European Commission

Indicators report

Annex to MORE3 study: support data collection and analysis concerning mobility patterns and career paths of researchers

IDEA Consult, WIFO and Technopolis
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Research and Innovation

Indicators report Europe – Annex to MORE3 study: Support data collection and analysis concerning mobility patterns and career paths of researchers

European Commission
Directorate-General for Research and Innovation
Directorate B — Open Innovation and Open Science
Unit B2 - Open Science and ERA policy
Contact Emiliano Carozza
E-mail Emiliano.CAROZZA@ec.europa.eu
RTD-PUBLICATIONS@ec.europa.eu
European Commission
B-1049 Brussels

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Directorate-General for Research and Innovation
European Research Area

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1. Introduction

The MORE 3 study, titled "support of data collection and analysis concerning mobility patterns and career paths of researchers", is carried out under the framework contract "provision of services in the field of research evaluation and research policy analysis" Lot 2 "Data collection and performance indicators to monitor the European Research Policy". It foresees **to update, improve and further develop the set of indicators** of the MORE2 study in order to meet the need for indicators over time and assess the impact on researchers of policy measures introduced during implementation of the EPR. The MORE3 study provides new indicators and thus new surveys to meet emerging policy needs and priorities.

The main objective of the MORE3 study is defined as:

"***Carrying out two major surveys and developing indicators to help monitor progress towards an open labour market for researchers"***

For this, four tasks are identified:

I. Carry out a survey of researchers currently working in the EU (and EFTA) in higher education institutions (HEI) regarding their mobility patterns, career paths, employment and working conditions (Task 1);

II. Carry out a global survey of researchers currently working outside Europe regarding their mobility patterns, career paths and working conditions (Task 2);

III. Update the set of internationally-comparable indicators on researchers (Task 3);

IV. Draft a final report that provides a comparative, policy-relevant analysis of the mobility patterns, working conditions and career paths of researchers (Task 4).

This is report is part of the Second Interim Report of the MORE3 study consisting of the final reports for Task 1 and Task 3:

- Part 1: Task 1 – EU higher education survey results
- Part 2: Task 3 – Indicator report on researchers

Underlying report thus presents the final results of Task 3, the revision, updating and development of a limited set of key indicators covering different aspects related to researchers in the EU: human resources, working conditions, career path, mobility (international, intersectoral and interdisciplinary) and attractiveness of ERA. These indicators provide recent trends and international comparison, in particular with respect to the EU average, of these aspects.

Starting from previous reports (including Researchers Reports and MORE2 report), an extensive and wide overview of indicators was conducted and resulted in the elaboration of a long list of 112 indicators. Each of these indicators was evaluated according to different criteria in order to identify the most relevant key indicators. The selection process was based on conceptual criteria (relevance, content validity, reliability/comparability) and availability criteria (country and time coverage).

31 indicators were identified in the previous progress report as being the most relevant for key indicators. 19 of these indicators are based on primary data from the MORE2

project and rely on data conducted on the MORE surveys. These indicators have been updated in the course of the current MORE3 project.

This report presents the final list of key indicators, a proposition of structure for the meta-data fiches to be delivered with the final report, the methodology followed for data collection and data imputation, and tables with data (including scorecards) for each indicator.

2. List of key indicators

Table 1: List of key indicators

No	Concept	Indicator	Rationale	Data source	Period (from 2000)	Female	Country coverage
1-1	Human resources	Researchers (FTE) per thousand employees	The indicator presents the current stock of researchers. It provides a measure of the achievements of EU Member States' national R&D targets established in the EUROPE 2020 Strategy.	Eurostat, Total R&D personnel by sectors of performance, occupation and sex (rd_p_persocc)	2000-2014	Yes	EU28; Iceland; Norway; Switzerland; United-States; China; Japan; South Korea
1-2	Human resources	Number of young PhD graduates (ISCED8) per thousand population aged 25-29	The indicator provides an indication of the efficacy of measures aimed to encourage the research career.	Eurostat, Graduates (educ_uoe_grad from 2013, educ_grad until 2012)	2000-2014	Yes	EU28; Iceland; Norway; Switzerland
1-3	Human resources	Number of PhD graduates (ISCED8) per thousand population	The indicator provides an indication of the efficacy of measures aimed to encourage the research career.	Eurostat, Graduates (educ_uoe_grad from 2013, educ_grad until 2012)	2000-2014	Yes	EU28; Iceland; Norway; Switzerland; US; Japan
1-4	Human resources	New women doctoral graduates (ISCED 8) per thousand population aged 25-34	This indicator addresses the gender dimension and provides an indication of the efficacy of measures aimed to encourage the research career.	Eurostat, Graduates (educ_uoe_grad from 2013, educ_grad until 2012)	2000-2014	Yes	EU28; Iceland; Norway; Switzerland

No	Concept	Indicator	Rationale	Data source	Period (from 2000)	Female	Country coverage
1-5	Human resources	Share of female researchers in the total number of researchers	This indicator addresses the gender dimension by providing a direct measure of the proportion of women in the population of researchers. This indicator is to be related to Indicators 3-1 and 3-4 which address the career development of female researchers.	Eurostat, Total R&D personnel by sectors of performance, occupation and sex (rd_p_persocc)	2000-2014	Yes	EU28; Iceland
1-6	Human resources	Share of researchers in the private sector in the total number of researchers	Given the significant differences between working conditions, incentives, potential for mobility and private sector, the indicator provides insight into better understanding the observed values in the other indicators.	Eurostat, Total R&D personnel by sectors of performance, occupation and sex (rd_p_persocc)	2000-2014	Yes	EU28; Iceland; Norway; Switzerland; United-States; China; Japan; South Korea
1-7	Human resources	Satisfaction with recruitment process at home research institution (open, transparent, merit-based)	The indicator provides insights into the recruitment process of researchers according to priority criteria of the Commission (OTM).	MORE2/MORE3 surveys	MORE2 (2012), MORE3 (2016)	Yes	EU and other selected non-EU countries
2-1	Working conditions	Share of researchers employed on fixed-terms contracts in their current academic position	The indicator measures the size of non–permanent employment compared with total employment.	MORE2/MORE3 surveys	MORE2 (2012), MORE3 (2016)	Yes	EU and other selected non-EU countries
2-2	Working conditions	Share of researchers with	The indicator measures the size of part-time	MORE2/MORE3 surveys	MORE2 (2012),	Yes	EU and other selected non-EU countries

No	Concept	Indicator	Rationale	Data source	Period (from 2000)	Female	Country coverage
		part-time employment in their current academic position	employment compared to full time researchers.		MORE3 (2016)		
2-3	Working conditions	Glass Ceiling Index	This indicator helps to assess and understand the difficulties for women progressing in their research career.	SHE figures (WIS database)	2000-2014	Yes	EU28; Iceland; Norway; Switzerland
2-4	Working conditions	Satisfaction with remuneration	The indicator provides an assessment of how each country stands in terms of remuneration according to researchers	MORE3 surveys	MORE3 (2016)	Yes	EU and other selected non-EU countries
2-5	Working conditions	Transferability of pensions/social security	The indicator provides a measurement of the existence of a potential barrier to international mobility (i.e. the transferability of pensions and social security). However, it does not indicate the degree of importance of the barrier. This indicator is to be related to the Pan-European pension fund.	MORE3 surveys	MORE3 (2016)	No	EU and other selected non-EU countries
2-6	Working conditions	Satisfaction in current academic position regarding pensions/social	The indicator provides an insight into the current level of satisfaction related to pension for academic	MORE3 surveys	MORE3 (2016)	Yes	EU and other selected non-EU countries

No	Concept	Indicator	Rationale	Data source	Period (from 2000)	Female	Country coverage
		security	researchers.				
2-7	Working conditions	Number of HRS4R acknowledged institutions per thousand researchers	These institutions have signed the Code of Conduct and provided the Commission with a gap analysis and a solid action plan on how to concretely implement the elements of the Code of Conduct. This indicates the strong commitment of the institutions of the countries.	EURAXESS	2005-2016	No	EU28; Iceland; Norway; Switzerland
3-1	Career path	Share of researchers receiving transferable skills training during PhD	The indicator assesses the extent of the countries' move towards more transferable skills training at the PhD stage.	MORE3 survey	MORE3 (2016)	Yes	EU and other selected non-EU countries
3-2	Career path	Appreciation of transferable skills (e.g. project management, data cleaning, networking, etc.) are regarded as positive factors for career progression	The indicator assesses the importance of transferable skills in the shaping of career paths.	MORE3 survey	MORE3 (2016)	Yes	EU and other selected non-EU countries
3-3	Career path	Degree of satisfaction with different aspects of the current academic position. Composite indicator with career related aspects	The indicator assesses the appreciation from the researcher's point of view of the different dimensions related to his/her career path.	MORE2/MORE3 surveys	MORE2 (2012), MORE3 (2016)	Yes	EU and other selected non-EU countries

No	Concept	Indicator	Rationale	Data source	Period (from 2000)	Female	Country coverage
3-4	Career path	Transparency and meritocracy in professional advancement in HEIs (composite indicator)	The indicator expresses the assessment by researchers of the level of transparency and meritocracy in the careers progression in their institutions.	MORE3 survey	MORE3 (2016)	Yes	EU and other selected non-EU countries
3-5	Career path	Proportion of women as Grade A academic staff	The indicator measures gender (in)equality and thereby helps to assess and understand the difficulties for women in entering in a research career. The gender dimension provides an indication of the progress made towards implementing measures of gender equal opportunities.	WIS database/ SHE figures	2000-2015	Yes	EU28; Iceland; Norway; Switzerland
3-6	Career path	Proportion of women on boards	The indicator measures gender (in)equality and thereby helps to assess and understand the difficulties for women in entering and progressing in the research career. The gender dimension provides an indication of the progress made towards implementing measures of gender equal opportunities.	WiS database/ SHE figures	2002-2014	Yes	EU28; Iceland; Norway; Switzerland
4-1	International mobility	Share of researchers (post PhD) that have worked abroad as researcher for more than 3 months in	The indicator measures medium- to long-term international mobility.	MORE2/MORE3 surveys	MORE2 (2012), MORE3 (2016)	Yes	EU and other selected non-EU countries

No	Concept	Indicator	Rationale	Data source	Period (from 2000)	Female	Country coverage
		the last 10 years					
4-2	International mobility	Share of researchers (post PhD) that have worked abroad as a researcher for less than 3 months in the last ten years	The indicator measures short-term international mobility.	MORE2/MORE3 surveys	MORE2 (2012), MORE3 (2016)	Yes	EU and other selected non-EU countries
4-3	International mobility	Share of HEI researchers that consider virtual mobility as substitute for short- or long-term mobility	The indicator gives information about the relevance of ICT in reducing physical mobility while maintaining international scientific collaboration.	MORE2/MORE3 surveys	MORE2 (2012), MORE3 (2016)	Yes	EU and other selected non-EU countries
4-4	International mobility	Percentage of co-publications of the country with an author from another country	The indicator is a proxy for scientific output effects of researcher mobility.	SCOPUS	2000-2014	No	EU28; Iceland; Norway; Switzerland; United States; China; Japan; South Korea
4-5	International mobility	R1-R2 PhD degree mobility	The indicator measures the proportion of mobile PhD candidates as a measurement of international mobility at early career stages.	MORE2/MORE3 surveys	MORE2 (2012), MORE3 (2016)	Yes	EU and other selected non-EU countries
5-1	Intersectoral mobility	Share of researchers with experience in private sector	The indicator measures intersectoral (public-private sector) mobility.	MORE2/MORE3 surveys	MORE2 (2012), MORE3 (2016)	Yes	EU and other selected non-EU countries
5-2	Intersectoral mobility	Share of female researchers with	This indicator on intersectoral (public-private	MORE2/MORE3 surveys	MORE2 (2012),	Yes	EU and other selected non-EU countries

No	Concept	Indicator	Rationale	Data source	Period (from 2000)	Female	Country coverage
		experience in private sector	sector) mobility addresses the gender issue.		MORE3 (2016)		
6-1	Interdisciplinary mobility	Interdisciplinary mobility as a positive factor for career progression	The indicator assesses whether interdisciplinarity is facilitating career progression.	MORE3 survey	MORE3 (2016)	Yes	EU and other selected non-EU countries
7-1	Attractiveness of ERA	Mobile PhD students (ISCED 6/8) from abroad as a share of total PhD students of the country	The indicator focuses on country of destination measuring mobility of researchers in the first stage of their career, with specific focus on mobility within Europe. It is also a measure of a country(s "brain-gain" within EU.	Eurostat: educ_uoe_mobs02/educ_uoe_enrt01	2008-2014	No	EU28
7-2	Attractiveness of ERA	Share of HEI researchers considering availability of research funding better in EU than in non-EU countries	The indicator measures the attractiveness of countries in terms of research funding.	MORE2/MORE3 surveys	MORE2 (2012), MORE3 (2016)	Yes	EU28
7-3	Attractiveness of ERA	Share of HEI researchers considering social security and pension plan better in EU than in non-EU countries	The indicator measures the attractiveness of countries in terms of social security/pension plans.	MORE2/MORE3 surveys	MORE2 (2012), MORE3 (2016)	Yes	EU28

3. Proposition of structure for meta-data fiches

For each key indicator, a fiche with meta-data will be created (for the final report) with information on the following elements (based on selected categories from Eurostat meta-data):

1 General information
Name of indicator
Type of data: primary data (from MORE survey) or secondary data
Description of the indicator
Source
Date of extraction
2 Statistical presentation
Classification system (e.g. ISCED, R1-R5, sector)
Statistical unit
Time-series (period covered)
Country coverage (list of countries)
Unit of measure (metric)
Reference period
Frequency of dissemination
3 Methodology for constructing the indicator
4 Rationale/relevance
5 Comments

This structure will be discussed with and validated by the European Commission.

4. Methodology

This section presents the methodology used for collecting data for each indicator by source. After the collection phase, an imputation procedure was implemented in order to fill in missing values in time series. This procedure is also explained in this section.

4.1. Data collection

Key indicators rely on primary data from the MORE surveys (19 key indicators) and secondary data collected from various sources of information (12 key indicators):

- Eurostat
- SHE Figures report (from the Women in Science WiS database)
- EURAXESS
- Scopus
- World Bank

This section explains how data was collected from these different sources.

4.1.1. Eurostat

Eurostat was used to produce the following key indicators:

Table 2: Indicators based on Eurostat

No	Concept	Indicator	Reference of Eurostat database
1-1	Human resources	Researchers (FTE) per thousand labour force	rd_p_persocc
1-2	Human resources	Number of young PhD graduates (ISCED8) per thousand population aged 25-29	2000 to 2012: educ_grad4 From 2013: educ_uoe_grad01
1-3	Human resources	Number of PhD graduates (ISCED8) per thousand population	2000 to 2012: educ_grad4 From 2013: educ_uoe_grad01
1-4	Human resources	New women doctoral graduates (ISCED 8) per thousand population aged 25- 34	2000 to 2012: educ_grad4 From 2013: educ_uoe_grad01
1-5	Human resources	Share of female researchers in the total number of researchers	rd_p_persocc
1-6	Human resources	Share of researchers in the private sector in the total number of researchers	rd_p_persocc
7-1	Attractiveness of ERA	Mobile PhD students (ISCED 6/8) from abroad as a share of total PhD students of the country	2008 to 2012: educ_mofo_orig and educ_enrl1tl From 2013: educ_uoe_mobs02 and

No	Concept	Indicator	Reference of Eurostat database
			educ_uoe_enrt01

Indicators 1-1, 1-5 and 1-6 in Table 2 were collected using the rd_p_persocc database from Eurostat. Data was extracted for years 2000 to 2014 in full time equivalent. For indicators 1-5 and 1-6, which are ratios, all data needed to calculate the share in the total number of researchers could be found in the rd_p_persocc database. On the other hand, to build the final indicator 1-1, the number of total researchers was divided by the total employment, in thousands (see section for information on the source of the employment data).

Indicators 1-2, 1-3 and 1-4 were collected using two different databases from Eurostat. Data on the number of PhD graduates from the year 2000 to 2012 was extracted from the educ_grad4 database, while for years 2013 and 2014, the data was extracted from the educ_uoe_grad01 database. Again, the use of additional data to build the final indicators (total population aged 25-34; total population and population aged 25-34) is described in in section 4.1.6.

Finally, indicator 7-1 was built as the share of foreign (intra-EU28) PhD students on the total number of PhD students of the country. Four Eurostat databases were used to build this indicator. From 2008 to 2012, educ_mofo_orig was used to gather the number of foreign PhD students from the EU27 + Croatia and educ_entr1tl for the total number of PhD students in each EU28 country. For 2013 and 2014, educ_uoe_mobs02 was used to collect the number of foreign PhD students from the EU28 and educ_uoe_enrt01 for the total number of PhD students in each EU28 country.

For all these indicators, missing values were imputed following the methodology explained in section 4.2.

4.1.2. SHE Figures

Data from the Women in Science (WIS) database, published in the SHE Figures reports, were used for the following indicators:

Table 3: Indicators based on SHE Figures

No	Concept	Indicator
3-5	Career path	Proportion of women as Grade A academic staff
3-6	Career path	Proportion of women on boards

For indicator 3-5, SHE Figures reports 2006, 2009, 2012 and 2015 were used. These reports respectively present the proportion of women as Grade A academic staff for the years 2004, 2007, 2010 and 2013. When exceptions to the reference year are mentioned in the reports for some countries, these have been taken into account in the data collection (e.g. in the SHE Figures report of 2015, the reference year for the indicators is 2013. However, the reference year for France is exceptionally 2011: in this case, we have reported our data for France to year 2011, instead of 2013).

Regarding indicator 3-6, SHE Figures reports 2009, 2012 and 2015 were used. These reports respectively present the proportion of women on boards for years 2007, 2010 and 2014. Similarly as with indicator 3-5, when exceptions to the reference year are mentioned in the reports for some countries, these have been taken into account in the data collection.
Values were imputed according to the methodology explained in section 4.2. This allowed us to create continuous time series for these indicators.

4.1.3. EURAXESS

The following indicator was built based on Euraxess.

Table 4: Indicators based on Euraxess

No	Concept	Indicator
2-7	Working conditions	Number of HRS4R acknowledged institutions per million inhabitants

The European Commission presents all listed institutions that have been acknowledged with HRS4R[1] on EURAXESS. A direct link to the website of each of the acknowledged institutions is provided, with information on the strategy and on specific measures taken by the organisation generally available.

In order to collect data, the project team browsed through all the available links in order to find out the exact year in which each organisation received the HRS4R acknowledgement from the European Commission. In cases where the year of obtainment was not directly available, alternative methods were used:

- Looking into other available sources (website of the organisation; online search);
- Contacting the Human Resources department of the organisation (via email and/or phone)

When none of these alternative methods was successful, an estimate was made based on the year of publication of the "*action plan on concrete measures for implementing the elements of the Code of Conduct for the Recruitment of Researchers*". Generally, institutions receive the HRS4R acknowledgement from the European Commission soon after the publication of such action plan.

The key indicator based on this data is presented as the number of institutions located in a country with an HRS4R acknowledgement from the European Commission in a given year per thousand researchers.

[1] See: http://ec.europa.eu/euraxess/index.cfm/rights/strategy4ResearcherOrgs.

4.1.4. Scopus

Scopus was used to produce the following key indicator.

Table 5: Indicator based on Scopus

No	Concept	Indicator
4-4	International mobility	Percentage of co-publications of the country with an author from another country

In order to calculate this percentage of international co-publications, intermediate indicators reported in Table 6 were used.

Table 6: Intermediate indicators for co-publications with another country

No	Indicator	Source
A	Total Number of publications by country (i.e. with at least one co-author with domestic affiliation)	Scopus
B	Total Number of publications by country excluding foreign affiliations of co-authors	Scopus
C	Number of co-publications with another country	Scopus
D	Percentage of co-publications with another country	Scopus
E	Number of co-publications by million population	Scopus
F	Number of copublications with another country by million population	EIS 2016

Raw data on publication counts by year was extracted from Scopus for each country separately (indicator A in Table 6). The extraction was limited to publications after 1999. Only data on articles or reviews from journals were collected.

After identification of foreign affiliation of co-authors within the publications of a given country, all foreign affiliated countries were excluded for a second extraction of data for this country (B).

The total number of exclusively domestic publications (i.e. with no foreign affiliation of co-authors) of a country was subtracted from the total number of publications in order to calculate the number of co-publication with another country, i.e. at least one co-author with foreign affiliation (C). The percentage of international co-publications (D) is the number of international co-publications by country divided by the total number of co-publications by country. This is key indicator 4-4.

In order to validate the figures, we compared them with data from the European Innovation Scoreboard (EIS). The key indicator on percentage of co-publications in MORE3 is not directly comparable with the EIS indicator as the latter is not the percentage of co-publications in total publications, but the number of co-publications per million population. Hence, for the purpose of the comparison only, the number of total co-publications per million population (E) was calculated and compared with the same ratio from the EIS 2016 (F). Results of the comparison analysis show similar figures, with a correlation coefficient of 99.1% between the country figures of both sources for 2015.

Differences are likely explained by different dates of extraction for the Scopus and Eurostat data and possibly slight differences in the filters used (though we use a definition of publications that is standard, i.e. articles and reviews from journals). EIS was not used as the main source of data to construct the indicator as it does not include non EU countries and the 2016 release of the database does not cover years before 2008.

4.1.5. MORE2/MORE3 surveys

19 key indicators rely on surveys conducted in the course of the MORE projects and are therefore unique to this project. Table 7 lists these 19 indicators.

Table 7: Indicators based on MORE surveys

No	Concept	Indicator
1-7	Human resources	Satisfaction with recruitment process at home research institution (open, transparent, merit-based)
2-1	Working conditions	Share of researchers employed on fixed-terms contracts in their current academic position
2-2	Working conditions	Share of researchers with part-time employment in their current academic position
2-4	Working conditions	Satisfaction with remuneration
2-5	Working conditions	Transferability of pensions/social security
2-6	Working conditions	Satisfaction in current academic position regarding the pension/social security
3-1	Career path	Share of researchers receiving transferable skills training during PhD
3-2	Career path	Appreciation of transferable skills (e.g. project management, data cleaning, networking, etc.) are regarded as positive factors for career progression
3-3	Career path	Degree of satisfaction with different aspects of the current academic position. Composite indicator with career related aspects.
3-4	Career path	Transparency and meritocracy in professional advancement in HEIs (composite indicator)
4-1	International mobility	Share of researchers (post PhD) that have worked abroad as researcher for more than 3 months in the last 10 years
4-2	International mobility	Share of researchers (post PhD) that have worked abroad as a researcher for less than 3 months in the last ten years
4-3	International mobility	Share of HEI researchers that consider virtual mobility as substitute for short- or long-term mobility
4-5	International mobility	R1-R2 PhD degree mobility
5-1	Intersectoral mobility	Share of researchers with experience in private sector

No	Concept	Indicator
5-2	Intersectoral mobility	Share of female researchers with experience in private sector
6-1	Interdisciplinary mobility	Interdisciplinary mobility as a positive factor for career progression
7-2	Attractiveness of ERA	Share of HEI researchers considering availability of research funding better in EU than in non-EU countries
7-3	Attractiveness of ERA	Share of HEI researchers considering social security and pension plan better in EU than in non-EU countries

As the survey focuses on researchers in HEIs currently working in the EU, these indicators do not cover non-EU countries.

Indicators 7-2 and 7-3 on the attractiveness of ERA in terms of research funding and social security/pension plan differentiate researchers according to their nationality as follows: one sub-set of data refer to non-EU researchers currently working in the EU while another sub-set refer to EU researchers currently working in the EU but that have previously been mobile outside the EU.

Methodology for collecting and treating data survey indicators are detailed in Task 1 of this project (Part 1 of this Second Interim report).

In comparison with other key indicators based on secondary sources, variations over time for MORE indicators between MORE2 (reference year 2012) and MORE3 (reference year 2016) can sometimes be larger. This can be due to sensitiveness of results to sampling differences per country and/or because questions in MORE surveys are more focused on perception of stakeholders of various concepts while indicators from secondary data are related to factual data like the number of researchers in a country.

4.1.6. Additional indicators

Additional indicators were collected in order to produce key indicators of Table 8, which consist in ratios with the denominator being population or employment in the country.

Table 8: Ratios indicators

No	Indicator
1-1	Researchers (FTE) per thousand employees
1-2	Number of young PhD graduates (ISCED8) per thousand population aged 25-29
1-3	Number of PhD graduates (ISCED8) per thousand population
1-4	New women doctoral graduates (ISCED 8) per thousand population aged 25- 34

Population and employment were collected by gender and for specific age categories when needed for the key indicators. These additional indicators are listed in Table 9.

Table 9: Additional indicators

Indicator	Source
Total population	Eurostat & World Bank
Total female population	Eurostat & World Bank
Total employment	Eurostat & World Bank
Total female employment	Eurostat & World Bank
Population aged 25 to 29	Eurostat & World Bank
Female population aged 25 to 29	Eurostat & World Bank
Population aged 25 to 34 (sum of 25-29 and 30-34)	Eurostat & World Bank
Female population aged 25 to 34 (sum of 25-29 and 30-34)	Eurostat & World Bank

Data for EU28 and EFTA countries were collected from Eurostat, while data for the US, China, Japan and South Korea were collected from the World Bank database.

Table 10: Sources for additional indicators

Country	Source
EU28, Iceland, Norway, Switzerland	Eurostat
United States, China, Japan, South Korea	World Bank

4.2. Data imputation

Missing data is imputed with simple imputation methods. All imputed values are flagged in the database with a code corresponding to the imputation method.

Standard imputations methods are used as follows:

- Interpolation: when data for a single year or a time period no longer than 6 years is missing with adjacent years available, the following formula was used:

$$Imputation\ for\ year\ t = \frac{(t - t_a)}{(t_b - t_a)} X_a + \frac{(t_b - t)}{(t_b - t_a)} X_b$$

  with X_a and X_b being data points for, respectively, previous year available (t_a) and next year available (t_b). This corresponds to a weighted average of adjacent available years with weights being the distance between the imputed year and available years.

- Last observation carried forward: when data for years at the end of the period is missing, the data point from the last available year is used as imputed value, with a maximum of three years of difference between the imputed year and the last available year.

- Next observation carried backward: when data for years at the beginning of the period is missing, the data point from the next available year is used as imputed value, with a maximum of three years of difference between the imputed year and the next available year.

Carry-backward and carry-forward imputations are used in order to get a better country coverage for a given year. The maximum length of three years for imputation reflects a compromise between ensuring better cross-sectional coverage and guaranteeing figures that still make sense for the imputed year. Trends should, however, be carefully assessed when comparing years for which these two types of imputations were used. For this reason, in the scorecards presented in section 5, carried forward imputations are not included in the analysis of the last two available years.

Regarding indicators that consist in dividing an indicator by employment or population (e.g. researchers per thousand employees), the numerator is imputed based on the above methodology, not the ratio, as the denominator (employment, population) does not present missing values.

Table 11 presents the codes that are used to flag imputed value in the database and in section 5.

Table 11: Flags used for imputation methods

Flag	Imputation method
ixy	Interpolation for the yth year in a series of missing value for x consecutive years. For example, i34 indicates that data for 4 consecutive years was initially missing, and that the flag correspond to the 3rd year of this period.
b	Next available data point was carried backward
f	Last available data point was carried forward

5. Indicators and scorecards

This section presents the key indicators in the following format:

- One scorecard reporting the indicator for the last year available and, when available, the indicator five years before the last year available. Changes between these two years are reported, together with an arrow indicating the direction of the change (up, down, or horizontal arrow for no change). Relative changes (percentage change) are reported except for indicators that consist in percentages. For these indicators, absolute changes in percentage points are reported. Coloured circles indicate the comparison with EU average as follows:

Country's performance is at least 20% above EU average	
Country's performance is between -10% and +20% of the EU average	
Country's performance is between -50% and -10% of the EU average	
Country's perfomance is below -50% of the EU average	

  For four indicators, a higher value is associated with a lower performance: share of researchers employed on fixed-term contracts (2-1); share of part-time researchers (2-2); glass ceiling index (2-3) and importance of transferability of pensions/social security as barrier for post-PhD mobility. For these indicators, green, yellow, red and black circles indicate country's performance being, respectively, at least 20% below, between -20% and 10%, between 10% and 50% and above 50% compared to EU average.

- One table reporting data since 2000 or most recent available year.

Regarding indicators based on the MORE surveys, only scorecards are presented because long time series are not available for these indicators.

Indicators for female researchers are reported separately when available.

5.1. Human resources

Positive trends over the last decade are generally observed for indicators related to human resources.

The **number of researchers** per thousand employees has been increasing over the past ten years. Denmark, Finland and Sweden can be found among the best performers, while Romania is the worst. From the international comparison, it emerges that EFTA countries, the US, Japan and South Korea all perform better than the EU average, while China scores very low figures.

Despite an overall decrease in 2013-2014, the number of young **PhD graduates** (aged 25-29) per thousand population shows a positive trend in the last decade, with no significant gender differences. The highest numbers are found in Slovakia and the UK, and the lowest numbers are registered in Bulgaria and Greece. When looking at the average number of PhD graduates (all ages) per thousand population, the trend is positive over the last decade. Best performing countries are Slovakia and Slovenia, while Cyprus and Malta show the lowest numbers. The international comparisons show that Switzerland outperforms the EU for both number of PhD graduates and young PhD graduates, while Japan has a very low number of PhD graduates per thousand population. The data on female new doctoral graduate per thousand population aged 25-34 are strongly increasing over the last decade, with largest numbers found in Slovenia and Germany. On the other hand, the share of women in total researchers are rather stable in the last decade.

An increasing trend is also observed for the share of **researchers in the private sector** during the last decade (increasing from 39% in 2005, to 42% in 2014), with Sweden, Austria and Ireland to show the highest shares, and strong increases recorded in Bulgaria and Poland.

Regarding **satisfaction with the recruitment process**, the majority of researchers seem to be satisfied with recruitment at their research institution according to the open, transparent and merit-based criteria.

5.1.1. Researchers (FTE) per thousand employees

No	Rationale	Data source
1-1	The indicator presents the current stock of researchers. It provides a measure of the achievements of EU Member States' national R&D targets established in the EUROPE 2020 Strategy.	Eurostat, Total R&D personnel by sectors of performance, occupation and sex (rd_p_persocc)

Key descriptive insights:

- Trend over the last decade is positive for EU average, both for total and female number of researchers per thousand employees. Average of EU countries is close to 8 FTE researchers per thousand employees.
- Largest numbers of researchers per thousand employees in the EU are found in Austria, Belgium, Denmark, Finland, France, Luxembourg and Sweden. Denmark, Finland and Sweden present particularly high figures for this indicator (more than 14 FTE researchers per thousand employees).
- Lowest numbers of researchers per thousand employees in the EU are found in Croatia, Cyprus and Romania (less than 4 FTE researchers per thousand employees).
- Concerning female researchers, Greece and Portugal present also high figures compared to EU average, while Romania is the country with the worst performance in the EU.
- EFTA countries perform better than EU average.
- US, Japan and South Korea also perform better than EU average, with particularly high figures for Japan and South Korea.
- China presents very low figures for this indicator (about 2 FTE researchers per thousand employees in the recent years).

Table 12: Researchers (FTE) per thousand employees – Scorecard

Country	2010	2014	2010-2014 % change		Comparison with EU
Austria	9.28	10.16	10%	⇧	🟢
Belgium	9.17	10.42	14%	⇧	🟢
Bulgaria	3.62	4.51	25%	⇧	🔴
Croatia	4.31	3.97	-8%	⇩	⚫
Cyprus	2.37	2.44	3%	⇧	⚫
Czech Republic	6.08	7.38	21%	⇧	🟡
Denmark	14.11	15.40	9%	⇧	🟢
Estonia	7.44	7.21	-3%	⇩	🔴
Finland	17.19	16.04	-7%	⇩	🟢
France	9.52	10.32	8%	⇧	🟢
Germany	8.78	9.08	3%	⇧	🟡
Greece	5.52	8.59	56%	⇧	🟡
Hungary	5.77	6.44	12%	⇧	🔴
Ireland	7.71	9.40	22%	⇧	🟡
Italy	4.67	5.50	18%	⇧	🔴
Latvia	4.70	4.37	-7%	⇩	🔴
Lithuania	7.02	6.71	-5%	⇩	🔴
Luxembourg	11.95	10.49	-12%	⇩	🟢
Malta	3.71	5.01	35%	⇧	🔴
Netherlands	6.53	9.41	44%	⇧	🟡
Poland	4.23	5.04	19%	⇧	🔴
Portugal	9.07	9.05	0%	⇩	🟡
Romania	2.38	2.19	-8%	⇩	⚫
Slovakia	6.58	6.28	-5%	⇩	🔴
Slovenia	8.18	9.61	17%	⇧	🟡
Spain	7.08	7.10	0%	⇧	🔴
Sweden	11.20	14.50	29%	⇧	🟢
United Kingdom	9.07	9.26	2%	⇧	🟡
EU28	7.40	8.07	9%	⇧	
Iceland	15.00	11.55	-23%	⇩	🟢
Norway	10.88	11.53	6%	⇧	🟢
Switzerland	7.35	8.23	12%	⇧	🟡
United States	10.04	10.19	2%	⇧	🟢
China	1.80	2.17	21%	⇧	⚫
Japan	14.07	14.88	6%	⇧	🟢
South Korea	12.66	14.87	17%	⇧	🟢

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 13: Researchers (FTE) per thousand employees over 2000-2014

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	6.61 b	6.59 b	6.63	6.74 i1	7.25	7.67	7.72	8.20	8.78	8.87	9.28	9.32	9.80	10.03	10.16
Belgium	7.46	8.03	7.61	7.88 i61	7.96 i62	8.07 i63	8.27 i64	8.29 i65	8.42 i66	8.71	9.17	9.55	10.18	10.34	10.42
Bulgaria	3.34	3.38	3.34	3.40	3.36	3.41	3.36	3.49	3.44	3.73	3.62	4.07	3.90	4.25	4.51
Croatia	b	b	5.82	3.95	4.69	3.79	3.79	3.62	3.88	4.06	4.31	4.32	4.38	4.37	3.97
Cyprus	1.06	1.11	1.42	1.55	1.78	2.02	2.15	2.17	2.17	2.35	2.37	2.37	2.34	2.47	2.44
Czech Republic	3.00	3.24	3.20	3.40	3.52	5.13	5.51	5.74	6.04	5.92	6.08	6.40	6.91	7.07	7.38
Denmark	7.22 b	7.26	9.46	9.34	9.67	10.41	10.45	10.94	12.72	13.51	14.11	14.82	15.29	15.38	15.40
Estonia	4.67	4.73	5.35	5.23	5.79	5.61	5.61	5.84	6.29	7.52	7.44	7.76	7.75	7.39	7.21
Finland		17.18 b	17.16 b	17.22 b	17.32	16.65	16.73	15.86	16.37	16.86	17.19	16.47	16.65	16.31	16.04
France	7.47	7.52	7.84	7.86	8.27	8.14	8.41	8.71	8.83	9.17	9.52	9.75	10.13	10.43	10.32
Germany	7.17	7.31	7.41	7.57	7.72	7.59	7.64	7.78	7.98	8.39	8.78	8.90	9.20	9.17	9.08
Greece	3.59 b	3.48	3.58 i1	3.66	4.07 i1	4.49	4.48	4.69	4.85 i31	5.11 i32	5.52 i33	6.20	6.82	8.45	8.59
Hungary	3.81	3.82	3.89	3.89	3.85	4.09	4.49	4.49	4.85	5.40	5.77	6.18	6.28	6.49	6.44
Ireland	5.20	5.30	5.43	5.71	6.11	6.05	6.07	6.05	6.97	7.40	7.71	8.47	8.92	9.21	9.40
Italy	3.21	3.17	3.33	3.24	3.27	3.74	3.95	4.13	4.22	4.56	4.67	4.78	5.00	5.34	5.50
Latvia	4.15	3.84	3.73	3.44	3.58	3.48	3.97	4.09	4.33	4.13	4.70	4.70	4.58	4.18	4.37
Lithuania	5.63	6.01	4.53	4.58	5.23	5.40	5.68	5.95	6.04	6.58	7.02	6.85	6.45	6.77	6.71
Luxembourg	9.15	9.45 i21	9.86 i22	10.47	10.80	11.53	10.54	10.86	11.34	11.15	11.95	12.73	9.88	10.60	10.49
Malta	1.91 b	1.86 b	1.84	1.87	3.00	3.23	3.47	3.18	3.43	3.13	3.71	4.54	5.00	4.95	5.01
Netherlands	5.40	5.70	5.42	5.44	6.05	5.97	6.52	6.12	5.99	5.56	6.53	7.52	8.96	9.46	9.41
Poland	3.90	4.04	4.20	4.38	4.54	4.49	4.15	4.09	3.97	3.91	4.23	4.19	4.37	4.67	5.04
Portugal	3.56	3.71	3.92	4.24	4.35	4.47	5.19	5.92	8.44	8.58	9.07	9.89	9.99	9.09	9.05
Romania	2.10	2.04	2.26	2.39	2.42	2.65	2.15	2.13	2.18	2.19	2.38	1.98	2.19	2.27	2.19
Slovakia	4.79	4.54	4.36	4.46	5.01	4.95	5.13	5.26	5.19	5.64	6.58	6.65	6.59	6.35	6.28
Slovenia	4.97	5.05	5.16	4.30	4.36	5.68	6.25	6.53	7.21	7.80	8.18	9.59	9.80	9.80	9.61
Spain	5.00	5.02	5.00	5.34	5.64	5.75	5.85	6.00	6.45	7.06	7.08 i41	7.07 i42	7.26 i43	7.33 i44	7.10
Sweden	11.36 b	10.78	11.02 i1	11.26	11.50	12.87	12.81	10.29	11.18	10.77	11.20	10.83	10.93	14.10	14.50
United Kingdom	6.36	6.72	7.29 i31	7.83 i32	8.36 i33	8.83	8.94	8.83	8.74	9.04	9.07	8.85	8.94	9.26	9.26
EU28	5.08	5.59	5.72	5.74	6.05	6.29	6.40	6.40	6.80	7.04	7.40	7.67	7.80	8.05	8.07
Iceland	12.38 b	12.25	12.58 i1	12.68	13.52 i1	14.00	14.81	13.02	13.53	15.69	15.00 i1	14.18	13.08 i1	11.79	11.55 f
Norway	8.79 b	8.78	8.91 i1	9.24	9.25	9.45	9.78	10.22	10.41	10.78	10.88	11.07	11.11	11.24	11.53
Switzerland	6.91	6.76 i31	6.66 i32	6.63 i33	6.57	6.52 i31	6.39 i32	6.28 i33	6.11	6.72 i31	7.35 i32	7.86 i33	8.43	8.34 f	8.23 f
United States	8.25	8.50	8.84	9.48	9.18	8.99	9.07	9.04	9.52	10.39	10.04	10.45	10.42	10.35 f	10.19 f
China	1.10	1.16	1.26	1.32	1.41	1.69	1.84	2.12	2.37	1.71	1.80	1.94	2.06	2.17	2.17 f
Japan	12.60	12.83	12.46	13.14	13.28	13.89	14.03	14.06	13.64	13.95	14.07	14.39	14.38	14.74	14.88 f
South Korea	5.51	6.84	6.98	7.49	7.62	8.72	9.65	10.65	11.34	11.82	12.66	13.63	14.70	14.85	14.87 f

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

Table 14: Female researchers (FTE) per thousand employees – Scorecard

Country	2009	2013	2009-2013% change		Comparison with EU
Austria	4.26	4.90	15%	↑	🔴
Belgium	6.08	6.56	8%	↑	🟡
Bulgaria	3.85	4.52	17%	↑	🔴
Croatia	4.39	4.72	8%	↑	🔴
Cyprus	1.88	1.96	4%	↑	⚫
Czech Republic	3.60	3.99	11%	↑	🔴
Denmark	8.41	10.47	25%	↑	🟢
Estonia	6.15	6.41	4%	↑	🟡
Finland					
France	3.79	5.67	50%	↑	🟡
Germany	3.75	4.45	19%	↑	🔴
Greece	4.68	7.93	69%	↑	🟢
Hungary	3.57	3.80	7%	↑	🔴
Ireland	5.25	5.80	11%	↑	🟡
Italy	3.84	4.58	19%	↑	🔴
Latvia	4.00	4.17	4%	↑	🔴
Lithuania	6.36	6.43	1%	↑	🟡
Luxembourg	5.77	6.54	13%	↑	🟡
Malta	2.69	3.70	38%	↑	🔴
Netherlands	4.00	5.18	29%	↑	🟡
Poland	3.31	3.79	15%	↑	🔴
Portugal	8.05	8.29	3%	↑	🟢
Romania	2.21	2.36	7%	↑	⚫
Slovakia	5.41	5.98	10%	↑	🟡
Slovenia	5.73	7.47	30%	↑	🟢
Spain	6.20	6.15	-1%	↓	🟡
Sweden	6.70	8.25	23%	↑	🟢
United Kingdom					
EU28	4.77	5.54	16%	↑	
Iceland	13.16	10.21	-22%	↓	🟢

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 15: Female researchers (FTE) per thousand employees over 2000-2014

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	2.37 b	2.35 b	2.32	2.56 i1	2.91	3.08 i1	3.29	3.70	3.95 i1	4.26	4.41 i1	4.54	4.71 i1	4.90	4.87 f
Belgium	4.50	4.87	4.85	4.96	5.18	5.32	5.69	5.79	5.94	6.08	6.42	6.65	6.62 f	6.56 f	6.47 f
Bulgaria	3.28	3.26	3.30	3.40	3.36	3.39	3.24	3.55	3.52	3.85	3.87	4.28	4.07	4.52	4.48 f
Croatia	b	b	5.59	4.28	4.84	4.01	3.90	3.89	4.30	4.39	4.65	4.72	4.81	4.72	4.61 f
Cyprus	0.76	0.80	1.00	1.09	1.36	1.61	1.64	1.64	1.67	1.88	1.84	1.84	1.82	1.96	1.93 f
Czech Republic	1.75	1.89	1.91	2.03	2.00	3.11	3.22	3.39	3.58	3.60	3.61	3.73	3.95	3.99	3.96 f
Denmark	4.42 b	4.47	5.35	5.60	5.94 i1	6.39	6.54 i1	6.81	7.48 i1	8.41	9.13	9.80	10.03	10.47	10.48 f
Estonia	3.92	4.08	4.49	4.51	4.76	4.41	4.59	4.96	4.89	6.15	6.05	6.52	6.74	6.41	6.43 f
Finland															
France								3.84 b	3.78 b	3.79 b	3.78	5.34	5.52	5.67	5.51 f
Germany	2.70 b	2.66	2.70 i1	2.74	2.90 i1	2.94	3.06 i1	3.19	3.46 i1	3.75	4.04 i1	4.22	4.36 i1	4.45	4.41 f
Greece	3.16 b	3.07	3.14 i1	3.19	3.42 i1	3.68	3.89 i51	4.16 i52	4.39 i53	4.68 i54	5.12 i55	5.85	6.94 i1	7.93	7.77 f
Hungary				3.09 b	3.12 b	3.10 b	3.09	3.13	3.27	3.57	3.73	3.99	3.84	3.80	3.61 f
Ireland	3.87 b	3.74 b	3.57	3.87	4.02	3.95	4.16	4.23	4.79	5.25	5.43	5.41	5.64 i1	5.80	5.74 f
Italy	2.64 b	2.54 b	2.48 b	2.42	2.40	3.07	3.26	3.49	3.47	3.84	3.95	4.04	4.27	4.58	4.56 f
Latvia	4.23	4.25	3.98	3.70	4.01	3.54	3.85	4.15	4.33	4.00	4.19	4.72	4.57	4.17	4.24 f
Lithuania	4.84	5.50	4.36	4.45	5.07	5.34	5.60	5.85	6.09	6.36	6.76	6.45	6.27	6.43	6.31 f
Luxembourg			5.21 b	5.19 b	5.08 b	4.85	5.08 i31	5.20 i32	5.76 i33	5.77	6.21 i1	6.70	6.44 i1	6.54	6.28 f
Malta		2.51 b	2.36 b	2.43 b	2.53	2.65	2.84	2.46	2.83	2.69	2.76	3.18	3.79	3.70	3.53 f
Netherlands									4.03 b	4.00 b	4.11 b	4.14	4.85	5.18	5.26 f
Poland	5.25	4.69 i21	4.19 i22	3.59	3.73	3.96	3.57	3.59	3.37	3.31	3.63	3.59	3.60	3.79	3.71 f
Portugal	3.50	3.67	3.88	4.16	4.25	4.33	4.95	5.58	7.86	8.05	8.31	9.01	9.10	8.29	8.09 f
Romania	1.93	1.90	2.24	2.35	2.35	2.73	2.15	2.07	2.23	2.21	2.43	2.06	2.24	2.36	2.35 f
Slovakia	4.04	3.91	3.88	4.00	4.58	4.58	4.92	4.96	5.00	5.41	6.20	6.36	6.23	5.98	5.85
Slovenia	3.78	3.82	3.90	3.01	3.03	4.20	4.54	4.87	5.25	5.73	6.17	7.36	7.25	7.47	7.42 f
Spain		4.77	4.70	5.08	5.33	5.39	5.37	5.49	5.81	6.20	6.29	6.12	6.13	6.15	6.09 f
Sweden			7.75 b	7.72 b	7.83 b	7.81	7.10 i1	6.35	6.45 i1	6.70	6.88 i1	6.87	7.57 i1	8.25	8.15 f
United Kingdom															
EU28	3.38	3.44	3.79	3.73	3.92	4.06	4.15	4.25	4.52	4.77	5.00	5.29	5.44	5.54	5.47
Iceland	9.09 b	9.10	9.39 i1	9.64	10.31 i1	10.77	11.70	10.44	10.80	13.16	11.84 i1	10.55	10.46 f	10.21 f	9.95 f

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

5.1.2. Number of young PhD graduates (ISCED8) per thousand population aged 25-29

No	Rationale	Data source
1-2	The indicator provides an indication of the efficacy of measures aimed to encourage the research career.	Eurostat, Graduates (educ_uoe_grad from 2013, educ_grad until 2012)

Key descriptive insights:

- Trend over the last decade is positive for EU average, but there was an overall decrease of number of young PhD graduates over 2013-2014. Average of EU countries is close to 1 young PhD graduates per thousand population (aged 25-29).
- There is overall no significant difference between the total and female young PhD figures.
- Largest numbers of young PhD graduates in the EU are found in Slovakia, the UK and Ireland with more than 2 young PhD graduates per thousand population. These countries also present the largest number of female young PhD graduates.
- Lowest numbers of young PhD graduates in the EU are found in Bulgaria, Croatia, Cyprus, Finland, Greece, Latvia, Luxembourg, Malta and Poland (less than 0.5 young PhD graduate per thousand population in 2014). Figures regarding female young PhD graduates are also the lowest in these countries.
- Concerning EFTA countries, Switzerland performs better than EU average.

Table 16: Young PhD graduates per thousand population aged 25-29 – Scorecard

Country	2010	2014	2010-2014 % change		Comparison with EU
Austria	1.76	1.37	-22%	⇩	🟢
Belgium	1.31	1.51	15%	⇧	🟢
Bulgaria	0.13	0.25	96%	⇧	⚫
Croatia	0.12	0.28	132%	⇧	⚫
Cyprus	0.09	0.36	314%	⇧	⚫
Czech Republic	0.72	0.68	-5%	⇩	🔴
Denmark	1.09	1.68	54%	⇧	🟢
Estonia	0.64	0.56	-12%	⇩	🔴
Finland	0.50	0.49	0%	⇩	⚫
France	1.61	1.57	-2%	⇩	🟢
Germany	1.68	1.92	15%	⇧	🟢
Greece	0.28	0.25	-11%	⇩	⚫
Hungary	0.43	0.57	32%	⇧	🔴
Ireland	1.27	2.07	63%	⇧	🟢
Italy	0.92	0.91	-1%	⇩	🔴
Latvia	0.12	0.26	117%	⇧	⚫
Lithuania	0.54	0.76	42%	⇧	🔴
Luxembourg	0.35	0.46	34%	⇧	⚫
Malta	0.10	0.19	98%	⇧	⚫
Netherlands	1.33	1.60	20%	⇧	🟢
Poland	0.32	0.33	4%	⇧	⚫
Portugal	0.25	1.18	364%	⇧	🟡
Romania	0.79	0.60	-23%	⇩	🔴
Slovakia	2.26	2.64	17%	⇧	🟢
Slovenia	0.99	1.72	74%	⇧	🟢
Spain	0.76	0.75	-2%	⇩	🔴
Sweden	0.69	1.21	76%	⇧	🟡
United Kingdom	1.92	2.22	16%	⇧	🟢
EU28	0.82	1.01	24%	⇧	
Iceland	0.33	0.27	-19%	⇩	⚫
Norway	0.57	0.70	23%	⇧	🔴
Switzerland	2.24	1.92	-15%	⇩	🟢

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 17: Young PhD graduates per thousand population aged 25-29

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria		1.72 b	1.78 b	1.83 b	1.85	1.94	1.62	1.56	1.64	1.69	1.76	1.68	1.52	1.31	1.37
Belgium		0.63 b	0.64 b	0.65 b	0.65	0.93	0.92	0.77	1.20	1.17	1.31	0.88	1.42	1.42	1.51
Bulgaria		0.09 b	0.10 b	0.09 b	0.10	0.16	0.17	0.18	0.19	0.18	0.13	0.12	0.15	0.18	0.25
Croatia							0.07 b	0.07 b	0.07 b	0.07	0.12 i1	0.17	0.22	0.29	0.28
Cyprus		0.12 b	0.12 b	0.12 b	0.12	0.02	0.25	0.15	0.23	0.14	0.09	0.18	0.21	0.16	0.36
Czech Republic		0.78 b	0.76 b	0.74 b	0.74	0.89	0.92	1.33	1.34	1.34	0.72	0.77	0.83	0.79	0.68
Denmark		0.61 b	0.63 b	0.65 b	0.66	0.51	0.59	0.57	0.73	0.80	1.09	1.18	0.89	1.66	1.68
Estonia				0.41 b	0.42 b	0.42 b	0.42	0.46	0.59	0.63	0.64	0.65	0.79	0.78	0.56
Finland	0.48	0.48 b	0.47 b	0.46	0.52	0.53	0.60	0.63	0.56	0.56	0.50	0.40	0.45	0.58	0.49
France											1.61 b	1.62 b	1.63 b	1.64	1.57
Germany		1.49 b	1.55 b	1.57 b	1.56	1.76	1.71	1.67	1.71	1.64	1.68	1.86	2.66	2.00	1.92
Greece					0.12	0.79	0.28	0.74	0.17	0.22 i1	0.28	0.27 i21	0.26 i22	0.25	0.25
Hungary		0.18 b	0.17 b	0.17 b	0.16	0.21	0.19	0.29	0.21	0.25	0.43	0.39	0.45	0.46	0.57
Ireland								1.25 b	1.22 b	1.23 b	1.27	1.42	1.52	1.84	2.07
Italy	0.39	0.39 b	0.40 b	0.42	0.51	0.64	0.74	0.80	0.84 i31	0.88 i32	0.92 i33	0.95	0.96	1.16	0.91
Latvia				0.08 b	0.08 b	0.08 b	0.08	0.11	0.12	0.24	0.12	0.22	0.26	0.29	0.26
Lithuania		0.45 b	0.47 b	0.48 b	0.49	0.62	0.61	0.66	0.57	0.50	0.54	0.66	0.75	0.82	0.76
Luxembourg									0.36 b	0.35 b	0.35 b	0.34	0.63	0.75	0.46
Malta				0.07 b	0.07 b	0.07 b	0.07	0.07	0.03	0.20	0.10	0.17	0.13	0.26	0.19
Netherlands									1.34 b	1.34 b	1.33 b	1.33	1.48	1.63	1.60
Poland										0.31 b	0.32 b	0.32 b	0.32	0.36	0.33
Portugal		0.08 b	0.08 b	0.08 b	0.08	0.15	0.16	0.16	0.20	0.20	0.25	0.32	0.37	1.31	1.18
Romania		0.27 b	0.29 b	0.29 b	0.29	0.85	0.38	0.28	0.33	0.70	0.79	0.93	0.92	0.90	0.60
Slovakia		0.66 b	0.63 b	0.62 b	0.61	0.70	0.90	1.20	2.00	1.75	2.26	1.93	2.85	2.71	2.64
Slovenia		0.56 b	0.55 b	0.55 b	0.54	0.41	0.38	0.57	0.49	1.04	0.99	1.13	1.20	2.69	1.72
Spain					0.45	0.38	0.43	0.49	0.51	0.59	0.76	0.54	0.60	0.64	0.75
Sweden		0.77 b	0.79 b	0.80 b	0.82	0.84	0.81	1.62	0.89	0.67	0.69	0.64	0.66	1.14	1.21
United Kingdom		1.71 b	1.77 b	1.82 b	1.84	1.80	1.87	1.98	1.80	1.84	1.92	1.98	1.94	2.13	2.22
EU28	0.44	0.65	0.66	0.59	0.58	0.67	0.62	0.73	0.74	0.76	0.82	0.82	0.93	1.08	1.01
Iceland		0.05 b	0.05 b	0.05 b	0.05	0.10	0.14	0.04	0.16	0.24	0.33	0.73	0.27	0.27 f	0.27 f
Norway		0.34 b	0.35 b	0.36 b	0.37	0.45	0.42	0.45	0.57	0.43	0.57	0.65	0.74	0.68	0.70
Switzerland		1.72 b	1.73 b	1.74 b	1.75	1.99	2.08	1.97	1.88	2.08	2.24	2.06	2.14	1.88	1.92

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

Table 18: Young female PhD graduates per thousand population aged 25-29 – Scorecard

Country	2010	2014	2010-2014 % change		Comparison with EU
Austria	1.72	1.30	-24%	⇩	🟢
Belgium	1.28	1.46	14%	⇧	🟢
Bulgaria	0.14	0.28	99%	⇧	⚫
Croatia	0.14	0.28	97%	⇧	⚫
Cyprus	0.14	0.47	229%	⇧	⚫
Czech Republic	0.64	0.66	3%	⇧	🔴
Denmark	0.68	1.25	85%	⇧	🟢
Estonia	0.58	0.57	-1%	⇩	🔴
Finland	0.51	0.37	-26%	⇩	⚫
France	1.36	1.34	-2%	⇩	🟢
Germany	1.88	2.15	14%	⇧	🟢
Greece	0.21	0.29	41%	⇧	⚫
Hungary	0.41	0.56	36%	⇧	🔴
Ireland	1.29	1.99	55%	⇧	🟢
Italy	0.97	0.95	-2%	⇩	🟡
Latvia	0.14	0.31	126%	⇧	⚫
Lithuania	0.57	0.79	39%	⇧	🔴
Luxembourg	0.23	0.37	57%	⇧	⚫
Malta	0.27	0.07	-75%	⇩	⚫
Netherlands	1.17	1.60	37%	⇧	🟢
Poland	0.35	0.36	1%	⇧	⚫
Portugal	0.32	1.19	267%	⇧	🟢
Romania	0.71	0.76	8%	⇧	🔴
Slovakia	2.37	2.86	21%	⇧	🟢
Slovenia	0.78	1.59	105%	⇧	🟢
Spain	0.82	0.84	2%	⇧	🔴
Sweden	0.69	0.94	36%	⇧	🟡
United Kingdom	1.75	2.02	16%	⇧	🟢
EU28	0.79	0.99	25%	⇧	
Norway	0.38	0.56	48%	⇧	🔴
Switzerland	2.34	1.85	-21%	⇩	🟢

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 19: Young female PhD graduates per thousand population aged 25-29

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria		1.43 b	1.49 b	1.53 b	1.55	1.79	1.53	1.47	1.63	1.58	1.72	1.52	1.49	1.26	1.30
Belgium		0.48 b	0.49 b	0.50 b	0.50	0.71	0.74	0.66	1.13	1.10	1.28	0.86	1.36	1.41	1.46
Bulgaria		0.10 b	0.11 b	0.11 b	0.11	0.21	0.20	0.24	0.21	0.21	0.14	0.13	0.17	0.20	0.28
Croatia							0.08 b	0.08 b	0.08 b	0.08	0.14 i1	0.21	0.29	0.34	0.28
Cyprus		0.24 b	0.23 b	0.23 b	0.23	0.04	0.35	0.30	0.32	0.18	0.14	0.33	0.31	0.24	0.47
Czech Republic		0.58 b	0.56 b	0.54 b	0.54	0.62	0.68	1.00	1.07	1.13	0.64	0.77	0.74	0.75	0.66
Denmark		0.36 b	0.36 b	0.37 b	0.38	0.31	0.30	0.35	0.43	0.55	0.68	0.85	0.70	1.17	1.25
Estonia				0.44 b	0.45 b	0.45 b	0.45	0.33	0.50	0.56	0.58	0.56	0.90	0.90	0.57
Finland	0.46 b	0.46 b	0.45 b	0.44	0.44	0.47	0.38	0.57	0.56	0.51	0.51	0.38	0.37	0.45	0.37
France											1.36 b	1.37 b	1.38 b	1.39	1.34
Germany		1.49 b	1.54 b	1.56 b	1.55	1.78	1.75	1.77	1.81	1.86	1.88	2.11	2.80	2.21	2.15
Greece					0.10	0.63	0.15	0.29	0.13	0.16 i1	0.21	0.22 i21	0.23 i22	0.25	0.29
Hungary		0.15 b	0.14 b	0.14 b	0.13	0.17	0.20	0.24	0.18	0.25	0.41	0.40	0.45	0.43	0.56
Ireland								1.32 b	1.27 b	1.26 b	1.29	1.32	1.41	1.77	1.99
Italy	0.40	0.40 b	0.41 b	0.43	0.53	0.66	0.77	0.85	0.88 i31	0.93 i32	0.97 i33	1.00	1.06	0.99	0.95
Latvia				0.10 b	0.10 b	0.11 b	0.11	0.10	0.14	0.17	0.14	0.25	0.21	0.23	0.31
Lithuania		0.42 b	0.44 b	0.45 b	0.46	0.65	0.56	0.71	0.52	0.54	0.57	0.65	0.68	0.83	0.79
Luxembourg									0.24 b	0.24 b	0.23 b	0.23	0.60	0.70	0.37
Malta				0.07 b	0.07 b	0.07 b	0.07	0.07 i1	0.07	0.41	0.27 i1	0.14	0.07	0.34	0.07
Netherlands									1.18 b	1.18 b	1.17 b	1.17	1.40	1.51	1.60
Poland										0.34 b	0.35 b	0.35 b	0.35	0.44	0.36
Portugal		0.08 b	0.08 b	0.07 b	0.07	0.15	0.16	0.17	0.24	0.21	0.32	0.34	0.45	1.45	1.19
Romania		0.30 b	0.32 b	0.32 b	0.32	0.57	0.35	0.30	0.42	0.79	0.71	1.04	1.07	1.07	0.76
Slovakia		0.64 b	0.61 b	0.60 b	0.59	0.65	0.89	1.17	2.06	1.74	2.37	2.06	2.95	3.00	2.86
Slovenia		0.42 b	0.42 b	0.41 b	0.41	0.33	0.34	0.31	0.44	0.94	0.78	0.93	0.98	2.39	1.59
Spain					0.48	0.41	0.44	0.53	0.55	0.66	0.82	0.57	0.69	0.75	0.84
Sweden		0.66 b	0.67 b	0.69 b	0.70	0.68	0.73	1.37	0.73	0.66	0.69	0.58	0.57	0.88	0.94
United Kingdom		1.53 b	1.59 b	1.63 b	1.65	1.56	1.62	1.74	1.61	1.68	1.75	1.83	1.83	1.95	2.02
EU28	0.43	0.57	0.58	0.53	0.52	0.59	0.56	0.66	0.71	0.74	0.79	0.79	0.91	1.05	0.99
Norway		0.25 b	0.26 b	0.27 b	0.27	0.28	0.29	0.29	0.42	0.35	0.38	0.51	0.61	0.57	0.56
Switzerland		1.51 b	1.52 b	1.54 b	1.54	1.62	1.84	1.82	1.74	2.03	2.34	2.12	2.16	1.89	1.85

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

5.1.3. Number of PhD graduates (ISCED8) per thousand population

No	Rationale	Data source
1-3	The indicator provides an indication of the efficacy of measures aimed to encourage the research career.	Eurostat, Graduates (educ_uoe_grad from 2013, educ_grad until 2012)

Key descriptive insights:

- Trend over the last decade is positive for EU average, with average number of PhD graduates in EU countries close to 0.24 per thousand population in 2013 and 2014.
- There is overall no significant difference between the figures related to total and female PhD graduates.
- Largest numbers of PhD graduates per thousand population in EU member states are found in Denmark, Finland (which presents however a low number of young PhD graduates according to the previous indicator), Germany, Ireland, Portugal, Slovakia, Slovenia, Sweden and the UK with more than 0.35 PhD graduates per thousand population. Together with Belgium, these countries also present the largest number of female young PhD graduates, together.
- Lowest numbers of PhD graduates for EU are found in Cyprus, Hungary, Malta and Poland (less than 0.12 PhD graduate per thousand population in 2014). Figures regarding female young PhD graduates are also the lowest in these countries.
- Norway and Switzerland present larger figures for PhD graduates compared to the EU, while Japan has a very low number of PhD graduates per thousand population (0.13 in 2014).

Table 20: PhD graduates per thousand population - Scorecard

Country	2010	2014	2010 - 2014 % change		Comparison with EU
Austria	0.30	0.26	-13%	↓	🟡
Belgium	0.20	0.23	17%	↑	🟡
Bulgaria	0.08	0.19	134%	↑	🔴
Croatia	0.19	0.20	3%	↑	🔴
Cyprus	0.04	0.07	91%	↑	⚫
Czech Republic	0.21	0.24	11%	↑	🟡
Denmark	0.25	0.38	51%	↑	🟢
Estonia	0.13	0.16	23%	↑	🔴
Finland	0.28	0.37	30%	↑	🟢
France	0.20	0.21	6%	↑	🔴
Germany	0.31	0.35	11%	↑	🟢
Greece	0.17	0.15	-14%	↓	🔴
Hungary	0.13	0.12	-8%	↓	⚫
Ireland	0.27	0.38	40%	↑	🟢
Italy	0.20	0.18	-11%	↓	🔴
Latvia	0.06	0.13	112%	↑	🔴
Lithuania	0.13	0.14	8%	↑	🔴
Luxembourg	0.12	0.15	29%	↑	🔴
Malta	0.03	0.05	78%	↑	⚫
Netherlands	0.23	0.27	19%	↑	🟡
Poland	0.09	0.09	2%	↑	⚫
Portugal	0.13	0.38	187%	↑	🟢
Romania	0.23	0.19	-19%	↓	🔴
Slovakia	0.53	0.40	-25%	↓	🟢
Slovenia	0.23	0.49	114%	↑	🟢
Spain	0.19	0.23	25%	↑	🟡
Sweden	0.29	0.37	30%	↑	🟢
United Kingdom	0.30	0.39	30%	↑	🟢
EU28	0.20	0.24	23%	↑	
Iceland	0.11	0.12	8%	↑	🔴
Norway	0.25	0.28	14%	↑	🟡
Switzerland	0.46	0.47	3%	↑	🟢
United States	0.22	0.24	6%	↑	🟡
Japan	0.12	0.13	2%	↑	🔴

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 21: PhD graduates per thousand population

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria		0.30 b	0.30 b	0.30 b	0.30	0.27	0.26	0.25	0.27	0.27	0.30	0.28	0.29	0.26	0.26
Belgium		0.14 b	0.14 b	0.14 b	0.14	0.15	0.16	0.16	0.18	0.18	0.20	0.20	0.21	0.22	0.23
Bulgaria		0.05 b	0.05 b	0.05 b	0.05	0.07	0.08	0.08	0.08	0.09	0.08	0.09	0.13	0.17	0.19
Croatia		0.08 b	0.08 b	0.08 b	0.08	0.09	0.10	0.11	0.11	0.13	0.19	0.25	0.31	0.19	0.20
Cyprus		0.02 b	0.02 b	0.02 b	0.02	0.01	0.04	0.02	0.04	0.04	0.04	0.05	0.06	0.06	0.07
Czech Republic		0.17 b	0.17 b	0.17 b	0.17	0.19	0.20	0.22	0.23	0.23	0.21	0.23	0.26	0.23	0.24
Denmark		0.15 b	0.15 b	0.15 b	0.15	0.18	0.17	0.18	0.20	0.21	0.25	0.27	0.28	0.34	0.38
Estonia		0.15 b	0.15 b	0.15 b	0.15	0.10	0.11 i1	0.11	0.12	0.12	0.13	0.19	0.14	0.18	0.16
Finland	0.24	0.24 b	0.24 b	0.24	0.26	0.27	0.27	0.29	0.29	0.31	0.28	0.31	0.31	0.35	0.37
France				0.16 b	0.16 b	0.16 b	0.16	0.17	0.18	0.19	0.20	0.20 i1	0.20	0.21	0.21
Germany		0.28 b	0.28 b	0.28 b	0.28	0.31	0.29	0.29	0.31	0.31	0.31	0.34	0.33	0.34	0.35
Greece		0.12 b	0.12 b	0.12 b	0.12	0.11	0.14	0.22	0.13	0.15 i1	0.17	0.15	0.16	0.14	0.15
Hungary		0.09 b	0.09 b	0.09 b	0.09	0.11	0.10	0.11	0.11	0.14	0.13	0.12	0.13	0.11	0.12
Ireland		0.18 b	0.18 b	0.17 b	0.17	0.20	0.23	0.24	0.24	0.27	0.27	0.32	0.32	0.33	0.38
Italy	0.11	0.11 b	0.11 b	0.11	0.15	0.17	0.18	0.18	0.21	0.21 i21	0.20 i22	0.19	0.19	0.18	0.18
Latvia		0.04 b	0.04 b	0.04 b	0.04	0.05	0.05	0.07	0.06	0.08	0.06	0.14	0.13	0.16	0.13
Lithuania		0.09 b	0.09 b	0.09 b	0.09	0.10	0.10	0.11	0.11	0.12	0.13	0.12	0.13	0.15	0.14
Luxembourg									0.12 b	0.12 b	0.12 b	0.11	0.11	0.12	0.15
Malta	0.01	0.01 b	0.01 b	0.01	0.01 i1	0.01	0.01	0.02	0.03	0.05	0.03	0.05	0.03	0.06	0.05
Netherlands		0.17 b	0.17 b	0.17 b	0.16	0.18	0.18	0.19	0.20	0.20	0.23	0.22	0.24	0.26	0.27
Poland		0.14 b	0.14 b	0.14 b	0.14	0.15	0.16	0.16	0.15	0.13	0.09	0.08	0.09	0.10	0.09
Portugal		0.09 b	0.09 b	0.09 b	0.09	0.10	0.10	0.12	0.12	0.12	0.13	0.15	0.18	0.40	0.38
Romania		0.12 b	0.12 b	0.12 b	0.12	0.18	0.15	0.14	0.16	0.23	0.23	0.28	0.26	0.27	0.19
Slovakia		0.16 b	0.16 b	0.16 b	0.16	0.19	0.23	0.26	0.31	0.36	0.53	0.31	0.40	0.39	0.40
Slovenia		0.18 b	0.18 b	0.18 b	0.18	0.18	0.20	0.21	0.20	0.23	0.23	0.26	0.28	0.57	0.49
Spain		0.20 b	0.20 b	0.20 b	0.19	0.16	0.16	0.16	0.16	0.17	0.19	0.19	0.20	0.22	0.23
Sweden		0.31 b	0.31 b	0.31 b	0.31	0.31	0.29	0.43	0.31	0.31	0.29	0.27	0.27	0.35	0.37
United Kingdom		0.26 b	0.26 b	0.26 b	0.26	0.26	0.27	0.29	0.27	0.28	0.30	0.32	0.32	0.41	0.39
EU28	0.12	0.15	0.15	0.15	0.15	0.16	0.16	0.18	0.17	0.19	0.20	0.20	0.21	0.24	0.24
Iceland		0.04 b	0.03 b	0.03 b	0.03	0.05	0.05	0.03	0.07	0.10	0.11	0.16	0.13	0.12 f	0.12 f
Norway		0.17 b	0.17 b	0.17 b	0.17	0.18	0.19	0.21	0.26	0.23	0.25	0.26	0.28	0.31	0.28
Switzerland		0.38 b	0.38 b	0.38 b	0.38	0.42	0.43	0.43	0.42	0.44	0.46	0.44	0.46	0.45	0.47
United States		0.17 b	0.17 b	0.17 b	0.17	0.18	0.19	0.20	0.21	0.22	0.22	0.23	0.24	0.24 f	0.24 f
Japan		0.12 b	0.12 b	0.12 b	0.12	0.12	0.12	0.13	0.13	0.13	0.12	0.12	0.13	0.13	0.13

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

Table 22: Female PhD graduates per thousand population – Scorecard

Country	2010	2014	2010 - 2014 % change		Comparison with EU
Austria	0.25	0.21	-14%	⇩	🟡
Belgium	0.24	0.31	29%	⇧	🟢
Bulgaria	0.05	0.13	145%	⇧	🔴
Croatia	0.19	0.20	7%	⇧	🔴
Cyprus	0.03	0.07	186%	⇧	⚫
Czech Republic	0.16	0.20	22%	⇧	🔴
Denmark	0.22	0.35	58%	⇧	🟢
Estonia	0.13	0.16	25%	⇧	🔴
Finland	0.29	0.38	31%	⇧	🟢
France	0.16	0.18	11%	⇧	🔴
Germany	0.27	0.31	15%	⇧	🟢
Greece	0.14	0.14	0%	⇩	🔴
Hungary	0.11	0.11	-6%	⇩	⚫
Ireland	0.26	0.37	45%	⇧	🟢
Italy		0.18			🔴
Latvia	0.07	0.15	113%	⇧	🔴
Lithuania	0.14	0.15	10%	⇧	🔴
Luxembourg	0.09	0.11	19%	⇧	⚫
Malta	0.01	0.03	95%	⇧	⚫
Netherlands	0.19	0.25	34%	⇧	🟡
Poland	0.08	0.09	10%	⇧	⚫
Portugal	0.14	0.39	169%	⇧	🟢
Romania	0.22	0.19	-13%	⇩	🔴
Slovakia	0.51	0.39	-23%	⇩	🟢
Slovenia	0.21	0.54	161%	⇧	🟢
Spain	0.17	0.23	30%	⇧	🟡
Sweden	0.29	0.34	21%	⇧	🟢
United Kingdom	0.27	0.36	35%	⇧	🟢
EU28	0.18	0.23	29%	⇧	
Iceland	0.10	0.13	27%	⇧	🔴
Norway	0.22	0.28	27%	⇧	🟢
Switzerland	0.39	0.40	3%	⇧	🟢
United States	0.24	0.25	7%	⇧	🟡
Japan	0.07	0.08	10%	⇧	⚫

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 23: Female PhD graduates per thousand population

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria		0.24 b	0.24 b	0.24 b	0.24	0.23	0.21	0.21	0.22	0.23	0.25	0.23	0.23	0.23	0.21
Belgium		0.12 b	0.12 b	0.13 b	0.13	0.15	0.17	0.17	0.20	0.21	0.24	0.25	0.28	0.28	0.31
Bulgaria		0.04 b	0.04 b	0.04 b	0.04	0.05	0.06	0.06	0.06	0.06	0.05	0.06	0.09	0.11	0.13
Croatia		0.07 b	0.07 b	0.07 b	0.07	0.08	0.10	0.11	0.11	0.12	0.19	0.27	0.33	0.21	0.20
Cyprus		0.02 b	0.02 b	0.02 b	0.02	0.00	0.05	0.03	0.03	0.03	0.03	0.06	0.05	0.06	0.07
Czech Republic		0.12 b	0.12 b	0.12 b	0.12	0.13	0.14	0.16	0.17	0.17	0.16	0.20	0.21	0.19	0.20
Denmark		0.10 b	0.10 b	0.10 b	0.10	0.14	0.14	0.14	0.17	0.18	0.22	0.24	0.25	0.30	0.35
Estonia		0.17 b	0.18 b	0.18 b	0.18	0.08		0.11	0.11	0.10	0.13	0.18	0.14	0.20	0.16
Finland	0.22	0.22 b	0.22 b	0.22	0.23	0.26	0.25	0.29	0.31	0.32	0.29	0.31	0.31	0.35	0.38
France				0.13 b	0.13 b	0.13 b	0.12	0.14	0.14	0.15	0.16		0.17	0.18	0.18
Germany		0.21 b	0.21 b	0.21 b	0.21	0.24	0.24	0.24	0.25	0.26	0.27	0.29	0.30	0.30	0.31
Greece		0.09 b	0.09 b	0.09 b	0.09	0.08	0.10	0.17	0.10		0.14	0.11	0.13	0.12	0.14
Hungary		0.07 b	0.07 b	0.07 b	0.07	0.09	0.08	0.08	0.09	0.13	0.11	0.11	0.11	0.10	0.11
Ireland		0.16 b	0.16 b	0.16 b	0.15	0.18	0.22	0.22	0.25	0.24	0.26	0.31	0.31	0.32	0.37
Italy	0.11	0.11 b	0.11 b	0.11	0.15	0.17	0.17	0.18	0.22			0.20	0.20	0.18	0.18
Latvia		0.04 b	0.04 b	0.04 b	0.04	0.06	0.04	0.07	0.07	0.09	0.07	0.17	0.14	0.16	0.15
Lithuania		0.09 b	0.09 b	0.09 b	0.10	0.10	0.11	0.13	0.12	0.14	0.14	0.12	0.14	0.16	0.15
Luxembourg									0.10 b	0.10 b	0.09 b	0.09	0.11	0.09	0.11
Malta	0.01	0.01 b	0.01 b	0.00	0.00 i21	0.00 i22	0.00	0.01	0.02	0.05	0.01	0.01	0.03	0.06	0.03
Netherlands		0.13 b	0.13 b	0.13 b	0.13	0.13	0.14	0.16	0.16	0.16	0.19	0.19	0.21	0.24	0.25
Poland		0.13 b	0.13 b	0.13 b	0.13	0.14	0.15	0.15	0.14	0.13	0.08	0.08	0.10	0.10	0.09
Portugal		0.08 b	0.08 b	0.08 b	0.08	0.09	0.11	0.11	0.12	0.12	0.14	0.16	0.19	0.41	0.39
Romania		0.12 b	0.12 b	0.12 b	0.12	0.17	0.14	0.14	0.15	0.21	0.22	0.27	0.28	0.27	0.19
Slovakia		0.14 b	0.14 b	0.14 b	0.14	0.17	0.21	0.23	0.29	0.34	0.51	0.31	0.38	0.39	0.39
Slovenia		0.14 b	0.14 b	0.14 b	0.14	0.17	0.19	0.19	0.19	0.20	0.21	0.23	0.28	0.60	0.54
Spain		0.19 b	0.19 b	0.18 b	0.18	0.15	0.15	0.15	0.15	0.17	0.17	0.18	0.19	0.22	0.23
Sweden		0.27 b	0.27 b	0.27 b	0.27	0.27	0.26	0.39	0.29	0.30	0.29	0.27	0.26	0.32	0.34
United Kingdom		0.22 b	0.22 b	0.22 b	0.21	0.22	0.23	0.25	0.24	0.25	0.27	0.28	0.29	0.37	0.36
EU28	0.11	0.13	0.13	0.13	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.19	0.20	0.23	0.23
Iceland		0.04 b	0.03 b	0.03 b	0.03	0.05	0.05	0.04	0.05	0.13	0.10	0.15	0.13	0.13 f	0.13 f
Norway		0.13 b	0.13 b	0.13 b	0.13	0.14	0.15	0.18	0.23	0.21	0.22	0.24	0.27	0.29	0.28
Switzerland		0.29 b	0.28 b	0.28 b	0.28	0.30	0.33	0.33	0.34	0.37	0.39	0.38	0.39	0.39	0.40
United States		0.16 b	0.16 b	0.16 b	0.16	0.17	0.18	0.20	0.21	0.23	0.24	0.25	0.26	0.26 f	0.25 f
Japan		0.06 b	0.06 b	0.06 b	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

5.1.4. New women doctoral graduates (ISCED 8) per thousand population aged 25- 34

No	Rationale	Data source
1-4	This indicator addresses the gender dimension and provides an indication of the efficacy of measures aimed to encourage the research career.	Eurostat, Graduates (educ_uoe_grad from 2013, educ_grad until 2012)

Key descriptive insights:

- Figures for new women doctoral graduates per thousand population (aged 25-34) are strongly increasing over the last decade, from an average of EU Member States close to 0.32 in 2005 to 0.56 in 2014.
- Largest numbers for EU Member States are found in Denmark, Germany, Slovakia and Slovenia with about 1 or more new women doctoral graduates per thousand population in 2014.
- Lowest EU figures are found in Bulgaria, Cyprus, Greece, Latvia, Malta and Poland.
- Within EFTA countries, this indicator is lower in Norway and Iceland than in the EU, while Switzerland performs better than the EU average with 1.18 new women doctoral graduates per thousand population in 2014.

Table 24: New women doctoral graduates per thousand population aged 25-34 – Scorecard

Country	2010	2014	2010-2014 % change		Comparison with EU
Austria	0.70	0.61	-13%	⇩	🟡
Belgium	0.53	0.62	17%	⇧	🟡
Bulgaria	0.14	0.24	79%	⇧	⚫
Croatia	0.27	0.42	57%	⇧	🔴
Cyprus	0.05	0.19	262%	⇧	⚫
Czech Republic	0.39	0.50	29%	⇧	🔴
Denmark	0.55	0.97	74%	⇧	🟢
Estonia	0.28	0.34	24%	⇧	🔴
Finland	0.48	0.57	18%	⇧	🟡
France	0.55	0.54	-2%	⇩	🟡
Germany	0.94	1.06	12%	⇧	🟢
Greece	0.16	0.21	35%	⇧	⚫
Hungary	0.24	0.29	19%	⇧	🔴
Ireland	0.57	0.88	53%	⇧	🟢
Italy	0.59	0.59	0%	⇩	🟡
Latvia	0.10	0.27	159%	⇧	⚫
Lithuania	0.36	0.45	24%	⇧	🔴
Luxembourg	0.25	0.31	23%	⇧	🔴
Malta	0.13	0.05	-62%	⇩	⚫
Netherlands	0.68	0.90	33%	⇧	🟢
Poland	0.22	0.24	8%	⇧	⚫
Portugal	0.25	0.77	203%	⇧	🟢
Romania	0.46	0.61	30%	⇧	🟡
Slovakia	1.02	0.95	-7%	⇩	🟢
Slovenia	0.47	1.12	135%	⇧	🟢
Spain	0.36	0.52	46%	⇧	🟡
Sweden	0.58	0.71	22%	⇧	🟢
United Kingdom	0.70	0.84	19%	⇧	🟢
EU28	0.43	0.56	31%	⇧	
Iceland	0.15	0.19	29%	⇧	⚫
Norway	0.35	0.46	30%	⇧	🔴
Switzerland	1.21	1.18	-2%	⇩	🟢

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 25: New women doctoral graduates per thousand population aged 25-34

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria		0.58b	0.60b	0.61b	0.63	0.64	0.60	0.60	0.64	0.67	0.70	0.65	0.68	0.64	0.61
Belgium		0.18b	0.19b	0.19b	0.19	0.23	0.26	0.27	0.48	0.46	0.53	0.36	0.58	0.58	0.62
Bulgaria		0.08b	0.08b	0.08b	0.08	0.13	0.13	0.18	0.14	0.15	0.14	0.16	0.19	0.24	0.24
Croatia							0.20b	0.20b	0.20b	0.20	0.27i1	0.33	0.40	0.44	0.42
Cyprus				0.17b	0.17b	0.16b	0.16	0.09	0.09i1	0.09	0.05	0.13	0.14	0.15	0.19
Czech Republic		0.29b	0.28b	0.28b	0.27	0.28	0.32	0.38	0.39	0.42	0.39	0.49	0.52	0.50	0.50
Denmark		0.24b	0.24b	0.25b	0.25	0.32	0.33	0.31	0.38	0.45	0.55	0.61	0.59	0.83	0.97
Estonia				0.19b	0.19b	0.19b	0.19	0.20	0.24	0.28	0.28	0.40	0.32	0.47	0.34
Finland	0.33	0.34b	0.34b	0.34	0.41	0.43	0.41	0.52	0.54	0.55	0.48	0.51	0.50	0.52	0.57
France											0.55b	0.55b	0.55b	0.54	0.54
Germany		0.61b	0.63b	0.66b	0.68	0.79	0.80	0.83	0.87	0.92	0.94	1.04	1.06	1.04	1.06
Greece		0.16b	0.16b	0.16b	0.16	0.24	0.33	0.58	0.08	0.12i1	0.16	0.17i21	0.19i22	0.21	0.21
Hungary		0.13b	0.12b	0.12b	0.12	0.14	0.14	0.15	0.16	0.23	0.24	0.23	0.25	0.23	0.29
Ireland								0.58b	0.57b	0.57b	0.57	0.65	0.67	0.74	0.88
Italy	0.29	0.29b	0.30b	0.30	0.40	0.47	0.50	0.54	0.55i31	0.57i32	0.59i33	0.61	0.63	0.60	0.59
Latvia				0.09b	0.09b	0.09b	0.09	0.14	0.13	0.13	0.10	0.26	0.24	0.24	0.27
Lithuania		0.23b	0.24b	0.24b	0.25	0.31	0.32	0.35	0.32	0.37	0.36	0.35	0.40	0.47	0.45
Luxembourg									0.26b	0.26b	0.25b	0.25	0.31	0.29	0.31
Malta							0.14b	0.14b	0.13b	0.13	0.13i31	0.12i32	0.12i33	0.11	0.05
Netherlands									0.67b	0.68b	0.68b	0.68	0.76	0.84	0.90
Poland										0.22b	0.22b	0.22b	0.22	0.28	0.24
Portugal		0.11b	0.11b	0.11b	0.11	0.13	0.15	0.17	0.18	0.17	0.25	0.30	0.36	0.83	0.77
Romania		0.21b	0.21b	0.22b	0.22	0.31	0.25	0.27	0.33	0.49	0.46	0.64	0.60	0.60	0.61f
Slovakia		0.30b	0.29b	0.29b	0.28	0.34	0.38	0.49	0.62	0.71	1.02	0.69	0.94	0.96	0.95
Slovenia		0.31b	0.31b	0.31b	0.31	0.34	0.44	0.35	0.39	0.51	0.47	0.53	0.61	1.37	1.12
Spain		0.28b	0.28b	0.27b	0.26	0.22	0.23	0.29	0.30	0.32	0.36	0.35	0.41	0.47	0.52
Sweden		0.48b	0.49b	0.50b	0.51	0.50	0.54	0.84	0.59	0.59	0.58	0.53	0.52	0.67	0.71
United Kingdom		0.52b	0.53b	0.55b	0.56	0.56	0.60	0.65	0.62	0.67	0.70	0.75	0.75	0.86	0.84
EU28	0.31	0.30	0.30	0.28	0.29	0.32	0.33	0.38	0.38	0.40	0.43	0.45	0.48	0.56	0.56
Iceland			0.05b	0.05b	0.05b	0.05	0.14	0.15i21	0.15i22	0.17	0.15	0.26	0.20	0.20f	0.19f
Norway		0.20b	0.21b	0.21b	0.22	0.26	0.25	0.30	0.37	0.34	0.35	0.40	0.49	0.51	0.46
Switzerland		0.79b	0.80b	0.81b	0.82	0.88	0.95	1.01	1.04	1.13	1.21	1.13	1.13	1.13	1.18

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

5.1.5. Share of female researchers in the total number of researchers

No	Rationale	Data source
1-5	This indicator addresses the gender dimension by providing a direct measure of the proportion of women in the population of researchers. This indicator is to be related to Indicators 3-1 and 3-4 which addresses the career development of female researchers.	Eurostat, Total R&D personnel by sectors of performance, occupation and sex (rd_p_persocc)

Key descriptive insights:

- Trend over the last decade is stable, with the average share of women in total researchers being close to 36%-37%.
- Largest proportions of women in total researchers are observed in Bulgaria, Croatia, Latvia, Lithuania, Portugal and Romania (at least 45% in 2014).
- Lowest proportions are found in Austria and Germany (23% of female researchers in 2014).

Table 26: Share of female researchers in the total number of researchers - Scorecard

Country	2009	2013	2009-2013 p.p. change		Comparison with EU
Austria	22%	23%	1%	⇧	🔴
Belgium	32%	29%	-2%	⇩	🔴
Bulgaria	48%	50%	2%	⇧	🟢
Croatia	49%	50%	1%	⇧	🟢
Cyprus	38%	38%	1%	⇧	🟡
Czech Republic	26%	25%	-2%	⇩	🔴
Denmark	30%	33%	3%	⇧	🟡
Estonia	42%	42%	1%	⇧	🟡
Finland					
France	20%	26%	6%	⇧	🔴
Germany	21%	23%	2%	⇧	🔴
Greece	37%	39%	2%	⇧	🟡
Hungary	30%	27%	-3%	⇩	🔴
Ireland	33%	29%	-3%	⇩	🔴
Italy	34%	36%	2%	⇧	🟡
Latvia	50%	50%	0%	⇧	🟢
Lithuania	50%	48%	-2%	⇩	🟢
Luxembourg	22%	27%	5%	⇧	🔴
Malta	29%	28%	-1%	⇩	🔴
Netherlands	33%	26%	-8%	⇩	🔴
Poland	38%	36%	-2%	⇩	🟡
Portugal	45%	45%	0%	⇧	🟢
Romania	45%	45%	0%	⇧	🟢
Slovakia	42%	42%	0%	⇩	🟡
Slovenia	34%	35%	1%	⇧	🟡
Spain	39%	39%	0%	⇧	🟡
Sweden	30%	28%	-2%	⇩	🔴
United Kingdom					
EU28	37%	35%	-1%	⇩	🟡
Iceland	40%	42%	2%	⇧	🟡

Note: EU28= average of EU MS. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 27: Share of female researchers in the total number of researchers

Country	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011	2012		2013		2014	
Austria	16%	b	16%	b	16%		17%	i1	18%		18%	i1	19%		21%		21%	i1	22%		22%	i1	23%	23%	i1	23%		23%	f
Belgium	25%		26%		27%		28%		29%		29%		30%		31%		32%		32%		32%		32%	30%	f	29%	f	29%	f
Bulgaria	46%		46%		47%		47%		47%		46%		45%		48%		48%		48%		50%		50%	50%		50%		47%	f
Croatia	43%	b	43%	b	43%		48%		46%		47%		46%		47%		49%		49%		49%		49%	50%		50%		53%	f
Cyprus	30%		32%		31%		32%		34%		35%		34%		34%		35%		38%		37%		37%	38%		38%		39%	f
Czech Repub	26%		26%		26%		26%		25%		26%		25%		25%		25%		26%		25%		25%	25%		25%		23%	f
Denmark	29%	b	29%		27%		28%		29%	i1	29%		29%	i1	29%		28%	i1	30%		31%		32%	31%		33%		32%	f
Estonia	42%		42%		41%		42%		41%		40%		40%		41%		38%		42%		41%		41%	43%		42%		43%	f
Finland																													
France															21%	b	20%	b	20%	b	19%		26%	26%		26%		26%	f
Germany	17%	b	16%		16%	i1	16%		17%	i1	18%		18%	i1	19%		20%	i1	21%		21%	i1	22%	22%	i1	23%		23%	f
Greece	33%	b	33%		33%	i1	33%		32%	i1	32%		34%	i51	35%	i52	36%	i53	37%	i54	38%	i55	39%	42%	i1	39%		38%	f
Hungary							36%	b	37%	b	35%	b	31%		32%		31%		30%		30%		30%	28%		27%		26%	f
Ireland	31%	b	29%	b	28%		29%		28%		28%		29%		30%		30%		33%		33%		30%	30%	i1	29%		28%	f
Italy	30%	b	30%	b	28%	b	29%		29%		32%		33%		34%		33%		34%		35%		35%	36%		36%		35%	f
Latvia	49%		55%		53%		53%		54%		50%		47%		50%		50%		50%		47%		52%	51%		50%		49%	f
Lithuania	44%		47%		47%		48%		47%		49%		49%		49%		50%		50%		51%		49%	50%		48%		48%	f
Luxembourg					21%	b	20%	b	19%	b	18%		21%	i31	21%	i32	22%	i33	22%		23%	i1	23%	29%	i1	27%		27%	f
Malta			40%	b	40%	b	39%	b	25%		25%		25%		25%		28%		29%		26%		25%	28%		28%		27%	f
Netherlands																	31%	b	33%	b	29%	b	25%	25%		26%		26%	f
Poland	61%		53%	i21	46%	i22	37%		37%		39%		38%		39%		38%		38%		38%		38%	37%		36%		33%	f
Portugal	44%		45%		45%		45%		45%		45%		44%		44%		44%		45%		44%		44%	44%		45%		44%	f
Romania	43%		43%		45%		45%		45%		46%		45%		44%		46%		45%		44%		46%	45%		45%		46%	f
Slovakia	39%		40%		41%		41%		41%		41%		42%		41%		42%		42%		42%		42%	42%		42%		41%	
Slovenia	35%		34%		35%		32%		32%		34%		33%		34%		33%		34%		35%		35%	34%		35%		35%	f
Spain	37%	b	35%		36%		37%		37%		38%		38%		38%		38%		39%		38%		39%	38%		39%		39%	f
Sweden					34%	b	33%	b	33%	b	29%		26%	i1	29%		27%	i1	30%		29%	i1	30%	33%	i1	28%		27%	f
United Kingdom																													
EU28	36%		36%		36%		36%		35%		36%		36%		36%		36%		37%		37%		37%	37%		37%		36%	
Iceland	35%	b	35%		35%	i1	36%		36%	i1	36%		36%		36%		36%		40%		38%	i1	36%	39%	f	42%	f	42%	f

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

5.1.6. Share of researchers in the private sector in the total number of researchers

No	Rationale	Data source
1-6	Given the significant differences between working conditions, incentives, potential for mobility and private sector, the indicator provides insight into better understanding the observed values in the other indicators	Eurostat, Total R&D personnel by sectors of performance, occupation and sex (rd_p_persocc)

Key descriptive insights:

- Overall, trend in the EU over the last decade is stable, with the average share of MS for researchers in the private sector being close to 40% (from 39% in 2005 to 42% in 2014). Trends are heterogeneous at the country level: strong increase in researchers in the private sector are observed in Bulgaria and Poland, where the share has doubled over the last decade, while the importance of the private sector has strongly decreased in Greece, Luxembourg and Romania.
- The proportion of female researchers in the private sector is significantly lower (about 30%).
- Largest proportions of researchers in the private sector are observed for EU MS in Austria, Ireland and Sweden (more than 64% in 2014). Countries with at least 50% of female researchers in the private sector are Ireland, Malta and Sweden.
- Croatia, Greece and Slovakia present the lowest figures in the EU, with less than 20% of researchers and less than 13% of female researchers in the private sector.

Table 28: Share of researchers in the private sector in the total number of researchers – Scorecard

Country	2009	2014	2009-2014 p.p. change		Comparison with EU
Austria	62%	64%	1%	⇧	🟢
Belgium	47%	51%	4%	⇧	🟢
Bulgaria	14%	27%	13%	⇧	🔴
Croatia	19%	15%	-4%	⇩	⚫
Cyprus	24%	21%	-3%	⇩	⚫
Czech Republic	44%	51%	7%	⇧	🟢
Denmark	64%	60%	-4%	⇩	🟢
Estonia	30%	29%	-1%	⇩	🔴
Finland	58%	56%	-2%	⇩	🟢
France	57%	60%	3%	⇧	🟢
Germany	58%	56%	-2%	⇩	🟢
Greece	23%	17%	-6%	⇩	⚫
Hungary	45%	59%	15%	⇧	🟢
Ireland	54%	64%	10%	⇧	🟢
Italy	37%	38%	1%	⇧	🟡
Latvia	9%	21%	12%	⇧	⚫
Lithuania	13%	23%	10%	⇧	🔴
Luxembourg	57%	40%	-17%	⇩	🟡
Malta	52%	60%	8%	⇧	🟢
Netherlands	44%	61%	17%	⇧	🟢
Poland	16%	32%	16%	⇧	🔴
Portugal	26%	27%	2%	⇧	🔴
Romania	32%	29%	-3%	⇩	🔴
Slovakia	12%	18%	6%	⇧	⚫
Slovenia	44%	54%	10%	⇧	🟢
Spain	34%	37%	2%	⇧	🔴
Sweden	62%	67%	4%	⇧	🟢
United Kingdom	33%	38%	5%	⇧	🟡
EU28	38%	42%	4%	⇧	
Iceland	36%	38%	2%	⇧	🔴
Norway	48%	49%	1%	⇧	🟡
Switzerland	43%	47%	4%	⇧	🟡
United States	70%	69%	-1%	⇩	🟢
China	61%	62%	1%	⇧	🟢
Japan	75%	73%	-1%	⇩	🟢
South Korea	76%	79%	3%	⇧	🟢

Note: EU28= average of EU MS. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 29: Share of researchers in the private sector in the total number of researchers

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	66% b	66% b	66%	65% i1	64%	64%	63%	63%	63%	62%	62%	62%	63%	64%	64%
Belgium	55%	56%	53%	53%	51%	51%	50%	50%	47%	47%	49%	50%	51%	51%	51%
Bulgaria	12%	12%	10%	13%	13%	12%	13%	12%	13%	14%	14%	13%	19%	22%	27%
Croatia	15% b	15% b	15%	16%	14%	12%	13%	14%	16%	19%	18%	18%	17%	16%	15%
Cyprus	25%	25%	27%	21%	19%	19%	22%	23%	26%	24%	22%	20%	19%	20%	21%
Czech Republic	40%	38%	41%	41%	44%	42%	42%	44%	44%	44%	43%	45%	46%	49%	51%
Denmark	50% b	50%	62%	59%	61%	63%	61%	63%	66%	64%	61%	61%	61%	59%	60%
Estonia	10%	15%	15%	17%	20%	27%	25%	26%	31%	30%	31%	33%	31%	31%	29%
Finland		57% b	57% b	57% b	57%	55%	56%	56%	59%	58%	55%	57%	57%	57%	56%
France	47%	50%	51%	52%	54%	53%	54%	56%	56%	57%	59%	60%	60%	61%	60%
Germany (until 1990 f	59%	60%	58%	60%	60%	61%	61%	60%	60%	58%	57%	56%	57%	56%	56%
Greece	23%	26%	27%	27%	29% i1	31%	27%	30%	26% i31	23% i32	19% i33	16%	18%	14%	17%
Hungary	27%	28%	29%	30%	29%	32%	36%	40%	43%	45%	48%	51%	56%	57%	59%
Ireland	66%	67%	64%	60%	57%	58%	58%	57%	54%	54%	56%	59%	61%	64%	64%
Italy	39%	40%	39%	38%	38%	34%	34%	35%	38%	37%	37%	38%	37%	37%	38%
Latvia	26%	20%	20%	14%	13%	14%	17%	10%	11%	9%	16%	14%	15%	16%	21%
Lithuania	4%	5%	4%	7%	7%	9%	11%	15%	14%	13%	14%	16%	16%	21%	23%
Luxembourg	85%	84% i21	83% i22	82%	76%	76%	71%	69%	64%	57%	56%	54%	40%	40%	40%
Malta	17% b	17% b	17%	18%	46%	49%	49%	49%	47%	52%	57%	67%	67%	64%	60%
Netherlands	47%	49%	47%	44%	48%	48%	53%	51%	49%	44%	50%	55%	60%	61%	61%
Poland	18%	17%	8%	12%	14%	15%	16%	16%	14%	16%	18%	16%	23%	29%	32%
Portugal	14%	15%	17%	19%	19%	19%	25%	30%	26%	26%	25%	28%	28%	27%	27%
Romania	62%	57%	53%	47%	43%	45%	41%	41%	33%	32%	30%	22%	28%	29%	29%
Slovakia	24%	24%	24%	20%	17%	18%	16%	13%	13%	12%	13%	13%	16%	17%	18%
Slovenia	32%	34%	35%	40%	41%	37%	39%	41%	43%	44%	44%	51%	52%	54%	54%
Spain	27%	24%	30%	30%	32%	32%	34%	34%	35%	34%	34%	34%	35%	36%	37%
Sweden	61% b	61%	60% i1	59%	58%	67%	68%	63%	66%	62%	62%	60%	62%	67%	67%
United Kingdom	50%	50%	48%	46%	41%	38%	37%	35%	34%	33%	33%	35%	35%	37%	38%
EU28	37%	38%	38%	37%	38%	39%	39%	39%	39%	38%	39%	40%	40%	41%	42%
Iceland	46% b	46%	45% i1	44%	45% i1	47%	48%	48%	48%	36%	41% i1	47%	43% i1	38%	38% f
Norway	56% b	56%	55% i1	54%	51%	48%	50%	49%	50%	48%	47%	47%	48%	48%	49%
Switzerland	62%	59% i31	56% i32	53% i33	50%	48% i31	45% i32	43% i33	41%	43% i31	44% i32	46% i33	47%	47% f	47% f
United States	108% b	105%	98% i61	88% i62	87% i63	84% i64	79% i65	76% i66	70%	70%	67%	68%	69%	69% f	69% f
China	51%	52%	55%	56%	57%	62%	63%	66%	69%	61%	61%	62%	62%	62%	62% f
Japan	65%	66%	69%	70%	70%	71%	71%	71%	75%	75%	75%	75%	74%	73%	73% f
South Korea	66%	73%	73%	74%	74%	77%	78%	75%	77%	76%	77%	77%	78%	79%	79% f

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

Table 30: Share of female researchers in the private sector in the total number of female researchers – Scorecard

Country	2009	2014	2009-2014 p.p. change		Comparison with EU
Austria	42%	44%	2%	⇧	🟡
Belgium	31%	34%	3%	⇧	🟡
Bulgaria	13%	19%	6%	⇧	🔴
Croatia	16%	13%	-3%	⇩	🔴
Cyprus	20%	18%	-1%	⇩	🔴
Czech Republic	25%	29%	4%	⇧	🟡
Denmark	52%	46%	-6%	⇩	🟡
Estonia	20%	22%	2%	⇧	🟡
Finland					
France	59%	48%	-11%	⇩	🟡
Germany	35%	34%	-1%	⇩	🟡
Greece	16%	10%	-6%	⇩	🔴
Hungary	32%	39%	6%	⇧	🟡
Ireland	45%	50%	5%	⇧	🟢
Italy	23%	22%	0%	⇩	🟡
Latvia	10%	14%	4%	⇧	🔴
Lithuania	9%	14%	5%	⇧	🔴
Luxembourg	29%	16%	-13%	⇩	🔴
Malta	48%	57%	9%	⇧	🟢
Netherlands	34%	42%	8%	⇧	🟡
Poland	10%	17%	7%	⇧	🔴
Portugal	16%	17%	1%	⇧	🔴
Romania	27%	25%	-2%	⇩	🟡
Slovakia	6%	8%	1%	⇧	🔴
Slovenia	29%	40%	10%	⇧	🟡
Spain	27%	29%	2%	⇧	🟡
Sweden	53%	54%	1%	⇧	🟢
United Kingdom					
EU28	28%	29%	1%	⇧	
Iceland	29%	34%	5%	⇧	🟡

Note: EU28= average of EU MS. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 31: Share of female researchers in the private sector in the total of number of female researchers

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	41% b	41% b	41%	40% i1	40%	40% i1	40%	41%	41% i1	42%	42% i1	42%	43% i1	44%	44% f
Belgium	36%	37%	36%	36%	34%	35%	35%	34%	32%	31%	34%	34%	34% f	34% f	34% f
Bulgaria	13%	13%	12%	13%	13%	12%	11%	10%	12%	13%	13%	12%	16%	19%	19% f
Croatia	12% b	12% b	12%	13%	13%	11%	10%	12%	16%	16%	16%	15%	16%	13%	13% f
Cyprus	23%	24%	24%	17%	15%	15%	16%	17%	22%	20%	18%	16%	18%	18%	18% f
Czech Republic	26%	24%	26%	26%	26%	25%	23%	24%	25%	25%	25%	27%	28%	29%	29% f
Denmark	42% b	42%	51%	50%	52% i1	54%	53% i1	52%	52% i1	52%	50%	48%	48%	46%	46% f
Estonia	8%	10%	9%	9%	11%	17%	16%	19%	18%	20%	21%	23%	21%	22%	22% f
Finland															
France				b	b	b		57%	57%	59%	62%	46%	47%	48%	48% f
Germany	44% b	44%	42% i1	41%	40% i1	40%	38% i1	36%	36% i1	35%	35% i1	35%	35% i1	34%	34% f
Greece	17% b	17%	19% i1	20%	19% i1	19%	19% i1	20%	18% i31	16% i32	15% i33	14%	12% i1	10%	10% f
Hungary				26% b	26% b	26% b	26%	30%	32%	32%	35%	37%	38%	39%	39% f
Ireland	47% b	47%	46%	42%	42%	43%	44%	44%	42%	45%	45%	45%	47% i1	50%	50% f
Italy	26% b	26% b	26% b	26%	26%	21%	20%	22%	24%	23%	22%	22%	22%	22%	22% f
Latvia	21%	21%	19%	14%	14%	14%	14%	9%	12%	10%	13%	15%	14%	14%	14% f
Lithuania	4%	5%	3%	5%	5%	6%	8%	9%	10%	9%	10%	11%	12%	14%	14% f
Luxembourg			62% b	62% b	62% b	62%	49% i1	38%	33% i1	29%	27% i1	26%	25% f	16%	16% f
Malta		36% b	36% b	36% b	36%	44%	42%	46%	42%	48%	47%	59%	63%	57%	57% f
Netherlands									34% b	34% b	34% b	34%	38%	42%	42% f
Poland	10%	9% i21	8% i22	7%	8%	11%	11%	12%	11%	10%	10%	9%	13%	17%	17% f
Portugal	8%	9%	11%	12%	12%	11%	16%	20%	17%	16%	16%	18%	19%	17%	17% f
Romania	61%	55%	51%	45%	40%	41%	37%	36%	28%	27%	25%	18%	23%	25%	25% f
Slovakia	17%	17%	18%	15%	14%	14%	13%	8%	7%	6%	6%	7%	8%	8%	8%
Slovenia	26%	27%	28%	31%	32%	27%	28%	30%	30%	29%	30%	38%	37%	40%	40% f
Spain	13% b	13%	22%	22%	23%	23%	26%	26%	27%	27%	26%	27%	28%	29%	29% f
Sweden	b	b	44% b	44%	50% i1	57%	55% i1	53%	53% i1	53%	51% i1	50%	52% i1	54%	54% f
United Kingdom															
EU28	25%	25%	28%	27%	27%	28%	27%	28%	28%	28%	28%	28%	29%	29%	29%
Iceland	46% b	46%	43% i1	40%	41% i1	42%	41%	40%	39%	29%	31% i1	34%	34% f	34% f	34% f

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

5.1.7. Satisfaction with recruitment process at home research institution (open, transparent, merit-based)

No	Rationale	Data source
1-7	The indicator provides insights into the recruitment process of researchers according to priority criteria of the Commission (OTM).	MORE2/MORE3 surveys

This indicator is calculated as the average between the following three indicators:

- Share of researchers who agree that research job vacancies are sufficiently externally and publicly advertised by their home institution;
- Share of researchers who agree that the recruitment process is sufficiently transparent in their home institution;
- And share of researchers who agree that recruitment is sufficiently merit-based in their home institution.

Key descriptive insights:

- The indicator has increased for all countries between the MORE2 and MORE3 projects. A majority of researchers seem to be satisfied with recruitment at their research institution according to the open, transparent and merit-based criteria.
- Highest scores for this indicator are found in Czech Republic, Malta and the UK.
- Lowest scores for this indicator are observed in Hungary, Portugal and Spain.
- The indicator is slightly lower for female researchers, but the difference is not significant.

We note that the respective question that was posed in MORE2 differs slightly from the question asked in 2016[2] and was placed at a different position in the questionnaire. This is unlikely, however, to have caused such a big difference on its own. Real developments also play a role, in particular in the strong increase of the first factor (public advertisement of vacancies). Based on national sources (experts), we found that in three countries that experience a very strong rise in this indicator, real events took place that

[2] The difference with 2012 data needs to be interpreted with caution since the respective question in MORE2 was stated slightly differently, in particular the item on external advertising.

MORE2: "What is your opinion on the following issues: 1) Are you satisfied with the extent to which job vacancies are publicly advertised and made known by your institution? 2) Do you think that the recruitment process at your home institution is sufficiently transparent? 3) Do you think that recruitment at your home institution is sufficiently merit-based?", with answer categories "yes", "no" and "N/A / no opinion".

MORE3: "What is your opinion on the following issues with respect to recruitment in your home institution: 1) Research job vacancies are sufficiently externally and publicly advertised and made known by the institution. 2) The recruitment process is sufficiently transparent. 3) Recruitment is sufficiently merit-based.", with answer categories "I agree", "I don't agree" and "N/A".

can be expected to have contributed to this rise[3]. This is the case in Romania (30pp rise), Austria (24pp rise) and Lithuania (20pp rise). In Romania, the EURAXESS initiative seems to have been strongly promoted in the last years: all vacancies/open positions (both national and international) must now be advertised on EURAXESS. In Austria, we found that public and international advertisement of new positions on Euraxess was already compulsory before but that in the 2013-2015 performance agreements with the universities, internationalisation was increasingly focused on, with emphasis on the compulsory use of Euraxess for international job advertisements. In 2015, a new mobility strategy of the Austrian government was implemented which stressed the use of the Euraxess platform as a central information platform. Finally, in Lithuania there is also the practice of public advertisement of vacancies, but more importantly the rise in this indicator can be associated with a recent expansion in the scope of project-based competitive funding to research provided by the Research Council of Lithuania. These are new research (usually short-term and often part-time) positions that are also publically advertised and which may thus have an influence on the researchers' perception. Moreover, increasing competitive pressure for talent has been cited by country experts, as well as the increased use of online platforms for recruiting (such as www.academicjobseu.com).

[3] Several country experts were contacted in this regard. Four out of six experts replied to our question. Information on real events that are expected to contribute to the strong rise in the indicator value is available for Romania, Austria and Lithuania. In the Czech Republic no change was observed that could affect this value. For Bulgaria and Latvia, no information was available through the country experts.

Table 32: Satisfaction with recruitment process at home research institution – Scorecard

	2012	2016	2012- 2016 p.p. change		Comparison with EU28
Country	**total**	**total**	**total**		**total**
Austria	56%	80%	24%	↑	🟡
Belgium	64%	80%	16%	↑	🟡
Bulgaria	47%	68%	21%	↑	🔴
Croatia	47%	66%	19%	↑	🔴
Cyprus	59%	74%	15%	↑	🟡
Czech Republic	59%	84%	25%	↑	🟡
Denmark	65%	81%	16%	↑	🟡
Estonia	70%	78%	9%	↑	🟡
Finland	61%	78%	17%	↑	🟡
France	56%	74%	18%	↑	🟡
Germany	63%	80%	17%	↑	🟡
Greece	57%	74%	17%	↑	🟡
Hungary	50%	58%	8%	↑	🔴
Ireland	70%	79%	8%	↑	🟡
Italy	41%	66%	26%	↑	🔴
Latvia	61%	81%	20%	↑	🟡
Lithuania	49%	68%	20%	↑	🔴
Luxembourg	72%	81%	9%	↑	🟡
Malta	64%	86%	22%	↑	🟡
Netherlands	67%	77%	10%	↑	🟡
Poland	63%	82%	19%	↑	🟡
Portugal	53%	62%	9%	↑	🔴
Romania	52%	82%	30%	↑	🟡
Slovakia	55%	64%	9%	↑	🔴
Slovenia	49%	67%	18%	↑	🔴
Spain	60%	59%	-1%	↓	🔴
Sweden	66%	81%	15%	↑	🟡
United Kingdom	80%	86%	5%	↑	🟡
EU27-EU28	63%	77%	14%	↑	
Iceland	58%	83%	25%	↑	🟡
Norway	66%	79%	13%	↑	🟡
Switzerland	67%	80%	14%	↑	🟡

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 33: Satisfaction with recruitment process at home research institution (female) – Scorecard

	2016	Comparison with EU28
Country	**female**	**female**
Austria	72%	
Belgium	79%	
Bulgaria	66%	
Croatia	64%	
Cyprus	75%	
Czech Republic	80%	
Denmark	72%	
Estonia	72%	
Finland	70%	
France	73%	
Germany	81%	
Greece	68%	
Hungary	62%	
Ireland	79%	
Italy	67%	
Latvia	77%	
Lithuania	65%	
Luxembourg	79%	
Malta	82%	
Netherlands	78%	
Poland	82%	
Portugal	60%	
Romania	82%	
Slovakia	62%	
Slovenia	73%	
Spain	60%	
Sweden	77%	
United Kingdom	82%	
EU27-EU28	75%	
Iceland	84%	
Norway	75%	
Switzerland	81%	

Note: EU28= average of EU MS. Yellow and red indicate country's performance being, respectively between -10% and 20% and between -50% and -10% compared to EU average.

5.2. Working Conditions

The series of indicators in this section relate to working conditions of researchers.

The percentage of researchers employed on a **fixed-term contrac**t basis has decreased between MORE2 and MORE3 surveys, for all countries with the exception of Bulgaria, Italy, Malta, Poland and Slovakia.

10% of EU researchers in the MORE3 survey are employed on **part-time contracts** in their current academic position, similar to MORE2 survey results. A particularly high proportion of these kind of contractual conditions is found, among others, in Germany, Lithuania and the Netherlands.

Overall, higher shares of fixed-term contracts and part-time contracts are recorded for female researchers than for male researchers.

Data confirm the existence of a **Glass Ceiling Effect** (see GCI) for EU female researchers, but this factor is improving over time. Overall, the average EU GCI has been decreasing over the last decade, which illustrates a slight improvement concerning difficulties for women in progressing their research career.

The majority of researchers in the MORE3 survey consider themselves **well paid or paid a reasonable salary**. The highest proportion of researchers are observed in Belgium and Luxembourg, the lowest in Greece and Lithuania.

Concerning **satisfaction with the pension plan**, the vast majority of EU researchers are satisfied with their pension plan with highest satisfaction in Denmark and the Netherlands. However, a strong heterogeneity across countries is observed. Approximately the same satisfaction levels are observed for **social security rights and benefits**. The highest satisfaction rates for social security are observed in Luxembourg and Switzerland, while the lowest are observed in Greece.

There are 264 **HRS4R acknowledged institutions** in EU MS, with about half of EU Member States possessing no or only a few HRS4R institutions.

5.2.1. Share of researchers employed on fixed-terms contracts in their current academic position

No	Rationale	Data source
2-1	The indicator measures the size of non–permanent employment compared with total employment	MORE2/MORE3 surveys

Key descriptive insights:

- 26% of EU researchers in the MORE3 survey are employed on fixed-term contracts in their current academic position. This is lower than the MORE2 figure of 34%.
- The percentage has decreased between both surveys for all countries, except for Bulgaria, Italy, Malta, Poland and Slovakia.
- Countries with lowest proportions of fixed-term contracts for academic researchers are Bulgaria, France, Greece, Malta and the UK, with less than 13% of fixed-term contracts.
- Shares of fixed-term contracts are the highest in Lithuania (70%), Slovakia (63%), Luxembourg (61%) and Germany (53%).
- Proportions of fixed-term contracts are higher for female researchers, with an EU average of 31%, especially in Lithuania (70%), Luxembourg (63%) and Slovakia (61%).

Table 34: Share of researchers employed on fixed-term contracts in their current academic position – Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	total	total	total		total
Austria	45%	33%	-13%	↓	🔴
Belgium	63%	44%	-19%	↓	⚫
Bulgaria	11%	13%	2%	↑	🟢
Croatia	46%	28%	-18%	↓	🟡
Cyprus	34%	23%	-11%	↓	🟡
Czech Republic	46%	39%	-6%	↓	⚫
Denmark	56%	36%	-20%	↓	🔴
Estonia	73%	45%	-28%	↓	⚫
Finland	63%	41%	-22%	↓	⚫
France	20%	8%	-12%	↓	🟢
Germany	54%	53%	-1%	↓	⚫
Greece	23%	12%	-11%	↓	🟢
Hungary	23%	19%	-4%	↓	🟢
Ireland	26%	20%	-6%	↓	🟢
Italy	7%	17%	11%	↑	🟢
Latvia	38%	33%	-5%	↓	🔴
Lithuania	74%	70%	-4%	↓	⚫
Luxembourg	65%	63%	-2%	↓	⚫
Malta	5%	7%	3%	↑	🟢
Netherlands	52%	35%	-16%	↓	🔴
Poland	32%	34%	3%	↑	🔴
Portugal	37%	23%	-14%	↓	🟡
Romania	7%	2%	-6%	↓	🟢
Slovakia	52%	61%	9%	↑	⚫
Slovenia	20%	17%	-3%	↓	🟢
Spain	21%	16%	-5%	↓	🟢
Sweden	51%	28%	-23%	↓	🟡
United Kingdom	28%	9%	-19%	↓	🟢
EU27-EU28	34%	26%	-8%	↓	
Iceland	21%	22%	1%	↑	🟡
Norway	31%	33%	2%	↑	🔴
Switzerland	61%	59%	-2%	↓	⚫

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% below, between -20% and 10%, between 10% and 50% and above 50% compared to EU average.

Table 35: Share of researchers employed on fixed-term contracts in their current academic position (female) – Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	female	female	female		female
Austria	56%	42%	-14%	⇩	🔴
Belgium	75%	55%	-20%	⇩	⚫
Bulgaria	12%	10%	-2%	⇩	🟢
Croatia	52%	30%	-23%	⇩	🟡
Cyprus	33%	25%	-7%	⇩	🟡
Czech Republic	41%	38%	-3%	⇩	🔴
Denmark	61%	40%	-21%	⇩	🔴
Estonia	77%	49%	-28%	⇩	⚫
Finland	59%	48%	-11%	⇩	⚫
France	27%	9%	-18%	⇩	🟢
Germany	61%	62%	1%	⇧	⚫
Greece	24%	13%	-11%	⇩	🟢
Hungary	30%	13%	-16%	⇩	🟢
Ireland	25%	20%	-5%	⇩	🟢
Italy	8%	18%	10%	⇧	🟢
Latvia	43%	33%	-10%	⇩	🟡
Lithuania	73%	75%	2%	⇧	⚫
Luxembourg	77%	75%	-2%	⇩	⚫
Malta	4%	14%	11%	⇧	🟢
Netherlands	63%	44%	-19%	⇩	🔴
Poland	34%	40%	6%	⇧	🔴
Portugal	34%	28%	-6%	⇩	🟡
Romania	8%	2%	-6%	⇩	🟢
Slovakia	53%	60%	7%	⇧	⚫
Slovenia	23%	18%	-5%	⇩	🟢
Spain	24%	17%	-7%	⇩	🟢
Sweden	52%	35%	-18%	⇩	🔴
United Kingdom	34%	13%	-21%	⇩	🟢
EU27-EU28	39%	31%	-7%	⇩	
Iceland	32%	26%	-6%	⇩	🟡
Norway	41%	37%	-4%	⇩	🔴
Switzerland	77%	62%	-15%	⇩	⚫

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% below, between -20% and 10%, between 10% and 50% and above 50% compared to EU average.

5.2.2. Share of researchers with part-time employment in their current academic position

No	Rationale	Data source
2-2	The indicator measures the size of part-time employment compared to full-time researchers	MORE2/MORE3 surveys

Key descriptive insights:

- 10% of EU researchers in the MORE3 survey are employed on part-time contracts in their current academic position. This figure is the same in the MORE2 survey.
- Proportions of part-time contracts are particularly high in a limited number of countries: Austria, Czech Republic, Estonia, Germany, Latvia, Lithuania and the Netherlands.
- The proportion of part-time researchers is slightly higher for female researchers, with 13% of female researchers being employed on part-time contracts. This figure is close to 30% or more in Germany, Lithuania and the Netherlands.
- The proportion of part-time researchers in Switzerland is particularly high: 33% of total researchers and 44% of female researchers are employed part-time.

Table 36: Share of researchers with part-time employment in their current academic position – Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	total	total	total		total
Austria	21%	15%	-6%	⇩	●
Belgium	9%	7%	-2%	⇩	●
Bulgaria	4%	5%	0%	⇧	●
Croatia	2%	6%	4%	⇧	●
Cyprus	1%	5%	3%	⇧	●
Czech Republic	20%	13%	-7%	⇩	●
Denmark	5%	7%	2%	⇧	●
Estonia	21%	21%	-1%	⇩	●
Finland	7%	4%	-3%	⇩	●
France	5%	5%	0%	⇩	●
Germany	23%	24%	0%	⇧	●
Greece	4%	1%	-3%	⇩	●
Hungary	10%	14%	4%	⇧	●
Ireland	2%	4%	3%	⇧	●
Italy	3%	1%	-2%	⇩	●
Latvia	29%	20%	-9%	⇩	●
Lithuania	31%	26%	-5%	⇩	●
Luxembourg	3%	6%	2%	⇧	●
Malta	7%	8%	2%	⇧	●
Poland	3%	3%	0%	⇩	●
Portugal	7%	7%	0%	⇩	●
Romania	4%	2%	-2%	⇩	●
Slovakia	9%	3%	-6%	⇩	●
Slovenia	6%	9%	3%	⇧	●
Spain	7%	5%	-2%	⇩	●
Sweden	10%	9%	0%	⇩	●
The Netherlands	17%	23%	5%	⇧	●
United Kingdom	8%	7%	0%	⇩	●
EU27-EU28	10%	10%	0%	⇩	
Iceland	20%	17%	-3%	⇩	●
Norway	8%	9%	1%	⇧	●
Switzerland	38%	33%	-4%	⇩	●

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% below, between -20% and 10%, between 10% and 50% and above 50% compared to EU average.

Table 37: Share of researchers with part-time employment in their current academic position (female) – Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	female	female	female		female
Austria	31%	21%	-10%	⇩	●
Belgium	9%	10%	2%	⇧	●
Bulgaria	5%	4%	-2%	⇩	●
Croatia	2%	7%	4%	⇧	●
Cyprus	2%	7%	6%	⇧	●
Czech Republic	20%	12%	-8%	⇩	●
Denmark	5%	5%	0%	⇧	●
Estonia	21%	25%	4%	⇧	●
Finland	11%	7%	-4%	⇩	●
France	11%	7%	-4%	⇩	●
Germany	32%	31%	-1%	⇩	●
Greece	3%	2%	-1%	⇩	●
Hungary	13%	15%	2%	⇧	●
Ireland	3%	7%	4%	⇧	●
Italy	3%	1%	-1%	⇩	●
Latvia	25%	19%	-7%	⇩	●
Lithuania	31%	28%	-4%	⇩	●
Luxembourg	6%	9%	3%	⇧	●
Malta	6%	1%	-5%	⇩	●
Poland	3%	1%	-2%	⇩	●
Portugal	4%	5%	2%	⇧	●
Romania	3%	3%	0%	⇧	●
Slovakia	10%	2%	-8%	⇩	●
Slovenia	4%	10%	5%	⇧	●
Spain	8%	3%	-5%	⇩	●
Sweden	14%	10%	-4%	⇩	●
The Netherlands	28%	35%	7%	⇧	●
United Kingdom	13%	14%	1%	⇧	●
EU27-EU28	14%	13%	-1%	⇩	
Iceland	16%	17%	1%	⇧	●
Norway	5%	7%	2%	⇧	●
Switzerland	51%	44%	-7%	⇩	●

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% below, between -20% and 10%, between 10% and 50% and above 50% compared to EU average.

5.2.3. Glass Ceiling Index (GCI)

No	Rationale	Data source
2-3	This indicator helps to assess and understand the difficulties for women progressing in their research career.	SHE figures (WIS database)

"The GCI measures the relative chance for women, as compared with men, of reaching a top position. The GCI compares the proportion of women in grade A positions (equivalent to Full Professors in most countries) to the proportion of women in academia (grade A, B, and C), indicating the opportunity, or lack of it, for women to move up the hierarchical ladder in their profession. A GCI of 1 indicates that there is no difference between women and men being promoted. A score of less than 1 means that women are over-represented at grade A level and a GCI score of more than 1 points towards a Glass Ceiling Effect, meaning that women are underrepresented in grade A positions. In other words, the interpretation of the GCI is that the higher the value, the thicker the Glass Ceiling and the more difficult it is for women to move into a higher position. It is important to note that differences between national grading systems may partly explain variations of the GCI between countries" (SHE report 2012).

Key descriptive insights:

- The average GCI of EU member states is 1.75, indicating the existence of a Glass Ceiling effect for EU female researchers.
- Overall, the average EU GCI has been decreasing over the last decade, which illustrates a slight improvement concerning difficulties for women in progressing in their research career.
- Under-representation of women in grade A position (i.e. highest values for GCI) are observed in Belgium, Cyprus, Czech Republic, Estonia, Lithuania, Luxembourg, and the UK according to latest figures available.
- Relative chance for women (compared to men) of reaching top position is highest in Bulgaria, Croatia and Germany, even if this chance is still lower than for men according to the GCI.

Table 38: Glass Ceiling Index – Scorecard

Country	2009	2013	2009-2013 % change		Comparison with EU
Austria	1.83	1.76	-4%	↓	●
Belgium	2.25	1.95	-13%	↓	●
Bulgaria	1.40	1.25	-11%	↓	●
Croatia	1.51	1.26	-17%	↓	●
Cyprus	3.39	3.16	-7%	↓	●
Czech Republic					
Denmark	1.89	1.71	-10%	↓	●
Estonia					
Finland	1.71	1.58	-8%	↓	●
France	1.76	1.72	-2%	↓	●
Germany	1.45	1.34	-8%	↓	●
Greece					
Hungary	1.76	1.57	-11%	↓	●
Ireland	1.46	1.43	-2%	↓	●
Italy	1.76	1.73	-2%	↓	●
Latvia	1.78	1.63	-8%	↓	●
Lithuania					
Luxembourg					
Malta					
Netherlands	1.92	1.78	-7%	↓	●
Poland	1.83	1.82	-1%	↓	●
Portugal	1.85	1.75	-5%	↓	●
Romania	1.35	1.63	21%	↑	●
Slovakia	1.95	1.82	-7%	↓	●
Slovenia	1.79	1.63	-9%	↓	●
Spain	1.96	1.80	-8%	↓	●
Sweden	1.93	1.64	-15%	↓	●
United Kingdom					
EU27-EU28	1.80	1.75	-3%	↓	
Iceland	1.48	1.41	-5%	↓	●
Norway	1.66	1.51	-9%	↓	●
Switzerland	1.89	1.73	-8%	↓	●

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% below, between -20% and 10%, between 10% and 50% and above 50% compared to EU average.

Table 39: Glass Ceiling Index

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	2.39 b	2.39 b	2.39 b	2.39	2.22 i1	2.04	1.99 i21	1.95 i22	1.90	1.83 i1	1.76	1.76 f	1.76 f	1.76 f	
Belgium	2.32 b	2.32 b	2.32 b	2.32	2.31 i21	2.31 i22	2.30	2.28 i21	2.27 i22	2.25	2.21	2.08 i1	1.95	1.95 f	1.95 f
Bulgaria	1.73 b	1.73 b	1.73 b	1.73	1.65 i21	1.58 i22	1.50	1.47 i21	1.43 i22	1.40	1.35 i21	1.30 i22	1.25	1.25 f	1.25 f
Croatia					1.51 b	1.51 b	1.51 b	1.51	1.51 i1	1.51	1.45 i31	1.39 i32	1.32 i33	1.26	1.26 f
Cyprus	3.75 b	3.75 b	3.75 b	3.75	3.73 i1	3.70	3.65 i21	3.61 i22	3.56	3.39	3.28 i1	3.16	3.16 f	3.16 f	3.16 f
Czech Republic	3.12 b	3.12 b	3.12 b	3.12	2.81 i21	2.51 i22	2.20	2.12	2.12 f	2.12 f	2.12 f				
Denmark	2.29 b	2.29 b	2.29 b	2.29	2.25 i1	2.20	2.11 i21	2.03 i22	1.94	1.89	1.83 i21	1.77 i22	1.71	1.71 f	1.71 f
Estonia	2.56 b	2.56 b	2.56 b	2.56	2.56 f	2.56 f	2.56 f								
Finland	1.84 b	1.84 b	1.84 b	1.84	1.83 i21	1.81 i22	1.80	1.77 i21	1.74 i22	1.71	1.63	1.61 i1	1.58	1.58 f	1.58 f
France	1.81 b	1.81 b	1.81 b	1.81	1.81 i1	1.80	1.79 i21	1.79 i22	1.78	1.76 i21	1.74 i22	1.72	1.72 f	1.72 f	1.72 f
Germany	1.89 b	1.89 b	1.89 b	1.89	1.76 i21	1.63 i22	1.50	1.48 i21	1.47 i22	1.45	1.41 i21	1.38 i22	1.34	1.34 f	1.34 f
Greece	2.00											1.49	1.49 f	1.49 f	1.49 f
Hungary	2.34 b	2.34 b	2.34 b	2.34	2.23 i21	2.11 i22	2.00	1.92 i21	1.84 i22	1.76	1.70 i21	1.63 i22	1.57	1.57 f	1.57 f
Ireland			3.80 b	3.80 b	3.80 b	3.80	3.22 i31	2.63 i32	2.05 i33	1.46	1.45 i1	1.43	1.43 f	1.43 f	1.43 f
Italy	1.91 b	1.91 b	1.91 b	1.91	1.87 i21	1.84 i22	1.80	1.79 i21	1.77 i22	1.76	1.75 i21	1.74 i22	1.73	1.73 f	1.73 f
Latvia	2.18 b	2.18 b	2.18 b	2.18	2.09 i21	1.99 i22	1.90	1.86 i21	1.82 i22	1.78	1.73 i21	1.68 i22	1.63	1.63 f	1.63 f
Lithuania	3.19 b	3.19 b	3.19 b	3.19	3.11 i21	3.04 i22	2.96	2.96 f	2.96 f	2.96 f					
Luxemburg		2.55 b	2.55 b	2.55 b	2.55	2.80	2.81 i21	2.81 i22	2.82	2.82 f	2.82 f	2.82 f			
Malta	11.70 b	11.70 b	11.70 b	11.70								0.72 b	0.72 b	0.72 b	0.72
Netherlands	2.26 b	2.26 b	2.26 b	2.26	2.21 i21	2.15 i22	2.10	2.04 i21	1.98 i22	1.92	1.84	1.81 i1	1.78	1.78 f	1.78 f
Poland	1.80 b	1.80 b	1.80 b	1.80	1.80 i21	1.80 i22	1.80	1.81 i41	1.82 i42	1.83 i43	1.84 i44	1.85	1.82	1.82 f	1.82 f
Portugal	1.74 b	1.74 b	1.74	1.76 i51	1.77 i52	1.79 i53	1.80 i54	1.82 i55	1.83	1.85	1.80 i1	1.75	1.75 f	1.75 f	1.75 f
Romania	1.42 b	1.42 b	1.42 b	1.42	1.38 i21	1.34 i22	1.30	1.28 i1	1.26	1.35 i31	1.45 i32	1.54 i33	1.63	1.63 f	1.63 f
Slovakia	2.90 b	2.90 b	2.90 b	2.90	2.63 i21	2.37 i22	2.10	2.05 i31	2.00 i32	1.95 i33	1.90	1.91	1.82	1.82 f	1.82 f
Slovenia	2.20 b	2.20 b	2.20 b	2.20	2.13 i21	2.07 i22	2.00	1.93 i21	1.86 i22	1.79	1.74 i21	1.68 i22	1.63	1.63 f	1.63 f
Spain	2.35 b	2.35 b	2.35 b	2.35	2.20 i21	2.05 i22	1.90	1.92 i21	1.94 i22	1.96	1.91 i21	1.85 i22	1.80	1.80 f	1.80 f
Sweden	2.05 b	2.05 b	2.05 b	2.05	2.13 i21	2.22 i22	2.30	2.22 i1	2.14	1.93 i1	1.71	1.68 i1	1.64	1.64 f	1.64 f
United Kingdom	2.35 b	2.35 b	2.35 b	2.35	2.29 i1	2.23	2.23 f	2.23 f	2.23 f						
EU	1.90 b	1.90 b	1.90 b	1.90	1.88 i51	1.87 i52	1.85 i53	1.83 i54	1.82 i55	1.80	1.78 i21	1.77 i22	1.75	1.75 f	1.75 f
Iceland	2.24 b	2.24 b	2.24 b	2.24	2.13 i21	2.01 i22	1.90	1.76 i21	1.62 i22	1.48	1.45 i1	1.41	1.41 f	1.41 f	1.41 f
Norway	1.70 b	1.70 b	1.70	1.72 i1	1.74	1.77 i1	1.80	1.75 i21	1.71 i22	1.66	1.56	1.54 i1	1.51	1.51 f	1.51 f
Switzerland	1.81 b	1.81 b	1.81 b	1.81	1.71 i21	1.60 i22	1.50	1.63 i21	1.76 i22	1.89	1.84 i21	1.78 i22	1.73	1.73 f	1.73 f

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

5.2.4. Satisfaction in current academic position with remuneration

No	Rationale	Data source
2-4	The indicator provides an assessment of how each country stands in terms of remuneration according to researchers	MORE3 survey

We present two sub-indicators related to key indicator 2-4:

- Satisfaction in current academic position with remuneration, measured as the share of researchers that consider themselves well paid or paid a reasonable salary.
- Share of researchers that consider the remuneration package in their current academic position better than that of people with comparable skills and experience outside academia

We note that in the MORE2 study there is also information on satisfaction with remuneration but this stems from a more general type of question on satisfaction in the current employment of the researchers. In MORE3, the information on satisfaction with remuneration was extended and deepened in new questions, which is why we only present the MORE3 values in this indicator report.

Key descriptive insights:

- 67% of EU researchers in the MORE3 survey consider themselves well paid or paid a reasonable salary.
- Highest shares of researchers satisfied with remuneration are observed in Austria, Belgium, Denmark, Luxembourg, the Netherlands and Sweden (more than 80%).
- Lowest proportions are in Greece, Lithuania and Slovakia (41% or less).
- Researchers in Norway and Switzerland also report high levels of satisfaction with their remuneration.

- Concerning the share of researchers that consider the remuneration package in their current academic position better than that of people with comparable skills and experience outside academia, this proportion is only 10% for EU researchers.
- Largest shares are observed in Romania (42%), Malta (18%), and Bulgaria (18%).
- Lowest shares for this indicator are found in France (4%), Czech Republic (5%) and the UK (6%).
- Average indicator for EU (10%) and patterns are similar for female researchers.

Table 40: Satisfaction in current academic position with remuneration – Scorecard

	2016	Comparison with EU28
Country	**total**	**total**
Austria	83%	
Belgium	89%	
Bulgaria	50%	
Croatia	55%	
Cyprus	67%	
Czech Republic	51%	
Denmark	82%	
Estonia	44%	
Finland	80%	
France	59%	
Germany	77%	
Greece	26%	
Hungary	34%	
Ireland	73%	
Italy	53%	
Latvia	45%	
Lithuania	33%	
Luxembourg	89%	
Malta	71%	
Netherlands	83%	
Poland	88%	
Portugal	52%	
Romania	52%	
Slovakia	41%	
Slovenia	32%	
Spain	61%	
Sweden	58%	
United Kingdom	78%	
EU27-EU28	67%	
Iceland	49%	
Norway	81%	
Switzerland	86%	

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 41: Share of researchers that consider the remuneration package in their current academic position better than that of people with comparable skills and experience outside academia - Scorecard

	2016	Comparison with EU28
Country	**total**	**total**
Austria	10%	🟡
Belgium	9%	🟡
Bulgaria	18%	🟢
Croatia	12%	🟢
Cyprus	20%	🟢
Czech Republic	5%	🔴
Denmark	10%	🟡
Estonia	17%	🟢
Finland	16%	🟢
France	4%	⚫
Germany	14%	🟢
Greece	11%	🟡
Hungary	12%	🟢
Ireland	9%	🔴
Italy	7%	🔴
Latvia	15%	🟢
Lithuania	13%	🟢
Luxembourg	15%	🟢
Malta	18%	🟢
The Netherlands	12%	🟢
Poland	8%	🔴
Portugal	14%	🟢
Romania	42%	🟢
Slovakia	14%	🟢
Slovenia	13%	🟢
Spain	10%	🟡
Sweden	11%	🟡
United Kingdom	6%	🔴
EU28	10%	
Iceland	7%	🔴
Norway	7%	🔴
Switzerland	14%	🟢

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 42: Share of researchers that consider the remuneration package in their current academic position better than that of people with comparable skills and experience outside academia (female) – Scorecard

	2016	Comparison with EU28
Country	**female**	**female**
Austria	15%	
Belgium	8%	
Bulgaria	16%	
Croatia	11%	
Cyprus	15%	
Czech Republic	8%	
Denmark	10%	
Estonia	17%	
Finland	13%	
France	4%	
Germany	15%	
Greece	9%	
Hungary	14%	
Ireland	7%	
Italy	5%	
Latvia	11%	
Lithuania	12%	
Luxembourg	17%	
Malta	18%	
The Netherlands	16%	
Poland	6%	
Portugal	11%	
Romania	30%	
Slovakia	9%	
Slovenia	10%	
Spain	11%	
Sweden	8%	
United Kingdom	7%	
EU28	10%	
Iceland	7%	
Norway	5%	
Switzerland	13%	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.2.5. Transferability of Pensions and Social Security

No	Rationale	Data source
2-5	The indicator provides a measurement of the existence of a potential barrier to international mobility (i.e. the transferability of pensions and social security). However, it does not indicate the degree of importance of the barrier. This indicator is to be related to the Pan-European pension fund.	MORE3 survey

We divide this indicator into two sub-indicators: one regarding pensions, and the other one regarding social security. The indicators measure the share of researchers acknowledging importance of transferring pensions/social security as barrier for post-PhD mobility for mobile R2-3-4 researchers.

Key descriptive insights:

- About 20% of surveyed researchers acknowledge the importance of transferring pensions or social security as a barrier to post-PhD mobility, with problems due to transfer of social security being slightly more important than for transfer of pensions (respectively 23% and 19%).
- Poland and Switzerland present the highest proportions of researchers reporting problems related to the transferability of pensions.
- Transferability of social security is reported in highest proportion as a barrier to post-PhD mobility in Lithuania, Poland and Malta.

Table 43: Share of researchers acknowledging the importance of transferring pensions as barrier to post-PhD mobility - Scorecard

	2016	Comparison EU28
Country	**Total**	**Total**
Austria	18%	🟡
Belgium	10%	🟢
Bulgaria		
Croatia	12%	🟢
Cyprus	27%	🔴
Czech Republic		
Denmark	9%	🟢
Estonia	16%	🟡
Finland	24%	🔴
France	26%	🔴
Germany	18%	🟡
Greece	20%	🟡
Hungary	19%	🟡
Ireland	19%	🟡
Italy	13%	🟢
Latvia		
Lithuania		
Luxembourg	12%	🟢
Malta		
Netherlands	15%	🟢
Poland	34%	⚫
Portugal		
Romania		
Slovakia	9%	🟢
Slovenia	25%	🔴
Spain	11%	🟢
Sweden	14%	🟢
United Kingdom	23%	🔴
EU28	19%	
Iceland	21%	🔴
Norway	25%	🔴
Switzerland	31%	⚫

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% below, between -20% and 10%, between 10% and 50% and above 50% compared to EU average.

Table 44: Share of researchers acknowledging the importance of transferring social security as barrier for post-PhD mobility - Scorecard

	2016	Comparison with EU28
Country	**total**	**total**
Austria	19%	
Belgium	16%	
Bulgaria		
Croatia	17%	
Cyprus	27%	
Czech Republic	17%	
Denmark	13%	
Estonia	23%	
Finland	29%	
France	30%	
Germany	21%	
Greece	25%	
Hungary	31%	
Ireland	22%	
Italy	19%	
Latvia	14%	
Lithuania	45%	
Luxembourg	16%	
Malta	37%	
Netherlands	16%	
Poland	41%	
Portugal	13%	
Romania	27%	
Slovakia	14%	
Slovenia	33%	
Spain	20%	
Sweden	20%	
United Kingdom	23%	
EU28	23%	
Iceland	32%	
Norway	34%	
Switzerland	19%	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% below, between -20% and 10%, between 10% and 50% and above 50% compared to EU average.

5.2.6. Satisfaction in current academic position regarding the pension/social security

No	Rationale	Data source
2-6	The indicator provides an insight into the current level of satisfaction related to pension/social security for academic researchers.	MORE3 survey

As for the previous indicator, we separate this indicator into two sub-indicators: one regarding pensions, and the other one regarding social security. The indicators measure the share of researchers that is satisfied with their pension plan or social security rights and benefits in their current academic position.

Key descriptive insights:

- 73% of EU researchers (68% for female researchers) in the MORE3 survey are satisfied with their pension plan.
- There is a strong heterogeneity across countries. Highest levels of satisfaction are reported in Denmark and the Netherlands (more than 90%), while only 26% of researchers in Greece are satisfied with their pension plan.
- Satisfaction in EFTA countries is higher than the EU average, especially in Norway and Switzerland.

- Concerning social security, 80% of EU researchers (78% for female researchers) in MORE3 are satisfied with their social security rights and benefits.
- Highest satisfaction levels are reported in Luxembourg and Switzerland with 97% of researchers being satisfied.
- Lowest satisfaction is observed in Greece, with only 42% of researchers and 38% of female researchers being satisfied with their social security rights and benefits.

Table 45: Share of researchers satisfied with their pension plan in the current academic position - Scorecard

	2016	Comparison with EU28
Country	total	total
Austria	87%	
Belgium	82%	
Bulgaria	61%	
Croatia	65%	
Cyprus	55%	
Czech Republic	70%	
Denmark	94%	
Estonia	58%	
Finland	86%	
France	83%	
Germany	79%	
Greece	26%	
Hungary	45%	
Ireland	81%	
Italy	56%	
Latvia	63%	
Lithuania	45%	
Luxembourg	86%	
Malta	58%	
Netherlands	93%	
Poland	72%	
Portugal	55%	
Romania	50%	
Slovakia	50%	
Slovenia	64%	
Spain	60%	
Sweden	86%	
United Kingdom	76%	
EU28	73%	
Iceland	84%	
Norway	94%	
Switzerland	92%	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average

Table 46: Share of researchers satisfied with their pension plan in the current academic position (female) – Scorecard

	2016	Comparison with EU28
Country	**female**	**female**
Austria	84%	🟢
Belgium	77%	🟡
Bulgaria	58%	🔴
Croatia	58%	🔴
Cyprus	49%	🔴
Czech Republic	63%	🟡
Denmark	92%	🟢
Estonia	47%	🔴
Finland	85%	🟢
France	78%	🟡
Germany	75%	🟡
Greece	27%	⚫
Hungary	51%	🔴
Ireland	83%	🟢
Italy	54%	🔴
Latvia	60%	🔴
Lithuania	40%	🔴
Luxembourg	84%	🟢
Malta	57%	🔴
Netherlands	94%	🟢
Poland	65%	🟡
Portugal	51%	🔴
Romania	47%	🔴
Slovakia	46%	🔴
Slovenia	62%	🟡
Spain	62%	🟡
Sweden	86%	🟢
United Kingdom	69%	🟡
EU28	68%	
Iceland	87%	🟢
Norway	93%	🟢
Switzerland	88%	🟢

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 47: Share of researchers satisfied with their social security rights and benefits in the current academic position - Scorecard

	2016	Comparison with EU28
Country	**total**	**total**
Austria	94%	
Belgium	91%	
Bulgaria	75%	
Croatia	82%	
Cyprus	69%	
Czech Republic	86%	
Denmark	96%	
Estonia	77%	
Finland	91%	
France	92%	
Germany	87%	
Greece	42%	
Hungary	58%	
Ireland	84%	
Italy	72%	
Latvia	61%	
Lithuania	60%	
Luxembourg	97%	
Malta	89%	
Netherlands	95%	
Poland	84%	
Portugal	73%	
Romania	83%	
Slovakia	59%	
Slovenia	84%	
Spain	83%	
Sweden	91%	
United Kingdom	85%	
EU28	80%	
Iceland	83%	
Norway	91%	
Switzerland	97%	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 48: Share of researchers satisfied with their social security rights and benefits in the current academic position (female) – Scorecard

	2016	Comparison with EU28
Country	**female**	**female**
Austria	93%	
Belgium	91%	
Bulgaria	69%	
Croatia	77%	
Cyprus	67%	
Czech Republic	81%	
Denmark	96%	
Estonia	75%	
Finland	90%	
France	93%	
Germany	85%	
Greece	38%	
Hungary	67%	
Ireland	86%	
Italy	72%	
Latvia	55%	
Lithuania	55%	
Luxembourg	95%	
Malta	87%	
Netherlands	95%	
Poland	80%	
Portugal	72%	
Romania	80%	
Slovakia	56%	
Slovenia	84%	
Spain	87%	
Sweden	91%	
United Kingdom	76%	
EU28	78%	
Iceland	81%	
Norway	90%	
Switzerland	98%	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.2.7. Number of HRS4R acknowledged institutions per thousand researchers

No	Rationale	Data source
2-7	These institutions have signed the Code of Conduct and provided the Commission with a gap analysis and a solid action plan on how to concretely implement the elements of the Code of Conduct. This indicates the strong commitment of the institutions of the countries.	EURAXESS

Key descriptive insights:

- There are 264 HRS4R acknowledged institutions in EU MS (13 in EFTA countries), which corresponds to close to 0.12 institutions per thousand researchers.
- About half of EU Member States possesses no or only a few HRS4R institutions.
- Countries with the largest number of these institutions per researcher are Croatia, Cyprus and Luxembourg.

Table 49: Number of HRS4R acknowledged institutions per thousand researchers - Scorecard

Country	2011	2015	2011-2015 change		Comparison with EU
Austria	0.05	0.12	0.07	⇧	🟢
Belgium	0.12	0.26	0.14	⇧	🟢
Bulgaria	0.00	0.08	0.08	⇧	⚫
Croatia	0.88	2.62	1.74	⇧	🟢
Cyprus	0.00	2.31	2.31	⇧	🟢
Czech Republic	0.00	0.00	0.00	⇨	⚫
Denmark	0.00	0.05	0.05	⇧	🔴
Estonia	0.00	0.00	0.00	⇨	⚫
Finland	0.00	0.26	0.26	⇧	🟢
France	0.00	0.01	0.01	⇧	⚫
Germany	0.00	0.02	0.02	⇧	⚫
Greece	0.00	0.07	0.07	⇧	⚫
Hungary	0.00	0.00	0.00	⇨	⚫
Ireland	0.07	0.52	0.45	⇧	🟢
Italy	0.03	0.08	0.06	⇧	⚫
Latvia	0.00	0.00	0.00	⇨	⚫
Lithuania	0.00	0.00	0.00	⇨	⚫
Luxembourg	0.35	0.78	0.43	⇧	🟢
Malta	0.00	0.00	0.00	⇨	⚫
Netherlands	0.00	0.15	0.15	⇧	🟢
Poland	0.00	0.13	0.13	⇧	🔴
Portugal	0.00	0.03	0.03	⇧	⚫
Romania	0.00	0.11	0.11	⇧	⚫
Slovakia	0.00	0.00	0.00	⇨	⚫
Slovenia	0.00	0.35	0.35	⇧	🟢
Spain	0.01	0.31	0.30	⇧	🟢
Sweden	0.00	0.00	0.00	⇨	⚫
United Kingdom	0.12	0.32	0.19	⇧	🟢
EU	0.03	0.13	0.10	⇧	
Iceland	0.44	0.51	0.07	⇧	🟢
Norway	0.11	0.27	0.16	⇧	🟢
Switzerland	0.03	0.08	0.06	⇧	🔴

Note: EU= total of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 50: Number of HRS4R acknowledged institutions per thousand researchers

Country	2010	2011	2012	2013	2014	2015
Austria	0.03	0.05	0.10	0.10	0.10	0.12
Belgium	0.02	0.12	0.13	0.19	0.23	0.26
Bulgaria	0.00	0.00	0.09	0.08	0.08	0.08
Croatia	0.14	0.88	1.35	2.14	2.29	2.62
Cyprus	0.00	0.00	0.00	1.14	1.16	2.31
Czech Republic	0.00	0.00	0.00	0.00	0.00	0.00
Denmark	0.00	0.00	0.02	0.02	0.02	0.05
Estonia	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.08	0.16	0.26
France	0.00	0.00	0.00	0.01	0.01	0.01
Germany	0.00	0.00	0.00	0.00	0.01	0.02
Greece	0.00	0.00	0.08	0.07	0.07	0.07
Hungary	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.07	0.13	0.30	0.34	0.52
Italy	0.03	0.03	0.04	0.06	0.07	0.08
Latvia	0.00	0.00	0.00	0.00	0.00	0.00
Lithuania	0.00	0.00	0.00	0.00	0.00	0.00
Luxembourg	0.00	0.35	0.43	0.80	0.78	0.78
Malta	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	0.00	0.00	0.01	0.07	0.09	0.15
Poland	0.00	0.00	0.01	0.04	0.05	0.13
Portugal	0.00	0.00	0.00	0.03	0.03	0.03
Romania	0.00	0.00	0.00	0.05	0.11	0.11
Slovakia	0.00	0.00	0.00	0.00	0.00	0.00
Slovenia	0.00	0.00	0.23	0.23	0.35	0.35
Spain	0.00	0.01	0.02	0.05	0.11	0.31
Sweden	0.00	0.00	0.00	0.00	0.00	0.00
United Kingdom	0.07	0.12	0.22	0.29	0.30	0.32
EU	0.01	0.03	0.06	0.09	0.10	0.13
Iceland	0.44	0.44	0.48	0.51	0.51	0.51
Norway	0.11	0.11	0.18	0.21	0.27	0.27
Switzerland	0.00	0.03	0.06	0.06	0.08	0.08

5.3. Career path

This section presents key indicators related to the career path of researchers.

About half of the surveyed EU researchers report receiving **training in transferable skills or developing transferable skills** through work experience, with high shares recorded in Ireland, Malta and Slovenia, and low shares recorded for Austria and Portugal. The large majority of researchers agree on the added value of transferable skills for career progression in their home institution.

The degree of **satisfaction with current academic position** is the highest in Belgium, Czech Republic, and Malta and is particularly low in Portugal and Italy. EFTA countries perform better than the EU average for this indicator.

On average, EU researchers are **positive about transparency and meritocracy in professional advancement** in HEIs. Female researchers are slightly less positive. This indicator is at its lowest in Hungary, Italy, Portugal and Spain.

Concerning female career paths, the **average EU proportion of women as Grade A academic staff increased steadily** between 2004 and 2013. In an international comparison with EFTA countries, Iceland and Norway show higher proportions than the EU average, while the average for Switzerland is lower than the EU. The **average EU proportion of women on boards also increased steadily** between 2005 and 2014, and the same comparison with EFTA countries is in line with the one for women as Grade A academic staff.

5.3.1. Share of researchers receiving transferable skills training during PhD

No	Rationale	Data source
3-1	The indicator assesses the extent of the countries' move towards more transferable skills training at the PhD stage.	MORE3 survey

This indicator corresponds to the share of R1-R2 researchers with a PhD or enrolled in a PhD programme who indicate they received training in transferable skills or developed transferable skills through work experience. We note that in MORE2 a similar question was asked, but referring to 'structured training' rather than specific training in transferable skills. Structured training refers to a (formal) training programme with a clearly detailed schedule, a fixed time frame and predefined targets/milestones. The training in transferable skills refered to in the MORE3 survey can be either part of such structured training programme or be independent of such programme. Given the different interpretation, the MORE2 estimates on structured training are not included in this indicator.

Key descriptive insights:

- On average, about half of the surveyed researchers report receiving/having received training in transferable skills or developing transferable skills through work experience.
- The largest proportion of researchers reporting these transferable skills are in Ireland, Latvia, Malta and Slovenia (more than 70%).
- Lowest shares are found in Austria and Portugal (40% or less).
- Figures are not significantly different for female researchers.

Table 51: Share of researchers receiving transferable skills training during PhD - Scorecard

	2016	Comparison with EU28
Country	**total**	**total**
Austria	23%	
Belgium	65%	
Bulgaria	67%	
Croatia	60%	
Cyprus		
Czech Republic	61%	
Denmark	61%	
Estonia	53%	
Finland	57%	
France	45%	
Germany	44%	
Greece	54%	
Hungary	50%	
Ireland	71%	
Italy	50%	
Latvia	70%	
Lithuania	45%	
Luxembourg	66%	
Malta	80%	
Netherlands	62%	
Poland	51%	
Portugal	40%	
Romania	47%	
Slovakia	57%	
Slovenia	73%	
Spain	66%	
Sweden	65%	
United Kingdom	56%	
EU27-EU28	51%	
Iceland	70%	
Norway	72%	
Switzerland	55%	

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 52: Share of researchers receiving transferable skills training during PhD (female) –Scorecard

	2016	Comparison with EU28
Country	female	female
Austria	26%	
Belgium	61%	
Bulgaria	70%	
Croatia	62%	
Cyprus		
Czech Republic		
Denmark	47%	
Estonia	52%	
Finland	58%	
France	48%	
Germany	47%	
Greece		
Hungary		
Ireland	73%	
Italy	42%	
Latvia		
Lithuania	47%	
Luxembourg	70%	
Malta		
Netherlands	59%	
Poland	58%	
Portugal	39%	
Romania		
Slovakia	53%	
Slovenia	74%	
Spain	71%	
Sweden	62%	
United Kingdom	60%	
EU27-EU28	52%	
Norway	79%	
Switzerland	61%	

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.3.2. Appreciation of transferable skills

No	Rationale	Data source
3-2	The indicator assesses the importance of transferable skills in the shaping of career paths.	MORE3 survey

This indicator is measured as the share of researchers who agree that transferable skills are regarded as a positive factor for career progress in their home institution.

Key descriptive insights:

- On average, 81% of the surveyed researchers agree that transferable skills are regarded as a positive factor for career progress in their home institution.
- Country differences are small, with most results being close to 80%.
- Largest proportions of researchers assessing transferable skills as being important are in Latvia and Romania (more than 90%).
- Lowest shares are found in Finland and Hungary (70% or less), but figures are still high.
- Figures are not significantly different for female researchers.

Table 53: Appreciation of transferable skills - Scorecard

	2016	Comparison with EU28
Country	**total**	**total**
Austria	84%	
Belgium	87%	
Bulgaria	73%	
Croatia	73%	
Cyprus	71%	
Czech Republic	84%	
Denmark	79%	
Estonia	84%	
Finland	70%	
France	79%	
Germany	86%	
Greece	75%	
Hungary	67%	
Ireland	80%	
Italy	75%	
Latvia	92%	
Lithuania	74%	
Luxembourg	82%	
Malta	82%	
Netherlands	83%	
Poland	79%	
Portugal	75%	
Romania	90%	
Slovakia	82%	
Slovenia	80%	
Spain	76%	
Sweden	85%	
United Kingdom	81%	
EU28	81%	
Iceland	84%	
Norway	74%	
Switzerland	82%	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 54: Appreciation of transferable skills (female) - Scorecard

	2016	Comparison with EU28
Country	**female**	**female**
Austria	78%	
Belgium	90%	
Bulgaria	71%	
Croatia	71%	
Cyprus	78%	
Czech Republic	81%	
Denmark	83%	
Estonia	86%	
Finland	66%	
France	72%	
Germany	87%	
Greece	75%	
Hungary	62%	
Ireland	78%	
Italy	77%	
Latvia	91%	
Lithuania	74%	
Luxembourg	78%	
Malta	80%	
Netherlands	79%	
Poland	82%	
Portugal	73%	
Romania	89%	
Slovakia	80%	
Slovenia	83%	
Spain	84%	
Sweden	89%	
United Kingdom	76%	
EU28	80%	
Iceland	82%	
Norway	76%	
Switzerland	82%	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.3.3. Degree of satisfaction with different aspects of the current academic position

No	Rationale	Data source
3-3	The indicator assesses the appreciation from the researcher's point of view of the different dimensions related to his/her career path.	MORE2/MORE3 surveys

This indicator is a composite indicator with a 0-1 scale measuring the satisfaction in current academic position with:

- Level of responsibility;
- Opportunities for advancement (MORE2) or career perspectives (MORE3);
- Mobility perspectives.

Each dimension has the same weight in the indicator presented.

Key descriptive insights:

- On average, the degree of satisfaction in current academic position as measured by this indicator is 0.77 on a scale from 0 to 1 for EU researchers (based on MORE3 data).
- Highest scores are found in Belgium, Czech Republic and Malta (0.86 or more in MORE3).
- The degree of satisfaction is particularly low in Portugal (score of 0.75) and Italy (0.62).
- EFTA countries perform better than the EU average for this indicator.
- Figures are slightly lower for female researchers in all countries, except Hungary and Latvia.

Table 55: Degree of satisfaction with different aspects of the current academic position – Scorecard

	2012	2016	2012-2016 change		Comparison with EU28
Country	total	total	total		total
Austria	0.70	0.82	0.12	↑	🟡
Belgium	0.74	0.86	0.11	↑	🟡
Bulgaria	0.71	0.73	0.02	↑	🟡
Croatia	0.69	0.80	0.10	↑	🟡
Cyprus	0.68	0.70	0.02	↑	🟡
Czech Republic	0.79	0.86	0.07	↑	🟡
Denmark	0.79	0.83	0.05	↑	🟡
Estonia	0.80	0.80	0.01	↑	🟡
Finland	0.75	0.84	0.09	↑	🟡
France	0.70	0.74	0.04	↑	🟡
Germany	0.76	0.79	0.03	↑	🟡
Greece	0.66	0.69	0.03	↑	🔴
Hungary	0.70	0.67	-0.03	↓	🔴
Ireland	0.64	0.77	0.13	↑	🟡
Italy	0.46	0.62	0.17	↑	🔴
Latvia	0.81	0.83	0.02	↑	🟡
Lithuania	0.70	0.73	0.03	↑	🟡
Luxembourg	0.73	0.75	0.02	↑	🟡
Malta	0.74	0.89	0.15	↑	🟡
Netherlands	0.78	0.81	0.04	↑	🟡
Poland	0.75	0.84	0.08	↑	🟡
Portugal	0.58	0.57	-0.01	↓	🔴
Romania	0.61	0.83	0.21	↑	🟡
Slovakia	0.75	0.82	0.07	↑	🟡
Slovenia	0.73	0.78	0.05	↑	🟡
Spain	0.69	0.68	-0.01	↓	🔴
Sweden	0.79	0.83	0.04	↑	🟡
United Kingdom	0.77	0.82	0.05	↑	🟡
EU27-EU28	0.72	0.77	0.06	↑	
Iceland	0.79	0.89	0.11	↑	🟡
Norway	0.79	0.85	0.06	↑	🟡
Switzerland	0.77	0.81	0.04	↑	🟡

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. Change = absolute change between 2012 and 2016. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 56: Degree of satisfaction with different aspects of the current academic position (female) - Scorecard

	2016	Comparison with EU28
Country	**female**	**female**
Austria	0.73	
Belgium	0.84	
Bulgaria	0.69	
Croatia	0.76	
Cyprus	0.70	
Czech Republic	0.81	
Denmark	0.78	
Estonia	0.77	
Finland	0.83	
France	0.71	
Germany	0.78	
Greece	0.66	
Hungary	0.70	
Ireland	0.73	
Italy	0.58	
Latvia	0.85	
Lithuania	0.72	
Luxembourg	0.67	
Malta	0.86	
Netherlands	0.78	
Poland	0.82	
Portugal	0.53	
Romania	0.80	
Slovakia	0.79	
Slovenia	0.73	
Spain	0.66	
Sweden	0.78	
United Kingdom	0.73	
EU27-EU28	0.73	
Iceland	0.90	
Norway	0.83	
Switzerland	0.81	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.3.4. Transparency and meritocracy in professional advancement in HEIs (composite indicator)

No	Rationale	Data source
3-4	The indicator expresses the assessment by researchers of the level of transparency and meritocracy in career progression at their institutions.	MORE3 survey

This indicator is a composite indicator based on the following indicators (with equal weights):

- Share of researchers who agree that the different types of career paths are clear and transparent at their home institution;
- Share of researchers who agree that career progression is sufficiently merit-based at their home institution;
- Share of researchers who agree that obtaining a tenured contract based on merit only is common practice at their home institution.

Key descriptive insights:

- On average, EU researchers are positive about transparency and meritocracy in professional advancement in HEIs. Female researchers are slightly less positive.
- Compared to other EU countries, researchers from Czech Republic, Latvia, Romania and Poland acknowledge the most transparency and meritocracy in advancement.
- This indicator is the lowest in Hungary, Italy, Portugal and Spain.
- Within EFTA countries, Iceland shows higher figures for this indicator than EU average.

Table 57: Transparency and meritocracy in professional advancement in HEIs - Scorecard

	2016	Comparison with EU28
Country	**total**	**total**
Austria	68%	
Belgium	72%	
Bulgaria	65%	
Croatia	59%	
Cyprus	69%	
Czech Republic	80%	
Denmark	69%	
Estonia	70%	
Finland	70%	
France	60%	
Germany	68%	
Greece	70%	
Hungary	53%	
Ireland	59%	
Italy	55%	
Latvia	79%	
Lithuania	66%	
Luxembourg	58%	
Malta	73%	
Netherlands	67%	
Poland	80%	
Portugal	52%	
Romania	79%	
Slovakia	63%	
Slovenia	66%	
Spain	53%	
Sweden	74%	
United Kingdom	72%	
EU28	67%	
Iceland	80%	
Norway	69%	
Switzerland	67%	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 58: Transparency and meritocracy in professional advancement in HEIs (female) – Scorecard

	2016	Comparison with EU28
Country	**female**	**female**
Austria	58%	
Belgium	70%	
Bulgaria	62%	
Croatia	55%	
Cyprus	68%	
Czech Republic	70%	
Denmark	59%	
Estonia	66%	
Finland	59%	
France	57%	
Germany	69%	
Greece	60%	
Hungary	57%	
Ireland	59%	
Italy	55%	
Latvia	78%	
Lithuania	61%	
Luxembourg	52%	
Malta	72%	
Netherlands	63%	
Poland	76%	
Portugal	47%	
Romania	78%	
Slovakia	58%	
Slovenia	65%	
Spain	56%	
Sweden	68%	
United Kingdom	62%	
EU28	62%	
Iceland	79%	
Norway	63%	
Switzerland	66%	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.3.5. Proportion of women as Grade A academic staff

No	Rationale	Data source
3-5	The indicator measures gender (in)equality and thereby helps to assess and understand the difficulties for women in entering a research career. The gender dimension provides an indication of the progress made towards implementing measures of gender equal opportunities.	WIS database/ SHE figures

Key descriptive insights:

- The trend is positive over the last decade, with the average EU proportion of women as Grade A academic staff increasing steadily from 15% to 22% between 2004 and 2013.
- Highest proportions are observed in Bulgaria, Croatia, Finland and Romania (26% or more).
- Lowest proportions are found in Belgium, Cyprus, Czech Republic and the Netherlands (16% or less).
- Within EFTA countries, Iceland and Norway show higher proportions of Grade A women than EU average, while the figure for Switzerland is lower than EU average.

Table 59: Proportion of women as Grade A academic staff – Scorecard

Country	2009	2014	2009-2014 p.p. change		Comparison with EU
Austria	17%	20%	3%	↑	🟡
Belgium	12%	16%	4%	↑	🔴
Bulgaria	25%	32%	6%	↑	🟢
Croatia	26%	38%	12%	↑	🟢
Cyprus	11%	11%	0%		⚫
Czech Republic	13%	13%	0%	↑	🔴
Denmark	15%	19%	4%	↑	🔴
Estonia					
Finland	24%	27%	3%	↑	🟢
France	19%	19%	0%		🔴
Germany	14%	17%	3%	↑	🔴
Greece		20%			🟡
Hungary	20%	24%	4%	↑	🟡
Ireland		28%			🟢
Italy	20%	21%	1%	↑	🟡
Latvia	33%				
Lithuania	14%	14%	0%	↑	🔴
Luxembourg	9%	17%	8%		🔴
Malta					
Netherlands	12%	16%	4%	↑	🔴
Poland	21%	23%	2%	↑	🟡
Portugal	22%	25%	3%		
Romania	36%	30%	-6%	↓	🟢
Slovakia	22%	24%	2%	↑	🟡
Slovenia	19%	23%	4%	↑	🟡
Spain	17%	21%	4%	↑	🟡
Sweden	20%	24%	4%	↑	🟡
United Kingdom	18%				
EU	19%	22%	3%	↑	
Iceland	22%	26%	4%	↑	🟢
Norway	20%	25%	5%	↑	🟡
Switzerland	25%	19%	-5%	↓	🔴

Note: EU= average of EU MS. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 60: Proportion of women as Grade A academic staff

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Austria	9.50 b	9.50 b	9.50	10.38 i31	11.25 i32	12.13 i33	13.00	14.33 i21	15.67 i22	17.00	18.65 i1	20.30	20.30 f	20.30 f	20.30 f	
Belgium		9.00 b	9.00 b	9.00 b	9.00	9.67 i21	10.33 i22	11.00	11.33 i21	11.67 i22	12.00	13.20 i21	14.40 i22	15.60	15.60 f	15.60 f
Bulgaria		18.00 b	18.00 b	18.00 b	18.00	20.00 i21	22.00 i22	24.00	24.67 i21	25.33 i22	26.00	27.90 i21	29.80 i22	31.70	31.70 f	31.70 f
Croatia						26.00 b	26.00 b	26.00 b	26.00	26.00 i1	26.00	29.00 i31	32.00 i32	35.00 i33	38.00	38.00 f
Cyprus	10.20 b	10.20 b	10.20 b	10.20	10.13 i21	10.07 i22	10.00	10.33 i21	10.67 i22	11.00	10.93 i21	10.87 i22	10.80	10.80 f	10.80 f	10.80 f
Czech Republic		10.30 b	10.30 b	10.30 b	10.30	11.20 i21	12.10 i22	13.00	13.00	13.02 i41	13.04 i42	13.06 i43	13.08 i44	13.10	13.10 f	13.10 f
Denmark		10.90 b	10.90 b	10.90 b	10.90	11.45 i1	12.00	13.00 i21	14.00 i22	15.00	16.05 i31	17.10 i32	18.15 i33	19.20	19.20 f	19.20 f
Estonia		17.20 b	17.20 b	17.20 b	17.20	17.20 f	17.20 f	17.20 f								
Finland					21.20	21.80 i21	22.40 i22	23.00	23.33 i21	23.67 i22	24.00	24.87 i21	25.73 i22	26.60	26.60 f	26.60 f
France		16.10	16.68 i41	17.26 i42	17.84 i43	18.42 i44	19.00	19.00 i21	19.00 i22	19.00			19.30	19.30 f	19.30 f	19.30 f
Germany		9.20 b	9.20 b	9.20 b	9.20	10.13 i21	11.07 i22	12.00	13.00 i21	14.00 i22	15.00	15.77 i21	16.53 i22	17.30	17.30 f	17.30 f
Greece	11.00	11.08 i31	11.15 i32	11.23 i33	11.30								19.60	19.60 f	19.60 f	19.60 f
Hungary		15.40 b	15.40 b	15.40 b	15.40	16.60 i21	17.80 i22	19.00	19.67 i21	20.33 i22	21.00	22.03 i21	23.07 i22	24.10	24.10 f	24.10 f
Ireland	10.00 b	10.00 b	10.00										28.20	28.20 f	28.20 f	28.20 f
Italy		16.40 b	16.40 b	16.40 b	16.40	17.27 i21	18.13 i22	19.00	19.33 i21	19.67 i22	20.00	20.37 i21	20.73 i22	21.10	21.10 f	21.10 f
Latvia		26.50 b	26.50 b	26.50 b	26.50	27.33 i21	28.17 i22	29.00	30.80 i21	32.60 i22	34.40	34.40 f	34.40 f	34.40 f		
Lithuania		12.10 b	12.10 b	12.10 b	12.10	12.73 i21	13.37 i22	14.00	14.00 i21	14.00 i22	14.00	14.13 i21	14.27 i22	14.40	14.40 f	14.40 f
Luxembourg				9.00 b	9.00 b	9.00 b	9.00	9.00 i31	9.00 i32	9.00 i33	9.00	12.75 i1	16.50	16.50 f	16.50 f	16.50 f
Malta		2.30 b	2.30 b	2.30 b	2.30											44.50
Netherlands					11.00 b	11.00 b	11.00 b	11.00	11.67 i21	12.33 i22	13.00	14.07 i21	15.13 i22	16.20	16.20 f	16.20 f
Poland		19.50 b	19.50 b	19.50 b	19.50	19.67 i21	19.83 i22	20.00	20.43 i51	20.87 i52	21.30 i53	21.73 i54	22.17 i55	22.60	22.60 f	22.60 f
Portugal	20.90 b	20.90 b	20.90 b	20.90	21.08 i51	21.27 i52	21.45 i53	21.63 i54	21.82 i55	22.00	23.00 i21	24.00 i22	25.00	25.00 f	25.00 f	25.00 f
Romania		29.10 b	29.10 b	29.10 b	29.10	30.07 i21	31.03 i22	32.00	34.00 i1	36.00	34.43 i31	32.85 i32	31.28 i33	29.70	29.70 f	29.70 f
Slovakia		13.50 b	13.50 b	13.50 b	13.50	15.67 i21	17.83 i22	20.00	20.75 i31	21.50 i32	22.25 i33	23.00	23.35 i1	23.70	23.70 f	23.70 f
Slovenia		12.90 b	12.90 b	12.90 b	12.90	14.27 i21	15.63 i22	17.00	18.00 i21	19.00 i22	20.00	20.83 i21	21.67 i22	22.50	22.50 f	22.50 f
Spain		17.60 b	17.60 b	17.60 b	17.60	17.73 i21	17.87 i22	18.00	17.67 i21	17.33 i22	17.00	18.30 i21	19.60 i22	20.90	20.90 f	20.90 f
Sweden		16.10 b	16.10 b	16.10 b	16.10	16.73 i21	17.37 i22	18.00	19.00 i1	20.00	20.95 i31	21.90 i32	22.85 i33	23.80	23.80 f	23.80 f
United Kingdom		15.90 b	15.90 b	15.90 b	15.90	16.70 i1	17.50	17.50 i21	17.50 i22	17.50	17.50 f	17.50 f	17.50 f			
EU28	12.32	14.57	14.60	14.62	14.80	16.56	17.24	17.92	18.51	19.08	19.54	20.43	21.36	22.06	21.68	22.68
Iceland		15.10 b	15.10 b	15.10 b	15.10	16.40 i21	17.70 i22	19.00	20.67 i21	22.33 i22	24.00	25.15 i1	26.30	26.30 f	26.30 f	26.30 f
Norway	15.70 b	15.70 b	15.70 b	15.70	16.28 i31	16.85 i32	17.43 i33	18.00	19.00 i21	20.00 i22	21.00	22.40 i21	23.80 i22	25.20	25.20 f	25.20 f
Switzerland		16.50 b	16.50 b	16.50 b	16.50	18.33 i21	20.17 i22	22.00	23.33 i21	24.67 i22	26.00	23.77 i21	21.53 i22	19.30	19.30 f	19.30 f

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

5.3.6. Proportion of women on boards

No	Rationale	Data source
3-6	The indicator measures gender (in)equality and thereby helps to assess and understand the difficulties for women in entering and progressing in a research career. The gender dimension provides an indication of the progress made towards implementing measures of gender equal opportunities.	WiS database/ SHE figures

Key descriptive insights:

- The trend is positive over the last decade, with average EU proportion of women on boards increasing steadily from 25% to 33% between 2005 and 2014.
- Highest proportions are observed in Bulgaria, Denmark, Finland, Luxembourg, the Netherlands and Sweden (50% or more).
- Proportions are particularly low in Estonia (12%) and Greece (11%).
- Within EFTA countries, Iceland and Norway show higher proportions of women on boards than the EU average (more than 40%), while the figure for Switzerland is lower than the EU average.

Table 61: Proportion of women on boards – Scorecard

Country	2009	2014	2009-2014 p.p. change		Comparison with EU
Austria	31%	38%	7%	↑	🟡
Belgium	20%	19%	-1%	↓	🔴
Bulgaria	32%	40%	8%	↑	🟢
Croatia	38%				
Cyprus	16%	26%	10%	↑	🔴
Czech Republic	12%				
Denmark	36%	43%	7%	↑	🟢
Estonia	26%	12%	-14%	↓	⚫
Finland	45%	50%	5%	↑	🟢
France					
Germany	21%	25%	4%	↑	🔴
Greece		11%			⚫
Hungary	19%	23%	4%	↑	🔴
Ireland					
Italy	23%	35%	13%	↑	🟡
Latvia	27%	29%	2%	↓	🔴
Lithuania	22%	32%	10%	↑	🟡
Luxembourg	11%	53%	42%	↑	🟢
Malta					
Netherlands	26%	50%	24%	↑	🟢
Poland		20%			🔴
Portugal	38%	21%	-17%	↓	🔴
Romania		36%			🟡
Slovakia	20%	21%	1%	↓	🔴
Slovenia	25%	32%	7%	↑	🟡
Spain	34%	32%	-2%	↓	🟡
Sweden	51%	55%	4%	↑	🟢
United Kingdom	31%				
EU	28%	33%	17%	↑	
Iceland	39%	47%	21%	↑	🟢
Norway	46%	40%	-12%	↓	🟢
Switzerland	20%	23%	13%	↑	🔴

Note: EU= average of EU MS. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 62: Proportion of women on boards

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria						31.00 b	31.00 b	31.00 b	31.00	32.75 i31	34.50 i32	36.25 i33	38.00
Belgium			21.00 b	21.00 b	21.00 b	21.00	20.71 i61	20.43 i62	20.14 i63	19.86 i64	19.57 i65	19.29 i66	19.00
Bulgaria				37.00 b	37.00 b	37.00	34.33 i21	31.67 i22	29.00	31.75 i31	34.50 i32	37.25 i33	40.00
Croatia				38.00 b	38.00 b	38.00	38.00 i21	38.00 i22	38.00	38.00 f	38.00 f	38.00 f	
Cyprus			12.00 b	12.00 b	12.00 b	12.00	14.00 i21	16.00 i22	18.00	20.00 i31	22.00 i32	24.00 i33	26.00
Czech Republic				12.00 b	12.00 b	12.00 b	12.00	12.00 f	12.00 f	12.00 f			
Denmark			37.00 b	37.00 b	37.00 b	37.00	36.33 i21	35.67 i22	35.00	37.00 i31	39.00 i32	41.00 i33	43.00
Estonia			25.00 b	25.00 b	25.00 b	25.00	25.33 i21	25.67 i22	26.00	22.50 i31	19.00 i32	15.50 i33	12.00
Finland			44.00 b	44.00 b	44.00 b	44.00	44.33 i21	44.67 i22	45.00	46.25 i31	47.50 i32	48.75 i33	50.00
France	27.00	27.00 f	27.00 f	27.00 f									
Germany			20.00 b	20.00 b	20.00 b	20.00	20.33 i21	20.67 i22	21.00	22.00 i31	23.00 i32	24.00 i33	25.00
Greece										11.00 b	11.00 b	11.00 b	11.00
Hungary			19.00 b	19.00 b	19.00 b	19.00	19.00 i21	19.00 i22	19.00	20.00 i31	21.00 i32	22.00 i33	23.00
Ireland	22.00 b	22.00 b	22.00	22.00 f	22.00 f	22.00 f							
Italy				28.00 b	28.00 b	28.00 b	28.00	22.50 i1	17.00	21.50 i31	26.00 i32	30.50 i33	35.00
Latvia			20.00 b	20.00 b	20.00 b	20.00	23.33 i21	26.67 i22	30.00	29.75 i31	29.50 i32	29.25 i33	29.00
Lithuania			18.00 b	18.00 b	18.00 b	18.00	20.00 i61	22.00 i62	24.00 i63	26.00 i64	28.00 i65	30.00 i66	32.00
Luxembourg			4.00 b	4.00 b	4.00 b	4.00	7.67 i21	11.33 i22	15.00	24.50 i31	34.00 i32	43.50 i33	53.00
Malta													
Netherlands			20.00 b	20.00 b	20.00 b	20.00	23.00 i21	26.00 i22	29.00	34.25 i31	39.50 i32	44.75 i33	50.00
Poland	7.00												20.00
Portugal	24.00 b	24.00	26.33 i51	28.67 i52	31.00 i53	33.33 i54	35.67 i55	38.00	34.60 i41	31.20 i42	27.80 i43	24.40 i44	21.00
Romania										36.00 b	36.00 b	36.00 b	36.00
Slovakia				17.00 b	17.00 b	17.00 b	17.00	20.00 i1	23.00	22.50 i31	22.00 i32	21.50 i33	21.00
Slovenia						28.00	26.33 i21	24.67 i22	23.00	25.25 i31	27.50 i32	29.75 i33	32.00
Spain						34.00 b	34.00 b	34.00 b	34.00	33.50 i31	33.00 i32	32.50 i33	32.00
Sweden			49.00 b	49.00 b	49.00 b	49.00	49.86 i61	50.71 i62	51.57 i63	52.43 i64	53.29 i65	54.14 i66	55.00
United Kingdom			25.00 b	25.00 b	25.00 b	25.00	28.00 i1	31.00	31.00 f	31.00 f	31.00 f		
EU	20.00	24.33	25.08	25.48	25.52	26.31	27.23	27.85	28.10	28.91	30.84	32.11	32.61
Iceland			37.00 b	37.00 b	37.00 b	37.00	38.00 i21	39.00 i22	40.00	41.75 i31	43.50 i32	45.25 i33	47.00
Norway			45.00 b	45.00 b	45.00 b	45.00	45.33 i21	45.67 i22	46.00	44.50 i31	43.00 i32	41.50 i33	40.00
Switzerland			19.00 b	19.00 b	19.00 b	19.00	19.67 i21	20.33 i22	21.00	21.50 i31	22.00 i32	22.50 i33	23.00

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

5.4. International Mobility

International mobility is measured by the mean of various indicators, based on the MORE surveys and bibliometrics.

The **long-term international mobility** of researchers, measured as the share of researchers that have worked abroad for 3 months or more in the last ten years (post PhD) has decreased slightly in most of the countries between MORE2 and MORE3. Researchers from EFTA countries are more mobile for a longer period of time than EU average.

As for the share of researchers that have worked abroad for less than 3 months (**short-term mobility**), the trend follows a similar path, but without significant differences between the EU average and the EFTA countries average. Female researchers appear to be less short-term mobile than male researchers.

Virtual mobility is considered to substitute international mobility (either short or long term) to a certain extent. This is the case for the majority of the researchers surveyed.

The average percentage of **international co-publications** (in total publications) of EU MS was 55% in 2015. This figure has been steadily increasing over the last decade for all EU countries. While Austria, Belgium, Cyprus and Luxembourg present the highest shares, Poland and Romania present particularly low shares.

16% of EU R1-R2 researchers are obtaining or have obtained a **PhD in another country than the country of their previous education**, with the highest shares in Greece, Ireland, Luxembourg, and the lowest in Croatia and Czech Republic. EFTA countries score higher shares on average.

5.4.1. Share of researchers (post PhD) that have worked abroad as researcher for more than 3 months in the last 10 years

No	Rationale	Data source
4-1	The indicator measures long-term (>3 month) international mobility	MORE2/MORE3 surveys

This indicator corresponds to the percentage of R2-3-4 researchers that have worked abroad for 3 months or more at least once in the last ten years of their post-PhD career.

Key descriptive insights:

- The share of researchers that have worked abroad for 3 months or more in the last ten years (post PhD) is close to 30% (27% in MORE3, 31% in MORE2).
- This share decreases slightly between the two surveys for most countries, while strong increases are observed in France, Luxembourg and Poland.
- This indicator for long-term mobility is the highest in Austria, Cyprus and

Luxembourg (38% or more in 2016).

- Latvia (12%) and Romania (13%) present the lowest figures.
- Researchers from EFTA countries are more mobile for a longer period of time than the EU average, especially Switzerland, with about 50% of researchers having worked abroad for 3 months or more in the last ten years (post PhD).

Table 63: Share of researchers (post PhD) that have worked abroad as researcher for more than 3 months in the last 10 years - Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	total	total	total		total
Austria	45%	38%	-7%	⇩	🟢
Belgium	46%	33%	-13%	⇩	🟢
Bulgaria	18%	21%	3%	⇧	🔴
Croatia	19%	19%	0%	⇩	🔴
Cyprus	44%	38%	-6%	⇩	🟢
Czech Republic	16%	19%	3%	⇧	🔴
Denmark	53%	30%	-23%	⇩	🟡
Estonia	27%	28%	1%	⇧	🟡
Finland	42%	25%	-17%	⇩	🟡
France	26%	35%	8%	⇧	🟢
Germany	45%	33%	-11%	⇩	🟢
Greece	34%	24%	-10%	⇩	🔴
Hungary	34%	33%	-1%	⇩	🟢
Ireland	37%	32%	-5%	⇩	🟡
Italy	25%	22%	-3%	⇩	🔴
Latvia	20%	12%	-7%	⇩	⚫
Lithuania	18%	17%	-1%	⇩	🔴
Luxembourg	47%	61%	14%	⇧	🟢
Malta	24%	17%	-7%	⇩	🔴
Netherlands	46%	33%	-14%	⇩	🟡
Poland	9%	20%	10%	⇧	🔴
Portugal	27%	17%	-11%	⇩	🔴
Romania	20%	13%	-6%	⇩	⚫
Slovakia	28%	24%	-4%	⇩	🔴
Slovenia	34%	23%	-10%	⇩	🔴
Spain	32%	29%	-3%	⇩	🟡
Sweden	39%	28%	-11%	⇩	🟡
United Kingdom	29%	26%	-3%	⇩	🟡
EU27-EU28	31%	27%	-4%	⇩	
Iceland	49%	31%	-18%	⇩	🟡
Norway	43%	40%	-3%	⇩	🟢
Switzerland	53%	48%	-5%	⇩	🟢

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 64: Share of researchers (post PhD) that have worked abroad as researcher for more than 3 months in the last 10 years (female) – Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	female	female	female		female
Austria	45%	38%	-7%	⇩	●
Belgium	49%	33%	-15%	⇩	●
Bulgaria	17%	21%	4%	⇧	●
Croatia	15%	19%	3%	⇧	●
Cyprus	25%	38%	13%	⇧	●
Czech Republic	9%	19%	10%	⇧	●
Denmark	54%	30%	-23%	⇩	●
Estonia	22%	28%	6%	⇧	●
Finland	33%	25%	-8%	⇩	●
France	20%	35%	15%	⇧	●
Germany	30%	33%	3%	⇧	●
Greece	30%	24%	-6%	⇩	●
Hungary	29%	33%	4%	⇧	●
Ireland	35%	32%	-2%	⇩	●
Italy	24%	22%	-1%	⇩	●
Latvia	22%	12%	-9%	⇩	●
Lithuania	17%	17%	0%	⇩	●
Luxembourg		61%			●
Malta	25%	17%	-8%	⇩	●
Netherlands	44%	33%	-12%	⇩	●
Poland	6%	20%	14%	⇧	●
Portugal	25%	17%	-8%	⇩	●
Romania	16%	13%	-2%	⇩	●
Slovakia	27%	24%	-3%	⇩	●
Slovenia	27%	23%	-3%	⇩	●
Spain	28%	29%	1%	⇧	●
Sweden	31%	28%	-3%	⇩	●
United Kingdom	25%	26%	0%	⇧	●
EU27-EU28	25%	27%	2%	⇧	
Iceland		31%			●
Norway	41%	40%	-1%	⇩	●
Switzerland	54%	48%	-6%	⇩	●

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.4.2. Share of researchers (post PhD) that have worked abroad as a researcher for less than 3 months in the last ten years

No	Rationale	Data source
4-2	The indicator measures short-term international mobility.	MORE2/MORE3 surveys

This indicator corresponds to the percentage of R2-3-4 researchers that have worked abroad for periods less than 3 months at least once in the last ten years of their post-PhD career.

Key descriptive insights:

- The share of researchers that have worked abroad for less than 3 months in the last ten years (post PhD) is close to 40% (37% in MORE3, 41% in MORE2).
- This share has decreased slightly for the majority of countries between the two surveys, with strongest declines in Denmark, Luxembourg and Romania.
- This indicator for short-term mobility is the highest in Italy (46%) and Slovenia (49%).
- Romania (22%) presents the lowest figure.
- Researchers from EFTA countries are not significantly more short-term mobile (indicator for Iceland and Norway is slightly higher than EU average while it is slightly lower for Switzerland).
- Female researchers appear to be less mobile in the short term than male researchers.

Table 65: Share of researchers (post PhD) that have worked abroad as a researcher for less than 3 months in the last ten years – Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	total	total	total		total
Austria	52%	39%	-13%	↓	🟡
Belgium	54%	41%	-13%	↓	🟡
Bulgaria	41%	42%	1%	↑	🟡
Croatia	40%	30%	-10%	↓	🔴
Cyprus	41%	36%	-5%	↓	🟡
Czech Republic	45%	41%	-4%	↓	🟡
Denmark	56%	36%	-20%	↓	🟡
Estonia	45%	37%	-8%	↓	🟡
Finland	43%	41%	-2%	↓	🟡
France	33%	34%	1%	↑	🟡
Germany	48%	40%	-9%	↓	🟡
Greece	44%	40%	-5%	↓	🟡
Hungary	61%	44%	-17%	↓	🟡
Ireland	40%	33%	-7%	↓	🔴
Italy	37%	46%	8%	↑	🟢
Latvia	45%	34%	-11%	↓	🟡
Lithuania	40%	36%	-4%	↓	🟡
Luxembourg	51%	29%	-21%	↓	🔴
Malta	37%	38%	1%	↑	🟡
Netherlands	44%	37%	-7%	↓	🟡
Poland	29%	34%	5%	↑	🟡
Portugal	44%	34%	-10%	↓	🟡
Romania	55%	22%	-33%	↓	🔴
Slovakia	44%	42%	-2%	↓	🟡
Slovenia	45%	49%	3%	↑	🟢
Spain	42%	41%	-1%	↓	🟡
Sweden	44%	36%	-8%	↓	🟡
United Kingdom	37%	34%	-4%	↓	🟡
EU27-EU28	41%	37%	-4%	↓	
Iceland	56%	39%	-17%	↓	🟡
Norway	42%	42%	0%	↓	🟡
Switzerland	41%	35%	-7%	↓	🟡

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 66: Share of researchers (post PhD) that have worked abroad as a researcher for less than 3 months in the last ten years (female) - Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	female	female	female		female
Austria	53%	35%	-18%	⇩	
Belgium	48%	35%	-13%	⇩	
Bulgaria	42%	45%	3%	⇧	
Croatia	43%	31%	-12%	⇩	
Cyprus	42%	49%	7%	⇧	
Czech Republic	47%	41%	-6%	⇩	
Denmark	52%	30%	-22%	⇩	
Estonia	43%	41%	-2%	⇩	
Finland	31%	42%	11%	⇧	
France	27%	31%	5%	⇧	
Germany	48%	35%	-13%	⇩	
Greece	47%	35%	-12%	⇩	
Hungary	59%	56%	-3%	⇩	
Ireland	34%	32%	-3%	⇩	
Italy	37%	44%	7%	⇧	
Latvia	40%	32%	-9%	⇩	
Lithuania	40%	41%	1%	⇧	
Luxembourg		25%			
Malta	44%	46%	2%	⇧	
Netherlands	45%	35%	-10%	⇩	
Poland	26%	33%	7%	⇧	
Portugal	53%	36%	-17%	⇩	
Romania	45%	19%	-25%	⇩	
Slovakia	37%	36%	-1%	⇩	
Slovenia	41%	51%	10%	⇧	
Spain	35%	35%	0%	⇧	
Sweden	35%	40%	5%	⇧	
United Kingdom	30%	32%	2%	⇧	
EU27-EU28	37%	35%	-2%	⇩	
Iceland		35%			
Norway	46%	37%	-8%	⇩	
Switzerland	41%	39%	-3%	⇩	

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.4.3. Share of HEI researchers that consider virtual mobility as substitute for short- or long-term mobility

No	Rationale	Data source
4-3	The indicator gives information about the relevance of ICT in reducing physical mobility while maintaining international scientific collaboration.	MORE2/MORE3 surveys

This indicator corresponds to the share of researchers for whom the use of web-based or virtual technology in international collaboration reduces either visits of less than 3 months or visits of 3 months or more.

Key descriptive insights:

- The share of researchers that consider virtual mobility as a substitute for international mobility is about 60% (61% in MORE3, 64% in MORE2). EU average figures for female researchers are similar.
- This indicator is the highest in Finland, Italy, Portugal, Romania and Spain (74% or more).
- It is lowest in Denmark, France and Germany (53% or less).
- Figures for EFTA countries are similar to EU average.

Table 67: Share of HEI researchers that consider virtual mobility as substitute for short- or long-term mobility – Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	total	total	total		total
Austria	60%	59%	-1%	⇩	🟡
Belgium	58%	61%	3%	⇧	🟡
Bulgaria	61%	60%	-1%	⇩	🟡
Croatia	55%	56%	1%	⇧	🟡
Cyprus	63%	70%	7%	⇧	🟡
Czech Republic	55%	65%	10%	⇧	🟡
Denmark	56%	47%	-9%	⇩	🔴
Estonia	61%	58%	-3%	⇩	🟡
Finland	61%	74%	13%	⇧	🟢
France	60%	53%	-7%	⇩	🔴
Germany	52%	46%	-6%	⇩	🔴
Greece	66%	69%	3%	⇧	🟡
Hungary	63%	68%	5%	⇧	🟡
Ireland	55%	60%	5%	⇧	🟡
Italy	75%	77%	2%	⇧	🟢
Latvia	62%	70%	8%	⇧	🟡
Lithuania	59%	63%	4%	⇧	🟡
Luxembourg	64%	62%	-2%	⇩	🟡
Malta	74%	71%	-3%	⇩	🟡
The Netherlands	64%	61%	-3%	⇩	🟡
Poland	70%	66%	-4%	⇩	🟡
Portugal	76%	84%	8%	⇧	🟢
Romania	73%	81%	8%	⇧	🟢
Slovakia	62%	58%	-4%	⇩	🟡
Slovenia	69%	57%	-12%	⇩	🟡
Spain	73%	74%	1%	⇧	🟢
Sweden	64%	67%	3%	⇧	🟡
United Kingdom	66%	56%	-10%	⇩	🟡
EU27-EU28	64%	61%	-3%	⇩	
Iceland	41%	63%	22%	⇧	🟡
Norway	53%	60%	7%	⇧	🟡
Switzerland	56%	61%	5%	⇧	🟡

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 68: Share of HEI researchers that consider virtual mobility as substitute for short- or long-term mobility (female) – Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	female	female	female		female
Austria	62%	64%	2%	⇧	🟡
Belgium	57%	59%	2%	⇧	🟡
Bulgaria	58%	62%	4%	⇧	🟡
Croatia	56%	50%	-6%	⇩	🔴
Cyprus	69%	73%	4%	⇧	🟡
Czech Republic	61%	67%	6%	⇧	🟡
Denmark	53%	41%	-12%	⇩	🔴
Estonia	68%	56%	-12%	⇩	🟡
Finland	58%	76%	18%	⇧	🟢
France	69%	55%	-14%	⇩	🟡
Germany	44%	40%	-4%	⇩	🔴
Greece	62%	69%	7%	⇧	🟡
Hungary	60%	72%	12%	⇧	🟡
Ireland	48%	65%	17%	⇧	🟡
Italy	77%	80%	3%	⇧	🟢
Latvia	61%	77%	16%	⇧	🟢
Lithuania	57%	64%	7%	⇧	🟡
Luxembourg	57%	65%	8%	⇧	🟡
Malta	81%	75%	-6%	⇩	🟢
The Netherlands	67%	52%	-15%	⇩	🔴
Poland	65%	62%	-3%	⇩	🟡
Portugal	77%	79%	2%	⇧	🟢
Romania	61%	82%	21%	⇧	🟢
Slovakia	60%	54%	-6%	⇩	🔴
Slovenia	70%	54%	-16%	⇩	🔴
Spain	77%	76%	-1%	⇩	🟢
Sweden	60%	71%	11%	⇧	🟡
United Kingdom	63%	58%	-5%	⇩	🟡
EU27-EU28	64%	61%	-3%	⇩	
Iceland		69%			🟡
Norway	60%	67%	7%	⇧	🟡
Switzerland	61%	64%	3%	⇧	🟡

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.4.4. Percentage of co-publications of the country with an author from another country

No	Rationale	Data source
4-4	The indicator is a proxy for scientific output effects of researcher mobility.	SCOPUS

Key descriptive insights:

- The average percentage of international co-publications of EU Member States corresponds to 55% of total publications in 2015.
- This rate has been steadily increasing over the last decade for all EU countries.
- EU countries with the highest percentages of international co-publications (more than two thirds) are Austria, Belgium, Cyprus and Luxembourg.
- Poland (32%) and Romania (37%) present particularly low shares of international co-publications.
- Proportions of international co-publications in EFTA countries are higher than EU average.
- The US (37%), China (20%), Japan (29%) and South Korea (27%) present lower shares of international co-publications compared to EU average.

Table 69: Percentage of co-publications of the country with an author from another country – Scorecard

Country	2010	2015	2010-2015 p.p. change		Comparison with EU
Austria	61%	67%	6%	⇧	🟢
Belgium	59%	67%	8%	⇧	🟢
Bulgaria	50%	49%	0%	⇧	🔴
Croatia	30%	40%	10%	⇧	🔴
Cyprus	70%	71%	1%	⇧	🟢
Czech Republic	40%	46%	6%	⇧	🔴
Denmark	57%	64%	6%	⇧	🟡
Estonia	50%	62%	12%	⇧	🟡
Finland	53%	61%	8%	⇧	🟡
France	49%	56%	7%	⇧	🟡
Germany	49%	54%	5%	⇧	🟡
Greece	39%	53%	14%	⇧	🟡
Hungary	49%	53%	5%	⇧	🟡
Ireland	52%	61%	9%	⇧	🟡
Italy	42%	48%	6%	⇧	🔴
Latvia	42%	50%	8%	⇧	🟡
Lithuania	28%	42%	13%	⇧	🔴
Luxembourg	79%	83%	4%	⇧	🟢
Malta	53%	62%	10%	⇧	🟡
Netherlands	53%	61%	8%	⇧	🟡
Poland	29%	32%	3%	⇧	🔴
Portugal	51%	55%	5%	⇧	🟡
Romania	29%	37%	8%	⇧	🔴
Slovakia	45%	49%	4%	⇧	🔴
Slovenia	41%	49%	8%	⇧	🔴
Spain	41%	48%	7%	⇧	🔴
Sweden	57%	64%	7%	⇧	🟡
United Kingdom	47%	56%	9%	⇧	🟡
EU	48%	55%	7%	⇧	
Iceland	73%	77%	4%	⇧	🟢
Norway	55%	62%	8%	⇧	🟡
Switzerland	65%	70%	5%	⇧	🟢
United States	31%	37%	6%	⇧	🔴
China	17%	20%	4%	⇧	⚫
Japan	25%	29%	4%	⇧	🔴
South Korea	27%	27%	0%	⇩	⚫

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 70: Percentage of co-publications of the country with an author from another country

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Austria	42%	40%	38%	48%	52%	54%	53%	56%	57%	59%	61%	61%	64%	65%	65%	67%
Belgium	45%	41%	43%	51%	52%	54%	54%	56%	56%	57%	59%	61%	61%	62%	64%	67%
Bulgaria	40%	39%	38%	49%	51%	48%	54%	51%	49%	51%	50%	49%	46%	46%	48%	49%
Croatia	21%	20%	18%	24%	27%	27%	28%	26%	28%	28%	30%	30%	34%	33%	37%	40%
Cyprus	59%	57%	59%	61%	64%	67%	69%	66%	68%	68%	70%	67%	69%	66%	66%	71%
Czech Republic	35%	33%	30%	36%	36%	38%	39%	40%	40%	41%	40%	39%	41%	43%	45%	46%
Denmark	43%	41%	41%	49%	51%	53%	54%	55%	55%	56%	57%	57%	58%	60%	61%	64%
Estonia	47%	41%	43%	50%	54%	54%	49%	48%	50%	49%	50%	54%	57%	58%	57%	62%
Finland	39%	34%	35%	45%	45%	46%	46%	49%	50%	51%	53%	53%	56%	57%	59%	61%
France	36%	33%	33%	42%	43%	44%	45%	46%	47%	48%	49%	49%	51%	52%	54%	56%
Germany	35%	32%	33%	41%	43%	43%	44%	46%	46%	48%	49%	49%	50%	52%	52%	54%
Greece	35%	31%	29%	35%	35%	34%	36%	37%	36%	38%	39%	41%	44%	47%	50%	53%
Hungary	44%	40%	39%	48%	48%	47%	45%	47%	45%	47%	49%	48%	50%	52%	52%	53%
Ireland	43%	38%	39%	49%	49%	50%	50%	50%	52%	52%	52%	52%	54%	56%	58%	61%
Italy	31%	29%	29%	35%	37%	38%	38%	39%	40%	40%	42%	43%	44%	44%	46%	48%
Latvia	53%	40%	43%	59%	60%	59%	62%	57%	53%	44%	42%	40%	40%	45%	48%	50%
Lithuania	46%	40%	37%	45%	39%	34%	37%	38%	28%	29%	28%	31%	35%	37%	39%	42%
Luxembourg	64%	63%	55%	79%	72%	76%	80%	80%	77%	78%	79%	76%	81%	79%	80%	83%
Malta	51%	41%	47%	39%	49%	67%	65%	59%	46%	44%	53%	56%	53%	53%	60%	62%
Netherlands	39%	36%	36%	46%	47%	46%	48%	49%	50%	52%	53%	54%	57%	58%	59%	61%
Poland	32%	29%	26%	31%	32%	30%	31%	31%	29%	30%	29%	28%	29%	30%	31%	32%
Portugal	45%	41%	42%	49%	50%	49%	51%	50%	50%	50%	51%	51%	52%	52%	54%	55%
Romania	44%	40%	38%	48%	48%	46%	47%	46%	33%	30%	29%	29%	32%	33%	37%	37%
Slovakia	37%	34%	33%	42%	45%	43%	47%	48%	47%	48%	45%	46%	47%	45%	49%	49%
Slovenia	32%	28%	29%	37%	37%	39%	38%	40%	40%	41%	41%	41%	44%	45%	45%	49%
Spain	29%	26%	27%	34%	35%	36%	36%	37%	38%	39%	41%	42%	43%	44%	46%	48%
Sweden	40%	37%	39%	47%	48%	49%	50%	53%	54%	55%	57%	58%	59%	60%	61%	64%
United Kingdom	31%	30%	30%	39%	41%	42%	42%	43%	45%	46%	47%	48%	50%	51%	54%	56%
EU	41%	37%	37%	45%	46%	47%	48%	48%	47%	47%	48%	48%	50%	51%	53%	55%
Iceland	59%	57%	52%	68%	65%	68%	67%	73%	69%	71%	73%	72%	72%	77%	77%	77%
Norway	37%	36%	37%	48%	50%	49%	51%	52%	53%	53%	55%	55%	57%	58%	61%	62%
Switzerland	48%	45%	47%	57%	59%	59%	60%	62%	63%	64%	65%	66%	67%	68%	69%	70%
United States	21%	19%	20%	26%	26%	27%	27%	28%	29%	30%	31%	32%	33%	35%	36%	37%
China	18%	13%	15%	20%	17%	13%	13%	14%	14%	16%	17%	18%	18%	18%	19%	20%
Japan	16%	15%	16%	21%	22%	23%	23%	23%	24%	24%	25%	26%	27%	27%	28%	29%
South Korea	23%	23%	23%	28%	29%	30%	30%	28%	27%	27%	27%	28%	28%	28%	27%	27%

5.4.5. R1-R2 PhD degree mobility

No	Rationale	Data source
4-5	The indicator measures the proportion of mobile PhD candidates as a measurement of international mobility at early career stages.	MORE2/MORE3 surveys

This indicator corresponds to the share of R1-R2 researchers obtaining or having obtained a PhD in another country than the country of their previous education giving direct access to the PhD.

Key descriptive insights:

- 16% of EU R1-R2 researchers are obtaining or have obtained a PhD in another country than the country of their previous education giving direct access to the PhD. The proportion is similar for female researchers. This figure is stable between the MORE2 and MORE3 surveys.
- This share is the highest in Greece, Ireland, Luxembourg and Malta (43% or more in MORE3).
- Croatia, Czech Republic and Portugal present very low PhD degree mobility at early career stages (7% or less).
- This indicator is higher in EFTA countries compared to EU average.

Table 71: R1-R2 PhD degree mobility - Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	total	total	total		total
Austria	19%	21%	3%	⇧	🟢
Belgium	16%	21%	5%	⇧	🟢
Bulgaria	16%	12%	-4%	⇩	🔴
Croatia	6%	5%	-1%	⇩	⚫
Cyprus					
Czech Republic	14%	7%	-6%	⇩	⚫
Denmark	24%	19%	-5%	⇩	🟡
Estonia	12%	10%	-2%	⇩	🔴
Finland	22%	15%	-8%	⇩	🔴
France	9%	15%	6%	⇧	🟡
Germany	17%	12%	-4%	⇩	🔴
Greece		46%			🟢
Hungary	16%	9%	-8%	⇩	🔴
Ireland	32%	43%	11%	⇧	🟢
Italy	17%	15%	-3%	⇩	🔴
Latvia	20%	12%	-7%	⇩	🔴
Lithuania	19%	11%	-8%	⇩	🔴
Luxembourg	83%	60%	-23%	⇩	🟢
Malta		46%			🟢
Netherlands	32%	30%	-3%	⇩	🟢
Poland	1%	19%	18%	⇧	🟡
Portugal	10%	4%	-6%	⇩	⚫
Romania	10%	15%	5%	⇧	🟡
Slovakia	16%	10%	-6%	⇩	🔴
Slovenia	10%	19%	9%	⇧	🟡
Spain	18%	15%	-3%	⇩	🔴
Sweden	26%	17%	-8%	⇩	🟡
United Kingdom	16%	24%	8%	⇧	🟢
EU27-EU28	15%	16%	1%	⇧	
Iceland		64%			🟢
Norway	33%	37%	4%	⇧	🟢
Switzerland	40%	40%	1%	⇧	🟢

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 72: R1-R2 PhD degree mobility (female) - Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	female	female	female		female
Austria	20%	32%	12%	⇧	🟢
Belgium	13%	17%	4%	⇧	🟡
Bulgaria		9%			🔴
Croatia	9%	4%	-5%	⇩	⚫
Cyprus					
Czech Republic	20%				
Denmark	23%	21%	-2%	⇩	🟢
Estonia	5%	6%	1%	⇧	⚫
Finland	21%	8%	-12%	⇩	🔴
France	4%	16%	13%	⇧	🟡
Germany	17%	10%	-7%	⇩	🔴
Greece					
Hungary	17%				
Ireland	26%	47%	20%	⇧	🟢
Italy	8%	26%	18%	⇧	🟢
Latvia					
Lithuania	20%	9%	-12%	⇩	🔴
Luxembourg	78%	67%	-11%	⇩	🟢
Malta		60%			
Netherlands	25%	19%	-6%	⇩	🟢
Poland	2%	15%	13%	⇧	🟡
Portugal	8%	2%	-7%	⇩	⚫
Romania	13%				
Slovakia	16%	5%	-11%	⇩	⚫
Slovenia	11%	19%	7%	⇧	🟡
Spain	12%	17%	5%	⇧	🟡
Sweden	13%	16%	3%	⇧	🟡
United Kingdom	11%	24%	13%	⇧	🟢
EU27-EU28	13%	16%	3%	⇧	
Norway	29%	33%	4%	⇧	🟢
Switzerland	26%	38%	13%	⇧	🟢

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.5. Intersectoral mobility

Regarding intersectoral mobility, 11% of EU R2-3-4 researchers in HEIs have previously worked as researchers in the private sector. This figure is 8% for women. Bulgaria, Greece and Hungary record the highest shares, and France and Romania the lowest.

Switzerland shows a higher figure than EU average. Norway and Iceland show lower figures compared to EU average for women researchers.

5.5.1. Share of researchers with experience in private sector

No	Rationale	Data source
5-1	The indicator measures intersectoral (HEI to private sector) mobility.	MORE2/MORE3 surveys

This indicator corresponds to the share of R2-3-4 researchers in HEIs who have worked as a researcher (excluding PhD) in private industry (excluding private not-for profit sector). Please note that only in MORE3 a distinction was made within the private sector between a large firm and an SME or start-up. In MORE2, only the aggregated option 'private sector' was available to the respondents.

Key descriptive insights:

- 11% of EU R2-3-4 researchers have previously worked as researchers in the private sector. This figure is stable between the MORE2 and MORE3 surveys (12% in MORE2).
- This share is the highest in Bulgaria, Greece, Hungary and Ireland (15% or more in MORE3).
- Romania presents a particularly low proportion of researchers with experience in the private sector (5%).
- Within EFTA countries, Switzerland shows a higher figure than EU average.

Table 73: Share of researchers with experience in private sector - Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	total	total	total		total
Austria	12%	12%	0%	⇩	🟡
Belgium	13%	10%	-3%	⇩	🟡
Bulgaria	16%	20%	4%	⇧	🟢
Croatia	14%	11%	-3%	⇩	🟡
Cyprus	16%	7%	-8%	⇩	🔴
Czech Republic	12%	13%	1%	⇧	🟢
Denmark	13%	13%	0%	⇧	🟢
Estonia	11%	13%	2%	⇧	🟢
Finland	12%	13%	2%	⇧	🟢
France	10%	6%	-4%	⇩	🔴
Germany	11%	12%	0%	⇧	🟡
Greece	16%	16%	0%	⇧	🟢
Hungary	18%	16%	-2%	⇩	🟢
Ireland	16%	15%	-1%	⇩	🟢
Italy	6%	12%	7%	⇧	🟡
Latvia	14%	11%	-3%	⇩	🟡
Lithuania	10%	10%	1%	⇧	🟡
Luxembourg	15%	12%	-3%	⇩	🟡
Malta	12%	8%	-4%	⇩	🔴
Netherlands	12%	14%	1%	⇧	🟢
Poland	15%	12%	-3%	⇩	🟡
Portugal	6%	10%	4%	⇧	🟡
Romania	11%	5%	-6%	⇩	⚫
Slovakia	9%	11%	3%	⇧	🟡
Slovenia	14%	11%	-3%	⇩	🟡
Spain	12%	11%	-1%	⇩	🟡
Sweden	11%	10%	-1%	⇩	🟡
United Kingdom	14%	10%	-4%	⇩	🟡
EU27-28	12%	11%	-1%	⇩	
Iceland	23%	8%	-15%	⇩	🔴
Norway	10%	10%	-1%	⇩	🔴
Switzerland	15%	15%	-1%	⇩	🟢

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.5.2. Share of female researchers with experience in private sector

No	Rationale	Data source
5-2	This indicator on intersectoral (public-private sector) mobility addresses the gender issue.	MORE2/MORE3 surveys

This indicator corresponds to the share of female R2-3-4 researchers who have worked as a researcher (excluding PhD) in private industry (in % of total number of female researchers).

Key descriptive insights:

- 8% of EU female R2-3-4 researchers have previously worked as researchers in the private sector. This figure is stable between the MORE2 and MORE3 surveys (9% in MORE2), but it is lower than for indicator 5-1, which includes all researchers.
- This share is the highest in Hungary and Ireland (15% or more in MORE3).
- Belgium and Romania present particularly low proportions of female researchers with experience in the private sector (5%).
- Within EFTA countries, Norway (1%) and Iceland (5%) show low figures compared to EU average while Switzerland (12%) presents a higher figure than EU average.

Table 74: Share of female researchers with experience in private sector - Scorecard

	2012	2016	2012-2016 p.p. change		Comparison with EU28
Country	female	female	female		female
Austria	10%	10%	1%	⇧	🟢
Belgium	15%	1%	-14%	⇩	⚫
Bulgaria	6%	12%	6%	⇧	🟢
Croatia	8%	9%	2%	⇧	🟡
Cyprus	23%	5%	-19%	⇩	🔴
Czech Republic	8%	11%	4%	⇧	🟢
Denmark	8%	13%	5%	⇧	🟢
Estonia	3%	12%	9%	⇧	🟢
Finland	7%	7%	1%	⇧	🔴
France	10%	5%	-5%	⇩	🔴
Germany	3%	9%	6%	⇧	🟡
Greece	11%	11%	0%	⇩	🟢
Hungary	5%	15%	11%	⇧	🟢
Ireland	9%	16%	7%	⇧	🟢
Italy	5%	9%	4%	⇧	🟡
Latvia	8%	7%	0%	⇩	🟡
Lithuania	7%	7%	0%	⇩	🔴
Luxembourg		11%			🟢
Malta	9%	12%	3%	⇧	🟢
Netherlands	10%	12%	2%	⇧	🟢
Poland	12%	13%	1%	⇧	🟢
Portugal	6%	9%	3%	⇧	🟡
Romania	9%	3%	-6%	⇩	⚫
Slovakia	7%	7%	0%	⇧	🔴
Slovenia	11%	5%	-6%	⇩	🔴
Spain	11%	10%	-1%	⇩	🟢
Sweden	7%	7%	1%	⇧	🔴
United Kingdom	13%	5%	-8%	⇩	🔴
EU27-28	9%	8%	-1%	⇩	
Iceland		5%			🔴
Norway	4%	1%	-3%	⇩	⚫
Switzerland	7%	12%	5%	⇧	🟢

Note: EU27-28= average of 27 EU MS in MORE2 and 28 EU MS in MORE3. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.6. Interdisciplinary mobility

This category includes one single indicator, which shows that a large majority of EU researchers agree that interdisciplinary mobility is a positive factor for career progression in their home institution. Shares for EFTA countries are similar to the EU average.

5.6.1. Interdisciplinary mobility as a positive factor for career progression

No	Rationale	Data source
6-1	The indicator assesses whether researchers regard interdisciplinarity as a factor that facilitates career progression.	MORE3 survey

This indicator corresponds to the share of researchers who agree that interdisciplinary mobility is regarded as a positive factor for career progression in their home institution.

Key descriptive insights:

- A large majority of EU researchers (74% for all researchers, 75% for female researchers) agree that interdisciplinary mobility is a positive factor for career progression in their home institution.
- Differences between countries are limited.
- This share is the highest in Germany, Latvia, Poland and Romania (80% or more).
- Lowest figures are observed in France and Hungary (62%).
- Shares in EFTA countries are similar to EU average, with share of Switzerland being slightly higher.

Table 75: Interdisciplinary mobility as a positive factor for career progression – Scorecard

	2016	Comparison with EU28
Country	**total**	**total**
Austria	79%	
Belgium	74%	
Bulgaria	72%	
Croatia	69%	
Cyprus	67%	
Czech Republic	79%	
Denmark	76%	
Estonia	79%	
Finland	72%	
France	62%	
Germany	81%	
Greece	74%	
Hungary	62%	
Ireland	76%	
Italy	70%	
Latvia	83%	
Lithuania	75%	
Luxembourg	77%	
Malta	77%	
Netherlands	75%	
Poland	80%	
Portugal	71%	
Romania	85%	
Slovakia	79%	
Slovenia	73%	
Spain	70%	
Sweden	78%	
United Kingdom	74%	
EU28	74%	
Iceland	74%	
Norway	73%	
Switzerland	78%	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 76: Interdisciplinary mobility as a positive factor for career progression (female) – Scorecard

	2016	Comparison with EU28
Country	**female**	**female**
Austria	75%	
Belgium	74%	
Bulgaria	70%	
Croatia	68%	
Cyprus	74%	
Czech Republic	74%	
Denmark	84%	
Estonia	77%	
Finland	68%	
France	64%	
Germany	82%	
Greece	78%	
Hungary	63%	
Ireland	76%	
Italy	74%	
Latvia	84%	
Lithuania	77%	
Luxembourg	78%	
Malta	78%	
Netherlands	77%	
Poland	83%	
Portugal	70%	
Romania	85%	
Slovakia	79%	
Slovenia	78%	
Spain	76%	
Sweden	80%	
United Kingdom	71%	
EU28	75%	
Iceland	70%	
Norway	77%	
Switzerland	79%	

Note: EU28= average of EU MS. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

5.7. Attractiveness of ERA

As a first insight about the attractiveness of ERA, figures concerning **mobile PhD students from abroad** as a share of the total, appear to be stable over the period 2008-2014. Countries scoring the highest numbers are Austria and the Netherlands, while the lowest numbers are observed in Croatia, Italy and Poland.

Less than half of researchers surveyed consider **research funding, pension plans or social security better** in the EU than outside the EU.

5.7.1. Mobile PhD students (ISCED 6/8) from abroad as a share of total PhD students of the country

No	Rationale	Data source
7-1	The indicator focuses on country of destination measuring mobility of researchers in the first stage of their career, with specific focus on mobility within Europe. It is also a measure of a country's "brain-gain" within EU.	Eurostat: educ_uoe_mobs02/educ_uoe_enrt01

Key descriptive insights:

- The trend over 2008-2014 is stable, with an average for an EU Member State of 8% of PhD students coming from another country.
- Countries with most PhD students from abroad relative to their total PhD students are Austria, Belgium, Denmark, Luxembourg, the Netherlands and the UK (12% or more).
- Lowest figures are observed in Bulgaria, Croatia, Poland, Italy, Poland and Romania (62%).

Table 77: Mobile PhD students (ISCED 6/8) from abroad as a share of total PhD students of the country – Scorecard

Country	2009	2014	2009-2014 p.p. change		Comparison with EU
Austria	17%	16%	-1%	⇩	🟢
Belgium	12%	12%	-1%	⇩	🟢
Bulgaria	2%	1%	-1%	⇩	⚫
Croatia	0%	0%	0%	⇧	⚫
Cyprus	8%	5%	-3%	⇩	🔴
Czech Republic	6%	9%	2%	⇧	🟡
Denmark	9%	15%	6%	⇧	🟢
Estonia	2%	3%	1%	⇧	⚫
Finland	4%	6%	2%	⇧	🔴
France	7%	7%	0%	⇧	🔴
Germany	0%	3%	3%	⇧	⚫
Greece					
Hungary	4%	5%	0%	⇧	🔴
Ireland	17%	9%	-9%	⇩	🟡
Italy	2%	0%	-2%	⇩	⚫
Latvia	0%	4%	3%	⇧	⚫
Lithuania	0%	2%	1%	⇧	⚫
Luxembourg	60%				🟢
Malta	5%	5%	0%	⇩	🔴
Netherlands	25%	17%	-8%	⇩	🟢
Poland	0%	0%	0%	⇩	⚫
Portugal	2%	2%	0%	⇩	⚫
Romania	1%	1%	0%	⇩	⚫
Slovakia	6%	7%	1%	⇧	🔴
Slovenia	4%	3%	-1%	⇩	⚫
Spain	5%				⚫
Sweden	8%				⚫
United Kingdom	16%	12%	-4%	⇩	🟢
EU	8%	8%	0%	⇩	

Note: EU= average of EU MS. p.p. change = change in percentage points. Green, yellow, red and black circles indicate country's performance being, respectively, at least 20% above, between -10% and 20%, between -50% and -10% and below -50% compared to EU average.

Table 78: Mobile PhD students (ISCED 6/8) from abroad as a share of total PhD students of the country

Country	2008	2009	2010	2011	2012	2013	2014
Austria	16%	17%	16%	16%	17%	17%	16%
Belgium	12%	12%	13%	13%	14%	11%	12%
Bulgaria	2%	2%	2%	2%	1%	1%	1%
Croatia	0%	0%	0%	0%	0%	0%	0%
Cyprus	6%	8%	7%	8%	9%	3%	5%
Czech Republic	6%	6%	7%	7%	8%	8%	9%
Denmark	8%	9%	10%	11%	12%	14%	15%
Estonia	2%	2%	3%	3%	3%	3%	3%
Finland	4%	4%	5%	5%	5%	6%	6%
France	7%	7%	7%	7%	7%	7%	7%
Germany	0%	0%	3% b	3% b	3% b	3%	3%
Greece							
Hungary	4%	4%	4%	5%	4%	4%	5%
Ireland	21% b	17% b	15%	16%	16%	12%	9%
Italy	2%	2%	2% i1	2%	2%	2%	0%
Latvia	1%	0%	1%	0%	2%	3%	4%
Lithuania	1%	0%	0%	0%	0%	1%	2%
Luxembourg	60% b	60% b	60% b	60%	64%	71%	71% f
Malta	1%	5%	0%	1%	5%	5%	5%
Netherlands	26%	25%	24%	18%	17%	17%	17%
Poland	0%	0%	0%	0%	0%	0%	0%
Portugal	2%	2%	3%	3%	3%	4%	2%
Romania	1%	1%	1%	1%	1%	1%	1%
Slovakia	4%	6%	6%	6%	7%	7%	7%
Slovenia	5%	4%	4%	4%	5%	3%	3%
Spain	5%	5%	5%	5%	6%	4%	4% f
Sweden	7%	8%	8%	9%	9%	8%	8% f
United Kingdom	17%	16%	16%	16%	16%	13%	12%
EU28	8%	8%	8%	8%	9%	9%	8%

Note: b: carry-backward imputation, f: carry-forward imputation, ixy: imputation by interpolation for data corresponding to the yth year in a period of x consecutive missing years.

5.7.2. Share of HEI researchers considering availability of research funding better in EU than in non-EU countries

No	Rationale	Data source
7-2	The indicator measures the attractiveness of countries in terms of research funding.	MORE2/MORE3 surveys

Key descriptive insights:

- 42% of HEI researchers consider that availability of research funding is better in the EU than in non-EU countries. This proportion is the same based on the MORE2 and MORE3 surveys.
- Non-EU researchers currently working in the EU present a lower figure for this indicator than EU researchers currently working in the EU with previous experience outside the EU.

Table 79: Share of HEI researchers considering availability of research funding better in EU than in non-EU countries - Scorecard

	2012	2016	2012-2016 p.p. change	
Non-EU researchers currently working in the EU	43%	38%	-5%	⇩
Non-EU researchers - Female	38%	37%	-1%	⇩
EU researchers currently working in the EU but that have previously been mobile outside the EU	42%	43%	1%	⇧
EU researchers - Female		47%		
Total EU and non-EU researchers	42%	42%	-1%	⇩

5.7.3. Share of HEI researchers considering social security and pension plan better in EU than in non-EU countries

No	Rationale	Data source
7-3	The indicator measures the attractiveness of countries in terms of social security/pension plan.	MORE2/MORE3 surveys

Key descriptive insights:

- About 31% of HEI researchers consider that social security and pension plans are better in the EU than in non-EU countries.
- Non-EU researchers currently working in the EU present a much higher figure for this indicator than EU researchers currently working in the EU with previous experience outside the EU, in particular for social security, with 50% of them considering that it is better in the EU than in non-EU countries.

Table 80: Share of HEI researchers considering social security and pension plan better in EU than in non-EU countries - Scorecard

	2012	2016 - Social security	2016 - Pension plan	2016 - average social security and pension plan	2012-2016 p.p. change	
Non-EU researchers currently working in the EU	35%	47%	37%	42%	7%	⇧
Non-EU researchers - Female	43%	49%	40%	45%	2%	⇧
EU researchers currently working in the EU but that have previously been mobile outside the EU	23%	27%	28%	28%	5%	⇧
EU researchers - Female		26%	27%	26%		
Total EU and non-EU researchers	27%	32%	30%	31%	4%	⇧

6. Conclusions

The results from the key indicators are presented here for each concept covered in this report and also in relation with the ERA priorities.

6.1. Human resources

POSITIVE TRENDS OVER THE LAST DECADE ARE GENERALLY OBSERVED FOR INDICATORS RELATED TO HUMAN RESOURCES.

The **number of researchers** per thousand employees has been increasing over the past ten years. Highest figures are found in Denmark, Finland and Sweden while Romania presents the lowest number of researchers per thousand employees. There are large differences between countries according to this indicator, indicating significant heterogeneity in national systems of research. EFTA countries, the US, Japan and South Korea all perform better than the EU average, while China scores very low figures.

The number of **PhD graduates** (and young PhD graduates) per thousand population in the EU shows a positive trend in the last decade, with no significant gender differences, but significant differences between countries. The share of women in total researchers has remained rather stable in the last decade.

An increasing trend is also observed for the share of **researchers in the private sector** during the last decade.

Regarding **satisfaction with the recruitment process**, a majority of researchers seem to be satisfied with recruitment at their research institution, according to the open, transparent and merit-based criteria.

6.2. Working conditions

STRONG COUNTRY HETEROGENEITY REGARDING WORKING CONDITIONS

The percentage of researchers employed on a **fixed-term contract** and **part-time contract** basis has decreased for most countries over the last five years. There is a significant country heterogeneity concerning these working conditions, for example with high proportions of part-time contracts found in Germany, Lithuania and the Netherlands.

A MAJORITY OF RESEARCHERS ARE SATISFIED WITH REMUNERATION, PENSION PLAN AND SOCIAL SECURITY RIGHTS AND BENEFITS

The majority of researchers consider themselves **well paid or paid a reasonable salary** and are satisfied with their **pension plan** and **social security rights and benefits**. For these indicators, there is also a strong country heterogeneity.

About half of EU Member States present no or only a few HRS4R institutions.

GENDER DIFFERENCES ARE OBSERVED FOR WORKING CONDITIONS, BUT THE SITUATION HAS IMPROVED OVER TIME

Higher shares of fixed-term contracts and part-time contracts are also recorded for female researchers than for male researchers.

Data confirm the existence of a **Glass Ceiling Effect** for EU female researchers, but this factor is improving over time. Overall, the average EU GCI has been indeed decreasing over the last decade, which illustrates a slight improvement concerning difficulties for women in progressing in their research career.

6.3. Career path

TRANSFERABLE SKILLS ARE HIGHLY VALUED BY RESEARCHERS FOR CAREER PROGRESS

A large majority of researchers agree on the added value of **transferable skills** for career progression in their home institution. About half of the surveyed EU researchers report receiving training in transferable skills or developing transferable skills through work experience.

MOST RESEARCHERS ACKNOWLEDGE THE TRANSPARENCY AND MERITOCRACY IN PROFESSIONAL ADVANCEMENT IN THEIR INSTITUTION

On average, EU researchers are **positive about transparency and meritocracy in professional advancement** in HEIs. Female researchers are slightly less positive.

A MINORITY OF GRADE A ACADEMIC STAFF AND BOARD MEMBERS ARE WOMEN, BUT THESE PROPORTIONS HAVE INCREASED DURING THE LAST DECADE

Concerning women's career paths, the **average EU proportion of women as Grade A (22% in 2013) academic staff increased steadily** between 2004 and 2013. The **average EU proportion of women on boards also increased steadily (33% in 2014)** between 2005 and 2014.

6.4. International mobility

INTERNATIONAL MOBILITY IS RELATIVELY STABLE: BETWEEN 2012 AND 2016, INTERNATIONAL COOPERATION INCREASED

International mobility (both short-term and long-term mobility) of researchers (post PhD) has slightly decreased in most of the countries. It still represents a significant aspect of the research career with about 27% of researchers reporting long-term mobility in the past ten years and 37% reporting short-term mobility. Female researchers appear to be less short-term mobile than male researchers. 16% of EU R1-R2 researchers are obtaining or have obtained a **PhD in another country than the country of their previous education**.

Virtual mobility is considered a substitute for international mobility (either short or long term) to a certain extent. This is the case for the majority of the researchers surveyed.

When looking at international co-authorships as an indicator of international cooperation, it appears that the average percentage of **international co-publications** (in total publications) of EU MS has been steadily increasing over the last decade (55% in 2015).

6.5. Intersectoral mobility

LOW BUT STABLE FIGURES ARE OBSERVED FOR INTERSECTORAL MOBILITY

Regarding intersectoral mobility, 11% of EU R2-3-4 researchers in HEIs have previously worked as researchers in the private sector. Switzerland shows a higher figure than the EU average. Overall women are less intersectorally mobile than men. Norway and Iceland show lower figures compared to EU average for women researchers.

6.6. Interdisciplinary mobility

INTERDISCIPLINARY MOBILITY IS HIGHLY VALUED BY RESEARCHERS

This category includes one single indicator, which shows that a large majority of EU researchers agree that interdisciplinary mobility is a positive factor for career progression in their home institution. Shares for EFTA countries are similar to the EU average.

6.7. Attractiveness of ERA

FIGURES CONCERNING MOBILE PHD STUDENTS FROM ABROAD ARE STABLE OVER TIME

As an initial impression about the attractiveness of ERA, figures concerning **mobile PhD students from abroad** as a share of the total appear to be stable over the period 2008-2014, with on average for EU Member States 8% of PhD students coming from another country.

LESS THAN HALF RESEARCHERS CONSIDER FUNDING, PENSION PLANS AND SOCIAL SECURITY BETTER IN THE EU THAN OUTSIDE THE EU

Less than half of researchers surveyed consider **research funding, pension plans or social security better** in the EU than outside the EU. About 31% of HEI researchers take the view that social security and pension plans are better in the EU than in non-EU countries, while 42% think that availability of research funding is better in the EU than in non-EU countries.

6.8. Results in relation with ERA priorities

These findings can be linked to the main priorities of the ERA reinforcement strategy[4], which aim to establish a European research system that can compete in a global research landscape. The table below summarises some of the main findings of the key indicators as they relate to each of these priorities.

[4] COM(2012) 392 final.

ERA priority areas	Related to concepts	Related findings in key indicators
1. More effective national research systems		⇨ While overall, the number of researchers per thousand employees has been increasing over the past ten years, there are large differences between countries, indicating a significant heterogeneity in European national systems of research. ⇨ Large discrepancies between countries are also found at early stages, with significant country heterogeneity also observed for PhD graduates. ⇨ Heterogeneity is also illustrated by strong differences between countries concerning satisfaction with respect to pensions and social security of researchers.
2. Optimal transnational cooperation and competition	International cooperation	⇨ Figures on international co-publications are increasing over time, indicating more frequent international cooperations between researchers. ⇨ Figures related to international mobility of researchers are relatively stable, yet presenting a 4pp decrease between 2012 and 2016. Figures related to mobile PhD students from abroad are also stable over time. ⇨ Virtual mobility can further support international cooperation as it is considered to some extent a substitute for international mobility by the majority of researchers.
	International competition	⇨ Less than half of researchers surveyed consider research funding, pension plans or social security better in the EU than outside the EU.
3. An open labour market for researchers (facilitating mobility, supporting training and ensuring attractive careers)	⇨ Facilitating mobility, open labour market for non-native researchers	⇨ The number of HRS4R institutions is growing, but about half of the EU MS present no or only a few HRS4R institutions.
	⇨ Open labour market based on merit, recognition of all relevant skills	⇨ The majority of researchers is satisfied with recruitment at their research institution according to the open, transparent and merit-based criteria. ⇨ On average, EU researchers are positive about transparency and meritocracy in professional advancement in their HEI. Female researchers are slightly less positive.
	⇨ Training of research skills, as well as other skills to create	⇨ About half of the surveyed EU researchers report receiving training in transferable skills or developing transferable skills

ERA priority areas	Related to concepts	Related findings in key indicators
	openness towards careers outside academia	through work experience. The large majority of researchers agree on the added value of transferable skills for career progress in their home institution, underlining the importance thereof.
	⇨ Attractiveness of research careers	⇨ The percentage of researchers employed on part-time contracts basis has decreased in the last 5 years. ⇨ The majority of researchers in the EU consider themselves well paid or paid a reasonable salary. ⇨ A large majority of EU researchers are satisfied with their pension plan and social security rights and benefits.
4. Gender equality and gender mainstreaming in research	Mainstreaming	⇨ Share of women in total FTE researchers has been stable over the last decade with the average share being close to 36%-37%. Large country differences are observed, however, ranging from 23% in Austria and Germany to 50% in Bulgaria, Croatia and Latvia.
	Equality	⇨ Overall, higher shares of fixed-term contracts and part-time contracts are recorded for female researchers than for male researchers. ⇨ Data confirm the existence of a Glass Ceiling Effect for EU female researchers, but there is slight improvement over time concerning difficulties for women in progressing in their research career. ⇨ Concerning women's career paths, the average EU proportion of women as Grade A academic staff (22% in 2013) increased steadily between 2004 and 2013. The average EU proportion of women on boards also increased steadily between 2005 and 2014 (33% in 2014).
5. Optimal circulation and transfer of scientific knowledge	Open innovation	⇨ Intersectoral mobility is not common among the HEI researchers, with 11% of R2-3-4 researchers having previously worked as researchers in the private sector. ⇨ On the other hand, a large majority of researchers in EU HEI agree that interdisciplinary mobility is a positive factor for career progression in their home institution.
	Open science: - Digital innovations	⇨ Virtual mobility is considered a relevant tool to substitute for

ERA priority areas	Related to concepts	Related findings in key indicators
	- New ways of disseminating research results - New ways of collaborating (globally)	international mobility.
	Open to the world	⇨ Average percentage of international co-publications (in total publications) of EU MS was 55% in 2015. This figure has been steadily increasing over the last decade for all EU countries.
	Knowledge circulation	⇨ Results on international, intersectoral, interdisciplinary and virtual mobility show interactions between researchers according to various channels, which support the idea that knowledge circulation is strongly valued by researchers.
6. International cooperation	Cross-cutting priority	⇨ Cf. priorities 2, 3 and 5.

List of Tables

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OPEN DATA FROM THE EU
The EU Open Data Portal (http://data.europa.eu/euodp/en/data) provides access to datasets from the EU. Data can be downloaded and reused for free, both for commercial and non-commercial purposes.

The MORE III study aims at updating, improving and further develop the set of indicators of the MORE2 study in order to meet the need for indicators over time and assess the impact on researchers of policy measures introduced for the development of an open labour market for researchers. This study gathers data to highlight emerging policy needs and priorities regarding mobility patterns, career paths and working conditions of researchers.

The study carries out two surveys: the first one addressed to researchers currently working in the EU (and EFTA) in higher education institutions (HEI) and the second one to researchers currently working outside Europe.

Studies and reports

Publications Office