



EUROPEAN COMMISSION  
EUROSTAT

Directorate G :Global Business Statistics  
**Unit G 4: Innovation and information society**

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# **COMMUNITY INNOVATION SURVEY 2014**

## **SYNTHESIS QUALITY REPORT**

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## Abbreviations

<b>Country code</b>	<b>Country Label</b>
<b>BE</b>	Belgium
<b>BG</b>	Bulgaria
<b>CZ</b>	Czech Republic
<b>DK</b>	Denmark
<b>DE</b>	Germany
<b>EE</b>	Estonia
<b>IE</b>	Ireland
<b>EL</b>	Greece
<b>ES</b>	Spain
<b>FR</b>	France
<b>HR</b>	Croatia
<b>IT</b>	Italy
<b>CY</b>	Cyprus
<b>LV</b>	Latvia
<b>LT</b>	Lithuania
<b>LU</b>	Luxembourg
<b>HU</b>	Hungary
<b>MT</b>	Malta
<b>NL</b>	Netherlands
<b>AT</b>	Austria
<b>PL</b>	Poland
<b>PT</b>	Portugal
<b>RO</b>	Romania
<b>SI</b>	Slovenia
<b>SK</b>	Slovakia
<b>FI</b>	Finland
<b>SE</b>	Sweden
<b>UK</b>	United Kingdom
<b>IS</b>	Iceland
<b>NO</b>	Norway
<b>MK</b>	Macedonia
<b>RS</b>	Serbia
<b>TR</b>	Turkey

# **1 Introduction**

The present report is the synthesis of the national quality reports provided by the countries participating to CIS 2014. The assessment and all the statements have been performed solely on the basis of these quality reports. This synthesis document makes an overall assessment of the main aspects of quality reported on the 2014 data collection on innovation statistics.

The purpose of this synthesis report is to get an overview of the quality of the Community Innovation Survey (CIS) carried out in each Member State, EFTA, Candidate or Associated country. Eurostat received 33 national quality reports (the EU 28 Member States, Iceland, Macedonia, Norway, Serbia and Turkey), which are summarised in the present synthesis. Results were reported for the reference period 2012-2014.

The synthesis report is organised as follows: Chapter 2 gives a methodological overview on national CIS 2014 reports' production. Chapter 3 refers to a quality assessment of CIS 2014 statistics and finally chapter 4 summarises the findings of this report.

## **2 Methodological overview of national surveys**

The collection of the CIS 2014 statistics at national level was made following the Commission Regulation No 995/2012 laying down rules for the implementing of Decision No 1608/2003 concerning the production and development of Community statistics on science and technology. The Regulation lists the variables to be collected and specifies the sectors (Core NACE coverage) and the breakdowns by size class of the results. In addition, the methodological guidelines proposed by Eurostat provide specific information on the implementation of the CIS 2014, the computation of the indicators and the transmission rules to Eurostat.

The target population for CIS 2014 was all enterprises in Core NACE coverage as described in the Commission Regulation 995/2012 on innovation statistics (market activity enterprises with 10 or more persons employed, with activity on innovation statistics , sections B, C, D, E, H, J, K and divisions 46, 71, 72 and 73).

### **2.1 Survey methodology**

The majority of the countries carried out a combination of sample survey and census of the enterprises included in the frame population. One country (Lithuania) used exclusively sample survey and another two (Bulgaria and Malta) used exclusively census. Where a combination of sampling with census was used, the employment size class was the main variable to define a threshold. Usually a census was taken for larger enterprises, while smaller enterprises where the population is particularly large, were sampled.

In accordance with Commission Regulation 995/2012 on innovation statistics, three size classes are included in the core target population: firstly of 10 - 49 employees, secondly of 50 - 249 employees and thirdly 250 or more employees. For two countries (Italy and Poland) CIS 2014 size classes were defined by the number of persons employed and not by the number of employees.

Table 1 below, gives an overview of the survey type (and if it was mandatory), the target population, the sample size and in the case of combined survey's method (sample/ census) the size of sampled and enumerated units. Moreover, the unweighted non-response rate is presented.

**Table 1. CIS 2014 statistics, overview of survey type and other sampling and response characteristics**

Countries	Survey type	Mandatory or Not	Target population	Sample	Sampled units	Enumerated units	Un-weighted non response rate (%)
<b>BE</b>	Combination census/ sampling	N	13,543	7,572	3,177	4,395	44.0
<b>BG</b>	Census survey	Y	n.a.	-	-	n.a.	0.4
<b>CZ</b>	Combination census/ sampling	Y	24,694	6,577	5,148	1,429	12.8
<b>DK</b>	Combination census/ sampling	Y	17,641	4,901	3,083	1,818	3.0
<b>DE</b>	Combination census/ sampling	N	135,984	25,929	n.a.	n.a.	49.2 <sup>1</sup>
<b>EE</b>	Combination census/ sampling	Y	3,641	2,309	n.a.	n.a.	20.8
<b>IE</b>	Combination census/ sampling	Y	8,219	4,645	n.a.	n.a.	30.7
<b>EL</b>	Combination census/ sampling	Y	13,843	5,496	5,201	295	38.6
<b>ES</b>	Combination census/ sampling	Y	68,683	25,350	14,742	10,608	6.6
<b>FR</b>	Combination census/ sampling	Y	71,398	13,277	10,192	3,085	25.3
<b>HR</b>	Combination census/ sampling	Y	10,470	4,428	n.a.	n.a.	25.2
<b>IT</b>	Combination census/ sampling	Y	111,892	18,511	16,353	2,158	37.5
<b>CY</b>	Combination census/ sampling	Y	1,602	1,346	412	934	0.0
<b>LV</b>	Combination census/ sampling	Y	5,003	1,501	767	734	4.2
<b>LT</b>	Sample survey	Y	9,780	2,480	2,480	0	0.5
<b>LU</b>	Combination census/ sampling	Y	1,751	892	394	498	11.8
<b>HU</b>	Combination census/ sampling	Y	14,720	7,850	6,240	1,610	7.7
<b>MT</b>	Census survey	Y	1,798	-	-	1,798	26.5
<b>NL</b>	Combination census/ sampling	Y	25,276	6,955	6,955	0	28.0
<b>AT</b>	Combination census/ sampling	N	16,645	5,615	4,827	788	47.0
<b>PL</b>	Combination census/ sampling	Y	62,156	21,300	12,562	8,738	20.8

<sup>1</sup> The un-weighted unit non-response rate for the paper form only is 74.8%. Out of the units that did not respond to the paper/online questionnaire, 5,020 units (i.e. 35% of the enterprises not replying to the paper form) were surveyed through telephone interviews in a second wave, giving a corrected unweighted non-response rate of 49.2%. The answers of the telephone interviews entered into the calculation of innovation indicators.

Countries	Survey type	Mandatory or Not	Target population	Sample	Sampled units	Enumerated units	Un-weighted non response rate (%)
<b>PT</b>	Combination census/ sampling	Y	18,601	6,802	8,931	524	15.7
<b>RO</b>	Combination census/ sampling	Y	n.a.	n.a.	n.a.	n.a.	6.6
<b>SI</b>	Combination census/ sampling	Y	4,273	2,800	1,848	952	17.8
<b>SK</b>	Combination census/ sampling	Y	8,016	3,372	n.a.	n.a.	21.2
<b>FI</b>	Combination census/ sampling	Y	8,750	3,555	3,192	363	25.7
<b>SE</b>	Combination census/ sampling	Y	34,737	9,348	7,991	1,357	11.7
<b>UK</b>	Combination census/ sampling	N	199,559	29,732	n.a.	n.a.	49.9
<b>IS</b>	Combination census/ sampling	Y	363	231	231	464	21.3
<b>NO</b>	Combination census/ sampling	Y	9,115	4,060	1,649	2,411	3.1
<b>MK</b>	Combination census/ sampling	Y	2,998	1,500	835	665	25.9
<b>RS</b>	Combination census/ sampling	Y	16,659	3,587	2,776	811	22.6
<b>TR</b>	Combination census/ sampling	Y	103,898	11,934	9,534	2,400	25.9

## 2.2 Data collection

CIS 2014 data were collected through an electronic survey mostly, as the web questionnaire was implemented as the only option of data reporting by the majority of countries. The survey was organised in this way in Denmark, Estonia, Greece, Finland, Croatia, Hungary, Ireland, Iceland, Italy, Lithuania, Luxembourg, Netherlands, Norway, Poland and Turkey.

In several cases there was also the possibility of a paper questionnaire which could additionally be sent by postal mail (Belgium, Bulgaria, Germany, Spain, France, Latvia, Portugal, Romania, Serbia, Slovakia), or even be used as a reminder to encourage survey participation (Austria, Germany, Sweden and The Netherlands). This last approach follows the recommendation for methods alternations which is considered to be the most effective practice. In Sweden 94% of the enterprises had already answered via web.

Only in a few cases, the postal survey (paper questionnaire) remained the only option for data collection (Czech Republic, Macedonia, Malta, Slovenia and United Kingdom). Additionally, in some cases (e.g. Macedonia) there was the possibility for the questionnaire to be sent electronically (by e-mail converted to excel file).

In Cyprus, the CIS data collection was conducted exclusively via face-to-face interviews, while in some countries non-responding enterprises were also contacted by telephone (Belgium, Germany Greece, and United Kingdom). This mode served as a direct contact for replying to the survey for a limited number of correspondents.

Table 2 below, gives an overview of the data collection methods used in CIS 2014.

**Table 2. CIS 2014 statistics, data collection methods**

Data Collection Method	Number of countries	Countries
Only electronic survey	14	DK, EE, EL, FI, HR, HU, IE, IS, IT, LT, LU, NO, PL, TR
Postal and electronic survey	13	AT, BE, BG, DE, ES, FR, LV, NL, PT, RO, RS, SE, SK
Only postal survey	5	CZ, MK, MT, SI, UK
Face-to-Face interviews	1	CY

### 2.3 Evaluation of the CIS 2014 methodology

Positive opinions were given in general, highlighting the improvement of the methodological process, which resulted in a satisfying response rate in most cases. Some weaknesses seem to remain through, particularly regarding the quantification of the turnover due to new or significantly improved products which are new to the market or/and to the enterprise (question 2.3). It was also commented that the definition of innovation was still not perfectly clear and that the given concept would make it difficult for enterprises to assess their own activities as innovative or not.

The main strengths and weaknesses of the CIS 2014 methodology, as reported by the countries in the national quality reports, are summarised as follows with the number of countries sharing the same opinion (a count of at least 2 countries was needed to include the item).

#### Highlighted strengths:

- High unit response rate (9 countries)
- Electronic form of collecting data (familiarity with the mode of collection, economical form, data control during fulfilling questionnaires, quicker collection, positive impact on the quality of the data) (8)
- Data checking through the introduction of filters and validation rules on the questionnaire (8)
- Better understanding of the questionnaire by the users (6)
- Collection of regional data (2)
- Coherence with SBS data (2)
- On-line manual and phone line available for respondents (2)

#### Highlighted weaknesses:

- Innovation concept (difficulties for the enterprises to assess their activities as innovative or not) (4)
- Quantification of the innovation expenditures (difficulties in splitting innovation expenditures from other activities as a high share of innovation expenditure consists of R&D) (3)
- Quantification of the turnover from innovative products (goods or services) (2)
- The long length of the questionnaire (small enterprises) (2)
- No user satisfaction survey was undertaken (2)

## 3 Quality assessment of CIS 2014 statistics

The quality assessment of CIS 2014 statistics reports the non-response and imputation rates because they reflect the reliability and accuracy of the published data. Furthermore, the comparability has been evaluated (the deviations of national survey questionnaires from the harmonised questionnaire), and information on the accessibility and dissemination of survey results is presented.

### 3.1 Non-response rates for the national surveys

Non response occurs when a survey fails to collect data on all survey variables from all the population units designated for data collection in a sample or complete enumeration.

There are two types of non-response:

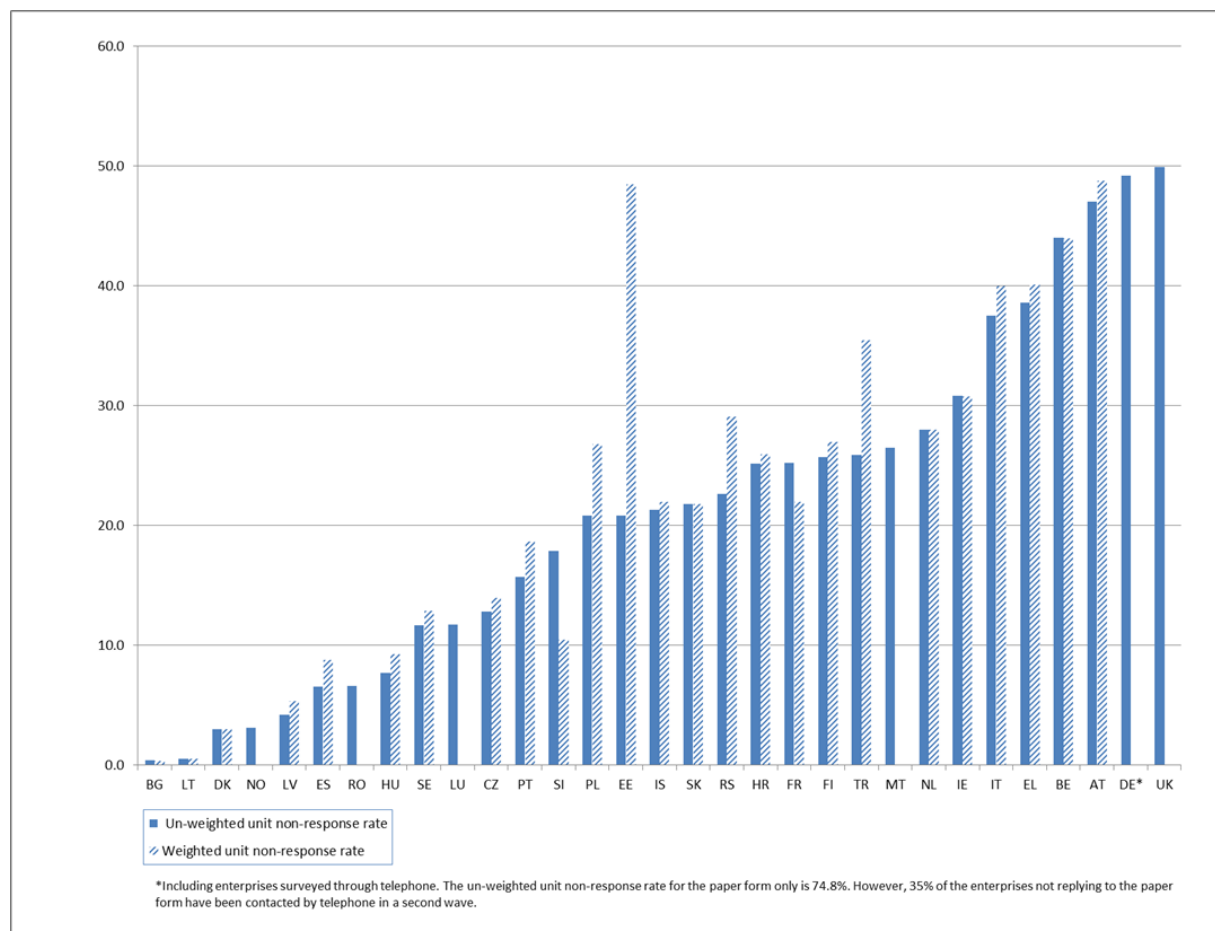
- Unit non-response, which occurs when no data is collected (or so little as to be unusable) about a population unit designated for data collection
- Item non-response, which occurs when only data on some (but not all) survey data items is not collected about a population unit designated for data collection

Figure 1, presents un-weighted and weighted unit non-response rates, defined as follows:

- Un-weighted unit non-response rate (%) =  $100 * (\text{Number of units with no response or not usable response}) / (\text{Total number of in-scope (eligible) units in the sample})$
- Weighted unit non-response rate (%) =  $100 * (\text{Number of weighted units with no response or not usable response}) / (\text{Total number of in-scope (eligible) units in the sample})$

It can be noticed that eight countries (BG, DK, ES, HU, LT, LV, NO, RO) have un-weighted non-response rates below 10%. Moreover for Cyprus non-response rate is zero, because all reported data was collected through mandatory interviews.

**Figure 1. CIS 2014 statistics, unit non-response rate (%)**





Following Eurostat's recommendations, a non-response survey should be performed when the non-response rate is above 30% (un-weighted). Austria, Belgium, Germany, Greece, Ireland, Italy and United Kingdom reported non-response rates above this threshold, therefore a non-response survey should have been carried out to overcome the effect of the low response rate on the data collected. According to the recommendations, a simple random sample of at least 10% of the non-respondents (excluding non-relevant enterprises) should have been selected and in case that non-response was not equally distributed across strata, a stratified non-response sample might have been used. The questions suggested to be included in the non-response survey were also specified in methodological recommendations (cf. annex 2 of this report).

In Austria the post-survey was started in February 2016 and 10% of the non-responding enterprises were sampled. 67% of all enterprises declared having had at least one of the types of innovation in the reference period. In the course of the regular survey, 63% of all respondents were innovation active. So the analysis showed that non-respondents to the CIS 2014 were slightly more innovative than respondents. As the re-weighting was done for each size class separately, the share of innovative enterprises in the final results increased.

In Belgium a non-response survey was conducted in the Brussels region and in the Flemish region. A little more than 10% of non-responding firms were selected with stratified random sampling and called. In Brussels, only a 38% response rate was collected, therefore data was not used in order to adjust the CIS 2014 results. In Flanders, the overall response rate to the non-response survey was 76%, which was sufficiently high to allow for these data to be used to adjust the weights used to extrapolate the sample results to the target population. In Flanders, the weighted percentage of innovators in the respondent population was 37%, the weighted percentage of innovators in the non-respondent population is 60%, a statistically significant difference. The results of this non-response survey were used to calculate non-response adjusted weights for the Flemish region. It should be noted that the experiment that the Flanders region conducted in the context of CIS 2014, comparing responses to long and short form innovation surveys, strongly suggested responses to long and short forms are not directly comparable. However, it was decided to still use the same method as had been used in previous waves in the Flemish region, and hence construct non-response adjusted weights using the results of the non-response survey, to avoid having multiple breaks in series in a row. While CIS 2014 was conducted, a revision of the Oslo Manual was under way, and it was expected that that revision in itself would yield a break in series in CIS 2018. It was decided that rather than implementing multiple changes in the survey that would need to be explained to the users, as they would each yield a break in series, we would aim to avoid confusing our users, and try to implement a number of rather major changes in one point in time.

In Germany a stratified random sample (stratified by size class, sector and region) of non-responding firms was drawn. A total of 9,533 enterprises have successfully been interviewed using computer-assisted telephone interview technique (5,433 of these enterprises were in the Core NACE and the Core size classes of CIS 2014). Particular attention has been paid to minimise the non-response among the firms contacted in the non-response analysis (non-response ratio was 51.7%). The non-response analysis collected information on the size of the non-responding enterprises (number of employees), the main product (in terms of sales volume) in order to check NACE class, and information about whether the enterprise has introduced a product innovation, has introduced a process innovation, has ongoing or abandoned innovation activities or has performed in-house R&D in 2012-2014.

In Greece the non-response survey was carried out to a simple random sample of around 10% of non-responding units. Since non-response was equally distributed across strata, there was no need for a stratified non-response sample. The non-response questionnaire included the questions proposed in the survey guidelines and also one question about the reason of non-response. Enterprises were contacted by interviewers via telephone or via on-site visits and were asked to reply to the given questions. The non-response survey succeeded a high response rate (around 85%). The results of the non-response analysis showed that there were no statistically significant differences between non-respondents and respondents

of the CIS 2014 survey. About the reasons for not responding, it was reported that for 55.9% the main reason was the lack of time, for 10.6% the length of questionnaire and for 3.7% the difficulties in understanding.

In Ireland, United Kingdom and Italy non-response surveys were not conducted. Some countries pointed out the cost of the non-response survey and some others the need to improve survey's methodology to achieve better results.

### 3.2 Non-response rates for the new questions of CIS 2014 questionnaire

Concerning the adaption of the new questions which are related to non-innovators (section 12) and to innovations with environmental benefits (section 13) and according with the information provided, it seems that not all NSOs included these questions in their national surveys, or if they did, they did not report the non-response rate.

Question 12.3 for example, which refers to the importance of current barriers for non-innovators, was not included by five countries and the item non-response rate was not reported by thirteen countries. Similarly, question 13.2 related to the environmental benefits due to enterprises innovation, was not included in seven national surveys and item non-response rate was not provided in thirteen surveys.

It is also noted that the new question about the share of turnover from sale outside the country (14.2) was also omitted (or rate not reported) in many surveys (20/33).

**Table 3 CIS 2014 statistics, item non-response rates for new questions**

	12.3	13.1	13.2	13.3	13.4	14.2
BE	N/A	N/A	N/A	N/A	N/A	N/A
BG	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
CZ	0.0%	0.0%	N/A	N/A	N/A	N/A
DK	N/A	42.0%	N/A	N/A	29.0%	N/A
DE	N/A	8.8%	N/A	16.9%	N/A	20.7%
EE	N/R	N/R	N/R	N/R	N/R	N/R
IE	N/A	2.4%	5.0%	N/A	4.0%	0.3%
EL	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ES	N/R	N/R	N/R	N/R	N/R	N/R
FR	4.2%	2.5%	1.7%	3.4%	0.9%	1.7%
HR	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
IT	20.7%	4.5%	4.0%	5.5%	7.4%	9.5%
CY	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
LV	N/R	N/R	N/R	N/R	N/R	N/R
LT	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
LU	N/R	N/R	N/R	N/R	N/R	N/R
HU	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MT	N/R	N/R	N/R	N/R	N/R	N/R
NL	0.0%	N/A	N/A	N/A	N/A	0.6%
AT	2.8%	2.8%	N/A	2.3%	1.6%	N/A
PL	N/R	N/R	N/R	N/R	N/R	N/R
PT	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RO	N/R	N/R	N/R	N/R	N/R	N/R
SI	N/R	N/R	N/R	N/R	N/R	N/R
SK	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FI	N/R	N/R	N/R	N/R	N/R	N/R

	12.3	13.1	13.2	13.3	13.4	14.2
SE	0.0%	8.4%	7.6%	11.1%	18.1%	N/A
UK	N/R	N/R	N/R	N/R	N/R	N/R
IS	0.0%	0.0%	0.0%	0.0%	0.0%	>30,00%
NO	N/R	N/R	N/R	N/R	N/R	N/R
MK	N/A	N/A	N/A	N/A	N/A	N/A
RS	N/R	N/R	N/R	N/R	N/R	N/R
TR	N/R	N/R	N/R	N/R	N/R	N/R

N/A = not included in national survey, N/R = not reported

### 3.3 Imputation rate

Imputations should have followed in order to correct the remaining non-response rate, after every attempt to get the information from the enterprises concerned had been made, according to recommendations. The imputation rates, for three metric CIS indicators (total turnover in the last year of the reference period (t), share of the turnover due to new or improved product in the total turnover for product innovative enterprises and expenditure in intramural R&D) are shown in Table 4. A weighted mean of each metric variable by NACE was calculated and applied as a ratio to the enterprises with the missing values, within the stratum concerned. For expenditure in intramural R&D, the highest rates were recorded in Belgium, Estonia, Germany and France. Respectively, the share of the turnover due to new/improved products in the total turnover for product innovative enterprises had the highest rates in Belgium and Germany.

Table 4 shows the results from those countries that have provided information on the subject in the quality reports transmitted to Eurostat.

**Table 4. CIS 2014 statistics, imputation rates (%) for 3 metric variables**

Countries	TOTAL TURNOVER in the last year of the reference period (t) (TURN t/TOTAL) [%]		Share of the TURNOVER due to NEW OR IMPROVED PRODUCT in the total turnover for product innovative enterprises (NEWMAR_TURN/INPDT)[%]		EXPENDITURE in intramural R&D (RRDINX/INNOACT) [%]	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
BE	4.0	5.0	14.0	13.0	21.0	23.0
BG	0.0	0.0	0.0	0.0	0.0	0.0
CZ	100.0	100.0	0.0	0.0	0.0	0.0
DE	0.0	0.0	13.9	41.6	13.9	8.2
EE	3.0	2.1	0.0	0.0	26.9	24.2
EL	0.9	0.8	1.5	1.2	6.9	2.5
ES	0.3	0.2	2.1	1.7	0.8	0.6
FR	4.6	5.0	10.8	6.9	9.3	10.6
IT	2.4	3.1	1.8	1.6	0.3	0.5
CY	<5.0	<5.0	0.0	0.0	0.0	0.0
LT	0.0	0.0	0.0	0.0	0.0	0.0
LU	Not imputed. admin. source		5.2	9.9	1.1	1.1
AT	Does not apply		4.9	2.7	3.4	9.0

Countries	TOTAL TURNOVER in the last year of the reference period (t) (TURN t/TOTAL) [%]		Share of the TURNOVER due to NEW OR IMPROVED PRODUCT in the total turnover for product innovative enterprises (NEWMAR_TURN/INPDT) [%]		EXPENDITURE in intramural R&D (RRDINX/INNOACT) [%]	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
PL	0.1	0.2	0.3	0.0	Expenditures were not imputed	
PT	0.6	0.9	2.9	2.7	2.5	2.1
SI	0.0	0.0	0.0	0.0	0.0	0.0
SK	0.0	0.0	0.0	0.0	0.0	0.0
SE			3.1	3.0	0.1	0.1

### 3.4 Comparability

In this section assesses the comparability of national CIS 2014 statistics. As has been mentioned before, for ensuring comparability across countries, the CIS 2014 used the harmonised survey questionnaire developed by the CIS 2014 Task Force and adopted by all Member States. It is noted that the questionnaire covers the main themes listed in the [Oslo Manual \(third edition of 2005\)](#).

#### 3.4.1 Deviations from the questionnaire

On Table 5 below, deviations (or not) are presented, concerning the questions included in the national questionnaires in comparison with the agreed harmonised questionnaire.

**Table 5. CIS 2014 statistics, alterations in the harmonised questionnaire**

Deviations	Nb. of countries	Added/ Omitted Questions
NO	10	CY, DK, HU, IE, LV, MT, RO, RS, SK, TR
YES	12	✓ Questions omitted of the national questionnaire (included in the harmonised questionnaire) AT, BG, ES, FR, FI, IS, LT, LU, MK, NL, NO, SE
	16	✓ Questions added in the national questionnaire (not included in the harmonised questionnaire/ for further information please see annex 1) AT, BE, CZ, DE, EE, EL, ES, FR, FI, HR, IS, IT, LU, PL, PT, SI

#### 3.4.2 Deviations from the target population

No serious deviations were reported regarding the coverage of the NACE sectors, the size classes and the statistical unit (some countries covered additional categories of NACE and size classes but all the countries have provided data corresponding to the recommendations).

#### 3.4.3 Deviations on data collection

See [chapter 2](#)

### 3.5 Accessibility and dissemination

The overall use of CIS data in academic research has intensified in recent years. It was estimated that more than a hundred academic publications had used CIS data in the year 2014. Therefore, accessibility of data and dissemination of results are important factors for the quality assessment.

Accessibility is evaluated through the different means used by the countries for the dissemination of the CIS statistics to users (researchers in majority). Table 6 below shows the available means in the CIS 2014, the level of access and the countries provided each mean of dissemination.

It can be concluded that the majority of countries had a press release, a paper publication and also published the survey's results on their website. An online database was also available to users in most cases. Finally, the dissemination of microdata has been increased and was permitted in several cases via a limited, controlled way as a signed contract, a specific approval or via working in a safe terminal.

**Table 6. CIS 2014 statistics, accessibility and dissemination**

Means of access		Number of countries	Countries
Press release	Yes (free of charge)	22	AT, BG, CY, CZ, DE, DK, EL, ES, FI, HR, IS, IT, LT, MT, NL, NO, PT, RO, RS, SE, MK, TR
	No	9	BE, FR, HU, IE, LU, LV, PL, SI, SK
Paper publication	Yes (free of charge)	17	AT, BE, BG, CY, CZ, DE, EL, FR, HR, HU, IS, NL, NO, PL, RO, RS, SK
	Yes (paid)	2	LT, FR
	No	13	DK, EE, ES, FI, IE, IT, LU, MK, MT, PT, SE, SI, TR
Online publication	Yes	27	AT, BE, CY, CZ, DE, DK, EL, TR, ES, FI, FR, HR, HU, IE, IS, IT, LT, LV, MK, NL, NO, PL, PT, RS, SE, SI, SK
	No	4	BG, EE, LU, MT
Online database	Yes	26	BE, BG, CZ, DE, DK, EE, EL, ES, FI, FR, HU, IE, IS, IT, LT, LV, MK, MT, NL, NO, PL, RO, SE, SI, SK, RS
	No	6	AT, CY, HR, LU, PT, TR
Microdata access	Yes (approval/ contract required, or via safe terminal)	23	BE, BG, DE, EE, EL, ES, FI, FR, HR, HU, IT, LT, LU, MK, NL, NO, PT, RO, SE, SI, SK, RS, TR
	No	9	AT, CY, CZ, DK, IE, IS, LV, MT, PL
CD ROM	Yes	9	BE, CZ, ES, HR, IT, NO, RO, SI, SK
	No	20	AT, CY, DE, DK, EE, EL, FI, FR, HU, IE, IS, LU, LV, MK, MT, NL, PL, PT, SE, TR

According to national reports, data was usually accompanied by comprehensive methodological notes that provided information on the scope of the survey, the related concepts and definitions and the data collection method. Moreover, many countries provided guidelines to users for the interpretation of the indicators published and the feedback received from users on the clarity of CIS statistics was considered highly positive.

## **4 Conclusions**

The recommended target population of the CIS 2014 was the total population of enterprises in Core NACE Rev. 2 sections & divisions B-C-D-E-46-H-J-K-71-72-73. These sections include most market activities. On a voluntary basis, some countries covered additionally some “non-core” economic activities. The reference period covered by the survey was 2012-2014 inclusive i.e. the three-year period from January 1st 2012 to December 31st 2014. Data was collected through a census or sample survey or mostly through a combination of both. The CIS 2014 was mainly based on online surveys. Some countries also used other data collection methods as mailed questionnaire or even telephone contacts combined with online surveys. Throughout the processing cycle, there was a systematic and sustained follow up with the responding enterprises to make sure that the data provided is of good quality and data quality checks were performed at the micro- and macro-level. In cases of low overall response rates (the un-weighted percentage of unit nonresponse exceeded 30%) non-response surveys were conducted in 4 (out of a total of 7) countries in order to investigate potential nonresponse biases. Where there was item non-response, imputations were made in most cases. In two countries the imputation rates for intramural R&D expenditure came close to 25%, and in one country the imputation rate for share of turnover due to new or significantly improved products, in the total turnover, slightly exceeded 40%. This does indicate that the quality of these data should be monitored.

The main strengths of CIS 2014 reported by the countries are a) the high response rate and b) the electronic form of collecting data. The electronic form facilitated data collection, was less expensive and time consuming, allowed data controls during processing and resulted in a positive impact on data quality. A better understanding of the questionnaire was also underlined in several cases. However, some challenges regarding the categories of innovation expenditures and the questions related to the turnover of new products are still to be handled.

Concerning the results of the national surveys, these are mainly available in the website of national statistical institutions (on line publications) and at the same time in paper publications, which are free of charge. Moreover, in the majority of countries a database has been created and microdata can also be accessed for research use under specific conditions.

## **ANNEX 1: List of questions included in the national questionnaire and not included in the harmonised questionnaire**

The national quality reports revealed the following interesting, additional questions:

- Whether or not the enterprise was a headquarter or subsidiary **(BE)**
- Percentages of turnover coming from 'Local/regional within [your country]' (Marloc), 'National (other regions of [your country])' (Marnat), 'Other European Union or associated countries' (Mareur), and 'All other countries' (Maroth) **(BE)**
- Full-time equivalent (FTE) of R&D personnel in 2014 **(BE)**
- Presence of R&D in biotechnology and nanotechnology **(BE)**
- If the process innovation resulted in reduced costs or increased quality, and if so, the accompanying percentages **(BE, only in Flemish region)**
- Number of projects to develop new goods, services, processes or methods in the reference period (finished, broken off or postponed, or ongoing at the end of 2014) **(BE, only in Flemish region)**
- 3 questions on social innovation (which type, how many people were reached with these social innovations, and why they were implemented) **(BE, only in Flemish region)**
- In case of public funding for innovation activities, whether those innovation activities involved cooperation with other enterprises or institutes, and if so, whether they involved cooperation with public research institutes or higher education **(BE, only in Flemish region)**
- Motivations for undertaking product/process innovations **(CZ)**
- Number of employees and turnover in 2013 **(DE)**
- Share of employees with a higher education degree in 2013 **(DE)**
- Effects of changes to the enterprise on turnover (increase or decrease in turnover of more than 10%) **(DE)**
- Number of competitors (6 categories)**(DE)**
- 8 items on the market environment (characteristics of competition), measured on a 4-point Likert **(DE)**
- Whether the enterprise is a "family enterprise" (and if yes in what generation), whether family members are part of the enterprise board and whether it is planned to continue as a family enterprise in the next generation **(DE)**
- Introduction of product innovations that extend an enterprise's product range, share in total sales of these product innovations **(DE)**
- Introduction of process innovations that led to a reduction in unit costs, share of unit cost reduction **(DE)**
- Introduction of process innovations that led to an increase in the quality of products, increase in sales due to this increase in quality **(DE)**
- Planned innovation activities for 2015 and 2016 **(DE)**
- Amount of innovation expenditures planned for 2015 and 2016 **(DE)**
- Obstacles to innovation (16 items, following the format of the obstacles question in CIS 3) **(DE)**
- Activities in the field of standardisation (6 items, yes/no) **(DE)**
- Financial data: expenditure for wages and salaries, expenditure for material and services, expenditure for energy, expenditure for further education, expenditure for marketing and advertising, expenditure for software, capital expenditure, volume of tangible assets, profit margin **(DE)**
- Number of persons that filled the questionnaire, time to complete, use of information provided in earlier CIS questionnaires, ease to collect the required information, no. of years the respondent works in the enterprise **(DE)**
- About foreign equity and division of market for CIS countries and other countries **(EE)**
- Two questions on strategies and obstacles (from the CIS 2012 ad-hoc module) which were addressed only to innovators **(EL)**
- Which are the stages of the production process that were either implemented in another country or were part of the production process carried out in another country by other enterprises/organisations **(EL)**

- Expenses on internal R&D and other innovation activities by Autonomous Community **(ES)**
- If the company carry out any technological innovation activities that contain free software in 2014 **(ES)**
- Brief description of the most important product/process innovation **(ES)**
- Sources of information for technological innovation activities during the 2012-2014 period **(ES)**
- Formula for cooperation used with each type of partner **(ES)**
- Objectives of technological innovation during the 2012-2014 periods **(ES)**
- Factors that hinder the technological innovation activities during the 2012-2014cperiod **(ES)**
- Intellectual and industrial property rights **(ES)**
- Who developed the organisational innovations **(ES)**
- Indicate the degree of importance of the objectives of the organisational innovations introduced by the company during the 2012-2014 periods **(ES)**
- Who developed the commercialisation innovations **(ES)**
- Indicate the degree of importance of the objectives of the commercialisation innovations introduced by the company during the 2012-2014 periods **(ES)**
- Time needed to complete CIS questionnaire **(FR)**
- Brief description of the most important product/process innovations **(FR)**
- Public support (national support in the form of research tax credits) **(FR)**
- Short description of the most important innovation in the enterprise 2012-2014 **(HR)**
- Detailed information on design expenditures **(IT)**
- Description of the competitive environment on the main market enterprise has operated during the three years 2012 to 2014 **(LU)**
- If/ to what extent the following factors describe the competitive environment on the main market **(LU)**
- Short description of the new or significantly improved goods or services **(LU)**
- Short description of the new or significantly improved processes or methods **(LU)**
- If process innovations introduced during the three years 2012 to 2014 lead to a decrease in the production cost per unit in 2014 **(LU)**
- If the enterprise made use of one of the following non-formal protection methods: a) lead time advantage before competitors b) complexity of goods or services c) secrecy (including non-disclosure agreements)**(AT)**
- Turnover from sales of goods (total and new or significantly improved) **(PL)**
- Expenditures on innovation activities more detailed - by kinds of innovation activity and source of funds **(PL)**
- Public support **(PL)**
- Cooperation within cluster initiatives **(PL)**
- Intellectual property protection **(PL)**
- Technology transfer **(PL)**
- Two questions on user innovations **(PT)**
- Description of the most important product (goods or services) innovation, description of the most important process innovation, expenditure for innovation activities design, training, marketing and other relevant activities **(SI)**
- Importance of co-operation partners, a question on utilisation of big data and public sector open data, a question on utilisation of digitalisation, a question on user innovations **(FI)**
- More detailed answer options on continents other than Europe **(IS)**



## **ANNEX 2: List of questions in case of non-response survey**

1. During the three years 2012 to 2014, did your enterprise introduce any of the following types of innovations? Please answer yes or no.

- New or significantly improved **goods or services** (Yes / No)
- New or significantly improved methods of **manufacturing or producing goods or services** (Yes / No)
- New or significantly improved logistics, delivery or distribution methods for your **inputs, goods or services** (Yes / No)
- New or significantly improved supporting activities for your processes, such as maintenance systems or operations for **purchasing, accounting or computing** (Yes / No)
- New or significantly improved **organisational methods**. These involve changes to your enterprise's business practices, organisation of work responsibilities, or external relations with other enterprises or public institutions. (Yes / No)
- New or significantly **improved marketing methods**. These involve the implementation of new marketing concepts or strategies that differ significantly from your enterprise's existing marketing methods and which have not been used before (Yes / No)

2. At some time during the three years 2012 to 2014, did your enterprise **perform R&D** to develop or improve goods, services, or processes? (Yes / No)

[Only ask the next question if there are one or more positive responses to questions 1.1 or 1.2]

3. During the three years 2012 to 2014, did your enterprise **acquire advanced machinery, equipment or software** in order to produce new or significantly improved goods or services or as part of new or improved processes? (Yes / No)