



EUROPEAN
COMMISSION

Community Research

Women and Science
Statistics and Indicators

She Figures 2003



SCIENCE and SOCIETY

European Commission
Directorate-General for Research

Science and Society

“She Figures”

**Women and Science
Statistics and Indicators**



**Europe Direct is a service to help you find answers
to your questions about the European Union**

New freephone number: 00 800 6 7 8 9 10 11

LEGAL NOTICE

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of the following information.

A great deal of additional information on the European Union is available on the Internet.

It can be accessed through the Europa server (<http://europa.eu.int>).

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

Luxembourg: Office for Official Publications of the European Communities, 2003

ISBN 92-894-5812-7

© European Communities, 2003

Reproduction is authorised provided the source is acknowledged.

Printed in Belgium

PRINTED ON WHITE CHLORINE-FREE PAPER

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.



A handwritten signature in black ink, consisting of a large, stylized 'P' followed by several horizontal strokes and a final flourish.

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.
- Ruth Springham, Séverine Kohl and Cécile Contal for preparing and compiling the data and calculating the indicators.
- Adele Menniti and Rossella Palomba of the Research Institute for Population and Social Policy, Rome, for preparation of the texts.
- Judith Glover of University of Surrey Roehampton, UK and Eeva-Sisko Veikkola, retired from Statistics Finland for their input and expertise.
- Ward Ziarko of the Belgian Federal Service for Scientific, Technical and Cultural Affairs; Giulio Perani from ISTAT, Italy; Jetty Faber from the Ministry of Education, Culture and Science, the Netherlands; Andrea Knop from Statistics Austria; Isabel Gonçalves from the Observatório das Ciências e das Tecnologias, Portugal; Anna Bengtsson of Statistiska Centralbyrån, Sweden; and Georgios Dogoritís from the Statistical Service of Cyprus for provision and verification of data.
- Alex Simpson and Christophe Zerr for the preparation of S&E and HRST data, and Claudine Greiveldinger for verification of the education data.
- Mary Dunne, Simona Frank, August Götzfried, Ibrahim Laafia, Anna Larsson, Jean-Louis Mercy, Spyros Pilos, Guido Strack and Karin Winqvist at Eurostat for providing data and advice.
- Ugur Muldur, Fotini Chiou, Angela Hullmann, Marianne Paasi and Anastassia Vakalopoulou of Unit K3, “Competitiveness, economic analysis and indicators” in the Directorate-General for Research for their advice and support.
- Brigitte Degen, Johannes Klumpers and Stephen Parker of the Science and Society Directorate for their editorial comments.
- 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 tests¹ 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 (χ^2)

Table of contents

| | |
|------------------------------------------------------------------|-----------|
| LIST OF TABLES AND FIGURES | 11 |
| GENERAL INTRODUCTION | 14 |
| CHAPTER 1. The critical mass | 19 |
| Advanced Research Graduates (ISCED 6) | 23 |
| Human Resources in Science and Technology (HRST) | 26 |
| Scientists and Engineers (S&E) | 27 |
| Researchers (RSEs) | 28 |
| CHAPTER 2. Gender differences across scientific fields | 40 |
| Advanced Research Graduates (ISCED 6) | 43 |
| Researchers | 47 |
| CHAPTER 3. Seniority in academia and R&D | 59 |
| Academic staff | 62 |
| Research and Development Personnel | 67 |
| CHAPTER 4. Gender equity in setting the scientific agenda | 72 |
| Research funding applicants and beneficiaries | 74 |
| Scientific boards | 75 |

Table of contents

| | |
|----------------------------------------------------------------------------|-----|
| ANNEX 1 | 77 |
| Data relating to Chapter 1 | |
| ANNEX 2 | 82 |
| Data relating to Chapter 2 | |
| ANNEX 3 | 90 |
| Data relating to Chapter 3 | |
| ANNEX 4 | 95 |
| Data relating to Chapter 4 | |
| ANNEX 5 | 97 |
| Methodological Notes | |
| ANNEX 6 | 107 |
| Women & Science Indicators list | |
| ANNEX 7 | 111 |
| The Helsinki Group on Women & Science - List of Statistical Correspondents | |
| REFERENCES | 114 |

List of Tables and Figures

CHAPTER 1. The critical mass

| | | |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Figure 1.1.a | Percentage of ISCED 6 graduates who are women in EU Member States, 2001 | 23 |
| Figure 1.1.b | Percentage of ISCED 6 graduates who are women in Associated Countries, 2001 | 23 |
| Figure 1.2.a | Compound annual growth rate of ISCED 6 graduates by sex in EU Member States, 1998-2001 | 24 |
| Figure 1.2.b | Compound annual growth rate of ISCED 6 graduates by sex in Associated countries, 1998-2001 | 25 |
| Figure 1.3.a | Percentage of HRSTE who are HRSTC by sex, EU Member States, 2002 | 26 |
| Figure 1.3.b | Percentage of HRSTE who are HRSTC by sex, Associated countries, 2002 | 26 |
| Figure 1.4 | Distribution of Scientists and Engineers by sex as a percentage of the total labour force, EU Member States, 2001 | 27 |
| Figure 1.5.a | Distribution of researchers per thousand labour force by sex in EU Member States, HC, 1999 | 28 |
| Figure 1.5.b | Distribution of researchers per thousand labour force by sex in Associated Countries, HC, 2000 | 28 |
| Figure 1.6.a | Percentage of researchers who are women by sector in EU Member States, HC, 2000 | 29 |
| Figure 1.6.b | Percentage of researchers who are women by sector in Associated Countries, HC, 2000 | 30 |
| Table 1.1.a | Distribution of researchers by sector and by sex in EU Member States, HC, 1999 | 31 |
| Table 1.1.b | Distribution of researchers by sector and by sex in Associated Countries, HC, 2000 | 32 |
| Table 1.2 | Number of researchers in PNP sector by sex; percentage women; FR; RSEs in PNP as a percentage of RSEs in all sectors in available countries, HC, 2000 | 33 |
| Figure 1.7.a | Compound annual growth rate of researchers in HES by sex in EU Member States, HC, 1998-2001 | 35 |
| Figure 1.7.b | Compound annual growth rate of researchers in HES by sex in Associated Countries, HC, 1998-2001 | 36 |
| Figure 1.8.a | Compound annual growth rate of researchers in GOV by sex in EU Member States, HC, 1997-2000 | 37 |
| Figure 1.8.b | Compound annual growth rate of researchers in GOV by sex in Associated Countries, HC, 1998-2001 | 38 |
| Figure 1.9.a | Compound annual growth rate of researchers in BES by sex in EU Member States, HC, 1997-1999 | 39 |
| Figure 1.9.b | Compound annual growth rate of researchers in BES by sex in Associated Countries, HC, 1998-2001 | 39 |

CHAPTER 2. Gender differences across scientific fields

| | | |
|--------------|-----------------------------------------------------------------------------------------------------------|----|
| Table 2.1.a | Percentage of ISCED 6 graduates who are women by broad field of study in EU Member States, 2001 | 43 |
| Table 2.1.b | Percentage of ISCED 6 graduates who are women by broad field of study in Associated Countries, 2001 | 44 |
| Figure 2.1.a | Distribution of ISCED 6 graduates across the broad fields of study by sex in EU Member States, 2001 | 45 |
| Figure 2.1.b | Distribution of ISCED 6 graduates across the broad fields of study by sex in Associated Countries, 2001 | 46 |
| Table 2.2.a | Percentage of researchers who are women by field of science in HES in EU Member States, HC, 1999 | 47 |
| Table 2.2.b | Percentage of researchers who are women by field of science in HES in Associated Countries, FTE, 2000 | 48 |
| Figure 2.2.a | Distribution of researchers across the fields of science in HES by sex in EU Member States, HC, 1999 | 49 |
| Figure 2.2.b | Distribution of researchers across the fields of science in HES by sex in Associated Countries, FTE, 2000 | 50 |
| Table 2.3.a | Percentage of researchers who are women by field of science in GOV in EU Member States, FTE, 1999 | 51 |
| Table 2.3.b | Percentage of researchers who are women by field of science in GOV in Associated Countries, FTE, 2000 | 52 |
| Figure 2.3.a | Distribution of researchers across the fields of science in GOV by sex in EU Member States, FTE, 1999 | 53 |

| | | |
|--------------|-----------------------------------------------------------------------------------------------------------|----|
| Figure 2.3.b | Distribution of researchers across the fields of science in GOV by sex in Associated Countries, FTE, 2000 | 54 |
| Table 2.4.a | Percentage of researchers who are women by NACE category in BES in EU Member States, HC, 1999 | 55 |
| Table 2.4.b | Percentage of researchers who are women by NACE category in BES in Associated Countries, HC, 2001 | 55 |
| Figure 2.4.a | Distribution of researchers across NACE categories in BES by sex in EU Member States, HC, 1999 | 56 |
| Figure 2.4.b | Distribution of researchers across NACE categories in BES by sex in Associated Countries, HC, 2001 | 56 |
| Table 2.5.a | Index of Dissimilarity and Feminisation Ratio for researchers in HES in EU Member States, HC, 1999 | 58 |
| Table 2.5.b | Index of Dissimilarity and Feminisation Ratio for researchers in HES in Associated Countries, FTE, 2000 | 58 |

CHAPTER 3. Seniority in academia and R&D

| | | |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Figure 3.1.a | Feminisation Ratio among senior academic staff (grade A) in EU Member States, HC, 2000 | 62 |
| Figure 3.1.b | Feminisation Ratio among senior academic staff (grade A) in Associated Countries, HC, 2001 | 62 |
| 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 | 64 |
| 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 | 64 |
| Table 3.2 | Percentage of grade A staff who are women by main field of science in all available countries, HC, 2001 | 65 |
| Figure 3.2.a | Distribution of grade A staff across the fields of science by sex in EU Member States, HC, 2000 | 66 |
| Figure 3.2.b | Distribution of grade A staff across the fields of science by sex in Associated Countries, HC, 2001 | 66 |
| Table 3.3.a | Distribution of R&D personnel across the occupations by sector and sex in EU Member States, HC, 2000 | 67 |
| Table 3.3.b | Distribution of R&D personnel across the occupations by sector and sex in Associated Countries, HC, 2000 | 68 |
| Figure 3.3 | Scatter plot of the Feminisation Ratios of researchers and technicians in HES, all countries, HC 2000 | 70 |
| Figure 3.4 | Scatter plot of the Feminisation Ratios of researchers and technicians in GOV, all countries, HC, 2000 | 70 |
| Figure 3.5 | Scatter plot of the Feminisation Ratios of researchers and technicians in BES, all countries, HC, 2000 | 71 |

CHAPTER 4. Gender equity in setting the scientific agenda

| | | |
|--------------|-----------------------------------------------------------------------------------------------------|----|
| Figure 4.1.a | Research funding success rates in EU Member States, 2001 | 75 |
| Figure 4.1.b | Research funding success rates in Associated countries, 2001 | 75 |
| Figure 4.2.a | Percentage of women on scientific boards (academies and universities) in EU Member States, 2001 | 76 |
| Figure 4.2.b | Percentage of women on scientific boards (academies and universities) in Associated countries, 2001 | 76 |

ANNEX 1

| | | |
|-------------|----------------------------------------------------------------------------|----|
| Annex 1.1.a | Number of ISCED 6 graduates by sex in EU Member States, 1998-2001 | 78 |
| Annex 1.1.b | Number of ISCED 6 graduates by sex in Associated Countries, 1998-2001 | 78 |
| Annex 1.2.a | Number of researchers in HES by sex in EU Member States, HC, 1997-2001 | 79 |
| Annex 1.2.b | Number of researchers in HES by sex in Associated Countries, HC, 1997-2001 | 79 |
| Annex 1.3.a | Number of researchers in GOV by sex in EU Member States, HC, 1997-2001 | 80 |
| Annex 1.3.b | Number of researchers in GOV by sex in Associated Countries, HC, 1997-2001 | 80 |
| Annex 1.4.a | Number of researchers in BES by sex in EU Member States, HC, 1997-2001 | 81 |
| Annex 1.4.b | Number of researchers in BES by sex in Associated Countries, HC, 1997-2001 | 81 |

ANNEX 2

| | | |
|-------------|--------------------------------------------------------------------------------------------------|----|
| Annex 2.1.a | Number of ISCED 6 graduates by broad field of study and sex in EU Member States, 2001 | 82 |
| Annex 2.1.b | Number of ISCED 6 graduates by broad field of study and sex in Associated Countries, 2001 | 83 |
| Annex 2.2.a | Number of researchers by main field of science and sex in HES in EU Member States, HC, 1999 | 84 |
| Annex 2.2.b | Number of researchers by main field of science and sex in HES in Associated Countries, FTE, 2000 | 85 |
| Annex 2.3.a | Number of researchers by main field of science and sex in GOV in EU Member States, FTE, 1999 | 86 |
| Annex 2.3.b | Number of researchers by main field of science and sex in GOV in Associated Countries, FTE, 2000 | 87 |
| Annex 2.4.a | Number of researchers by NACE category and sex in BES in EU Member States, HC, 1999 | 88 |
| Annex 2.4.b | Number of researchers by NACE category and sex in BES in Associated Countries, HC, 2001 | 89 |

ANNEX 3

| | | |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------|----|
| 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 | 90 |
| 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 | 90 |
| Annex 3.2.a | Number of grade A academic staff by main field of science and sex in EU Member States, HC, 2000 | 91 |
| Annex 3.2.b | Number of grade A academic staff by main field of science and sex in Associated Countries, HC, 2001 | 92 |
| Annex 3.3.a | Number of R&D personnel by sector, occupation and sex in EU Member States, HC, 2000 | 93 |
| Annex 3.3.b | Number of R&D personnel by sector, occupation and sex in Associated Countries, HC, 2000 | 94 |

ANNEX 4

| | | |
|-------------|-------------------------------------------------------------------------------------------------------|----|
| Annex 4.1.a | Number of applicants and beneficiaries of research funding by sex in EU Member States, 2001 | 95 |
| Annex 4.1.b | Number of applicants and beneficiaries of research funding by sex in Associated countries, 2001 | 95 |
| Annex 4.2.a | Number of women and men on scientific boards (academies and universities), EU Member States, 2001 | 96 |
| Annex 4.2.b | Number of women and men on scientific boards (academies and universities), Associated Countries, 2001 | 96 |

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 researchers¹.

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 debate².

It was therefore decided to form a sub-group of Statistical Correspondents³ 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 science⁴ 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,

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

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 equality⁵. In the specific case of Women and Science, it was given added impetus by a Commission communication⁶, two European Research Council resolutions⁷ and two European Parliament Resolutions⁸.

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 (RR431754EN.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".

⁹Approved 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 services¹⁰.

¹⁰This 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.

19

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 period¹. 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-age² 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 technician³ 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. 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 women⁴. 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 1999⁵, 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 occurred⁶. 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.

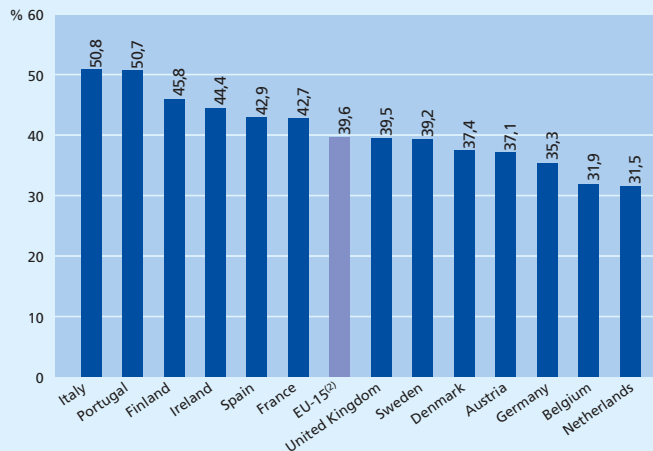
⁴ European Commission, (2003)

⁵ See http://europa.eu.int/comml/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

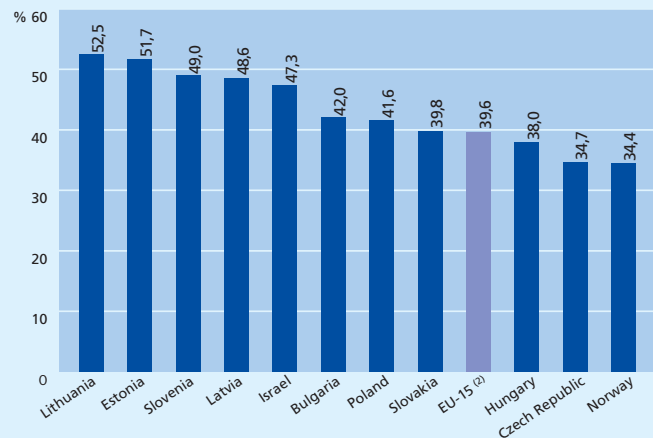
⁽²⁾EU-15 estimate excludes EL and LU. Above exceptions to reference year apply

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.

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

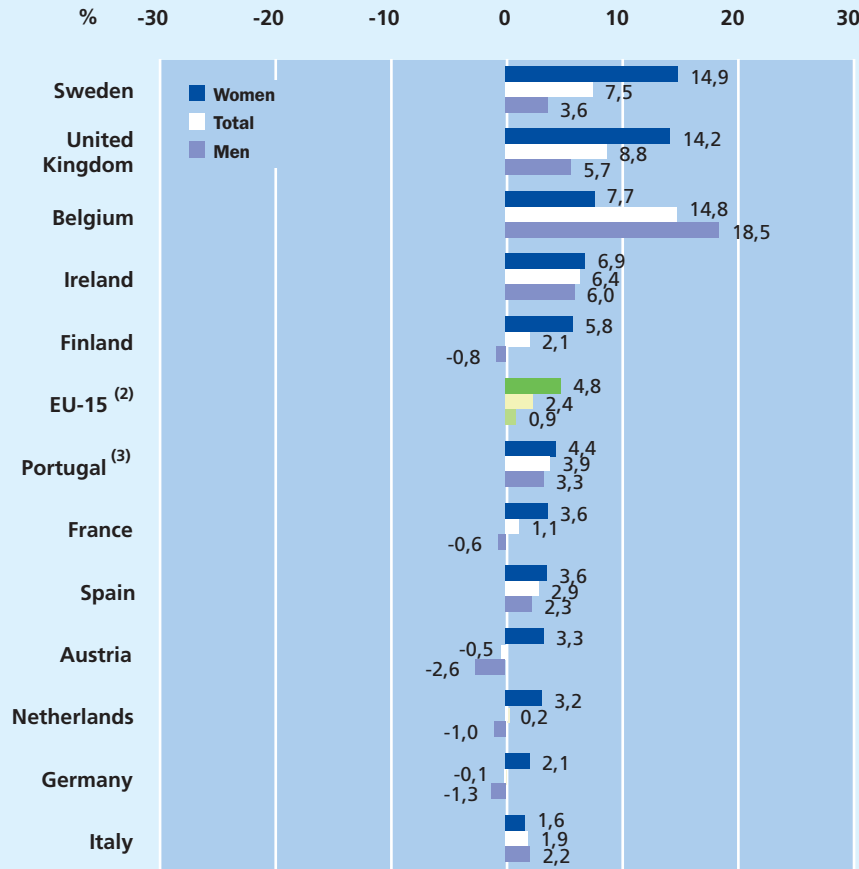
⁽²⁾EU-15 estimate excludes EL and LU. Exceptions to reference year as in Figure 1.1 a

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

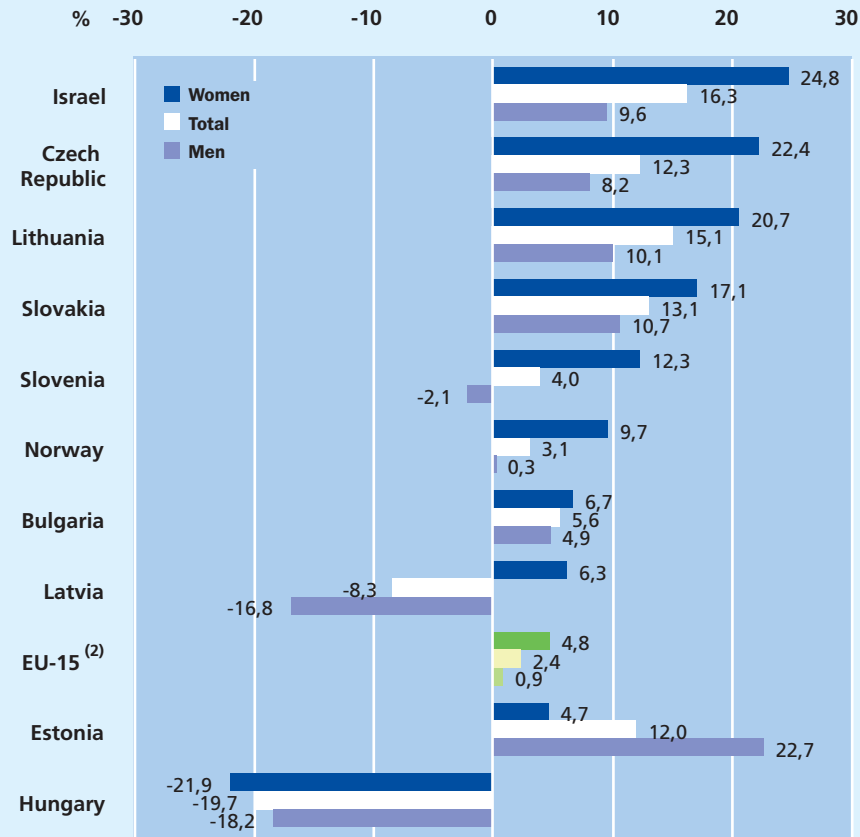
Notes: ⁽¹⁾Exceptions to the reference year: BE: 2000-2001; DK: 1999-2000; FR, IT, FI: 1998-2000,

⁽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.

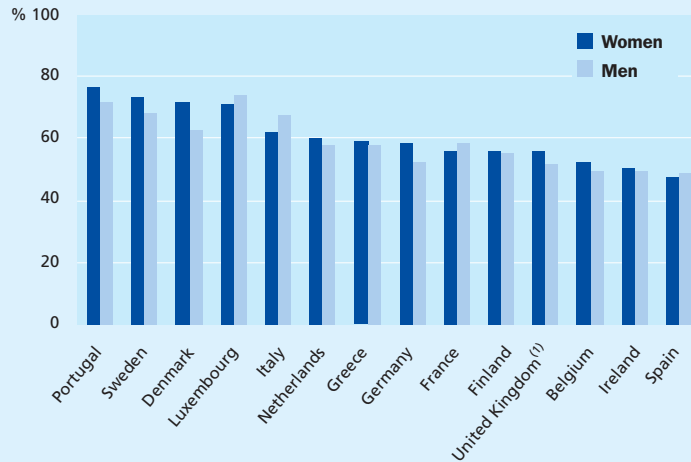
Source: Eurostat, Education; Israel Central Bureau of Statistics & Council for Higher Education

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

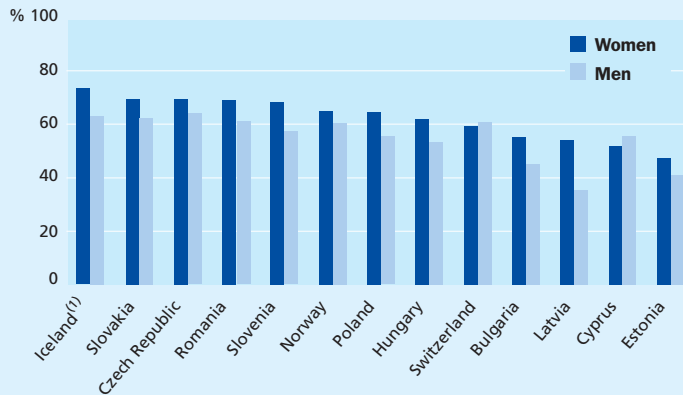
Percentage of HRSTE who are HRSTC by sex, EU Member States, 2002



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

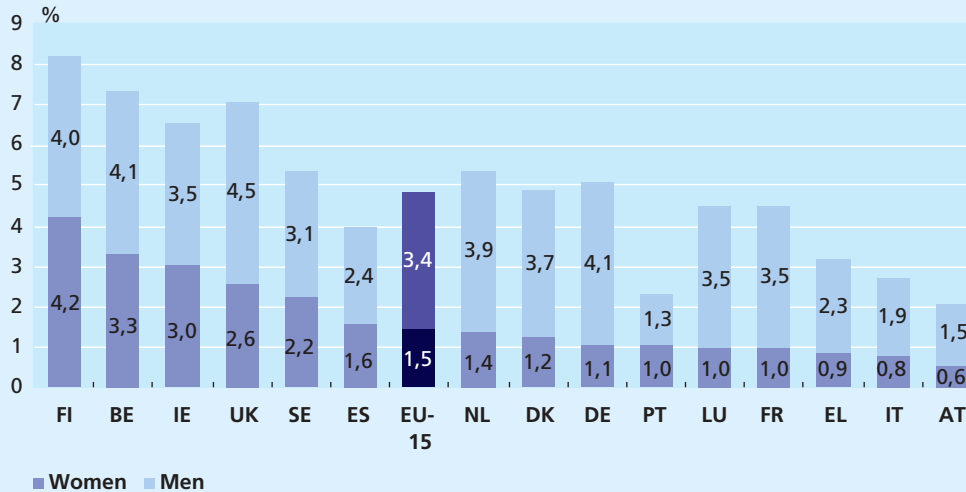


In the Accession Countries women constitute on average 54.2% of HRSTE and 57.5% of HRSTC. Furthermore, 53.4% of HRSTE who are HRSTC are women. After enlargement, the Accession Countries will boost the HRSTC stocks by 17.9% (women) and 12.4% (men), bringing the new EU-25 average of HRSTE that are HRSTC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



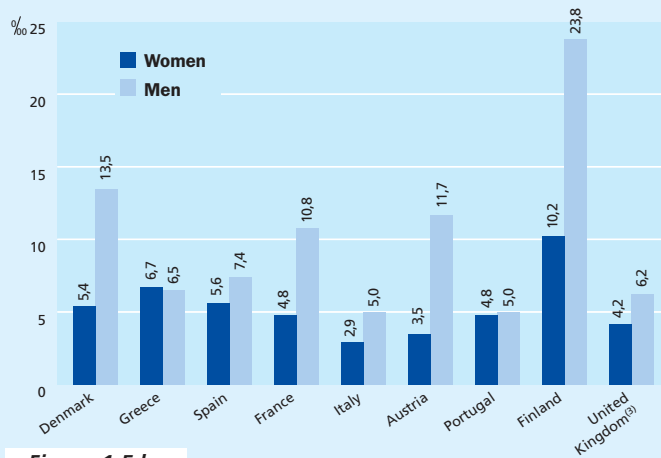
Source: Eurostat, S&T statistics, Community Labour Force data. Graph adapted from Statistics in Focus, Catalogue No. KS-NS-03-005-EN-C

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

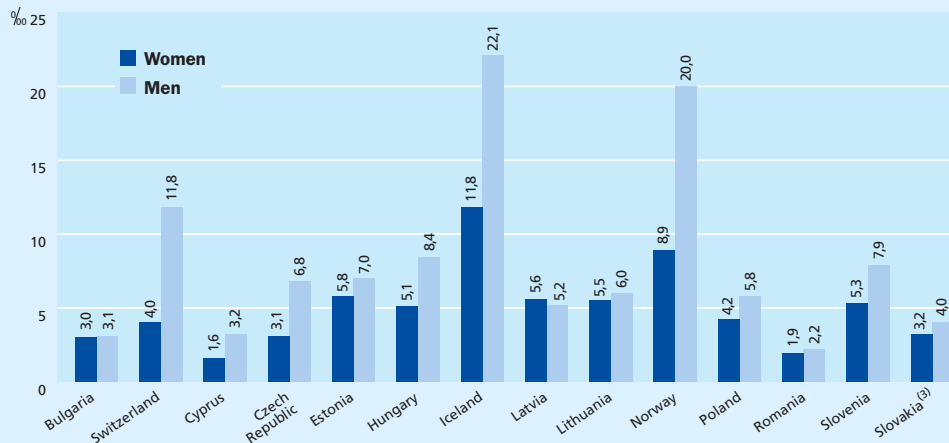
Notes: ⁽¹⁾Exceptions to the reference year: FR, FI: 2000; AT (RSEs only): 1998

⁽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

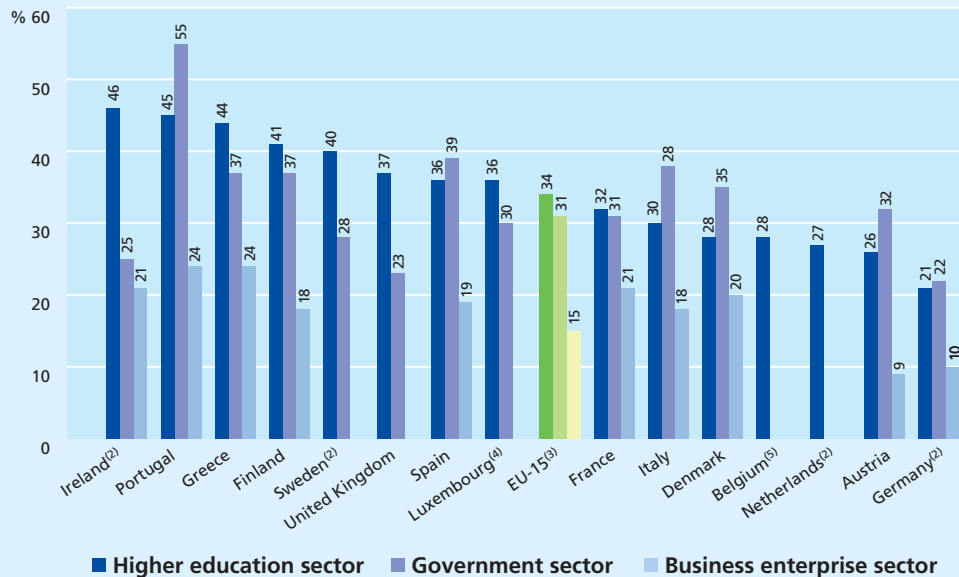
Notes: ⁽¹⁾Exceptions to the reference year: CZ, HU, LT, NO, RO, SK: 2001; IS: 1999

⁽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⁾



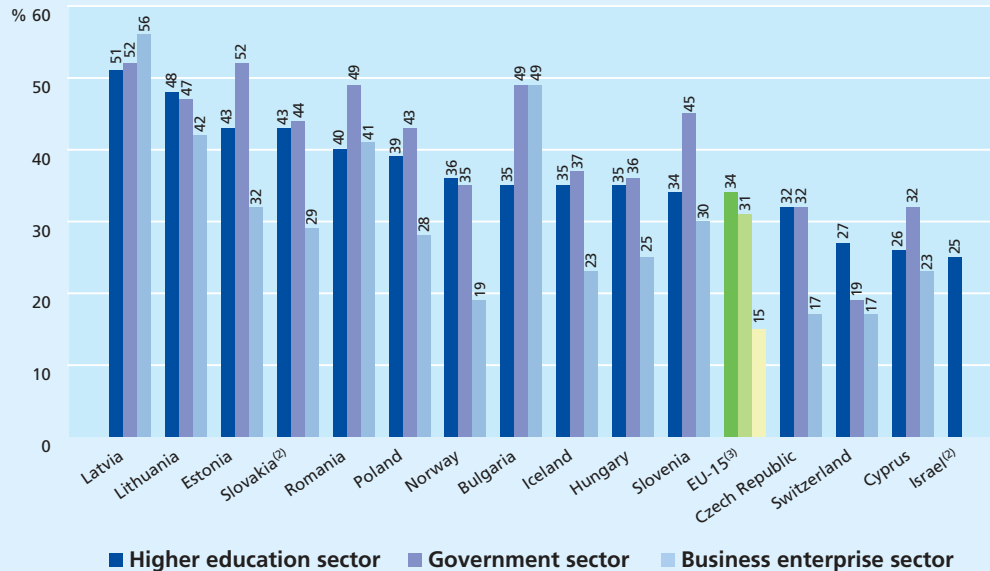
Source: Eurostat, S&T statistics; DG Research, WiS database

- 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 ⁽²⁾ |
|-------------------------|-------|-------------------------|-------------------|----------------------------|----------------------------------|
| 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

Number of researchers in PNP sector by sex; percentage women; FR; RSEs in PNP as a percentage of RSEs 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.

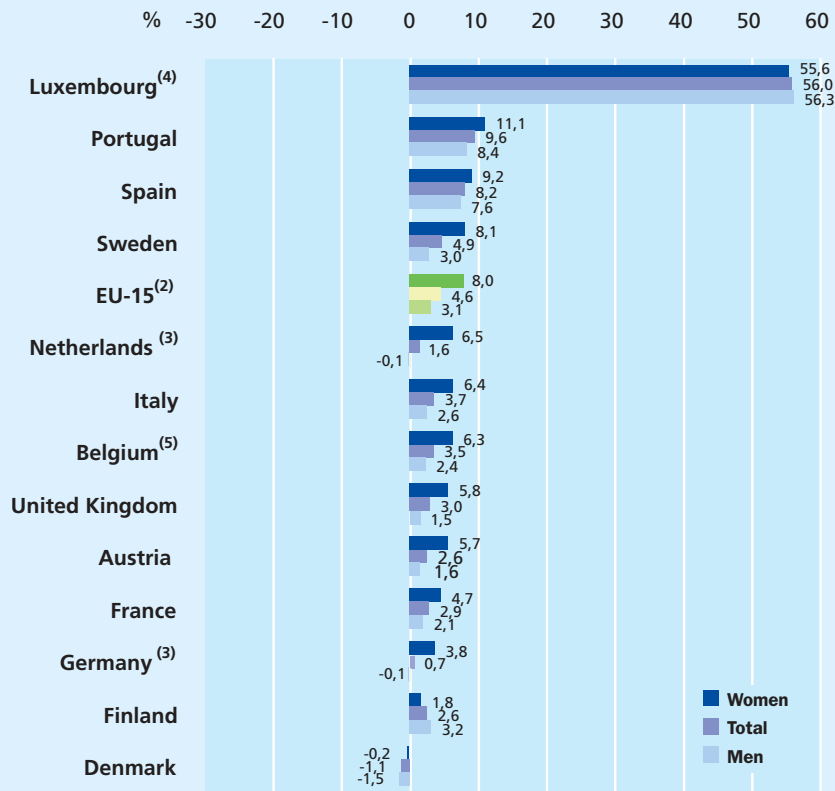
The formula is the following:
$$\left(\sqrt[y-x]{\frac{P_y}{P_x}} - 1 \right) \times 100$$

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

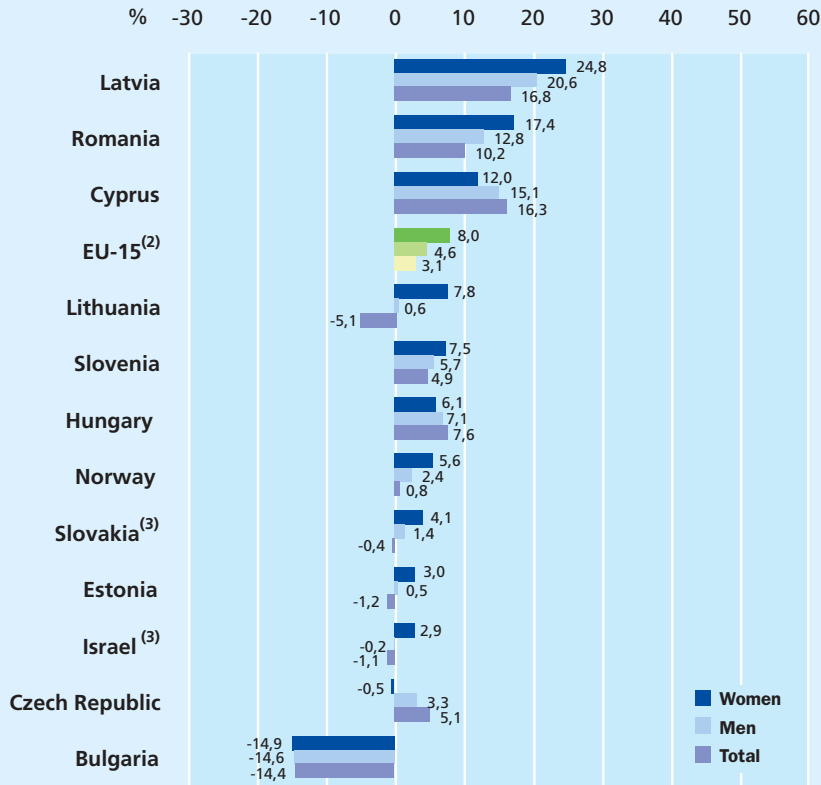
⁽³⁾FTE as exception to HC

⁽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

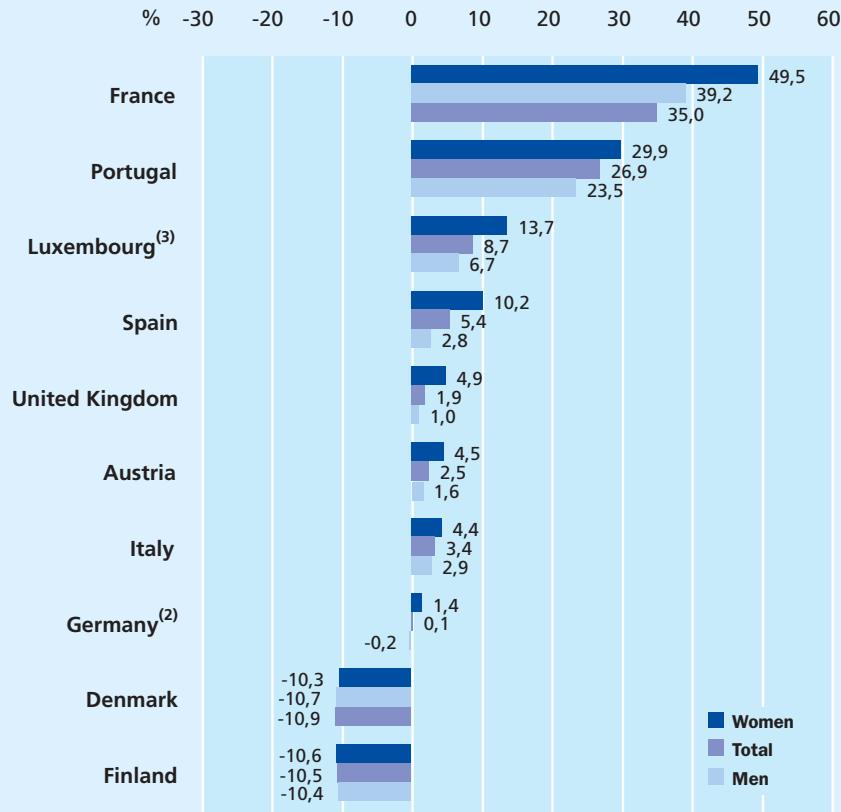
Notes: ⁽¹⁾Exceptions to the reference years: BG, SI: 1997-2000; CY: 1998-2000; CZ, LV, LT: 2000-2001; EE: 1999-2000; NO: 1997-2001

⁽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⁾

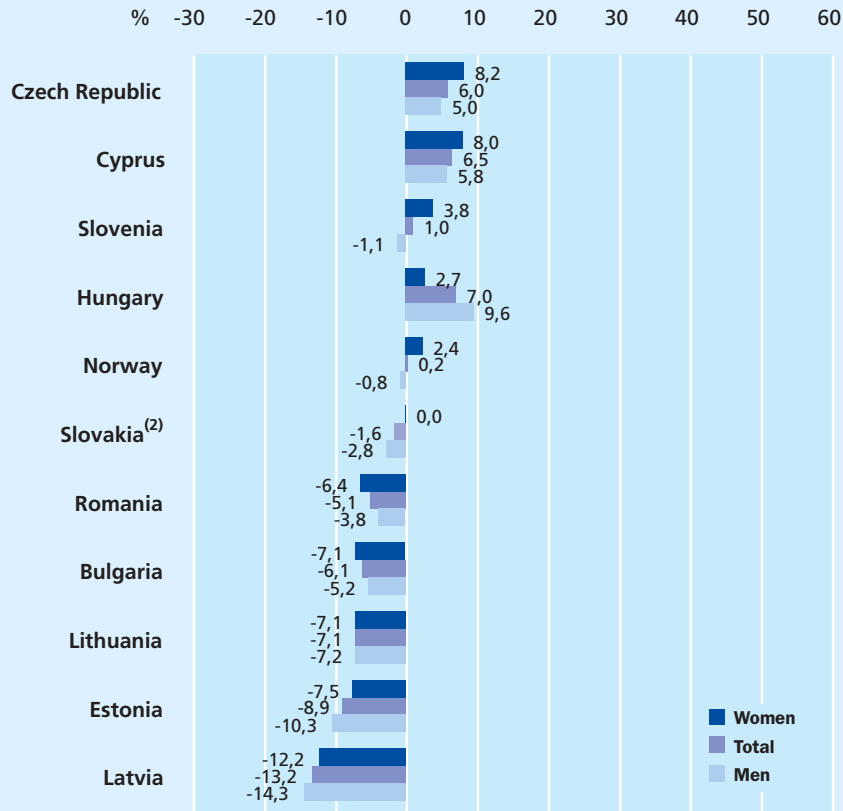


Researchers in Government institutions in most EU countries are also experiencing growth and again, the trend is generally stronger for women than for men. The context of this growth must be reviewed with the variable significance of the GOV sector across the Member States in mind. For example, in 1999, 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.

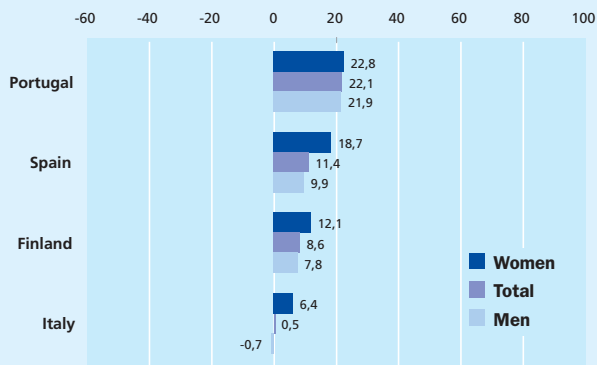
Source: Eurostat, S&T statistics; DG Research, WiS database

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⁾



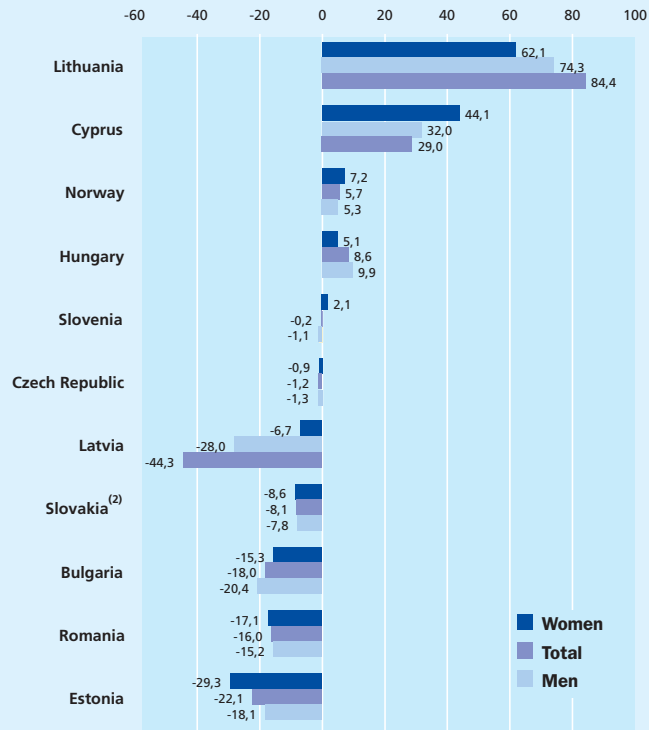
Source: Eurostat, S&T statistics; DG Research, WiS database
 Notes: ⁽¹⁾Exceptions to the reference years: IT, FI: 1999-2000
⁽²⁾FTE as exception to HC

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 dissimilarities¹ 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 countries² 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&E³ 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

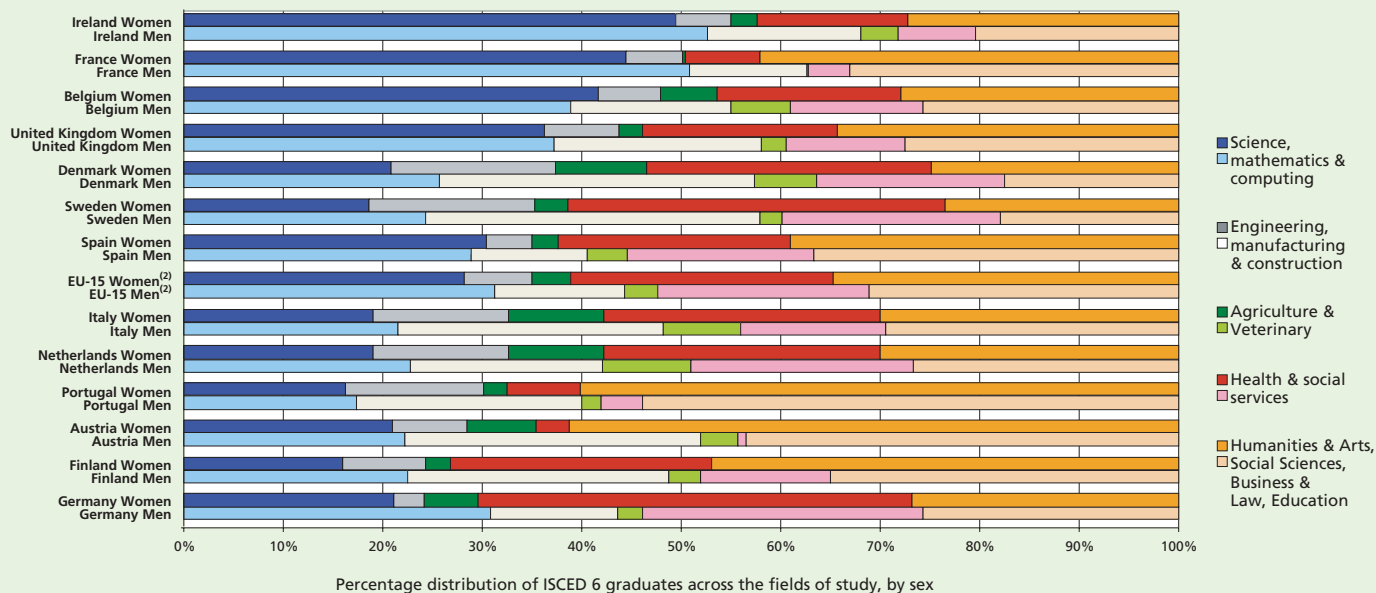
Notes: ⁽¹⁾Exceptions to the reference year: IL: 1999; CY: 2000

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⁾



Source: Eurostat, Education

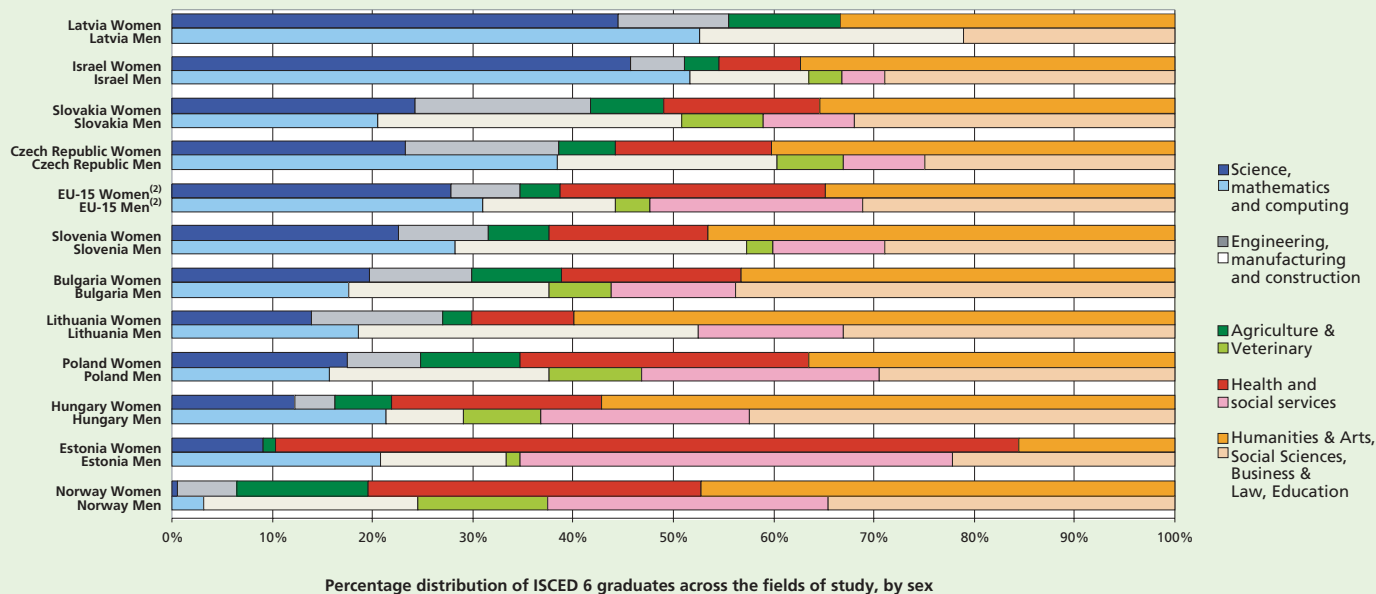
Notes: ⁽¹⁾Exceptions to the reference year: DK, FR, IT, FI: 2000

⁽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⁾



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 |

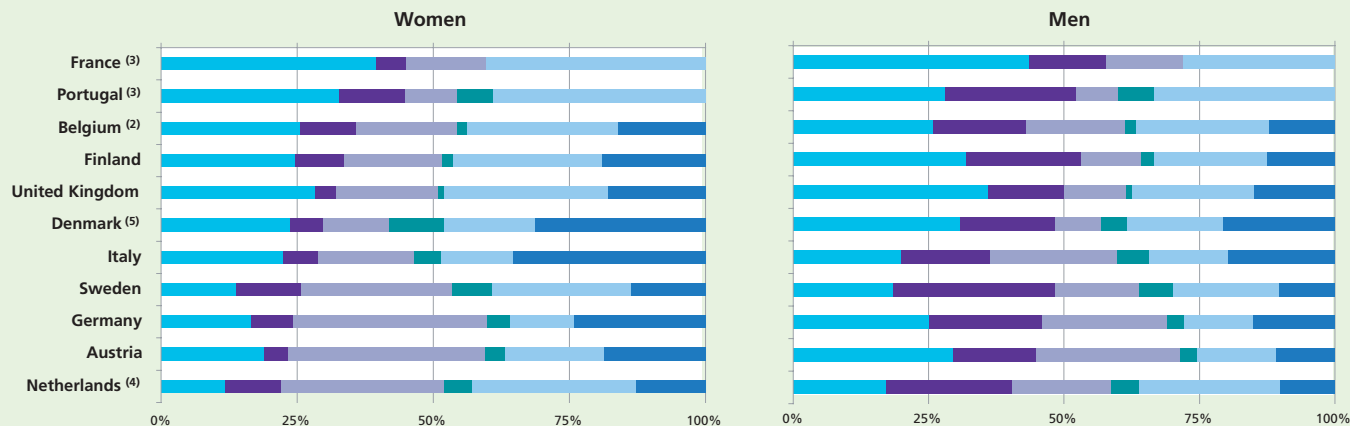
Source: Eurostat, S&T statistics; DG Research, WiS database

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

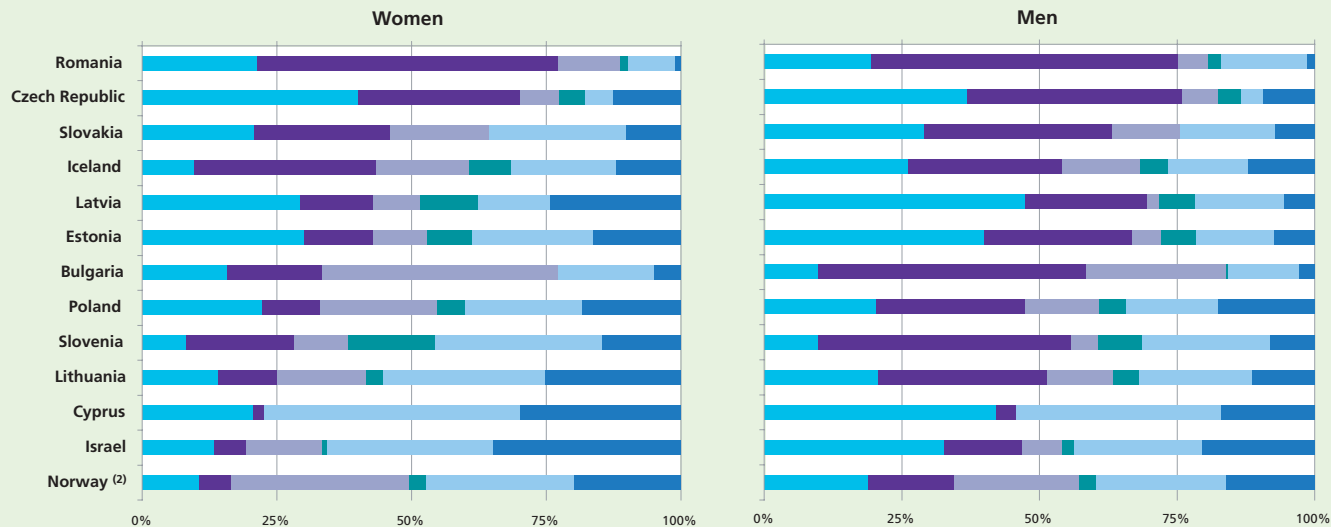
⁽⁵⁾Definition of HES coverage differs slightly from Annex Table 1.2.a

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

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

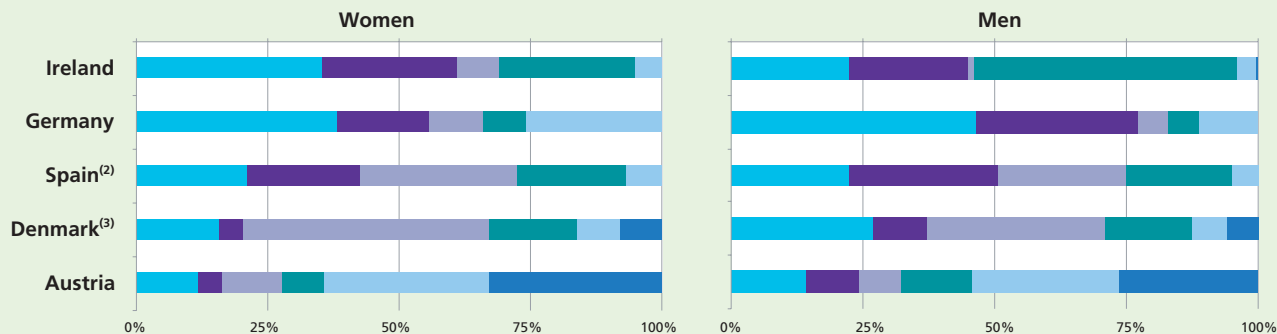
Notes: ⁽¹⁾ Exceptions to the reference year: LT, NO: 2001; IS, LV: 1999

⁽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

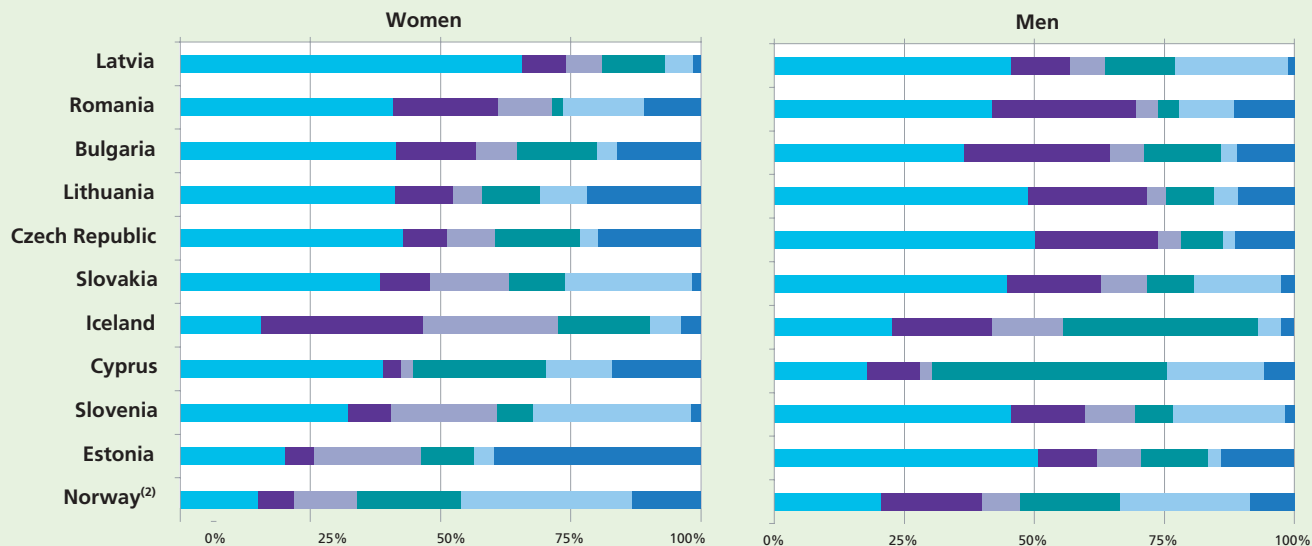
⁽³⁾Definition of GOV coverage differs slightly from Annex Table 1.3.a

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

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

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

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

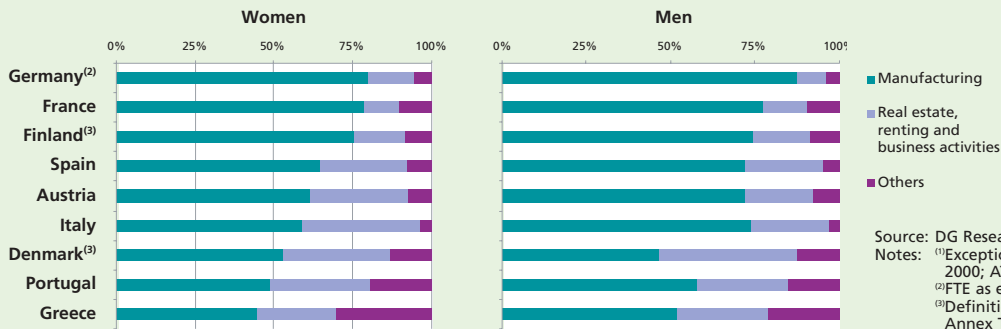
⁽²⁾FTE as exception to HC

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

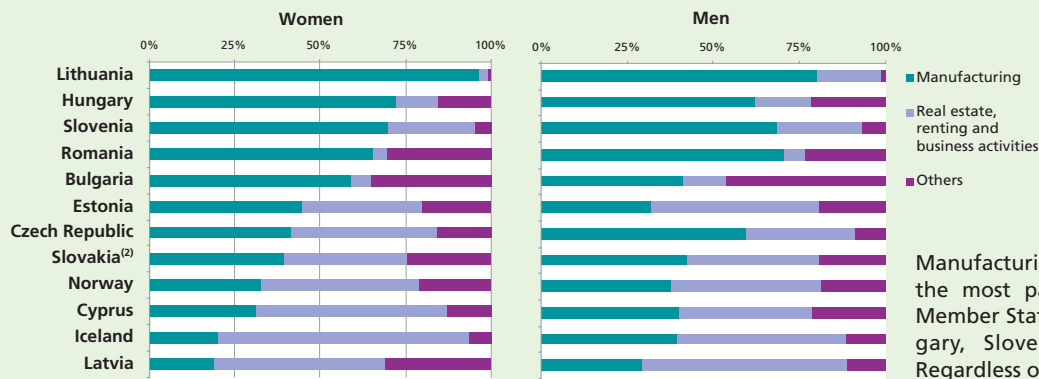
Distribution of researchers across NACE categories in BES by sex in EU Member States, HC, 1999⁽¹⁾



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⁾



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.

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 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: $ID = \frac{1}{2} \sum_i \left| \frac{F_i}{F} - \frac{M_i}{M} \right|$

Where: i denotes each occupation

F_i is the number of women researchers in each occupation

M_i 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 concentration¹ in academia and at vertical dissimilarity² 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.

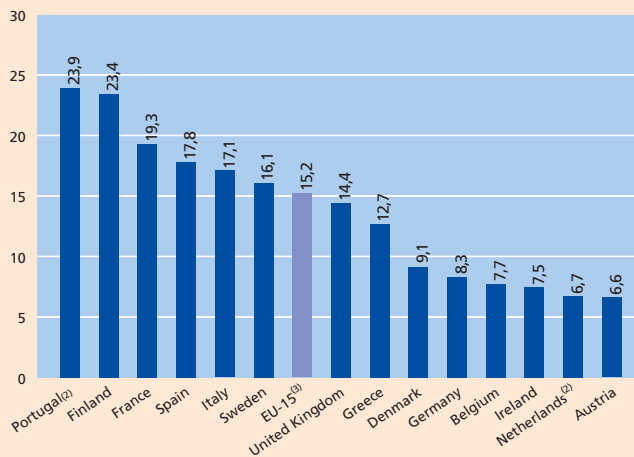
There are also high levels of vertical dissimilarity among R&D personnel in many countries, but the pattern varies across the sectors. The relationship between occupations seems to depend on the institutional sector and the group of countries. This is mostly due to low proportions of women as researchers 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

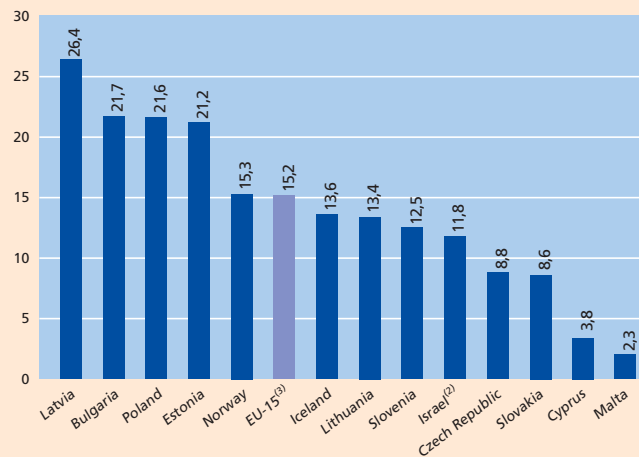
⁽²⁾FTE as exception to HC

⁽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.

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 (FR_i). 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:

$$FR_i = (F_i/M_i)*100$$

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⁾

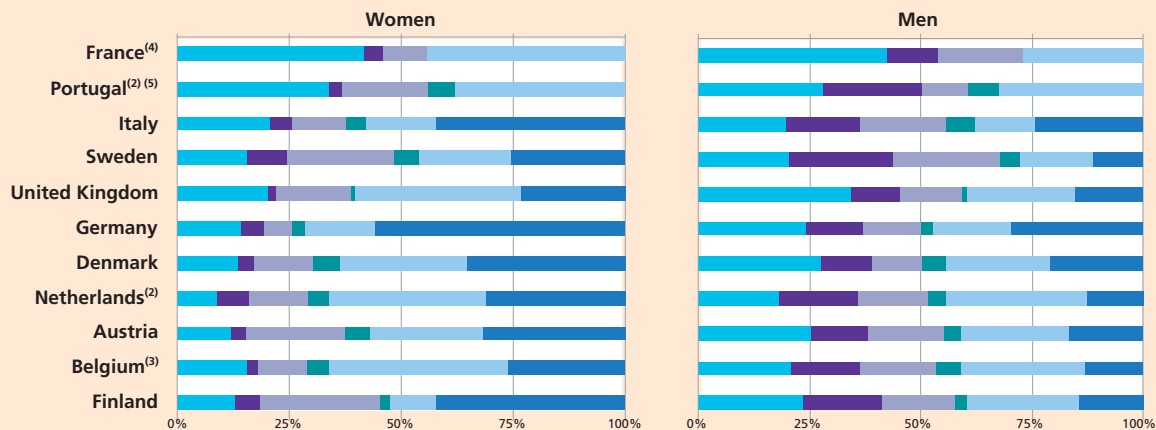


Figure 3.2.b

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

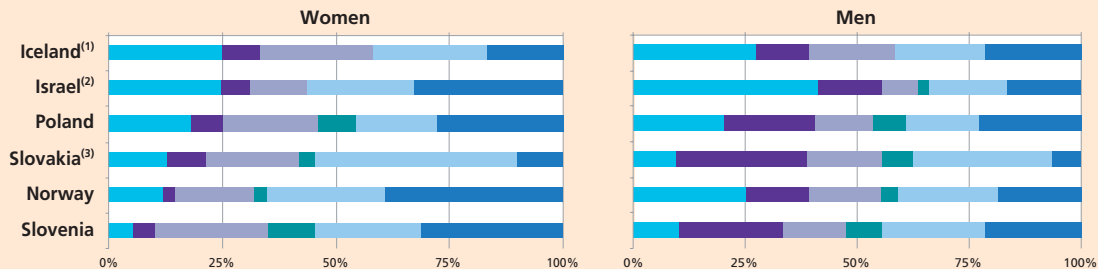


Table 3.3.a

| 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 ⁽³⁾ | 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.

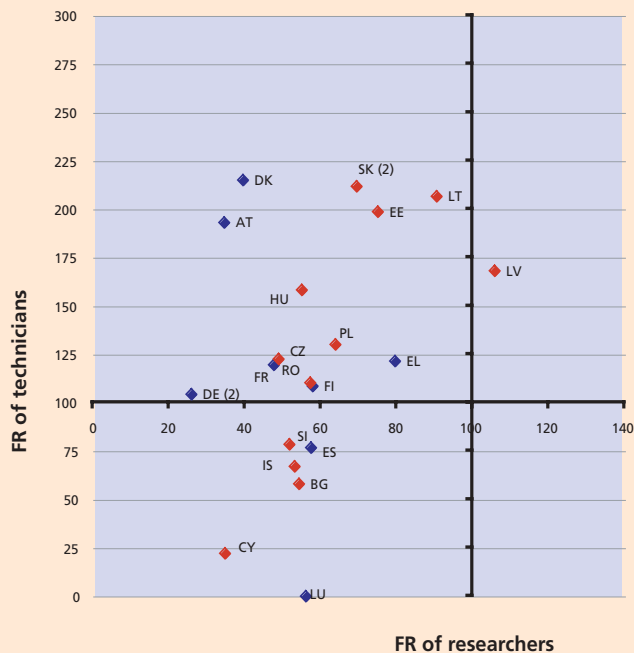
The graphs are therefore composed of four quadrants in which countries can be positioned. Each of the quadrants shows a 'type' of situation:

| | | |
|-----------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| 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

Figure 3.3

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



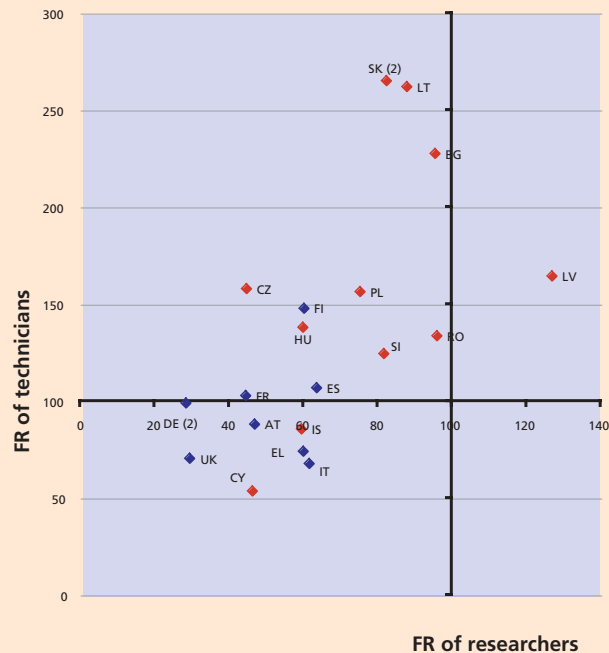
Source: Eurostat, S&T statistics

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⁾



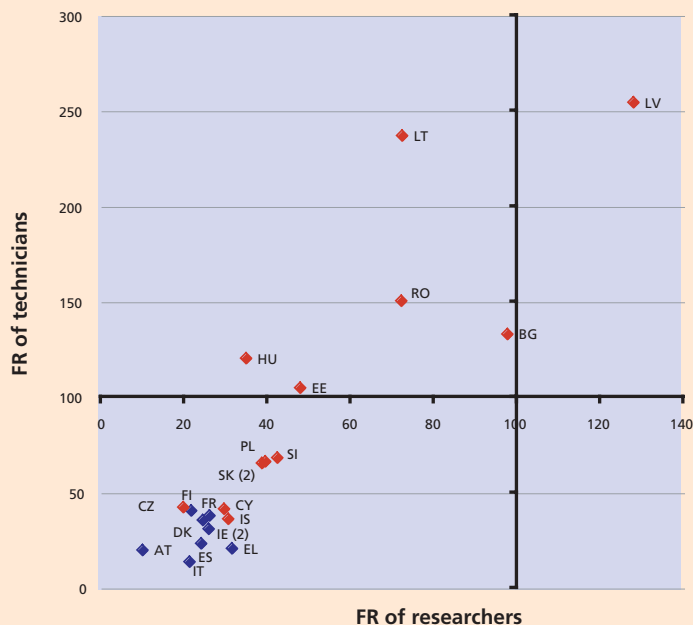
Source: Eurostat, S&T statistics

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 ($r = \text{minus } 36\%$) 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 significant¹ 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.*

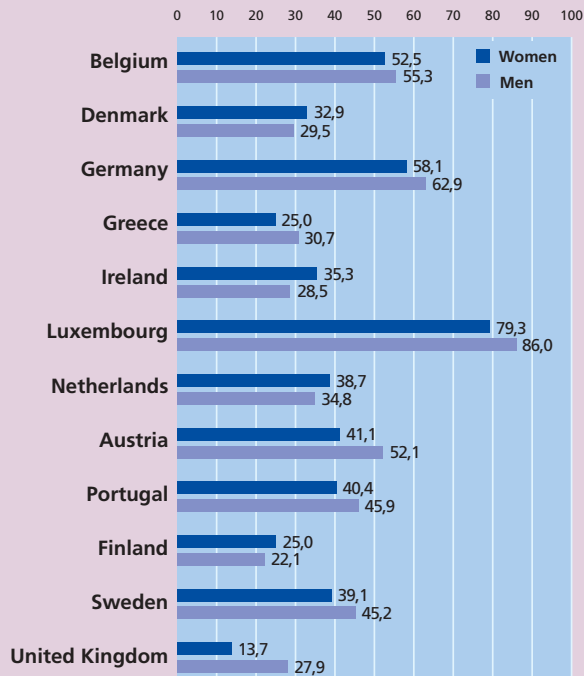
Boards

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⁾

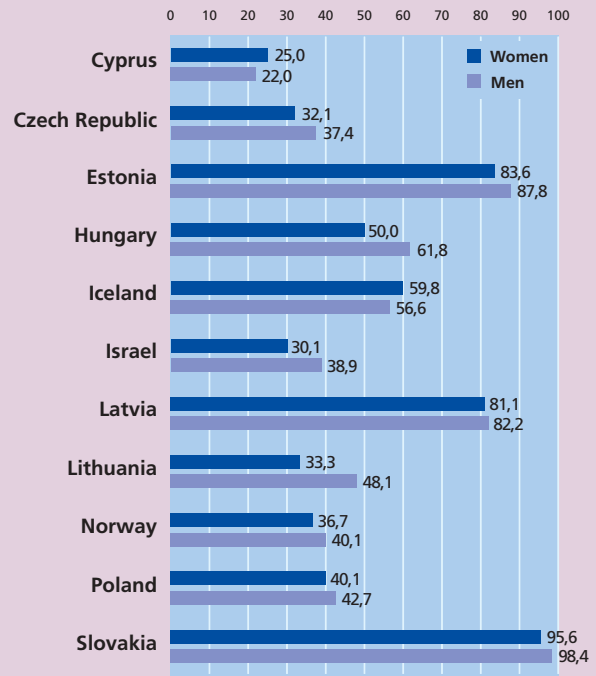


Source: DG Research, WiS database

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⁾



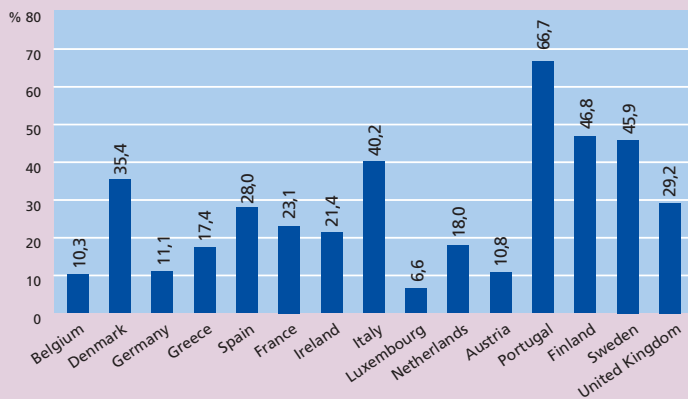
Source: DG Research, WiS database

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⁾



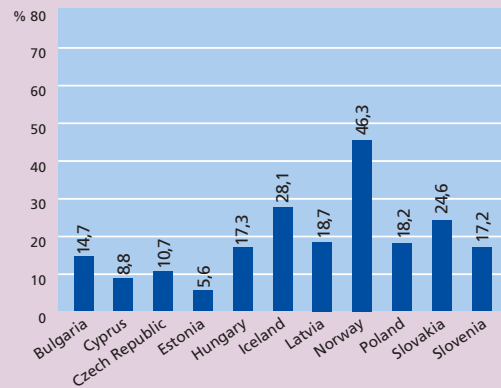
Source: DG Research, WiS database

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 ^(a) | 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 ^(a) | 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 ^(a) | Women | : | : | : | 9 | 14 |
| | Men | : | : | : | 16 | 25 |
| | Total | : | : | : | 25 | 39 |
| Netherlands ^(a) | 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: ^(a)FTE as exception to HC

^(b)Data provisional

^(c)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 ^(a) | 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 ^(a) | 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: ^(a)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

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

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

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 A5; 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

| 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 | : | : |

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

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

| 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 ^(a) | 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 |

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

Source: Eurostat, S&T statistics
 Notes: ⁽¹⁾Exceptions to the reference year: LV (BES), LT, NO: 2001; IS: 1999
^(a)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 the 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 indi-

cators. 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 publication¹ 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 | FR | France |
| BE-FL | Dutch-speaking community in Belgium | IE | Ireland |
| BE-FR | French-speaking community in Belgium | IT | Italy |
| DK | Denmark | LU | Luxembourg |
| DE | Germany | NL | The Netherlands |
| EL | Greece | AT | Austria |
| ES | Spain | 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 | HU | Hungary |
| CZ | Czech Republic | LV | Latvia |
| EE | Estonia | 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 | EE | Estonia |
| CY | Cyprus | HU | Hungary |
| CZ | Czech Republic | 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/forskningstip

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
 Commission 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 forskningsinstitut
 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 Planteavlfsforsøg
 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 Laboratories
 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 |

| Country (EU) | Statistical Correspondent | Department | Organisation | Fax | Email |
|------------------------------------------|----------------------------------|---------------------------------------------------|------------------------------------------------------------------|------------------|-------------------------------|
| Austria | Dr. Karl MESSMANN | Wissenschafts- & Technologiostatistik Abteilung 6 | Statistik Österreich | +43.1.71128-7680 | Karl.Messmann@statistik.gv.at |
| Belgium, French-speaking Community | Mme Marie-Josée SIMOEN | Secrétaire générale | F.N.R.S | +32.2.514.00.06 | mjsimoen@fnrs.be |
| | Mme E. KOKKELKOREN | Responsable pour les statistiques | | | kokkelkoren@fnrs.be |
| Dutch-speaking Community | Ms. Lut BOLLEN | Afdeling Technologie & Innovatie | Ministry of Flemish Community | +32.2.553.55.98 | lut.bollen@wim.vlaanderen.be |
| Germany | Ms. Andrea LÖTHER | | Center of Excellence Women in Science | +49.228.73.48.40 | loether@cews.uni-bonn.de |
| Denmark | Cand. Polit. Kamma LANGBERG PHD. | | The Danish Institute for Studies in Research and Research Policy | +45 8942 2399 | kl@afsk.au.dk |
| | Ms. Karin Kjaer MADSEN | | Ministry of Information Technology and Research | +45.3392.79.93 | kkm@fsk.dk |
| Greece | Ms. Zografia KYMPERI | Programming & Planning Directorate | General Secretariat of Research and Technology | +301.771.14.27 | ekyb@gsrt.gr |
| Spain | Mr. Antonio SALCEDO GALIANO | Area de Indicadores de Ciencia y Tecnología | Instituto Nacional de Estadística | +34.91.5839.376 | asalcedo@ine.es |
| | Ms. Belen GONZALES OLMOs | Science & Technology Statistics/Indicators | Instituto Nacional de Estadística | +34.91.583.93.76 | bgolmos@ine.es |

| Country (EU) | Statistical Correspondent | Department | Organisation | Fax | Email |
|----------------|-----------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------|-------------------------------------|
| France | Mme Dominique FRANCOZ | Bureau des études statistiques sur la recherche | Ministère de l'Education nationale, de la Recherche et de la Technologie | +33.1.5555 7029 | dominique.francoz@education.gouv.fr |
| | Mme Martine CARISEY | | Obseatoire des Sciences et des techniques | +33.1.4548 6394 | martine.carisey@obs-ost.fr |
| Ireland | Ms. Bernadette NULTY | Policy and Planning, Science, Technology & Innovation Division | Forfas | +353.1.607.32.60 | bernadette.nulty@forfas.ie |
| Italy | Dott.ssa Giuliana MATTEOCCI | Servizio Centrale/ Affari Generali/ sistema informativo e statistico ufficio V | Ministero Università e Ricerca Scientifica e Tecnologica Ufficio MIUR-URST | +39.06.584.96.465 | giuliana.matteocci@murst.it |
| Luxembourg | M. Robert KERGER | | Ministère de la Culture, de l'Ens. Supérieur & de la Recherche | +352.460.927 | robert.kerger@mces.etat.lu |
| Netherlands | Jan VAN STEEN | | Ministry of Education, Culture and Science | +31.79.323.20.80 | j.c.g.vansteen@minocw.nl |
| Portugal | Ms. Sandra PEREIRA | R&D Statistics Department | OCES Observatory for Science and Higher Education | +351.21.395.09.79 | SPereira@oces.mces.pt |
| Finland | Ms. Jaana SALMENSIVU | | Academy of Finland | +358.9.7748.8388 | jaana.salmensivu@aka.fi |
| Sweden | Ms. Karin Arvemo NOTSTRAND | Higher Education Statistics | Statistics Sweden | +46.19.17.70.82 | karin.arvemo@scb.se |
| United Kingdom | Mr. Glenn EVERETT | | Office of Science & Technology/DTI | +44.207.215.3293 | Glenn.Everett@dti.gsi.gov.uk |

| Country (non EU) | Statistical Correspondent | Department | Organisation | Fax | Email |
|------------------|-------------------------------|---------------------------------------------------------------|----------------------------------------------------------------|-------------------|--------------------------------------|
| Bulgaria | Ms. Reny PETKOVA | Unit 'Statistics on Services' | National Institute of Statistics | +359.29.857.24.88 | Rpetkova@NSI.bg |
| Switzerland | Mme Elisabeth PASTOR | | Office Fédéral de la statistique HSW | | elisabeth.pastor@bfs.admin.ch |
| Czech Republic | Ms. Miluse KOPACKOVA | Division of new technologies & non-market services statistics | Czech Statistical Office | +420.284.818.102 | kopackova@gw.czso.cz |
| Estonia | Mr. Aavo HEINLO | Education & Research Statistics Sector | Statistical Office of Estonia | +372.62.59.370 | aavo.heinlo@stat.ee |
| Hungary | Ms. Katalin JANAK | | Hungarian Central Statistical Office | +36.1.345.6751 | katalin.janak@ksh.gov.hu |
| Iceland | Ms. Sigridur VILH-JALMSDOTTIR | | Statistics Iceland | +354.528.11.99 | sigridur.vilhjalmsdottir@hagstofa.is |
| Israel | Ms. Shirley KAHANOVICH | | Ministry of Science & Technology | +972.3.640.55.96 | shir193@post.tau.ac.il |
| Latvia | Ms. Maranda BEHMANE | Social Statistical Department | Central Statistical Bureau | +371.783.01.37 | mbehmane@csb.lv |
| Lithuania | Ms. Danguole ARESKIENE | Statistics Unit | Central Statistical Bureau of Lithuania | +370.52.634.666 | Danguole.Areskiene@mail.std.lt |
| Malta | Ms. Catherine VELLA | Library & Information Unit | National Statistics Office | +35.624.98.41 | catherine.vella@magnet.mt |
| Norway | Ms. Susanne LEHMANN SUNDNES | | Norwegian Institute for Studies in Research & Higher Education | +47.22.59.51.01 | Susanne.Sundnes@nifu.no |
| Poland | Dr. Maria ANTOSIK | | Information Processing Centre | +48.22.825.33.19 | antosik@opi.org.pl |
| Romania | Mme Clementina IVAN UNGUREANU | | Institutul national de Statistica | +40.213.357.373 | ciu@insse.ro |
| Slovakia | Ms. Marta MOSNA | Division of Science & Technology | Ministry of Education | +421.2.6920.2203 | mosna@education.gov.sk |
| Slovenia | Ms. Metka MEDVESEK-MILOSEVIC | | Statistical Office of the Republic of Slovenia | +386.12.340.860 | Metka.Medvesek-Milosevic@gov.si |

REFERENCES

- Blackburn R., Browne J., Brooks B. & Jarman J.**, (2002), *"Explaining Gender Segregation"* in The British Journal of Sociology, Volume 53, Number 4, (December 2002), pp. 513-536, ISSN: 0007-1315.
- Dunne M.** (2003), "Education in Europe, Key Statistics 2000/2001" in Statistics in Focus, OPOCE, Luxembourg, Catalogue Number KS-NK-03-013-EN-C, ISSN 1024-4352.
- European Commission**, (1998), "One hundred words for equality - A glossary of terms on equality between men and women", OPOCE, Luxembourg, 57pp. ISBN 92-828-2627-9.
- European Commission**, (1999), "Women and Science, Proceedings of the Conference, Brussels, April 28-29 1998", OPOCE, Luxembourg, 217pp. ISBN 92-828-5752-2.
- European Commission**, (2002), "Science and Society Action Plan (COM (2001) 714)", OPOCE, Luxembourg, 31pp. ISBN: 92-894-3025-7.
- European Commission**, (2003), "Third European Report on Science & Technology Indicators –Towards a Knowledge-based Economy" OPOCE, Luxembourg, 451pp. ISBN: 92-894-1795-1.
- Franco A. and Blöndal L.**, (2003), "Labour Force Survey, Principal results 2002, Acceding countries" in Statistics in Focus, OPOCE, Luxembourg, Catalogue Number KS-NK-03-016-EN-C, ISSN 1024-4352.
- Franco A. & Jouhette S.**, (2003), "Labour Force Survey, Principal results 2002, EU and EFTA countries", in Statistics in Focus, OPOCE, Luxembourg, Catalogue Number KS-NK-03-015-EN-C, ISSN 1024-4352.
- ILO**, (1990), "International standard classification of Occupations : ISCO-88", International Labour Organization, Geneva, 467pp. ISBN 92-2-106438-7.
- Jakobsson J.**, (2002), "Mainstreaming Europe? – An Assessment of Gender Mainstreaming in the European Commission", University of Lund, Sweden.
- Long, S. J.**, (ed.), (2001), "From Scarcity to Visibility", National Research Council, Washington. ISBN 0-309-05580-6.
- National Science Foundation**, (2000), "Women, Minorities and Persons with Disabilities in Science and Engineering: 2000". Arlington, VA, 2000 (NSF 00-327).
- OECD**, (1994), "Manual of the measurement of human resources devoted to S&T" – Canberra Manual. OECD, Paris, 112pp.
- OECD**, (2002), "Proposed Standard Practice for Surveys on Research and Experimental Development" – Frascati Manual. OECD, Paris, 257pp. ISBN 92-64-19903-9.
- Osborn M. et al.**, (2002) "Science policies in the European Union: Promoting excellence through mainstreaming gender equality", OPOCE, Luxembourg, 157pp. ISBN 92-828-8682-4.
- Palomba R.**, (ed.), (2000), "Figlie di Minerva" Franco Angeli, Milano.
- Rees T.**, (2002), "National Policies on women and science in Europe", OPOCE, Luxembourg, 140pp. ISBN 92-894-3579-8.
- Rübsamen-Waigmann H. et al.**, (2003), "Women in Industrial Research – A wake up call for European Industry", OPOCE, Luxembourg, 80pp. ISBN 92-894-4400-2.
- Strack G.**, (2003), "Towards a European Knowledge-based society: the contributions of men and women" in Statistics in Focus, OPOCE, Luxembourg, Catalogue Number KS-NS-03-005-EN-C, ISSN 1609-5995.
- UNESCO (United Nations Educational Scientific and Cultural Organization)**, (1997), "International Standard Classification of Education, ISCED 1997", UNESCO, Paris, 42pp. BPE-98/WS/1.
- Wennerås C. and Wold A.**, (1997), "Nepotism and sexism in peer review", Nature, vol. 347, pp 341-3.

European Commission

EUR 20733 – She Figures 2003 – Women and Science Statistics and Indicators

Luxembourg: Office for Official Publications of the European Communities

2003 – 118 pp. – 14.8 x 21 cm

ISBN 92-894-5812-7

Interested in European research?

RTD info is our quarterly magazine keeping you in touch with main developments (results, programmes, events, etc.). It is available in English, French and German. A free sample copy or free subscription can be obtained from:

European Commission
Directorate-General for Research
Information and Communication Unit
B-1049 Brussels
Fax (32-2) 29-58220
E-mail: research@cec.eu.int
Internet: http://europa.eu.int/comm/research/rtdinfo/index_en.html

EUROPEAN COMMISSION
Directorate-General for Research
Directorate C – Science and Society
Unit C.5 – Women and Science
E-mail: RTD-SCIENCESOCIETY@cec.eu.int
Contact: Nicole Dewandre
European Commission
Office SDME 06/79
B-1049 Brussels
Tel. (32-2) 29-94925
Fax (32-2) 29-93746
E-mail: Nicole.Dewandre@cec.eu.int
http://europa.eu.int/comm/research/science-society/women-science/women-science_en.html

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.



Publications Office

Publications.eu.int

ISBN 92-894-5812-7



9 789289 458122 >