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Preface

Monitoring the progress towards gender equality in science has become a well-established activity of the European Union's research policy.

Now, and thanks to the considerable efforts mobilised by the various stakeholders, especially the Helsinki Group on Women and Science and its sub-group of Statistical Correspondents, "She Figures" broadens the existing base of descriptive statistics. It enables the reader to deepen her or his understanding of the participation of women as graduates, as researchers, as academic staff, as funding beneficiaries and as board members.

These statistics reveal that Women and Science is indeed a European question. Women remain in the minority in public research (34% in 2001, a slight increase from 32% in 1999), but their annual growth rate is 8% compared to that of 3.1% for men. This represents an increase of some 50 000 researchers in this sector in the period, of which just over half were women. This changing situation also calls for closer gender monitoring in the exercise of Benchmarking national research policies.

This progress is most welcome and encouraging, but we should not react to it with complacency. It is still of utmost importance for the success of the European Research Area that women continue to increase their participation in European science. Their collective voices must be heard both as decision-makers in science and as catalysts of change in the scientific workplace.

Indeed, we will not reach the 3% objective if we fail to recruit, retain and promote the women who constitute an important share of Europe's pool of trained scientists. Young Europeans in schools, laboratories, universities and research centres who are interested in science need to see that science is a rewarding career choice. I am convinced that the promotion of a research environment free of gender bias is beneficial to science and will reinforce the democratic support of all European citizens.

Philippe BUSQUIN
Commissioner for Research

Acknowledgements

Gender mainstreaming, by its very nature, cannot happen in isolation. It requires a consistent and focused effort on the part of many players if it is to be achieved. In the same way, the data and texts in *She Figures* are the outcome of a co-ordinated working effort, which has benefited from the expertise of many individuals across Europe. I would particularly like to thank the following women and men who have all made valuable contributions to this booklet:

- The Statistical Correspondents of the Helsinki Group on Women and Science for providing the data and technical advice.
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- Linda Maxwell of the Women and Science Unit for practical support.
- Marge Fauvelle of the Women and Science Unit for impetus and overall co-ordination of this project.

NICOLE DEWANDRE
Head of the Women and Science Unit

Executive summary

"She Figures" is the result of two years of methodological and statistical work undertaken by the Commission in co-operation with the Statistical Correspondents of the Helsinki Group on Women and Science. This work has involved discussions on the harmonisation of data, two data collection exercises and the development of a coherent system of statistical indicators. The intention is for it to serve as a solid benchmarking tool for scientists, researchers, policy makers and human resource managers concerned by women and science.

By presenting the results from these indicators, this publication describes some of the common trends in the employment of European women and men scientists and researchers:

- There are broadly equal numbers of men and women working in science and technology occupations when a wide definition of S&T is examined.
- On the other hand, women are consistently under-represented as PhD graduates, as researchers – especially in the Business Enterprise Sector, among senior university staff and as members of scientific boards.
- Only a third of researchers in higher education and government research institutions are women. Furthermore only 15% of researchers in the business enterprise sector are women.
- The rates of increase are currently higher for women than for men PhD graduates and researchers in most countries and sectors.

As the most detailed collection of statistics and indicators yet available, *"She Figures"* is also a tool that enables analysts at national level to review the overall patterns in scientific education and employment by field of study and field of science. The results indicate that there are strong common gender patterns in the distributions of women and men in the scientific fields across Europe, among PhD graduates, in research and in academia. Women remain under-represented in engineering and natural sciences but form the major part of people performing research in humanities and social sciences in many countries. However, for the first time a deeper analysis of senior university staff by field of science reveals that there are still relatively few women in leadership positions in these fields. In fact there appears to be a serious dichotomy in career outcomes for men and women in academia. The average percentage of women (13.2%) in senior academic positions in the Member States in 2000 was lower than we would have expected from the overall percentage for all women in all academic positions (31%). It is, on the other hand, an increase from 11.6% in 1999.

The data on academic staff are drawn from national surveys of higher education systems, and there are, as a result, some differences in the coverage and in the definitions applied. However, among all men covered by these surveys, as many as 19% have reached senior positions, whereas only 6% of the women surveyed have enjoyed the same recognition.

The data therefore suggest that women are least present in the most highly rewarded positions. This appears to be the case for Member States and for Associated Countries alike. In fact, there are slightly higher proportions of women participating in science and research in the Associated Countries, but the dichotomy in seniority is just as pronounced. The purpose of *"She Figures"* is simply to present the available data, so it is not possible to establish to what extent this is due to women's choices (i.e. a work-life trade-off whereby they settle for the low-pressure/ low-reward posts) or to invisible barriers in promotion mechanisms.

Two other aspects of success and fairness that are central to the scientific system are explored. The first of these is the attribution of research funds. The figures reveal a general pattern whereby the success rates are slightly but consistently higher for men than for women. Statistical tests[1] show that these differences are in fact significant for several countries. The second aspect is concerned with the representation of women in scientific decision-making and therefore examines the sex composition of scientific boards. The indicators show that women are under-represented in all countries, with only one exception. More work is needed to study the mechanisms of the composition of scientific boards to discover why this is and how this can be redressed.

The possibilities for measuring the progress towards gender equality in science have clearly come a long way since the late 1990s. The breakdown of data, not only by sex but also by field and by seniority, is crucial for an accurate overview of the current situation in Europe. It is important to continue monitoring the indicators presented in *"She Figures"* in order to measure the rapid change occurring in the gender dynamics of the European Research Area. These indicators will also be developed as the quantity and quality of available sex-disaggregated data improves.

[1] *Chi Squared (X^2)*

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General Introduction

General Introduction

"Statistics are central, the word comes from 'numbers for the state', if you wish to have policy, you have to have competent statistics. No statistics, no problem, no policy. You just get gestures. Statistics help identify problems and can monitor the effectiveness of remedies"

Dr. Hilary Rose, Emeritus Professor
University of Bradford, United Kingdom

The role and participation of women as scientists emerged as a major policy concern at EU level in the late 1990's. The European Commission's activities in this domain are now producing a range of results, including a collection of sex-disaggregated statistics on scientists and researchers[1].

The objective of this publication is to present the breadth of relevant data that are currently available with the intention of facilitating the utilisation of policy-relevant gender indicators at institutional, national and European level. Some ready-made primary analysis has been prepared for the busier reader in the main body of the booklet. The raw data from which these indicators have been calculated are presented in Annexes 1-4. By presenting the raw data, researchers who wish to analyse national data in more depth will also have the necessary information at their fingertips.

The "Helsinki Group on Women and Science" are policy experts from the Member States and from countries associated to the Framework Programme. When they met for the first time in 1999, they found that, although sex-disaggregated data were available nationally, no harmonised data were available at European level to enable a full and informed debate[2].

It was therefore decided to form a sub-group of Statistical Correspondents[3] from each country (see Annex 7 for a list of the members), who have collaborated with the Commission to produce this booklet.

An action entitled "*Monitoring progress towards gender equality in science*" was included as Action 25 of the Science and Society Action Plan (European Commission 2002). The Statistical Correspondents have subsequently developed

[1] *In order to study the influence of gender in the organisation of society, it is vital to have data broken down by the sex of the observed population. In this booklet the term 'sex' relates to whether individuals are male or female and the term 'gender' refers to the way in which social and professional roles appear to be pre-determined by sex.*

[2] *This message was consistently reiterated by experts at the time, see, for example, European Commission, 1999.*

[3] *Turkey became associated to the Framework Programme in 2003, so it has not yet been possible to include the Turkish data .*

a system of indicators (listed in Annex 6) based on available data and the most pressing information needs. "*She Figures*" presents the results for many of these indicators relating to 1999, 2000 and 2001. On the eve of European enlargement, data for the European Union Member States appear shoulder to shoulder with those of the Associated Countries.

For gender indicators to be fully useful they should be formulated in such a way that governments, policy-makers and R&D managers can draw coherent and valid conclusions from them. In order to undertake balanced comparative analysis of the situations of women scientists in each different country it is vital to have a thorough overview of the depth of different national systems. In the text accompanying the data in this booklet, as well as in the methodological notes, every effort has been made to ensure that data can be interpreted correctly.

Although women remain seriously under-represented in science[4] and R&D across Europe, the extent of the under-representation varies and is closely linked to the different cultural, social and economic settings of each country. These differences should also be taken into account in interpreting the data.

The value and demand for statistics on Women and Science

Case studies at national and sub-national levels reveal that differences exist between men and women for career paths, research outputs, earnings and funding. There is a constant demand from policy-makers, social and economic researchers, analysts and scientists themselves for timely information in order to monitor this situation, to establish priorities, to evaluate costs and benefits, to make decisions and draw conclusions regarding the effects of new policies and actions. Therefore, countries must and do devote considerable resources to the collection, production and publication of statistics and indicators. Statistics can therefore lend a high level of social and political relevance to the situations of specific sub-groups within the population, in this case, women scientists.

Gender mainstreaming in S&T statistics

This demand for more and better sex-disaggregated data is an integral part of gender mainstreaming, the term coined for openly taking into account and systematically integrating the respective situations of women and men in policy development, with a view to promoting gender equality[5]. In the specific case of Women and Science, it was given added impetus by a Commission communication[6], two European Research Council resolutions[7] and two European Parliament Resolutions[8].

[4] In this booklet the term science is used in a very broad sense and it includes the social sciences and humanities.

[5] European Commission, (1998).

[6] Communication of the Commission: "Women and science" Mobilising women to enrich European research - Brussels 17/02/99 COM (1999)76 final.

[7] Council Resolution on "Women and science" Brussels, 01/06/99 (OR. En) 8565/99. Council Resolution on Science and Society and on Women in Science, Brussels, 03/07/01 (OR.en) 10357/01.

[8] Parliament Resolution PE 284.656 on the Communication of the Commission listed above, §6 & §23; Parliament Resolution (RR\431754EN.doc - PE 297.122) on the Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions - "Making a reality of The European Research Area: Guidelines for EU research activities" (2002-2006) (COM (2002) 612 - C5-0738/2000-2000/2334(COS)) §44.

In the context of the establishment of a European Research Area, there is a high-level group of experts on Benchmarking National Research Policies. Part of the remit of this group is to suggest and oversee an indicators activity in which the breakdown by sex is requested for all human resource statistics. In addition to these fundamental steps, the Directorate-General for Research has made firm improvements to the system for monitoring the participation of women in the European Union's Sixth Framework Programme for Research and Technological Development.

Gendered indicators are also starting to be developed in other related policy areas within the Commission. In Eurostat's 'Statistical Programme of the Commission for the year 2003'[9] "*the development of gender statistics is an integrated part of all statistics on individuals. If possible, data on individuals are collected by sex in all subject areas, in line with the principle of gender mainstreaming. Gender statistics are relevant in all areas, including demographic, employment, social and information society statistics. Social statistics is co-ordinating the efforts of having more extensive presentation of gender statistics*". This is certainly true for the R&D surveys, where Eurostat has requested the sex breakdown since 2002 for the Member States and EEA countries and since 2001 for the candidate countries. Although the inclusion of the sex variable into the European R&D survey has taken nearly two years to implement, it is now starting to produce concrete results. Furthermore, the sex breakdown will apply to all the main data items that should be covered by the forthcoming "Legal Basis on Science and Technology and Innovation Statistics".

[9]*Approved by the Commission on 2 December 2002*

The structural indicators, which underpin the analysis in the Spring Report each year, cover six domains, one of which is "Innovation and Research". The Spring Report is an instrument for assessing the progress towards the Lisbon 2000 objective "*of becoming the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion*". There is one gender-specific indicator: the gender pay gap in the "Employment" domain. A principle was introduced in 2002 that all indicators should be broken down by sex (where possible and relevant).

Employment outcomes of women as scientists are hinged upon the collective performance of women in education, particularly higher education. At the Education Council on 5 May 2003, the European Ministers of Education adopted five European benchmarks. One of these is "*the total number of graduates in mathematics, science and technology in the European Union should increase by at least 15% by 2010 while at the same time the level of gender imbalance should decrease*". The Directorate-General for Education and Culture also requests the sex breakdown in the course of its statistical activities. So, the mainstreaming of sex-disaggregated statistics relating to S&T education and employment is really being implemented in practice by many of the Commission's services[10].

[10]*This is also the case in many areas where statistics are not necessarily the priority. For example, the Directorate-General for Justice and Home Affairs has specific action programmes targeted at women (Jakobsson, 2002).*

Data Sources

Many of the statistics presented in "*She Figures*" are therefore drawn from the Commission Services' official sources, in particular where they relate to education, R&D and the labour force. These data, although valuable, tell us about the overall participation of women as graduates and as researchers, but do not give a deeper insight into the existence of gender-specific dynamics in the scientific workplace. The Helsinki Group Statistical Correspondents have therefore reported additional data on academic staff, the applicants for and recipients of research funding and the sex composition of scientific boards, as well as R&D data (for a few countries only).

The work of the Statistical Correspondents of the Helsinki Group

When the Statistical Correspondents of the Helsinki Group on Women and Science first met in March 2001, their information needs were honed into five broad policy concerns: "How Many?"; "Horizontal Segregation"; "Vertical Segregation", "Pay Gap" and "Fairness and Success Rates". Their discussions revealed that a selection of relevant data on these topics was available from most countries and it was decided to press ahead and collect them on an ad hoc basis, with the exception of "Pay Gap" for which no data were available. Each of the other four policy themes is presented in a separate Chapter in "*She Figures*":

Chapter 1 ("The Critical Mass") provides an overview of the various scientific and research populations to respond to the "How Many?" question. "Horizontal Segregation" is tackled in Chapter 2 with data broken down by field of science and field of study as well as by sex. In Chapter 3, career progression for academic staff and R&D personnel is presented to illustrate "Vertical Segregation". In Chapter 4, data on funding applicants and beneficiaries and the members of scientific boards are examined in order to provide descriptive measures of "Fairness and Success Rates".

These statistics are collected by R&D surveys, Higher Education surveys, Ministries and Academies of Science, Research Councils and Universities as part of their own monitoring systems. The joint repository for these data is referred to in "*She Figures*" as the "WiS (Women in Science) database. These data are not always ready for cross-national interpretation and comparison at European level. A review of the data and comparison of the results have enabled the group of statistical correspondents to identify the areas where methodological work is necessary. The data presented in "*She Figures*" are therefore the results of the work that has been achieved so far. Further work is still ongoing for a number of data items. Technical details relating to adherence to standards and classifications and data sources can be found in Annex 5.

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The critical mass

1. The Critical Mass

The figures presented in this Chapter provide a thorough overview of gender patterns for scientists and researchers studying and working in Europe.

PhD Graduates

The gender balance of the graduate population serves as an indication of the profile of the potential highly-qualified workforce of the future. Patterns of graduation from higher education can be taken as baseline for examining access to knowledge-intensive careers, including science. 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). In the Higher Education (HES) and Government (GOV) sectors, the PhD qualification is often a baseline qualification for a research career. By looking specifically at ISCED 6 graduates we are therefore identifying people who have been directly learning and executing research and are becoming qualified for research careers.

It is sometimes suggested that the scarcity of women researchers may be due to differences in trends in educational attainment, but this Chapter reveals that this is not the case. Since we know that access to higher education increased throughout the 1990s (Strack, 2003) we can assume that the labour force in general is becoming more highly qualified. The approach here is to calculate the recent growth of numbers of graduates by sex over a three-year period[1]. This approach capitalises upon the most recent data, but smoothes out the effect of any sudden changes. In countries with smaller numbers of ISCED 6 graduates it is important to look at the increase in absolute terms as well, since a higher growth rate in the numbers of women does not necessarily signal that the increase is largely female. We can see that although women only constitute 39.6% of ISCED 6 graduates in Europe, their numbers are increasing by an annual average of 4.8%, as opposed to just 0.9% for men. This is therefore an environment in which noticeable and positive changes are taking place, both in the EU-15 and Associated Countries.

[1] *Another approach is to study retrospective data going back one generation. However, since the implementation of the revised ISCED and because of structural changes relating to access to higher education in Europe over the last two decades, it is not certain how much the results of such a study would tell us about the career outcomes of today's researchers.*

Scientific Employment

Many employment indicators vary according to gender and the gender patterns are again different between Member States and Accession Countries (Franco & Jouhette, 2003; Franco & Blöndal, 2003). Furthermore, prime-age[2] women are more likely (18%) than prime-age men (< 2%) to withdraw from the labour force to assume family responsibilities (Van Bastelaer & Blöndal, 2003). The indicators in this Chapter should therefore be interpreted with the different employment contexts in mind.

In this chapter, the gender patterns of three different employment groups are examined:

- Human Resources in Science & Technology (HRST). This is the widest possible definition of scientists and includes S&T qualified graduates in the labour force and people who are working in professional or technician occupations.
- Scientists and Engineers (S&E). Data for this group are also drawn from the Community Labour Force Survey, but are restricted to "Physical, mathematical and engineering science professionals" and therefore exclude the other fields of science, such as social, agricultural or medical 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". The data on researchers are drawn from R&D surveys.

From a gender perspective, it is important to examine each of these groups separately since they do not always yield the same results. More detailed information on the definitions and data sources can be found in Annex 5.

HRST (Human Resources in Science & Technology)

The HRST methodology proposed in the Canberra manual (OECD, 1994) enables us to identify S&T qualified graduates in the labour force (HRSTE); people who are working in professional or technician[3] occupations (HRSTO); and people who fall into both these categories (HRSTC). In 2002, women constituted an average of 47.5% and 48.3% of HRSTE and HRSTC respectively in the Member States. An average of 46.6% of HRSTE women are also HRSTC, the corresponding figure for men being 45.1%. This means that more or less half of the human resources in science and technology in Europe are women, and that the appropriately qualified women are slightly more likely than men to be working in an S&T occupation.

It is important here to remember the breadth of the HRST categories, which include science-based workers who are not necessarily involved in research. In fact, closer analysis whereby the data are broken down by level of qualification for each Professionals and Technicians reveals that 67% of professionals with less than upper secondary education (2%)

[2] 25-54 year-olds. These averages mask considerable differences for women between countries, ranging from less than 2% in Denmark, Finland, Sweden, Iceland and Norway to 21% in Ireland and 26% in Greece.

[3] The definitions of Professionals and Technicians are taken from the International Standard Classification of Occupations (ISCO-88) and are more fully described in Annex 5.

are men. On the other hand, among technicians, 53% of the 33% share that have achieved tertiary education are women[4]. These findings really confirm that under-qualification can no longer be regarded as a factor that is keeping women out of scientific employment. Furthermore, women seem to be more likely to take jobs for which they are over-qualified.

Scientists and Engineers

If we focus more specifically upon S&Es, then a marked change in the indicator results can be seen. With the exception of Finland, women S&Es are in the minority across the EU-15. Interestingly, in the countries with the highest percentages of S&Es in the labour force, women account for more than 40% of S&Es, signifying the actual and potential value of women S&Es to national economies.

Researchers

A closer look at researchers by sex across the sectors of the economy confirms that women remain under-represented in European research, but that the overall patterns of distribution are strikingly similar between countries. Women are consistently least present in the Business Enterprise Sector (BES) where they only account for 15% of researchers.

The same is true for the Associated Countries, with the exceptions of Bulgaria, Latvia and Romania where the Higher Education sector (HES) has the lowest proportions of women. The overall proportions of women researchers are generally higher in the Associated Countries than in the Member States. This is a reflection of the higher levels of female employment, including scientific employment and research, in the economies of these countries during recent decades.

The EU average of 33.6% women researchers in the Higher Education Sector (HES) in 2000 has increased from 31.7% in 1999[5], but the average has remained at 31% for Government institutions (GOV) and at 15% for the BES (see Rübsamen-Waigmann et al., 2003). However, the lack of time series data for the Business Enterprise Sector prevents us from seeing whether any change has occurred[6]. It is particularly important to redress this imbalance in view of the increased numbers of researchers that are needed in the BES to reach the Barcelona objective of 3% of GDP devoted to R&D, of which two thirds should come from the BES.

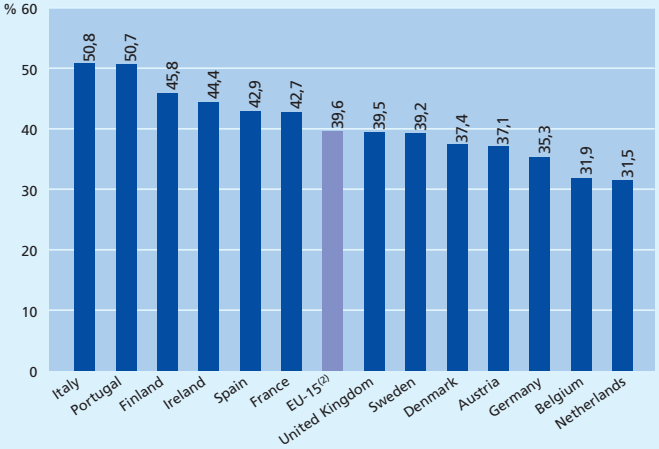
[4] *European Commission, (2003)*

[5] *See http://europa.eu.int/comm/research/science-society/women/wssi/pdf/how_many_iii.pdf*

[6] *Although there are currently data gaps, several countries have just introduced surveys, to obtain these data. Belgium (since 2003 for 2001), the Netherlands (ad hoc survey for 2001), Sweden (since 2003) and the United Kingdom (the gender split was piloted in 2002 and will have been incorporated by reference year 2004).*

Figure 1.1.a

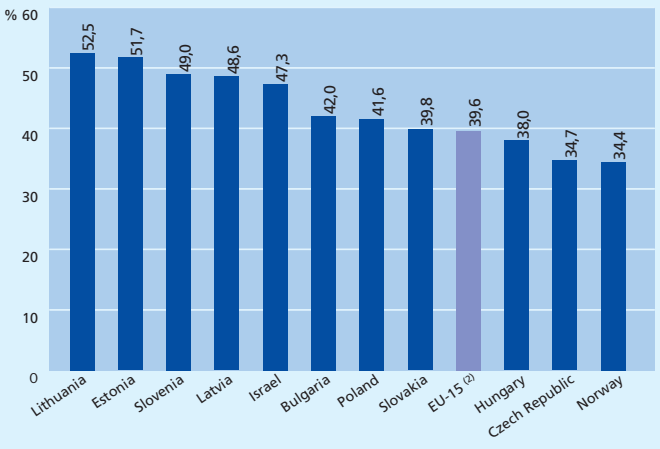
Percentage of ISCED 6 graduates who are women in EU Member States, 2001[(1)]



Source: Eurostat, Education
Notes: [(1)]Exceptions to the reference year: DK, FR, IT, FI: 2000
[(2)]EU-15 estimate excludes EL and LU. Above exceptions to reference year apply

Figure 1.1.b

Percentage of ISCED 6 graduates who are women in Associated Countries, 2001[(1)]



Source: Eurostat, Education; Israel Central Bureau of Statistics & Council for Higher Education
Notes: [(1)]Exception to the reference year: CY, HU: 2000; IL: 1999
[(2)]EU-15 estimate excludes EL and LU. Exceptions to reference year as in Figure 1.1 a

At the age of 18, women in all the Member States, especially Ireland, are more likely (75%) than men (70%) to continue their studies (Dunne, 2003). While women consequently account for more than half of the two million graduates from the whole of higher education (the estimated EU average was 55.2% in 2000 and 55.8% in 2001) the EU average for PhD (ISCED level 6) graduates is lower at 39.6% for women.

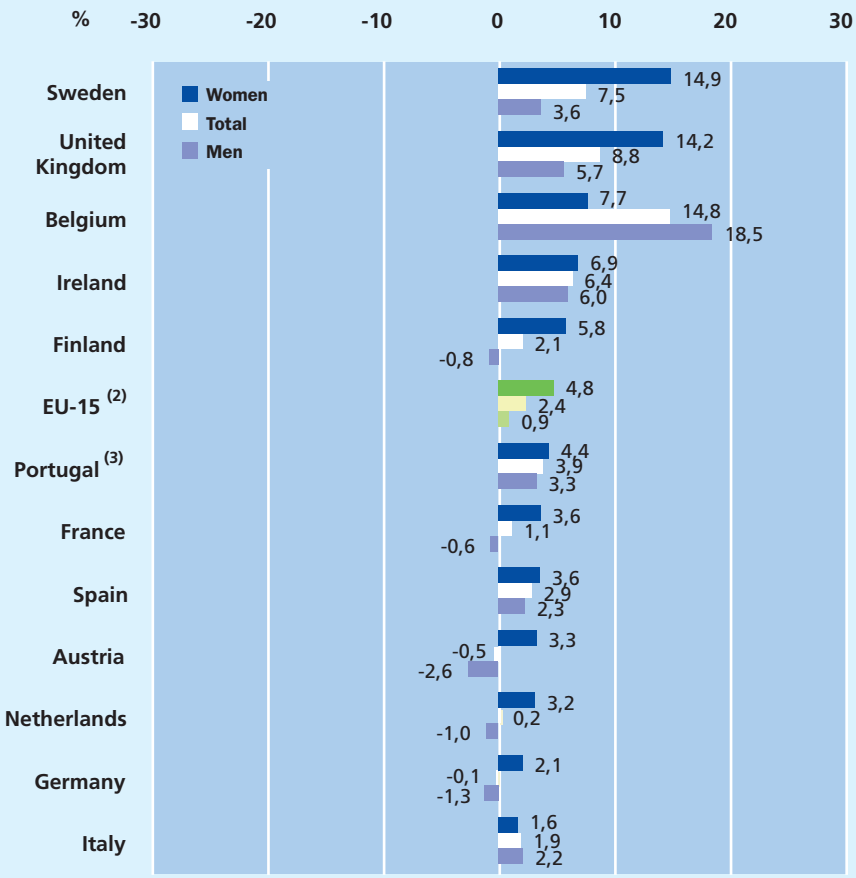
However, this average has increased by one percentage point since 2000. These results indicate that the levels of women as PhD graduates are likely to increase gradually over the coming years.

Like the Member States, Norway has a high level of retention in education at age 18 (87.6% women and 84.6% men) but only a third of ISCED 6 graduates are women. Several of the Accession and Candidate Countries (Bulgaria, Cyprus, Malta, Romania and Slovakia) appear to have more difficulty than the Member States retaining both young women and young men in education at the age of 18.

On the other hand, the Accession countries and Bulgaria tend, on the whole, to have higher proportions of women undergraduates and women ISCED 6 graduates than the Member States. This may be indicative of the different status of women in the economies of these countries. (See Annex 5 for country groupings).

Figure 1.2.a

Compound annual growth rate of ISCED 6 graduates by sex in EU Member States, 1998-2001[1]



Looking at the compound annual growth rates (see Box 1) since 1998, we can see that numbers of ISCED 6 graduates, in particular women, are largely on the increase. Growth is higher for women than for men in all countries except in Belgium and Italy. In Ireland, the increase was slightly higher for men than for women in absolute numbers, although the growth rate was higher for women.

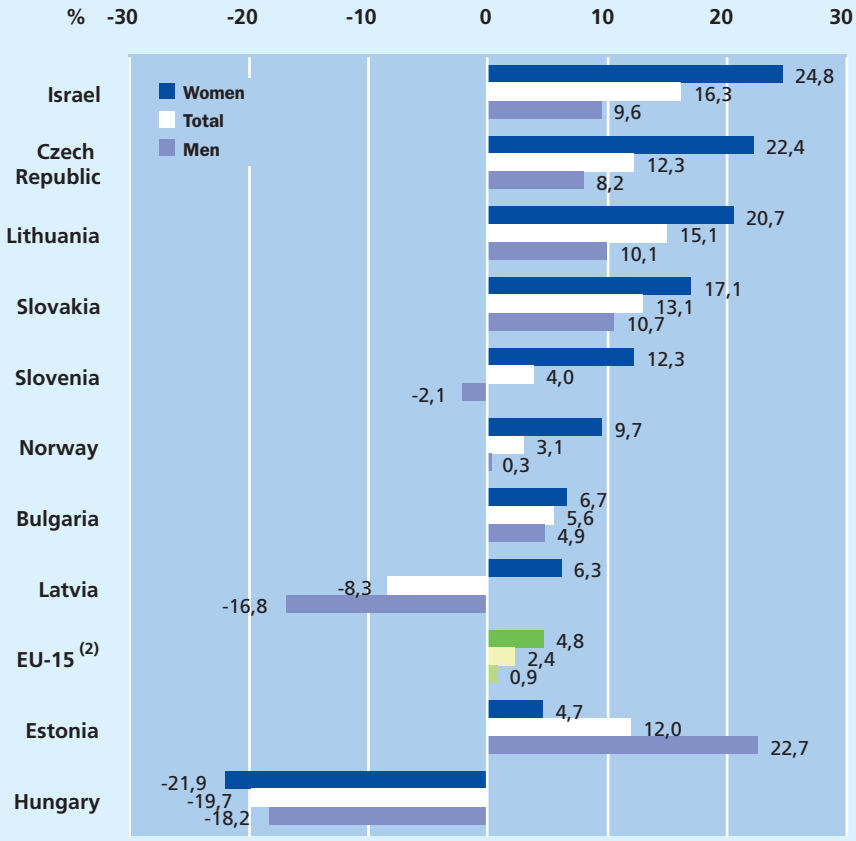
With the exceptions of Spain (where the percentage of women decreased between 2000 and 2001), Ireland, Italy and Portugal, the rates are generally very different for men and for women.

Source: Eurostat, Education

Notes: [1]Exceptions to the reference year: BE: 2000-2001; DK: 1999-2000; FR, IT, FI: 1998-2000,
[2]EU-15 estimate excludes EL, LU and is calculated for 3-year period. Above exceptions to reference years apply
[3]Provisional data

Figure 1.2.b

Compound annual growth rate of ISCED 6 graduates by sex in Associated countries, 1998-2001[(1)]



The growth rates of ISCED 6 graduates favour women in all countries except Estonia and Hungary, although in Slovakia, there was a marginally higher increase in the numbers of men graduates. The decline in Hungary's growth rate is more accentuated for women than for men, but in absolute terms the decrease was higher for men.

Even though the rates of increase are higher for women here than they are for men, it is important to bear in mind that the percentage of women graduates from ISCED 6 programmes declined in Bulgaria, Iceland, Norway, Czech Republic, Estonia, Latvia and Slovakia between 2000 and 2001.

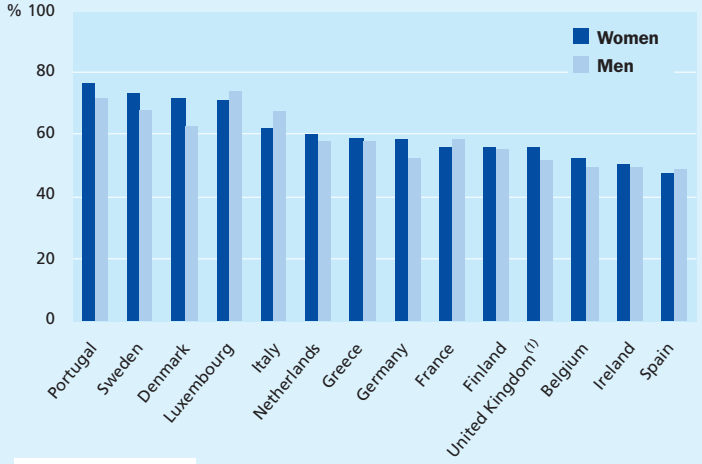
Source: Eurostat, Education; Israel Central Bureau of Statistics & Council for Higher Education

Notes: [(1)]Exceptions to the reference year: HU: 1999 - 2001; IL: 1998-1999

[(2)]EU-15 rate calculated for 3-year period. Exceptions to reference years as per Figure 1.2.a

Figure 1.3.a

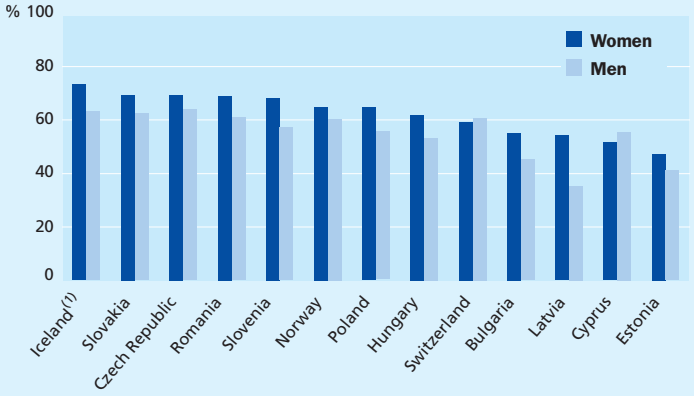
Percentage of HRSTE who are HRSTC by sex, EU Member States, 2002



Women constitute 51.6% of the population aged 15+ in Member States, 52.6% of the population aged 15+ in Accession Countries and 43.1% and 45.5% of the labour force in each group of countries respectively. In this context, 47.5% of S&T qualified graduates in the labour force (HRSTE) and 48.3% of people who are both HRSTE and working in professional or technician occupations (HRSTC) are women. Since about half of the HRSTE women (46.6%) and men (45.1%) are also HRSTC (i.e. both S&T qualified and working in professional or technician occupations), there appears on the surface to be very little gender difference in the utilisation of HRST and in the S&T returns to education.

Figure 1.3.b

Percentage of HRSTE who are HRSTC by sex, Associated countries, 2002

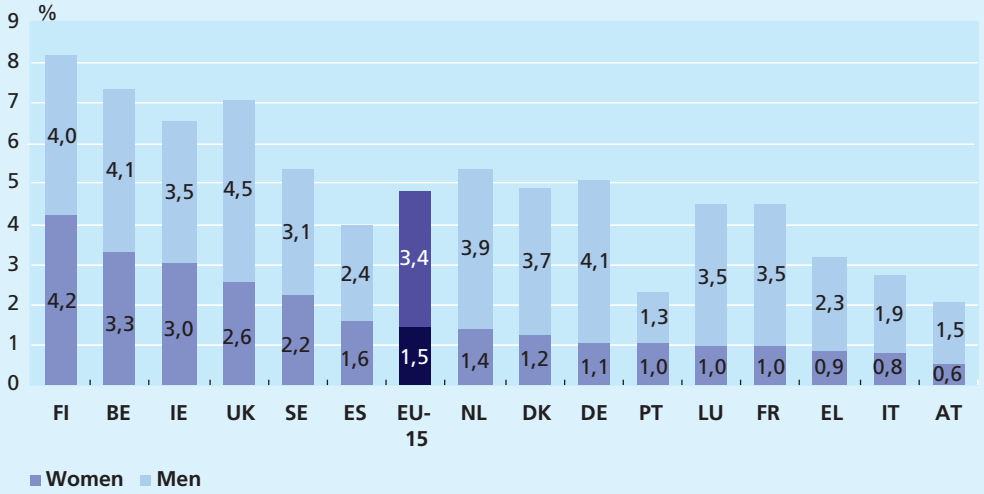


In the Accession Countries women constitute on average 54.2% of HRSTE and 57.5% of HRSTC. Furthermore, 53.4% of HRSTE who are HRSTC are women. After enlargement, the Accession Countries will boost the HRSTC stocks by 17.9% (women) and 12.4% (men), bringing the new EU-25 average of HRSTE that are HRSTC to 48.5% (women) and 46.1% (men).

Source: Eurostat, Community Labour Force data
Notes: (1) Exceptions to reference year: UK: 2000; IS: 2001.

Figure 1.4

Distribution of Scientists and Engineers by sex as a percentage of the total labour force, EU Member States, 2001[(1)]



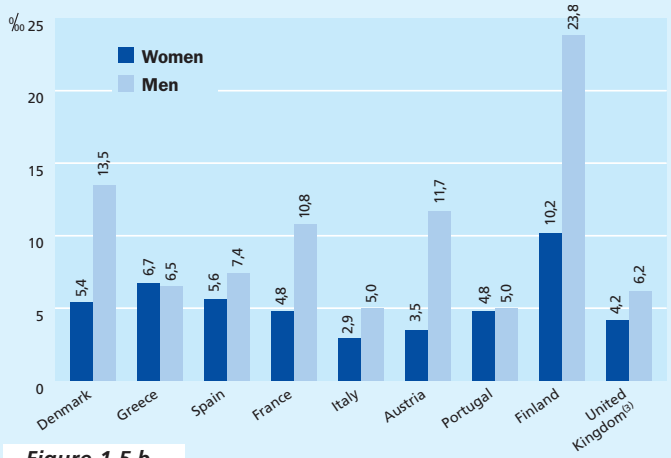
Source: Eurostat, S&T statistics, Community Labour Force data. Graph adapted from Statistics in Focus, Catalogue No. KS-NS-03-005-EN-C

Notes: [(1)]Exceptions to the reference year: AT (1997); SE & UK (2000) These exceptions also apply to the EU-15 total

Information on Scientists and Engineers (S&Es) is derived from the labour force surveys, and refers to "Physical, mathematical and engineering" occupations and "Life science and health" occupations which are subgroups 21 and 22 – of the ISCO major group 2 "Professionals". It does not therefore include any of the people working in social or agricultural sciences that are included in the HRST data. Focussing on S&Es appears to exclude a disproportionate number of women since the proportion of women tails off markedly in many Member States. The countries with the most S&Es in the labour force are generally the ones with the highest proportions of women.

Figure 1.5.a

Distribution of researchers per thousand labour force by sex in EU Member States, HC, 1999[(1)(2)]

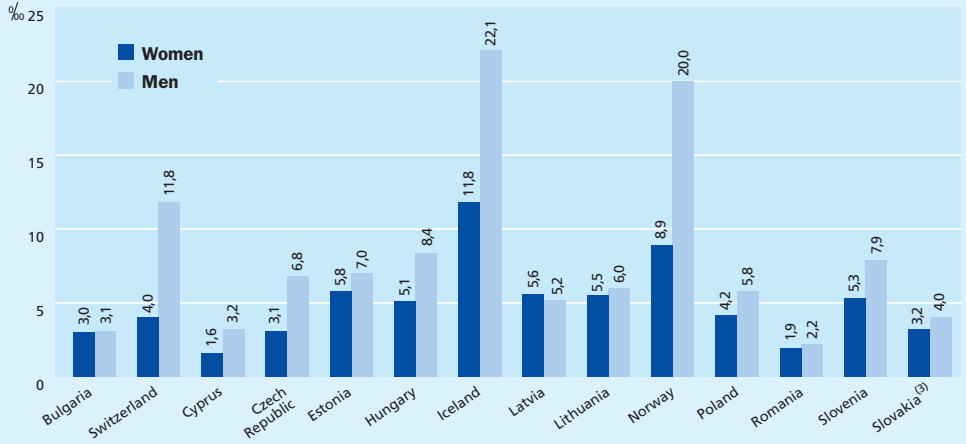


Although the definition of researchers encompasses a wider range of fields of science than S&E, they are a more specific and therefore far smaller group, as can be seen by comparing these results per thousand with those of Figure 1.4 in percent. As in Figure 1.4, Finland leads Europe in terms of the percentage of researchers and women researchers within the total labour force, but the presence of women as researchers is much lower than it is for S&E. There are high levels of male researchers in Finland, Norway and Iceland. Otherwise these results are very diverse, both between the sexes and between countries – especially for men.

Source: Eurostat, S&T statistics, Community Labour Force data; DG Research, WiS database
Notes: (1)Exceptions to the reference year: FR, FI: 2000; AT (RSEs only): 1998
(2)Excludes PNP
(3)HES and GOV only

Figure 1.5.b

Distribution of researchers per thousand labour force by sex in Associated Countries, HC, 2000[(1)(2)]

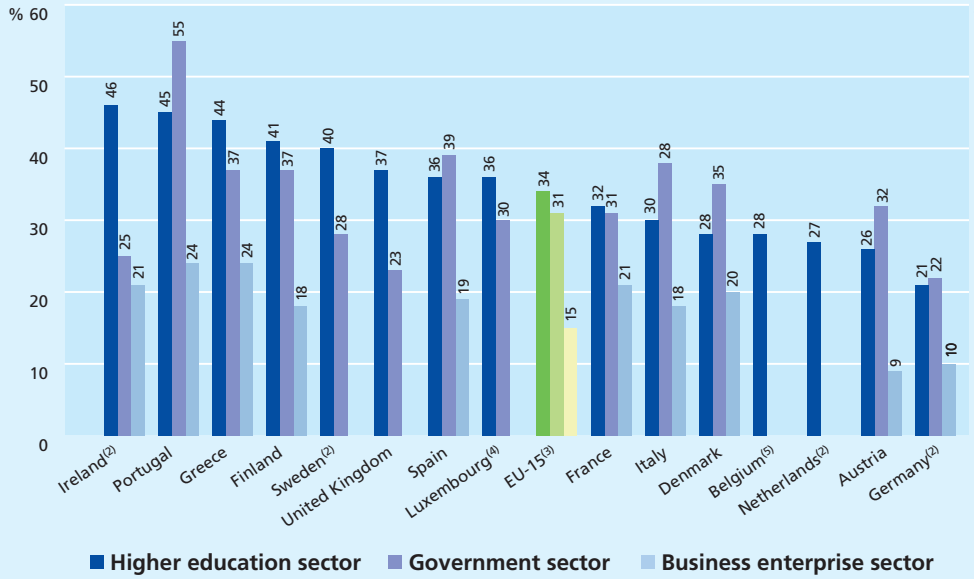


Iceland and Norway join Finland whereby research constitutes an important part of their labour forces. The intensity of research employment is far lower in Candidate countries, and the gender differences appear less pronounced.

Source: Eurostat, S&T statistics, Community Labour Force data; DG Research, WiS database
Notes: (1)Exceptions to the reference year: CZ, HU, LT, NO, RO, SK: 2001; IS: 1999
(2)Excludes PNP
(3)FTE as exception to HC (RSEs only)

Figure 1.6.a

Percentage of researchers who are women by sector in EU Member States, HC, 2000[1]



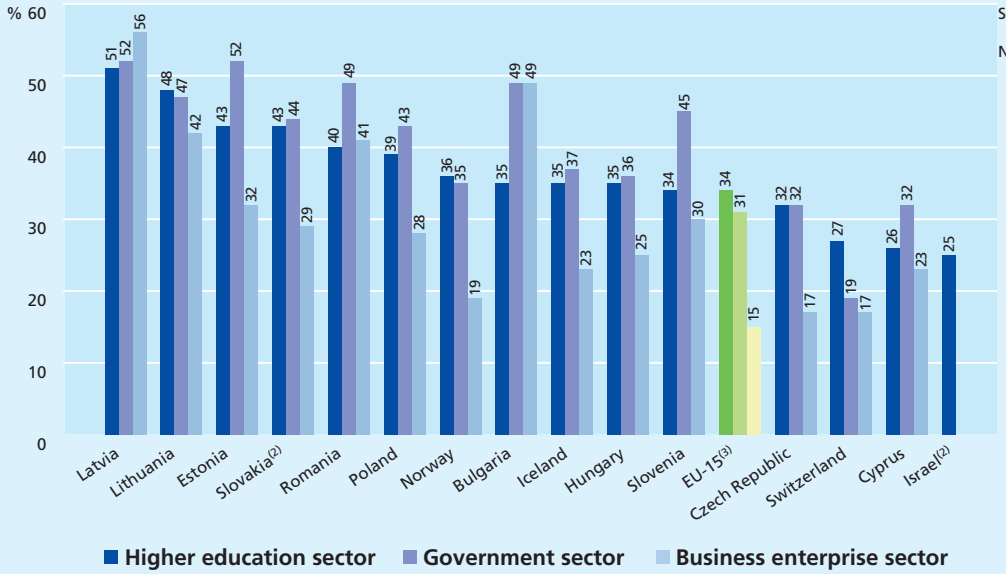
Source: Eurostat, S&T statistics; DG Research, WiS database

Notes: [1]Exceptions to the reference year: IT (HES), LU (HES & GOV), SE (HES): 2001; DK (BES), DE (BES), EL, ES (BES), IE (GOV, BES), IT (GOV), PT, SE (GOV): 1999; AT: 1998
[2]FTE as exception to HC: SE (GOV only); IE (GOV & BES only)
[3]EU-15 estimate excludes BE & NL for GOV and BE, LU, NL, SE & UK for BES
[4]Data provisional
[5]Data not official

The overall presence of women as researchers is lower than we would have expected from the graduates and HRST figures. Although the sex breakdown is only available for 70% of the BES researchers in the Member States, the scarcity of women in the BES is more extreme than in public sector research (HES & GOV). Portugal is the only country that has more than 50% women researchers in a sector (GOV). It is useful to interpret these figures alongside results from Figures 1.2.a and 1.2.b to see where the feminisation of education is having an impact on the feminisation of research.

Figure 1.6.b

Percentage of researchers who are women by sector in Associated Countries, HC, 2000[(1)]



Source: Eurostat, S&T statistics; DG Research, WiS database

Notes: (1)Exceptions to the reference year: CZ, HU, IL, LV (BES), NO, RO, SK: 2001; IS: 1999

(2)FTE as exception to HC

(3)EU-15 estimate excludes BE & NL for GOV and BE, LU, NL, SE & UK for BES. See footnotes for Figure 1.3.a for exceptions to reference year

As we may have expected from the ISCED graduates, there are higher proportions of women in research in the Associated Countries than in the EU. In most countries, women are again more seriously under-represented in the BES than in the other sectors, although every country has more than 15% women researchers (the EU average) in this sector. Latvia has the highest percentages of women in both the BES and the HES out of all of the countries in Europe. Based on 2000 data, Accession Countries will increase the numbers of EU researchers in the HES by more than 45 000 women and 72 000 men in 2004. Europe will also benefit from an estimated 14 000 women and 20 000 men in GOV and an estimated 8 000 women and 23 000 men in the BES, that is, an overall estimate of 182 000 researchers.

Table 1.1.a

Distribution of researchers by sector and by sex in EU Member States, HC, 1999[1]

		HIGHER EDUCATION SECTOR	GOVERNMENT SECTOR	BUSINESS ENTERPRISE SECTOR	TOTAL RESEARCHERS[2]
Belgium	**Women**	:	:	:	:
	Men	:	:	:	:
Denmark	**Women**	36,0	32,0	32,0	7 350
	Men	33,5	21,4	45,0	20 990
Germany[3]	**Women**	37,5	23,2	39,4	36 616
	Men	24,2	13,7	62,1	218 641
Greece	**Women**	83,7	8,5	7,8	12 066
	Men	73,0	9,9	17,2	17 410
Spain	**Women**	75,3	15,8	8,9	37 710
	Men	69,3	12,7	17,9	77 860
France	**Women**	53,4	15,0	31,6	56 320
	Men	41,9	12,7	45,4	150 654
Ireland[3]	**Women**	35,9	15,8	48,3	2 247
	Men	15,4	16,8	67,8	6 201
Italy	**Women**	54,4	26,0	19,6	26 328
	Men	50,5	15,5	34,0	71 683
Luxembourg[4]	**Women**	11,0	89,0	:	82
	Men	8,2	91,8	:	195
Netherlands	**Women**	:	:	:	:
	Men	:	:	:	:
Austria	**Women**	65,9	12,5	21,6	5 830
	Men	43,8	6,1	50,1	25 386
Portugal	**Women**	65,7	27,1	7,2	10 974
	Men	64,4	17,3	18,3	13 839
Finland	**Women**	47,6	17,1	35,3	12 686
	Men	26,6	11,2	62,2	32 106
Sweden	**Women**	98,1	1,9	:	9 747
	Men	97,1	2,9	:	17 096
United Kingdom	**Women**	93,7	6,3	:	54 677
	Men	88,3	11,7	:	100 506

It is important to interpret this table closely with the data in Figure 1.6.a. For example, we can now see that the high percentage of women in GOV in Portugal is representative of just one quarter of Portugal's women researchers.

The interface between the HES and GOV sectors in the context of national R&D systems vary from country to country. For example, a researcher in the HES in Germany or France may nonetheless be a civil servant. In other countries, key characteristics of research institutions such as source of funding, performance, management and employment status may all pertain clearly to the same sector.

The significance of the BES as an employer of researchers is highly diverse both between the sexes and between countries.

Source: Eurostat, S&T statistics; DG Research, WiS database

Notes: [1]Exceptions to the reference year: FR, IE (HES), FI, UK: 2000; AT: 1998
[2]Researchers in PNP not included
[3]FTE as exception to HC
[4]Data provisional

Table 1.1.b

Distribution of researchers by sector and by sex in Associated Countries, HC, 2000[(1)]

Bulgaria and Romania have different patterns of researchers from the other Candidate Countries, since they are the only countries where less than four in every ten of researchers are concentrated in the HES. In Bulgaria, researchers are more likely to be in the GOV sector and in Romania, half of all researchers, both men and women, work in the BES. In Iceland, Norway and Switzerland although the gender differences are quite pronounced, the distributions in each country are all different.

		HIGHER EDUCATION SECTOR	GOVERNMENT SECTOR	BUSINESS ENTERPRISE SECTOR	TOTAL RESEARCHERS[(3)]
Bulgaria	**Women**	18,3	69,0	12,7	4 781
	Men	28,3	60,8	10,9	5 695
Switzerland	**Women**	57,4	2,1	40,4	7 035
	Men	42,6	2,4	55,0	26 125
Cyprus	**Women**	43,3	28,9	27,8	194
	Men	44,3	22,2	33,5	546
Czech Republic	**Women**	49,5	31,6	18,9	7 079
	Men	39,5	25,3	35,3	19 210
Estonia	**Women**	73,7	17,9	8,4	1 947
	Men	74,1	12,6	13,3	2 582
Hungary	**Women**	67,4	19,7	12,9	9 363
	Men	63,0	17,5	19,5	18 988
Iceland	**Women**	40,8	36,0	23,2	850
	Men	36,0	28,4	35,6	1 813
Israel	**Women**	:	:	:	:
	Men	:	:	:	:
Latvia	**Women**	67,9	13,8	18,3	3 033
	Men	64,0	12,4	23,6	3 082
Lithuania	**Women**	71,6	23,2	5,2	4 801
	Men	70,2	23,4	6,3	5 412
Malta	**Women**	:	:	:	:
	Men	:	:	:	:
Norway	**Women**	55,2	14,4	30,4	9 811
	Men	39,1	10,7	50,2	24 917
Poland	**Women**	74,3	15,8	9,9	33 564
	Men	71,6	12,9	15,5	54 590
Romania	**Women**	24,4	27,7	47,8	10 107
	Men	27,5	22,0	50,6	13 490
Slovakia[(2)]	**Women**	54,7	28,4	16,9	3 817
	Men	48,6	23,5	28,0	5 768
Slovenia	**Women**	43,0	36,8	20,1	2 340
	Men	47,3	25,7	27,1	4 118

Source: Eurostat, S&T statistics; DG Research, WiS database

Notes: [(1)]Exceptions to the reference year: CZ, HU, LT, NO, RO, SK: 2001; IS: 1999
[(2)]FTE as exception to HC
[(3)]Researchers in PNP not included

Table 1.2

Researchers in PNP sector by sex; percentage women; FR; RSEs in PNP as a percentage of RSEs, and number of researchers in all sectors in available countries, HC, 2000[1]

The Private non-profit sector (PNP) has fewer researchers than the other sectors. On the other hand, for most of the countries that report these data, with the only exceptions of the Czech Republic and Slovenia, we can see that women are better represented as researchers here than in the HES and the GOV.

		PERCENTAGE WOMEN	FEMINISATION RATIO	PNP AS A %AGE OF ALL SECTORS[2]	ABSOLUTE NUMBERS
Denmark	**Women**	45	83	1,5	115
	Men			0,7	138
	Total			0,9	253
Greece	**Women**	45	80	0,3	37
	Men			0,3	46
	Total			0,3	83
Spain	**Women**	43	74	1,8	708
	Men			1,2	953
	Total			1,4	1 661
Austria	**Women**	38	61	1,2	71
	Men			0,5	117
	Total			0,6	188
Portugal	**Women**	37	58	10,6	1 301
	Men			14,0	2 261
	Total			12,6	3 562
Finland	**Women**	32	48	1,1	145
	Men			0,9	304
	Total			1,0	449
Bulgaria	**Women**	31	46	0,3	16
	Men			0,6	35
	Total			0,5	51
Cyprus	**Women**	27	37	6,7	14
	Men			6,5	38
	Total			6,6	52
Czech Republic	**Women**	19	24	0,8	54
	Men			1,2	229
	Total			1,1	283
Estonia	**Women**	54	116	1,1	22
	Men			0,7	19
	Total			0,9	41
Iceland	**Women**	54	117	6,9	63
	Men			2,9	54
	Total			4,2	117
Latvia	**Women**	80	400	0,1	4
	Men			0,0	1
	Total			0,1	5
Lithuania[3]	**Women**	42	71	0,2	10
	Men			0,3	14
	Total			0,2	24
Slovenia	**Women**	17	21	0,8	18
	Men			2,0	86
	Total			1,6	104

Source: Eurostat, S&T statistics; DG Research, WiS database

Notes: [1]Exceptions to reference year: AT, FI (PNP) (1998); EL; PT; IS (1999); CZ (2001)
[2]Data for other sectors are for 1999, except AT (1998); FI, BG, CY, EE, LV, SI (2000) and CZ, HU, LT (2001)
[3]FTE instead of HC

Box 1

Compound Annual Growth Rates

In order to measure how much a group of people has increased or decreased in a given period there are a number of possible methods, which depend on the type of growth. The growth of graduates or researchers over a period of several years is not necessarily linear. In fact it is likely to be compounded (or indeed diminished) by growth (or decline) from the previous year(s) and is subject to changing trends during the period in question. The value of the compound annual growth rate is therefore that it takes these effects into account and then smoothes the variation over time to yield a rate that is relevant in a medium- to long-term perspective. It also provides an approximation for the annual linear growth rate within a short period.

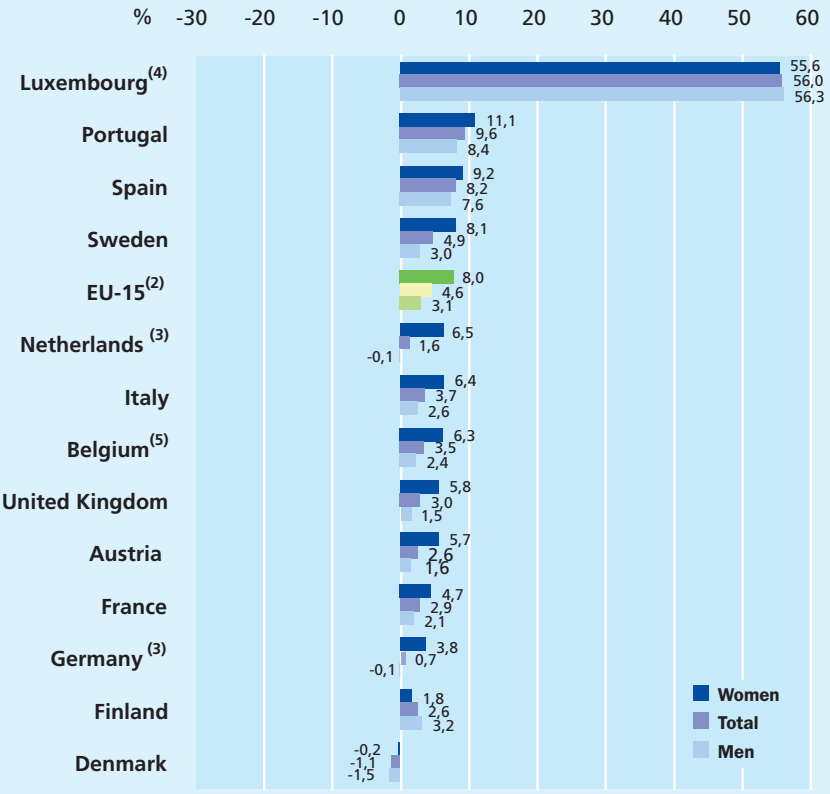
The formula is the following: $$\left(\sqrt[(y-x)]{\mathrm{Py}/\mathrm{Px}} - 1 \right) \times 100$$

Where: y is the final year of observation (for example 2001)
x is the initial year of observation (for example 1998)
Py is the population in year y
Px is the population in year x

The Compound Annual Growth Rate has political, social and economic relevance because it allows decision-makers to monitor the performance of the sector over time and provides the possibility of comparing the growth of sub-groups. It should however be borne in mind that the results for men and women only tell us about growth during the period – and not about increase or decrease in the absolute number of people. It is therefore possible, especially in a climate of rapid change, to see higher growth rates for one sex (usually the minority group), but a greater increase in absolute numbers for the other sex.

Figure 1.7.a

Compound annual growth rate of researchers in HES by sex in EU Member States, HC, 1998-2001[(1)]



The compound annual growth rates (see Box 1) enable us to appreciate the dynamics of each sector and to make a preliminary assessment of the progress towards gender equality in research. Growth for Luxembourg is high in the HES because there has only been a University since 2000. The outlook here is encouragingly positive for research and for women. Another way of assessing the progress towards gender equality is to extrapolate the number of years to a 50% balance, based on current trends. However, no firm methodology currently exists for undertaking such projections at cross-national level, in view of the diversity of R&D systems and rates of change.

Source: Eurostat, S&T statistics; DG Research, WiS database

Notes: [(1)]Exceptions to the reference years: BE: 1999-2001; FR, FI: 1999-2000; DK, ES, NL, UK: 1997-2000; LU: 2000-2001; PT: 1997-1999; AT: 1993-1998

[(2)]EU-15 estimate excludes EL and IE and includes data for 1993 for AT. Data for NL and DE in FTE. Above exceptions to reference years apply. CAGR based on average 2,1 years growth

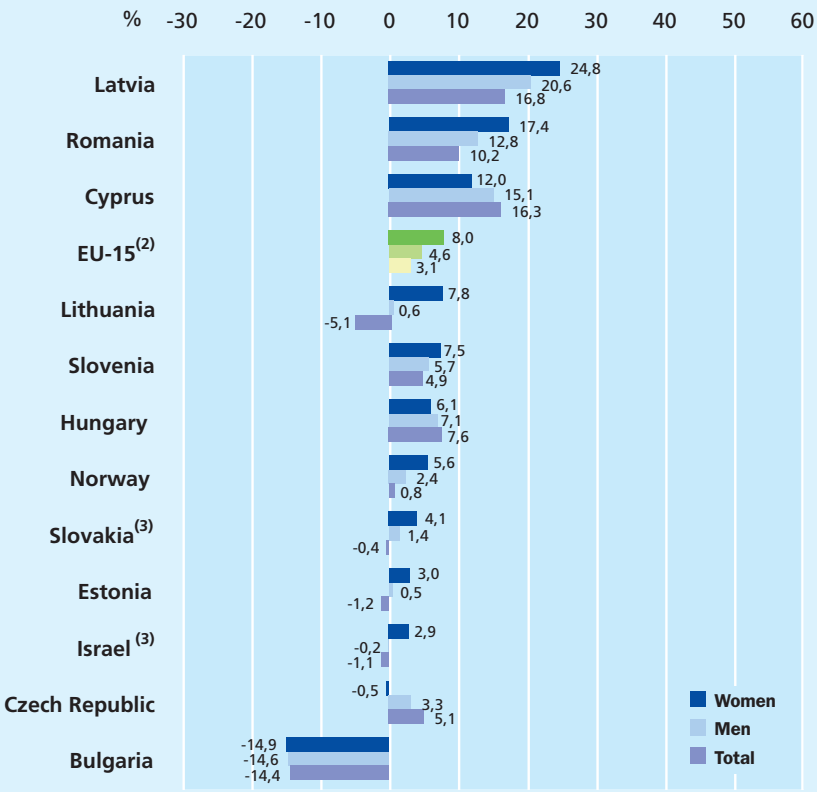
[(3)]FTE as exception to HC

[(4)]Data provisional

[(5)]Data not official

Figure 1.7.b

Compound annual growth rate of researchers in HES by sex in Associated Countries, HC, 1998-2001[(1)]



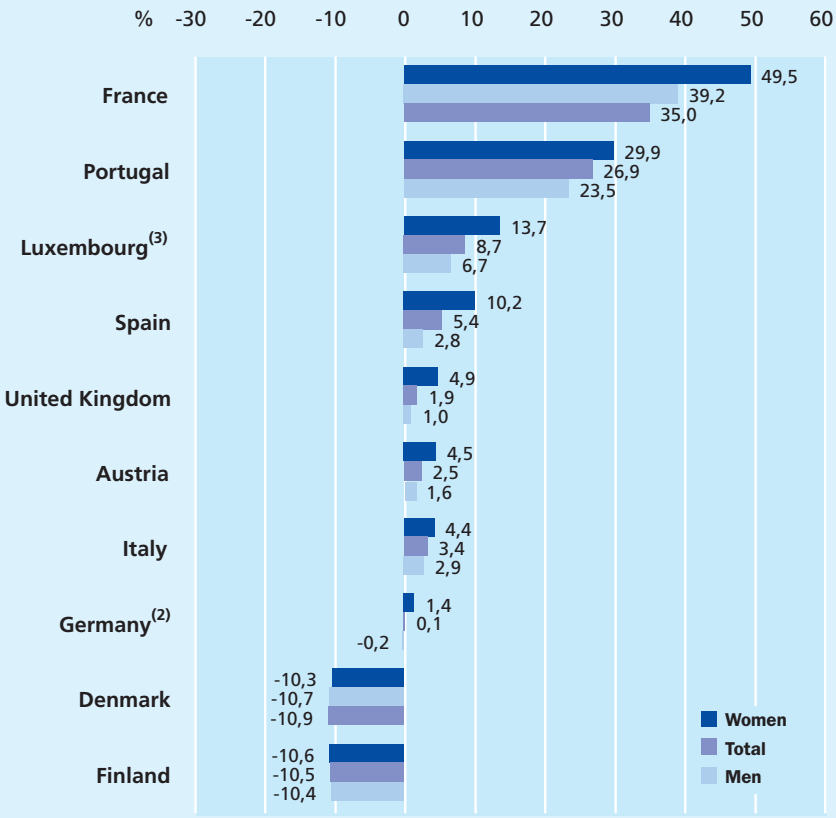
In Figures 1.2.a and b we saw that the growth rates for ISCED 6 graduates are generally stronger than the European average in the Associated Countries. However, the increase in researchers in the HES appears to have more momentum in the Member States than in all but three of the Associated countries, even though the general trend here is positive.

The economic data however indicate that this sector is flourishing. The total expenditure on R&D in the HES (HERD) for the Candidate Countries in this Figure increased from €225 million in 1997 to €357 million in 2000 – a compound annual growth rate of 16.6%. These figures also represent an increased share of gross domestic expenditure on R&D (GERD) for all sectors from 14% in 1997 to 18% in 2000. In this favourable climate, the increase in researchers in the HES can be seen for all the Associated Countries, except for Bulgaria, although only Latvia can match the 16.6% economic growth.

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: (1)Exceptions to the reference years: BG, SI: 1997-2000; CY: 1998-2000; CZ, LV, LT: 2000-2001; EE: 1999-2000; NO: 1997-2001
(2)EU-15 estimate: see footnotes for Figure 1.4.b
(3)FTE as exception to HC

Figure 1.8.a

Compound annual growth rate of researchers in GOV by sex in EU Member States, HC, 1997-2000[(1)]



Researchers in Government institutions in most EU countries are also experiencing growth and again, the trend is generally stronger for women than for men. The context of this growth must be reviewed with the variable significance of the GOV sector across the Member States in mind. For example, in 1999, it performed as little as 3.4% of GERD in Sweden and as much as 27.9% in Portugal. The attractiveness of the sector is not necessarily the same in every country either. During the period 1998-2001, the estimated GOV expenditure on R&D (GOVERD) increased by just under €2 billion in the EU, although its share of the overall estimated expenditure on R&D (GERD) decreased from 14.8% to 13.5%. In Finland, where the FRs are the highest in Europe and where RSEs form an important part of the labour force there has been a sharp decline in the number of researchers during the period.

Source: Eurostat, S&T statistics; DG Research, WiS database

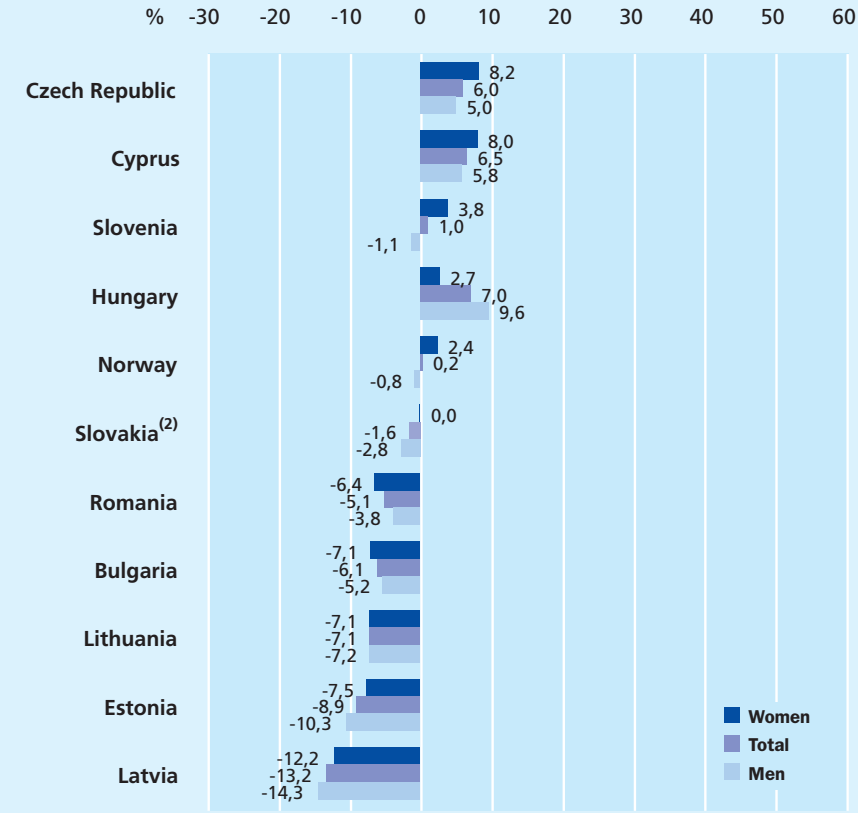
Notes: (1)Exceptions to the reference years: LU: 2000-2001; DK, FR, FI: 1999-2000; IT: 1998-1999; AT: 1993-1998; PT: 1997-1999; UK: 1998-2000

(2)FTE as exception to HC

(3)Data provisional

Figure 1.8.b

Compound annual growth rate of researchers in GOV by sex in Associated Countries, HC, 1998-2001[(1)]



Government institutions in Bulgaria, Cyprus and Lithuania are crucial centres of performance among candidate countries, representing over 40% of R&D performance. In eight out of ten candidate countries (no data for Malta and Turkey), the share of total R&D performance executed in the GOV sector declined between 1997 and 2000, especially in Latvia and Lithuania. In Slovakia and Romania, the GOV performance remained the same during the period, but overall R&D performance declined.

This economic background bears witness to a sector where there is a worrying decline in the numbers of researchers, both female and male, for the majority of countries.

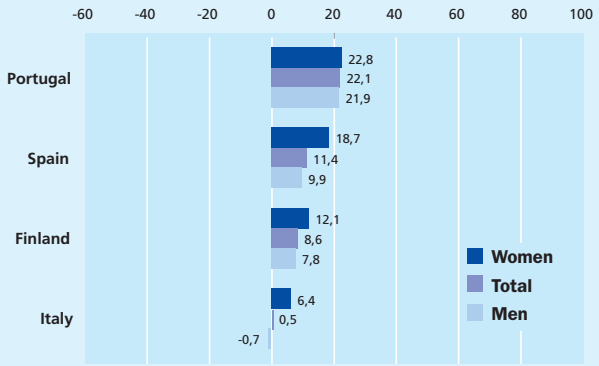
Source: Eurostat, S&T statistics; DG Research, WiS database

Notes: [(1)]Exceptions to the reference years: BG, EE, LV, SI: 1997-2000; CY: 1998-2000; CZ, LT: 2000-2001; NO: 1997-2001

[(2)]FTE as exception to HC

Figure 1.9.a

Compound annual growth rate of researchers in BES by sex in EU Member States, HC, 1997-1999(1)



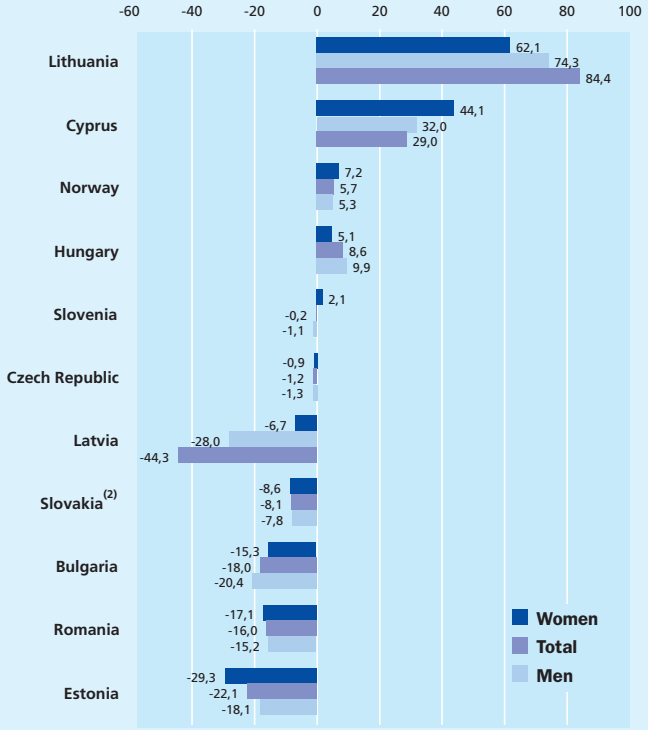
Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: (1)Exceptions to the reference years: IT, FI: 1999-2000
(2)FTE as exception to HC

In 2000, R&D expenditure in the BES (BERD) as a percentage of GDP was an estimated 1.26% in the EU-15, an average annual real growth rate of 4.3% since 1995 (European Commission, 2003). This general increase in BERD was highest in Finland (16.1%) and lowest in Italy (1.7%). It is borne out by an overall increase in the numbers of BES researchers, particularly women.

During 1997-2000 there was only decline in Romania and Slovakia for R&D expenditure in the BES. Among four Accession Countries, there was a decline in the numbers of researchers regardless of the increased expenditure, but no common gender pattern. Lithuania's extreme growth corresponds, in absolute numbers, to 95 new women researchers and 157 new men researchers.

Figure 1.9.b

Compound annual growth rate of researchers in BES by sex in Associated Countries, HC, 1998-2001(1)



Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: (1)Exceptions to the reference years: BG, SI: 1997-2000; CY: 1998-2000; CZ, LV, LT: 2000-2001; EE: 1999-2000; NO: 1997-2001
(2)FTE as exception to HC

Gender differences across scientific fields

2. Gender differences across scientific fields

The value of looking more closely at different scientific disciplines

Educational choices are made in a gendered environment under the influence of factors such as peer pressure and teacher preference. These choices impact on the career possibilities of women and men. Probably the most highlighted difference is the lack of women in engineering professions. It is therefore important for analysts and policy makers to have a clear idea of how well research is capitalising upon knowledge intensity in certain fields. The indicators presented in this Chapter refer to horizontal segregation, in this case, the dissimilarity in the distributions of the sexes across scientific fields.

Studies on segregation in the European labour market have found that existing overall segregation is mostly due to high levels of horizontal segregation (Blackburn et al., 2002). This means that the different distributions of men and women in employment are due to differences across fields of employment, rather than in seniority. This may or may not be the case for research – the data currently available do not lend themselves easily to such an analysis. Nevertheless, we can start to get an understanding of the significance of horizontal dissimilarities[1] by looking at differences in given parts of the R&D system. Furthermore, the diversity in the percentage of women in each sector and country and the small numbers involved for some countries[2] must be kept in mind when drawing conclusions at national or European level.

Common patterns between education and research for many countries

The results presented here reveal that not only are gender differences evident, especially among Member States from several perspectives, but that they follow the stereotypical patterns that can be witnessed in the labour market at large. Alongside the lack of women in engineering, there are high concentrations of women in Health and Medical fields, in Humanities and in the Social Sciences in many countries. This is the case for both higher education and research. In many countries the share of women is also high in Agricultural and Natural Sciences. Some countries, for example Bulgaria and Latvia, stand out as having quite individual gender profiles.

There are data gaps for the Member States in GOV that hinder the possibility of making a fuller analysis and of calculating any EU estimates, but women appear more likely to be undertaking S&E[3] research in GOV than in the HES in the Associated Countries. However, the GOV sector is smaller than the HES and the BES and not always as well resourced in many of these

[1] It should be borne in mind, however, that a uniform distribution of the sexes across scientific fields is not necessarily realistic or beneficial to women

[2] Especially Luxembourg, Cyprus, Estonia and Malta.

[3] Here the term 'S&E' refers to the combination of the two fields of science NS and ET

countries. Romania is the only country where women are more likely than men to be undertaking S&E research – and this is only true in the HES sector. Interestingly, in the BES, where men are in a sharp majority, the distributions of women and men across economic activities are remarkably homogenous.

Is there change afoot?

It is only possible from the available data to make a crude analysis for three Member States and ten Associated Countries where the data broken down by field of science were available for either 1999 or 2000 and then for either 2000 or 2001 in the HES. In Denmark, Germany and Estonia in both Natural Sciences and Engineering , there was change of less than 1% in the percentages of women. This was also the case for Natural sciences alone in Bulgaria, Cyprus, Iceland and Israel. In Czech Republic, Lithuania, Norway and Slovenia, the percentage of women increased by more than 1% in S&E, and in Engineering by 3.1%, 4.1% and 5% in Cyprus, Lithuania and the United Kingdom respectively. There was a small decline in the proportion of women S&E researchers in Slovakia.

For the remaining fields of science, there were minor increases in the order of one or two percent in almost every case, with more significant increases in the Humanities for Czech Republic, Lithuania and Slovenia. The proportion of women researchers in Agricultural sciences in Israel also increased from 10% to 14%. In the other fields of science, the only exceptions to this positive trend are to be found in Medical sciences in the United Kingdom, Czech Republic and Slovakia. Also, in Lithuania, the proportion of women researchers in Agricultural Sciences declined from 50% to 39%. So, the gradual increase in the proportion of women researchers seems to be evident across most fields of science for the Czech Republic, Lithuania and Slovenia between 1999 and 2000/2001 but is otherwise barely discernible for most countries.

Table 2.1.a

Percentage of ISCED 6 graduates who are women by broad field of study in EU Member States, 2001[(1)]

Percentage Women	EDUCATION	HUMANITIES AND ARTS	SCIENCE, MATHEMATICS AND COMPUTING	AGRICULTURE & VETERINARY	HEALTH AND SOCIAL SERVICES	ENGINEERING, MANUFACTURING & CONSTRUCTION	SOCIAL SCIENCES, BUSINESS AND LAW
Belgium	54,5	31,1	33,6	31,2	39,6	15,4	35,0
Denmark[(2)]	X	50,6	32,6	46,6	47,5	23,7	41,7
Germany	41,7	45,2	26,8	52,5	45,5	11,8	32,1
Greece	:	:	:	:	:	:	:
Spain	54,3	45,4	44,6	33,3	48,7	23,2	44,0
France	50,0	56,5	39,3	56,5	57,0	26,8	42,4
Ireland	50,0	54,3	42,7	36,8	60,3	22,2	49,1
Italy	:	57,9	47,7	56,0	66,3	34,4	46,0
Luxembourg	-	-	-	-	-	-	-
Netherlands	:	31,5	25,5	32,8	41,8	13,8	37,2
Austria	62,1	51,4	35,6	51,1	71,9	13,0	39,4
Portugal	66,4	64,2	49,8	56,1	64,9	39,1	46,1
Finland	72,2	45,6	37,4	39,2	62,9	21,2	50,9
Sweden	65,6	44,0	33,0	48,4	52,7	24,1	41,1
United Kingdom	55,2	46,4	38,9	39,6	51,6	18,8	40,2
EU-15[(3)]	55,4	48,9	35,7	46,5	49,0	20,6	39,3

Source: Eurostat, Education
Notes: [(1)]Exceptions to the reference year: DK, FR, IT, FI: 2000
[(2)]Humanities and arts includes education
[(3)]EU-15: estimate excludes EL, LU. Above exceptions to reference year apply

Although women outnumber men only in the field of Education for the EU-15 average, they enjoy more or less equal numbers of ISCED 6 graduates as men in Humanities & Arts, Health & Social Services and Agriculture & Veterinary Sciences. An estimated 41.4% of university graduates in Science, Mathematics or Computing subjects in 2000 were women, so the average of 35.7% is less than we would have expected. Furthermore, the numbers of these graduates appear to have fallen from 105 000 in 2000 to 90 000 in 2001.

Among engineering graduates the percentage of women was 20.8% in 2001 and 20.2% in 2000 – a close match for the EU-15 average of 20.6%. However, there was in real terms a decrease in head count from 1 800 (in 2000) to an estimated 1 200 (in 2001) women graduating in Engineering at ISCED 6 level.

In some countries there are signs that this "hard science bottleneck" between ISCED 5 and ISCED 6 graduates might be disappearing. In Science, Mathematics and Computing in Denmark, Spain, Austria and Portugal there are higher proportions of women graduates at ISCED 6 than at ISCED 5. For Engineering, this can also be witnessed in France, Ireland, Italy, the Netherlands, Portugal and the UK.

Table 2.1.b

Percentage of ISCED 6 graduates who are women by broad field of study in Associated Countries, 2001[(1)]

Percentage Women	EDUCATION	HUMANITIES AND ARTS	SCIENCE, MATHEMATICS AND COMPUTING	AGRICULTURE & VETERINARY	HEALTH AND SOCIAL SERVICES	ENGINEERING, MANUFACTURING & CONSTRUCTION	SOCIAL SCIENCES, BUSINESS AND LAW
Bulgaria	43,8	43,9	45,6	51,9	51,9	27,6	40,3
Cyprus	50,0	100	66,7	-	-	-	100
Czech Republic	63,0	50,0	24,4	31,3	50,9	27,1	42,0
Estonia	-	35,7	31,8	50,0	64,8	0	50,0
Hungary	60,7	41,9	26,1	30,9	38,2	24,0	42,6
Iceland	:	:	:	:	66,7	:	100
Israel	75,6	42,3	44,2	48,1	63,3	28,6	58,6
Latvia	66,7	50,0	44,4	100	-	28,6	66,7
Lithuania	:	60,0	45,2	100	43,8	30,0	70,5
Malta	:	0	:	0	:	0	:
Norway	54,5	46,8	9,1	36,9	40,7	13,9	39,6
Poland	-	48,5	44,6	43,9	47,0	19,6	44,4
Slovakia	44,8	36,7	45,0	38,5	54,2	28,6	46,7
Slovenia	81,3	51,1	43,4	69,2	57,5	22,8	63,3

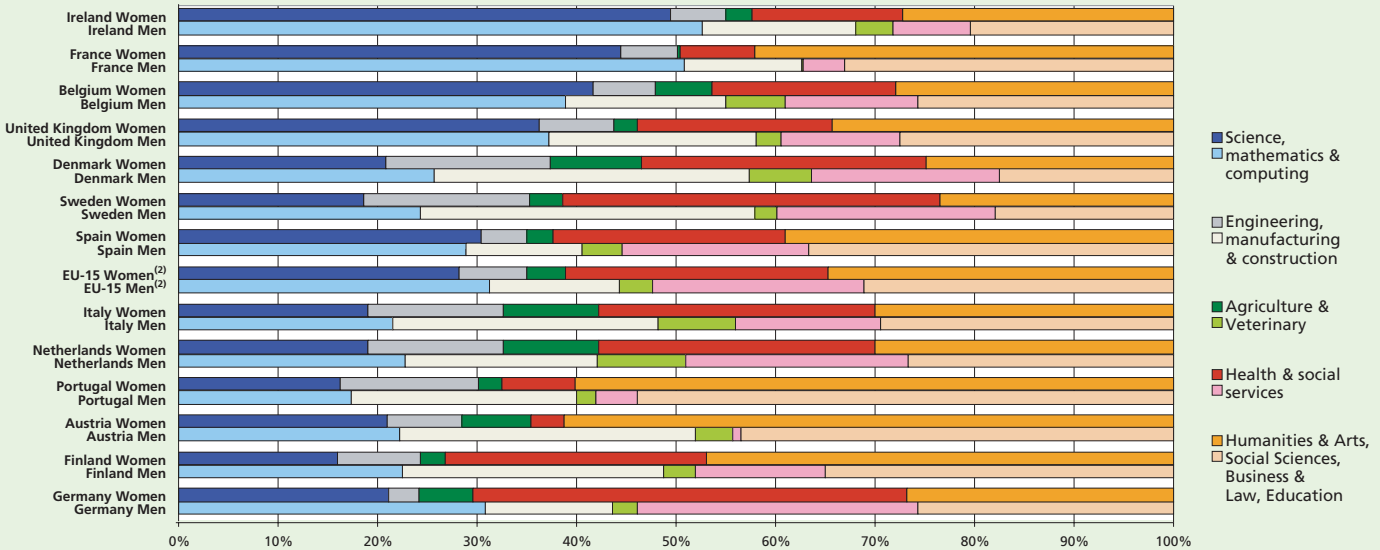
Source: Eurostat, Education; Israel Central Bureau of Statistics & Council for Higher Education
Notes: [(1)]Exceptions to the reference year: IL: 1999; CY: 2000

In Bulgaria, Latvia, Lithuania and Romania a majority of graduates from higher education (ISCED 5+6) programmes in Science, Mathematics or Computing are women. This is reflected in the composition of PhD graduates in the same subject. Bulgaria also had the highest proportion of women engineering graduates in 2000 (39.7%) and in 2001 (35.5%), and in Estonia, Lithuania and Poland about a third of engineering graduates from ISCED 5 programmes were women. The overall pattern for ISCED 6 graduates visible in Member States remains discernible here, whereby there are higher proportions of women graduates in Humanities & Arts, Health & Social Services and Agriculture & Veterinary Sciences. Women remain a minority among successful engineering PhDs in all countries.

In Norway, where 60% of all university graduates are women, only in the field of Education are there more than 50% women graduates from ISCED 6. The proportion of women graduates in Science, Mathematics & Computing was 30.8% in 2000 and 29.7% in 2001 for ISCED 5 and ISCED 6 combined. It therefore appears from this table that Norwegian women are dropping out of studying in these fields in the national system at ISCED 6 level more sharply than men.

Figure 2.1.a

Distribution of ISCED 6 graduates across the broad fields of study by sex in EU Member States, 2001[(1)]



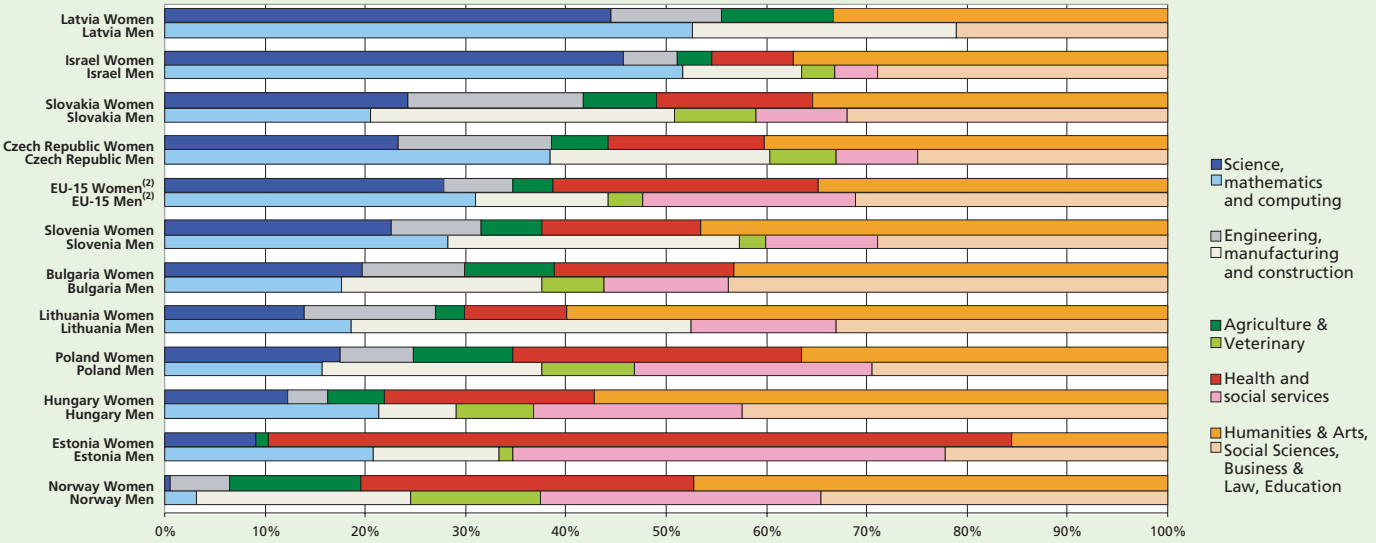
Percentage distribution of ISCED 6 graduates across the fields of study, by sex

Source: Eurostat, Education
Notes: [(1)]Exceptions to the reference year: DK, FR, IT, FI: 2000
[(2)]EU-15 estimate excludes EL, LU. Exceptions to reference year apply as above

Putting the results from Table 2.1.a into perspective, where ISCED 6 graduates in some fields of study tend to be dominated by one or the other sex, we can now see that the distributions of men and women graduates across the possible fields are also gendered. Only Agriculture & Veterinary Sciences appear immune from this effect. Men graduates are consistently more likely than women graduates to be graduating from Engineering programmes and, with the only exceptions of Belgium and Spain, from Science, Mathematics & Computing programmes. Conversely, women graduates are consistently more likely than men graduates to be graduating from Humanities & Arts and Health & Social Services programmes.

Figure 2.1.b

Distribution of ISCED 6 graduates across the broad fields of study by sex in Associated Countries, 2001[(1)]



Percentage distribution of ISCED 6 graduates across the fields of study, by sex

Source: Eurostat, Education; Israel Central Bureau of Statistics & Council for Higher Education
Notes: [(1)]Exceptions to the reference year: IL: 1999
[(2)]EU-15 estimate excludes EL, LU. Exceptions to reference year apply as per Figure 2.1.a

In line with the relatively high proportion of women graduates from Science, Maths & Computing in Bulgaria, Poland and Slovakia, we can see that women graduates are more likely than men graduates in these countries to be graduating in this field. However, the proportion of men graduating from ISCED 6 engineering programmes in all the Associated Countries is at least twice that of women, for most countries. Equally, with the only exceptions of Bulgaria and Estonia the proportion of women graduating from Humanities & Arts and Health & Social Services programmes, is higher than that of men.

Table 2.2.a

Percentage of researchers who are women by field of science in HES in EU Member States, HC, 1999[1]

Percentage Women	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGIES	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES
Belgium[2]	29,5	20,0	30,1	25,1	32,4	35,9
Denmark[5]	22,9	12,2	35,6	44,7	26,8	37,1
Germany	18,1	11,3	34,1	31,5	23,5	35,2
Greece	:	:	:	:	:	:
Spain	:	:	:	:	:	:
France[3]	29,4	15,2	32,4	:	39,8	X
Ireland	:	:	:	:	:	:
Italy	31,0	13,4	22,9	24,3	26,7	41,5
Luxembourg	50,0	-	50,0	-	37,5	66,7
Netherlands[4]	19,7	13,7	37,0	25,7	29,2	31,2
Austria	18,2	8,9	31,9	30,6	29,9	37,2
Portugal[3]	48,6	28,7	49,7	44,0	48,7	X
Finland	34,4	22,4	52,0	36,2	47,0	50,6
Sweden	30,5	19,0	51,2	40,9	43,3	43,7
United Kingdom	30,6	13,2	48,1	35,5	42,8	40,3

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]Exceptions to the reference year: DK, DE, FR, UK: 2000; AT: 1998
[2]Data not official. Estimates made from BE-FL for 2001 and BE-FR for 2000
[3]SS includes H
[4]FTE as exception to HC
[5]Definition of HES coverage differs slightly from Annex Table 1.2.a

In Chapter 1 it was clear that women are already under-represented in all sectors of research. Here we can see that the low percentages of women researchers are reflected in some of the main fields of science in the Higher Education sector. These low proportions of women are found in engineering for every single country and corroborate the low proportions of women engineers among ISCED 6 graduates. In fact, there is only a majority of women researchers in the HES Finland and Sweden in Medical Sciences and Humanities, which are generally the most feminised fields. The percentages of women in Social Sciences seem to be very similar to the overall percentage of women researchers in many countries.

Table 2.2.b

Percentage of researchers who are women by field of science in HES in Associated Countries, FTE, 2000[1]

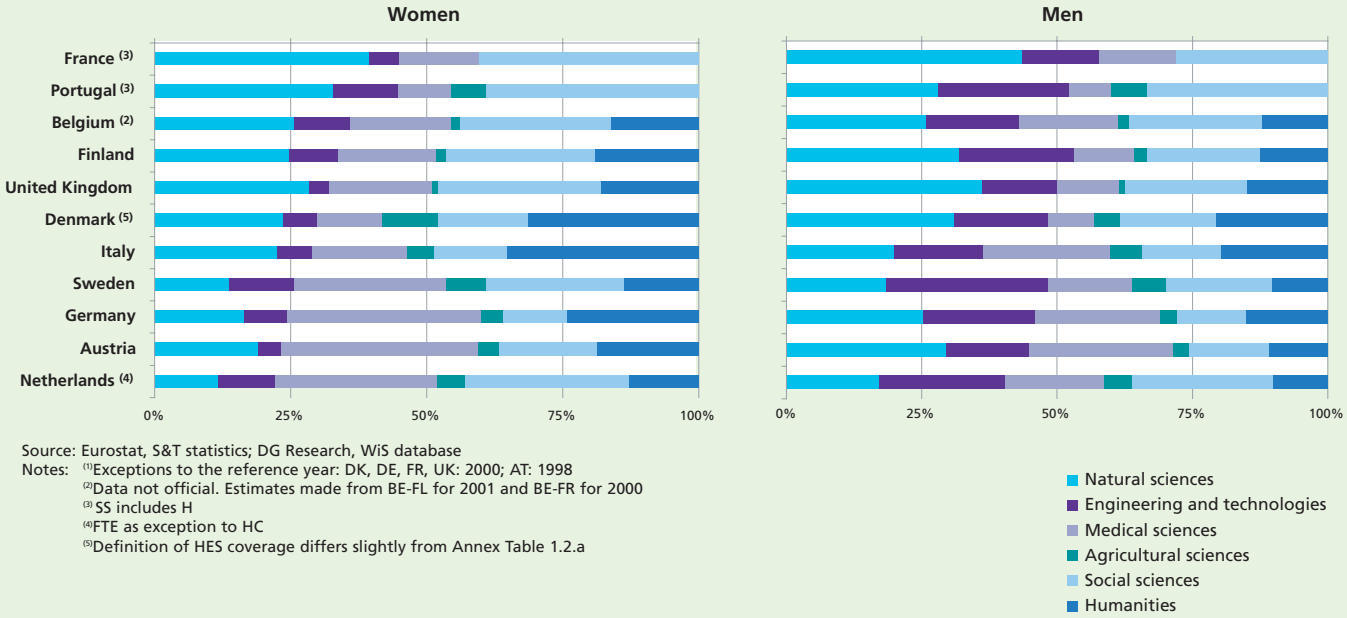
Percentage Women	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGIES	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES
Bulgaria	45,3	15,8	47,2	0	41,4	47,7
Cyprus	16,3	16,7	0	0	33,7	40,9
Czech Republic	34,3	26,9	34,8	36,3	39,3	38,7
Estonia	33,3	23,8	55,7	45,7	51,6	59,2
Hungary	:	:	:	:	:	:
Iceland	17,5	41,0	41,1	46,7	43,6	36,2
Israel	11,8	12,1	38,1	13,6	30,3	35,6
Latvia	35,2	34,9	78,4	59,0	41,9	79,3
Lithuania	37,9	24,5	55,2	39,3	57,1	66,5
Malta	:	:	:	:	:	:
Norway[2]	23,5	17,4	44,7	34,0	39,4	40,4
Poland	33,8	15,8	43,3	33,1	37,9	33,0
Romania	36,4	34,3	51,5	24,5	22,8	27,3
Slovakia	33,2	33,9	50,8	:	50,5	49,9
Slovenia	30,6	18,8	51,7	51,4	41,4	48,9

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]Exceptions to the reference year: IL, LT, NO, PL: 2001; IS, LV: 1999
[2]HC as exception to FTE

For six countries (Bulgaria, Cyprus, Israel, Latvia, Lithuania and Slovakia), it can be seen that the average percentage of researchers that are women in the HES presented in Figure 1.6.b is hiding marked differences between fields of science. In fact, the average percentage of women from Figure 1.6.b is at least five points away from any of the percentages for the fields of science here. This variation is less evident in the Member States.

Figure 2.2.a

Distribution of researchers across the fields of science in HES by sex in EU Member States, HC, 1999[(1)]



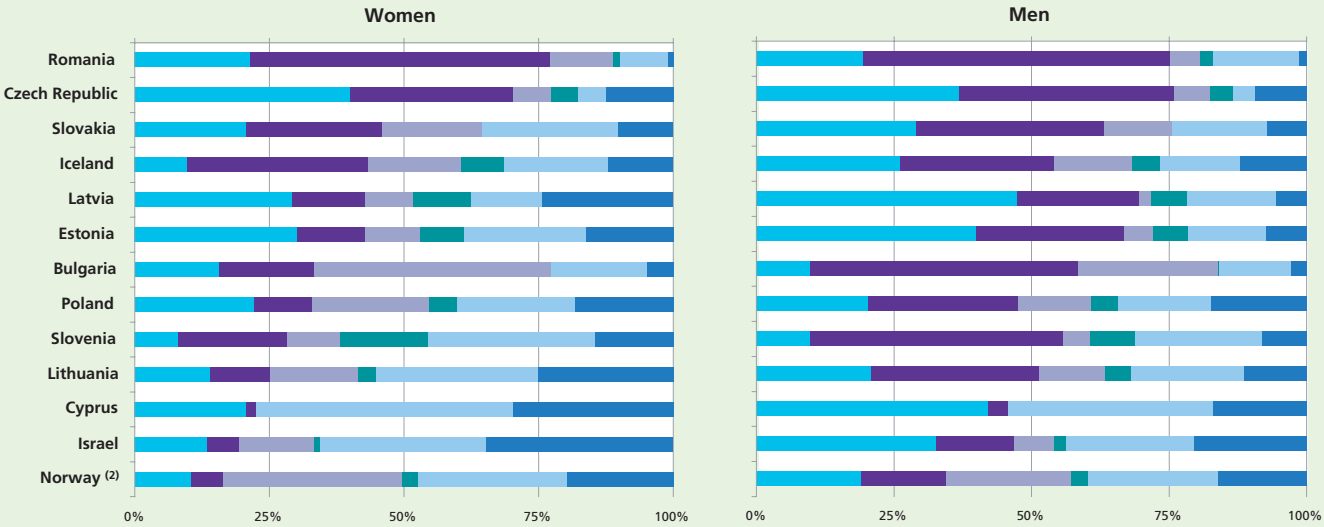
Source: Eurostat, S&T statistics; DG Research, WiS database

Notes: [(1)]Exceptions to the reference year: DK, DE, FR, UK: 2000; AT: 1998
[(2)]Data not official. Estimates made from BE-FL for 2001 and BE-FR for 2000
[(3)] SS includes H
[(4)]FTE as exception to HC
[(5)]Definition of HES coverage differs slightly from Annex Table 1.2.a

In the HES sector in EU Member States, the proportion of men performing research in the Engineering & Technology field is twice as high as that of women in all countries for which data are available. On the other hand, there is a lower proportion of women researchers in Medical Sciences compared to the proportion of women graduating from Health science programmes at ISCED 6 in a number of countries. Without further study it is not possible to say whether these women are in another sector or professional field or whether they are working in technical as opposed to research occupations.

Figure 2.2.b

Distribution of researchers across the fields of science in HES by sex in Associated Countries, FTE, 2000[1]



Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]Exceptions to the reference year: IL, LT, NO, PL: 2001; IS, LV: 1999
[2]HC as exception to FTE

Only in Romania is there a higher proportion of women researchers than men researchers working in S&E research. This is true for both Natural Sciences and Engineering, but it is an isolated case.

Table 2.3.a

Percentage of researchers who are women by field of science in GOV in EU Member States, FTE, 1999[1]

Percentage Women	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGIES	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES
Belgium	:	:	:	:	:	:
Denmark[3]	24,3	19,7	43,3	35,7	41,1	42,1
Germany	18,9	13,9	34,1	28,1	39,6	:
Greece	:	:	:	:	:	:
Spain[2]	35,3	30,9	42,1	37,9	44,5	X
France	:	:	:	:	:	:
Ireland	34,8	28,0	71,8	14,9	33,3	0
Italy	:	:	:	:	:	:
Luxembourg	:	:	:	:	:	:
Netherlands	:	:	:	:	:	:
Austria	26,8	16,0	38,4	20,4	32,9	35,2
Portugal	:	:	:	:	:	:
Finland	:	:	:	:	:	:
Sweden	:	:	:	:	:	:
United Kingdom	:	:	:	:	:	:

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1] Exceptions to the reference year: DK: 2000; AT: 1998; ES: 2001
[2] SS includes H
[3] Definition of GOV coverage differs slightly from Annex Table 1.3.a

As a general rule, the percentages of women researchers in Engineering are higher in the Associated Countries than in the EU Member States for both the HES and the GOV. However, the percentages of S&E women are higher in GOV for the three countries for which data are available for both sectors (Denmark, Germany and Austria). The same is also true for Medical and Social Sciences but Agricultural Sciences are more feminised in the HES. This may be a reflection of the organisation and dynamics of R&D in each the HES and the GOV in these countries.

Table 2.3.b

Percentage of researchers who are women by field of science in GOV in Associated Countries, FTE, 2000[(1)]

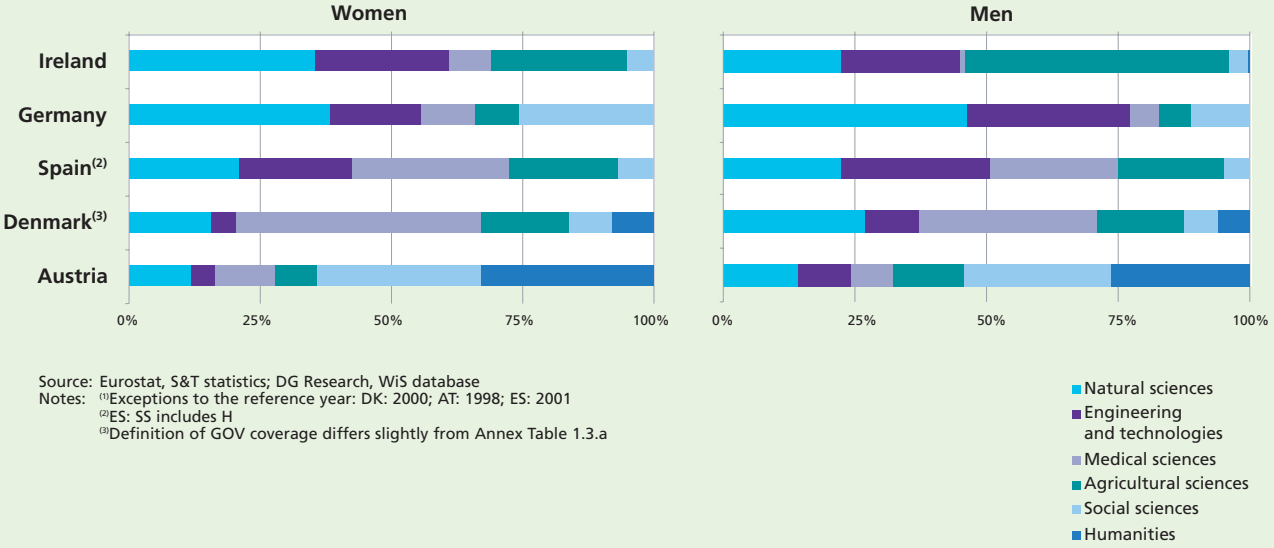
Percentage Women	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGIES	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES
Bulgaria	52,0	34,1	53,2	50,1	53,5	58,2
Cyprus	56,0	15,9	36,8	24,8	28,4	63,0
Czech Republic	28,3	14,0	49,2	48,3	40,5	44,6
Estonia	29,6	34,0	72,0	45,3	61,1	75,0
Hungary	:	:	:	:	:	:
Iceland	24,4	43,3	47,3	18,3	38,1	41,7
Israel	:	:	:	:	:	:
Latvia	65,2	49,3	56,9	54,2	24,5	60,0
Lithuania	41,1	28,3	55,6	50,0	62,3	62,2
Malta	:	:	:	:	:	:
Norway[(2)]	27,9	15,8	47,4	35,4	41,3	44,8
Poland	:	:	:	:	:	:
Romania	48,5	41,2	69,7	33,3	59,1	47,5
Slovakia	41,3	30,5	58,6	49,4	54,8	34,5
Slovenia	34,6	30,3	61,0	41,5	51,5	44,4

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: (1) Exceptions to the reference year: LT, NO: 2001; IS, LV: 1999
(2) HC as exception to FTE

Iceland and Norway fit well with the pattern visible among the Member States whereby all the fields in GOV except Agriculture have higher proportions of women than in the HES. For the other Associated Countries there is less definition to the pattern, although the percentages of women are higher for most countries and fields as we would have expected from Figure 1.6.b. It is important to recall that in many Associated Countries the GOV sector is relatively small in terms of performance. Furthermore, the GOV sector is undergoing economic restructuring in many countries and so performance is not always increasing as rapidly as in the HES and BES.

Figure 2.3.a

Distribution of researchers across the fields of science in GOV by sex in EU Member States, FTE, 1999[(1)]

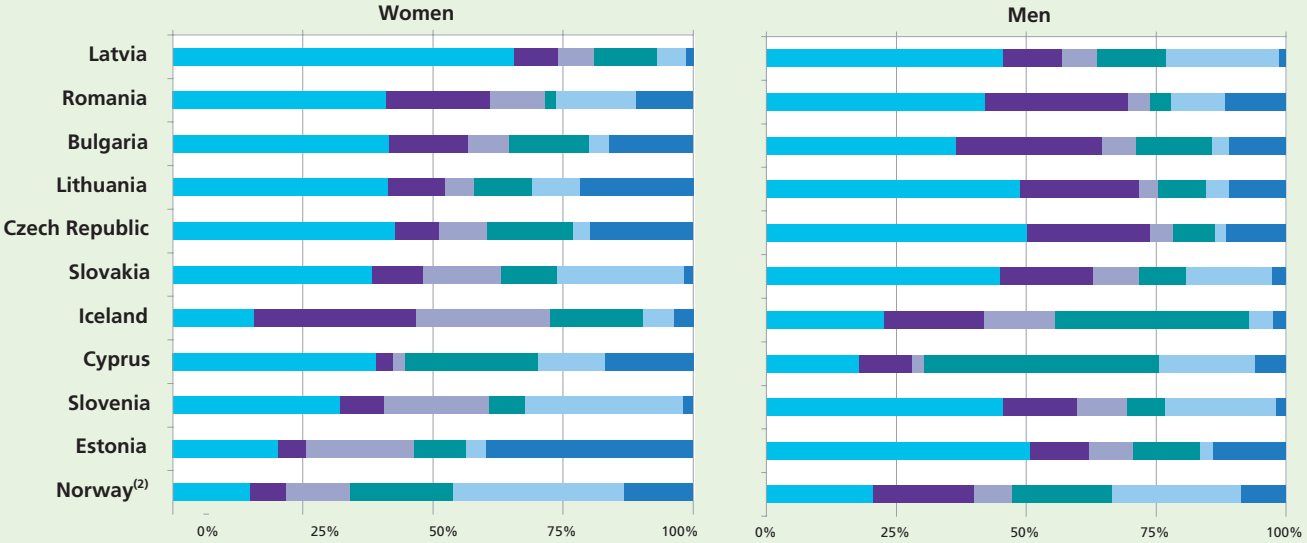


Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: (1)Exceptions to the reference year: DK: 2000; AT: 1998; ES: 2001
(2)ES: SS includes H
(3)Definition of GOV coverage differs slightly from Annex Table 1.3.a

It is clear that in Ireland and Germany, more than half of the women researchers in GOV are working in S&E fields. Furthermore, in Ireland women researchers appear more likely than men researchers to be working in either Natural or Engineering Sciences in the GOV sector. However, we also know from Table 2.3.a that they are still in a minority compared to men, particularly in Germany.

Figure 2.3.b

Distribution of researchers across the fields of science in GOV by sex in Associated Countries, FTE, 2000[(1)]



Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: (1)Exceptions to the reference year: LT, NO: 2001; IS, LV: 1999
(2)HC as exception to FTE

In the GOV, Romanian women researchers are less likely than their male counterparts to be working in S&E fields, as they are in the HES, but those in Latvia, Iceland, and Norway are. At least 40% of women researchers in GOV in all these countries, except Estonia and Norway, are working in S&E.

Table 2.4.a

Percentage of researchers who are women by NACE category in BES in EU Member States, HC, 1999[1]

Percentage Women	MANUFACTURING	REAL ESTATE, RENTING AND BUSINESS ACTIVITIES	OTHERS
Belgium	:	:	:
Denmark[3]	21,9	16,8	20,3
Germany[2]	9,0	14,8	13,6
Greece	21,4	22,5	30,8
Spain	17,7	22,2	28,5
France	21,0	17,9	21,4
Ireland	:	:	:
Italy	15,3	26,7	23,1
Luxembourg	:	:	:
Netherlands	:	:	:
Austria	7,8	13,3	8,7
Portugal	20,8	27,1	28,5
Finland[3]	21,8	20,8	20,4
Sweden	:	:	:
United Kingdom	:	:	:

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: FR, IT, FI: 2000; AT: 1998
[2]FTE as exception to HC
[3]Definition of BES coverage differs from Annex Table 1.4.a

Table 2.4.b

Percentage of researchers who are women by NACE category in BES in Associated Countries, HC, 2001[1]

Percentage Women	MANUFACTURING	REAL ESTATE, RENTING AND BUSINESS ACTIVITIES	OTHERS
Bulgaria	58,2	31,8	42,4
Cyprus	18,9	29,7	15,2
Czech Republic	12,1	21,1	26,3
Estonia	40,1	25,6	33,7
Hungary	27,5	20,4	18,7
Iceland	13,5	31,4	14,9
Israel	:	:	:
Latvia	44,9	51,9	78,2
Lithuania	46,6	9,9	28,6
Malta	:	:	:
Norway	17,0	20,2	21,2
Poland	:	:	:
Romania	39,7	32,0	47,9
Slovakia[2]	27,0	27,3	34,1
Slovenia	30,2	29,8	23,7

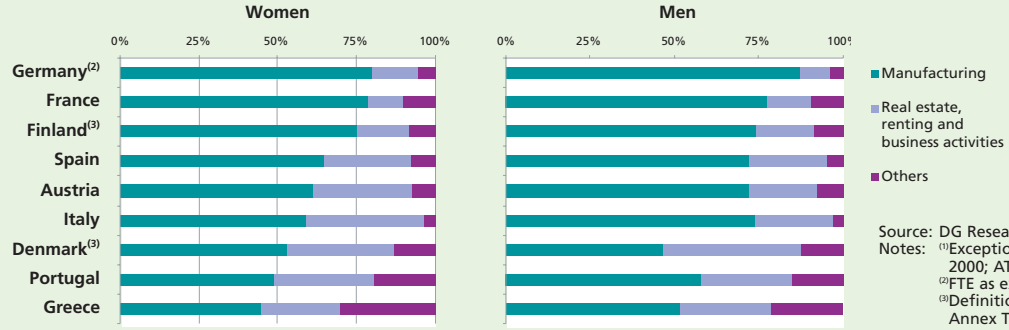
Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: BG, CY, EE, LT, SI: 2000; IS: 1999
[2]FTE as exception to HC

The recommendation of the Frascati Manual (OECD, 2002) is to use the NACE classification to observe the fields in which BES researchers are working. It categorises businesses by their main economic activity and does not therefore necessarily tell us exactly what the researchers are doing, so it is not possible to make any links with the education data. Compared with the national patterns visible in Figures 1.6.a and 1.6.b, it could be argued that women are slightly less likely to be concentrated in companies where the main economic activity is Manufacturing or Real Estate, Renting or Business Activities (which includes research).

Looking at Annexes 2.4.a and 2.4.b we can see that, in most countries, there are higher proportions of women researchers in companies whose main economic activity is pharmaceuticals, but they are hidden when Manufacturing is aggregated. In Bulgaria, Estonia, Hungary, Lithuania and Slovenia the highest percentage of women is found in Manufacturing. The BES in Latvia was highlighted as having the highest percentage (56%) of women out of any sector in Europe in 2000 (see Figure 1.6.b) and boasts no less than 73% women researchers in companies whose main economic activity is pharmaceuticals.

Figure 2.4.a

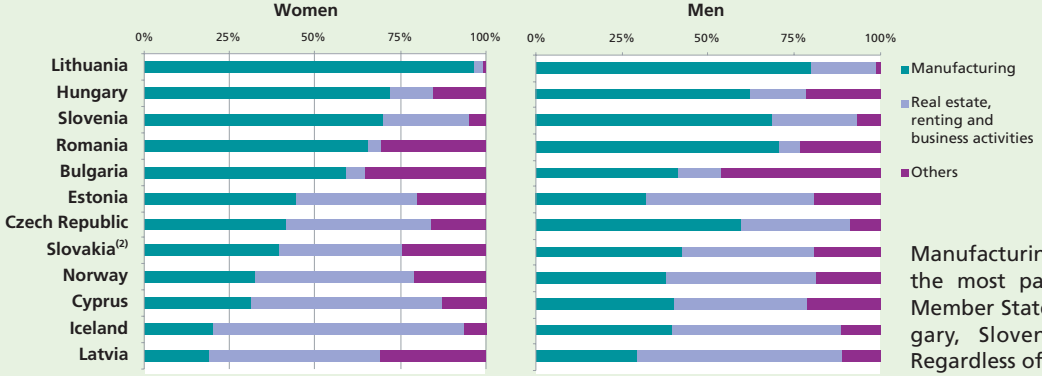
Distribution of researchers across NACE categories in BES by sex in EU Member States, HC, 1999[(1)]



Source: DG Research, WiS database
Notes: (1)Exceptions to the reference year: FR, IT, FI: 2000; AT: 1998
(2)FTE as exception to HC
(3)Definition of BES coverage differs from Annex Table 1.4.a

Figure 2.4.b

Distribution of researchers across NACE categories in BES by sex in Associated Countries, HC, 2001[(1)]



Source: DG Research, WiS database
Notes: (1)Exceptions to the reference year: BG, CY, EE, LT, SI: 2000; IS: 1999
(2)FTE as exception to HC

Manufacturing is the category that employs the most part of BES researchers in the Member States as well as in Lithuania, Hungary, Slovenia, Romania and Bulgaria. Regardless of the representation of women, the patterns of distribution for each sex in the Member States, Norway, Romania, Slovakia and Slovenia are strikingly similar.

Box 2

The Dissimilarity Index

The Dissimilarity Index (ID) provides a theoretical measurement of the percentage of women and men in a group who would have to move to another occupation to ensure that the proportions of women were the same across all the possible occupations. It can therefore be interpreted as the hypothetical distance from a balanced gender distribution across occupations, based upon the overriding proportion of women (NSF, 2000).

The formula for the Dissimilarity Index is: $\mathrm{ID} = \frac{1}{2}\sum_{i}\left|\frac{Fi}{F} - \frac{Mi}{M}\right|$

Where: i denotes each occupation
Fi is the number of women researchers in each occupation
Mi is the number of men researchers in each occupation
F is the total number of women researchers across all occupations
M is the total number of men researchers across all occupations.

The brackets || indicate that the absolute value is taken, but not the sign.

For example, if we have three occupations, A, B and C with 17, 37 and 91 women and 108, 74, 182 men respectively, the overall proportion of women is 28.5%. We therefore need to calculate:

$$\frac{\left|\frac{17}{145} - \frac{108}{364}\right| + \left|\frac{37}{145} - \frac{74}{364}\right| + \left|\frac{91}{145} - \frac{182}{364}\right|}{2} = \frac{0.1795 + 0.0519 + 0.1276}{2} = 0.1795$$

This means that 18% of researchers will have to change occupation in order to maintain the background proportion of 28.5% women in each occupation.

The ID must be interpreted alongside the Feminisation Ratio (see Box 3), which will indicate which gender is in the majority. The maximum value is 1, which indicates the presence of only either women or men in each of the occupations. The minimum value of 0 indicates an equal distribution between women and men across occupations. If the same occupational categories are used for different countries, the ID yields a comparable and descriptive statistic that reflects the extent to which the two sexes are differently distributed. The results also depend on the number of categories. If more categories are used, the indicator will reflect greater variability in the distribution, which in turn will yield results indicating a higher level of segregation.

Table 2.5.a

Index of Dissimilarity and Feminisation Ratio for researchers in HES in EU Member States, HC, 1999[1]

	Index of Dissimilarity	Feminisation Ratio
Belgium[2]	0,08	42,1
Denmark[5]	0,20	38,9
Germany	0,23	34,4
Greece	:	:
Spain	:	:
France	0,12	47,6
Ireland	:	:
Italy	0,18	39,6
Luxembourg[4]	-	52,6
Netherlands[3]	0,18	35,6
Austria	0,21	34,6
Portugal	0,12	80,9
Finland	0,20	67,6
Sweden	0,23	58,7
United Kingdom	0,17	57,7

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]Exceptions to the reference year: DK, DE, FR, UK: 2000; AT: 1998
[2]Data not official. Estimates made from BE-FL for 2001 and BE-FR for 2000
[3]FTE as exception to HC
[4]Numbers of RSEs too small to calculate the ID
[5]Definition of HES coverage differs slightly from Annex Table 1.2.a

Table 2.5.b

Index of Dissimilarity and Feminisation Ratio for researchers in HES in Associated Countries, FTE, 2000[1]

	Index of Dissimilarity	Feminisation Ratio
Bulgaria	0,31	51,7
Cyprus	0,23	39,6
Czech Republic	0,09	47,9
Estonia	0,24	66,1
Hungary	:	:
Iceland	0,17	57,4
Israel	0,28	32,6
Latvia	0,30	87,7
Lithuania	0,28	90,3
Malta	:	:
Norway[2]	0,18	55,6
Poland	0,17	46,0
Romania	0,08	52,1
Slovakia	0,17	69,5
Slovenia	0,27	52,8

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]Exceptions to the reference year: IL, LT, NO, PL: 2001; IS, LV: 1999
[2]HC as exception to FTE

Belgium and Romania have the lowest levels of dissimilarity across the fields of science in the HES and Bulgaria has the highest levels (see Box 2). In fact, in Belgium and Romania only 8% of RSEs would have to change field of science in order to achieve proportions of 28% and 40% women respectively throughout each of the six main fields of science. Likewise, 31% of researchers in Bulgarian universities would theoretically need to switch to another field of science in order to have a proportion of 35% women in each field. In parallel, it can be seen from the gender split that since men outnumber women, they are likely to form a larger part of the RSEs who would have to move.

Seniority in academia and R&D

3. Seniority in academia and R&D

Seniority in academia and R&D

In the first two Chapters, it has been seen how the overall patterns of the distribution of scientists and researchers are gendered according to the sectors of performance and to the fields of science. Furthermore, it has emerged that these patterns cannot be isolated from the different national contexts of R&D organisation, of the labour force and of education outcomes. However, although this information is valuable in terms of mapping women's participation and career choices, it still does not reveal whether women and men are on equal terms in R&D employment.

This Chapter on the other hand, sets out to explore the vertical dimension. This tells us about the dissimilarity in the distributions of the sexes throughout a given hierarchical system, and can therefore be used to highlight differences in career opportunities and outcomes (Osborn et al., 2000).

Although women and men study and work within the same infrastructures, case studies at institutional level have shown that they have different experiences when it comes to the reward and recognition systems (Wennerås & Wold, 1997; Palomba, 2000). Furthermore, a US study has shown that vertical segregation is linked to gender bias in S&T productivity indicators, whereby senior men use their positions to claim authorship (Long, 2002). Eliminating vertical differences between women and men at European level is therefore central to attracting young women into research careers.

The approach that has been taken in this Chapter is to look at levels of vertical concentration[1] in academia and at vertical dissimilarity[2] in each of the three R&D occupations (Researchers, Technicians and Auxiliary staff). From the European perspective, R&D and academia are the two domains where the necessary information is available and of sufficient quality. We have capitalised upon the data collected in national higher education surveys, which have several common questions. However, no formal methodology for harmonising these exists at present. The coverage of the grades presented here, and, more specifically, the identification of grade A (see Annex 5) has therefore been agreed for this publication by the Statistical Correspondents of the Helsinki Group on Women and Science. Further methodological work is necessary if more detailed analysis is to be undertaken. Here we are nevertheless able to obtain a preliminary overview of the professional advancement of women in universities and in R&D institutions, despite the differences between countries in the grading systems.

[1] *The term 'concentration' here refers to the practice of comparing part(s), rather than the whole of the system.*

[2] *See Box 2 in Chapter 2.*

Findings

The Feminisation Ratios (see Box 3) are even lower for senior academic staff than they are for academic staff in general, and the percentage of women in the top grades never exceeds 21%. Men are three times more likely than women to obtain professorships or their equivalents in Europe.

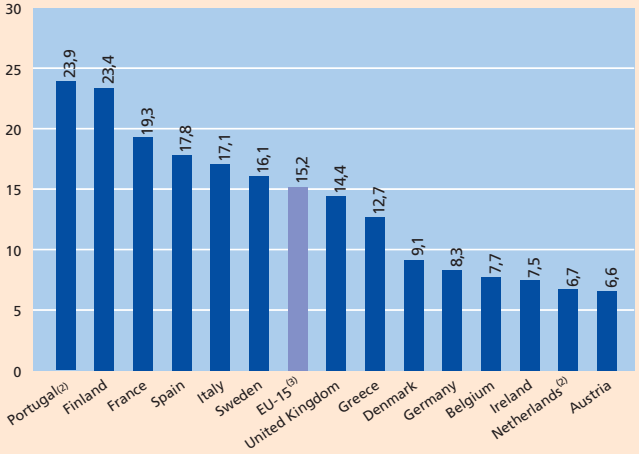
There are also high levels of vertical dissimilarity among R&D personnel in many countries, but the pattern varies across the sectors. The relationship between occupations seems to depend on the institutional sector and the group of countries. This is mostly due to low proportions of women as researchers and high proportions of women as auxiliary staff. It is not at present possible to examine whether this is due to gender differences in qualification in R&D, although, based upon the evidence from the HRST results, this is unlikely.

The Feminisation Ratios of researchers and technicians are strongly and positively correlated (r=74%) in the HES and the BES in the Candidate Countries. On the other hand the same correlation in the HES for the Member States and Iceland is negative, although weaker (r=-36%). The findings in this Chapter support the conclusion in the chapter on differences across scientific fields (Chapter 2), that it is important to examine the summary data on R&D personnel and academic staff both horizontally and vertically in order to obtain a truly accurate analysis.

[1] *In "She Figures", the term 'senior academic staff' is synonymous with the term 'grade A'. A list of the grades that are included in grade A for each country can be found in Annex 5. In many countries, but not all, grade A is also synonymous with the title of "Full Professor".*

Figure 3.1.a

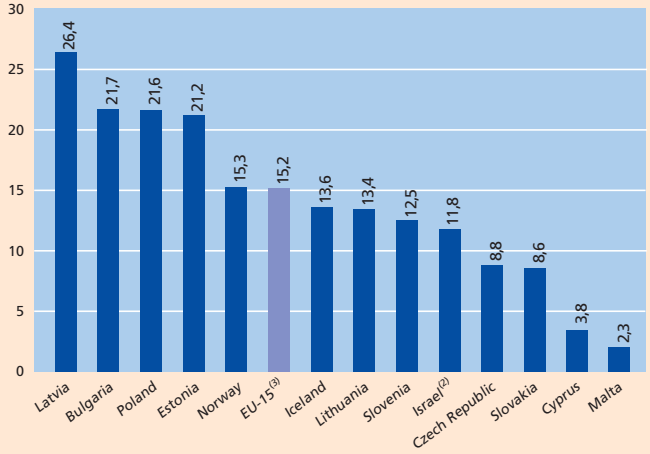
Feminisation Ratio among senior academic staff (grade A) in EU Member States, HC, 2000[(1)]



Source: DG Research, WiS database
Notes: [(1)]Exceptions to the reference year: DE, IT, SE: 2001; BE, ES, PT: 1999; AT: 1998
[(2)]FTE as exception to HC
[(3)]EU-15: estimate excludes LU. Above exceptions to reference year apply
Data are not yet comparable between countries due to differences in coverage & definitions

Figure 3.1.b

Feminisation Ratio among senior academic staff (grade A) in Associated Countries, HC, 2001[(1)]



Source: DG Research, WiS database
Notes: [(1)]Exceptions to the reference year: CY: 2000; MT: 1999
[(2)]FTE as exception to HC
[(3)]EU-15: estimate excludes LU. Exceptions to reference year from Figure 3.1.a apply
Data are not yet comparable between countries due to differences in coverage & definitions

There are only two Member States (Portugal and Finland) in the European Union where there are more than two women for every ten men in the top echelons of academia. Portugal is a special case because its university system is relatively new and in Finland gender balance in all areas of employment has been a priority policy action for many years.

In six out of the fourteen Member States presented here (Denmark, Germany, Belgium, Ireland, the Netherlands and Austria) there is less than one woman for every ten men in the top grade of University staff. However, the EU average of grade A university staff who are women has crept up from 11.6% in 1998/1999 to 13.2% in 2000.

The feminisation ratios for Iceland and Norway do not differ remarkably from the EU average.

Box 3

Vertical Concentration

The vertical dimension is the only dimension that tells us something about inequality between the sexes. This is because vertical concentration describes the relative intensity of women and men at identified points in a given hierarchical system. The two main indicators of vertical concentration presented in this booklet are the percentage of women (%) and the Feminisation Ratio (FRi). They each have slightly different meanings.

Percentages

A percentage tells us what we could expect if the denominator were standardised to 100. Throughout this publication, percentages are used in two ways:

• the number of women in category i (F_i) among women and men combined (T_i) in category i

Where the formula for the percentage (%) is expressed as $(F_i/T_i)*100$

• the number of women or men in category i (F_i) among the total number of women or men (F).

Where the formula for the percentage (%) is expressed as $(F_i/F)*100$

The denominator always includes the numerator. By using different numerators and denominators it is possible to build up a fuller picture of situations. For a more accurate picture, it is always important to review the combined results of several related indicators, including the Feminisation Ratio (FR_i).

The Feminisation Ratio

The Feminisation Ratio (FR_i) denotes the number of women per 100 men:

$FRi = (F_i/M_i)*100$

Where: F_i is the number of women in category i

M_i is the number of men in category i

So, if $FR_i = 100$, there are equal numbers of women and men. Again, it is often best to regard the FR_i alongside other indicators, such as the ID (see Tables 2.5.a and 2.5.b and Box 2).

Table 3.1.a

Percentage of academic staff who are grade A by sex. Percentage of academic staff and grade A staff who are women, EU Member States, HC, 2000[1]

	% GRADE A AMONG ACADEMIC STAFF		% WOMEN ALL GRADES	% WOMEN GRADE A
	Women	Men		
Belgium	3,9	20,0	28,1	7,2
Denmark	2,9	12,5	28,0	8,3
Germany	2,2	9,9	27,0	7,7
Greece	11,4	30,8	25,6	11,3
Spain	5,9	15,8	32,2	15,1
France	12,8	31,5	32,3	16,2
Ireland	2,2	12,7	30,3	7,0
Italy	15,1	37,5	29,8	14,6
Netherlands[2]	2,5	14,2	27,7	6,3
Austria	3,4	17,5	25,5	6,2
Portugal[2]	4,1	11,2	39,6	19,3
Finland	8,4	23,0	39,1	19,0
Sweden	11,7	28,8	28,3	13,8
United Kingdom	3,7	14,5	35,8	12,6

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: DE, IT, SE: 2001; BE, ES, PT: 1999; AT: 1998
[2]FTE as exception to HC
Data are not yet comparable between countries due to differences in coverage & definitions

Table 3.1.b

Percentage of academic staff who are grade A by sex. Percentage of academic staff and grade A staff who are women, Associated Countries, HC, 2001[1]

	% GRADE A AMONG ACADEMIC STAFF		% WOMEN ALL GRADES	% WOMEN GRADE A
	Women	Men		
Bulgaria	3,7	13,1	43,4	17,8
Cyprus	1,2	10,7	25,8	3,7
Czech Republic	2,4	14,1	34,0	8,1
Estonia	6,0	20,9	42,6	17,5
Hungary	:	:	34,6	:
Iceland	14,2	43,7	29,9	12,0
Israel[2]	14,5	40,0	24,6	10,6
Latvia	3,7	17,5	55,4	20,9
Lithuania	1,8	12,0	47,5	11,8
Malta	5,3	21,0	8,3	2,2
Norway	5,6	20,4	35,7	13,3
Poland	9,4	21,2	32,8	17,7
Slovakia	2,3	15,4	36,2	7,9
Slovenia	11,6	31,5	25,4	11,1

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: CY: 2000; MT: 1999
[2]FTE as exception to HC
Data are not yet comparable between countries due to differences in coverage & definitions

The first two columns in these Tables show the percentage of academic staff who are grade A for each sex. By calculating this percentage, the under-representation of women is disregarded. It is certainly alarming to see that in the European Union only 6.4% of academic women are reaching the top level in their professions, whereas this success is reserved for as many as 18.8% of male academics. These figures average out at 5.4% and 17.7% respectively for the Candidate Countries.

The opportunities seem to be comparatively less discriminatory in France, Italy, Sweden and Poland – but even in these countries men are two and half times more likely than women to obtain a full professorship. This situation appears to be at its worst in Ireland, the Netherlands, Cyprus, Czech Republic, Lithuania and Slovakia where men are at least five times more likely than women to obtain full professorships.

By comparing the indicators in each of the last two columns, we can see that the percentage of grade A staff who are women is consistently lower than the overall percentage of women among academic staff. These differences are lowest in Poland and highest in Cyprus.

Table 3.2

Percentage of grade A staff who are women by main field of science, all available countries, HC, 2001[1]

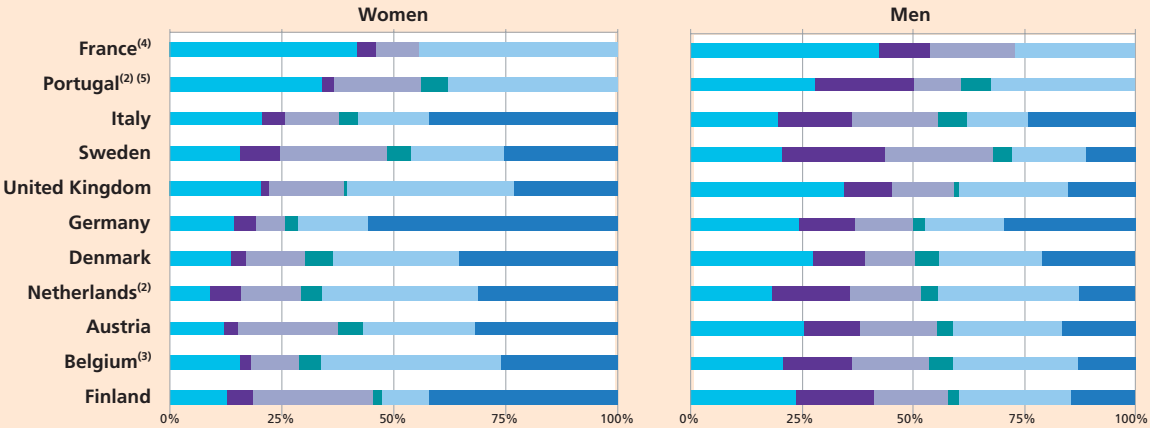
	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES
Belgium[3]	4,2	1,0	3,4	5,1	12,3	10,5
Denmark	4,2	2,8	9,8	9,8	9,7	13,3
Germany	4,6	3,2	4,0	8,0	6,8	13,7
France[4]	15,7	6,4	8,9	X	23,8	X
Italy	15,0	5,2	9,5	10,2	16,8	22,9
Netherlands[2]	3,2	2,7	5,2	7,1	7,0	14,2
Austria	3,1	1,7	7,6	9,3	6,4	11,1
Portugal[2][5]	22,4	3,1	30,2	17,6	21,8	X
Finland	8,3	5,2	21,3	12,8	24,7	33,2
Sweden	10,4	5,5	12,9	16,3	15,8	25,4
United Kingdom	7,7	2,3	14,5	7,9	17,8	17,9
Iceland	7,0	5,6	9,7	-	9,4	6,1
Israel[2]	6,6	4,8	16,4	0,0	13,6	18,9
Norway	6,9	2,8	14,2	8,9	15,3	24,3
Poland	16,1	6,8	26,2	20,0	19,2	21,0
Slovakia[6]	10,4	2,4	9,4	4,6	10,9	12,2
Slovenia	6,0	2,8	18,3	14,0	11,5	15,8

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: BE, DK, FR, NL, FI, UK: 2000; PT, IS: 1999; AT: 1998
[2]FTE as exception to HC
[3]French-speaking community only
[4]NS includes AS; SS includes H
[5]SS includes H
[6]H = Sciences of culture & arts; SS = SS + rest of H
Data are not yet comparable between countries due to differences in coverage & definitions

In Chapter 2, we saw that the overall indicators presented in Chapter 1 hide differences in the concentration of women across the fields of science. In this table, we can see that this is also the case for grade A university staff, among all the countries, although the low figures make it harder to discern. In Engineering and Technology, less than 7% of women are grade A staff. It seems that the highest concentration of professors in Europe are to be found in Finland (Humanities) and in Portugal (Medical Sciences), but even so, they represent less than a third of grade A staff in the field. The highest concentrations of women are to be found in the Social Sciences for the European Union countries and in Medical Sciences among Associated Countries.

Figure 3.2.a

Distribution of grade A staff across the fields of science by sex in EU Member States, HC, 2000[(1)]

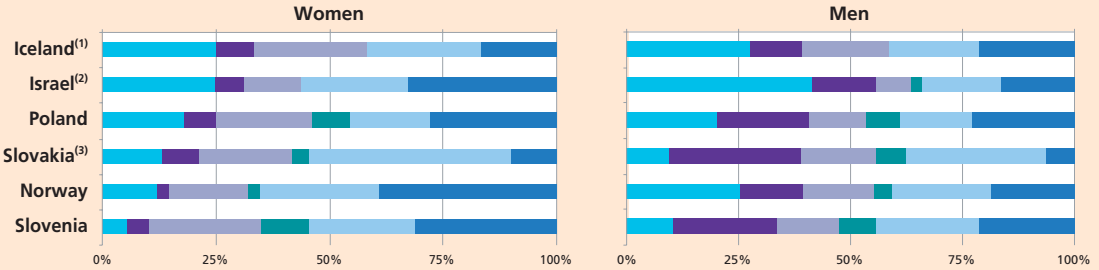


Source: DG Research, WiS database
Notes: (1)Exceptions to reference year: DE, IT, SE: 2001; PT: 1999; AT: 1998
(2)FTE as exception to HC
(3)French-speaking community only
(4)NS includes AS; SS includes H
(5)SS includes H
Data are not yet comparable between countries due to differences in coverage and definitions

- Natural sciences
- Engineering and technologies
- Medical sciences
- Agricultural sciences
- Social sciences
- Humanities

Figure 3.2.b

Distribution of grade A staff across the fields of science by sex in Associated Countries, HC, 2001[(1)]



Source: DG Research, WiS database
Notes: (1)Exceptions to the reference year: IS:1999; LV: 2000
(2)FTE as exception to HC
(3)Slovakia: H = Sciences of culture & arts; SS = SS + rest of H
Data are not yet comparable between countries due to differences in coverage and definitions

Table 3.3.a

Country	Occupation	HIGHER EDUCATION SECTOR		GOVERNMENT SECTOR		BUSINESS ENTERPRISE SECTOR	
		Distribution of women	Distribution of men	Distribution of women	Distribution of men	Distribution of women	Distribution of men
Belgium	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Denmark	Researchers	50,3	84,6	:	:	30,8	43,2
	Technicians	49,7	15,4	:	:	42,6	41,1
	Others	:	:	:	:	26,5	26,5
Germany[2]	Researchers	37,6	81,5	33,5	63,8	:	:
	Technicians	17,6	9,6	66,5	36,2	:	:
	Others	44,8	8,9	:	:	:	:
Greece	Researchers	50,4	62,3	34,9	34,6	38,4	48,5
	Technicians	22,8	18,4	21,9	17,5	18,4	35,2
	Others	26,8	19,2	43,1	47,9	43,2	16,2
Spain	Researchers	75,8	86,1	51,2	62,4	32,7	38,6
	Technicians	5,9	5,0	25,7	18,6	34,6	41,5
	Others	18,3	8,9	23,1	19,0	32,7	19,9
France	Researchers	56,9	76,8	41,8	62,5	38,9	48,3
	Technicians	:	:	:	:	:	:
	Others	43,1	23,2	58,2	37,5	61,1	51,7
Ireland[2]	Researchers	:	:	:	:	55,7	66,0
	Technicians	:	:	:	:	24,3	23,8
	Others	:	:	:	:	20,0	10,2
Italy	Researchers	:	:	42,0	45,2	46,0	42,5
	Technicians	:	:	37,4	36,3	29,7	41,3
	Others	:	:	20,6	18,5	24,3	16,2
Luxembourg	Researchers	87,5	89,3	65,9	74,6	:	:
	Technicians	0,0	10,7	25,4	11,3	:	:
	Others	12,5	0,0	8,7	14,1	:	:
Netherlands	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Austria	Researchers	44,8	83,3	29,8	47,5	32,8	60,2
	Technicians	25,1	8,3	22,3	18,8	34,8	31,6
	Others	30,2	8,4	47,9	33,7	32,4	8,2
Portugal	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Finland	Researchers	66,1	74,7	49,9	71,0	49,8	65,2
	Technicians	33,9	25,3	50,1	29,0	50,2	34,8
	Others	:	:	:	:	:	:
Sweden	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
United Kingdom	Researchers	:	:	33,7	56,7	:	:
	Technicians	:	:	27,0	18,9	:	:
	Others	:	:	39,3	24,5	:	:

Distribution of R&D personnel across the occupations by sector and sex in EU Member States, HC, 2000[1]

In order to fully analyse these percentages, it is helpful to calculate the Index of Dissimilarity (see Box 2) across the occupations. For the countries and sectors with data in all three R&D occupations, the ID reveals that by far the highest levels of vertical dissimilarity occur in Germany and Austria's Higher Education sectors (44% and 39% respectively). In Germany, the dissimilarity is so pronounced that almost half of all R&D personnel would have to change occupation in order to replicate the overall average of 36% women in each activity. This is also the case for a quarter of R&D personnel in Greece and Austria (both 27%) in the BES. GOV is the only sector, where the ID is relatively low: 5% in Greece and 3% in Italy, although the United Kingdom has the highest ID at 23%.

The main causes of this dissimilarity seem to be disproportionately high numbers of men who are researchers and high numbers of women who are auxiliary personnel.

Source: Eurostat, S&T statistics
Notes: [1]Exceptions to the reference year: LU: 2001; DK (BES), DE, EL, ES (BES), IE, IT, FI: 1999; AT: 1998
[2]FTE as exception to HC

Table 3.3.b

Country	Occupation	HIGHER EDUCATION SECTOR		GOVERNMENT SECTOR		BUSINESS ENTERPRISE SECTOR	
		Distribution of women	Distribution of men	Distribution of women	Distribution of men	Distribution of women	Distribution of men
Bulgaria	Researchers	74,9	80,7	50,9	71,2	49,3	59,3
	Technicians	13,5	13,6	32,4	19,0	34,0	29,9
	Others	11,6	5,7	16,7	9,9	16,7	10,8
Cyprus	Researchers	78,5	89,3	22,5	30,7	35,5	61,6
	Technicians	1,9	3,3	31,7	37,3	23,0	28,3
	Others	19,6	7,4	45,8	32,0	41,4	10,1
Czech Republic	Researchers	56,2	79,7	40,2	68,7	25,1	46,6
	Technicians	26,3	14,9	35,5	17,1	43,5	37,5
	Others	17,5	5,4	24,3	14,1	31,4	15,8
Estonia	Researchers	66,4	83,9	50,4	76,5	42,5	65,5
	Technicians	15,5	7,4	21,7	6,8	32,4	22,7
	Others	18,1	8,7	27,9	16,7	25,1	11,8
Hungary	Researchers	53,3	81,0	36,0	59,1	40,8	69,2
	Technicians	16,6	8,8	27,3	19,4	45,0	22,1
	Others	30,1	10,2	36,7	21,5	14,2	8,7
Iceland	Researchers	59,9	79,1	60,8	69,4	56,4	64,2
	Technicians	11,9	12,5	22,7	17,9	25,5	24,3
	Others	28,2	8,5	16,5	12,7	18,1	11,5
Israel	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Latvia	Researchers	78,0	82,6	51,0	65,1	51,5	57,0
	Technicians	12,5	8,8	14,3	12,8	24,6	13,6
	Others	9,5	8,5	34,7	22,1	23,9	29,4
Lithuania	Researchers	70,3	88,1	41,3	59,8	53,4	70,0
	Technicians	9,4	5,1	32,2	15,6	26,1	10,4
	Others	20,3	6,7	26,5	24,6	20,5	19,6
Malta	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Norway	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Poland	Researchers	71,8	87,2	47,6	65,7	39,6	54,0
	Technicians	13,6	8,1	28,0	18,6	32,3	26,1
	Others	14,6	4,8	24,4	15,7	28,1	20,0
Romania	Researchers	67,5	81,6	65,5	74,4	52,2	59,8
	Technicians	11,0	6,9	18,6	15,1	27,8	15,3
	Others	21,5	11,5	15,9	10,6	20,0	25,0
Slovakia[2]	Researchers	78,7	90,9	49,3	73,9	35,4	53,4
	Technicians	18,7	7,1	33,4	15,5	37,9	33,5
	Others	2,6	2,1	17,4	10,6	26,7	13,1
Slovenia	Researchers	59,0	79,9	56,6	65,7	27,7	35,7
	Technicians	11,0	9,8	22,3	17,0	35,1	27,9
	Others	30,0	10,3	21,1	17,3	37,2	36,4

Distribution of R&D personnel across the occupations by sector and sex in Associated Countries, HC, 2000[1]

The Czech Republic and Hungary both have IDs ranging from 22-29% across all three sectors and Estonia and Slovakia have IDs of 26% and 25% respectively in the GOV.

The lowest vertical ID scores are to be found in Iceland and Slovenia in the GOV and the BES (both 9% and 8% respectively); in the HES for Bulgaria and Latvia (6% and 5%) and in the GOV in Romania (9%). It is most important to note that an above-average FR, which is largely the scenario in the Associated countries, is not necessarily indicative of vertical equality.

Source: Eurostat, S&T statistics
Notes: [1]Exceptions to the reference year: LV (BES), LT: 2001; IS: 1999
[2]FTE as exception to HC

Box 4

How to read the Scatter Plots (Figures 3.3, 3.4 and 3.5)

The analysis of the relationship between the FR of researchers and FR of technicians is well illustrated by using scatter plots. Each country is positioned on the graph according to the combination of the values of the FRs for researchers and technicians. The X-axis refers to FR for researchers and the Y-axis refers to the FR for technicians.

Data to the right hand side of the X-axis indicate the countries in which female researchers outnumber their male colleagues, while in countries to the left, the men researchers outnumber the women. The upper parts of the graphs indicate the countries where female technicians outnumber their male counterparts and the lower parts of the graphs show where male technicians outnumber their female counterparts.

The graphs are therefore composed of four quadrants in which countries can be positioned. Each of the quadrants shows a 'type' of situation:

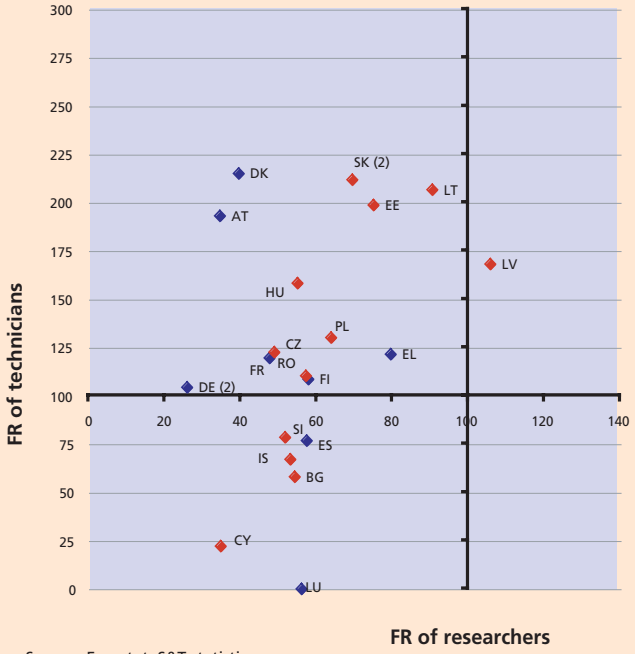
FR Technicians		
	Female technicians outnumber male technicians Male researchers outnumber female researchers	**Female technicians outnumber male technicians Female researchers outnumber male researchers**
	Male technicians outnumber female technicians Male researchers outnumber female researchers	**Male technicians outnumber female technicians Female researchers outnumber male researchers**

FR Researchers

The positions of the Member States are indicated in blue and the positions of the Associated Countries are indicated in red.

Figure 3.3

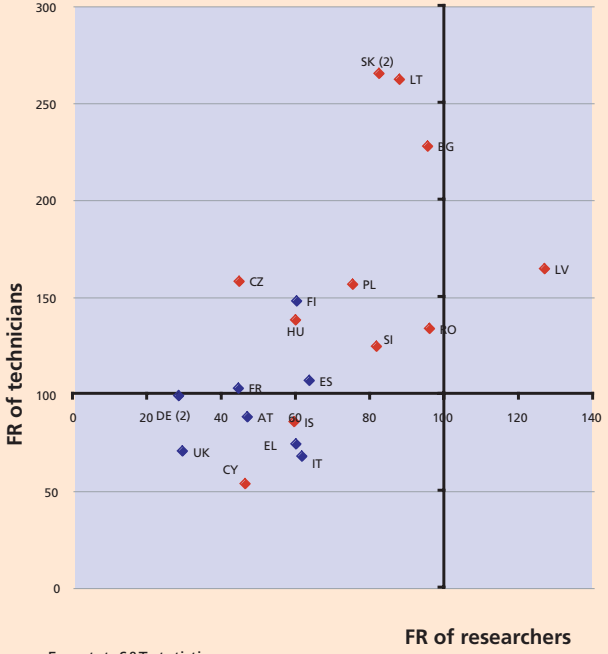
Scatter plot of the Feminisation Ratios of researchers and technicians in HES, all countries, HC 2000(1)



Source: Eurostat, S&T statistics
Notes: (1)Exceptions to the reference year: LU, LT: 2001; DE, EL, FI, IS, SE: 1999; AT: 1998
(2)FTE as exception to HC

Figure 3.4

Scatter plot of the Feminisation Ratios of researchers and technicians in GOV, all countries, HC, 2000(1)



Source: Eurostat, S&T statistics
Notes: (1)Exceptions to the reference year: LU, LT: 2001; DE, EL, IT, IF, IS: 1999; AT: 1998
(2)FTE as exception to HC

Figure 3.5

Scatter plot of the Feminisation Ratios of researchers and technicians in BES, all countries, HC, 2000[(1)]

Source: Eurostat, S&T statistics
Notes: [(1)]Exceptions to the reference year: LV, LT: 2001; DK, EL, ES, IE, IT, FI, IS: 1999; AT: 1998
[(2)]FTE as exception to HC

The relationship between the FR value for researchers and technicians (see Box 4) gives us a further insight into the roles of women in R&D. Two questions spring to mind here. Firstly are women opting for occupations for which they are in fact overqualified, as a trade-off that enables them to juggle the work-life balance? Secondly does the presence of women as technicians have a positive impact on the numbers of researchers – that is, can we see evidence of women coming up through the ranks of R&D?

We can see from the upper part of the graphs that female technicians outnumber their male counterparts in half of the countries in the HES and GOV sectors. We have also seen that women and men are equally qualified in the labour force. Unfortunately, the data that would enable us to answer this question, although already available in some countries, will not be collected at European level until 2004.

If we calculate Pearson's product-moment correlation coefficient 'r' for the FRs of RSEs and TECs in the HES, it appears that there is no firm correlation between the occupations (r=35%). However, closer inspection reveals that there are very different 'r' statistics for the Member States and Iceland (r = minus 36%) and a strong positive correlation in the Candidate Countries (r =74%). In the GOV however, a slightly stronger 'r' is obtained when both groups of countries join forces, but it is still just 57%. The strongest correlation between the Feminisation Ratios of technicians and researchers emerges in the BES (89%) and is largely propelled by the Candidate Countries (80%).

The breakdown by occupation and sex is not available for Portugal, but if it were, Portugal would join Latvia on the right hand side of Figure 3.5.

Gender equity in setting the scientific agenda

4. Gender equity in setting the scientific agenda

Decision-making

The scarcity of women in senior positions in science inevitably means that their individual and collective opinions are less likely to be voiced in policy and decision-making processes. This in turn means disempowerment in terms of the general planning of research agendas and in the allocation of public funding for projects and managing resources. It also means that women are contributing less than men to shaping the big scientific questions of the moment, many of which impact directly on the lives of women across Europe.

In this Chapter, the sex composition of applicants and beneficiaries of research funds and of scientific boards are examined. The data presented are usually drawn from administrative data from national bodies (see Annex 5 for a precise list for each country) and must be interpreted within the different national contexts. Because this situation is monitored through *ad hoc* indicators, it should also be recalled that the data may not be complete for some countries, but in the calculation of the indicators, the coverage of the numerator always matches the coverage of the denominator.

Research funding

The Statistical Correspondents of the Helsinki Group have therefore reported sex-disaggregated data on the applicants for and beneficiaries of research funds and the composition of scientific boards. The research funding success rate presented here measures the percentage of women applicants who successfully receive funding as a result of their applications.

Despite the apparent similarities in the results for men and women, the differences between the success rates of men and women are significant[1] in the United Kingdom, Germany, Sweden, Austria and Hungary.

Although it is not possible to ascertain here what amounts of funding women are obtaining, it is clear that they are marginally less successful as a rule, but that their success rates are dependent upon the culture of awarding funds, which varies enormously between countries. For example, in Slovakia nearly all applicants receive funding, whereas the likelihood is far lower in Finland and the United Kingdom. The volume of applicants can also be regarded as an indicator of the levels of activity of researchers in each country.

[1] *The Chi Square statistic (χ^2) was higher than 8.15 for these countries and is significant at 99.5% (1-tailed sig.). However, the numbers of observed cases are higher in Germany, Sweden and the UK, which has the effect of amplifying their results.*

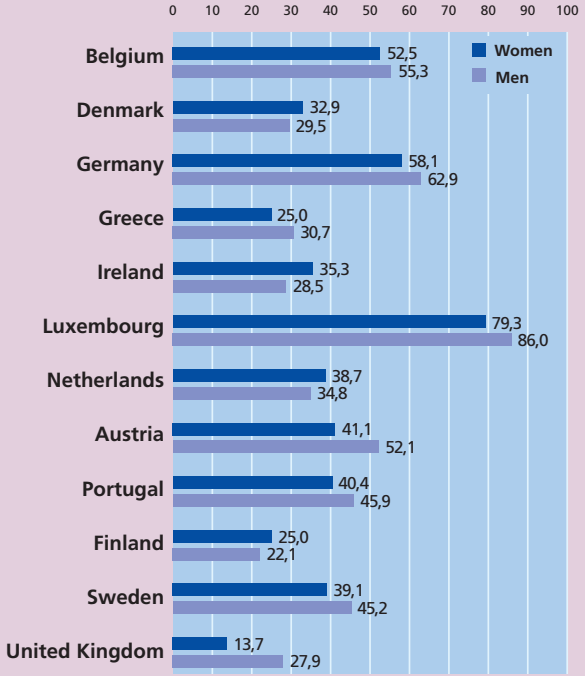
Boards

The sex composition of scientific boards is intended to yield a measure of the representation of women in scientific decision-making at national level. When it comes to appointing highly skilled professionals to decision-making bodies in national research and academic institutions, women are already at a disadvantage because of their smaller numbers. However, the figures here suggest that the practices of networking and 'old school tie' systems are preventing them from participating more equitably in the highest echelons of science. The impression that we obtain from the results is therefore of male domination over scientific institutions.

Since we know that many aspects of the organisation of science, especially peer review are affected by gender bias (Osborn et al., 2000), it is of utmost importance to the science-society dialogue that the compositions of boards are gender-balanced. The improvement of appointment procedures and recruitment strategies for national boards is therefore a crucial starting point to redressing this balance.

Figure 4.1.a

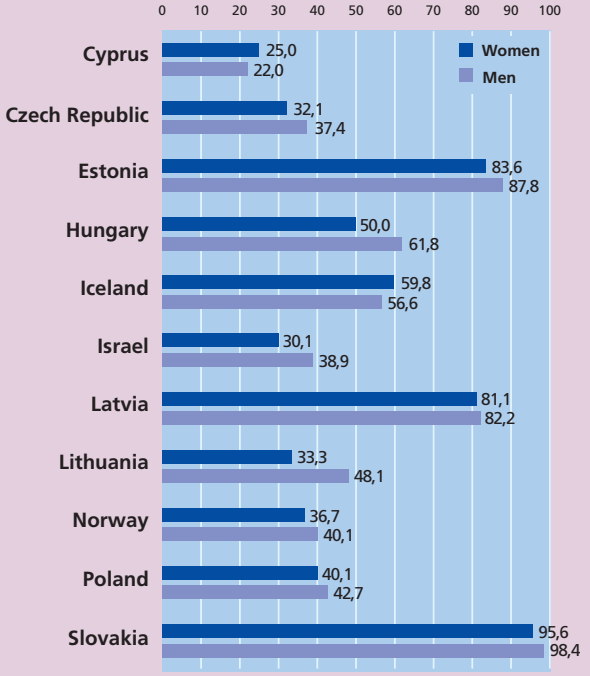
Research funding success rates in EU Member States, 2001[1]



Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: EL, IE: 2002; UK: 2000; AT, SE: 1999 ; BE: 1998
Data are not comparable between countries due to differences in coverage

Figure 4.1.b

Research funding success rates in Associated Countries, 2001[1]

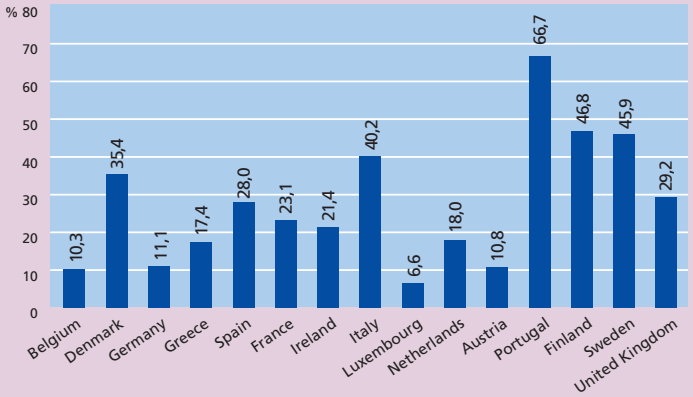


Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: EE: 2002; IL, NO: 2000.
Data are not comparable between countries due to differences in coverage

Although the sex composition of working teams is taken into account in these calculations, the results are based upon the numbers of researchers involved but do not tell us anything about the amounts requested or received. In Denmark, Ireland, the Netherlands, Finland, Cyprus and Iceland, women are more likely than men to submit successful research funding applications. In fact in the Netherlands, the advantage of women is significant at 90% (1-tailed sig.). These figures show that the diversity of grant allocation between countries is as strong, if not stronger, than the diversity between the sexes.

Figure 4.2.a

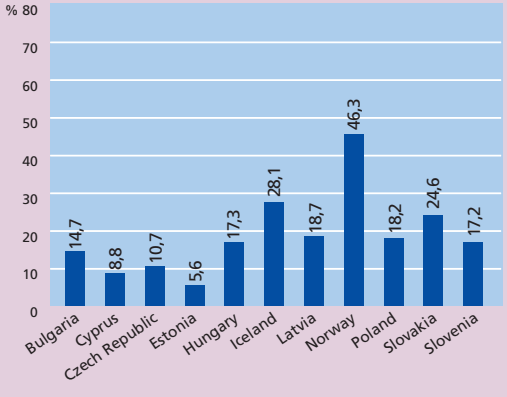
Percentage of women on scientific boards (academies and universities) in EU Member States, 2001[(1)]



Source: DG Research, WiS database
Notes: [(1)]Exceptions to the reference year: FR: 1999-2002; EL, IE: 2002; BE: 2000; ES, AT: 1999
Data are not comparable between countries due to differences in coverage

Figure 4.2.b

Percentage of women on scientific boards (academies and universities) in Associated Countries, 2001[(1)]



Source: DG Research, WiS database
Notes: [(1)]Exceptions to the reference year: BG, CY: 2000
Data are not comparable between countries due to differences in coverage

This indicator serves a double purpose in that it reflects not only the representation of women, but assuming that there is fair competition between men and women for these positions, their ability to break the glass ceiling. Alternatively, when aligned with background indicators such as the percentage of women researchers, women Professors or women HRSTC, it can be interpreted as a measure of the "breakability" of the glass ceiling.

In the Member States, women only make up more than half the members of scientific boards in Portugal, but this is based on just fifteen members. The composition is more or less balanced in Sweden and Finland. Norway is the only Associated Country where the gender balance is even – in fact much higher than the representation among academic staff, particularly grade A's – but again it only refers to a small number of people.

Annexes

Annex 1.1.a

Number of ISCED 6 graduates by sex in EU Member States, 1998-2001

		1998	1999	2000	2001
Belgium	Women	:	:	390	420
	Men	:	:	757	897
	Total	:	:	1 147	1 317
Denmark[2]	Women	:	351	297	:
	Men	:	562	498	:
	Total	:	913	795	:
Germany	Women	8 228	8 186	8 852	8 752
	Men	16 662	16 359	16 928	16 044
	Total	24 890	24 545	25 780	24 796
Greece	Women	:	:	:	:
	Men	:	:	:	:
	Total	:	:	:	:
Spain	Women	2 491	2 765	2 643	2 767
	Men	3 440	3 542	3 364	3 686
	Total	5 931	6 307	6 007	6 453
France	Women	4 138	4 070	4 445	:
	Men	6 035	5 833	5 959	:
	Total	10 173	9 903	10 404	:
Ireland	Women	208	:	236	254
	Men	267	:	265	318
	Total	475	:	501	572
Luxembourg[1]	Women	-	-	-	-
	Men	-	-	-	-
	Total	-	-	-	-
Italy	Women	1 988	1 877	2 054	:
	Men	1 906	1 680	1 990	:
	Total	3 894	3 557	4 044	:
Netherlands	Women	726	744	806	797
	Men	1 791	1 739	1 683	1 736
	Total	2 517	2 483	2 489	2 533
Austria	Women	630	635	648	695
	Men	1 271	1 208	1 142	1 176
	Total	1 901	1 843	1 790	1 871
Portugal[2]	Women	1 245	1 206	1 305	1 415
	Men	1 247	1 152	1 199	1 376
	Total	2 492	2 358	2 504	2 791
Finland	Women	735	823	823	:
	Men	990	1 068	974	:
	Total	1 725	1 891	1 797	:
Sweden	Women	875	991	1 117	1 328
	Men	1 850	1 925	1 932	2 060
	Total	2 725	2 916	3 049	3 388
United Kingdom	Women	3 753	4 163	4 434	5 594
	Men	7 241	7 176	7 134	8 553
	Total	10 994	11 339	11 568	14 147

Source: Eurostat, Education
Notes: [1]LU does not have a complete university system. Most students graduate abroad
[2]Provisional data

Annex 1.1.b

Number of ISCED 6 graduates by sex in Associated Countries, 1998-2001

		1998	1999	2000	2001
Bulgaria	Women	130	128	164	158
	Men	189	222	235	218
	Total	319	350	399	376
Cyprus[1]	Women	:	:	10	:
	Men	:	:	3	:
	Total	:	:	13	:
Czech Republic	Women	202	256	258	370
	Men	550	571	637	696
	Total	752	827	895	1 066
Estonia	Women	67	69	66	77
	Men	39	66	51	72
	Total	106	135	117	149
Hungary	Women		493	274	301
	Men		736	443	492
	Total		1 229	717	793
Iceland	Women	:	0	1	3
	Men	:	1	1	0
	Total	:	1	2	3
Israel	Women	303	378	:	
	Men	385	422	:	
	Total	688	800	:	
Latvia	Women	15	33	19	18
	Men	33	17	21	19
	Total	48	50	40	37
Lithuania	Women	78	113	212	137
	Men	93	130	230	124
	Total	171	243	442	261
Malta	Women	:	2	3	0
	Men	:	5	3	6
	Total	:	7	6	6
Norway	Women	200	252	219	264
	Men	500	444	439	504
	Total	700	696	658	768
Poland[2]	Women	:	:	:	1 832
	Men	:	:	:	2 568
	Total	:	:	:	4 400
Romania	Women	:	:	:	:
	Men	:	:	:	:
	Total	:	:	:	:
Slovakia	Women	132	155	171	212
	Men	236	260	275	320
	Total	368	415	446	532
Slovenia	Women	103	103	114	146
	Men	162	157	182	152
	Total	265	260	296	298

Source: Eurostat, Education; Israel Central Bureau of Statistics & Council for Higher Education
Notes: [1]Excludes students graduating abroad. The number of students studying abroad accounts for over the half of the total number of Cypriot students
[2]Poland: Data for ISCED level 6 only available since 2001

Annex 1.2.a

Number of researchers in HES by sex in EU Member States, HC, 1997-2001

		1997	1998	1999	2000	2001
Belgium[3]	Women	:	:	3 990	:	4 511
	Men	:	:	10 196	:	10 695
	Total	:	:	14 186	:	15 206
Denmark	Women	2 924	:	2 645	2 905	:
	Men	7 683	:	7 040	7 346	:
	Total	10 607	:	9 685	10 251	:
Germany[1]	Women	12 716	:	13 714	14 229	:
	Men	52 988	:	52 981	52 858	:
	Total	65 704	:	66 695	67 087	:
Greece	Women	:	:	10 097	:	:
	Men	:	:	12 702	:	:
	Total	9 140	:	22 799	:	:
Spain	Women	26 286	:	28 406	34 235	:
	Men	47 916	:	53 981	59 684	:
	Total	74 202	:	82 387	93 919	:
France	Women	:	:	28 714	30 055	:
	Men	:	:	61 851	63 135	:
	Total	:	:	90 565	93 190	:
Ireland	Women	:	:	:	1 469	:
	Men	:	:	:	1 735	:
	Total	:	:	:	3 204	:
Italy	Women	13 579	13 579	14 326	14 970	16 372
	Men	35 614	35 628	36 169	36 983	38 484
	Total	49 193	49 207	50 495	51 953	54 856
Luxembourg[2]	Women	:	:	:	9	14
	Men	:	:	:	16	25
	Total	:	:	:	25	39
Netherlands[1]	Women	4 945	5 317	5 612	5 970	:
	Men	15 946	16 058	15 767	15 922	:
	Total	20 891	21 375	21 379	21 892	:
Austria	Women	:	3 842	:	:	:
	Men	:	11 118	:	:	:
	Total	:	14 960	:	:	:
Portugal	Women	5 843	:	7 209	:	:
	Men	7 574	:	8 908	:	:
	Total	13 417	:	16 117	:	:
Finland	Women	:	:	5 936	6 041	:
	Men	:	:	8 265	8 531	:
	Total	12 063	12 918	14 201	14 572	:
Sweden	Women	8 686	10 135	11 008	11 733	12 819
	Men	17 101	17 671	18 204	18 671	19 286
	Total	25 787	27 806	29 212	30 404	32 105
United Kingdom	Women	43 294	45 634	48 575	51 218	:
	Men	84 782	85 502	87 172	88 722	:
	Total	128 076	131 136	135 747	139 940	:

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]FTE as exception to HC
[2]Data provisional
[3]Data not official

Annex 1.2.b

Number of researchers in HES by sex in Associated Countries, HC, 1997-2001

		1997	1998	1999	2000	2001
Bulgaria	Women	1 421	1 240	1 051	875	:
	Men	2 568	2 568	2 193	1 613	:
	Total	3 989	3 808	3 244	2 488	:
Switzerland	Women	:	:	:	4 040	:
	Men	:	:	:	11 140	:
	Total	:	:	:	15 180	:
Cyprus	Women	:	67	76	84	:
	Men	:	179	202	242	:
	Total	:	246	278	326	:
Czech Republic	Women	:	:	:	3 522	3 504
	Men	:	:	:	7 212	7 580
	Total	:	:	:	10 734	11 084
Estonia	Women	1 313	1 307	1 298	1 434	:
	Men	1 981	1 903	1 836	1 913	:
	Total	3 294	3 210	3 134	3 347	:
Hungary	Women	4 744	5 293	4 898	6 303	6 313
	Men	8 725	9 591	10 558	11 457	11 958
	Total	13 469	14 884	15 456	17 760	18 271
Iceland	Women	:	:	347	:	:
	Men	:	:	653	:	:
	Total	917	:	1 000	:	:
Israel[1]	Women	:	1 046	1 078	1 125	1 140
	Men	:	3 618	3 610	3 549	3 498
	Total	:	4 663	4 688	4 674	4 638
Latvia	Women	1 059	1 178	1 458	2 059	:
	Men	1 239	1 380	1 544	1 974	:
	Total	2 298	2 558	3 002	4 033	:
Lithuania	Women	:	:	:	3 190	3 439
	Men	:	:	:	4 005	3 800
	Total	:	:	:	7 195	7 239
Malta	Women	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:
Norway	Women	4 362	:	4 839	:	5 418
	Men	9 423	:	9 525	:	9 746
	Total	13 785	:	14 364	:	15 164
Poland	Women	:	:	:	24 925	:
	Men	:	:	:	39 072	:
	Total	:	:	:	63 997	:
Romania	Women	1 469	1 528	1 551	1 643	2 470
	Men	2 399	2 771	2 807	2 872	3 707
	Total	3 868	4 299	4 358	4 515	6 177
Slovakia[1]	Women	1 657	1 853	1 703	2 053	2 089
	Men	2 481	2 832	2 551	2 956	2 801
	Total	4 138	4 685	4 254	5 009	4 890
Slovenia	Women	811	870	954	1 007	:
	Men	1 688	1 848	1 964	1 947	:
	Total	2 499	2 718	2 918	2 954	:

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]FTE as exception to HC

Annex 1.3.a

Number of researchers in GOV by sex in EU Member States, HC, 1997-2001

		1997	1998	1999	2000	2001
Belgium	**Women**	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:
Denmark	**Women**	771	:	2 355	2 112	:
	Men	1 787	:	4 498	4 008	:
	Total	2 558	:	6 853	6 120	:
Germany[1]	**Women**	7 913	8 077	8 488	8 253	:
	Men	29 489	30 133	29 927	29 314	:
	Total	37 402	38 210	38 415	37 567	:
Greece	**Women**	:	:	1 029	:	:
	Men	:	:	1 717	:	:
	Total	3 094	:	2 746	:	:
Spain	**Women**	4 955	:	5 951	6 628	:
	Men	9 618	:	9 922	10 443	:
	Total	14 573	:	15 873	17 071	:
France	**Women**	:	:	5 661	8 464	:
	Men	:	:	14 121	19 067	:
	Total	:	:	19 782	27 531	:
Ireland[1]	**Women**	:	:	355	:	:
	Men	:	:	1 041	:	:
	Total	:	:	1 395	:	:
Italy	**Women**	:	6 553	6 841	:	:
	Men	:	10 819	11 129	:	:
	Total	:	17 372	17 970	:	:
Luxembourg[2]	**Women**	:	:	:	73	83
	Men	:	:	:	179	191
	Total	:	:	:	252	274
Netherlands	**Women**	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:
Austria	**Women**	:	730	:	:	:
	Men	:	1 560	:	:	:
	Total	:	2 290	:	:	:
Portugal	**Women**	1 761	:	2 972	:	:
	Men	1 570	:	2 396	:	:
	Total	3 331	:	5 368	:	:
Finland	**Women**	:	:	2 420	2 163	:
	Men	:	:	4 027	3 609	:
	Total	5 404	6 098	6 447	5 772	:
Sweden[1]	**Women**	:	:	190	:	:
	Men	:	:	495	:	:
	Total	2 439	:	685	:	:
United Kingdom	**Women**	:	3 145	:	3 459	:
	Men	:	11 549	:	11 784	:
	Total	:	14 694	15 253	15 243	15 257

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]FTE as exception to HC
[2]Data provisional

Annex 1.3.b

Number of researchers in GOV by sex in Associated Countries, HC, 1997-2001

		1997	1998	1999	2000	2001
Bulgaria	**Women**	4 112	3 978	3 716	3 301	:
	Men	4 066	4 102	3 861	3 462	:
	Total	8 178	8 080	7 577	6 763	:
Switzerland	**Women**	:	:	:	150	:
	Men	:	:	:	620	:
	Total	:	:	:	770	:
Cyprus	**Women**	:	48	50	56	:
	Men	:	108	110	121	:
	Total	:	156	160	177	:
Czech Republic	**Women**	:	:	:	2 065	2 234
	Men	:	:	:	4 624	4 853
	Total	:	:	:	6 689	7 087
Estonia	**Women**	441	393	383	349	:
	Men	452	372	375	326	:
	Total	893	765	758	675	:
Hungary	**Women**	1 480	1 794	1 708	2 008	1 842
	Men	2 915	3 038	3 382	3 358	3 330
	Total	4 395	4 832	5 090	5 366	5 172
Iceland	**Women**	:	:	306	:	:
	Men	:	:	515	:	:
	Total	625	656	821	:	:
Israel	**Women**	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:
Latvia	**Women**	619	520	492	419	:
	Men	606	451	407	381	:
	Total	1 225	971	899	800	:
Lithuania	**Women**	:	:	:	1 199	1 114
	Men	:	:	:	1 367	1 269
	Total	:	:	:	2 566	2 383
Malta	**Women**	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:
Norway	**Women**	1 287	:	1 300	:	1 414
	Men	2 750	:	2 671	:	2 663
	Total	4 037	:	3 971	:	4 077
Poland	**Women**	:	:	:	5 307	:
	Men	:	:	:	7 054	:
	Total	:	:	:	12 361	:
Romania	**Women**	3 145	3 413	2 958	2 638	2 802
	Men	3 327	3 328	2 897	2 752	2 962
	Total	6 472	6 741	5 855	5 390	5 764
Slovakia[1]	**Women**	1 000	1 082	1 072	1 140	1 083
	Men	1 469	1 475	1 356	1 386	1 354
	Total	2 468	2 557	2 428	2 526	2 438
Slovenia	**Women**	770	824	849	862	:
	Men	1 094	1 110	1 114	1 057	:
	Total	1 864	1 934	1 963	1 919	:

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]FTE as exception to HC

Annex 1.4.a

Number of researchers in BES by sex in EU Member States, HC, 1997-2001

		1997	1998	1999	2000	2001
Belgium	**Women**	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:
Denmark	**Women**	:	1 532	2 350	:	:
	Men	:	9 137	9 452	:	:
	Total	:	10 669	11 802	:	:
Germany(1)	**Women**	:	:	14 414	:	:
	Men	:	:	135 735	:	:
	Total	:	133 529	150 149	153 210	:
Greece	**Women**	:	:	940	:	:
	Men	:	:	2 991	:	:
	Total	2 832	:	3 931	:	:
Spain	**Women**	2 381	:	3 353	:	:
	Men	11 556	:	13 957	:	:
	Total	13 937	:	17 310	:	:
France	**Women**	:	:	:	17 787	:
	Men	:	:	:	68 428	:
	Total	:	:	:	86 215	:
Ireland(1)	**Women**	:	:	1 085	:	:
	Men	:	:	4 206	:	:
	Total	:	:	5 291	:	:
Italy	**Women**	:	:	5 161	5 490	:
	Men	:	:	24 385	24 216	:
	Total	:	30 596	29 546	29 706	:
Luxembourg	**Women**	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:
Netherlands	**Women**	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:
Austria	**Women**	:	1 258	:	:	:
	Men	:	12 708	:	:	:
	Total	:	13 966	:	:	:
Portugal	**Women**	526	:	793	:	:
	Men	1 707	:	2 535	:	:
	Total	2 233	:	3 328	:	:
Finland	**Women**	:	:	3 999	4 482	:
	Men	:	:	18 516	19 966	:
	Total	17 541	20 218	22 515	24 448	:
Sweden	**Women**	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:
United Kingdom	**Women**	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: (1)FTE as exception to HC

Annex 1.4.b

Number of researchers in BES by sex in Associated Countries, HC, 1997-2001

		1997	1998	1999	2000	2001
Bulgaria	**Women**	994	930	637	605	:
	Men	1 230	1 074	798	620	:
	Total	2 224	2 004	1 435	1 225	:
Switzerland	**Women**	:	:	:	2 845	:
	Men	:	:	:	14 365	:
	Total	:	:	:	17 210	:
Cyprus	**Women**	:	26	39	54	:
	Men	:	110	150	183	:
	Total	:	136	189	237	:
Czech Republic	**Women**	:	:	:	1 353	1 341
	Men	:	:	:	6 865	6 777
	Total	:	:	:	8 218	8 118
Estonia	**Women**	:	:	232	164	:
	Men	:	:	419	343	:
	Total	:	:	651	507	:
Hungary	**Women**	1 143	1 042	948	1 226	1 208
	Men	2 992	2 789	3 115	3 524	3 700
	Total	4 135	3 831	4 063	4 750	4 908
Iceland	**Women**	:	:	197	:	:
	Men	:	:	645	:	:
	Total	652	685	842	:	:
Israel	**Women**	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:
Latvia	**Women**	:	:	:	555	518
	Men	:	:	:	727	405
	Total	:	:	:	1 282	923
Lithuania	**Women**	:	:	:	153	248
	Men	:	:	:	186	343
	Total	:	:	:	339	591
Malta	**Women**	:	:	:	:	:
	Men	:	:	:	:	:
	Total	:	:	:	:	:
Norway	**Women**	2 253	:	2 476	:	2 979
	Men	10 169	:	10 150	:	12 508
	Total	12 422	:	12 626	:	15 487
Poland	**Women**	:	:	:	3 332	:
	Men	:	:	:	8 464	:
	Total	:	:	:	11 796	:
Romania	**Women**	8 965	8 479	6 934	5 560	4 835
	Men	11 358	11 204	9 345	7 714	6 821
	Total	20 323	19 683	16 279	13 274	11 656
Slovakia(1)	**Women**	962	843	742	674	644
	Men	2 425	2 060	1 780	1 746	1 612
	Total	3 387	2 903	2 522	2 420	2 256
Slovenia	**Women**	443	461	506	471	:
	Men	1 151	1 214	1 266	1 114	:
	Total	1 594	1 675	1 772	1 585	:

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: (1)FTE as exception to HC

Annex 2.1.a

Number of ISCED 6 graduates by broad field of study and sex in EU Member States, 2001[(1)]

Women	EDUCATION	HUMANITIES AND ARTS	SCIENCE, MATHEMATICS AND COMPUTING	AGRICULTURE & VETERINARY	HEALTH AND SOCIAL SERVICES	ENGINEERING, MANUFACTURING AND CONSTRUCTION	SOCIAL SCIENCES, BUSINESS AND LAW	SERVICES & UNSPECIFIED	TOTAL
Belgium	6	47	175	24	78	26	64	0	420
Denmark	:	39	62	27	85	49	35	:	297
Germany	175	941	1 833	464	3 802	275	1 218	44	8 752
Greece	:	:	:	:	:	:	:	:	:
Spain	108	394	822	71	631	125	552	64	2 767
France	62	959	1 963	13	328	256	841	24	4 445
Ireland	4	38	125	7	38	14	27	1	254
Italy	:	309	392	196	571	278	308	:	2 054
Luxembourg(2)	-	-	-	-	-	-	-	-	-
Netherlands	:	70	135	75	279	54	184	:	797
Austria	64	131	144	47	23	52	226	8	695
Portugal	170	231	216	32	98	183	396	89	1 415
Finland	96	115	129	20	212	68	169	14	823
Sweden	63	114	246	45	501	220	134	5	1 328
United Kingdom	316	875	2 025	135	1 090	412	726	16	5 594

Men	EDUCATION	HUMANITIES AND ARTS	SCIENCE, MATHEMATICS AND COMPUTING	AGRICULTURE & VETERINARY	HEALTH AND SOCIAL SERVICES	ENGINEERING, MANUFACTURING AND CONSTRUCTION	SOCIAL SCIENCES, BUSINESS AND LAW	SERVICES & UNSPECIFIED	TOTAL
Belgium	5	104	346	53	119	143	119	8	897
Denmark	:	38	128	31	94	158	49	:	498
Germany	245	1 140	4 998	419	4 555	2 058	2 573	56	16 044
Greece	:	:	:	:	:	:	:	:	:
Spain	91	474	1 020	142	664	413	703	179	3 686
France	62	737	3 026	10	247	701	1 143	33	5 959
Ireland	4	32	168	12	25	49	28	0	318
Italy	:	225	429	154	290	530	362	:	1 990
Luxembourg(2)	-	-	-	-	-	-	-	-	-
Netherlands	:	152	395	154	389	336	310	:	1 736
Austria	39	124	261	45	9	348	347	3	1 176
Portugal	86	129	218	25	53	285	463	117	1 376
Finland	37	137	216	31	125	253	163	12	974
Sweden	33	145	500	48	449	691	192	2	2 060
United Kingdom	256	1 009	3 177	206	1 021	1 778	1 081	24	8 553

Source: Eurostat, Education
Notes: [(1)]Exceptions to the reference year: DK, FR, IT, FI: 2000
[(2)]Luxembourg does not have a complete university system. Most students study abroad

Annex 2.1.b

Number of ISCED 6 graduates by broad field of study and sex in Associated Countries, 2001[1]

Women	EDUCATION	HUMANITIES AND ARTS	SCIENCE, MATHEMATICS AND COMPUTING	AGRICULTURE & VETERINARY	HEALTH AND SOCIAL SERVICES	ENGINEERING, MANUFACTURING AND CONSTRUCTION	SOCIAL SCIENCES, BUSINESS AND LAW	SERVICES & UNSPECIFIED	TOTAL
Bulgaria	14	29	31	14	28	16	25	1	158
Cyprus[2]	2	1	2	0	0	0	5	0	10
Czech Republic	17	46	85	21	57	56	84	4	370
Estonia	0	5	7	1	57	0	7	:	77
Hungary	37	83	37	17	63	12	52	:	301
Iceland	:	:	:	:	2	:	1	:	3
Israel	31	52	173	13	31	20	58	:	378
Latvia	2	2	8	2	0	2	2	:	18
Lithuania	:	27	19	4	14	18	55	:	137
Malta	:	0	:	0	:	0	:	:	0
Norway	12	37	1	24	61	11	38	80	264
Poland	0	491	316	180	522	133	170	20	1 832
Slovakia	13	18	50	15	32	36	42	6	212
Slovenia	13	24	33	9	23	13	31	:	146

Men	EDUCATION	HUMANITIES AND ARTS	SCIENCE, MATHEMATICS AND COMPUTING	AGRICULTURE & VETERINARY	HEALTH AND SOCIAL SERVICES	ENGINEERING, MANUFACTURING AND CONSTRUCTION	SOCIAL SCIENCES, BUSINESS AND LAW	SERVICES & UNSPECIFIED	TOTAL
Bulgaria	18	37	37	13	26	42	37	8	218
Cyprus[2]	2	0	1	0	0	0	0	0	3
Czech Republic	10	46	264	46	55	151	116	8	696
Estonia	0	9	15	1	31	9	7	:	72
Hungary	24	115	105	38	102	38	70	:	492
Iceland	:	:	:	:	1	:	0	:	0
Israel	10	71	218	14	18	50	41	:	422
Latvia	1	2	10	0	0	5	1	:	19
Lithuania	:	18	23	0	18	42	23	:	124
Malta	:	4	:	1	:	1	:	:	6
Norway	10	42	10	41	89	68	58	186	504
Poland	0	522	393	230	589	546	213	75	2 568
Slovakia	16	31	61	24	27	90	48	23	320
Slovenia	3	23	43	4	17	44	18	0	52

Source: Eurostat, Education; Israel Central Bureau of Statistics & Council for Higher Education
Notes: [1]Exceptions to the reference year: IL: 1999; CY: 2000
[2]Cyprus: Data exclude students studying abroad

Annex 2.2.a

Number of researchers by main field of science and sex in HES in EU Member States, HC, 1999[1]

Women	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	OTHER	TOTAL
Belgium[3]	1 125	453	822	71	1 220	709	15	4 415
Denmark	665	175	340	289	467	883	0	2 819
Germany	6 276	2 966	13 535	1 574	4 417	9 191	2 301	40 260
Greece	:	:	:	:	:	:	:	:
Spain	:	:	:	:	:	:	:	:
France[4]	9 344	1 315	3 449	:	9 559	X	6 388	30 055
Ireland	:	:	:	:	:	:	:	:
Italy	3 218	920	2 516	712	1 906	5 060	0	14 332
Luxembourg	1	-	1	-	6	2	0	10
Netherlands[2]	631	559	1 609	276	1 620	690	227	5 612
Austria	730	167	1 387	147	697	714	0	3 842
Portugal[4]	2 365	864	694	469	2 817	X	0	7 209
Finland	1 231	450	894	96	1 365	943	0	4 979
Sweden	1 221	1 056	2 471	647	2 249	1 214	0	8 858
United Kingdom	12 919	1 709	8 590	563	13 651	8 172	5 614	51 218

Men	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	OTHER	TOTAL
Belgium[3]	2 687	1 808	1 910	212	2 547	1 268	61	10 493
Denmark	2 239	1 259	614	357	1 275	1 494	0	7 238
Germany	28 335	23 318	26 099	3 428	14 414	16 920	4 442	116 956
Greece	:	:	:	:	:	:	:	:
Spain	:	:	:	:	:	:	:	:
France[4]	22 430	7 356	7 210	:	14 447	X	11 692	63 135
Ireland	:	:	:	:	:	:	:	:
Italy	7 178	5 939	8 468	2 221	5 236	7 127	0	36 169
Luxembourg	1	-	1	-	10	1	6	19
Netherlands[2]	2 575	3 516	2 745	800	3 919	1 519	693	15 767
Austria	3 282	1 699	2 965	334	1 634	1 204	0	11 118
Portugal[4]	2 497	2 148	702	596	2 965	X	0	8 908
Finland	2 351	1 560	826	169	1 540	919	0	7 365
Sweden	2 784	4 495	2 354	935	2 950	1 563	0	15 081
United Kingdom	29 339	11 262	9 264	1 022	18 248	12 087	7 500	88 722

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]Exceptions to the reference year: LU: 2001; DK, DE, FR, UK: 2000; AT: 1998
[2]FTE as exception to HC
[3]Data not official. Estimates made from BE-FL for 2001 and BE-FR for 2000
[4]SS includes H

Annex 2.2.b

Number of researchers by main field of science and sex in HES in Associated Countries, FTE, 2000[1]

Women	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	OTHER	TOTAL
Bulgaria	101	114	282	0	115	31	:	643
Cyprus	8	1	0	0	17	11	:	36
Czech Republic	489	368	87	61	64	152	:	1 221
Estonia	217	91	73	59	163	116	:	719
Hungary	:	:	:	:	:	:	:	:
Iceland	17	59	30	14	34	21	:	175
Israel	147	66	154	12	340	382	39	1140
Latvia	230	107	69	85	104	191	:	786
Lithuania	349	272	408	84	746	621	:	2 480
Malta	:	:	:	:	:	:	:	:
Norway[2]	564	320	1 777	162	1 478	1 061	56	5 418
Poland	3 477	1 690	3 381	836	3 401	2 861	793	16 439
Romania	186	487	100	12	77	9	:	871
Slovakia	427	516	380	:	521	209	:	2 053
Slovenia	38	93	46	75	144	67	:	463

Men	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	OTHER	TOTAL
Bulgaria	122	606	315	3	163	34	:	1 243
Cyprus	39	4	0	0	34	16	:	92
Czech Republic	938	999	163	107	99	241	:	2 547
Estonia	435	291	58	70	153	80	:	1 087
Hungary	:	:	:	:	:	:	:	:
Iceland	80	85	43	16	44	37	:	305
Israel	1101	476	250	74	781	689	127	3 498
Latvia	424	200	19	59	144	50	:	896
Lithuania	571	840	331	130	561	313	:	2 746
Malta	:	:	:	:	:	:	:	:
Norway[2]	1 836	1 516	2 199	315	2 275	1 563	42	9 746
Poland	6 805	9 036	4 420	1 687	5 582	5 816	2 396	35 742
Romania	325	931	94	37	260	24	:	1 671
Slovakia	861	1 006	368	:	511	210	:	2 956
Slovenia	86	403	43	71	204	70	:	877

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]Exceptions to the reference year: IL, LT, NO, PL: 2001; IS, LV: 1999
[2]HC as exception to FTE

Annex 2.3.a

Number of researchers by main field of science and sex in GOV in EU Member States, FTE, 1999[1]

Women	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	OTHER	TOTAL
Belgium	:	:	:	:	:	:	:	:
Denmark	202	59	603	214	106	102		1 286
Germany	3 231	1 496	874	691	2 196	:	:	8 488
Greece	:	:	:	:	:	:	:	655
Spain[2]	598	616	860	596	192	X	:	2 861
France	:	:	:	:	:	:	:	:
Ireland	124	91	28	91	18	0	3	355
Italy	:	:	:	:	:	:	:	5 065
Luxembourg	:	:	:	:	:	:	:	:
Netherlands	:	:	:	:	:	:	:	:
Austria	34	13	33	23	91	95		289
Portugal	:	:	:	:	:	:	:	2 927
Finland	:	:	:	:	:	:	:	2 420
Sweden	:	:	:	:	:	:	:	190
United Kingdom	:	:	:	:	:	:	:	:

Men	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	OTHER	TOTAL
Belgium	:	:	:		:	:	:	:
Denmark	630	240	791	386	152	140	:	2 339
Germany	13 862	9 261	1 689	1 770	3 345	:	:	29 927
Greece	:	:	:	:	:	:	:	1 345
Spain[2]	1 094	1 380	1 185	977	239	X	:	4 876
France	:	:	:	:	:	:	:	:
Ireland	232	234	11	520	36	4	4	1 041
Italy	:	:	:	:	:	:	:	8 632
Luxembourg	:	:	:	:	:	:	:	:
Netherlands	:	:	:	:	:	:	:	:
Austria	93	68	53	90	186	175		665
Portugal	:	:	:	:	:	:	:	2 441
Finland	:	:	:	:	:	:	:	4 027
Sweden	:	:	:	:	:	:	:	495
United Kingdom	:	:	:	:	:	:	:	:

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]Exceptions to the reference year: DK: 2000; ES: 1993; AT: 1998
[2]SS includes H

Annex 2.3.b

Number of researchers by main field of science and sex in GOV in Associated Countries, FTE, 2000[1]

Women	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	TOTAL
Bulgaria	1 298	478	248	482	121	503	3 130
Cyprus	12	1	1	8	4	5	30
Czech Republic	598	117	131	228	47	276	1 397
Estonia	58	16	59	29	11	114	287
Hungary	:	:	:	:	:	:	2 008
Iceland	21	42	35	24	8	5	135
Israel	:	:	:	:	:	:	:
Latvia	279	36	29	52	23	6	425
Lithuania	454	121	60	124	99	239	1 097
Malta	:	:	:	:	:	:	:
Norway[2]	211	98	172	281	466	186	1 414
Poland	:	:	:	:	:	:	:
Romania	1 056	515	271	54	401	280	2 577
Slovakia	438	110	171	123	279	19	1 140
Slovenia	206	53	130	44	195	12	640

Men	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	TOTAL
Bulgaria	1 199	924	218	480	105	361	3 287
Cyprus	9	5	1	23	10	3	52
Czech Republic	1 517	718	135	244	69	343	3 026
Estonia	138	31	23	35	7	38	272
Hungary	:	:	:	:	:	:	3 358
Iceland	65	55	39	107	13	7	286
Israel	:	:	:	:	:	:	:
Latvia	149	37	22	44	71	4	327
Lithuania	651	307	48	124	60	145	1 335
Malta	:	:	:	:	:	:	:
Norway[2]	546	522	191	513	662	229	2 663
Poland	:	:	:	:	:	:	:
Romania	1 120	734	118	108	277	310	2 667
Slovakia	622	251	121	126	230	36	1 386
Slovenia	389	122	83	62	184	15	855

Source: Eurostat, S&T statistics; DG Research, WiS database
Notes: [1]Exceptions to the reference year: LT, NO: 2001; IS, LV: 1999
[2]HC as exception to FTE

Annex 2.4.a

Number of researchers by NACE category and sex in BES in EU Member States, HC, 1999[1]

Women	Nace Code 24.4 - Pharmaceuticals, medicinal chemicals and botanical products	Nace Code 24 - Chemicals, chemical products and man-made fibres (excluding pharmaceuticals, 24.4)	Total Manufacturing (including 24)	Real estate, renting and business activities	Other Nace codes (except D & K)	Total
Belgium	:	:	:	:	:	:
Denmark[4]	757	72	1 183	751	288	2 222
Germany[2][3]	x	3 956	11 686	2 078	844	14 608
Greece	61	50	421	234	285	940
Spain	598	288	2 165	926	262	3 353
France	3 658	1 519	14 022	1 950	1 816	17 788
Ireland	:	:	:	:	:	:
Italy	924	430	3 233	2 040	217	5 490
Luxembourg	:	:	:	:	:	:
Netherlands	:	:	:	:	:	:
Austria	206	40	773	389	96	1 258
Portugal	37	54	387	250	156	793
Finland[3][4]	x	1 660	6 182	1 340	683	8 205
Sweden	:	:	:	:	:	:
United Kingdom	:	:	:	:	:	:

Men	Nace Code 24.4 - Pharmaceuticals, medicinal chemicals and botanical products	Nace Code 24 - Chemicals, chemical products and man-made fibres (excluding pharmaceuticals, 24.4)	Total Manufacturing (including 24)	Real estate, renting and business activities	Other Nace codes (except D & K)	Total
Belgium	:	:	:	:	:	:
Denmark[4]	960	233	4 218	3 722	1 133	9 073
Germany[2][3]	x	8 369	118 225	11 951	5 366	135 542
Greece	52	91	1 542	808	641	2 991
Spain	835	819	10 054	3 246	658	13 958
France	3 984	3 044	52 818	8 921	6 689	68 428
Ireland	:	:	:	:	:	:
Italy	1284	1 614	17 891	5 603	722	24 216
Luxembourg	:	:	:	:	:	:
Netherlands	:	:	:	:	:	:
Austria	295	305	9 158	2 544	1 006	12 708
Portugal	40	102	1 471	673	391	2 535
Finland[3]	x	987	22 216	5 091	2 657	29 964
Sweden	:	:	:	:	:	:
United Kingdom	:	:	:	:	:	:

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: FR, IT, FI: 2000; AT: 1998
[2]FTE as exception to HC
[3]24.4 included in 24
[4]Definition of BES coverage differs from Annex Table 1.4.a

Annex 2.4.b

Number of researchers by NACE category and sex in BES in Associated Countries, HC, 2001[1]

Women	Nace Code 24.4 - Pharmaceuticals, medicinal chemicals and botanical products	Nace Code 24 - Chemicals, chemical products and man-made fibres (excluding pharmaceuticals, 24.4)	Total Manufacturing (including 24)	Real estate, renting and business activities	Other Nace codes (except D & K)	Total
Bulgaria[3]	x	214	358	35	212	605
Cyprus	7	5	17	30	7	54
Czech Republic	93	103	558	571	212	1 341
Estonia	3 [2]	19 [2]	73	58	33	164
Hungary	488	109	870	152	186	1 208
Iceland	9	9	40	144	13	197
Israel	:	:	:	:	:	:
Latvia[3]	x	74	97	260	161	518
Lithuania[3]	x	58	239	7	2	248
Malta	:	:	:	:	:	:
Norway	133	156	975	1 372	632	2 979
Poland	:	:	:	:	:	:
Romania[3]	x	362	3 167	196	1 472	4 835
Slovakia[2]	62	96	254	232	158	644
Slovenia	116	32	330	118	23	471

Men	Nace Code 24.4 - Pharmaceuticals, medicinal chemicals and botanical products	Nace Code 24 - Chemicals, chemical products and man-made fibres (excluding pharmaceuticals, 24.4)	Total Manufacturing (including 24)	Real estate, renting and business activities	Other Nace codes (except D & K)	Total
Bulgaria[3]	x	91	257	75	288	620
Cyprus	5	16	73	71	39	183
Czech Republic	105	275	4 043	2 140	594	6 777
Estonia	5 [2]	29 [2]	109	169	65	343
Hungary	458	177	2 297	593	810	3 700
Iceland	9	17	256	315	74	645
Israel	:	:	:	:	:	:
Latvia[3]	x	28	119	241	45	405
Lithuania[3]	x	29	274	64	5	343
Malta	:	:	:	:	:	:
Norway	340	160	4 750	5 410	2 348	12 508
Poland	:	:	:	:	:	:
Romania[3]	x	122	4 804	416	1 601	6 821
Slovakia[2]	39	87	687	620	305	1 612
Slovenia	54	28	762	278	74	1 114

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: BG, CY, EE, SI: 2000; IS: 1999
[2]FTE as exception to HC
[3]24.4 included in 24

Annex 3.1.a

Number of senior academic staff (grade A) and total number of academic staff (grades A+B+C+D) by sex in EU Member States, HC, 2000[1]

	GRADE A		Total academic staff (A+B+C+D)	
	Women	Men	Women	Men
Belgium	157	2 035	3 990	10 196
Denmark	82	905	2 819	7 239
Germany	967	11 612	43 228	117 161
Greece	216	1 699	1 898	5 511
Spain	1 457	8 188	24 582	51 717
France	3 845	19 901	30 055	63 135
Ireland	23	307	1 050	2 411
Italy	2 468	14 423	16 372	38 484
Luxembourg	-	-	-	-
Netherlands[2]	156	2 314	6 244	16 333
Austria	123	1 872	3 650	10 680
Portugal[2]	102	429	2 516	3 836
Finland	412	1 760	4 930	7 665
Sweden	493	3 068	4 206	10 661
United Kingdom	1 691	11 770	45 338	81 248

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: DE, IT, SE: 2001; BE, ES, PT: 1999; AT: 1998
[2]FTE as exception to HC
Data are not yet comparable between countries due to differences in coverage & definitions

Annex 3.1.b

Number of senior academic staff (grade A) and total number of academic staff (grades A+B+C+D) by sex in Associated Countries, HC, 2001[1]

	GRADE A		Total academic staff (A+B+C+D)	
	Women	Men	Women	Men
Bulgaria	384	1 771	10 359	13 529
Cyprus	1	26	84	242
Czech Republic	133	1 519	5 555	10 805
Estonia	97	458	1 627	2 194
Hungary	:	:	6 313	11 958
Iceland	22	162	155	363
Israel[2]	165	1 398	1 140	3 498
Latvia	78	295	2 093	1 686
Lithuania	61	455	3 439	3 800
Malta	1	44	19	210
Norway	304	1 986	5 418	9 746
Poland	1 445	6 698	15 378	31 554
Romania	:	:	:	:
Slovakia	108	1 254	4 628	8 141
Slovenia	78	624	675	1 982

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: CY: 2000; MT: 1999
[2]FTE as exception to HC
Data are not yet comparable between countries due to differences in coverage & definitions

Annex 3.2.a

Number of grade A academic staff by main field of science and sex in EU Member States, HC, 2000[1]

Women	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	OTHER	TOTAL
Belgium[3]	6	1	4	2	26	10	0	49
Denmark	11	3	11	5	23	29	0	82
Germany	137	48	61	30	149	536	6	967
Greece	:	:	:	:	:	:	:	216
Spain	:	:	:	:	:	:	:	1 457
France[4]	1 526	150	355	X	1 615	X	199	3 845
Ireland	:	:	:	:	:	:	:	23
Italy	508	129	294	105	394	1 038	0	2 468
Luxembourg	-	-	-	-	-	-	-	-
Netherlands[2]	14	11	20	7	54	48	2	156
Austria	15	4	27	7	31	39	:	123
Portugal[2][5]	35	3	20	6	39	X	:	102
Finland	38	17	80	6	146	125	:	412
Sweden	72	41	108	25	95	115	37	493
United Kingdom	326	29	271	9	596	375	85	1 691

Men	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	OTHER	TOTAL
Belgium[3]	138	103	113	37	185	85	6	667
Denmark	250	106	101	46	213	189	0	905
Germany	2 817	1 456	1 461	344	2 040	3 383	111	11 612
Greece	:	:	:	:	:	:	:	1 699
Spain	:	:	:	:	:	:	:	8 188
France[4]	8 168	2 186	3 634	X	5 181	X	732	19 901
Ireland	:	:	:	:	:	:	:	307
Italy	2 869	2 364	2 815	924	1 951	3 500	0	14 423
Luxembourg	-	-	-	-	-	-	-	-
Netherlands[2]	420	393	361	91	715	289	45	2 314
Austria	475	238	326	68	452	313	:	1 872
Portugal[2][5]	120	96	45	29	138	X	:	429
Finland	418	309	295	41	445	252	:	1 760
Sweden	622	702	731	128	505	338	42	3 068
United Kingdom	3 891	1 236	1 596	105	2 756	1 720	466	11 770

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: DE, IT, SE: 2001; ES, PT: 1999; AT: 1998
[2]FTE as exception to HC
[3]Belgium: French-speaking community only
[4]France: NS includes AS; SS includes H
[5]Portugal: SS includes H
Data are not yet comparable between countries due to differences in coverage & definitions

Number of grade A academic staff by main field of science and sex in Associated Countries, HC, 2001[1]

Women	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	OTHER	TOTAL
Bulgaria	:	:	:	:	:	:	:	:
Cyprus	1	0	0	0	0	0	0	1
Czech Republic	:	:	:	:	:	:	:	:
Estonia	:	:	:	:	:	:	:	:
Hungary	:	:	:	:	:	:	:	:
Iceland	3	1	3	0	3	2	2	14
Israel[2]	39	10	20	0	37	52	6	165
Latvia	0	0	5	0	11	8	54	78
Lithuania	:	:	:	:	:	:	:	:
Malta	:	:	:	:	:	:	:	:
Norway	37	8	53	8	79	119	0	304
Poland	260	97	304	122	251	398	13	1 445
Romania	:	:	:	:	:	:	:	:
Slovakia[3]	14	9	22	4	48	11	:	108
Slovenia	4	4	19	8	18	24	1	78

Men	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	OTHER	TOTAL
Bulgaria	:	:	:	:	:	:	:	:
Cyprus	5	0	0	0	12	9	0	26
Czech Republic	:	:	:	:	:	:	:	:
Estonia	:	:	:	:	:	:	:	:
Hungary	:	:	:	:	:	:	:	:
Iceland	40	17	28	0	29	31	3	148
Israel[2]	560	197	105	33	236	224	43	1 398
Latvia	37	0	8	0	17	14	233	309
Lithuania	:	:	:	:	:	:	:	:
Malta	:	:	:	:	:	:	:	:
Norway	503	276	319	82	436	370	0	1 986
Poland	1 350	1 324	858	488	1 056	1 500	122	6 698
Romania	:	:	:	:	:	:	:	:
Slovakia[3]	121	366	213	83	392	79	:	1 254
Slovenia	63	138	85	49	138	128	23	624

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: CY, LV: 2000; IS: 1999
[2]FTE as exception to HC
[3]Slovakia: H = Sciences of culture & arts; SS = SS + rest of H
Data are not yet comparable between countries due to differences in coverage & definitions

Annex 3.3.a

Number of R&D personnel by sector, occupation and sex in EU Member States, HC, 2000[1]

COUNTRY	OCCUPATION	HIGHER EDUCATION SECTOR		GOVERNMENT SECTOR		BUSINESS ENTERPRISE SECTOR	
		Women	Men	Women	Men	Women	Men
Belgium	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Denmark	Researchers	2 905	7 346	2 112	4 008	2 350	9 452
	Technicians	2 875	1 337	:	:	3 246	8 989
	Others	:	:	:	:	2 028	3 444
Germany[2]	Researchers	13 714	52 979	8 488	29 927	14 414	135 735
	Technicians	6 411	6 255	16 853	16 983	:	:
	Others	16 315	5 795	:	:	:	:
Greece	Researchers	10 097	12 702	1 029	1 717	940	2 991
	Technicians	4 567	3 760	646	870	452	2 170
	Others	5 367	3 921	1 270	2 379	1 058	1 000
Spain	Researchers	34 235	59 684	6 628	10 443	3 353	13 957
	Technicians	2 645	3 442	3 332	3 116	3 540	15 026
	Others	8 271	6 157	2 987	3 177	3 349	7 204
France	Researchers	30 053	63 138	8 464	19 067	17 787	68 429
	Technicians	:	:	:	:	:	:
	Others	22 761	19 031	11 788	11 451	27 902	73 293
Ireland[2]	Researchers	:	:	:	:	1 085	4 206
	Technicians	:	:	:	:	474	1 519
	Others	:	:	:	:	389	648
Italy	Researchers	:	:	6 841	11 129	5 161	24 385
	Technicians	:	:	6 079	8 941	3 335	23 717
	Others	:	:	3 351	4 566	2 729	9 313
Luxembourg	Researchers	14	25	83	191	:	:
	Technicians	0	3	32	29	:	:
	Others	2	0	11	36	:	:
Netherlands	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Austria	Researchers	3 842	11 118	730	1 560	1 258	12 708
	Technicians	2 151	1 114	546	618	1 335	6 658
	Others	2 589	1 119	1 175	1 105	1 244	1 737
Portugal	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Finland	Researchers	5 936	8 265	2 420	4 027	3 999	18 516
	Technicians	3 039	2 796	2 433	1 643	4 026	9 865
	Others	:	:	:	:	:	:
Sweden	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
United Kingdom	Researchers	:	:	3 459	11 784	:	:
	Technicians	:	:	2 769	3 921	:	:
	Others	:	:	4 036	5 095	:	:

Source: Eurostat, S&T statistics

Notes: [1]Exceptions to the reference year: LU: 2001; DK (BES), DE, EL, ES (BES), IE, IT, FI: 1999; AT: 1998

[2]FTE as exception to HC

Annex 3.3.b

Number of R&D personnel by sector, occupation and sex in Associated Countries, HC, 2000[1]

COUNTRY	OCCUPATION	HIGHER EDUCATION SECTOR		GOVERNMENT SECTOR		BUSINESS ENTERPRISE SECTOR	
		Women	Men	Women	Men	Women	Men
Bulgaria	Researchers	875	1 613	3 301	3 462	605	620
	Technicians	158	272	2 101	922	417	313
	Others	135	113	1 086	481	205	113
Cyprus	Researchers	84	242	56	121	54	183
	Technicians	2	9	79	147	35	84
	Others	21	20	114	126	63	30
Czech Republic	Researchers	3 522	7 212	2 065	4 624	1 353	6 865
	Technicians	1 651	1 347	1 825	1 154	2 343	5 523
	Others	1 094	486	1 250	952	1 690	2 332
Estonia	Researchers	1 434	1 913	349	326	164	343
	Technicians	336	169	150	29	125	119
	Others	391	199	193	71	97	62
Hungary	Researchers	6 303	11 457	2 008	3 358	1 226	3 524
	Technicians	1 968	1 244	1 521	1 101	1 355	1 124
	Others	3 554	1 446	2 045	1 222	427	442
Iceland	Researchers	347	653	306	515	197	645
	Technicians	69	103	114	133	89	244
	Others	163	70	83	94	63	116
Israel	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Latvia	Researchers	2 059	1 974	419	381	518	405
	Technicians	330	211	117	75	247	97
	Others	252	204	285	129	240	209
Lithuania	Researchers	3 439	3 800	1 114	1 269	248	343
	Technicians	459	222	868	331	121	51
	Others	995	291	715	523	95	96
Malta	Researchers	:	:	:	:	:	:
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Norway	Researchers	5 418	9 746	1 414	2 663	2 979	12 508
	Technicians	:	:	:	:	:	:
	Others	:	:	:	:	:	:
Poland	Researchers	24 925	39 072	5 307	7 054	3 332	8 464
	Technicians	4 721	3 627	3 126	1 997	2 718	4 088
	Others	5 064	2 130	2 726	1 682	2 369	3 136
Romania	Researchers	1 643	2 872	2 638	2 752	5 560	7 714
	Technicians	269	244	747	558	2 966	1 970
	Others	523	404	641	391	2 127	3 222
Slovakia[2]	Researchers	2 053	2 956	1 140	1 386	674	1 746
	Technicians	487	230	772	291	720	1 097
	Others	67	67	402	198	508	427
Slovenia	Researchers	1 007	1 947	862	1 057	471	1 114
	Technicians	187	238	340	273	597	872
	Others	512	251	321	279	632	1 138

Source: Eurostat, S&T statistics
Notes: [1]Exceptions to the reference year: LV (BES), LT, NO: 2001; IS: 1999
[2]FTE as exception to HC

Annex 4.1.a

Number of applicants and beneficiaries of research funding by sex in EU Member States, 2001[1]

	APPLICANTS		BENEFICIARIES	
	Women	Men	Women	Men
Belgium	870	2 846	457	1 573
Denmark	584	1 709	192	505
Germany	2 522	19 144	1 465	12 043
Greece	888	745	222	229
Spain	:	:	712	669
France	:	:	1 547	2 353
Ireland	153	260	54	74
Italy	:	:	:	:
Luxembourg	29	43	23	37
Netherlands	648	3 213	251	1 117
Austria	207	891	85	464
Portugal	1 152	1 013	465	465
Finland	500	1 224	125	270
Sweden	1 206	4 039	472	1 827
United Kingdom	8 561	20 068	1 169	5 609

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: EL, IE: 2002; FR, UK: 2000; ES, AT, SE: 1999 ; BE: 1998
Data are not comparable between countries due to differences in coverage and definitions

Annex 4.1.b

Number of applicants and beneficiaries of research funding by sex in Associated countries, 2001[1]

	APPLICANTS		BENEFICIARIES	
	Women	Men	Women	Men
Bulgaria	:	:	:	:
Cyprus	20	91	5	20
Czech Republic	53	230	17	86
Estonia	232	670	194	588
Hungary	266	903	133	558
Iceland	338	606	202	343
Israel	236	1 119	71	435
Latvia	285	573	231	471
Lithuania	24	77	8	37
Malta	:	:	:	:
Norway	1 041	4 086	382	1 638
Poland	2 513	6 401	1 008	2 733
Romania	:	:	:	:
Slovakia	45	124	43	122
Slovenia[2]	219	215	446	527

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: EE, CY: 2002; IL, LT, NO: 2000
[2]SI: Beneficiaries include all the persons who are receiving funds for junior research, not only the ones who have received the funds in the observed year
Data are not comparable between countries due to differences in coverage and definitions

Annex 4.2.a

Number of women and men on scientific boards (academies and universities), EU Member States, 2001[1]

	Women	Men
Belgium	94	815
Denmark	182	332
Germany	134	1 068
Greece	91	433
Spain	94	242
France	657	2 185
Ireland	88	323
Italy	1 393	2 072
Luxembourg	6	85
Netherlands	35	159
Austria	275	2 257
Portugal	10	5
Finland	37	42
Sweden	135	159
United Kingdom	95	230

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: FR: 1999-2002; EL, IE: 2002; BE: 2000; ES, AT: 1999
Data are not comparable between countries due to differences in coverage and definitions

Annex 4.2.b

Number of women and men on scientific boards (academies and universities), Associated Countries, 2001[1]

	Women	Men
Bulgaria	74	429
Cyprus	5	52
Czech Republic	28	233
Estonia	4	68
Hungary	74	353
Iceland	48	123
Israel	:	:
Latvia	28	122
Lithuania	:	:
Malta	:	:
Norway	25	29
Poland	1 693	7 584
Romania	:	:
Slovakia	143	438
Slovenia	23	111

Source: DG Research, WiS database
Notes: [1]Exceptions to the reference year: CY: 2002; BG: 2000
Data are not comparable between countries due to differences in coverage and definitions

Methodological Notes

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

Statistical terms & classifications

1. Students and Graduates
The International Standard Classification of Education (ISCED-97) categorises education programmes by level (ISCED 6 is used here, which corresponds to "advance research programmes", i.e. doctoral degrees and PhDs) and by field of study. The 1976 ISCED classification was revised in 1997, which has resulted in a break in the time series data from 1998 onwards (UNESCO, 1997).
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.

2. S&T (Science and Technology) in education
The term S&T corresponds to the sum of ISCED narrow fields of study 42 (Life sciences), 44 (Physical sciences), 46 (Mathematics and statistics), 48 (Computing), 52 (Engineering and engineering trades), 54 (Manufacturing and processing) and 58 (Architecture and building). A more detailed description for each field can be found in the ISCED-97 manual (UNESCO, 1997).

3. Human Resources in Science and Technology (HRST)
This methodology is based upon identifying individuals from the Community Labour Force Survey case data, according to educational attainment and occupation, and is proposed by the Canberra Manual (OECD, 1994). 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 third level in an S&T field of study
- Not formally qualified as above but employed in a 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 education at the third level (tertiary education or ISCED 5+6 since the 1997 revision) in an S&T field of study (see S&T (Science and Technology) in education above.

HRSTO: HRST Occupation – People who are employed in a S&T occupation (ISCO '88 COM, codes 2 "Professionals" and 3 "Technicians")

HRSTC: HRST Core – People who are both HRSTE and HRSTO.

4. ISCO-88 definitions
Two of the ISCO-88 major groups are used in eth definition of HRST, HRSTO and HRSTC. They are:
Major group 2 - "Professionals" (ISCO-2): "*This major group includes occupations whose 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*".

Research occupations are classified as ISCO-2.

Major group 3 – "Technicians and associate professionals" (ISCO-3): "*This major group includes occupations whose 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.*"

5. Scientists and Engineers (S&E) in employment (see below for definition of S&E researchers)
- Physical, mathematical and engineering occupations (ISCO '88 COM code 21)
- Life science and health occupations (ISCO '88 COM code 22).

6. Researchers and research personnel
The Frascati Manual (Proposed standard practice for Surveys on Research and Experimental Development, OECD, 2002) provides an international definition for Research personnel, §294, which is composed of:

RSE: 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".*

TEC: Technicians and equivalent staff §306: "*Technicians and equivalent staff are persons whose main tasks require technical knowledge and experience in one or more fields of engineering, physical and life sciences or social sciences and humanities. They participate in R&D by performing scientific and technical tasks involving the application of concepts and operational methods, normally under the supervision of researchers.*

Equivalent staff perform the corresponding R&D tasks under the supervision of researchers in the social sciences and humanities".
AUX: 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."*

7. Main fields of science
The Frascati Manual (OECD 2002) also provides definitions for the six main fields of science (page 67), which are adhered to in this publication, unless otherwise indicated. 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 study of their qualification.

8. S&E Researchers
In Chapter 2, the term 'S&E' refers to the sum of Researchers in the main fields of science NS and ET.

9. Sectors of the economy
The Frascati Manual (OECD 2002) identifies and defines four sectors of the economy (§156):

HES (§206):	Higher Education Sector
GOV (§184):	Government Sector
BES (§163):	Business Enterprise Sector
PNP (§194):	Private non-profit sector.

The sector entitled "Abroad" is not referred to in this booklet.

10. Units (Head count & Full-time equivalence)
The units of measurement proposed by the Frascati Manual are:
HC (§329): Head count. The number of persons engaged in R&D at a given date; the average number of persons engaged in R&D during the (calendar) year or the total number of persons engaged in R&D during the (calendar) year.
FTE (§333): Full-time equivalence. One FTE corresponds to one year's work by one person.
Data are presented where possible in HC. For the countries only able to provide data in FTE, an estimated figure in HC is necessary to calculate some indicators. As the relationship between HC and FTE is not necessarily linear, the estimation procedure is based on factors for conversion between HC and FTE and agreed with the statistical correspondent for that country. When data on national conversion factors are available, the mean of the conversion factors available for countries and years is used. HC figures that have been estimated from observed FTE data are remarked in the footnotes.

11. R&D expenditure
The following terms are used in Chapter 1 of this booklet:
GERD: Gross Domestic Expenditure on R&D. It relates to the total intramural expenditure on R&D performed on the national territory during a given period. (Frascati Manual, §423).
GOVERD: Government Intramural Expenditure on R&D.
HERD: Higher Education expenditure on R&D.

12. Academic staff grades / Full Professors
The data for this analysis are drawn from the various surveys of higher education that are undertaken within European countries (see Data sources below). However, although these surveys have many questions in common, there is no broad rule for defining the coverage of personnel surveyed and it is not possible to distinguish research staff from teaching staff in most cases. Furthermore, there is no formal international standard or classification that would enable such an analysis of these data.
The mapping of grades presented in this publication is based upon the national perception of the titles Full, Associate and Assistant Professors might be. They are not based on any other explicit guideline, although every effort has been made to ensure that the grades are broadly comparable. This idea has been drawn from the methodology presented in the ETAN report 'Science policies in the European Union: Promoting excellence through mainstreaming gender equality, which included three grades of professors: Full Professor (Grade A), Associate Professor (Grade B), and Assistant Professor (Grade C). In order to avoid over-interpretation of these grades, we have limited the analysis in this publication to the Full Professors (grade A) and to the overall total academic staff (grades A+B+C+D), since there is a good level of comparability for the Full Professors. A complete list of the grades reported for each country is included later in this Annex.
Because this is one of only two sources of data that enable us to measure vertical segregation, the statistical correspondents of the Helsinki Group on Women and Science, in collaboration with the Research Directorate General's Women and Science Unit, have carried out further work to develop this framework. The new framework will include a 4-tier scheme, for which definitions have been agreed but harmonisation of the coverage of

these data remains to be determined. Until this framework is developed, it will not be possible to present any time series analysis from these data.

Data sources

Data for **ISCED 6 graduates** have been obtained from Eurostat's online database NewCronos, except for Israel who provides data directly to the Women and Science Unit's WiS (Women in Science) 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 and not nationals who are studying abroad. For some countries (EL, IE, LU, PT, CY, IS, MT) large numbers also graduate from universities in other countries.

Data on **researchers** have been obtained where possible from NewCronos but supplemented where necessary with data reported to the Women and Science Unit's WiS database. This data collection was initiated as part of a common project between Eurostat and the Women and Science Unit, with the support of the Helsinki Group on Women and Science. The statistical correspondents from the Helsinki Group have been involved in both the collection and validation of the data contained in the WiS database.

For **researchers in HES**, the total figure has been estimated as the sum of the grades among academic staff for Belgium (French-speaking part), the United Kingdom and Israel.

Data on **R&D personnel** by occupation are extracted from NewCronos.

Data referring to **labour force** are drawn from the Community Labour Force Survey (CLFS) in different ways. The **HRST** data are part of a special extraction provided by Eurostat. Data on **S&E employment** have been derived from a recent Statistics in Focus publication[1] and labour force data presented in Figures 1.9.a and 1.9.b are extracted from NewCronos.

The data refer to all persons aged 15+ living in private households and include the employed, unemployed and inactive populations.

The statistical correspondents of the Helsinki Group on Women and Science report data on **academic staff** (see *Academic staff grades / Full Professors* above), on the applicants and beneficiaries of **research funding** and the sex-composition of **scientific boards** 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

Small numbers

For some countries with small populations, raw data relating to small numbers of people have been reported here. Percentages and other indicators that are calculated from these small figures have also been included. 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 provided in the text of "*She Figures*" are estimates based upon existing data, although data for adjacent years may have been used to complete any gaps. These estimates are not official, but are intended as a guide to the reader.

Horizontal & vertical segregation

In this publication, passing reference is made to the term segregation, which is a measure of the different distributions of the sexes across disciplines or sectors (horizontal segregation) and within hierarchical systems (vertical segregation). In practice, horizontal segregation can only be calculated by netting the vertical segregation out of overall segregation. It should therefore be noted that where the term horizontal segregation is used in the texts, it may in fact refer to overall segregation.

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.

Country Codes

Country names have been used in full where possible or abbreviated in accordance with the ISO Alpha-2 codes, with the exceptions of Greece and the United Kingdom, as follows:

[1] Strack, Guido (2003)

Member States:

BE	Belgium
BE-FL	Dutch-speaking community in Belgium
BE-FR	French-speaking community in Belgium
DK	Denmark
DE	Germany
EL	Greece
ES	Spain
FR	France
IE	Ireland
IT	Italy
LU	Luxembourg
NL	The Netherlands
AT	Austria
PT	Portugal
FI	Finland
SE	Sweden
UK	United Kingdom

Associated Countries:

This term refers to countries that are associated to the Sixth EU Framework Programme for Research and Technological Development, 2002-2006 (FP6).

BG	Bulgaria
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
EE	Estonia
HU	Hungary
IS	Iceland
IL	Israel

Accession Countries:

This term refers to countries that will become Member States of the European Union in 2004.

CY	Cyprus
CZ	Czech Republic
EE	Estonia
HU	Hungary
LV	Latvia
LT	Lithuania
MT	Malta
PL	Poland
SK	Slovakia
SI	Slovenia

Candidate Countries:

This term refers to countries that are associated to the Sixth EU Framework Programme for Research and Technological Development, 2002-2006 (FP6).

BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
EE	Estonia
HU	Hungary
LV	Latvia
LT	Lithuania
MT	Malta
PL	Poland
RO	Romania
SK	Slovakia
SI	Slovenia
TR	Turkey

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

Academic Staff

The following lists the academic staff grades to which reference is made in Chapter 3. Under each country heading, the grade(s) corresponding to Grade A and to the sum of Grades B, C and D are presented.

Dutch-speaking community in Belgium

A
ZAP1 - Gewoon/buitengewoon hoogleraar
ZAP2 - Hoogleraar
B-D
ZAP3 - Hoofddocent
ZAP4 - Docent
AAP2 - Doctor-assistant
Unpaid researchers (post-doctoral)
WP3 - Post-doctoral of unlimited duration
WP4 - Post-doctoral of limited duration
AAP1 - Assistant
AAP3 - Other
AAP3 - Other
Unpaid researchers (pre-doctoral)
WP1 - Pre-doctoral of unlimited duration
WP2 - Pre-doctoral of limited duration
ZAP5

French-speaking community in Belgium

A
Professeur extraordinaire
Professeur ordinaire
B-D
Professeur
Chargé(e) de cours

Denmark

A
Professor
B-D
Associate Professor
Assistant Professor
Senior/forskningsstip
Scientific staff
Temporary scientific staff

Germany

A
C4 an allen Hochschularten
B-D
C3 an allen Hochschularten
C2 auf Dauer an allen Hochschularten
C2 auf Zeit an allen Hochschularten
Ordentliche Professoren 1), HSL1-6, BAT I-IIa, AT
Außerordentliche Professoren 2) , HSL1-6, BAT I-IIa, AT
Hochschuldozenten, R1, C2, C3, A9-A15, BAT I-IIa, III, AT
Universitätsdozenten, H1-H3, BAT Ia, Ib, AT
Oberassistenten, C2, H1, H2, A14, BAT Ia-IIa
Oberingenieure, C2, H1, H2, A14, BAT Ib
Hochschuldozenten 3), HSL 2-6, BAT I-IIa
Außerordentliche Hochschuldozenten 4), HSL 2-6, BAT I-IIa
Oberassistenten 4), WM 3-6, BAT I-IIa
Hochschulassistenten, C1, H2, BAT Ia-IIa
Wissenschaftliche und künstlerische

Assistenten, C1, H1, A13-A14, BAT Ib, IIa
Akademische (Ober)Räte -auf Zeit-, A13, A14
Wissenschaftliche Mitarbeiter im befristeten Arbeitsverhältnis 6), WM V, Va, BAT IIa
Akademische Räte, Oberräte und Direktoren, A13-A16, C1-C3, R1, R2, H1-H3, BAT I-IIa, AT
Wissenschaftl. und künstl. Mitarbeiter im Angestelltenverh., BAT I-IVb, Va, AT, Verg. entspr. A13
Ärzte im Praktikum, Tarif für AIP
Wissenschaftliche Mitarbeiter im unbefristeten Arbeitsverhältnis 7), WM 2-6, BAT I-IIa
Studienräte, -direktoren im Hochschuldienst, A13-A16, BAT I-IIb
Fachlehrer, Technische Lehrer, A9-A13, AT
Lektoren, A13-A14, BAT I-II, AT
Sonstige Lehrkräfte für besondere Aufgaben, A9-A13, BAT I-Vc, Kr. VIII-XIII, AT
Lektoren 8), WM 3, BAT IIa
Lehrer im Hochschuldienst 9), WM 4-6, BAT IIa, IIb

Greece
A
Professor
B-D
Associate Professor
Assistant Professor
Assistant staff, lecturer, post-graduate scholars, temporary teaching staff

Spain
A
Full Professor
B-D
Associate Professor
Assistant Professor
(The data split by level are only available from Universities with public entitlement)

France
A
Directeur de recherche
Professeur d'université
B-D
Chargé(e) de recherche
Maître de conférence

Ireland
A
Professor
B-D
Associate Professor
Statutory / senior lecturer
(Full-time staff in HEA institutions only)

Italy
A
Full Professor
B-D
Associate Professor
Academic researcher
Others

The Netherlands
A
Professor
B-D
Associate Professor
Assistant Professor
Other academic staff
Post-graduate (2-year post)
Post-graduate (4-year post)
Student assistant
(Data relate to the Universities only)

Austria
A
Professor
B-D
Universitätsdozent
Assistent
Sonst. Wissenschaft Personnel
Wissenschaftliche Hilfskräfte
(Data relate to the Universities only)

Portugal
A
Professor Catedrático
B-D
Professor Associado
Professor Auxiliar
Assistente

Finland
A
Professor (including former Associate Professors)
B-D
Lecturer
Senior assistant
Assistant
Full-time teacher
Researcher

Sweden
A
Professor
B-D
Post-doctoral senior fellow
Senior lecturer
Junior lecturer

United Kingdom
A
Professor
B-D
Senior lecturer
Senior researcher
Lecturer
Researcher

Bulgaria
A
Professor
B-D
Associate Professor
Assistant
Lecturer
Research associate

Cyprus
A
Professor
B-D
Associate Professor
Assistant Professor
Lecturer
Teaching Support Staff
Research associates and other staff

Czech Republic
A
Professor
B-D
Associate Professor
Senior Assistant
Assistant
Lecturer

Estonia
A
Professor
B-D
Associate Professor
Assistant Professor
Assistant
Teacher
Other
(The data on academic staff cover universities and research centres

within universities (most research institutes have been incorporated into universities).These data are represented in FTE and include both educational and R&D activities)

Hungary
A
Professor (Tanár)
B-D
Associate Professor (Docens)
Senior Lecturer (Adjunktus)
Lecturer (Tanársegéd)

Iceland
A
Professor
B-D
Associate Professor (Assistant Professor)
Assistant Professor (Lecturer)

Israel
A
Professor
B-D
Associate Professor
Senior Lecturer
Lecturer

Latvia
A
Full Professor
B-D
Associate Professor
Assistant Professor
Assistant
Lecturer
Researcher

Lithuania
A
Professor
B-D
Associate Professor
Other teaching Staff

Malta
A
Professor
B-D
Associate Professor
Senior Lecturer

Norway
A
Full Professor
B-D
Associate Professor
Assistant Professor

Poland
A
Full Professor
B-D
Doctor
Doctor hab.
Professor of high school

Slovakia
A
Professor
B-D
Docent
Senior Lecturer
Lector
Lecturer

Slovenia
A
Full Professor
B-D
Associate Professor
Assistant Professor

Research Funds

The following list details each of the national funding bodies which have provided data for both applicants and beneficiaries of research funds, unless otherwise indicated. For the funding success rate, only those funds that have data available for both applicants and beneficiaries have been used in the calculation.

Belgium
- Fund for scientific research Flanders (FWO)
- Funds for industrial research (IWT)
- Fonds National de la Recherche Scientifique (FNRS)

Denmark
- The Danish Research Council for the Humanities (SHF)
- The Danish Agricultural and Veterinary Research Council (SJVF)
- The Danish Natural Science Research Council SNF)
- The Danish Social Science Research Council (SSF)
- The Danish Medical Research Council (SSVF)
- The Danish Technical Research Council (STVF)
- Other funding bodies

Germany
- Deutsche Forschungsgemeinschaft (DFG)

Greece
- Hellenic Public Foundation for Grants (IKY)

Ireland
- Health Research Board

Luxembourg
- Gouvernement Luxembourgeois

Netherlands
- Royal Netherlands Academy of Arts and Sciences council (KNAW)
- The Netherlands Organisation for Scientific Research Council

Austria
- Bureau for International Research and Technology Co-operation programmes (BIT)
- Austrian Science Funds (FWF)
- Non-framework programmes
- Austrian Academy of Science (ÖAW)

Portugal
- Foundation for Science and Technology (FCT)

Finland
- Academy of Finland

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
- Swedish Research Council for Engineering Sciences

United Kingdom
- 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)

Cyprus
- Research Promotion Foundation (RPF)

Czech Republic
- Academy of Science
- Grant Agency of Academy of Science

Estonia
- Estonian Science Fund

Hungary
- The Hungarian Scientific Research Fund Office (OTKA)

Iceland
- Graduate Research Fund
- Programme for Information technology and Environmental Sciences
- The Christianity Millennium Fund
- The Research Fund of the UI
- The Science Fund
- The Technology fund

Israel
- Bilateral (US-Israel) Science foundation
- Israel Science Foundation

Latvia
- Latvian Council of Science

Lithuania
- State scientific institutes

Norway
- The Research Council of Norway (RCN) - Bioproduction and Processing
- The Research Council of Norway (RCN)-Culture and Society
- The Research Council of Norway (RCN)-Environment and Development
- The Research Council of Norway (RCN)-Industry and Energy
- The Research Council of Norway (RCN)-Medicine and Health
- The Research Council of Norway (RCN)-Science and Technology

Poland
- Government

Slovakia
- VEGA – Scientific Grant Agency of Ministry of Education and Slovak Academy of Sciences (data of the SAS)

Slovenia
- Ministry of Science and Technology

Scientific boards, academies and universities

Data from the following boards have been included in the figures, tables and annex tables results for scientific boards:

Belgium
- Fund for scientific research Flanders
- Interuniversity Institute for Micro-Electronics
- Funds for industrial research
- Royal Academy of Flanders for Sciences and Arts
- Universities
- Commision ad hoc "recherche en éducation"
- Commission scientifique FNRS
- Commission scientifique FRIA
- Commission scientifique FRSM
- Commission scientifique IISN

Denmark
- Universities
- Analyseinstitut for Forskning
- Amternes og Kommunernes forskingsinstitut
- Arbejdsmiljøinstituttet
- The Copenhagen Peace Research Institute
- Center for Sprogteknologi (Center of language technology)
- Council for Sciences and Technologies
- Center for udviklingsforskning
- Danish Cancer Society
- Dansk Bilharziose Laboratorium

Danish school of pharmacy
Danmarks Fiskeriundersøgelser
Dansk Institut for Klinisk Epidemiologi
Danmarks Jordbrugsforskning (replaces SHDF and SPAF from 2001)
DLH
Danmarks miljøundersøgelser
Danmarks Pædagogiske Universitet (replaces DLH from 2001)
Danmarks og Grønlands Geologiske Undersøgelser
Dansk Rumforskningsinstitut
Forskningscentret for Skov og Landskab
Forskningscenter RISØ
GFF
Institut for Sundhedsvæsen
Institut for Grænseregionsforskning
John F Kennedy instituttet
Royal Danish Academy of Sciences and Letters
Statens Byggeforskningsinstitut
Socialforskningsinstituttet
Statens Husdyrbrugsforsøg
The Danish Research Councils
Statens Jordbrugs- og Fiskeriøkonomiske Institut
Statens Planteavlsforsøg
Statens Skadedyrslaboratorium

Germany

Higher Education Institutions
Non-university Research Institutions

Greece

Universities
Alexander Fleming Greek Foundation
Biomedical Sciences Research Centre "Alexander Fleming" (BSRC)
Centre for Renewable Energy Sources (CRES)
Centre for Research and Technology - Hellas (CERTH)
Cultural and Educational Technology Institute (SETI)
Foundation for Research and Technology (FORTH)
Foundation of Biomedical Research / Academy of Athens
Greek Atomic Energy Commission (GAEC)
Hellenic Pasteur Institute
Industrial Systems Institute (ISI)
Institute for Language and Speech Processing (ILSP)
Institute of Communication and Computer Sciences
Institute of Constitutional Research
Institute of International Relations, Panteio University
Institute of Marine Biology of Crete (IMBC)
Ioannina Biomedical Research Institute (IBRI)
National Centre for Scientific Research "Demokritos" (NCSR)
National Centre for Social Research (NCRC)
National Council for Research and Technology (ex National Advisory Research Council)
National Hellenic Research Foundation (NHRF)
National Technical University of Athens
Institute for Deep Sea Research, Technology and Neutrino Astroparticle Physics
Neurosurgical Institute Of University of Ioannina
Research University Institute of Urban Environment and Human Resources
Solid Earth Physics Institute
TEI of Athens
TEI of Chalkida
TEI of Ipeiros
TEI of Kalamata
TEI of Larissa
TEI of Serres
TEI of Thessaloniki
Telecommunication Systems Institute (TSI) - Technical University of Crete
University Mental Health Research Institute
University Research Institute of Applied Communication

Spain

CSIC, boards of directors
National research council
Oficina de Ciencia y Tecnologia
Universities

France

Total (Presidents)
Total board of trustees) (Members)
Total scientific committees (Members)
Total scientific strategic council (Members)

Ireland

Agriculture and Food Development Authority
Agency to encourage the preservation and extension of the Irish language

Bord Iascaigh Mhara
Central and Regional Fisheries Board
Central Bank
Central Statistics Office
COFORD (Forestry)
Departments of Enterprise, Trade & Employment
Dublin Institute of Advanced Education (DIAS)
Enterprise Ireland
Environmental Protection Agency
Economic & Social Research Institute (dpt of Finance)
Training and Employment Authority
Food Safety Authority of Ireland
Forfas
Geological Survey (dpt of Public Enterprise)
Higher Education Authority
Health Research Board
Industrial Development Authority
Marine Institute
National Museum
National Roads Authority
Departments of the Taoiseach
Post Graduate Medical and Dental Board
Radiological Protection Institute
Royal Irish Academy of Science, Polite Literature and Antiquities
Salmon Research Agency of Ireland
Shannon Development

Italy

A. Dohrn Zoological Station
Agency for New Technologies, Energy and Environment
"E. Fermi" Historical Museum of the Physics and Center of Studies and Researches
Excellence centers for university research
Institute of International and Comparative Agrarian Law
Italian National Statistical Institute
Italian Space Agency
Italian Association for Cancer Research
Italian Aerospace Research Center
Italian Center on Early Middle Ages Studies
National research councils
Tropical Herbarium of Florence
National Institutes
Research Programmes of National Interest
University boards

Luxembourg

Centre d'Études de Populations, de Pauvreté et de Politiques Socio-Economiques
Centre Universitaire de Luxembourg
Fonds National de Recherche
Institut Supérieur de Technologie
Public Research Centres

Netherlands

Royal Netherlands Academy of Arts and Sciences council
The Netherlands Organisation for Scientific Research Council
TNO
Universities/ university board

Austria

Austrian Science Research Council
Boards of the universities
Boards of the universities of the arts
Austrian Academy of Science

Portugal

Foundation for Science and Technology (FCT)
Institute for International Cooperation in Science, Technology and Higher Education (GRICES)
Observatory for Science, Technology and Higher Education (OCES)

Finland

Academy Board
Academy of Finland Research councils
Science and Technology Policy Council of Finland
Tekes Board

Sweden

Universities and Colleges
Swedish Research Councils
The Cancer Foundation

United Kingdom

Department of Culture, Media and Sport
Department of Trade and Industry
Department for the Environment, Transport and the Regions
Department for Education and Employment

Department of Health
Imperial Cancer Research Fund
Ministry of Agriculture, Fisheries and Food
Ministry of Defense
Northern Ireland Office
Research Councils
Research Career Awards
Scottish Office
Training and Career Development Board
(studentships, fellowships and professorships)
Royal Society of London
Royal Academy of Engineering
Universities
Welsh Office
Wellcome Trust

Bulgaria
Higher Education Sector
Bulgarian Academy of Sciences
Ministry of Education and Science
National Center for Agricultural Sciences
(The previous Academy of Agricultural Sciences)

Cyprus
Research Promotion Foundation
University of Cyprus

Czech Republic
Academy Assembly ASCR
Academy Council ASCR

Estonia
Estonian Academy of Sciences
Estonian Science Fund Council

Hungary
The Hungarian Scientific Research Fund Office

Iceland
Advisory Boards of IRC
Board of IRC
Board of the Graduate Research Refund
Board of the Research Fund of the UI
University Councils
Grant committee of the Science Fund
Grant committee of the Technology Fund
Institute of Freshwater Fisheries Research
The Agricultural Research Institute
The Building Research Institute
The Icelandic Fisheries Labaratories
The Icelandic Forest Research Station
The Marine Research Institute
The National Energy Authority
The Technological Institute

Israel
Bilateral (US-Israel) Science Foundation

Latvia
Expert commissions

Norway
The Research Council of Norway

Poland
Governmental bodies
Higher education and research institutes
Scientific societies and foundations

Slovakia
Higher Education Institutions

Slovenia
Council for Science and Technology
National Scientific Research Council
Scientific research councils for individual fields
and the Technology development Council

Theme 1: How many?

INDICATORS	SCIENTIFIC AND SOCIO- ECONOMIC MEANING	SOURCE	AVAILABILITY
Percentage of graduates from ISCED level 5A, level 5B & level 6 programmes, by sex	Measures the distributions and concentrations of women and men as graduates from higher education	Eurostat (Education) and DG EAC	Available for 2001
Percentage of Researchers by sex and institutional sector, FTE & HC	Measures the presence, distributions and concentrations of women and men in research	Eurostat (R& D)	Available for 1999-2001
Researchers per thousand labour force by sex and institutional sector	Measures the R&D human resource intensity	Eurostat (CLFS & Benchmarking)	Available for 1999-2001
Scientists and Engineers (ISCO '88 COM, codes 21 and 22) as a percentage of the labour force, by sex	Measures the S&E human resource intensity	Eurostat (CLFS)	Available for 2001
Compound Annual Growth Rate by sex, for HES & GOV(HC and FTE) RSEs (current target years 1998-2001)	Measures the progress of women at the highest level of R&D production and (indirectly) indicates overall impact of W&S activities.	Eurostat (R& D)	Available for 1999-2001
Ratio of ISCED 6 graduates in Year t to "Number of young researchers recruited in universities and public research centres", by sex, HES and GOV in Year t+ 1	Measures the absorption of newly-qualified Ph.D. graduates into public research	Eurostat (Education & Benchmarking)	Not available

Theme 2: Horizontal Segregation

INDICATORS	SCIENTIFIC AND SOCIO- ECONOMIC MEANING	SOURCE	AVAILABILITY
Percentage of graduates from ISCED level 5A , level 5B & level 6 programmes, by field of study and sex	Measures the concentrations of women and men as graduates from higher education and distributions by field of study	Eurostat (Education) and DG EAC	Available for 2001
Feminisation ratio (FR) of researchers by institutional sector and by main field of science	Measures the incidence of female researchers against a benchmark of 100 male researchers	Eurostat (R&D),	Available for 1999-2001
%age distribution of researchers within each main field of science by sex and institutional sector	Illustrates women's and men's presence across the fields of science and provides a basis for comparison.	Eurostat (R&D), WiS database	Available for 1999-2001
Index of Dissimilarity (ID) for researchers by institutional sector and by main field of science, ideally over a number of years	Expresses how far a country is from obtaining an equal gender distribution across all scientific disciplines (is an alternative to GSI).	Eurostat (R&D), WiS database	Available for 1999-2001
HRSTE (successfully completed education at ISCED level 5 or 6 in a S&T field of study) as a percentage of total labour force by sex	Numerator measures the educational attainment of men and women qualified in S&T in the labour force. Indicator measures S&T knowledge intensity	Eurostat (HRST)	Available for 2002
Gender segregation index (GSI) of researchers by field of science and by sector (HES and GOV)	Measures the concentration of men and women in specific fields. Measures how men and women tend to concentrate in specifically "masculine" and "feminine" fields respectively	Eurostat (R&D), WiS database	Available for 1999-2001
Correlation between FR of RSEs and / or R&D personnel and GERD per capita RSE, for each institutional sector and overall	Measures whether the sexes may be polarised in terms of access to research funding and facilities	Eurostat (R&D), WiS database	Medium-term

Theme 3: Vertical Segregation

INDICATORS	SCIENTIFIC AND SOCIO- ECONOMIC MEANING	SOURCE	AVAILABILITY
Ratio of A Grade academic staff: all grades academic staff by sex (initially in the HES, but ideally extended to the other institutional sectors)	Measures the difference between men and women as entrants and as top achievers in academic systems.	WiS database	Available but work still required to improve comparability
Percentage of R&D personnel by sex, occupation and institutional sector, FTE & HC	Enables measurement of the presence, distributions and concentrations of women and men in research	Eurostat (R& D)	Available for 1999-2001
Feminisation rate among the most senior research staff	Measures the difference between men and women at the top of the academic scale	WiS database	Available but work still required to improve comparability
Percentage distribution of R&D personnel by sector and sex		Eurostat R&D	Available for 1999-2001
Probability of being promoted to upper grades (by calculating survival curves)	Assesses any discrimination in selection procedures	Institutional administrative data	Medium-term
Distribution of academic staff throughout the grades, by sex	Measures the difference between men and women at each grade	WiS database	Available but work still required to improve comparability
ID and / or GSI across the grades	Measures the presence and mobility of women in science	WiS database	Available but work still required to improve comparability
RSEs and TECs by highest educational achievement and sex	Will tell us whether women are being under-used – and to what extent this compares with the utilisation of men.		Medium-term
Number of scientific publications and most cited publications by sex	Measures gender patterns in scientific performance and output	Currently, data NOT available by sex.	Long-term

Theme 4: Pay Gap

INDICATORS	SCIENTIFIC AND SOCIO- ECONOMIC MEANING	SOURCE	AVAILABILITY
The GINI coefficient (G)	Measures the dissimilarity in salary by sex for different grades	SES micro data	Medium-term

Theme 5: Fairness and success rate

INDICATORS	SCIENTIFIC AND SOCIO- ECONOMIC MEANING	SOURCE	AVAILABILITY
Research funding success rates by sex	Measures the conversion rates of women and men to obtain grants for which they applied	WiS database	Available but work still required to improve comparability
Percentage of women among members of publicly-managed scientific boards	Reflects the gendering of scientific decision-making	WiS database	Available but work still required to improve comparability
Gender Empowerment Measure for Science (GEMS)	Measures gender (in)equality in 3 key areas: political participation, economic participation, power over economic resources	UNDP HDR, Eurostat/OECD/ WiS	Medium-term
Percentage of employees/researchers on short-term contracts, by sex, in comparison to the overall number	Tells us about job security across the sexes	Institutional administrative data	Long-term
Success rate of applications for research posts by sex	Shows the equity of recruitment	Benchmarking data for successful recruits. No data for applicants at national level	Long-term
Percentage of EPO registered inventors who are women	Tells us something about the gender aspects of how ownership of scientific productivity is claimed.	Currently, data NOT available by sex Source: Eurostat/ EPO/USPTO	Long-term
Sex composition of editorial boards and review panels	Tells us whether women are proportionately represented in terms of ability to judge the work of peer groups	Data from journals and periodicals	Long-term

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At its inaugural meeting in 1999, the Helsinki Group on Women and Science identified the lack of internationally comparable statistics on women and science as a major obstacle to full and informed debate. As a result, a sub-group of statistical correspondents was formed which, in co-operation with the Research DG and Eurostat, has stimulated the mainstreaming of the sex variable into the European R&D surveys.

It is clear from the ensuing data that women are not only under-represented in scientific research, but that they are distributed differently across disciplines and are less likely to be concentrated at the top of academic and research hierarchies. These phenomena are common to every participating European country. This publication explores the data to find other common patterns in the education, recruitment, promotion and participation of women as researchers and scientists.

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