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WOMEN AND SCIENCE 2008

Italy and the International Context

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Ergon Edizioni

Women and Science 2008. Italy and the International Context. English Summary

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More information on Observa – Science in Society’s activities, publications, research materials at www.scienceinsociety.eu.

FOREWORD

Science and technology are fundamental to assuring humanity's welfare and enabling continued improvements in length and quality of life. In recent years, there was an increasing recognition of a global need for a larger science and technology workforce, especially of women and youth. The situation of women in science is of particular relevance in this context: while women constitute half of the humanity, the number of women who pursue a successful scientific career is much lower than that of men, even in countries where they have access to higher education and scientific disciplines.

This unbalanced situation was acknowledged by UNESCO's 193 member States who have adopted, on the occasion of the 34th General Conference on October 2007, 'Gender Equality' as one of the two main priorities of UNESCO's cross-cutting action for the medium-term period 2008-2013.

I am therefore pleased that my Office, in particular Iulia Nechifor, has contributed to the elaboration of the present Report which shows the state-of-the art in Italy, on a comparative basis, with regard to the involvement of women in scientific studies and careers. I am confident that this publication will be a solid basis for gender sensitive measures to be taken at decision-making levels leading to the improvement of the situation in Italy and in other European countries. I take this opportunity to congratulate OBSERVA team who has wonderfully selected the information and elaborated this interesting publication and ensure that my Office will be committed to collaborate and support similar actions in the future.

Engelbert Ruoss, Director UNESCO BRESCE.

*Studio Pirovano Consulting Srl offers consultancy, coaching and training services to businesses. It has for years operated in Italy and is well aware of gender issues. For a company whose mission is centred on the development of human potential to its maximum extent and value, promoting a gender culture is crucial if individual abilities are to be discovered and valued. This applies both to pedagogical matters and to the ethical and strategic goals which *Studio Pirovano Consulting* pursues.*

Female potential is essential for the growth of the economy, as well as for that of society as a whole. In recent years especially, it has become evident that business results, and the health of organizations in terms of productivity and competitiveness, are in many cases correlated with the

degree of well-being perceived – and generated – by the organization’s interrelated human resources; and that valorizing female skills is of central importance for the quality of work in organizations. However, this requires that every individual must be able realize his/her potential and invest it in ways conducive to his/her individual and social development in the workplace.

Necessary for this purpose is an open and confident stance towards the *person*, man or woman. This openness must give persons freedom to consider themselves and the options available to them free from conditioning; and here we still have a long road to travel. For this freedom is still strongly conditioned – even in the apparently ‘evolved, ‘free’ and ‘advanced’ West – by the numerous stereotypes and prejudices which distort our perceptions and notions of reality.

It for this reason that we are pleased to support Observa’s valuable initiative on the theme ‘women, science and society’: to promote awareness that overcomes the barriers and resistances that often unconsciously prevent individuals and organizations from developing and enhancing their human resources. As men and women. For the growth and well-being of all.

Fabrizio Pirovano e Barbara Ongaro, Studio Pirovano Consulting S.r.l.

INTRODUCTION

Who are the female students most proficient in mathematics and sciences? Which country has the largest number of women employed in technical-scientific sectors? In what country are female researchers paid the most? How many Nobel Prizes have been won by women? Are European women interested in scientific research? How many female readers of science periodicals are there in Italy? Who do women trust when scientific issues are debated?

With this first edition of **Women and Science. Italy and the International Context**, published with the cooperation of *UNESCO Office in Venice, Regional Bureau for Science and Culture in Europe (BRESCE)*, *Studio Pirovano Consulting S.r.l.*, and the *FAiR association*, *Observe – Science in Society* presents a classified collection of data and information gathered from the most authoritative national and international sources and useful for understanding the present state and ongoing changes in gender relationships in the world of science and research in Italy and abroad. The publication divides into three parts. The first furnishes an overview on the topic 'Women in Science': the mathematical and scientific abilities of female students attending upper-secondary school, the professional careers of female graduates and postgraduates in scientific disciplines, Nobel Prizes awarded to women, the female occupancy of key roles in organizations, statistics on applications for patents and funding by female researchers. When possible, the data are presented in comparative terms, with reference to both male counterparts and the situation in other countries.

The second part of the book is devoted to 'Science for Women' and focuses on gender attitudes towards, and perceptions of, research and innovation: women's interest in scientific research, their attendance at events and exhibitions on science, the opinions of European researchers on the female presence in research, the image of science among young Italian women, the priorities of research according to women.

The last part, 'Women and Research: Find out More', collects resources on the theme of gender relations in the Italian scientific community: a chronology of the main events during the year on the theme, the statistical sources from which the data are drawn, books and articles published on the theme during the year, references to institutions, scientific awards, and websites devoted to gender issues in scientific research.

Addressed to policy-makers, researchers, business people, journalists, and opinion leaders particularly interested in gender issues regarding research, the aim of **Women and Science** is to promote and contribute to open and well-informed debate among researchers, social partners, policy-makers and media on gender issues in Italian science and research. Accordingly, the intention is to create regular occasions to monitor trends and changes in the sector through the constant updating of data and information.

A synopsis of the key tables and graphs is presented in the following pages, aiming at providing an English overview of the publication. Tables and figures numbers match those of the full publication.

1.1. Female students most proficient in mathematics: performances in mathematics tests by female high school students in OECD Countries.

Female mean score		Male mean score			
1	Korea	543	1	Finland	554
	Finland	543	2	Korea	552
3	Netherlands	524	3	Netherlands	537
4	Switzerland	523	4	Switzerland	536
5	Canada	520	5	Canada	534
6	Belgium	517	6	Japan	533
	New Zealand	517	7	Australia	527
8	Australia	513		New Zealand	527
	Japan	513	9	Belgium	524
10	Denmark	508	10	Denmark	518
	Iceland	508	11	Austria	517
12	Czech Republic	504	12	Czech Republic	514
13	Sweden	500	13	Germany	513
14	Ireland	496	14	Ireland	507
15	Austria	494	15	Sweden	505
	Germany	494	16	United Kingdom	504
17	France	492	17	Iceland	503
18	OECD average	492		OECD average	503
19	Poland	491	19	Poland	500
20	Norway	487	20	France	499
	United Kingdom	487		Slovakia	499
22	Hungary	486	22	Luxembourg	498
23	Slovakia	485	23	Hungary	496
24	Luxembourg	482	24	Norway	493
25	Spain	476	25	Spain	484
26	USA	470	26	USA	479
27	Portugal	459	27	Portugal	474
28	Greece	457	28	Italy	470
29	Italy	453	29	Greece	462
30	Turkey	421	30	Turkey	427
31	Mexico	401	31	Mexico	410

SOURCE: OECD, *PISA 2006: Science Competencies for Tomorrow's World*, December 2007. Reference year: 2006.

NOTE: a score of 500 is considered the threshold of sufficient competence.

1.3. Female students most proficient in science: performances in science tests by female high school students in OECD Countries.

Female mean score			Male mean score		
1	Finland	565	1	Finland	562
2	Canada	532	2	Canada	536
3	New Zealand	532	3	Japan	533
4	Japan	530	4	New Zealand	528
5	Australia	527		Netherlands	528
6	Korea	523	6	Australia	527
7	Netherlands	521	7	Korea	521
8	Germany	512	8	Germany	519
9	Belgium	510	9	United Kingdom	520
	United Kingdom	510	10	Austria	515
	Czech Republic	510		Czech Republic	515
12	Switzerland	509	12	Switzerland	514
	Ireland	509	13	Belgium	511
14	Austria	507	14	Ireland	508
15	Sweden	503	15	Hungary	507
16	Hungary	501	16	Sweden	504
17	OECD average	499	17	OECD average	501
18	Poland	496	18	Denmark	500
19	France	494		Poland	500
	Iceland	494	20	France	497
21	Denmark	491	21	Luxembourg	491
22	USA	489	22	Slovakia	491
23	Norway	489		Spain	491
24	Spain	486	24	USA	489
25	Slovakia	485	25	Iceland	488
26	Luxembourg	482	26	Norway	484
27	Greece	479	27	Italy	477
28	Italy	474		Portugal	477
29	Portugal	472	29	Greece	468
30	Turkey	430	30	Turkey	418
31	Mexico	406	31	Mexico	413

SOURCE: OECD, *PISA 2006: Science Competencies for Tomorrow's World*, December 2007. Reference year: 2006.

NOTE: a score of 500 is considered the threshold of sufficient competence.

1.5. Italian female students most proficient in mathematics: performances in mathematics tests by female students in Italian high schools.

	Female mean score		Male mean score
1 Friuli Venezia Giulia	505	1 Veneto	525
2 Provincia Autonoma di Bolzano	503	2 Provincia Autonoma di Bolzano	523
3 Provincia Autonoma di Trento	497	3 Friuli Venezia Giulia	521
4 Veneto	495	4 Provincia Autonoma di Trento	520
5 Piemonte	490	5 Emilia Romagna	510
6 Lombardia	486	6 Piemonte	493
7 Emilia Romagna	478	7 Lombardia	488
8 Liguria	469	8 Liguria	476
9 Basilicata	442	9 Campania	453
10 Puglia	430	10 Basilicata	445
11 Campania	420	11 Puglia	440
12 Sardegna	419	Sardegna	440
13 Sicilia	415	13 Sicilia	431

SOURCE: OECD, *PISA 2006: Science Competencies for Tomorrow's World*, December 2007. Reference year: 2006.

NOTE: a score of 500 is considered the threshold of sufficient competence.

1.6. Italian female students most proficient in science: performances in science tests by female students in Italian high schools.

	Female mean score		Male mean score
1 Friuli Venezia Giulia	531	1 Friuli Venezia Giulia	536
2 Provincia Autonoma di Bolzano	520	2 Provincia Autonoma di Bolzano	532
Provincia Autonoma di Trento	520	Veneto	532
4 Veneto	515	4 Provincia Autonoma di Trento	522
5 Piemonte	513	5 Emilia Romagna	516
6 Emilia Romagna	503	6 Piemonte	503
Lombardia	503	7 Lombardia	496
8 Liguria	495	8 Liguria	482
9 Basilicata	453	9 Campania	453
10 Sardegna	452	10 Basilicata	449
11 Puglia	449	11 Puglia	446
12 Sicilia	434	Sardegna	446
13 Campania	432	13 Sicilia	432

SOURCE: OECD, *PISA 2006: Science Competencies for Tomorrow's World*, December 2007. Reference year: 2006.

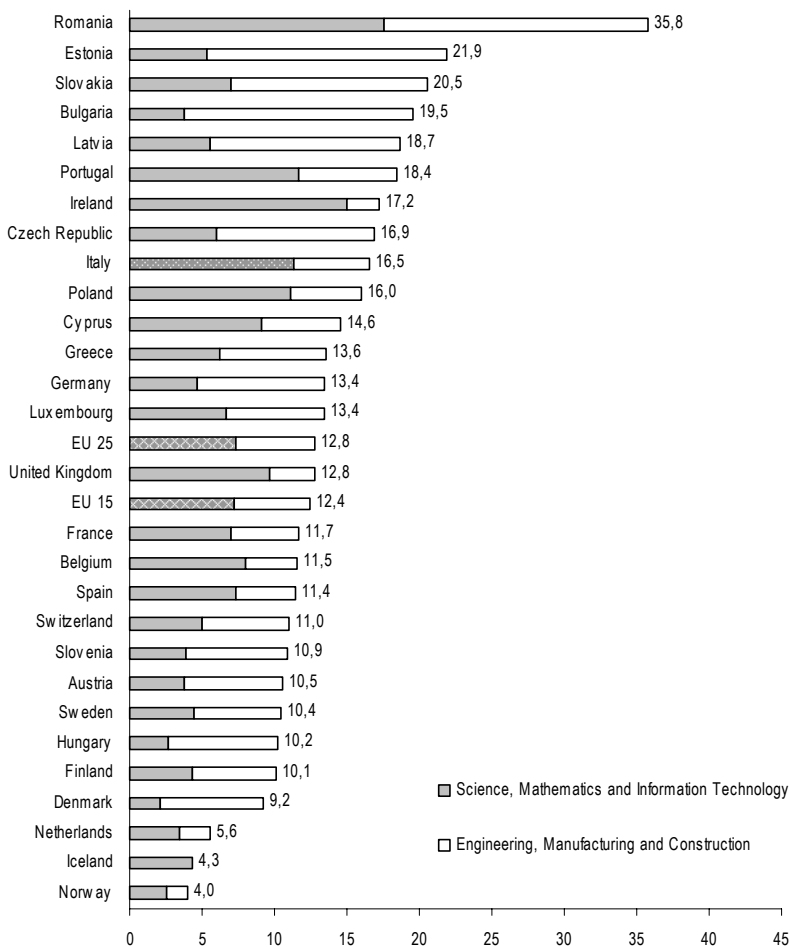
NOTE: a score of 500 is considered the threshold of sufficient competence.

1.9. Women in university courses: percentage of female students in each field.

	Female enrolment as % of total university enrolment	Engineering, manufacturing and construction	Science	Agriculture	Health and welfare
Andorra	51	-	10	-	83
Austria	54	21	34	63	68
Belgium	54	21	34	49	73
Cyprus	52	13	35	-	71
Denmark	57	33	32	52	81
Finland	54	19	41	51	84
Greece	51	28	39	44	74
Ireland	55	16	41	43	79
Italy	57	28	49	44	65
Malta	56	28	35	31	67
Norway	60	24	32	57	81
Paesi Bassi	51	13	20	46	74
Portugal	56	26	49	55	77
United Kingdom	57	19	36	62	79
Spain	54	28	35	46	75
Sweden	60	28	42	58	81
Switzerland	46	14	28	45	68
North America ed Western Europe	56	28	42	58	81
Central and Eastern Europe	55	26	63	48	65
Arab States	49	20	53	25	67
East Asia	46	25	36	39	71
West and south Asia	41	24	40	-	42
Latin America	54	27	38	38	59
World	50	16	30	32	63

SOURCE: UNESCO, *EFA Global Monitoring Report 2008, Education for All by 2015 Will we make it?*, Reference year: 2007.

1.12. Countries with the highest proportion of female graduates in engineering or scientific disciplines, as a percentage of total graduates in all disciplines.



SOURCE: Eurostat, *Science and Technology, Statistics in Focus 18/2006*. Reference year: 2005, except Spain (2004) and Czech Republic (2003).

NOTE: Percentage values calculated on total graduates aged between 25 and 64 years old.

1.18. Female tertiary graduates, as a percentage of total tertiary graduates, by field.

	Life sciences, Physical sciences and Agriculture	Health and Welfare	Mathematics and Computer science	Engineering, Manufacturing and Construction	Humanities, Arts and Education	Social sciences, Business, Law and Services
Austria	56	63	20	20	70	57
Belgium ¹	51	62	19	27	67	57
Denmark	51	84	26	30	69	50
Finland ²	57	85	42	22	77	71
France	50	56	26	26	77	60
Germany	48	62	26	22	70	49
Greece	47	51	39	40	82	63
Ireland	58	83	31	22	70	56
Italy	56	64	42	29	81	56
Netherlands	46	76	12	16	74	53
Poland	66	69	32	30	78	68
Portugal	66	79	37	36	79	63
United Kingdom	50	75	26	21	67	56
Czech Republic	55	74	22	22	71	59
Slovakia	52	76	20	32	70	58
Spain	55	78	28	31	74	62
Sweden	58	83	36	30	78	61
Hungary	52	77	31	26	75	64
Australia	55	76	26	24	70	55
Canada ²	57	81	29	25	70	58
Korea	46	60	40	25	71	45
Japan	32	57	-	11	68	37
Iceland	49	87	24	35	79	63
Mexico	45	64	39	27	78	59
Norway	52	84	22	23	71	55
New Zealand	54	80	28	30	73	58
United States	54	78	28	22	68	55
Switzerland	41	57	13	15	66	42
Turkey	44	61	38	24	53	43

SOURCE: OECD *Education at a Glance*, September 2007. Reference year: 2005.

NOTES:

1. Flemish community only.
2. Reference year: 2004.

1.20. Women teaching in universities (grade A), as a percentage of total senior academic staff, by field.

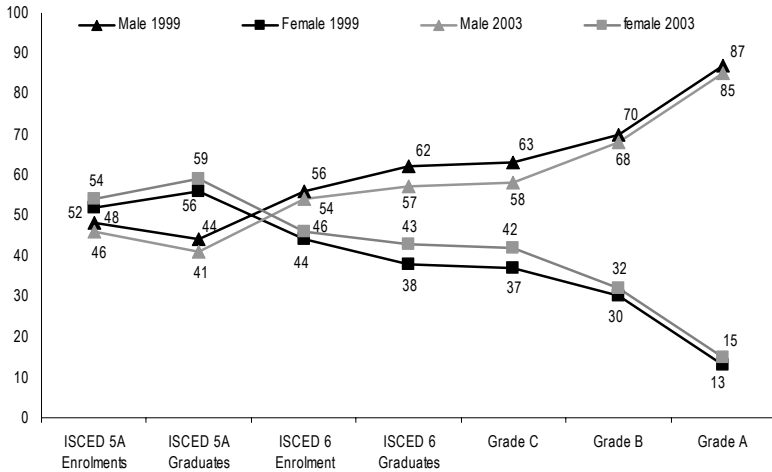
	Natural sciences	Engineering and Technology	Medical Sciences	Agricultural sciences	Social Sciences	Humanities
Austria ³	4,4	3,7	8,9	5,6	9,6	19,1
Belgium	7,7	4,2	8,3	3,6	11,5	13,0
Cyprus ³	18,8	0,0	-	-	11,1	0,0
Denmark	6,9	1,4	14,9	16,2	13,2	15,2
Finland	11,3	6,3	21,6	16,0	28,6	35,1
France ²	12,3	5,6	15,3	-	17,0	30,1
Germany	5,6	3,8	5,8	8,9	8,0	16,3
Italy	15,9	6,1	11,1	11,8	17,1	29,4
Latvia ¹	0,0	-	38,5	-	39,3	36,4
Malta	0,0	0,0	8,3	0,0	0,0	0,0
Norway ³	9,9	4,9	16,8	14,0	18,3	24,6
Netherlands	5,3	3,1	6,3	11,0	11,5	16,3
Poland	16,9	8,7	28,2	24,3	20,6	22,5
Portugal ³	27,5	5,0	26,2	27,0	20,4	-
United Kingdom	8,2	4,9	22,0	14,7	21,2	17,2
Czech Republic	9,2	4,5	14,2	9,1	13,0	14,5
Slovakia	13,0	6,6	17,0	3,5	17,3	20,6
Slovenia	3,8	5,4	19,0	20,4	14,5	17,8
Sweden	11,7	7,1	15,3	18,2	19,7	25,8
EU 25	11,3	5,8	15,6	14,9	16,6	23,9
Switzerland	7,3	10,1	18,1	12,8	23,4	19,9
Turkey ¹	25,7	15,6	34,5	13,6	24,3	20,3

SOURCE: European Commission, *She Figures 2006, Women and Science Statistics and Indicators*, 2006. Reference year: 2004.

NOTES:

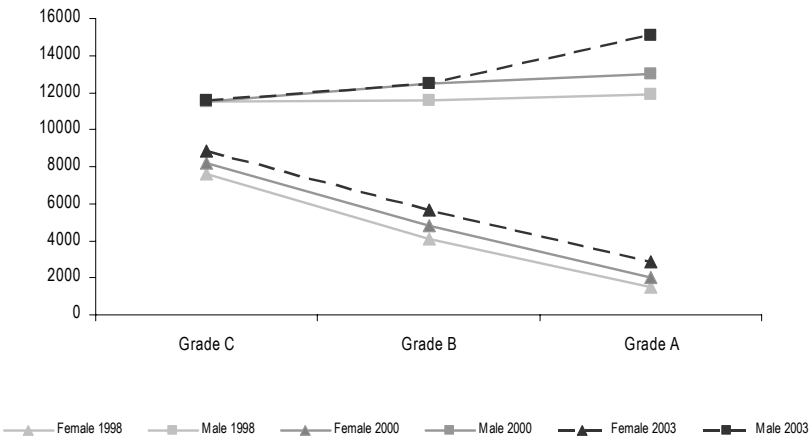
1. Reference year: 2000.
2. Reference year: 2001.
3. Reference year: 2003.

1.21. Percentage of men and women in various stages of a typical academic career in the European Union (EU 25).



SOURCE: UNESCO, *Science Technology and Gender*, 2007.

1.22. Number of men and women in various stages of a typical academic career in Italy.



SOURCE: OECD, *Women in scientific careers*, 2006.

1.25. Female researchers, as a percentage of total researchers.

	Business Enterprise Sector	Government Sector	Higher Education Sector	Non Profit Sector	Total
Austria ¹	5,9	1,9	15,5	0,4	23,7
Belgium ²	8,7	1,5	17,7	0,3	28,2
Korea	6,8	0,6	5,2	0,2	12,8
Denmark ²	12,6	3,2	12,1	0,2	28,1
Russia	23,3	16,1	2,9	0,0	42,3
Finland	9,1	4,6	15,9	0,5	30,1
France ¹	9,4	3,5	14,2	0,7	27,8
Germany ²	5,2	3,0	11,3	0,0	19,5
Japan	3,9	0,5	7,4	0,1	11,9
Greece ²	5,6	4,2	27,0	0,3	37,1
Ireland	8,7	0,9	20,2	0,0	29,8
Iceland	12,1	11,7	14,2	1,3	39,3
Italy¹	5,6	6,5	16,2	1,6	29,9
Luxembourg ²	11,3	5,1	1,0	0,0	17,4
Mexico ²	6,0	4,8	19,0	1,7	31,5
Norway	7,9	4,6	19,2	0,0	31,7
New Zealand ³	2,4	2,5	34,4	0,0	39,3
Netherlands ²	4,7	4,7	7,9	0,0	17,3
Poland	3,1	5,8	30,3	0,1	39,3
Portugal ²	5,1	8,1	25,5	5,7	44,4
Czech Republic	5,8	7,9	15,0	0,1	28,8
Slovakia	4,5	6,9	30,1	0,0	41,5
Spain ¹	6,2	6,5	23,3	0,1	36,1
Switzerland ¹	6,8	0,6	19,4	0,0	26,8
Turkey ¹	2,2	1,8	32,4	0,0	36,4
Hungary	4,4	7,5	22,2	0,0	34,1

SOURCE: OCSE, *Science, Technology and Industry Scoreboard*, 2007. Reference year: 2005.

NOTES:

1. Reference year: 2004
2. Reference year: 2003.
3. Reference year: 2001.

1.29. Average weighted total yearly salary of female researchers in the European Union (EU25) and Associated Countries.

	Females	Males
Austria	45.689	65.647
Belgium	42.161	62.326
Bulgaria	5.345	6.270
Cyprus	37.661	54.472
Croatia	16.404	20.274
Denmark	39.777	44.740
Estonia	12.179	23.070
Finland	29.938	41.063
France	40.317	52.111
Germany	46.134	56.385
Greece	27.922	32.568
Ireland	39.487	55.051
Island	33.820	37.592
Israel	37.298	59.812
Italy	25.652	38.440
Lithuania	19.033	25.526
Luxembourg	45.758	60.093
Malta	42.392	40.014
Norway	38.233	43.395
Netherlands	43.317	64.691
Poland	16.795	23.606
Portugal	25.721	40.671
United Kingdom	43.830	58.907
Czech Republic	25.313	39.831
Slovakia	15.403	19.636
Romania	12.429	15.358
Slovenia	34.095	40.249
Spain	32.268	43.484
Sweden	41.553	50.168
Switzerland	48.462	63.334
Turkey	20.707	28.939
Hungary	22.029	29.386

SOURCE: European Commission, Research Directorate, *Remuneration of Researchers in the Public and Private Sector*, April 2007. Reference year: 2006.

NOTE: all currencies in term of PPS (Purchasing Power Standard).

1.31. Success of female researchers in funding applications, as a percentage of total applicants and beneficiaries of research funding.

	Applicants %	Beneficiaries %
Ireland ⁴	55,2	42,3
Greece	54,4	49,2
Portugal ³	52,6	51,4
Belgium ⁵	43,3	44,6
Luxemburg ³	40,3	38,3
Lithuania ³	38,9	40,0
Slovenia ²	37,4	38,2
Hungary	33,9	33,4
Island	33,1	34,3
United Kingdom	31,3	23,7
Denmark	28,8	25,7
Poland	27,4	24,7
Finland ⁴	27,2	32,2
Norway	25,2	27,0
Estonia	25,0	25,2
Switzerland	23,5	22,5
Sweden ¹	23,0	20,5
Italy ⁴	22,4	21,1
Netherlands ³	22,1	23,5
Slovakia	21,6	25,0
Czech Rep.	19,3	18,9
Austria ¹	18,9	15,5
Israel ²	17,4	14,0
Cyprus	16,0	10,3
Germany	13,0	11,9

SOURCE: adapted European Commission, *She Figures 2006, Women and Science Statistics and Indicators*, 2006.
Reference year: 2004.

NOTES:

1. Reference year: 1999.
2. Israel, reference year: 2000; Slovenia, reference year: 2001.
3. Reference year 2002.
4. Reference year 2003.
5. Flemish community only.

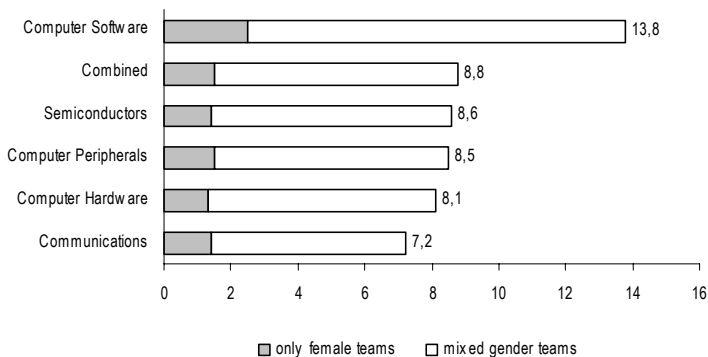
1.34. Countries with the highest number of female Nobel Laureates in Physics, Chemistry and Physiology or Medicine.

Place	n°	Data and name	Field
1. United States	6,5	1963 - Maria Göppert-Mayer	Physics
		1947 - Gerty Cori	Physiology or Medicine
		1977 - Rosalyn Yalow	Physiology or Medicine
		1983 - Barbara McClintock	Physiology or Medicine
		1986 - Rita Levi-Montalcini	Physiology or Medicine
		1988 - Gertrude B. Elion	Physiology or Medicine
2. France	3	2004 - Linda B. Buck	Physiology or Medicine
		1911 - Marie Curie	Chemistry
		1935 - Irène Joliot-Curie	Chemistry
3. Germany	1	1903 - Marie Curie	Physics
		1995 - Christiane Nüsslein-Volhard	Physiology or Medicine
United Kingdom	1	1964 - Dorothy Crowfoot Hodgkin	Chemistry
5. Italy	0,5	1986 - Rita Levi-Montalcini	Physiology or Medicine

SOURCE: The Nobel Foundation, Official web site: www.nobelprize.org.

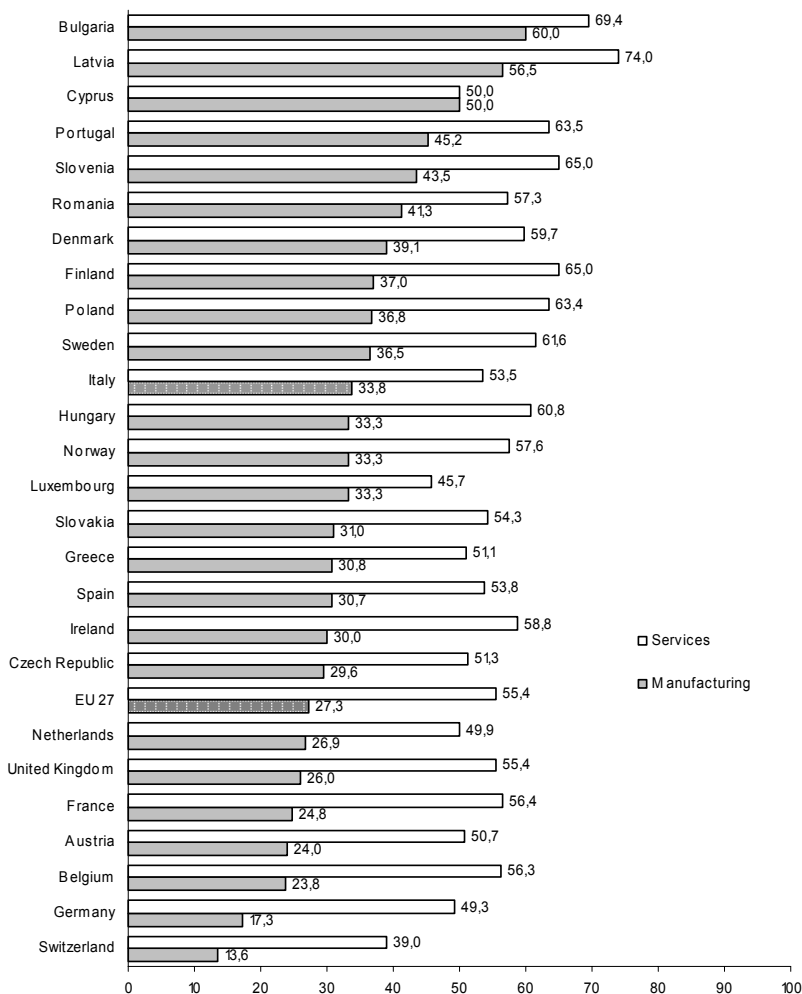
NOTE: titles, data and places given above refer to the time of the award.

1.36. Women inventors of IT patents: percentage of females among registrants of IT patents in the United States, by category.



SOURCE: NCWIT, *Who Invents IT? An Analysis of Women's Participation in Information Technology Patenting*, March 2007.

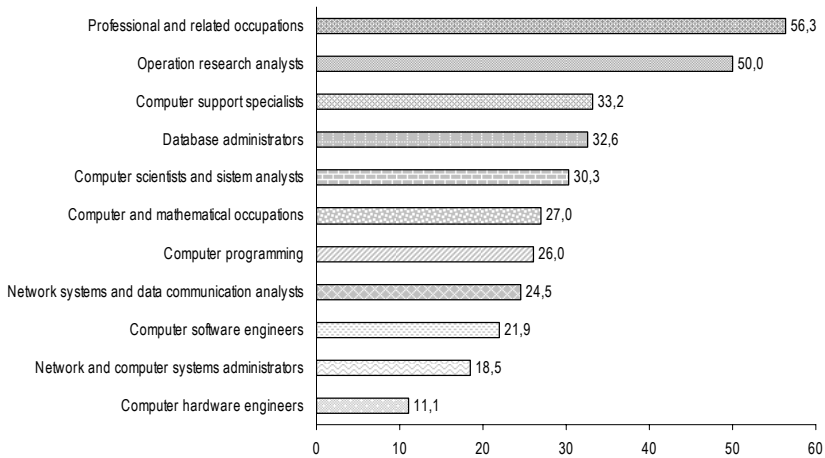
1.40. European Countries with the highest proportion of women in S&T manufacturing and service sectors: females as a percentage of the total highly qualified human resources employed.



SOURCE Eurostat, *Statistics in focus* 103/2007. Reference year: 2006.

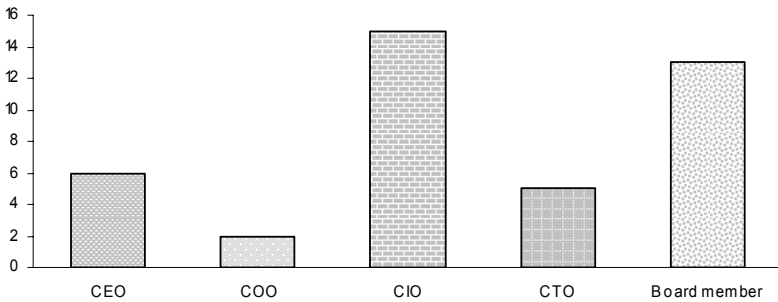
NOTE: Reference year for Austria, Luxembourg and Switzerland is 2005. EU 27 figures are estimates.

1.43. Women participation in IT-related occupations, as a percentage of total IT-related employed in the United States.



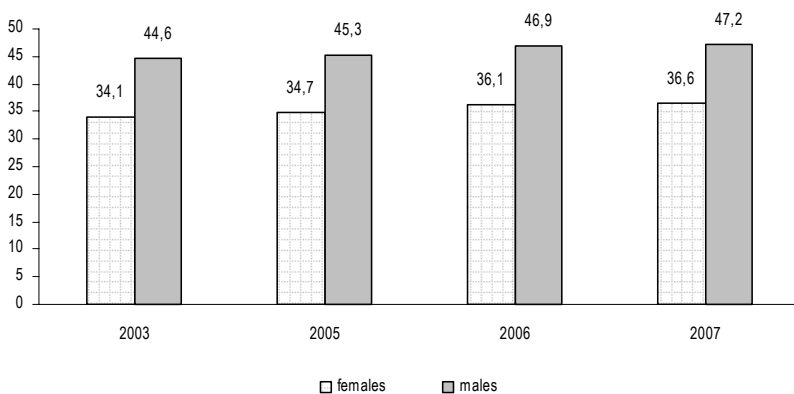
SOURCE: NCWIT, *Scorecard 2007, A Report on the Status of Women in Information Technology*, 2007. Reference year: 2005.

1.44. Women covering leadership positions in the IT sector, as a percentage of total leadership-related positions in the United States.



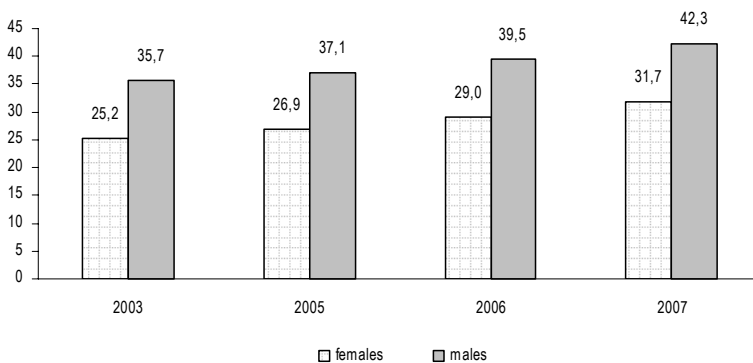
SOURCE: NCWIT, *Scorecard 2007, A Report on the Status of Women in Information Technology*.
 NOTE: based on survey of top 100 Fortune 500 companies classified by Hoover's as IT-related companies.

1.45. Computer usage in Italy: gender differences, 2003-2007.



SOURCE: ISTAT, *Statistiche in breve*, January 2008. Percentage values calculated on total population aged over 3.

1.46. Internet usage in Italy: gender differences, 2003-2007.



SOURCE: ISTAT, *Statistiche in breve*, January 2008. Percentage values calculated on total population aged over 6.

2.2. The most interesting news according to European women (EU 25).

	Females		Males
	%		%
Entertainment and celebrities	46	Sports	60
Arts and Culture	40	Politics	41
Scientific research	31	Economy	34
Politics	27	Scientific research	31
Economy	23	Arts and Culture	24
Sport	20	Entertainment and celebrities	22
Other	10	Other	6

SOURCE: European Commission, *Scientific Research in the Media*, Special Eurobarometer 282, December 2007.

2.3. The most interesting research areas, according to European women (EU 25).

	Females		Males
	%		%
Medicine	76	Medicine	47
Environment	48	Environment	37
Biology	20	Energy	26
Energy	12	Information technology	25
Information technology	9	Space	19
Space	9	Telecommunication	17
Telecommunication	6	Biology	13

SOURCE: European Commission, *Scientific Research in the Media*, Special Eurobarometer 282, December 2007.

2.4. Italian women who perceive themselves as informed on science/policy issues.

	Highly or fairly informed		Do not know what it is	
	Females	Males	Females	Males
Climate Change	60,2	65,7	0,8	/
Civil Unions	52,7	54,7	2,8	1,1
Stem Cells Research	35,0	41,9	1,8	3,7
GMOs	34,7	39,4	6,5	6,6
The European Constitution	29,9	30,8	2,5	0,2
The Election Law reform	29,3	43,1	2,5	0,5
The Budget Law	29,0	43,5	1,4	1,1
The Biological Testament	26,0	25,4	4,5	6,1
Nanotechnologies	7,2	17,2	10,8	8,8

SOURCE: Observa – Science in Society, “Gli Italiani e la scienza”, in *Annuario Scienza e Società 2008*. Percentage values; females=536; males=462; reference year: 2007.

2.6. Italian women and science in the Media.

	<i>At least once in a month</i>	
	Females %	Males %
Read articles on science in the newspapers	67,6	65,4
Read magazines on science and technology	52,3	61,5
Visit website on science and technology	17,9	34,8
Watch TV programs on science and technology	78,1	81,2
Listen to radio programs on science and technology	9,7	8,9

SOURCE: Observa – Science in Society, “Gli Italiani e la scienza”, in *Annuario Scienza e Società 2008*. Percentage values; females=536; males=462; reference year: 2007.

2.7. Italian female and male readers of monthly magazines about science, nature and health issues.

Italian monthly magazines	Total number of readers (x 1000)	adults %	
		Females	Males
1 Focus	5.726	44	56
2 National Geographic	874	45	55
3 Airone	541	49	51
4 Geo	403	42	58
5 Newton oggi	361	35	65
6 Le Scienze	349	39	61
7 Psychologies Magazine	265	73	27
1 Starbene	1.569	82	18
2 Sihouette Donna	971	96	4
3 Bimbisani & Belli	707	78	22
4 Men's Health	549	15	85
5 OK La salute prima di tutto	484	74	25

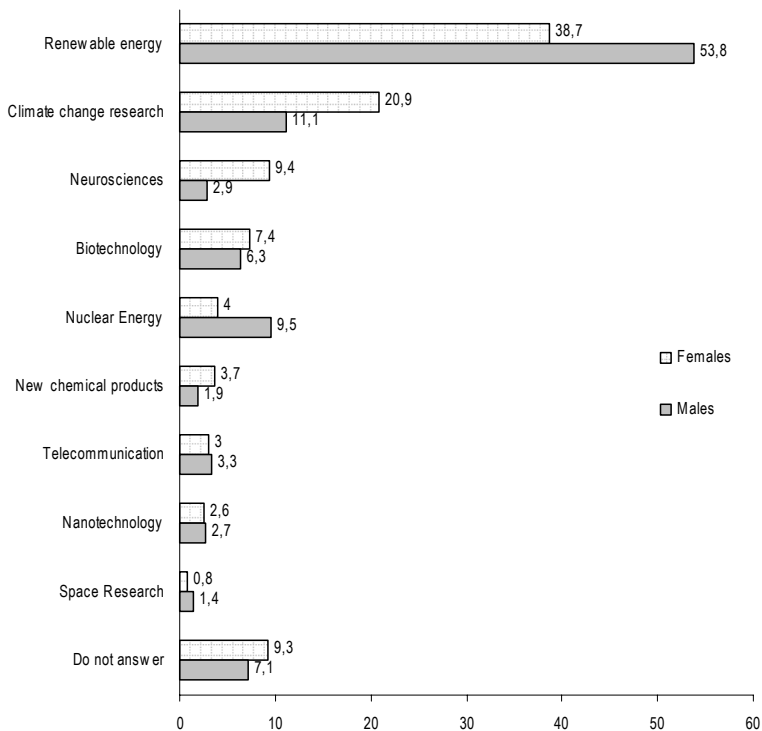
SOURCE: Audipress, *Indagine sulla lettura dei quotidiani e dei periodici in Italia*, 3rd volume – magazines, 2007.

2.8. Position of italian monthly magazines about science, nature and health in the ranking of monthly magazines most read by italian women.

	Number of female readers (x 1000)	Position in the general ranking
1 Focus	2531	1
2 Starbene	1284	4
6 Sihouette Donna	929	14
16 National Geographic	390	16
17 Bimbisani & Belli	549	22
27 Ok La salute prima di tutto	362	35
37 Psychologies Magazine	194	58
33 Airone	266	31
47 Geo	165	42
54 Le Scienze	135	49
58 Newton Oggi	126	47
67 Men's Health	80	29

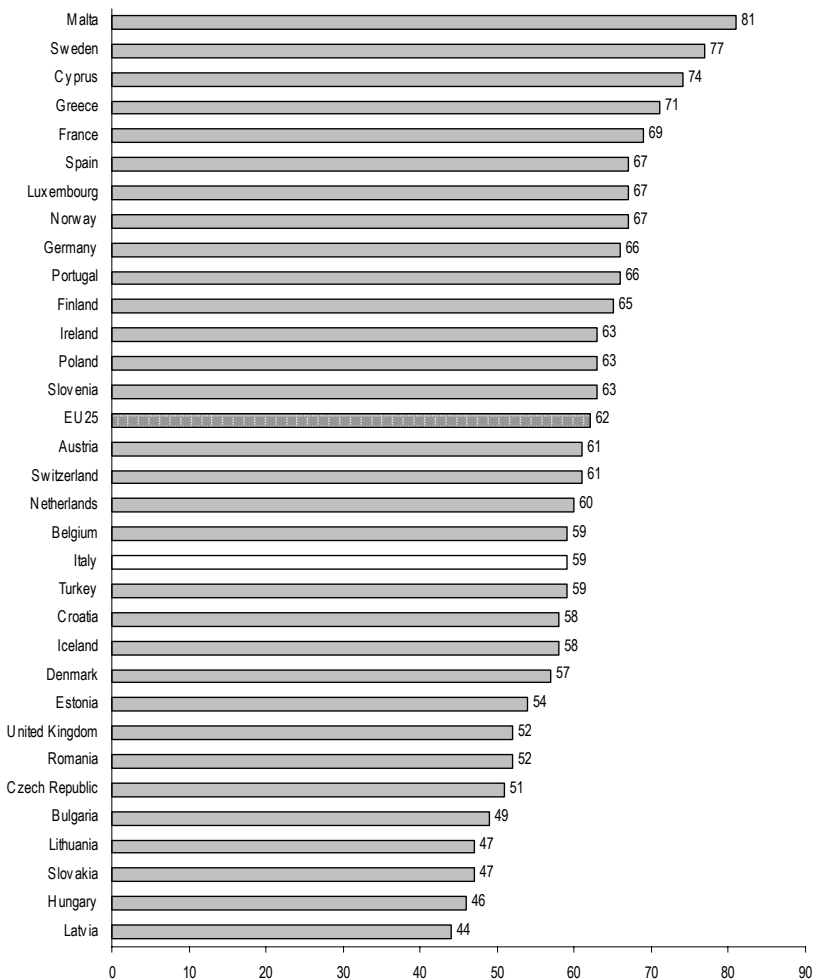
SOURCE: Audipress, *Indagine sulla lettura dei quotidiani e dei periodici in Italia*, 3rd volume – magazines, 2007.

2.12. Priorities in public investments in research, according to Italian women and men.



SOURCE: Observa – Science in Society, “Gli Italiani e la scienza”, in *Annuario Scienza e Società 2008*. Percentage values; females=536; males=462; reference year: 2007.

2.13. European citizens agreeing that there should be more women in European research.



SOURCE: European Commission, DG-Research, *Social values, Science and Technology*, Eurobarometer 225, June 2005. Percentage values.

2.17. Women and research: the views of a sample of European researchers.

	<i>Strongly or rather agree</i>	
	Females	Males
A scientific career is difficult to conciliate with child care	72,3	58,9
Women are less gifted than men for doing research in the sciences	15,6	3,6
If I had a daughter, I would encourage her to study a scientific topic at the university.	77,3	83,6
If I had a boy, I would encourage him to study a scientific topic at the university.	80,0	83,6
If I had a daughter, I would encourage her to undertake a professional career in science.	60,0	65,5
If I had a boy, I would encourage him to undertake a professional career in science.	62,2	65,5
Research is ruled by men.	76,6	47,3
Men have more often than women the necessary skills to hold positions of responsibility.	19,1	16,1
Women are less willing than men to fight for their career.	57,4	27,3
In research, women are too often relegated in administrative or subordinate roles.	76,6	33,9

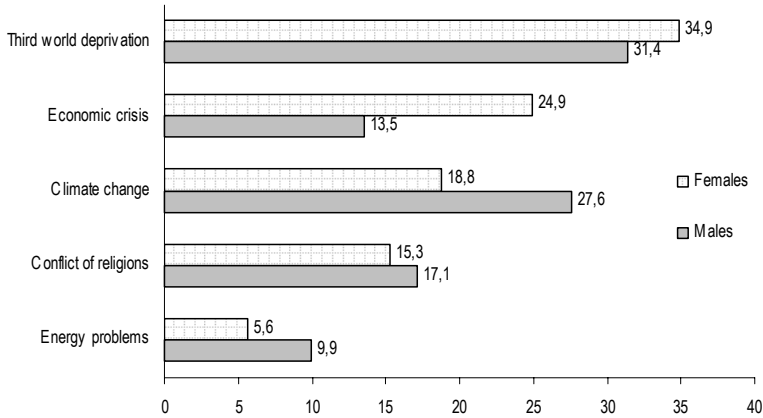
SOURCE: Observa – Science in Society, “A survey on SABRE and EADGENE researchers’ perceptions with regard to gender issues” in *SABRE and EADGENE Gender Action Plan Study, 2007*. Percentage values, females=47, males=56.

2.18. Women and research: the views of a sample of Italian young people (16-19 years old).

	<i>Strongly or rather agree</i>	
	Females	Males
A scientific career is difficult to conciliate with child care	38,5	40,8
Women are less gifted than men for doing research in the sciences	14,5	17,7
If I had a daughter, I would encourage her to study a scientific topic at the university.	62,0	67,9
If I had a boy, I would encourage him to study a scientific topic at the university.	61,5	67,9
Research is ruled by men.	68,4	57,9
School encourages mostly male students to study scientific disciplines	21,6	25,4

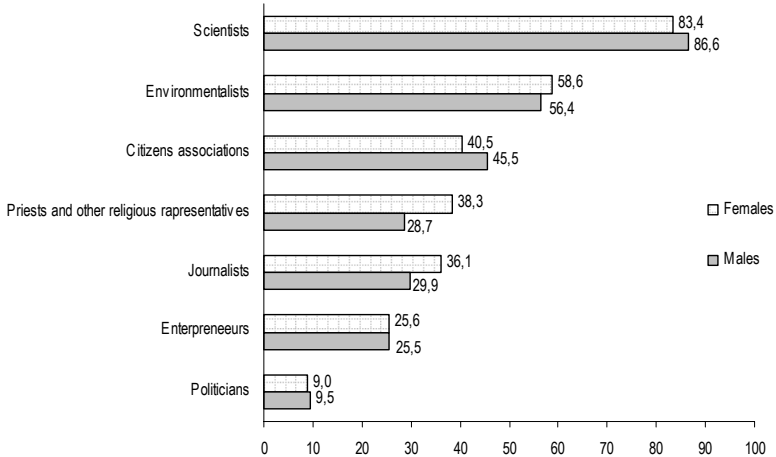
SOURCE: Observa – Science in Society, *Osservatorio Scienza e Società, 2006*. Percentage values, females=236; males=213.

2.25. The most relevant problems at the global level, according to Italian women.



SOURCE: Observa – Science in Society, "Gli Italiani e la scienza", in *Annuario Scienza e Società* 2008. Percentage values; females=536; males=452; reference year: 2007.

2.26 The most trustworthy figures, when it comes to relevant scientific issues.



SOURCE: Observa – Science in Society, "Gli Italiani e la scienza", in *Annuario Scienza e Società* 2008. Percentage values; females=536; males=462; reference year: 2007.

2.37. Italian women and investments in nuclear energy.

	%		Perché:	% on respondents	
	Female	Male		Female	Male
Favourable towards nuclear energy investments	25,5	49,8	We should not be dependent on oil producing country	30,2	42,0
			The existing energy sources are insufficient	42,1	30,8
			Also other industrialized countries have their own nuclear plants	21,0	18,4
			Also thermo-electric stations pollute	6,8	8,8
Against nuclear energy investments	39,8	36,4	it is better to develop alternative energy sources	41,1	50,9
			Radioactive waste treatment, storage and disposal are dangerous	23,9	25,2
			no municipality would like to have a nuclear station in its own territory	22,2	9,6
			Nuclear plants are not secure	9,6	12,6
			The existing energy sources are sufficient	3,1	1,8
Do not know	34,6	13,8	I have no competences in order to decide.	83,5	56,6
			Pros and cons balance	16,5	43,4
Total	100,0	100,0			

SOURCE: Observa – Science in Society, "Gli Italiani e la scienza", in *Annuario Scienza e Società* 2008. Percentage values; females=536; males=452; reference year 2007.

Women and science: can we break the glass ceiling?

A research into gender differences in European scientific research

By Valeria Arzenton, Massimiano Bucchi, Elisabetta Giuffra, Simona Palermo.

The theme of gender equality has taken a central place in the debate between institutions, social partners, industry and in all spheres of social and professional life. Scientific research is not an exception to this, as its problems are similar to those in other professional sectors.

In the last few years the more important international organisations, starting from the United Nations and the European Commission, have also recognized the extreme importance of achieving gender equality in the scientific and technological sector. There are several considerations as to why is it necessary to give importance to women in the field. First and foremost it's an obvious matter of human rights and social justice, in the sense that all individuals should have the same opportunities to have access to scientific education and equally benefit from progress in science and technology. Secondly, a lack or limited presence of women in scientific research means a great loss of competence and talent, with serious consequences for the entire scientific and technological sector in terms of productivity and competitiveness. At last, giving importance to women's talent means giving importance to the diversity and specific contributions that women can make to research because of their innate qualities, such as sensitiveness, intuition, motivation and attitude towards work.

These important considerations have paved the way to numerous initiatives and specific programmes in Europe, which have already provided some clear results. In fact, according to figures from the European Commission, the number of woman scientists is increasing and 50% of human resources in the entire scientific field consists of women, who often prove they have better capabilities and skills than their male colleagues. Even so, the goal of real gender equality is still far from being achieved, since woman researchers have to deal with the same problems that affect most other professional sectors. In fact, women are only well represented in some scientific fields, such as biology and medicine, whereas they are excluded from other disciplines, which are still considered male prerogatives. In addition to this kind of 'horizontal' discrimination, the differences become especially evident from a 'vertical' point of view, if we think of the so-called 'glass ceiling' phenomenon which keeps young female researchers from getting on in their career. As a matter of fact, even though women in Europe represent 50% of the total number of graduates in scientific disciplines, woman researchers only constitute 29% of the total number of European researchers and this percentage gets smaller as we climb the professional ladder (only 23% of professors are women). Besides this, women are practically absent in decision-making commissions and works councils.

Even if there are more and more statistics available on the presence and participation of women in the scientific and technological sector in Europe, there isn't much information about

perceptions, motivations, opinions and possible prejudice with regards to gender in the professional field.

A particularly interesting contribution in this respect can be found in the first findings of an Italian research team consisting of scientists and science sociologists who carried out research into the staff of two European research networks. This research is one of the activities of *Gender Action Plans* of the Integrated Project SABRE (Cutting Edge Genomics for Sustainable Animal Breeding) and the Network of Excellence EADGENE (European Animal Disease Genomics Network of Excellence for Animal Health and Food Safety), with respectively 200 and 130 scientists from 14 and 10 European countries involved in genomic research applied to zootechnical species. The survey was coordinated by the Parco Tecnologico Padano di Lodi (www.tecnoparco.org), a research centre for agricultural and food biotechnologies, with the collaboration of experts from Observa – Science in Society (www.observa.it), a cultural non-profit association that promotes research, reflection and debate on the relationship between science and society, and supports dialogue between researchers, policy makers and citizens. The aim of the research was, on the one hand, to monitor possible gender differences in terms of recruiting, course and progression of career and, on the other hand, evaluate the manner in which gender issues are perceived by the individual researchers and how they determine their professional and private life. In order to do this, a structured questionnaire was given to the entire staff of the two networks.

In general, the survey confirms the European trends. First of all, even if most of the interviewed researchers of both sexes think that women have all the necessary intellectual requirements and technical abilities to make an important contribution to science, there is a clear gender imbalance in these two networks too. Above all most apical positions (e.g. head of department, director etc.) are occupied by men, whereas almost half of the women interviewed complain about being excluded from important decisions and more responsible positions. Secondly, men benefit from better contractual conditions as they are on open-ended contracts, while women are more often employed with short-term contracts or scholarships. Partly, these differences can be led back to women's age in the two research networks, as they are on average younger than their male colleagues. Research results suggest that many women tend to be more actively involved in research in the first years in their career, while their professional ambitions give way to family priorities as they get older. And it is exactly this problem of having to reconcile a career with a family that is perceived by most researchers, both men and women, as one of the main obstacles for reaching gender equality in the scientific sector. A second obstacle, according to the researchers' findings, concerns the often self-discriminatory attitude of women themselves with regards to their professional position. More than half of the interviewees in fact seem to think that women are not capable of obtaining higher positions and are even less willing to fight for their

career than men are, also because they don't want to adopt their male colleagues' aggressive behaviour.

On the whole, the general findings and the abovementioned aspects in particular suggest that there are at least two ways in which the participation of women can be promoted at all levels in the field of science. The first step concerns the education of future scientists, which cannot be limited to technical aspects, but also has to include psychological and behavioural elements, in order to encourage young woman researchers to show more determination and a more positive attitude towards themselves and their professional position, so they will be able to compete with their male colleagues more easily. Secondly, it is clear that gender politics cannot limit themselves to attempts – however useful – to reconcile career with having a family, but also have to try to overcome some traditional ideas about career and role patterns. For example, recruiting criteria and career incentives should also recognize the value of characteristics like the willingness to collaborate with colleagues, to contribute to colleagues' professional growth, and to share knowledge and information, and should award an open and interdisciplinary approach to science, in order to encourage a collaborative rather than a competitive work attitude.

Article published in the Italian magazine "D.a. La rivista per superare le barriere culturali", VIII, 3, Dec. 2007.

Observa – Science in Society is a non profit cultural association which promotes the study and the discussion of the interaction between science and society, stimulating dialogue among researchers, policy makers and citizens.

With its *Science in Society Monitor*, based on a representative sample of more than 1000 interviewees and published on Nòva24, the Science and Technology supplement of the newspaper Il Sole 24 Ore, Observa regularly surveys the relationship between citizens and science in Italy. Its yearly publication *Science in Society Facts and Figures* summarizes data and information to help understand the state and transformation of research and innovation in our society.

Observa cooperates to international networks engaged in science in society issues, among which *Esconet* (European Science Communicators Network), *Science and the City*, *Macospol* (Mapping Scientific Controversies) and the one coordinated by *London School of Economics*. Observa activities are supervised by an international scientific committee, involving both natural and social sciences experts.

Information, publications, news and research materials at www.scienceinsociety.eu

The United Nations Educational, Scientific and Cultural Organization (UNESCO) was founded on 16 November 1945. Today, UNESCO functions as a laboratory of ideas and a standard-setter to forge universal agreements on emerging ethical issues. The Organisation serves also as a clearinghouse – for the dissemination and sharing of information and knowledge – while helping its 192 Member States to build their human and institutional capacities in the fields of education, science, culture and communication and information. UNESCO is working to create the conditions for genuine dialogue based upon respect for shared values and the dignity of each civilization and culture.

The UNESCO Office in Venice - UNESCO Regional Bureau for Science and Culture in Europe (BRESCE) focuses its action in the fields of science and culture in Member States of South-East Europe as a priority by promoting scientific and cultural cooperation, providing science policy advocacy to governments from the region, building human and institutional capacities in the basic and engineering sciences, fostering collaborative research in the field of the environment; it equally contributes to the protection of tangible and intangible cultural heritage, and promotes cultural diversity and intercultural dialogue.

www.portal.unesco.org; www.portal.unesco.org/venice

FAiR (Fairness and Accountability in Research) is a non-profit Association founded in January 2007, European Year of Equal Opportunities for All, by two Italian scientists. FAiR's mission is to promote fairness and accountability in scientific research, with specific regard to enhancement of gender equity at all levels and apart from origin, class, race, faith and political creed.

FAiR is based at Parco Tecnologico Padano in Lodi (Italy).

www.fair-research.eu; info@fair-research.eu

Studio Pirovano Consulting Srl is a training, consulting and coaching company founded by Barbara Ongaro and Fabrizio Pirovano, President and CEO, whose passion, values and style involve the other consultants that are experts in different areas of training and consultancy. "Animum debes mutare, non caelum", writes Seneca (Epistulae Morales Ad Lucilium): the real potential of human being is not in his havings or in the external conditions, but in his inner resources.

For all of us the high potential of the person and his never-ending possibilities of growth are the main focus and we trust the talents of everyone. Our goal is to walk aside the customer offering training, organizational consultancy and coaching paths in the fields of *sales, marketing, team working, business nlp, systems thinking, change management, quality, project management, empowerment and problem solving*, either in Italy and abroad.

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