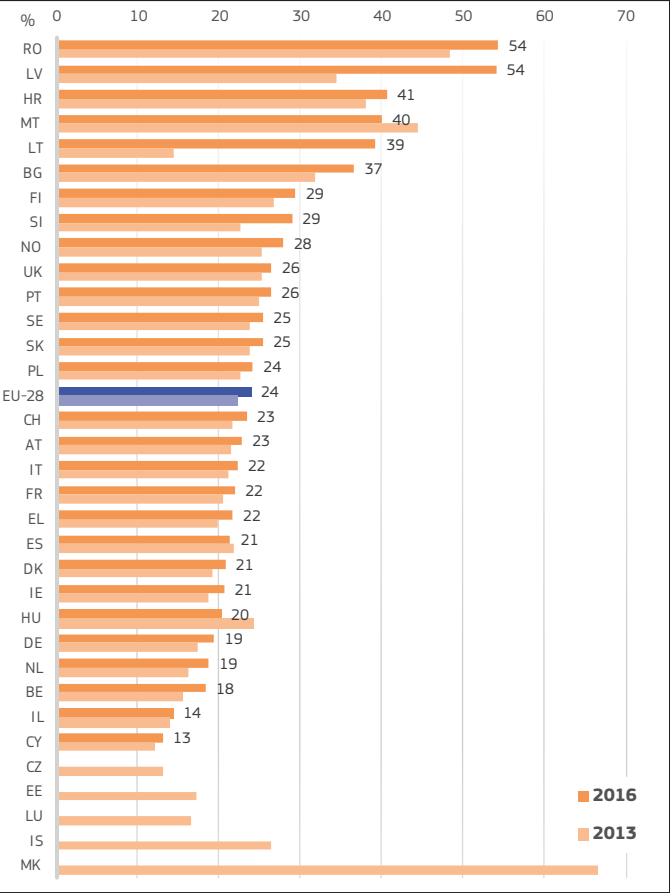


Figure 2: Evolution of the proportion (%) of women among grade A positions, 2013 vs. 2016



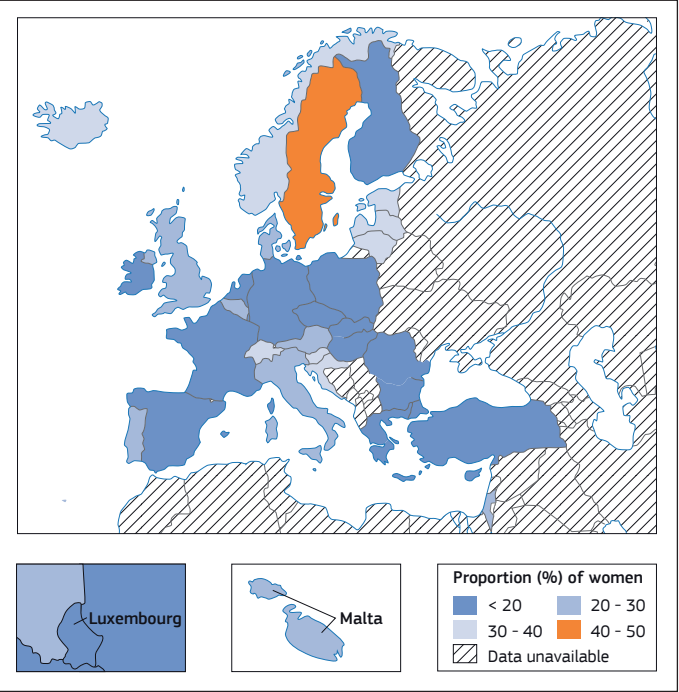
Exceptions to the reference years: FR: 2012 – 2015; IE, CY, HU, AT, SI, SE: 2013 – 2015; BG: 2013 – 2017; CZ, EE: 2014 – 2015; RO, UK: 2014–2016; HR: 2014 – 2017; LU, IL: 2015 – 2016; IS, MK: 2012; MT (Malta College for Arts, Science and Technology): 2017. Data unavailable for: LT (2013), MT (2013), IS (2016), ME, AL, RS, TR, AM, FO, GE, MK (2016), MD, TN, UA; EU-28 for each ref. year is the aggregate of the MS with available data for that year.
Break in time series: UK (2014); ES (2015).
Estimated data: RO (2014).
The data for PL exclude researchers whose sex has not been recorded.
The data for the UK are rounded to the nearest multiple of 5; This affects the EU-28 aggregates.
The same person may be counted in several fields of R&D: BE (French speaking community), SE; Totals adjusted to avoid double-counting: SE.
Private colleges and other smaller institutions are not included: IE;
The reference population is ‘Researchers’ as defined in the Frascati Manual, with the exception of the following countries which used ‘Academic Staff’ as defined in the UOE Manual: BG, DE, IE, EL, IT, LV, LT, NL, SI, SK, SE, IS, IL.
The data for MK (2013) correspond to nine members of staff of grade A.

Proportions are shown rounded to the nearest integer but the text discusses them at the precision of one decimal digit.
Source: Women in Science database, DG Research and Innovation.

The under-representation of women in top academic positions is also evident in the low proportion of women as heads of higher education institutions (Map 1).

At EU-level, 21.7% of the heads of higher education institutions were women in 2017. At country level, the share of women among heads of institutions varied from 0% in Luxembourg (only one head, which is a man) and 8% in Spain to 41.7% in Sweden. In 16 of the 32 countries examined, the proportion of women heads was less than 20% (Map 1).

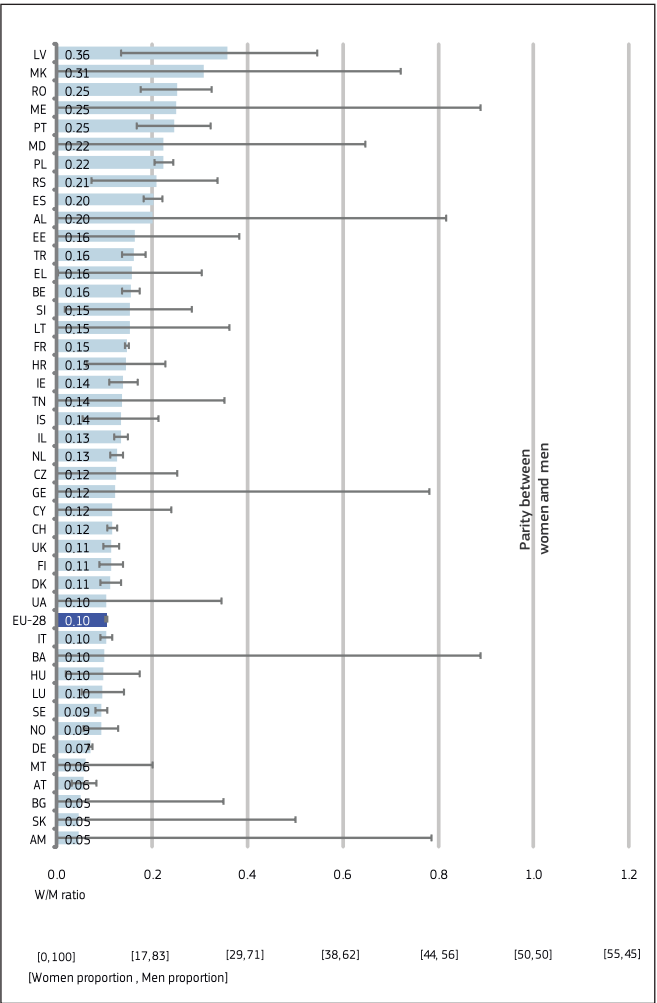
Map 1: Proportion (%) of women among heads of institutions in the higher education sector, 2017



Exceptions to the reference year: BE (French speaking community Hautes Écoles): 2013; BE (French speaking community universities), CZ, PT, RO, SI, UK: 2016; CY: Acad. year 2015 – 2016.
Data unavailable for: ME, MK, AL, RS, BA, AM, FO, GE, MD, TN, UA. Data about heads of scientific organisation are not available: BG.

Private colleges and other smaller institutions are not included: IE.
Source: Women in Science database, DG Research and Innovation.

Figure 3: Women to men ratio of inventorships, all International Patent Classification (IPC) sections, 2013 – 2016



Data not applicable: FO.
Error bars represent 90 % confidence intervals, accounting for potential biases due to the inability to infer the sex of inventors on some patent applications. It is assumed that the attribution of sex to inventor names is 100 % accurate (i.e. that the sex attributed to a given inventor name is always the correct one).
The bottom rows show the women to men ratios and the proportions of women's and men's inventorships that correspond to each vertical gridline of the chart.
Source: Computed using data on European patent applications (kind codes A1 and A2) in PATSTAT.

The number of women among patent inventors remains extremely low

Figure 3 shows a comparison between the scientific output of women and men in terms of European Patent Office (EPO) patent applications. The indicator is the ratio of women to men in inventorships based on computed-fractionalised counts of women and men inventors. For example, if a patent application involves 10 inventors, each inventor is counted as one tenth of an inventor. These fractional counts are summed separately for men and women and then divided in order to produce the ratio.

Women were strongly under-represented as inventors both at EU and at country level in the patent applications of the period 2013 – 2016. At EU level, the ratio of women to men inventorships was 0.10 – that is to say for each inventorship by a woman, there are 10 inventorships by men. The highest value of the ratio was observed in Latvia (0.36) and the lowest in Armenia (0.05).

These figures have not changed considerably from the 2010 – 2013 period. During that period the ratio at EU-28 level was also 0.1.

Arguments have been made that the small values of this ratio for women are to be expected because patent applications are more prevalent in scientific fields where men predominate. Moreover, it should be noted that patent applications are only one form of scientific output.

Overall, although the pace remains slow, signs of progress towards gender equality can be seen. However, it is only by the joint effort and constant action of all stakeholders that gender equality can be achieved.

She Figures 2018 Publication

She Figures 2018 presents key indicators on the progress made towards gender equality in research and innovation (R&I) in Europe. The chapters follow the ‘journey’ of scientists (mainly researchers) from completing higher education to acquiring decision-making roles while examining their research output, earnings, distribution by sector of the economy, mobility and working conditions. The share of published research integrating a gender dimension is also examined.

The publication has been released every three years since 2003, providing comparable statistics useful to policy makers, researchers and anyone with a general interest in these issues. It is accompanied by the ‘She Figures Handbook’, which contains methodological guidance on the collection of data and the calculation of all indicators in the main publication. The coopertion of the Member States, Associated Countries and Eurostat in preparing She Figures is gratefully acknowledged.

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SHE FIGURES 2018

Gender in Research and Innovation

Statistics and Indicators



Research and Innovation

The European Commission is committed to promoting gender equality in research and innovation (R&I). It is part of its Strategic engagement for gender equality in all European Union (EU) policies for the period 2016 – 2019. The promotion of gender equality in research careers, in decision making, as well as the integration of the gender dimension in R&I content is also a priority in the European Research Area (ERA). The Council of the EU in its conclusions on ‘Advancing gender equality in the European Research Area’, adopted on 1 December 2015, acknowledged that gender equality in research contributes to diversity, excellence and quality in outcomes. Making use of all talent and creating equal opportunities for women and men is a matter of fairness and an issue of economic efficiency.

This leaflet presents preliminary results from the forthcoming ‘She Figures 2018’ publication. More specifically, it shows the proportion of women among graduates at PhD or equivalent level and among researchers; the gender pay gap of persons employed in scientific research and development (R&D); the proportion of women among top academic staff and heads of higher education sector institutions and the ratio of women to men in inventorship.

Table 1: Proportion (%) of women among PhD or equivalent graduates (2016) and compound annual growth rate (%) of PhD or equivalent graduates (2007 – 2016), by sex

Country	Women graduates	Growth	
		Women	Men
EU-28	47.9	2.3	1.4
BE	46.8	8.1	4.4
BG	52.8	9.6	10.5
CZ	42.7	2.1	-0.5
DK	48.5	11.6	7.8
DE	45.2	2.7	1.5
EE	54.4	5.7	4.4
IE	47.8	4.1	3.3
EL	49.2	0.1	-4.0
ES	50.8	9.1	7.6
FR	44.5	3.0	1.7
HR	55.0	4.3	3.0
IT	51.8	-0.9	-0.7
CY	60.0	19.3	24.5
LV	57.9	3.0	3.9
LT	57.7	-1.8	-0.8
LU	40.2	12.4	13.5
HU	46.9	3.1	0.9
MT	42.2	22.8	17.7
NL	49.1	7.1	3.2

Country	Women graduates	Growth	
		Women	Men
AT	42.3	0.8	0.8
PL	53.9	-4.2	-6.2
PT	50.0	-	-
RO	54.8	-2.0	-4.1
SI	61.3	32.0	23.0
SK	52.4	4.3	1.5
FI	51.6	0.1	0.1
SE	45.2	-1.4	-0.9
UK	46.2	5.6	4.6
IS	63.9	-	-
NO	50.1	5.8	2.1
CH	44.3	3.4	0.3
ME	67.9	-	-
MK	56.3	11.1	9.2
AL	55.6	91.9	83.5
RS	54.9	28.2	11.8
TR	46.3	8.1	5.7
BA	44.9	12.3	6.2
AM	37.1	-0.6	-4.0
GE	56.9	3.0	-10.8
IL	49.7	2.1	3.8
MD	57.1	1.6	-1.6
TN	48.1	6.7	10.7
UA	56.7	-0.8	-2.7

Exceptions to the reference period: IE, NL, IL: 2007 – 2015; AL, TN, UA: 2011 – 2016; RS: 2014 – 2016.
Definition differs for: EU-28.
Data unavailable: FO.
Growth (%) shows average yearly change of the number of PhD or equivalent graduates; not computed due to fewer than 20 graduates for either start or end year: MT, IS; not computed due to lack of comparability with 2007: PT; not computed due to lack of data for non-consecutive start and end years: ME.
ISCED 2011 level 8 is used for 2014 – 2016 data; ISCED 1997 level 6 is used for 2007 – 2011 data.
Source: Eurostat (online data codes: educ_grad5 and educ_uoe_grad02), UNESCO Institute of Statistics (dataset: Science, technology and innovation - Tertiary graduates by level of education).

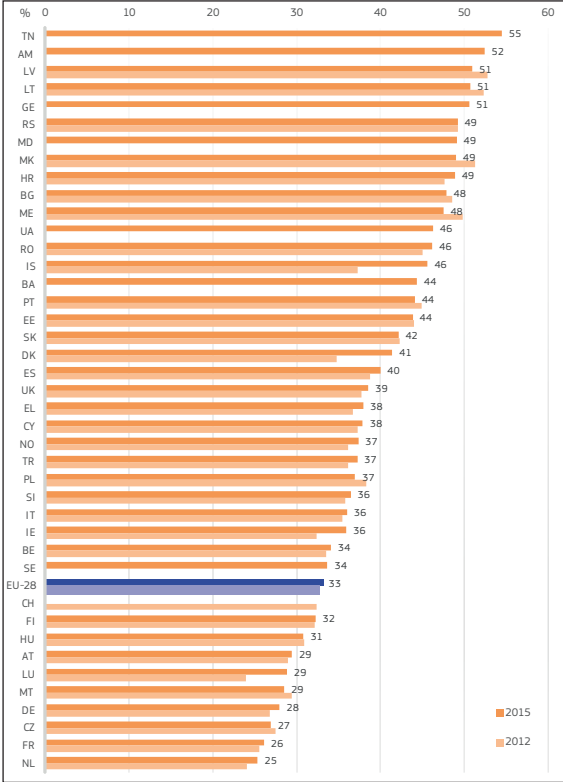
A gender-balanced pool of PhD graduates exists

Overall, gender balance exists in the population of PhD graduates with 47.9 % of women in the EU-28 in 2016 (Table 1). In almost all countries, the proportion of women among PhD graduates ranges between 40 % and 60 %. Furthermore, in the majority of countries the number of women PhD graduates grew at a higher rate than the number of men PhD graduates between 2007 and 2016 (Table 1). Indeed, at EU level, the number of women PhD graduates increased by 2.3 % on average each year while that of men by 1.4 %.

The under-representation of women among researchers persists in the EU

The proportion of women among researchers grew between 2012 and 2015 in most countries (Figure 1). However, women are still under-represented; only 33.4 % of researchers in the EU were women in 2015. Compared to 2012, this proportion increased by just 0.4 percentage points.

Figure 1: Evolution of the proportion (%) of women among researchers, 2012 vs. 2015



Exceptions to the reference year: FR: 2012-2014; EU-28, ME, IS, SE, EL, BE, IS, AT, DE, LU: 2011 – 2015;
GE: 2013 – 2015.
Data unavailable: AL, IL, FO.
Estimated data: EU-28, FR, SE, UK (2012).
Definition differs: ME (2015).
Break in time series: [2011]: EL, IS; [2012]: NL; [2013]: PT, SE, IS; [2014]: FR.
Proportions computed from data in head count (HC); They are shown rounded to the nearest integer but the text discusses them at the precision of one decimal digit.
Source: Eurostat (online data code: rd_p_persocc), UNESCO Institute of Statistics (dataset: Science, technology and innovation - Human resources in R&D).

Table 2: Proportion (%) of women among researchers in the higher education sector, by field of R&D, 2015

Country	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural and veterinary sciences	Social sciences	Humanities and the arts
BE	33	22	52	46	50	49
BG	54	34	55	42	54	60
CZ	31	22	47	35	43	40
DK	30	24	46	41	47	46
DE	32	20	50	50	44	49
EE	40	32	56	45	60	61
IE	36	26	60	53	53	52
EL	37	32	45	34	39	41
ES	42	38	44	41	43	43
HR	48	37	56	44	61	58
IT	43	27	37	40	43	53
CY	33	30	42	30 (3/10)	41	47
LV	41	37	61	58	64	68
LT	45	35	62	56	65	65
LU	21	21	40	-	57	48
HU	28	24	46	40	49	46
MT	30	13	47	22 (2/9)	41	28
NL	38	29	42	45	52	50
AT	31	24	47	55	51	53
PL	39	27	55	51	48	48
PT	51	29	58	55	53	51
RO	49	43	59	49	53	46
SI	30	27	54	50	47	54
SK	45	33	58	50	52	49
FI	31	31	61	59	58	57
SE	31	26	58	50	53	51
UK	38	23	60	57	45	52
IS	34	19	64	53	56	48
NO	32	24	59	52	50	48
ME	48	37	53	50	37	59
MK	40	37	61	43	44	56
RS	52	36	46	59	51	56
TR	44	32	49	32	43	42
BA	52	38	66	47	40	57
AM	46	28	95	0 (0/2)	71	71
GE	47	29	61	52	51	67
MD	43	29	54	35	63	56
UA	54	34	71	58	73	58

■ = More men than women
□ = Parity between men and women
■ = More women than men

Exceptions to the reference year: BG: 2014; UK: 2013.
Data unavailable: EU-28, FR, AL, IL, FO, TN.
Estimated data: ES, IT, UK.
Definition differs: ME; DE (medical and health sciences).
Break in time series: DE (natural sciences, engineering and technology, social sciences, humanities and the arts).
‘-’ indicates that the number of researchers was zero.
Proportions computed from data in head count (HC); For those based on fewer than 20 graduates, numerators and denominators are displayed in brackets.
Colour intensity is increasing when values deviate from gender parity.
Source: Eurostat (online data code: rd_p_perssci), UNESCO Institute of Statistics (dataset: Science, technology and innovation - Researchers by sector of employment and field of R&D).

Gender segregation of researchers exists among the different fields of R&D

The proportion of women among researchers varies depending on the field of R&D in which they work. Women are under-

represented in the field of engineering and technology in all countries examined and over-represented in the field of medical and health sciences in most of the countries (Table 2).

In the humanities and the arts, there is gender balance in the population of researchers in 20 of the 39 countries, where the proportion of women among researchers ranges between 45 % and 55 %. The respective number of countries drops to 18 in the social sciences, 14 in the agricultural and medical sciences, and 12 in the natural sciences (Table 2).

Women researchers earn on average less than their male colleagues

Women employed in scientific R&D activities in the EU earned on average 17 % less than their male colleagues in 2014. In the total economy the gender pay gap was marginally smaller, reaching 16.6 % (Table 3).

Higher average hourly earnings for men in both scientific R&D and the total economy is also evident in almost all examined countries. In scientific R&D, only five countries have a gender pay gap that favours women. In the total economy the pay gap favours women in only one country.

Table 3: Gender pay gap (%) in economic activity ‘Scientific Research & Development’ and in total economy, 2014

Country	Scientific R&D	Total economy
EU-28	17.0	16.6
BE	16.3	6.6
BG	-1.4	14.2
CZ	25.4	22.5
DK	18.3	16.0
DE	19.4	22.3
EE	22.4	28.1
IE	30.5	13.9
EL	23.1	12.5
ES	16.6	14.9
FR	17.1	15.5
HR	18.1	8.7
IT	6.4	6.1
CY	18.9	14.2
LV	16.5	17.3
LT	5.8	13.3

Country	Scientific R&D	Total economy
LT	5.8	13.3
LU	-3.8	5.4
HU	25.0	15.1
MT	:	10.6
NL	25.0	16.1
AT	16.5	22.2
PL	16.6	7.7
PT	14.6	14.9
RO	-6.7	4.5
SI	3.5	7.0
SK	20.6	19.7
FI	17.3	18.4
SE	17.1	13.8
UK	18.3	20.9
IS	:	16.6
NO	15.9	14.4
CH	20.9	17.4
ME	22.5	7.7
MK	-21.8	9.1
RS	-0.8	8.7
TR	35.7	-1.3

Data unavailable: MT, IS (Scientific R&D); AL, BA, AM, FO, GE, IL, MD, TN, UA.
EU-28 aggregate (Scientific R&D) does not include MT.
‘Scientific R&D’ corresponds to NACE Rev. 2 Division 72; ‘Total economy’ corresponds to NACE Rev. 2 Sections B to S excluding O.
Gender pay gap is the difference between average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees. Positive values denote higher pay for men. 2014 is the most recent reference year with available data from the Structure of Earnings Survey.
Source: Eurostat – Structure of Earnings Survey (SES) (all data computed by Eurostat).

At EU level, women are still a minority in top academic positions

Women remain under-represented in top academic positions (grade A) within the higher education sector (Figure 2). However, at EU level, as well as in most of the countries with available data, there was a slight increase in the proportion of women in grade A positions since 2013. At EU level, women accounted for 22.1 % of grade A positions in 2013 and 23.7 % in 2016.

At country level, the proportion of women among grade A positions is over 30 % in only seven of the examined countries, reaching up to 54.3 %. In the remaining countries it ranges from 13 % to 29.4 %. However, the proportion increased between 2013 and 2016 in all but two countries (Figure 2).