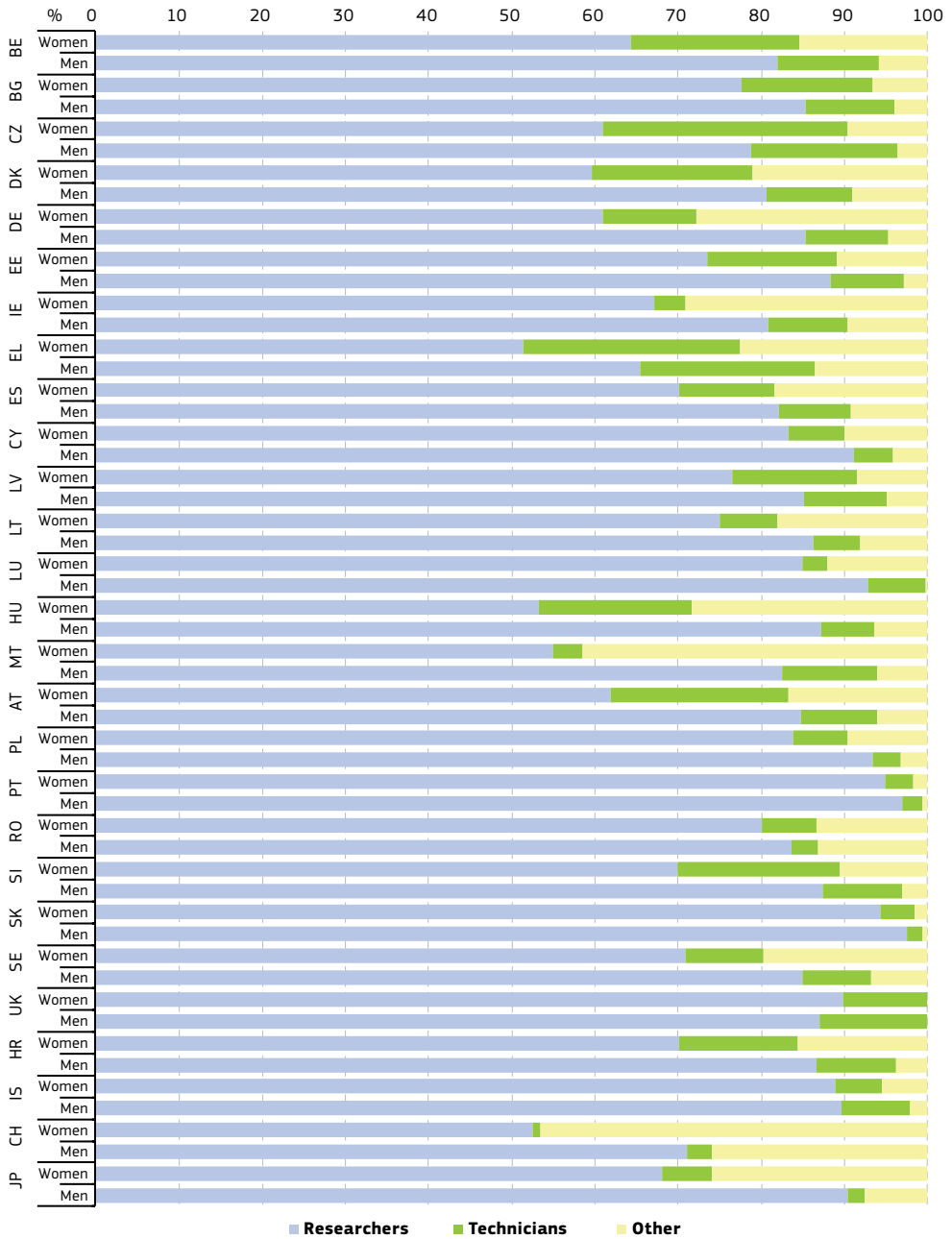
Data estimated: IE, UK.

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).



**Figure 3.10:** Distribution of R&D personnel across occupations for the Higher Education Sector (HES) by sex, 2009



Exceptions to the reference year: EL: 2005; CH, JP: 2008.

Data unavailable: EU-27, EU-25, EU-15, FR, NL, FI, MK, TR, NO, IL, US.

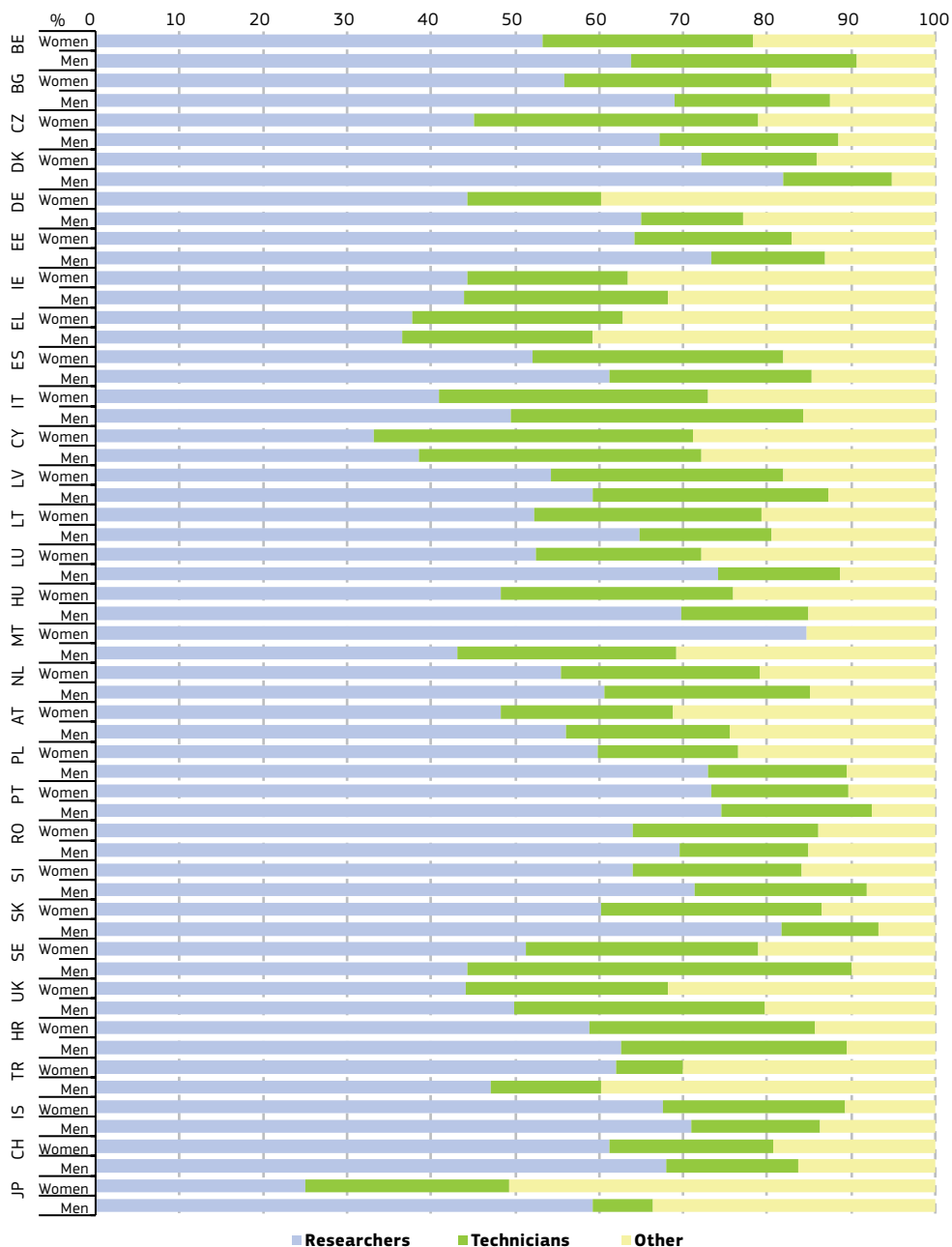
Data estimated: IE.

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: rd\_p\_persocc).



**Figure 3.11:** Distribution of R&D personnel across occupations for the Government Sector (GOV) by sex, 2009



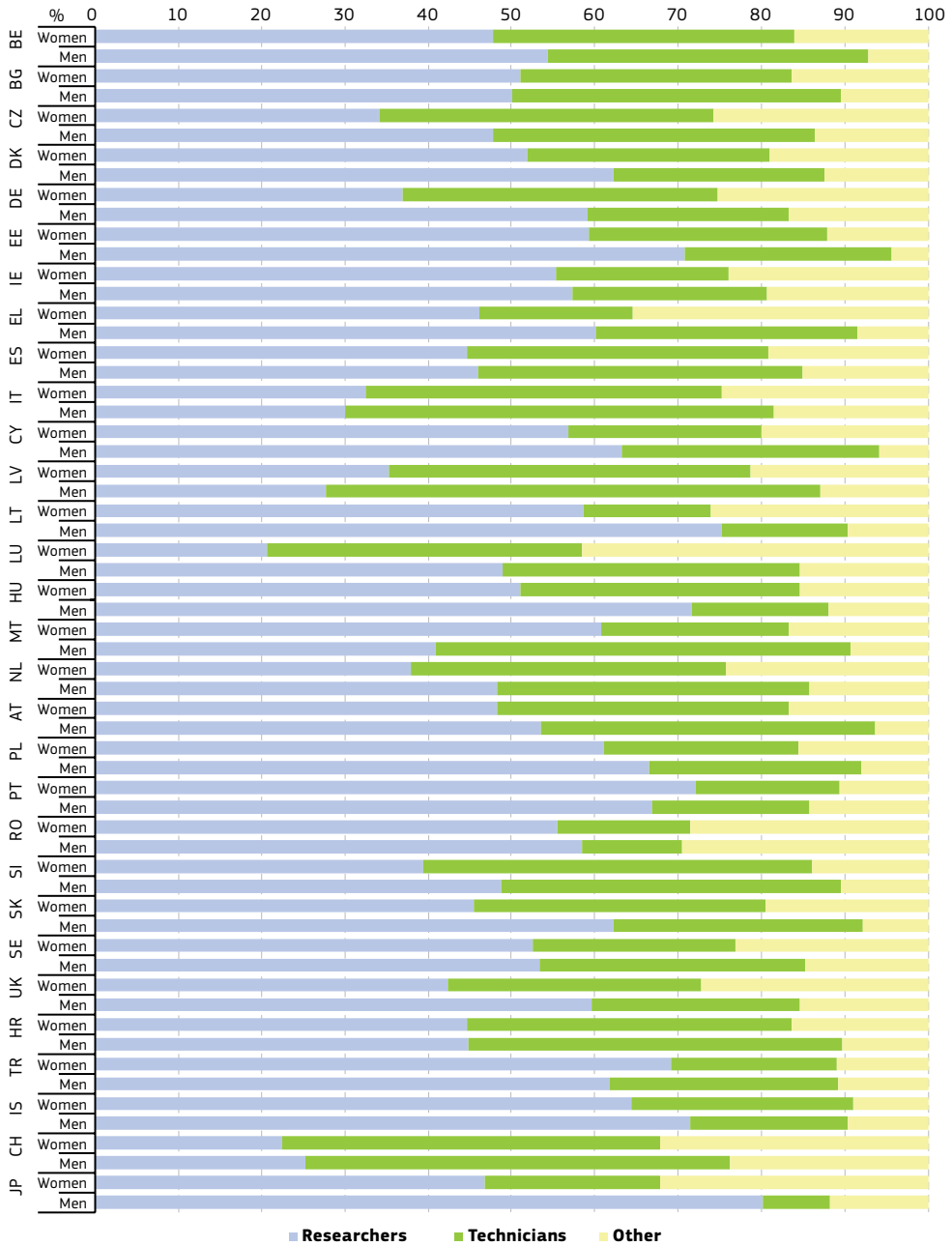
Exceptions to the reference year: EL: 2005; CH, JP: 2008.

Data unavailable: EU-27, EU-25, EU-15, FR, NL, FI, MK, NO, IL, US.

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: rd\_p\_persocc).

**Figure 3.12:** Distribution of R&D personnel across occupations for the Business Enterprise Sector (BES) by sex, 2009



Exceptions to the reference year: EL: 2007; CH, JP: 2008.

Data unavailable: EU-27, EU-25, EU-15, FR, FI, MK, NO, IL, US.

Data estimated: UK.

Others: Head count.

Source: Eurostat - Statistics on research and development (online data code: rd\_p\_persocc).



**Summary of key findings regarding vertical segregation**

Although girls form a majority in the population of ISCED 5A students and graduates, the pipeline leaks because at the PhD stage and the first grades of a typical academic career, the share of women falls below that of men. At the very top, at grade A, we are left with just 20% of women. Women are relatively more present than men at the lower grades of the academic career. This general picture of female attrition also marks the specific field of science and engineering although the shares of women are much lower at all levels in this field. Of all fields of science, it is engineering and technology where female grade A staff are least well represented. The Glass Ceiling Index which can be viewed as a summary statistic on vertical segregation in academic careers shows just slight progress since 2004. Proactive policies are therefore of utmost importance, also because data by age do not point toward a spontaneous movement towards gender equality at the highest rank of a typical academic career.

Given that the grade system applies to the Higher Education sector only, it is hazardous to study the hierarchical position of female scientists in the other broad sectors of economic activity. It is possible to study the distribution of R&D personnel by sex across the occupations of researchers, technicians and others. Whereas the proportion of male researchers generally exceeds that of female researchers, the reverse pattern marks the lowest occupational level of other supporting staff. The proportion of women among technicians varies between the three sectors.



**Annex 3.1:** Number of academic staff by grade and sex, 2010

	Grade A		Grade B		Grade C		Grade D	
	Women	Men	Women	Men	Women	Men	Women	Men
BE	272	1 963	741	2 030	1 918	3 785	:	:
BG	619	1 774	2 812	4 280	x	x	6 987	5 960
CZ	286	1 899	2 755	6 141	175	342	3 403	4 009
DK	237	1 343	1 291	3 199	1 008	1 634	3 168	3 550
DE	1 991	11 622	5 945	22 261	4 274	11 508	63 214	89 734
EE	94	454	372	630	966	740	653	328
ES	1 733	8 504	12 550	20 358	4 421	4 547	32 909	30 557
FR	4 784	20 821	23 735	36 087	1 548	3 679	6 183	8 671
IT	3 182	12 672	5 814	11 141	11 786	14 393	9 087	8 855
CY	8	67	27	99	185	193	140	267
LV	190	401	294	335	2 231	1 291	:	:
LT	106	628	925	1 297	1 135	979	3 246	1 879
LU	9	70	15	32	66	88	15	25
HU	447	1 728	1 473	2 628	3 562	5 333	792	1 369
NL	413	2 745	512	1 938	1 821	3 504	7 622	9 310
AT	381	1 814	884	3 098	3 115	3 962	5 426	7 418
PT	448	1 547	1 661	2 881	6 423	7 763	4 765	5 448
RO	4 052	7 324	8 977	8 665	x	x	1 235	850
SI	292	1 161	353	794	1 281	1 480	309	298
SK	394	1 339	950	1 602	3 718	3 835	436	372
FI	645	2 025	1 885	1 733	280	254	4 883	5 858
SE	1 065	4 249	11 552	12 500	572	760	4 592	4 563
UK	2 697	12 694	10 941	19 745	16 442	19 598	13 592	17 175
HR	666	1 861	1 755	2 306	1 632	1 994	4 696	3 619
TR	4 250	10 886	9 989	18 248	3 898	4 290	17 453	18 883
IS	72	225	87	156	130	137	:	:
NO	683	2 503	2 249	3 775	1 319	1 442	5 232	4 259
CH	1 974	5 633	814	2 275	9 914	15 632	1 585	1 844
IL	210	1 239	279	809	451	811	261	279

Exceptions to the reference year: EE: 2004; CZ:2008; DK, FR, CY, LU, AT, PT, RO, SE: 2009; UK: 2006; LT: 2007; SK: 2011.

Data unavailable: EL, IE, PL, MK, JP, US.

Data estimated: SI.

Others: 'x': data included in another cell; ':' not available.

Head count.

Some differences exist in coverage and definitions between countries.

Grade C unavailable: BG, RO (included in B); Grade D unavailable: BE (French-speaking community).

**Source:** WIS database (DG Research and Innovation).

**Annex 3.2:** Number of senior academic staff (Grade A) by field of science and sex, 2010

	Natural sciences		Engineering and technology		Medical sciences		Agricultural Sciences		Social sciences		Humanities		Unknown	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
BE	55	429	21	310	61	434	4	43	80	441	44	246	7	60
BG	:	:	:	:	:	:	:	:	:	:	:	:	619	1 774
CZ	34	286	48	602	89	363	24	189	51	276	40	183	:	:
DK	33	303	13	192	47	255	16	74	85	406	43	113	0	0
DE	333	3 077	96	1 544	129	1 270	48	308	313	2 165	1 043	3 100	29	158
EE	:	:	:	:	:	:	:	:	:	:	:	:	94	454
ES	545	2 854	99	1 149	160	821	33	223	458	2 117	407	1 192	31	148
FR	:	:	:	:	:	:	:	:	:	:	:	:	:	:
IT	743	3 002	242	2 303	264	1 902	123	698	722	2 878	1 088	1 889	:	:
CY	4	20	0	12	0	0	1	2	3	21	0	12	:	:
LV	:	:	:	:	:	:	:	:	:	:	:	:	190	401
LT	10	137	8	171	21	72	3	26	24	111	40	111	:	:
LU	:	:	:	:	:	:	:	:	:	:	:	:	9	70
HU	:	:	:	:	:	:	:	:	:	:	:	:	:	:
NL	44	473	37	508	12	106	9	100	212	1 140	92	360	7	58
AT	38	460	20	240	38	225	10	45	116	438	159	406	:	:
PT	165	332	24	320	44	207	25	64	99	408	91	216	:	:
RO	:	:	:	:	:	:	:	:	:	:	:	:	:	:
SI	10	123	26	272	57	146	20	42	55	237	116	288	8	53
SK	30	138	51	373	66	196	9	61	215	499	23	72	0	0
FI	63	470	29	364	136	367	25	51	230	525	162	248	:	:
SE	139	830	111	986	250	987	41	168	221	740	194	448	109	90
UK	309	3 126	167	2 205	784	2 596	22	155	565	1 924	10	83	1 028	3 512
HR	24	120	40	215	113	215	49	47	140	264	20	40	2	3
TR	404	1 167	486	2 060	2 091	3 816	242	995	667	1 795	359	1 052	:	:
IS	:	:	:	:	:	:	:	:	:	:	:	:	72	225
NO	89	510	45	404	150	393	11	52	205	679	183	465	0	0
CH	101	757	281	1 563	246	691	11	86	1 010	1 830	260	552	65	154
IL	39	356	26	364	24	98	3	22	40	197	76	168	2	34

Exceptions to the reference year: EE, 2004; DK, CY, LU, AT, PT, SE, 2009; LT, 2007; UK, 2006; SK, 2011.

Data unavailable: EL, FR, HU, IE, MT, PL, RO, MK, JP, US.

Data estimated: SI.

Source: WIS database (DG Research and Innovation).

Others: \*: not available.

Some differences exist in coverage and definitions between countries.

Head count.

Medical sciences exclude female professors at university hospitals for Denmark.

**Annex 3.3:** Number of academic staff (Grade A) by age group and sex, 2010

	<35		35-44		45-54		55+	
	Women	Men	Women	Men	Women	Men	Women	Men
BE	0	3	35	201	146	807	91	952
BG	:	:	5	5	113	225	501	1 544
DE	25	85	560	2 293	934	4 850	472	4 394
IT	0	2	108	460	805	3 170	2 269	9 040
AT	7	11	93	281	170	558	111	964
PT	3	3	12	66	141	422	292	1 056
RO	91	108	1 165	1 294	1 400	2 126	1 396	3 796
SK	0	1	17	45	82	259	295	1 034
FI	4	23	83	295	248	709	310	998
SE	2	3	64	344	334	1 353	665	2 549
IS	0	1	8	15	29	74	35	135
NO	1	3	55	220	239	751	388	1 529

Exceptions to the reference year: AT, PT, RO, SE: 2009; SK: 2011.

Data unavailable: CZ, DK, EE, IE, EL, ES, FR, CY, LV, LT, LU, HU, MT, NL, PL, SI, UK, HR, MK, TR, CH, IL, JP, US.

Others: ':' not available.

Head count.

Source: WiS database (DG Research and Innovation).

**Annex 3.4:** Number of R&D personnel across occupations for the Higher Education Sector (HES) by sex, 2009

	Researchers		Technicians		Other	
	Women	Men	Women	Men	Women	Men
BE	11 835	18 519	3 730	2 790	2 843	1 318
BG	2 839	3 736	571	469	243	173
CZ	6 878	12 541	3 337	2 789	1 080	590
DK	9 359	13 569	3 027	1 741	3 295	1 532
DE	74 816	140 658	13 928	16 297	34 113	7 925
EE	2 062	2 423	430	244	308	76
IE	4 605	7 295	255	851	1 990	878
EL	9 106	14 878	4 629	4 762	4 012	3 099
ES	49 790	75 340	8 087	7 800	13 173	8 559
FR	36 250	69 258	:	:	:	:
IT	29 170	47 915	40 147	30 823	:	:
CY	360	626	29	32	43	28
LV	2 631	2 417	510	280	293	141
LT	5 663	4 970	519	330	1 359	468
LU	197	353	7	26	28	1
HU	6 644	11 751	2 276	855	3 531	877
MT	183	438	12	61	138	32
NL	8 321	14 236	:	:	9 672	7 846
AT	10 965	18 074	3 802	1 995	2 964	1 284
PL	29 744	40 848	2 312	1 545	3 407	1 405
PT	28 715	29 166	988	684	556	223
RO	8 279	9 858	683	373	1 381	1 552
SI	1 723	2 508	482	274	259	86
SK	7 359	9 126	329	156	121	68
FI	9 987	11 463	:	:	4 015	3 425
SE	16 712	20 854	2 195	2 003	4 670	1 687
UK	124 310	159 967	14 196	23 782	0	0
HR	3 389	4 077	694	451	755	181
TR	33 802	49 479	:	:	:	:
IS	658	846	43	77	40	20
NO	9 392	11 923	:	:	:	:
CH	11 408	22 195	192	952	10 129	8 089
JP	71 402	234 445	6 398	5 343	27 235	19 421

Exceptions to the reference year: EL: 2005; CH, JP: 2008.

Data unavailable: EU-27, EU-25, EU-15, MK, IL, US.

Data estimated: IE.

Others: ': not available.

Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).



**Annex 3.5:** Number of R&D personnel across occupations for the Government Sector (GOV) by sex, 2009

	Researchers		Technicians		Other	
	Women	Men	Women	Men	Women	Men
BE	1 056	2 195	496	923	429	323
BG	3 249	2 766	1 449	739	1 133	499
CZ	3 126	5 286	2 341	1 674	1 449	900
DK	697	1 284	133	204	136	82
DE	18 852	39 246	6 752	7 357	16 933	13 836
EE	444	279	130	51	118	50
IE	207	326	89	179	171	236
EL	1 190	1 726	790	1 057	1 174	1 924
ES	16 618	17 659	9 527	6 907	5 769	4 229
FR	10 693	19 794	:	:	:	:
IT	9 080	11 667	7 097	8 236	5 996	3 700
CY	93	108	106	94	81	78
LV	447	391	228	186	149	84
LT	909	800	468	193	360	241
LU	230	418	86	81	122	64
HU	2 391	3 582	1 375	774	1 196	782
MT	22	28	0	17	4	20
NL	2 353	5 383	1 010	2 161	883	1 329
AT	1 355	1 790	576	624	878	785
PL	6 367	9 095	1 786	2 047	2 494	1 326
PT	2 673	1 751	594	420	379	178
RO	2 975	3 035	1 024	675	648	661
SI	1 124	1 348	349	386	281	152
SK	1 461	1 814	633	258	329	150
FI	2 444	3 318	:	:	1 582	1 203
SE	862	1 355	468	1 395	354	307
UK	3 471	6 350	1 880	3 797	2 508	2 571
HR	1 609	1 498	729	642	394	255
TR	1 939	4 693	246	1 321	943	3 963
IS	576	654	186	141	91	126
NO	2 511	3 471	:	:	:	:
CH	337	697	108	161	106	167
JP	4 946	30 138	4 786	3 678	10 037	17 068

Exceptions to the reference year: EL: 2005; CH, JP: 2008.

Data unavailable: EU-27, EU-25, Eu-15, MK, IL, US.

Others: ': not available.

Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).

**Annex 3.6:** Number of R&D personnel across occupations for the Business Enterprise Sector (BES) by sex, 2009

	Researchers		Technicians		Other	
	Women	Men	Women	Men	Women	Men
BE	5 260	16 682	3 984	11 800	1 755	2 213
BG	878	1 146	562	903	281	237
CZ	2 359	12 691	2 788	10 281	1 780	3 582
DK	6 571	20 868	3 664	8 497	2 410	4 157
DE	26 843	184 152	27 308	75 045	18 332	51 879
EE	578	1 522	278	532	118	94
IE	2 310	6 650	865	2 707	997	2 244
EL	1 939	4 946	770	2 577	1 485	702
ES	17 588	43 528	14 304	37 014	7 521	14 288
FR	30 922	124 710	:	:	:	:
IT	9 493	36 364	12 544	62 126	7 211	22 455
CY	108	287	44	140	38	27
LV	234	204	288	436	141	95
LT	463	1 022	120	207	206	130
LU	199	1 554	364	1 131	400	488
HU	2 288	8 611	1 496	1 963	688	1 442
MT	73	201	27	245	20	46
NL	3 430	20 782	3 409	16 080	2 199	6 132
AT	4 362	22 320	3 178	16 646	1 517	2 645
PL	2 675	9 419	1 018	3 598	681	1 128
PT	5 475	12 651	1 312	3 606	807	2 689
RO	2 400	3 989	692	819	1 230	2 017
SI	871	2 851	1 034	2 379	307	612
SK	448	1 610	344	771	192	204
FI	4 776	23 249	:	:	3 747	9 490
SE	8 373	24 446	3 896	14 525	3 682	6 755
UK	16 521	69 786	11 861	29 305	10 639	17 908
HR	619	902	540	899	226	207
TR	5 787	18 736	1 659	8 290	909	3 276
IS	414	888	171	233	58	120
NO	3 867	13 598	:	:	:	:
CH	2 101	9 136	4 270	18 534	3 010	8 572
JP	38 443	501 148	17 284	50 451	26 333	74 032

Exceptions to the reference year: EL: 2007; CH, JP: 2008.

Data unavailable: EU-27, EU-25, EU-15, MK, IL, US.

Data estimated: UK.

Others: ': not available.

Head count.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_p\\_persocc](#)).

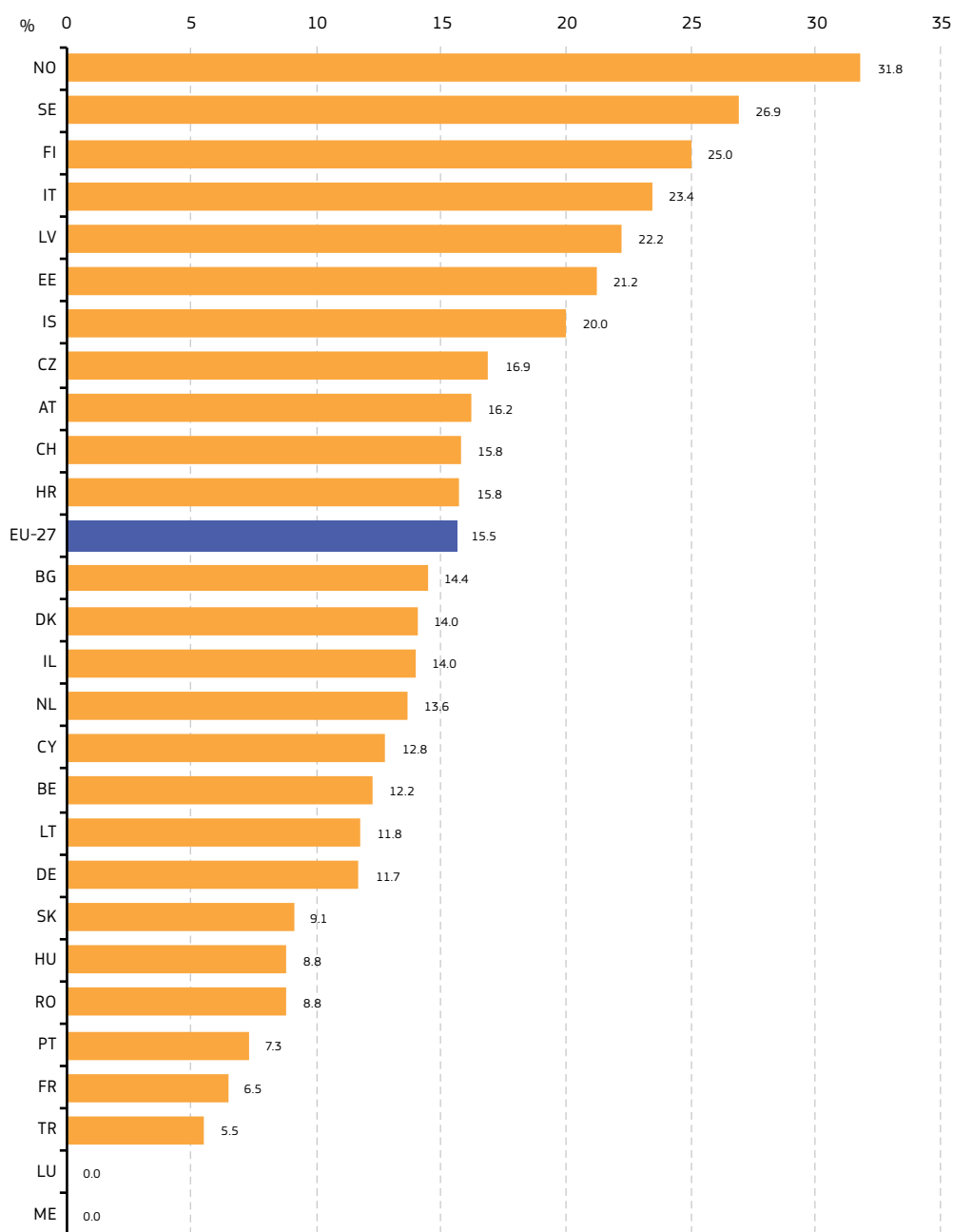
# ***4. Setting the scientific agenda***

Women's under-representation at the highest hierarchical levels of the academic career severely hampers their chances of being at the head of universities or similar institutions in higher education. Data still show that only a small proportion of women is at the head of institutions in the Higher Education Sector or in decision-making committees. This implies great difficulties for young women in academia to find female role models, and thus to identify with the highest levels of academic life. Furthermore, the weak presence of women in high-power positions, and the male dominance that results from this, can bias, often unconsciously, decisions that are taken at these high ranks and that shape scientific policies, determine the choice of research subjects, orient research credits and fix nominating rules and criteria. What could be called a discriminatory snowball effect is thus revealed: women's under-representation at the highest echelons might act as an obstacle for the access of young women into the PhD level and the first stages of the academic career.

### **On average in the EU-27, 20% of grade A academics are women but just 10% of universities have a female rector**

Figure 4.1 and Table 4.1 illustrate these phenomena. Figure 4.1 yields the proportion of female heads of any institution belonging to the large sector of Higher Education whereas Table 4.1 focuses on the narrower group of women heading a university or an institution that is also accredited to deliver PhD degrees. On average throughout the EU-27, 15.5% of institutions in the Higher Education Sector are headed by women. This proportion varies between 27% in Sweden (in Norway, not an EU Member State, the proportion is highest at 32%) and 6.5% in France. The seven countries where it is highest (at 20% or above) are, for the EU, Sweden, Finland, Italy, Latvia, and Estonia and, for the non-EU members, Norway and Iceland. By contrast, it is the lowest (under 10%) in Slovakia, Hungary, Romania, Portugal, and France, and, among non-EU members, Turkey and Montenegro. This situation of female under-representation at the head of institutions is even more pronounced when only institutions able to award PhD degrees are taken into account. On average throughout the EU-27, just 10% of universities have a female head. The highest shares of female rectors (above 20%) are observed in Finland and Sweden, but also in Croatia, Iceland, and Norway. In Cyprus and Hungary, no single university is headed by a woman (in Malta there are just four higher education institutions). In Luxembourg, the only university of the country has a male head. Women's proportion of rectors is very low (below 10%) in a further ten EU members (the Czech Republic, Romania, Germany, the Netherlands, Slovakia, Italy, Belgium, Denmark, Lithuania, and Estonia) and also in Montenegro, Turkey and Switzerland. It is interesting to compare these figures with the proportions of women among grade A academic staff as they were analysed in the previous chapter on seniority. Whereas the average proportion of women among grade A academics stood at 20% in the EU-27 in 2010, just 10% of universities were headed by women in 2010. The image of the leaky pipeline is thus felt everywhere. The more we advance along the academic ladder, the less women we find.



**Figure 4.1:** Proportion of female heads of institutions in the Higher Education Sector (HES), 2010

Exceptions to the reference year: PT: 2012; SK: 2011; SE: 2008; HR: 2009.

Data unavailable: IE, EL, ES, MT, PL, SI, UK, MK, JP, US.

Data estimated: EU-27 (by DG Research and Innovation).

Others: Head count.

LU: only one university.

Source: WiS database (DG Research and Innovation).

**Table 4.1:** Proportion of female heads of universities or assimilated institutions based on capacity to deliver PhDs, 2010 (%)

	Women	Men
<b>EU-27</b>	10	90
BE	8	92
BG	12	88
CZ	4	96
DK	8	92
DE	7	93
EE	11	89
FR	13	88
IT	7	93
CY	0	100
LV	17	83
LT	8	92
LU	0	100
HU	0	100
NL	7	93
AT	4	96
RO	5	95
SI	14	86
SK	7	93
FI	31	69
SE	43	57
HR	22	78
TR	4	96
IS	33	67
NO	25	75
CH	8	92
IL	14	86
ME	0	100

Exceptions to the reference year: DE, SE: 2008.

Data unavailable: IE, EL, ES, MT, PT, UK, MK, JP, US.

Data estimated: EU-27 (by DG Research and Innovation).

Others: Head count.

LU: only one university.

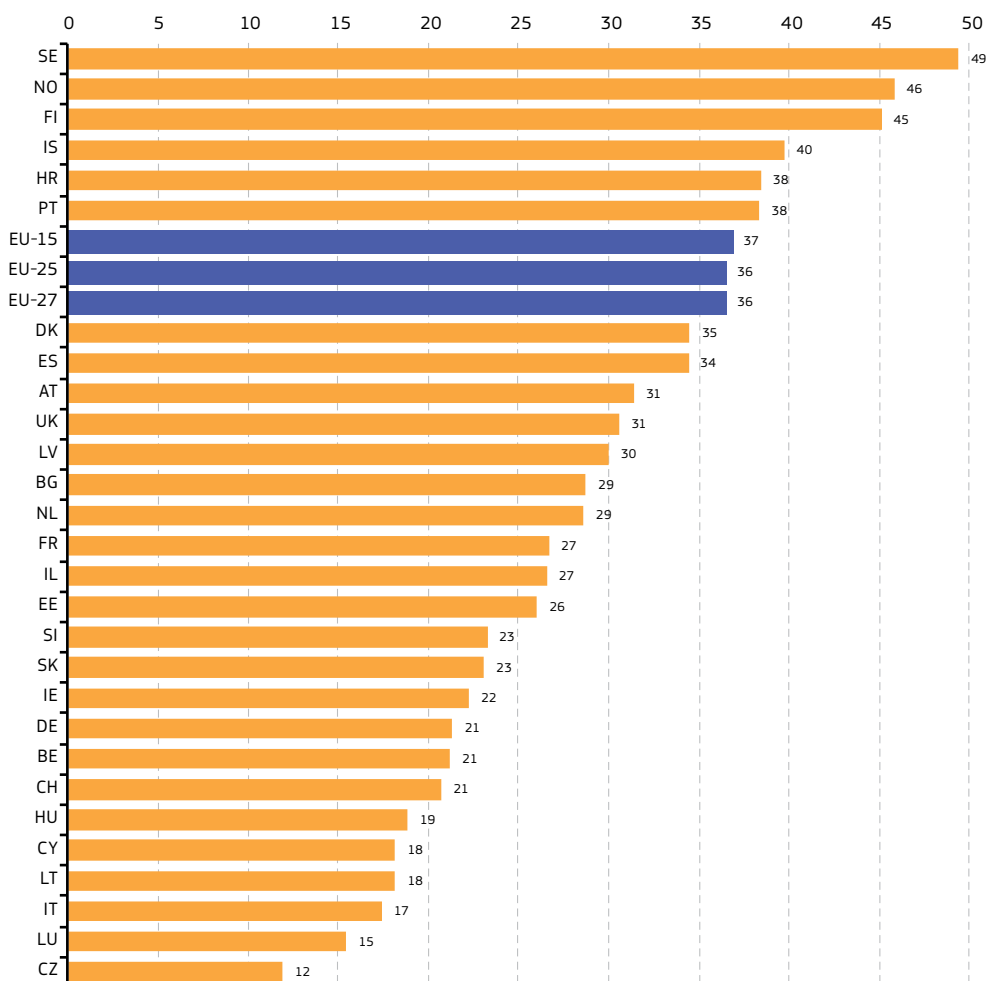
Source: WIS database (DG Research and Innovation).

### **Predominantly men set the scientific agenda as on average in the EU-27 there is only about one woman for every two men in scientific and management boards**

Another indicator can be usefully added to this overall pattern: the proportion of women on boards. The coverage of boards shows considerable cross-country variation. A list of boards covered in each country is provided in the appendix to this publication. However, in general, data on boards cover scientific commissions, R&D commissions, boards, councils, committees and foundations, academy assemblies and councils, and also different field-specific boards, councils and authorities. Figure 4.2 indicates to what extent women are involved in top decision-making committees that have a crucial impact on the orientation of research. On average in the EU-27, 36% of board members are women in 2010 whereas in 2007 they represented just 22%. This change is at least partly

due to changes in the EU-27 aggregate calculation between the previous She Figures and the present one. The most important institutions in the scientific landscape continue to be dominantly led and managed by men. In these boards, a gender bias, subtle and largely unconscious, is likely to influence the decisions that are made (Addis 2010, Meulders et al. 2010). The usefulness of fixing quotas in order to reach a critical minimal proportion of women in decision-making at this level has been the object of fierce debate. In terms of women's presence on boards, the Nordic countries stand out from the others. Indeed, in Sweden, Norway and Finland, the share of female board members is respectively 49%, 46% and 45%. This is consistent with the obligation in these countries (not in Denmark) to have at least 40% of members of each sex in all national research committees and equivalent bodies. Female participation on boards was above one third in Portugal, Denmark and Spain and also, at the non-EU level, in Iceland and Croatia. In contrast, less than 20% of board members are women in Hungary, Cyprus, Lithuania, Italy, Luxembourg, and the Czech Republic. In policy terms, it is crucial to promote a balanced representation of women and men on boards that determine scientific policy. This responds to the EU fundamental principle of equality between women and men. Furthermore it contributes to improve the quality of research and the relevance of its outputs to all members of society.

**Figure 4.2:** Proportion of women on boards, 2010



Exceptions to the reference year: FR: 2002; IE: 2004; BE, LT, SE: 2007; CZ: 2008; PT, UK: 2009.

Data unavailable: BE (Dutch-speaking community), EL, MT, PL, RO, TR, MK, JP, US.

Data estimated: EU-27, EU-25, EU-15 (by DG Research and Innovation).

Others: There is no common definition of boards. The total number of boards varies considerably between countries.

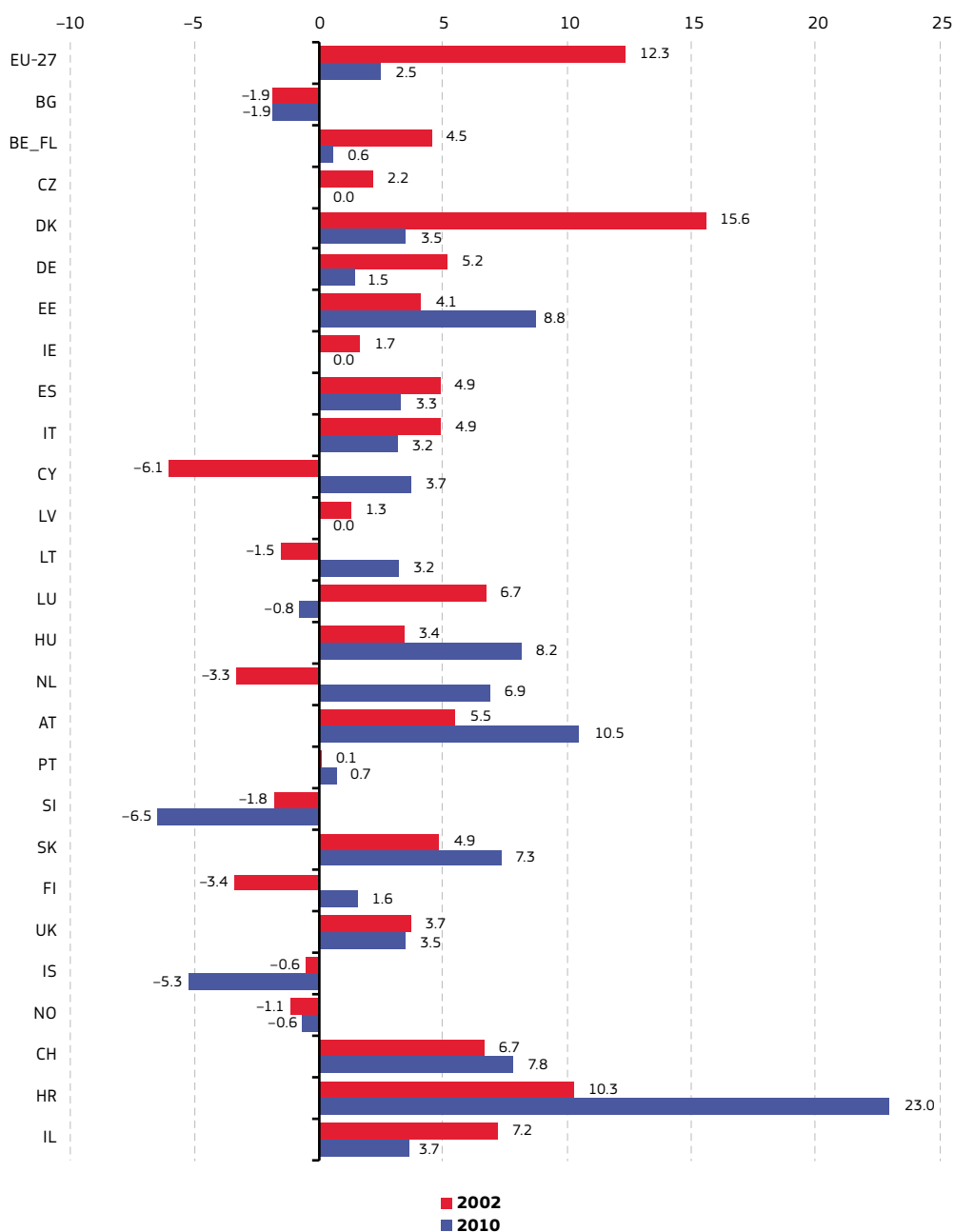
Source: WiS database (DG Research and Innovation).

## **A gender gap continues to exist in the success rates of researchers to obtain research funding**

If women are under-represented at the highest decision-making levels, then does this affect their chances of obtaining research credits? Figure 4.3 presents research funding success rate differences between women and men for two years, 2002 and 2010. In other words, it compares the gender gap in the number of applicants for research grants who were successful in obtaining them between two years. Note that there is an important degree of cross-country disparity in the total number of funds that were taken into account, their definition and coverage (for more details, please refer to the appendix). A positive difference between men and women in obtaining research funding indicates that more male than female applicants for funding are successful in actually obtaining them. Out of the 22 countries for which 2010 data are available, 17 reported higher success rates for men in obtaining research funding and five countries (Slovenia, Bulgaria, Luxembourg and Iceland, Norway) reported higher success rates for women in 2010. Of the 17 countries where women are disadvantaged, the gap varies between 1% in Belgium (Flanders) and Portugal and 11% in Austria. Large gaps are also observed for Estonia, Hungary, and Slovakia. Among the non-EU members, the gender gap in success rates is largest in Croatia, at 23%. Of the three EU countries which reported greater success rates for women, the gap varies between -0.8% (Luxembourg) and -6.5% (Slovenia). Between 2002 and 2010, although on average in the EU-27, a closing of the gender gap in success rates seems to have taken place, many individual countries deviate from this overall pattern, gaps have become larger in 11 countries.





**Figure 4.3:** Evolution in research funding success rate differences between women and men, 2002-2010

Exceptions to the reference years: **2002:** BG: 2008; DK, ES, SI: 2004; SK: 2003; HR, UK: 2005; IL: 2006; **2010:** EE, LT, LU: 2007; IT, CY, PT, UK: 2009. Data unavailable: BE (French-speaking community), CZ, EL, FR, IE, LV, MT, NL, PL, RO, SE, TR, MK, JP, US.

Data estimated: EU-27 (by DG Research and Innovation).

Others: There is no common definition of funds. The total number of funds varies considerably between countries and over the period considered.

UK: All 'applications' data cover number of applications, not applicants.

Male success rate minus female success rate.

Source: WiS database (DG Research and Innovation).

### **There is no clear relationship between gender segregation across fields of science and gender differences in the success to obtain research funding**

Table 4.2 presents these same success rate differences between men and women in obtaining research funding but within different fields of science for 15 EU members and four non-EU members for the year 2010. As shown by Table 4.2, considerable cross-country variations were noted in the gender gap in field-specific success rates to obtain funding so that no clear pattern is set forth by the table.

In the field of natural sciences, men are more likely than women to successfully obtain funding in 15 of the 19 countries. The greatest differences in success rates (above 10 percentage points) were observed in Switzerland, Estonia, Slovakia and Hungary. In contrast, in engineering and technology, the balance was slightly in favour of women, with 11 countries where women are more successful in obtaining funds and eight where the opposite was observed. In agricultural sciences, social sciences and in humanities, roughly two thirds of the countries put forth positive success rate differences, indicating that male applicants are somewhat more likely than female applicants to actually obtain research funding. In the medical sciences, positive differences were observed in nine countries and negative ones in ten.

To sum up, the data do not enable a clear relationship to be drawn between the relative proportion of women present in a given field and their relative success in obtaining research funding. Fields where women are relatively well represented are not systematically those where the gender gap in success rates in obtaining research funding is smallest. Besides the absolute numbers of men and women in the different fields of science, success rates necessarily depend on how many of them actually apply for research funds. The proportion of women applying for research funds within the pool of potential female applicants is generally smaller than the number of men who apply as a proportion of all potential male applicants (cfr. *She Figures 2009*, Chapter 4, p. 95). Policies should thus not only target the promotion of gender balance at the stage of attribution of research funds but also at the stage of application for research funding.

**Table 4.2:** Research funding success rate differences between women and men by field of science, 2010

	Natural sciences	Engineering and technology	Medical sciences	Agricultural Sciences	Social sciences	Humanities
BG	4.1	-13.4	5.6	23.9	-27.4	0.0
CZ	4.2	-0.8	-1.2	4.4	0.5	:
DK	2.8	7.6	6.1	10.9	5.4	:
DE	4.5	-1.1	-1.8	:	2.9	x
EE	14.5	-1.9	16.0	3.6	4.6	-2.6
IT	8.3	3.2	-2.5	-0.7	4.4	5.9
CY	-6.2	11.7	-7.1	13.3	9.0	7.4
LV	-6.6	-8.0	-15.9	-4.3	-10.4	-5.9
LT	5.4	23.7	7.1	-100.0	1.8	-4.6
HU	12.9	-27.3	10.5	-5.9	19.5	8.5
NL	-7.9	-26.9	-7.8	-	-1.3	2.7
PT	1.6	-0.9	2.3	7.7	0.8	:
SK	12.9	0.4	-6.3	11.0	22.9	-17.5
FI	2.3	2.4	2.6	0.6	-1.7	2.9
UK	7.9	3.6	-0.4	2.3	-0.9	1.8
IS	8.8	-16.0	-10.4	0.3	-2.5	3.3
NO	-3.9	-10.8	3.1	6.1	2.5	-8.9
CH	16.1	4.6	4.5	23.8	0.7	4.0
IL	6.7	-4.1	-7.5	-9.2	1.3	0.4

Exceptions to the reference year: NL: 2002; CZ, LV: 2003; EE, LT: 2007; IT, CY, PT, UK: 2009.

Data unavailable: EU-27, EU-25, EU-15, BE, IE, EL, ES, FR, LU, MT, AT, PL, RO, SI, SE, HR, MK, TR, JP, US, ME.

Others: 'x': data included in another cell; ':': not available; '-': not applicable.

DE, PT: SS includes H; DE: MS includes biology.

There is no common definition of funds. The total number of funds varies considerably between countries and over the period considered.

SI, HR: data not available on annually basis (multiannual grants).

FI: Counted by number of team leaders and the individual grants (posts) holders post holders amount for applied/amount received in calculated value. After 2005 amount of applied not relevant on posts, new paysystem (collective).

Male success rate minus female success rate.

Source: WiS database (DG Research and Innovation).

## The proportion of female researchers is negatively correlated with the level of R&D expenditure

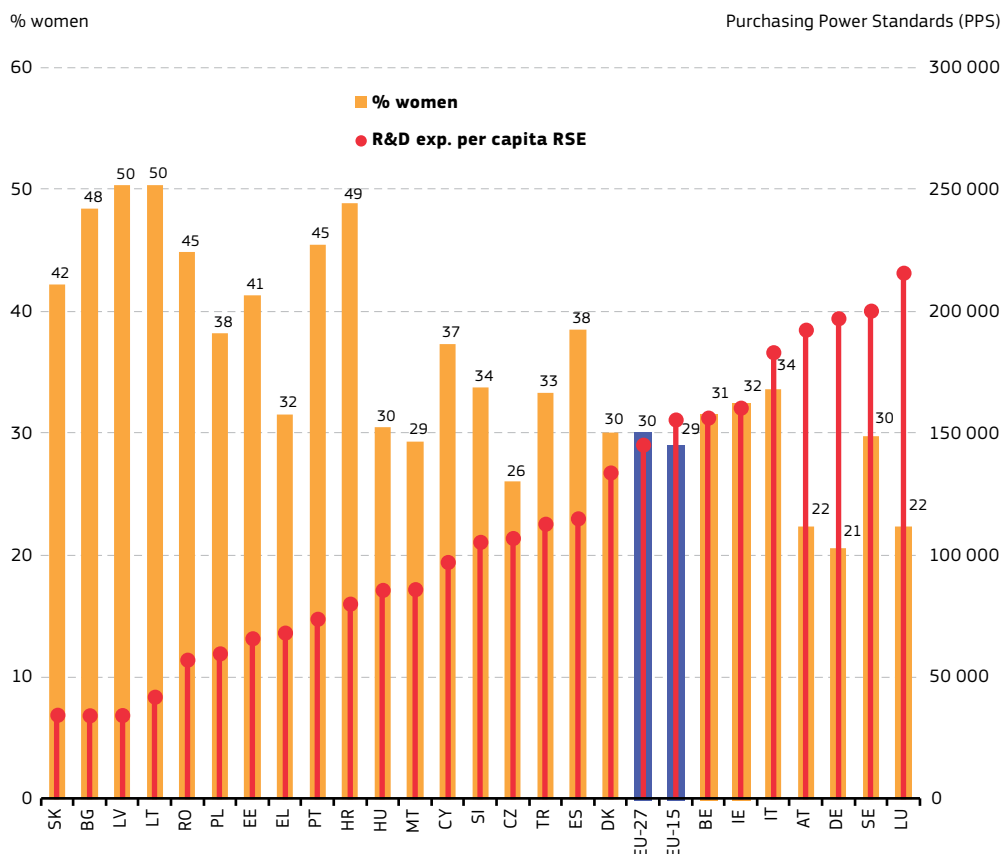
Besides their actual presence in the different fields of science and their propensity to apply for research funds, women's success in obtaining funding might also be determined by the overall level of R&D expenditure in the different sectors and countries. Figure 4.4 cross-tabulates macro-level R&D expenditure data and the proportion of female researchers in Full Time Equivalent (FTE) in 2009. Figure 4.5 breaks down R&D expenditure for 2010 by sector (Business Enterprise, Government and Higher Education). To account for differences in prices, currency and exchange rates, the data are expressed in purchasing power standard.

### Purchasing Power Standard

*The purchasing power standard, abbreviated as PPS, refers to the artificial common reference currency unit used in the European Union to express the volume of economic aggregates for the purpose of spatial comparisons in such a way that price level differences between countries are eliminated. One PPS thus buys the same volume of goods and services in all countries, whereas different amounts of national currency units are needed to buy this same volume of goods and services in individual countries.*

From Figure 4.4 we see that countries such as Slovakia, Bulgaria, Latvia, and Lithuania, with the lowest levels of expenditure per capita researcher (less than 50 000 PPS), have among the highest proportions of women in research (between 42% in Slovakia and 50% in Latvia and Lithuania). The countries with the highest R&D expenditure per capita researcher are Austria, Germany, Sweden and Luxembourg (expenditure above 190 000 PPS), followed closely by Italy. Among these countries we find those with the lowest proportions of female researchers (21% in Germany, 22% in Austria and Luxembourg, and 30% in Sweden). To quantify the observed negative relationship between the level of spending on R&D per capita researcher and the proportion of female researchers, we computed the correlation coefficient between both series of data for 2009. As expected, it turned out strongly negative at -0.8. It should be noted that the correlation coefficient can range between 0 and 1 in the case of an increasing linear relationship and between 0 and -1 in the case of a decreasing linear relationship. The degree of linear dependence between the variables is indicated by the level of the coefficient. The closer the coefficient is to either -1 or 1, the stronger the linear correlation between the variables. If the variables are linear independent then the correlation is 0.

**Figure 4.4:** Proportion of female researchers in FTE and R&D expenditure in Purchasing Power Standards (PPS) per capita researcher, 2009



Exceptions to the reference years: EL: 2005.

Data unavailable: FR, NL, FI, UK, MK, IS, CH, NO, IL, JP, US.

Break in series: LU.

Provisional data: R&D Expenditure: SE (HES).

Data estimated: EU-27, EU-15; IE (HES).

Others: Purchasing power parities (PPPs) are defined as currency conversion rates that both convert national currencies to a common currency and equalise the purchasing power of different currencies.

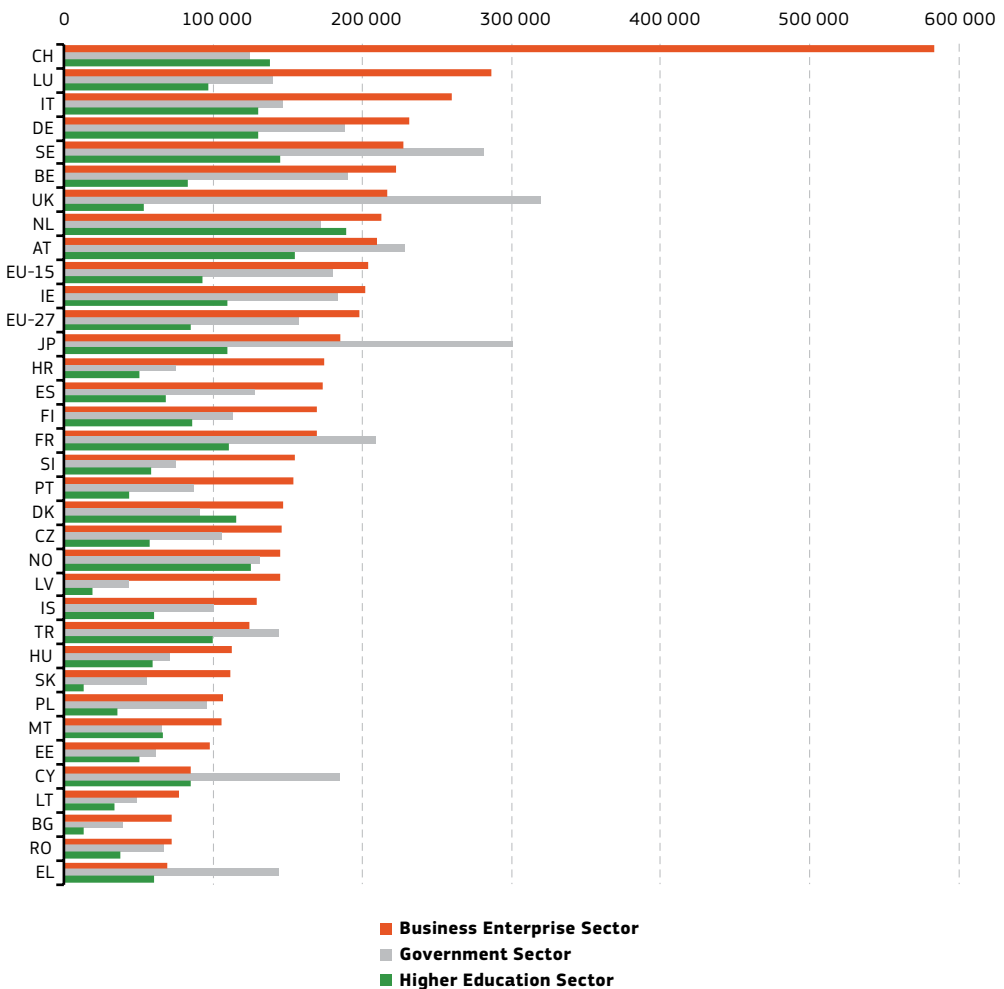
Purchasing power standard (PPS) is the artificial common currency into which national currencies are converted.

Source: Eurostat - Statistics on research and development (online data codes: [rd\\_p\\_persocc](#) and [rd\\_e\\_gerdtot](#)).

## Whereas women are least present in Business Sector research, it is this sector that on average spends the largest budget on research

Figure 4.5 shows the level of R&D expenditure per capita researcher in the three broad sectors of Higher Education, Business Enterprise and Government, for the year 2009. Except for the United Kingdom, Sweden, Austria, the Netherlands, Japan, France, Poland, Cyprus, and Greece, R&D expenditure per capita researcher is always the highest in the Business Enterprise Sector. In Romania, the expenditure level is roughly the same in the Government and the Business Enterprise Sector. Again there seems to be a negative correlation between level of expenditure and female researchers' representation, as female researchers are most under-represented in the Business Enterprise Sector. While it is difficult to explain this negative correlation, the fact that female researchers are far better represented in low-spending sectors of activity offers at least a partial explanation. R&D expenditure per capita researcher was the highest in the Government Sector in the United Kingdom, Sweden, Japan, France, Poland, Cyprus, Romania and Greece, while in the Netherlands it was the highest in the Higher Education Sector.

**Figure 4.5:** R&D Expenditure in Purchasing Power Standards (PPS) per capita researcher in FTE by sector, 2009



Exceptions to the reference year: EL: 2007; CH, JP: 2008.

Data unavailable: MK, IL, US.

Data estimated: EU-27, EU-15, IE (HES).

Source: Eurostat - Statistics on research and development (online data codes: [rd\\_p\\_persocc](#) and [rd\\_e\\_gerdtot](#)).

### **Summary of key findings regarding women's access to decision-making in science and research**

The most important institutions in the scientific landscape continue to be dominantly led and managed by men. On average in the EU-27, 15.5% of institutions in the Higher Education Sector are headed by women and 10% of universities have a female rector. Moreover, on average in the EU-27, 36% of members of scientific and management boards are women in 2010, a share that is likely overestimated notably by methodological changes in the calculation of the EU-27 aggregate, as in 2007, women represented just 22% of board members.

A gender gap continues to exist in the success rates of researchers to obtain research funding: out of 22 countries for which 2010 data are available, 17 reported higher success rates for men. Although at the aggregate EU level some closing of the gender gap in success rates has taken place between 2002 and 2010, many individual countries deviate from this overall pattern. Also, gender differences in field-specific success rates to obtain funding vary widely across countries, and there is no general pattern.

Finally, there is a negative relationship between the level of national spending on R&D per capita researcher and the proportion of female researchers. Among the three broad economic sectors, it is the Business Enterprise Sector, where female researchers are least present, that spends the largest R&D budget.



**Annex 4.1:** Number of heads of institutions in the Higher Education Sector (HES) by sex, 2010

	Women	Men
BE	6	43
BG	13	77
CZ	12	59
DK	8	49
DE	43	324
EE	7	26
FR	8	116
IT	109	356
CY	6	41
LV	4	14
LT	4	30
LU	0	1
HU	6	62
NL	3	19
AT	17	88
PT	3	37
RO	9	93
SK	3	30
FI	11	33
SE	7	19
HR	23	123
TR	9	154
IS	2	8
NO	14	30
CH	6	32
IL	6	37
ME	0	3

Exceptions to the reference year: SK: 2011; SE: 2008; HR: 2009.

Data unavailable: IE, EL, ES, MT, PL, SI, UK, MK, JP, US.

Others: Head count.

Source: WIS database (DG Research and Innovation).



**Annex 4.2:** Number of applicants and beneficiaries of research funding by sex, 2002-2010

	Beneficiaries				Applicants			
	2002		2010		2002		2010	
	Women	Men	Women	Men	Women	Men	Women	Men
BG	125	182	41	63	412	640	143	235
BE	217	351	285	345	551	799	1 148	1 285
CZ	571	2 747	:	:	744	3 480	:	:
DK	4	27	168	514	22	80	1 129	2 791
DE	1 557	11 646	798	2 997	2 713	18 611	1 946	7 054
EE	194	588	189	442	232	670	256	535
IE	214	292	:	:	1 451	1 778	:	:
ES	743	972	1 269	1 594	2 976	3 257	4 168	4 719
IT	117	740	107	436	374	2 044	929	2 967
CY	8	29	29	147	27	123	198	800
LV	221	450	63	99	246	494	:	:
LT	28	42	51	96	84	132	172	292
LU	23	37	6	29	29	43	16	79
HU	178	506	51	157	315	844	216	494
NL	402	1 310	:	:	898	3 160	:	:
AT	176	1 465	841	4 250	341	2 564	1 701	7 089
PT	621	560	1 408	1 276	1 365	1 228	1 485	1 336
SI	130	318	479	965	350	900	789	1 781
SK	24	110	46	193	45	189	223	690
FI	127	271	161	335	481	1 178	880	1 687
UK	704	2 832	988	2 915	2 663	9 406	4 030	10 390
IS	187	303	169	288	330	540	379	732
NO	460	1 477	276	628	1 285	4 258	1 021	2 380
CH	310	1 138	550	1 660	538	1 770	1 133	2 944
IL	91	341	157	487	352	1 031	536	1 478

Exceptions to the reference years: **2002:** BG: 2008; DK, ES, SI: 2004; SK: 2003; HR, UK: 2005; IL: 2006; **2010:** EE, LT, LU: 2007; IT, CY, PT, UK: 2009.

Data unavailable: BE (French-speaking community), CZ, EL, FR, IE, LV, MT, NL, PL, RO, SE, UK, HR, TR, MK, JP, US.

Confidential data: EU-27 (by DG Research and Innovation).

Others: ': not available.

There is no common definition of funds. The total number of funds varies considerably between countries and over the period considered.

BE data refer to Dutch-speaking community.

UK: All 'applications' data cover number of applications, not applicants.

Male success rate minus female success rate.

Source: WiS database (DG Research and Innovation).



**Annex 4.3:** Number of applicants and beneficiaries of research funding by sex and field of science, 2010

	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
BG	Beneficiaries	14	11	7	1	5	3	0	41	26	21	7	4	2	3	63
	Applicants	58	28	21	8	13	15	0	143	92	81	18	11	18	15	235
CZ	Beneficiaries	92	162	85	158	74	:	:	571	926	915	214	428	264	:	2 747
	Applicants	125	197	108	224	90	:	:	744	1 190	1 124	276	571	319	:	3 480
DK	Beneficiaries	28	5	67	4	41	23	0	168	156	45	177	16	74	46	514
	Applicants	224	62	423	30	234	145	11	1 129	1 017	287	807	66	323	252	2 791
DE	Beneficiaries	122	77	363	:	236	x	:	798	761	679	986	:	571	x	2 997
	Applicants	298	176	828	:	644	x	:	1 946	1 673	1 593	2 343	:	1 445	x	7 054
EE	Beneficiaries	56	17	34	17	28	37	:	189	216	69	48	27	35	47	442
	Applicants	82	20	52	19	41	42	:	256	261	83	59	29	48	55	535
IT	Beneficiaries	36	7	22	7	9	26	:	107	164	63	70	18	53	68	436
	Applicants	348	91	152	89	89	160	:	929	879	579	585	251	366	307	2 967
CY	Beneficiaries	7	4	11	0	7	0	0	29	28	54	26	2	35	2	147
	Applicants	32	44	44	6	63	9	0	198	179	260	145	15	174	27	800
LV	Beneficiaries	82	22	44	14	53	24	:	239	228	71	55	44	43	19	460
	Applicants	82	23	46	14	53	26	:	244	244	81	69	46	48	22	510
LT	Beneficiaries	8	1	25	2	7	8	:	51	29	19	38	0	7	3	96
	Applicants	31	11	89	2	20	19	:	172	93	58	108	6	19	8	292
HU	Beneficiaries	16	3	7	9	7	9	:	51	71	10	23	14	18	21	157
	Applicants	84	6	32	27	30	37	:	216	222	44	71	51	42	64	494
NL	Beneficiaries	68	9	43	0	59	40	183	402	388	73	128	0	141	140	1 310
	Applicants	182	16	92	0	177	76	186	729	1 316	249	329	0	440	253	3 160
PT	Beneficiaries	354	192	207	60	259	336	:	1 408	312	415	121	31	184	213	1 276
	Applicants	381	198	219	65	274	348	:	1 485	330	432	125	31	193	225	1 336
SK	Beneficiaries	11	13	11	7	1	3	0	46	68	70	11	25	14	5	193
	Applicants	56	51	37	38	33	8	0	223	209	270	47	85	54	25	690
FI	Beneficiaries	66	8	24	2	34	23	4	161	197	35	22	4	40	37	335
	Applicants	367	50	125	23	170	118	27	880	969	190	101	43	219	165	1 687
UK	Beneficiaries	147	95	121	105	334	186	0	988	907	670	259	406	375	298	2 915
	Applicants	659	292	591	466	1 279	743	0	10 390	3 007	1 855	1 291	1 637	1 489	1 111	10 390

**Annex 4.3:** Number of applicants and beneficiaries of research funding by sex and field of science, 2010 (continued)

	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
IS	Beneficiaries	32	30	45	17	36	8	169	67	65	37	72	30	16	2	288
	Applicants	70	69	94	38	90	17	379	123	232	99	157	88	31	2	732
NO	Beneficiaries	46	56	41	16	66	51	276	125	196	76	57	127	47	:	628
	Applicants	185	126	230	64	258	158	1 021	597	582	364	183	453	201	:	2 380
CH	Beneficiaries	150	29	100	2	163	106	550	701	195	256	4	293	211	0	1 660
	Applicants	315	56	252	6	306	198	1 133	1 101	346	580	7	543	367	0	2 944
IL	Beneficiaries	44	11	18	4	42	22	157	210	82	30	6	71	31	57	487
	Applicants	144	28	55	9	166	61	536	564	233	119	17	267	85	193	1 478

Exceptions to the reference year: NL: 2002; CZ, LV: 2003; EE, LT: 2007; IT, CY, PT, UK: 2009.

Others: x: data included in another cell; -: not available; -: not applicable.

DE, PT, SS includes H; DE: MS includes biology.

There is no common definition of funds. The total number of funds varies considerably between countries and over the period considered.

FI: Counted by number of team leaders and the individual grants (posts) holders post holders amount for applied/amount received in calculated value. After 2005 amount of applied not relevant on posts, new paysystem (collective).

SI, HR: data not available on annually basis (multiannual grants).

Male success rate minus female success rate.

Source: WIS database (DG Research and Innovation).

**Annex 4.4:** Total intramural R&D expenditure (GERD) for all sectors (BES, GOV, HES), in million PPS, 2009

	BES	GOV	HES
<b>EU-27</b>	137 412	30 800	54 693
<b>EU-15</b>	131 926	27 426	51 426
BE	3 980	537	1 429
BG	125	230	58
CZ	1 851	660	558
DK	3 289	101	1 425
DE	42 329	9 285	11 040
EE	128	31	121
IE	1 559	85	692
EL	433	317	746
ES	8 012	3 099	4 297
FR	22 611	5 997	7 593
IT	9 903	2 442	5 622
CY	18	19	42
LV	46	31	49
LT	85	85	189
LU	393	83	42
HU	1 006	353	368
MT	27	2	14
NL	4 352	1 179	3 714
AT	4 540	356	1 740
PL	1 046	1 260	1 361
PT	1 561	241	1 198
RO	443	385	273
SI	508	163	114
SK	184	152	112
FI	4 012	511	1 062
SE	6 626	418	2 363
UK	18 329	2 780	8 480
HR	225	151	180
TR	2 616	822	3 101
IS	145	55	68
NO	1 839	584	1 143
CH	6 028	60	1 982
US	225 564	32 945	39 918
JP	91 039	9 664	13 502

Exceptions to the reference year: EL: 2007; CH, JP: 2008.

Data unavailable: MK, IL.

Data estimated: EU-27, EU-15, IE (HES).

Others: Researchers: FTE.

Source: Eurostat - Statistics on research and development (online data code: [rd\\_e\\_gerdtot](#)).



# ***Annexes***

## Annex 5 - Methodological notes

These notes are intended to provide the reader with a quick reference guide concerning the coverage, identification and definition of groups, units and concepts presented and used in this booklet.

### Statistical terms & classifications

#### Students and Graduates

The International Standard Classification of Education (ISCED-97) categorises education programmes by level. 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).

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-nationals graduating in the country, but does not include nationals graduating abroad. In some countries, France and Portugal, for example, non-PhD programmes with an advanced research component are included in ISCED 6.

#### Human Resources in Science and Technology (HRST)

The Canberra Manual (OECD, 1994) 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:

- HRST people who fulfil one or the other of the following conditions:
  - Successfully completed education at the tertiary level in an S&T (Science and Technology) field of study (see S&T fields of study below).
  - Not formally qualified as above but employed in an S&T occupation (ISCO-2 “Professionals” and ISCO-3 “Technicians”) where the above qualifications are normally required.
- HRSTE: HRST Education – People who have successfully completed tertiary education in an S&T field of study (see S&T fields of study below).
- HRSTO: HRST Occupation – People who are employed in an S&T occupation (ISCO '88 COM, codes 2 “Professionals” and 3 “Technicians”) (see ISCO 88 definitions for explanation of S&T occupations).
- HRSTC: HRST Core – People who are both HRSTE and HRSTO.

#### 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-27 level according to NACE Rev. 2 (2-digit), 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).

#### Science and Technology (S&T) fields of study

ISCED 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.

### ISCO-88 definitions

Two of the ISCO-88 major groups are used in the definition of HRST, HRSTO and HRSTC. They are:

Major group 2 - “Professionals” (ISCO-2): “This major group includes occupations where the main tasks require a high level of professional knowledge and experience in the fields of physical and life sciences, or social sciences and humanities. The main tasks consist of increasing the existing stock of knowledge, applying scientific and artistic concepts and theories to the solution of problems, and teaching about the foregoing in a systematic manner”.

Researchers are classified as ISCO-2.

Major group 3 - “Technicians and associate professionals” (ISCO-3): “This major group includes occupations where the main tasks require technical knowledge and experience in one or more fields of physical and life sciences, or social sciences and humanities. The main tasks consist of carrying out technical work connected with the application of concepts and operational methods in the above-mentioned fields, and in teaching at certain educational levels.”

### Scientists and Engineers (S&E) in employment

- Physical, mathematical and engineering occupations (ISCO '88 COM code 21).
- Life science and health occupations (ISCO '88 COM code 22).

### Researchers and R&D personnel

The Frascati Manual (Proposed standard practice for Surveys on Research and Experimental Development, 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 performs 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) also provides definitions for the six main fields of science, which 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.

### 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://epp.eurostat.ec.europa.eu/cache/ITY\\_OFFPUB/KS-RA-07-015/EN/KS-RA-07-015-EN.PDF](http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-07-015/EN/KS-RA-07-015-EN.PDF)

### 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 booklet.

### Units - Head Count & Full-Time Equivalent

The units of measurement of personnel employed on R&D as proposed by the Frascati Manual 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 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 in the process of conversion of economic indicators expressed in a national currency to an artificial common currency, called 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:  $g = [(I_b / I_a)^{1/(b-a)} - 1] \times 100$ .

## Seniority grades / Academic staff

The statistics on the seniority of 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 are not yet part of a formal international classification. Furthermore it is not always possible to distinguish research staff from teaching staff, although the target population for 'academic staff' in the Women and Science Questionnaire has been defined as researchers in higher education institutions (excluding staff involved only in teaching or administration and not at all in research).

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.
- B: Researchers working in positions not as senior as top position (A) but more senior than newly qualified PhD holders (ISCED 6).
- C: The first grade/post into which a newly qualified PhD graduate would normally be recruited.
- D: Either postgraduate students not yet holding a PhD degree who are engaged as researchers, or researchers working in posts that do not normally require a PhD.

A complete list of the grades reported for each country is included in this Annex.

## Researchers with children

The EU-SILC data allow identifying children as long as they are present in the household. There is not necessarily a biological relationship between parents and children. If children are for any reason not living in the same household as their parents then the EU-SILC data do not allow to establish the link between parents and children.

## Mobile researchers

Mobile researchers are defined as those who have moved from the country of their highest graduation to work as a researcher for at least three months in the last three years in another country (Mobility Patterns and Career Paths of the EU Researchers Survey).

## Data sources

Data for ISCED 6 graduates come from the UOE (UNESCO-UIS/OECD/Eurostat) questionnaire on education and have been downloaded from Eurostat's online database Eurobase ([http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search\\_database](http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database)), except for Israel which directly provided data to the Ethics and Gender Unit's Women in Science (WiS) database. The reference year is the calendar year in which the academic year began. Eurostat data represent the numbers of people who are studying in the reference country but exclude nationals studying abroad.

Data on researchers, apart from mobility, R&D personnel and R&D expenditure come from the R&D survey and have been extracted from Eurobase.

Data concerning mobility of researchers come from the Mobility Patterns and Career Paths of the EU Researchers Survey. The results and the methodological notes are available online at: <http://ec.europa.eu/euraxess/index.cfm/general/researchPolicies>

Data referring to the labour force are drawn from the European Union Labour Force Survey (EU LFS) in different ways. The HRST and Scientists & Engineers in the total labour force data have been extracted from Eurobase.

The Statistical Correspondents of the Helsinki Group on Women and Science report data on academic staff (see Seniority grades/ Academic staff above), on the applicants and beneficiaries of research funding, the sex-composition of scientific boards and heads of institutions in the HES and in universities or assimilated institutions by sex to the WiS database on a goodwill basis. A complete list of the source institutions can be found at the end of this Annex.

### 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 here. 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 Luxembourg, Cyprus and Malta, and, in some cases, for Estonia, Iceland and Latvia.

#### 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 the 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

The cut-off date for data downloaded from Eurostat's dissemination database (Eurobase) was October 2012.

## 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

AT	Austria	PT	Portugal
BE	Belgium	RO	Romania
BG	Bulgaria	SE	Sweden
CY	Cyprus	SI	Slovenia
CZ	Czech Republic	SK	Slovakia
DE	Germany	UK	United Kingdom
DK	Denmark		
EL	Greece		
EE	Estonia		
ES	Spain		
FI	Finland		
FR	France		
HU	Hungary		
IE	Ireland		
IT	Italy		
LT	Lithuania		
LV	Latvia		
LU	Luxembourg		
MT	Malta		
NL	The Netherlands		
PL	Poland		

### Acceding Countries

HR Croatia

### Candidate countries

IS Iceland  
 ME Montenegro  
 MK The former Yugoslav Republic of Macedonia  
 TR Turkey

### Associated countries

CH Switzerland  
 IL Israel  
 NO Norway

### Other Countries

JP Japan  
 US United States of America

Countries listed in the tables and figures throughout this booklet are displayed in one of the following ways:

- Ranked according to the data on women.
- Country codes listed in alphabetical order according to the abbreviations listed above (EU-27 Member States presented first, followed by non-EU-27 countries, followed by JP and US).

## 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

For more detailed methodological notes on the data presented in She Figures 2012 please access Eurostat's online database Eurobase at:

[http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search\\_database](http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database)

or the She Figures Handbook at the Gender section of the e-Library of the Science in Society website at <http://ec.europa.eu/research/science-society/index.cfm?fuseaction=public.topic&id=1282&lang=1>

or the She Figures 2012 CD-ROM that accompanies this publication.

## Abbreviations and acronyms

AS	Agricultural sciences
BES	Business Enterprise Sector
ET	Engineering and Technology
EU	European Union
EUROSTAT	Statistical Office of the European Union
EU-SILC	European Statistics on Income and Living Conditions
FTE	Full Time Equivalent
GCI	Glass Ceiling Index
GERD	Gross domestic expenditure on R&D
GOV	Government Sector
H	Humanities
HC	Head Count
HES	Higher Education System
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
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
KIA	Knowledge-intensive activities
KIABI	Knowledge-intensive activities - Business Industries
LFS	Labour Force Survey
MORE	Mobility Patterns and Career paths of EU Researchers
MS	Medical sciences
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
PNP	Private Non-Profit Sector
PPP	Purchasing Power Parity
PPS	Purchasing Power Standard
R&D	Research and Development
S&E	Scientists & Engineers
S&T	Science & Technology
SS	Social sciences
UNESCO-UIS	United Nations Educational, Scientific, and Cultural Organisation Institute for Statistics
UOE	UNESCO-UIS/OECD/EUROSTAT joint data collection (UOE)
WiS	Women in Science

## Academic staff

Country	Grade	National classification	Minimum level of education required	Responsibilities of the post
AUSTRIA	A	(Ordentliche/r) Universitätsprofessor/in Universitätsprofessor/in (Prof. § 49 VBG und KV) Vertragsprofessor/in Stiftungsprofessor/in Gastprofessor/in mit F&E-Tätigkeit Emeritierte/r Universitätsprofessor/in mit F&E-Tätigkeit Professor/in in Ruhestand mit F&E-Tätigkeit	Habilitation and a professorship at a university	Teaching and research
	B	Assoziierte/r Professor/in (KV) Universitätsdozent/in Vertragsdozent/in Assistenzprofessor/in (since 2007 in B; before 2007 in C)	Habilitation, respectively a qualification agreement.	Teaching and research
	C	Assistenzprofessor/in (KV) Universitätsassistent/in Universitätsassistent/in - Doktorand/in und Postdoc (KV) Staff Scientist Senior Scientist / Senior Artist Vertragsassistent/in Angestellte/r Assistent/in in Ausbildung (wissenschaftliche/r bzw. künstlerische/r Mitarbeiter/in) Assistenzarzt, Assistenzärztin Arzt, Ärztin	A completed university study, but a PhD is not always required.	Other
	D	Projektmitarbeiter/in Senior Lecturer Bundeslehrer/in und Vertragslehrer/in Wissenschaftliche/r Beamter, Beamtin Wissenschaftliche/r Vertragsbedienstete/r Studienassistent/in; studentische/r Mitarbeiter/in (KV) Demonstrator/in Sonstiges wissenschaftliches Personal	Other	Other
Comments:	Grades A, B, C and D are only available for the Public Universities, incl. University hospitals and Universities of Arts without the University for Continuing Education Krems.			
DUTCH-SPEAKING COMMUNITY IN BELGIUM	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 - Assistent AAP3 – Other WP1 – Pre-doctoral of unlimited duration WP2 – Pre-doctoral of limited duration Unpaid researchers (pre-doctoral)		
FRENCH-SPEAKING COMMUNITY IN BELGIUM	A	Ordinary and extraordinary professors		
	B	Others professors		
	C	“Chargé(e) de cours”, deputy		
	D	-		

Country	Grade	National classification	Minimum level of education required	Responsibilities of the post
BULGARIA	A	Professors	ISCED 6	Teaching and research
	B	Associate Professors	ISCED 6	Teaching and research
	D	Assistants Lecturers Science assistants	ISCED 5	Teaching and research
Comments:		Grade C is included in B.		
CYPRUS	A	Professors	PhD	Teaching and research
	B	Associate Professors	PhD	Teaching and research
	C	Assistant Professors Lecturers Teaching Support Staff	Assistant Professors (PhD), Lecturers & Teaching Support Staff (MSc and/or PhD).	Teaching and research
	D	Research associates and other staff		
CZECH REPUBLIC	A	Since the year 2005 Professors – researchers, till the year 2004 Professors.		
	B	Since the year 2005 researchers below A and above C, till the year 2004 Associate professors		
	C	Since the year 2005 newly qualified PhDs, till the year 2004 senior assistants		
	D	Since the year 2005 researchers below C, till the year 2004 Assistants and lectures		
GERMANY	A	W3 / C4, all types of HEI	PhD and habilitation	Teaching and research; leading a chair with assistant professors and scientific staff
	B	Professors: W2/C3, all types of HEI Visiting professors (primary occupation), W2, W3, C2, C3, BAT Iia, E13h, E14, AT Professors: C2, all types of HEI; tenure Professors: C2, all types of HEI; non-tenure Professor in HEI (Hochschuldozenten), R1, C2, C3, A9-A15, BAT I-III, E11-E15Ü, AT Professor in universities (Universitätsdozenten), H1-H3, BAT Ia, Ib, E14, E15, AT Senior assistant (Oberassistenten) C2, H1, H2, A14, BAT Ia-III, E13-E15, AT Senior engineer (Oberingenieure), C2, H1, H2, A14, BAT Ib, E14, E15, AT	Phd and Habilitation, equivalent or professional and research experience outside higher education	Teaching and research; senior researchers: leading research teams
	C	Junior professor: W1 Assistant (Hochschul-assistenten), C1, H2, BAT Ia-III, E13-E15, AT Assistant in sciences and arts (Wissenschaftliche und künstlerische Assistenten) C1, H1, A13-A14, BAT Ib, Iia, E12-E15, AT Lecturer (Akademische (Ober)Räte), non-tenure, A13, A14, AT Lecturer (Akademische Räte, Oberräte und Direktoren), A13-A16, C1-C3, R1, R2, B3, H1-H3, BAT I-III, E12-E15Ü, AT	PhD	Teaching and research; lecturer: priority in teaching

Country	Grade	National classification	Minimum level of education required	Responsibilities of the post
GERMANY	D	Scientific staff (Wissenschaftl. Und künstl. Mitarbeiter im Angestelltenverh.), BAT I-Va, E9-E15Ü, AT, Verg. Entspr. A13 Teaching staff with special responsibilities (Lehrkräfte für besondere Aufgaben)	Master	Research and teaching, under the supervision of a professor or senior researcher
DENMARK	A	Professor Academic directors Department directors		
	B	Associate professors Senior researchers		
	C	Assistant professors Post docs		
	D	PhD students Other researchers (R&D advisors, research assistants and other VIPs)		
Comments:		Data based on the collected Danish R&D Statistics.		
ESTONIA	A	Full and extraordinary professors		
	B	Senior lecturers Senior researchers		
	C	Lecturers Senior teachers Researchers		
	D	Teachers Assistants Others		
SPAIN	A	Full professor and emeritus professor		
	B	Tenured professor Visiting professor		
	C	Assistant Professor		
	D	PhD student		
FINLAND	A	Professor		
	B	Lecturer Senior assistant		
	C	Assistant Full-time teacher		
	D	Researcher		
FRANCE	A	Directeur de Recherche Professeur d'université		
	B	Chargé de Recherche Maître de conférence		
	C	Ingénieur de recherche		
	D	Boursiers de thèse		
HUNGARY	A	Professor		
	B	Assistant professor		
	C	Lecturer		
	D	-		
IRELAND	A	Academic staff		
	B	Post Doctoral Fellows		
	C	Contract lecturer		
	D	Other contract researchers		
Comments:		Grade D does not include PhD Students; this data was not included in the HERD report following OECD recommendations.		

Country	Grade	National classification	Minimum level of education required	Responsibilities of the post
ITALY	A	Full professor (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 professor (permanent employment – lower level)	cfr. Grade A - Minimum level of education required	Teaching and research.
	C	Academic researcher (permanent employment – lower level)	cfr. Grade A - Minimum level of education required.	Research.
	D	Fellowship researchers (data available since 2007)	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:	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%)			
LITHUANIA	A	Professor	Doctor habilis with the title of professor; doctor with the title of professor, professor without scientific degree	
	B	Associate professor	Doctor habilis with the title of docent; doctor with the title of docent, docent without scientific degree	
	C	Assistant professor	Doctor habilis with the title of doctor, doctor degree	
	D	Other teaching staff		
Comments:	At the moment the number of researchers in R&D survey is not allocated by grades. Until 2007 the estimates have been applied for calculating of the number of researches by ABCD grades.			
LATVIA	A	Full Professor		
	B	Associate Professor		
	C	Assistant Professor Assistant Lecturer Researcher		
	D	-		
LUXEMBOURG	A	Professeurs	PhD	Teaching and research
	B	Assistants-Professeurs	PhD	Teaching and research
	C	Autres chercheurs	PhD	Teaching or research or both
	D	Assistants chercheurs (postgraduate students not yet holding a PhD degree and engaged as researchers)	Master degree	Teaching
MALTA	A	Professor		
	B	Associate Professor		
	C	Senior Lecturer		
	D	-		



Country	Grade	National classification	Minimum level of education required	Responsibilities of the post
NETHERLANDS	A	Full Professor		Teaching and research
	B	Associate Professor		Teaching and research
	C	Assistant Professor		Teaching and research
	D	Other scientific personnel Postgraduate		Depends on the subcategory: some do only teaching, some only research, some both, PhD students have a small educational task.
Comments:	Student assistants are excluded.			
PORTUGAL	A	Reitor Vice Reitor Professor Catedrático	Doctor Degree	Teaching and research.
	B	Professor Associado Professor Coordenator	Doctor Degree	Teaching and research.
	C	Professor Auxiliar Professor Adjunto	Doctor Degree	Teaching and research.
	D	Assistente Assistente Politecnico Leitor Assistente estagiario	Doctor Degree	Teaching and research.
ROMANIA	A	Professor	The persons who hold an academic rank, or scientific title such as PhD in the branch according to the title or in the jointed branch; it is also necessary a period of work in tertiary education of 9 years or in scientific research in the branch.	
	B	Lecturers Assistant professor Assistant	The persons who hold PhD or PhD students with 6 years in the tertiary education, or 4 years if the person hold the PhD title.	
	C	-		
	D	Teaching assistant	2 years period of work in tertiary education, research, or 4 years in the pre-universitary education.	
Comments:	Grade C is included in B.			
SWEDEN	A	Professor		
	B	Residual grade		
	C	Post-doctoral fellow		
	D	Postgraduate student		
Comments:	Grade B: For 2004, 2003 and 2002: Senior lecturer and Other research and teaching staff; Grade D: (not yet holding a PhD), having a university post; for 2004, 2003 and 2002: residual grade			
SLOVENIA	A	Full Professor		
	B	Associate Professor		
	C	Assistant professor Senior lecturer Lecturer Lector		
	D	Young researcher		
SLOVAKIA	A	Full Professor	Degree of "docent", successful completion of appointment procedure	Teaching and research
	B	Associate professor	Higher education of the third level, habilitation	Teaching and research

Country	Grade	National classification	Minimum level of education required	Responsibilities of the post
SLOVAKIA	C	Lecturer	Higher education of the third level (or second level) - majority of them has "PhD", if not they educate themselves to receive it.	Teaching and research
	D	Assistant lecturer Lector	Higher education of the second level, HE Institution creates for assistant lecturer space for education leading to "PhD" (lector - second or first level)	Assistant lecturer – teaching and research, Lector - teaching
UNITED KINGDOM	A	Professor		
	B	Senior lecturer Senior researcher		
	C	Lecturer		
	D	Researcher		
CROATIA	A	Full professor Scientific advisor	PhD/ISCED 6	Teaching and research
	B	Associate professor Senior research associate Assistant professor Research associate	PhD/ISCED 6	Teaching and research
	C	Senior assistant College professor Senior lecturer Lecturers	ISCED 5+6	Teaching
	D	Assistant Professional Associate Senior Professional Associate Professional Advisor Junior Researcher	ISCED 5A	Teaching
TURKEY	A	Professor		Teaching and research
	B	Associate professor Assistant professor		Teaching and research
	C	Instructor		Teaching and research
	D	Research Assistant		Teaching and research
ICELAND	A	Full professors		Teaching 48%; research 40%; administration 12%.
	B	Associate Professor		Teaching 51%; research 43%; administration 6%.
	C	Assistant Professor		Teaching 51%; research 43%; 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.			
SWITZERLAND	A	Universities – Category I, II Universities of applied sciences: categories 1 and 2	Doctorate holder	Teaching and research.
	B	Universities: – Category III to VI	Tertiary level	Teaching and research
	C	Universities: Categories VII to IX	Tertiary level	Teaching and research
	D	Universities: Category X	-	-
Comments:	Universities: Cat I and II Cat. I = State doctorate (habilitation) or doctorate with experience; extensive teaching and research experience; person who can be hired to direct the institute, faculty or the higher educational institution; employed for a long period. Cat. II = State doctorate (habilitation) or doctorate with experience; extensive teaching and research experience; can lead teaching, research or service-delivery projects; person employed for a long or medium-term period.			

Country	Grade	National classification	Minimum level of education required	Responsibilities of the post
<p>Comments:</p> <p>Universities of applied sciences: categories 1 and 2            Cat. 1 = Professorial staff: Professor, Principal Lecturer, Assistant Professor, Chancellor, Vice-chancellor, Dean or Head of Department            Cat. 2 = Senior non-professional staff (other teaching staff): Private Docent, Lecturer, and Visiting Professor.            Universities: Categories III to VI            Cat. III = State doctorate or doctorate; independent specialised teaching activity, without educational training responsibility; person employed for a long or medium-term period.            Cat. IV = State doctorate or doctorate, specialised teaching and/or research activity; can lead teaching, research or service-delivery projects; person employed for a long or medium-term period            Cat. V = University degree or diploma; person charged with giving practical or supplementary courses; independent within the teaching curriculum framework but without teaching or educational training responsibility; employed for a long or medium-term period.            Cat. VI = Visiting professor, independent within the educational framework but without teaching or educational training responsibility; employed for a limited period (generally one year).            Universities of applied sciences: no categories            Grade B does not correspond to any personnel category within the universities of applied sciences.            Universities: Categories VII to IX.            Cat. VII = Doctorate, teaching activity within the framework of seminars or practical exercises; can lead subordinate colleagues within the framework of teaching, research and service-delivery activities; person employed for a long or medium-term period.            Cat. VIII = Doctorate mainly conducts research work; leads colleagues within the framework of the project; person employed for a long or medium-term period.            Cat. IX = University degree or diploma; teaching activity in seminars or practical work or research collaboration; limited responsibilities, relatively little independence, no subordinates; person employed on a medium-term basis.            Universities of applied sciences: category 3            Cat. 3 = Junior non-professional staff (Assistants et Research Associates) : Assistant Professor, Assistant, Research Assistant, Auxiliary Assistant.            Universities: Category X            Cat. X = No university degree or diploma; teaching activity in seminars or practical work or research collaboration; limited responsibilities, relatively little independence, no subordinates; person employed on a medium-term basis.            Universities of applied sciences: Grade D does not correspond to any personnel category within the universities of applied sciences.</p>				
NORWAY	A	Full Professor	PhD	Teaching and research
	B	Associate Professor Department chief physician, chief physician Senior lecturer College reader Senior researcher	PhD	Teaching and research
	C	Post.doc. Fellowshipholder Researcher	Normally PhD, some on Masters level	Teaching and research
	D	PhD student Assistant Professor University/college lecturer Assistant physician Research assistant	Masters level	Mostly only research, but sometimes also teaching
<p>Comments:</p> <p>Responsibilities of post vary with employment and founding source.</p>				
ISRAEL	A	University/college lecturer	PhD	Teaching and research
	B	Assistant physician	PhD	Teaching and research
	C	Research assistant	PhD	Teaching and research
	D	Lecturer		
MONTENEGRO	A	Full professor or scientific adviser	PhD and minimum 15 years of experience	Teaching and research
	B	Associate professor or higher scientific associate	PhD and minimum 10 years of experience	Teaching and research
	C	Assistant professor or scientific associate	PhD and minimum 5 years experience	Teaching and research
	D	Assistant, associate	MSc or PhD without academic or scientific title	Teaching and research

## 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
AUSTRIA	FWF (Fonds zur Förderung der wissenschaftlichen Forschung) (2000-2010) - Austrian Science Fund ÖAW (Österreichische Akademie der Wissenschaften) (2003-2010) - Austrian Academy of Sciences AWS (Austria Wirtschaftsservice) (2004-2009) FFG (Austrian Research Promotion Agency) (2000-2010)
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 (FRS-FNRS) Fonds de la Recherche Fondamentale Collective (FRFC) Fonds pour le Formation à la Recherche dans l'Industrie et dans l'Agriculture (FRIA) Fonds de la Recherche Scientifique Médicale (FRSM) Institut Interuniversitaire des Sciences Nucléaires (IISN)
BULGARIA	National Science Fund
CYPRUS	Research Promotion Foundation (RPF)
CZECH REPUBLIC	Grant Agency of the Czech Republic
DENMARK	From 2004 and onwards The Danish Council for Research Policy - Advisory Council (DCRP) The Danish Councils for Independent Research (DCIR) The Danish Council for Strategic Research (DCSR) The Danish National Research Foundation (DNRF) Before 2004 The Danish Natural Science Research Council (SNF) The Danish Medical Research Council (SSVF) The Danish Agricultural and Veterinary Research Council (SJVf) The Danish Social Science Research Council (SSF) The Danish Technical Research Council (STVF) The Danish Research Council for the Humanities (SHF) European Space Agency-related research (ESA)
ESTONIA	Estonian Science Fund
FINLAND	Academy of Finland
FRANCE	Ministère de l'Éducation Nationale (MEN) Ministère de l'enseignement supérieur et de la Recherche (MESR)
GERMANY	Deutsche Forschungsgemeinschaft (DFG) Federal Ministry for Education and Research (BMMF)
HUNGARY	The Hungarian Scientific Research Fund Office (OTKA)
IRELAND	Enterprise Ireland Teagasc IRCSET IRCHSS HEA HRB IDA Ireland
ITALY	Research Programs of Relevant National Interest (PRIN) – MIUR/Universities Investment Fund for Basic Research (FIRB) – MIUR/Universities Ordinary Financing Fund for universities and public research bodies (FFO) – MIUR/Universities
LATVIA	Latvian Council of Science
LITHUANIA	Ministry of Education and Science Lithuanian State Science and Studies Foundation
LUXEMBOURG	Fonds National de la Recherche
NETHERLANDS	Royal Netherlands Academy of Arts and Sciences council (KNAW) The Netherlands Organisation for Scientific Research Council (NOW)
PORTUGAL	POCTI POSI POPH
SLOVAKIA	Ministry of Education, Science, Research and Sport of the Slovak Republic Slovak Research and Development Agency

Country	Research Funds
SLOVENIA	Slovenian Research Agency
SPAIN	Ministry of Science and Innovation
SWEDEN	Swedish Council for Forestry and Agricultural Research Swedish Council for Planning and Coordination of Research Swedish Council for Research in the Humanities and Social Sciences Swedish Medical Research Council Swedish Natural Science Research Council
UNITED KINGDOM	From 2005 and onwards Arts and Humanities Research Council (AHRC) Biotechnology and Biological Sciences Research Council (BBSRC) Engineering and Physical Sciences Research Council (EPSRC) Economic and Social Research Council (ESRC) Medical Research Council (MRC) Natural Environment Research Council (NERC) Science and Technology Facilities Council (STFC) Before 2004 Biotechnology and Biological Sciences Research Council (BBSRC) Engineering and Physical Sciences Research Council (EPSRC) Economic and Social Research Council (ESRC) Medical Research Council (MRC) Natural Environment Research Council (NERC) Particle Physics and Astronomy Research Council (PPARC) Royal Academy of Engineering (RAE) Royal Society (RS)
CROATIA	Ministry of Science, Education and Sport (MSES) Croatian National Science Foundation (HRZZ) Croatian Environmental Protection Fund (FZOEU) State Institute for Nature Protection (DZZP) Local authorities in Croatia (counties and municipalities) Ministry of Defence of Croatia Ministry of Agriculture, Fisheries and Rural Development Hrvatske vode (public organisation) HRVATSKA ELEKTROPRIVREDA (HEP d.d.) Unity through Knowledge Fund (UKF) FP7 European Commission IPA (IPA II; IPA III; IPA Cross Border Cooperation Programme 2007-2013) European Science Foundation (ESF) EUREKA ASO Ljubljana National Institutes of Health (NIH), (the Nation's Medical Research Agency) NORGLOBAL (Norway - a global partner) Carlsberg CROATIA
ICELAND	Graduate Research Fund Programme for Information technology and Environmental Sciences University of Iceland The Science Fund The Technology fund The Research Fund The Research Development Fund The Fund for Research Equipment The Research Fund of the University of Iceland The Christianity Millennium Fund AVS R&D Fund of Ministry of Fisheries in Iceland The Research Fund of the University of Akureyri The Research Fund of the University of Education
ISRAEL	Bilateral (US-Israel) Science foundation (BSF) Israel Science Foundation (ISF) German-Israeli Foundation for Scientific Research and Development (GIF)
NORWAY	The Research Council of Norway (RCN)
SWITZERLAND	Swiss National Science Foundation (SNSF)
MONTENEGRO	Ministry of Science

## Boards

The following lists the boards to which reference is made in chapter 4.

Country	Boards
FRENCH-SPEAKING COMMUNITY IN BELGIUM	Commission scientifique (FNRS) Commission scientifique (FRIA)
BULGARIA	Standing Scientific and Expert Commission at the National Science fund (starting with 2009).
CYPRUS	Agricultural Research and Development Board Cyprus Research Council Research Promotion Foundation (RPF) Board of Directors University of Cyprus Council, Research Committee and Senate boards European University Cyprus (EUC) Council, Research Committee and Senate boards University of Nicosia (UNIC) Council, Research Committee and Senate boards Frederick University (FU/FIT) Council, Research Committee and Senate boards Cyprus University of Technology (CUT) Research Committee and Governing boards Open University Cyprus (OUC) Research Committee and Governing boards
CZECH REPUBLIC	Academy Assembly (ASCR) Academy Council (ASCR) R&D Council Czech Rectors Conference
DENMARK	The Danish Council for Research Policy (DCRP) The Danish Councils for Independent Research (DCIR) The Danish Social Science Research Council (DSSRC) The Danish Research Council for Technology and Production Sciences (DRCTPS) The Danish Research Council for the Humanities (DRCH) The Danish Natural Science Research Council (DNSRC) The Danish Medical Research Council (DMRC) The Danish Council for Strategic Research (DCSR) The Danish Council for Strategic Research, subcommittees The Danish National Research Foundation (DNRF) The Danish Council for Technology and Innovation (DCTI) Danish National Advanced Technology Foundation (DNATF)
ESTONIA	General Assembly of the Estonian Academy of Sciences Estonian Science Foundation Council and its 11 Expert commissions Research Council of 23 universities or scientific institutes Council of 21 universities or academy Senate of the Estonian Business School Senate of the Tallinn University Council of the Research Competency of the Ministry of Education and Research
FINLAND	Academy Board Academy of Finland Research councils Council of Finland Science and Technology Policy National Technology Agency of Finland Board
FRANCE	Board of Trustees Scientific strategic council Scientific Committees
GERMANY	Higher Education Institutions Public Research Institutions Deutsche Forschungsgemeinschaft, German Research Foundation (DFG) German Science Council (Wissenschaftsrat)
HUNGARY	The Hungarian Scientific Research Fund Office (OTKA)
IRELAND	Board Iascaigh Mhara Central and Regional Fisheries Board Central Bank National Council for Forest Research and Development (COFORD) Dublin Institute of Advanced Education (DIAS) Enterprise Ireland Environmental Protection Agency (EPA) Economic & Social Research Institute (ESRI) Training and Employment Authority (FAS) Policy advisory and co-ordination board for industrial development and science and technology in Ireland (Forfas) Health Research Board Higher Education Authority (HEA) Industrial Development Authority (IDA Ireland) Irish Research Council for Science Technology and Innovation (ICSTI) Marine Institute National Roads Authority Department of the Taoiseach (NESC) National Economic and Social Council

Country	Boards
IRELAND	Tyndall Institute National Microelectronics Research Centre Industry Board Scientific Board Radiological Protection Institute Royal Irish Academy Science Foundation Ireland (SFI) Agriculture and Food Development Authority (Teagasc) Agency to encourage the preservation and extinction of the Irish language (Udaras)
ITALY	Consortium for Scientific and Technological Research Area of Trieste (AREA) Italian Space Agency (ASI) National Research Council (CNR) National Institute for Meteorological Research (INRIM) Astrophysics National Institute (INAF) "Francesco Severi" National Institute of High Mathematics (INDAM) National Institute of Nuclear Physics (INFN) National Institute of Geophysics and Vulcanology (INGV) Istituto Italiano di Studi Germanici (IISG) Museo Storico della Fisica e Centro Studi e Ricerche E. Fermi National Institute of Oceanography and Experimental Geophysics (OGS) "A. Dohrn" Zoological Station (SZN) Agency for New Technologies, Energy and Environment (ENEA) Institute for Environmental Protection and Research (ISPRA)
LATVIA	Latvian Council of Science (19 expert commissions)
LITHUANIA	Lithuanian Science Council
LUXEMBOURG	Centre de Recherche Public Gabriel Lippmann Centre de Recherche Public Henri Tudor Centre de Recherche Public Santé Centre d'Études de Populations, de Pauvreté et de Politiques Socio-économiques Université du Luxembourg Fonds National de Recherche Fonds Integrated Biobank Lux. Comité Supérieur de la Recherche et de l'Innovation
NETHERLANDS	Royal Netherlands Academy of Arts and Sciences council (KNAW) The Netherlands Organisation for Scientific Research Council (NWO) Netherlands Organisation for Applied Scientific Research (TNO) University/ university board University medical centres / board and supervisory board
PORTUGAL	R&D Units (HES, GOV, BES, PNP)
SLOVAKIA	The Council of Government of the Slovak Republic for Science and Technology The Council of the national R&D program Slovak Research and Development Agency (12 councils) Council of Universities of the Slovak Republic Slovak Rector's Conference Slovak Academy of Sciences Board of the national R&D programmes
SLOVENIA	Scientific Council of the Slovenian Research Agency Scientific research councils for individual fields
SWEDEN	The Swedish Research Council Scientific councils Swedish council for working life and social research Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning Swedish Agency for Innovation Systems
UNITED KINGDOM	Arts and Humanities Research Council (AHRC) Biotechnology and Biological Sciences Research Council (BBSRC) Engineering and Physical Sciences Research Council (EPSRC) Medical Research Council (MRC) Natural Environment Research Council (NERC) Science and Technology Facilities Council (STFC) Department for Innovation, Universities and Skills (DIUS) Department of Culture, Media and Sport (DCMS) Ministry of Defence (MoD) Department for Communities and Local Government (DCLG) Department for Environment, Food & Rural Affairs (DEFRA) Food Standards Agency (FSA) Department of Health (DoH) Department of Trade and Industry (DTI)

Country	Boards
	Department for Business, Enterprise & Regulatory Reform (BERR) The Coal Authority British Nuclear Fuels The UK Commission for Employment and Skills Department for Education (DfES)
CROATIA	The Expert Council (Faculty and Academy) Other boards (Ethical, Scientific, Educational System, Quality assurance, Human resources, etc)
ICELAND	Council for Science and Technology Policy Board of the Research Fund of the UI Board of the Graduate Research Refund University Councils Boards of the governmental sectoral research institutions Council for Science and Technology Policy Science Board Technology Board Research Fund Board Technology Development Fund Fund for Research Equipment Programme for IT and Environmental Sci. The Research Fund of the University of Akureyri AVS R&D Fund of Ministry of Fisheries and Agriculture Programme for Post Genomic Biomedicine and Nanotechnology Strategic Research Programme for Centres of Excellence and Research Clusters
ISRAEL	Bilateral (US-Israel) Science Foundation (BSF) Israel Science Foundation (ISF)
NORWAY	The Research Council of Norway (RCN)
SWITZERLAND	National Research Council of the Swiss National Science Foundation (SNSF)

### Heads of institutions in the Higher Education Sector - Heads of universities or assimilated institutions

An institution is assimilated to a university if it is able to deliver PhD degrees.



## Annex 6: List of statistical correspondents of the Helsinki group on Women and Science

Country	Contact Person	Department	Organisation	Email	Web site
Austria	Ms Gabriele SPÖRKER	Science, Technology & Education Statistics	Statistics Austria	gabriele.spoerker@statistik.gov.at	www.statistik.at
Belgium, Dutch-speaking Community	Mr Kris MAISON	Economy, Science and Innovation	Flemish government	kris.maison@ewi.vlaanderen.be	http://www.ewi.vlaanderen.be/en
Belgium, French-speaking Community	Ms Elisabeth KOKKELKOREN	Relations extérieures	Fonds de la Recherche Scientifique - FNRS	Kokkelkoren@frs-frns.be	www.frs-frns.be
	Mr Jean-François CHEVALIER	European & International Affairs	Fonds de la Recherche Scientifique - FNRS	jean-francois.chevalier@frs-frns.be	www.frs-frns.be
Bulgaria	Ms Svetoslava FILIPOVICH	Structural Business Statistics	National Statistical Institute of Bulgaria	sfilipovich@nsi.bg	www.nsi.bg
Cyprus	Mr Panteelis PROTOPAPAS	STI Statistics Section	Statistical Service of Cyprus	pprotopapas@cystat.mof.gov.cy	www.cystat.gov.cy
	Mr Georgios DOGORITIS	STI Statistics Section	Statistical Service of Cyprus	gdogoritis@cystat.mof.gov.cy	www.cystat.gov.cy
Czech Republic	Mr Daniel CHYTIL	Head of Unit for Labour Forces, Migration and Equal Opportunities	Czech Statistical Office	daniel.chytil@czso.cz	www.czso.cz; http://www.czso.cz/csu/cizinci.nsf/engkapitola/gender_obyvatelestvo
Denmark	Ms Helle MÅNSSON		Statistics Denmark	HEJ@dst.dk	http://www.dst.dk/en.aspx
	Mr Jesper ALLERUP		Danish Agency for Higher Education and Educational Support	jeal@vvs.dk	www.fivu.dk
	Ms Helle FOULSEN		Danish Agency for Science Technology and Innovation	heppo@fi.dk	www.fivu.dk
Estonia	Mr Aavo HEINLO	Enterprise Statistics Department	Statistical Office of Estonia	aaavo.heinlo@stat.ee	http://www.stat.ee/en
Finland	Ms Mariju PIETILÄINEN	Demographic and Gender Statistics	Statistics Finland	Mariju.Pietilainen@stat.fi	http://tilastokeskus.fi/tup/tasaarvo/index_en.html
France	Ms Claudette-Vincent NISSE	Département des études statistiques - Pôle Recherche	Ministère de l'enseignement supérieur et de la recherche	claudette-vincent.nisse@education.gouv.fr	http://www.enseignementsup-recherche.gouv.fr/reperes/
Germany	Ms Andrea LÖTHER	Center of Excellence Women and Science	GESIS	andrea.loether@gesis.org	http://www.gesis.org/cews/en/home/
Greece	To be appointed	Programming & Planning Directorate	General Secretariat of Research and Technology		http://www.gstr.gr/
Hungary	Ms Katalin JANÁK	Living Conditions, Labour Market and Education Statistics Department	Hungarian Central Statistical Office	katalin.janak@ksh.hu	www.ksh.hu
Ireland	Mr Jonathan HEALY	Survey Unit	Forfas	jonathan.healy@forfas.ie	www.forfas.ie
	Ms Helena CONNELLAN	Survey Unit	Forfas	helena.connellan@forfas.ie	www.forfas.ie
Italy	Ms Simonetta SAGRAMORA	MIUR, Ministero Istruzione Università e Ricerca	Ufficio di Statistica	simonetta.sagramora@miur.it	http://statistica.miur.it
Latvia	Ms Maramda BEHMANE	Social Statistical Department	Central Statistical Bureau	Maramda.Behmame@csb.gov.lv	http://www.csb.gov.lv/
	Ms Inga PRIBITOKA	Social Statistical Department	Central Statistical Bureau	Inga.Pribitoka@csb.gov.lv	http://www.csb.gov.lv/
Lithuania	Ms Gaile DAŠPIENĖ	Education and Culture Statistics Department	Statistics Lithuania	gaile.dapsiene@stat.gov.lt	www.stat.gov.lt
Luxembourg	Mr Vincent DAUJEL	Firms & industrial organizations	CEPS/INSTEAD	vincent.daujel@ceps.lu	http://www.ceps.lu/
Malta	Ms Nicola VELLA HABER	Social Statistics and Information Society	National Statistics Office	nicola.vella-haber@gov.mt	http://www.nso.gov.mt

## Annex 6 – List of statistical correspondents of the Helsinki group on Women and Science

## Annex 6: List of statistical correspondents of the Helsinki group on Women and Science (continued)

Country	Contact Person	Department	Organisation	Email	Web site
Netherlands	Mr Jan VAN STEEN		Rathenau Institute	j.vansteen@rathenau.nl	<a href="http://www.rathenau.nl/en.html">http://www.rathenau.nl/en.html</a> <a href="http://www.dutchtscience.info">http://www.dutchtscience.info</a>
Poland	To be appointed		Information Processing Institute		
Portugal	Ms Joana DUARTE	Directorate-General for Education and Science Statistics	Ministry of Education and Science	joana.duarte@dgeec.mec.pt	<a href="http://www.opi.org.pl/en/">http://www.opi.org.pl/en/</a> <a href="http://www.dgeec.mec.pt">www.dgeec.mec.pt</a>
Romania	Ms Rodica DUMITRIU	Department of short term economic statistics indicators	National Institute of Statistics	Rodica.Dumitriu@insse.ro	<a href="http://www.insse.ro">http://www.insse.ro</a>
	Ms Camelia COSCA	Department of short term economic statistics indicators	National Institute of Statistics	Camelia.Cosca@insse.ro	<a href="http://www.insse.ro">http://www.insse.ro</a>
	Ms Nicoleta ADAMESCU	Department of social services statistics	National Institute of Statistics	Nicoleta.Adamescu@insse.ro	<a href="http://www.insse.ro">http://www.insse.ro</a>
Slovak Republic	Ms Marta MOSNÁ	Division of Science & Technology	Ministry of Education, Science, Research and Sport of the Slovak Republic.	marta.mosna@minedu.sk	<a href="http://www.minedu.sk">www.minedu.sk</a>
Slovenia	Ms Urška ARSENUJK	Social services statistics department	Statistical Office, Republic of Slovenia	urska.arsenjuk@gov.si	<a href="http://www.stat.si/">http://www.stat.si/</a>
Spain	Ms Marta Cangas FERNANDEZ	Subdirección General de Estadísticas de las Empresas	Instituto Nacional de Estadística	marta.cangas.fernandez@ine.es	<a href="http://www.ine.es">www.ine.es</a>
	Ms Belen GONZALEZ OLMOS	Subdirección General de Estadísticas de las Empresas	Instituto Nacional de Estadística	belen.gonzalez.olmos@ine.es	<a href="http://www.ine.es">www.ine.es</a>
Sweden	Ms Regina VILKENAS	Investment, R&D and IT Unit	Statistics Sweden	regina.vilkenas@scb.se	<a href="http://www.scb.se">www.scb.se</a>
United Kingdom	Ms Stephanie ROBSON	Department for Business, Innovation and Skills	Office of Science & Technology/DTI	stephanie.robson@bis.gsi.gov.uk	<a href="https://www.gov.uk/government/organisations/department-for-business-innovation-skills">https://www.gov.uk/government/organisations/department-for-business-innovation-skills</a>
Croatia	Ms Emira BEČIĆ	Directorate for Science and Technology	Ministry of Science, Education and Sports (MSES)	emira.beccic@mzos.hr	<a href="http://www.mzos.hr">www.mzos.hr</a>
Turkey	Mr Salim GÜRBÜZ	Annual Business Statistics Department/Industrial Product, Science and Technology Statistics Group	Turkish Statistical Institute	SALIMGURBUZ@tuirk.gov.tr	<a href="http://www.turkstat.gov.tr">http://www.turkstat.gov.tr</a>
Switzerland	Ms Elisabeth PASTOR	Federal Department of Home Affairs	Federal Statistical Office	elisabeth.pastor@bfs.admin.ch	<a href="http://www.bfs.admin.ch/bfs/portalen/index.html">http://www.bfs.admin.ch/bfs/portalen/index.html</a>
Iceland	Ms Sigrður VILHJÁLMSDÓTTIR	Labour market and social statistics	Statistics Iceland	sigridurviljalmsdottir@hagstofa.is	<a href="http://www.statice.is">www.statice.is</a>
Norway	Ms Kaja WENDT	Statistics and indicators	NIFU – Nordic Institute for Studies in Innovation, Research and Education	kaja.wendt@nifu.no	<a href="http://www.nifu.no">www.nifu.no</a>
Israel	Ms Miriam EREZ	Faculty of Industrial Engineering & Management	Techion – Israel Institute of Technology	meretz@ie.technion.ac.il	<a href="http://ie.technion.ac.il/Home/Users/meretz0.html">http://ie.technion.ac.il/Home/Users/meretz0.html</a>

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European Commission

**EUR 25617 — She Figures 2012 - *Gender in Research and Innovation***

Luxembourg: Publications Office of the European Union

2013 - 156 pp. - 17,6 x 25,0 cm

ISBN 978-92-79-27642-2

doi 10.2777/38520

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