

Research and development (R&D) (rd)

RD_BESSI_A_RO_2021_0000

National Reference Metadata in Single Integrated Metadata Structure (SIMS)

Compiling agency: NATIONAL INSTITUTE OF STATISTICS ROMANIA



Eurostat metadata

Reference metadata

- [1. Contact](#)
 - [2. Metadata update](#)
 - [3. Statistical presentation](#)
 - [4. Unit of measure](#)
 - [5. Reference Period](#)
 - [6. Institutional Mandate](#)
 - [7. Confidentiality](#)
 - [8. Release policy](#)
 - [9. Frequency of dissemination](#)
 - [10. Accessibility and clarity](#)
 - [11. Quality management](#)
 - [12. Relevance](#)
 - [13. Accuracy](#)
 - [14. Timeliness and punctuality](#)
 - [15. Coherence and comparability](#)
 - [16. Cost and Burden](#)
 - [17. Data revision](#)
 - [18. Statistical processing](#)
 - [19. Comment](#)
- [Related Metadata](#)
- [Annexes](#) (including footnotes)

For any question on data and metadata, please contact: [EUROPEAN STATISTICAL DATA SUPPORT](#)

1. Contact		Top
1.1. Contact organisation	NATIONAL INSTITUTE OF STATISTICS ROMANIA	
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2. Metadata update		Top
06/10/2023		
2.1. Metadata last certified	06/10/2023	
2.2. Metadata last posted	06/10/2023	
2.3. Metadata last update	06/10/2023	

3. Statistical presentation

[Top](#)

3.1. Data description

Statistics on Business enterprise R&D (BERD) measure research and experimental development (R&D) performed in the business enterprise sector, i.e. R&D expenditure and R&D personnel. In line with this objective the target population for the national R&D survey of the business enterprise sector consist of all R&D performing enterprises (including all R&D performers – occasional and continuous, known and unknown - in all branches and size classes) belonging to this sector. The “enterprise” is defined in [Council Regulation \(EEC\) No 1993/696 of 15 March 1993](#). The results are related to the population of all R&D performing enterprises classified in Sections A to U of the common statistical classification of economic activities as established by Regulation (EC) No 1893/2006 of the European Parliament and of the Council (NACE Rev.2).

The main concepts and definitions used for the production of R&D statistics are given by OECD (2015), [Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities](#), which is the internationally recognised standard methodology for collecting R&D statistics and by Eurostat’s [European Business Statistics Methodological Manual on R&D Statistics](#). (EBS Methodological Manual on R&D Statistics).

Since the beginning of 2021, the collection of R&D statistics is based on [Commission Implementing Regulation \(EU\) No 2020/1197](#) of 30 July 2020. The Regulation sets the framework for the collection of R&D statistics and specifies the main variables of interest and their breakdowns at predefined level of detail. Statistics on science, technology and innovation were collected until the end of 2020 based on Commission [Implementing Regulation \(EU\) No 2012/995](#) concerning the production and development of Community statistics on science and technology.

3.2. Classification system

- The distribution of principal economic activity and by product field are based on [Statistical classification of economic activities in the European Community \(NACE Rev. 2\)](#);
- The local unit for the statistics are compiled at regional level according to [NUTS 2 – Nomenclature of Territorial Units for Statistics](#);
- The distribution by socioeconomic objectives (SEO) are based on [Nomenclature for the Analysis and Comparisons of Scientific Programmes and Budgets \(NABS\)](#);
- The fields of research and development are based on [Classification and distribution by Fields of Research and Development \(FORD\)](#).

3.2.1. Additional classifications

Additional classification used	Description
N/A	

3.3. Coverage - sector

See below.

3.3.1. General coverage

Definition of R&D	<p>YES</p> <p>Research and development is defined as any systematic and creative activity initiated to increase the volume of knowledge, including knowledge about man, culture and society and the use of this knowledge for new applications.</p> <p>The research-development activity includes the technological design.</p> <p>Does not include: market research activities, industrial and agricultural micro-production (except execution activities, prototypes, experimental installations, pilot stations), production and related activities, education and training activities, information services, general collection data, testing and standardization, patenting and licensing work, feasibility studies, specialized medical services, regular software development, industrial innovation (other than research and development), policy studies (application of research results -development to evaluate government policies).</p>
Fields of Research and Development (FORD)	<p>Natural Sciences and Engineering (NSH) and Social Sciences and Humanities (SSH) separately available.</p> <p>Starting with 2011, available only for one digit FOS level.</p>
Socioeconomic objective (SEO)	<p>NO</p>

3.3.2. Sector institutional coverage

Business enterprise sector	<p>The business enterprise sector includes all firms, organisations and institutions whose primary activity is the market production of goods and services (other than higher education sector) for sale to the general public at an economically significant price. The private non-profit institutions mainly serving them are included in Private Non-Profit sector.</p>
Hospitals and clinics	<p>The higher education sector includes university hospitals and medical clinics. For some of these, as well as for other types of medical center, there are problems of delimitation between R&D activities and health activities and in these cases no data is available on R&D expenditures and personnel.</p>
Inclusion of units that primary don't belong to BES	<p>NO</p>

3.3.3. R&D variable coverage

R&D administration and other support activities	<p>No deviations from FM; personnel is not included but expenditure is included.</p>
External R&D personnel	<p>Starting with 2018 reference year, new questions related External R&D Personnel; External R&D personnel included in personnel by occupation, but separately by employment status.</p>
Clinical trials	<p>Not included (clinical trials are included in Higher Education Sector); Included only private business medical clinics with R&D activity.</p>

3.3.4. International R&D transactions

Receipts from Rest of the world by sector - availability	Available
Payments to Rest of the world by sector - availability	Available
R&D expenditure of foreign affiliates - coverage	Available taking in consideration the specific of reporting unit

3.3.5. Extramural R&D expenditures

According to the Frascati Manual, expenditure on extramural R&D (i.e. R&D performed outside the statistical unit) is not included in intramural R&D performance totals (FM, §4.12).

Data collection on extramural R&D expenditure (Yes/No)	Y
Method for separating extramural R&D expenditure from intramural R&D expenditure	Starting with 2011, we included in questionnaire a specific question related to extramural expenditure. Starting with 2018, we included in questionnaire a specific questions for intramural and extramural current costs related R&D personnel
Difficulties to distinguish intramural from extramural R&D expenditure	Difficulties to distinguish and understand for respondents the new indicators for External R&D personnel expenditure

3.4. Statistical concepts and definitions

See below.

3.4.1. R&D expenditure

Coverage of years	Calendar year
Source of funds	In line with FM
Type of R&D	In line with FM
Type of costs	In line with FM, not detailed breakdown of costs
Economic activity of the unit	Main economic activity of unit
Economic activity of industry served (for enterprises in ISIC/NACE 72)	Main economic activity of unit
Product filed	In 2011, included.
Defense R&D - method for obtaining data on R&D expenditure	Data is obtained in the survey questionnaire. Data for Defense makes reference only to the expenditure for civilian purpose.

3.4.2. R&D personnel

See below.

3.4.2.1. R&D personnel – Head Counts (HC)

Coverage of years	data refer to end of period
Function	Data compatible with ISCO-08.
Qualification	Not difficulties
Age	Not difficulties In 2011, not included
Citizenship	We assimilate the citizenship with the origin country. Starting with 2011, reference year, not included in national BES questionnaire specific question related this.

3.4.2.2. R&D personnel – Full Time Equivalent (FTE)

Coverage of years	Calendar year
Function	Data compatible with ISCO-08
Qualification	Not difficulties
Age	Not difficulties. In 2011, not included.
Citizenship	We assimilate the citizenship with the origin country. Starting with 2011, reference year, not included in national BES questionnaire specific question related this.

3.4.2.3. FTE calculation

The respondent unit calculates the hours worked in research projects by the post-graduate students and computes in full time equivalent.

3.4.2.4. R&D personnel - Cross-classification by occupation and qualification

Cross-classification	Unit	Frequency
Total R&D personnel	HC	Yearly
R&D researchers	HC	Yearly
Total R&D personnel	FTE	Yearly
R&D researchers	FTE	Yearly

3.5. Statistical unit

The statistical unit for BERD is the enterprise as defined by [Council Regulation \(EEC\) No 1993/696 of 15 March 1993](#), – **if there are deviations please explain.**

3.6. Statistical population

See below.

3.6.1. National target population

The objective of the European R&D statistics is to cover all intramural R&D activities. In line with this objective the target population for the national R&D survey of the Business Enterprise Sector should consist of all R&D performing units (including all R&D performers – occasional and continuous, known and unknown - in all branches and size classes) belonging to this sector. In practice however, countries in their R&D surveys might exclude some units for which R&D activities are deemed to be non-existent or negligible, in order to limit the response burden or due to budgetary constraints.

	Target population when sample/census survey is used for collection of raw data	Target population when administrative data or pre-compiled statistics are used
Definition of the national target population	The national target population consists of all legal units reporting R&D activities in previous R&D survey and all units with R&D activities (continuous or occasionally, known and unknown) selected from innovation survey (CIS), labour forces survey (LFS) and statistical business survey (SBS).	N/A
Estimation of the target population size	Aproximative 11000 units according with definition of national target population	N/A
Size cut-off point	Without size cut-off point	N/A
Size classes covered (and if different for some industries/services)	According with FM and without differences for some industries/services.	N/A
NACE/ISIC classes covered	According with FM, NACE classification	N/A

3.6.2. Frame population – Description

The target population is the population for which inferences are made. The frame (or frames, as sometimes several frames are used) is a device that permits access to population units. The frame population is the set of population units which can be accessed through the frame and the survey data really refer to this population.

Method used to define the frame population	All enterprises known or supposed to perform R&D which sale goods or services to general public and other firms which declared performing R&D activity in other statistical surveys.
Methods and data sources used for identifying a unit as known or supposed R&D performer	The data source was the register of enterprises performing R&D activity, the list of enterprises receiving government grants for R&D activity, the list of enterprises which declared R&D activity in the previous survey, the list of enterprises performing R&D activity which took part to trade fairs and exhibitions. Another method to identify unknown units was internet.

Frequency and the methods applied for inclusion R&D performers not known and not supposed to perform R&D	Efforts to include unknown enterprises performing R&D are made. A combined R&D and innovation survey carry out in 2014 determined identification of new R&D performers.
Number of “new”¹⁾ R&D enterprises that have been identified and included in the target population	
Systematic exclusion of units from the process of updating the target population	We did not excluded any units.
Estimation of the frame population	
1) i.e. enterprises previously not known or not supposed to perform R&D	
3.7. Reference area	
Not requested.	
3.8. Coverage - Time	
Not requested. See point 3.4.	
3.9. Base period	
Not requested.	

4. Unit of measure	Top
R&D indicators are available according to 3 units of measure:	
<ul style="list-style-type: none"> - R&D expenditure is available in National currency - R&D Personnel data is available in full-time equivalent (FTE) - R&D Personnel data is available in headcount (HC) 	

5. Reference Period	Top
Reference period is the calendar previous year.	

6. Institutional Mandate	Top
6.1. Institutional Mandate - legal acts and other agreements	
See below.	

6.1.1. European legislation

Legal acts / agreements	Since the beginning of 2021, the collection of R&D statistics is based on Commission Implementing Regulation (EU) No 2020/1197 of 30 July 2020 laying down technical specifications and arrangements pursuant to Regulation (EU) 2019/2152 of the European Parliament and of the Council on European business statistics repealing 10 legal acts in the field of business statistics. Regulation No 2020/1197 sets the framework for the collection of R&D statistics and specifies the main variables of interest and their breakdowns at predefined level of detail. Commission Implementing Regulation (EU) No 2012/995 concerning the production and development of Community statistics on science and technology was in force until the end of 2020.
Nature of the “obligations” of responsible national organisations to produce statistics and report to international organisations	In complying with the Program of Statistical Surveys of the Romanian National Institute of Statistics drawn up on an annually basis, approved by the Government and published in the Official Journal of Romania.

6.1.2. National legislation

Existence of R&D specific statistical legislation	<ul style="list-style-type: none">-National research, development and innovation strategy 2014-2020 https://www.research.gov.ro/uploads/legislatie/proiecte-de-acte-normative/phg-modificare-sncdi.pdf-Modification and completion of the National Strategy for research, development and innovation 2014 - 2020, approved by GD 929/2014 http://legislatie.just.ro/Public/DetaliiDocument/187003-National Education Law – http://legislatie.just.ro/Public/DetaliiDocument/125150-Government Ordinance 57/2002 on scientific research and technological development https://www.research.gov.ro/uploads/programe-nationale/program-nucleu/doc/og_57_2002_mcu.pdf- Law 319/2003 on the Statute of research and development staff https://uefiscdi.gov.ro/UserFiles/File/LEGISLATIE_DODI/MODIFICARI/Modificari_Legea_319_2003.pdf-Evaluation and classification in order to certify the institutions from the national research-development system https://www.research.gov.ro/uploads/programe-nationale/program-nucleu/doc/hg_1062_2011.pdf-Government Ordinance 41/2015 amending and supplementing Government Ordinance no. 57/2002 on scientific research and technological development – https://www.research.gov.ro/uploads/sistemul-de-cercetare/legislatie-organizare-si-functionare/legislatia-sistemului-de-cercetare/ordonanta-41-2015.pdf-Law 206/2004 on good conduct in scientific research, technological development and innovation – http://legislatie.just.ro/Public/DetaliiDocument/52457
Legal acts	Law on the organization and functioning of official statistics in Romania no. 226/2009 - https://insse.ro/cms/ro/content/cadru-legal-ins
Obligation of responsible organisations to produce statistics (as derived from the legal acts)	Government Decision no. 586/2020 on the approval of the National Annual Statistical Program 2020- https://insse.ro/cms/ro/content/cadru-legal-ins

Right of responsible organisations to collect data – obligation of (natural / legal) persons to provide raw and administrative data (as derived from the legal acts)	This right derives from Law 206/2004 on good conduct in scientific research, technological development and innovation – http://legislatie.just.ro/Public/DetaliiDocument/52457
Obligation of responsible organisations to protect confidential information from disclosure (as derived from the legal acts)	NIS President Order no 530/31.07.2001; Law 677/2001 https://www.dataprotection.ro/servlet/ViewDocument?id=35 Law 682/2001- http://legislatie.just.ro/Public/DetaliiDocumentAfis/32945
Rights of access of third organisations / persons to data and statistics (as derived from the legal acts)	National Law 544/2001 https://www.edu.ro/sites/default/files/_fi%C8%99iere/Minister/2016/Transparenta/2016/544/LEGE_544-2001_actualizata-aug2016.pdf
Planned changes of legislation	According with international changes of legislation
6.1.3. Standards and manuals	
- Frascati Manual 2015 , Guidelines for Collecting and Reporting Data on Research and Experimental Development - EBS Methodological Manual on R&D Statistics	
6.2. Institutional Mandate - data sharing	
Not requested.	

7. Confidentiality

[Top](#)

7.1. Confidentiality - policy

Confidentiality, being one of the process quality components, concerns the privacy of data providers (households, enterprises, administrations and other respondents), the confidentiality of the information they provide and the extent of its use for statistical purposes.

A property of data indicating the extent to which their unauthorized disclosure could be prejudicial or harmful to the interest of the source or other relevant parties.

a) Confidentiality protection required by law:

-No deviations from secure procedure

-Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of individuals with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46 / EC (General Regulation on data protection)- <https://insse.ro/cms/ro/content/norme-de-confiden%C8%9Bialitate>

- Law no. 190 of 18 July 2018 on measures to implement Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of individuals with regard to the processing of personal data and on the free movement of these data and repealing Directive 95/46 / EC (General Data Protection Regulation)-<https://insse.ro/cms/ro/content/norme-de-confiden%C8%9Bialitate>

-Regulation (EU) 2019/2152 of the European Parliament and of the Council on European business statistics repealing 10 legal acts in the field of business statistics

-LAW no. 363 of December 28, 2018 on protection natural persons regarding the processing of personal data by the competent authorities for the purpose of preventing, detecting, investigating, prosecuting and combating crime or the execution of punishments, educational and security measures, and regarding the free movement of such data

-Law no. 102/2005 on the establishment, organization and functioning of the National Authority for the Supervision of Personal Data Processing, with subsequent amendments and completions.

b) Confidentiality commitments of survey staff:

A confidentiality certificate agreement is signed upon employment, where the official terms of confidentiality are established

7.2. Confidentiality - data treatment

Primary confidentiality:

- The rule of three (all cells with 3 and less units);
- The rule of dominance unit.

Secondary confidentiality:

- Disclosure by subtraction (differencing)

8. Release policy

[Top](#)

8.1. Release calendar

On the NIS website there are two calendars one for the press releases and the other for publications; both of them are accessible to the general public. The final data are target to be published in press release and also in national publication to 11 months after the end of the reference year (in November).

8.2. Release calendar access

https://insse.ro/cms/files/catalog/Catalogul_publicatiilor_INS_2020.pdf - for publications

<https://insse.ro/cms/ro/comunicate-de-presa-view-> for press release

8.3. Release policy - user access

The NIS has on the web page a section “Calendar of press releases”, with links to the monthly lists of publications planned for the current year. Each monthly list is sorted by date of publication and contains a brief description of the statistics to be provided. The monthly calendar is established for the following year in December of the previous year. NIS publishes annually on the site the calendar of press releases, calendar based on the terms of the Annual National Statistical Program and contains: title of the press release, reference period, date of issue. The monthly calendar is established and posted on the NIS website from December of the previous year. The calendar of press releases on the NIS website covers only the statistics published by the NIS

In the event of a change in the broadcast date, this is announced 24 hours before the calendar date, specifying the new broadcast date.

9. Frequency of dissemination

[Top](#)

The frequency of dissemination is annual.

10. Accessibility and clarity

[Top](#)

10.1. Dissemination format - News release

See below.

10.1.1. Availability of the releases

	Availability (Y/N) ¹	Content, format, links, ...
Regular releases	Y	The NIS press releases are sent directly by the NIS Press Office to the accredited media and ministries and are posted online at 9:00 a.m. in the dedicated section. Also, on the site there is the archive of these press releases, structured on statistical topics.
Ad-hoc releases	N	

1) Y - Yes, N - No

10.2. Dissemination format - Publications

See below.

10.2.1. Availability of mean of dissemination

Mean of dissemination	Availability (Y/N) ¹	Content, format, links, ...
General publication/article (paper, online)	Y	R&D data are included in Romanian Yearbook, "Territorial statistics" publication, "Romania in figures" publication Web-site of Romanian National Institute of Statistics: www.insse.ro
Specific paper publication (e.g. sectoral provided to enterprises) (paper, online)	Y	"Research and development activity in 2021" https://insse.ro/cms/sites/default/files/field/publicatii/activitatea_de_cercetare_dezvoltare_5.pdf

1) Y - Yes, N - No

10.3. Dissemination format - online database

Data for BES sector of performance are available in database TEMPO ONLINE: <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>

10.3.1. Data tables - consultations

Not requested.

10.4. Dissemination format - microdata access

See below.

10.4.1. Provisions affecting the access

Access rights to the information	<p>NIS does not have a "Safe center" for access to microdata. Due to the confidential nature of microdata, direct access to anonymized data is offered only for scientific research projects according to European and national legislation in the field, through an access contract.</p> <p>The access is, in principle, limited to universities, research institutes, national statistical institutes, central banks within the EU and euro area countries, as well as to the European Central Bank. Individuals cannot be granted direct access to microdata.</p> <p>The access to microdata is allowed only to research projects carried out on behalf of an accredited organization for scientific research, and exclusively for its staff, which signs a contract with NIS. Requests for changes shall be made by the contractor before the expiry of the contract by means of an amendment to the contract.</p>
Access cost policy	N
Micro-data anonymisation rules	N/A

10.5. Dissemination format - other

See below.

10.5.1. Metadata - consultations

Not requested.

10.5.2. Availability of other dissemination means

Dissemination means	Availability (Y/N)¹	Micro-data / Aggregate figures	Comments
Internet: main results available on the national statistical authority's website	Y		
Data prepared for individual ad hoc requests	Y		
Other	N		

1) Y – Yes, N - No

10.6. Documentation on methodology	
<p>A confidentiality certificate agreement is signed upon employment, where the official terms of confidentiality are established. Data are accompanied of metadata describing the indicators and the calculation thereof. To all other questions regarding the methodology or the manner of designing the tables and the data we respond whenever necessary. In the TEMPO online database, each indicator is accompanied by the related metadata.</p>	
10.6.1. Metadata completeness - rate	
Not requested.	
10.7. Quality management - documentation	
See below.	
10.7.1. Information and clarity	
Type(s) of data accompanying information available (metadata, graphs, quality reports, etc.)	Metadata, graphs, methodological notes and quality report
Request on further clarification, most problematic issues	Clarifications regarding R&D expenditure and sources of funds. To all other questions regarding the methodology or the manner of designing the tables and the data we respond whenever necessary.
Measure to increase clarity	<p>More details for tables provided We included in national questionnaire more methodological details about new FM 2015 indicators related R&D personnel and R&D expenditure.</p> <p>For R&D Personnel: - methodological details related status employment breakdown by internal/external R&D Personnel and internal/external researchers</p> <p>For R&D Expenditure: - methodological details related current costs breakdown by R&D internal/external Personnel expenditure - methodological details related type of funds breakdown by R&D internal /external funds</p>
Impression of users on the clarity of the accompanying information to the data	We consider our users are satisfied with the clarity of the accompanying information to the data.

11. Quality management

[Top](#)

Quality management is defined as systems and frameworks in place within an organisation to manage the quality of statistical products and processes.

11.1. Quality assurance

The quality quantifies how well the statistics are fit for their purpose. The criteria to judge statistical quality correspond to: relevance, accuracy and reliability, timeliness and punctuality, accessibility and clarity, comparability, coherence and cost and burden. The aim is to reduce the errors of coverage, the non-response, the measurements errors, the processing errors.

The legal acts and other document related quality assurance are: Legislation concerning quality assurance, Task Forces or Working Groups, Law No. 226/2009 on the organisation and functioning of official statistics in Romania, Internal procedures, European Statistics Code of Practice, Quality Guidelines for Romanian Official Statistics

Statistical practices used to compile national R&D data for government sector of performance are in compliance with Frascati Manual recommendations

11.2. Quality management - assessment

National methodology applies harmonized concepts and definitions according with Frascati Manual. As it is recommended, we include in the national R&D survey on the BES sector all enterprises known or supposed to perform R&D.

The methodology was improved through the identification of units belonging BES sector of performance.

The R&D survey for BES sector of performance is conducted to provide knowledge about R&D indicators (mandatory and optional) and to allow comparisons with other European countries.

At every R&D survey for BES sector of performance, before the finalisation of the national questionnaire, the main national users and the representatives of regional NIS departments are invited to a discussion, by Romanian NIS, to express their opinions and suggestions about the final national questionnaire (clarity, difficulties, understanding and perception of the questions and about other national statistical needs).

12. Relevance

[Top](#)

Relevance is the degree to which statistics meet current and potential users' needs. It includes the production of all needed statistics and the extent to which concepts used (definitions, classifications etc.) reflect user needs. The aim is to describe the extent to which the statistics are useful to, and used by, the broadest array of users. For this purpose, statisticians need to compile information, firstly about their users (who they are, how many they are, how important is each one of them), secondly on their needs, and finally to assess how far these needs are met.

12.1. Relevance - User Needs

See below.

12.1.1. Needs at national level

Users' class ¹	Description of users	Users' needs
1 - Institutions	European Commission	Data used for the European R&D statistics and its further development
1 - Institutions	Governmental departments: Ministry of National Education, Authorities for Regional Development, Ministry of Economy, Ministry of Public Finances.	Data used for R&D national and regional strategies and policies, sectoral comparisons, publications, training.
1 - Institutions	International organizations: OECD	Data used for international comparability and publications
2- Social actors	Scientific institutes and universities	Data used for analyses
2- Social actors	Trade unions	Data are used for strategies and policies
2- Social actors	Employer's associations	Data are used for strategies, policies and training.
3- Media	International or regional media	Data used for analyses and comments to the general public
4- Researchers and students	Researchers and students	Data used for analyses, scientific projects and access to specific data.
5-Enterprises or businesses	Enterprises or businesses	Market analyses, marketing strategies, consultancy services

1) Users' class codification

1- Institutions:

- European level: Commission (DGs, Secretariat General), Council, European Parliament, ECB, other European agencies etc.
- in Member States, at the national or regional level: Ministries of Economy or Finance, Other Ministries (for sectoral comparisons), National Statistical Institutes and other statistical agencies (norms, training, etc.), and
- International organisations: OECD, UN, IMF, ILO, etc.

2- Social actors: Employers' associations, trade unions, lobbies, among others, at the European, national or regional level.

3- Media: International or regional media – specialized or for the general public – interested both in figures and analyses or comments. The media are the main channels of statistics to the general public.

4- Researchers and students (Researchers and students need statistics, analyses, ad hoc services, access to specific data.)

5- Enterprises or businesses (Either for their own market analysis, their marketing strategy (large enterprises) or because they offer consultancy services)

6- Other (User class defined for national purposes, different from the previous classes.)

12.2. Relevance - User Satisfaction

To evaluate if users' needs have been satisfied, the best way is to use user satisfaction surveys.

12.2.1. National Surveys and feedback

Conduction of a user satisfaction survey or any other type of monitoring user satisfaction	A user satisfaction survey is conducted in National Institute of Statistics. This survey is addressed to a selection of users of all statistical fields. Last survey in March 2019, once at 3 years.
User satisfaction survey specific for R&D statistics	National user satisfaction survey is not specific to R&D statistics, but we have comments received from the large user's categories.
Short description of the feedback received	We received feedback and detailed requirements from national users regarding R&D expenditures, detailed regional R&D expenditures, number of personnel involved in R&D projects and researchers by age groups.

12.3. Completeness

See below.

12.3.1. Data completeness - rate

Data completeness of final mandatory data are very good and good. National questionnaire survey for BES sector of performance included also mandatory and optional R&D indicators.
Starting with 2019 year of reference, we stopped collecting data by NACE industry orientation indicator.

12.3.2. Completeness - overview

Completeness is assessed via comparison of the data delivered against the requirements of Commission Implementing Regulation (EU) No 2020/1197.

	5 (Very Good)	4 (Good)	3 (Satisfactory)	2 (Poor)	1 (Very poor)	Reasons for missing cells
Preliminary variables	X					
Obligatory data on R&D expenditure	X					
Optional data on R&D expenditure		X				
Obligatory data on R&D personnel		X				
Optional data on R&D personnel		X				
Regional data on R&D expenditure and R&D personnel	X					

Criteria:

A) Obligatory data. Only 'Very Good' = 100%, 'Poor' >95%; 'Very Poor' <100% apply.

B) Optional data. 'Very Good' = 100%; 'Good' = >75%; 'Satisfactory' 50 to 75%; 'Poor' 25 to 50%; 'Very Poor' 0 to 25%.

12.3.3. Data availability

See below.

12.3.3.1. Data availability - R&D Expenditure

	Availability ¹	Frequency of data collection	Gap years – years with missing data	Modifications - Description	Modifications - Year of introduction	Modifications - Reasons
Source of funds	Y-1993	annual	1993,1994 only current expenditure	introduced total expenditure	1995	to be in line with Frascati Manual
Type of R&D	Y-1995	annual				
Type of costs	Y-1995	annual				
Socioeconomic objective	Y-1995	annual				
Region	Y-2000	annual				
FORD	Y-1999	annual				
Type of institution	Y-2019	annual				

1) Y-start year, N – data not available

12.3.3.2. Data availability - R&D Personnel (HC)

	Availability ¹	Frequency of data collection	Gap years – years with missing data	Modifications - Description	Modifications - Year of introduction	Modifications - Reasons
Sex	Y-1999	annual				
Function	Y-1993	annual				
Qualification	Y-1993	annual				1993-2003 first stage tertiary education theoretical (ISCED-5A) and practical (ISCED-5B) were surveyed together; since 2003 we have comparable data as they were surveyed separately.
Age	Y-1993	annual	1993-2002	new breakdown of the ages corresponding to Frascati Manual: up to 25, 25-34, 35-44,45-54, 55-64, 65 and more	2003	there were other groups for the age: up to 30, 30-39, 40-49, 50-59, 60 and more
Citizenship	Y-2004	annual				
Region	Y-2000	annual				

FORD	Y-1999	annual				
Type of institution	Y-2019	annual				
Economic activity	Y-1995	annual				
Product field	Y-2010-2018	annual	until 2019			
Employment size class	Y-2002	annual				

1) Y-start year, N – data not available

12.3.3.3. Data availability - R&D Personnel (FTE)

	Availability ¹	Frequency of data collection	Gap years – years with missing data	Modifications - Description	Modifications - Year of introduction	Modifications - Reasons
Sex	Y-1999	annual				
Function	Y-1993	annual				
Qualification	Y-1993	annual				1993-2003 first stage tertiary education theoretical (ISCED-5A) and practical (ISCED-5B) were surveyed together; since 2003 we have comparable data as they were surveyed separately.
Age	N					
Citizenship	N					
Region	Y-2000	annual				
FORD	Y-1999	annual				
Type of institution	Y-2019	annual				
Economic activity	Y-1995	annual				
Product field	Y- 2010-2018	annual	until 2019			
Employment size class	Y-2002	annual				
Isced 2011	Y-2011	annual	until 2011			

1) Y-start year, N – data not available

12.3.3.4. Data availability - Other

Additional dimension/variable available at national level ¹⁾	Availability ²⁾	Frequency of data collection	Breakdown variables	Combinations of breakdown variables	Level of detail
number of scientific meetings organised at national level with international participation	2000-2010	annual			
training courses of R&D personnel	2000-2010	annual			
Publications papers by scientific programs according with NABS classifications (domestic level and international level)	2000-2010	annual			
number of R&D projects by NABS programs and by sources of funds	2000-2010	annual			
Breakdown of public funds by type of national R&D projects	2000-2010	annual			

1) This question is optional. It refers to variables and breakdowns NOT asked by the Commission Implementing Regulation (EU) No 2020/1197 (neither as 'optional'), if R&D data for BES are collected for additional breakdowns or/and at more detailed level than requested.

2) Y-start year

13. Accuracy

[Top](#)

13.1. Accuracy - overall

Accuracy in the statistical sense denotes the closeness of computations or estimates to the exact or true values. Statistics are not equal with the true values because of variability (the statistics change from implementation to implementation of the survey due to random effects) and bias (the average of the possible values of the statistics from implementation to implementation is not equal to the true value due to systematic effects).

Several types of statistical errors occur during the survey process. The following typology of errors has been adopted:

1. **Sampling errors.** These only affect sample surveys. They are due to the fact that only a subset of the population, usually randomly selected, is enumerated.
2. **Non-sampling errors.** Non-sampling errors affect sample surveys and complete enumerations alike and comprise:
 - a) Coverage errors,
 - b) Measurement errors,
 - c) Non response errors and
 - d) Processing errors.

Model assumption errors should be treated under the heading of the respective error they are trying to reduce.

13.1.1. Accuracy - Overall by 'Types of Error'

	Sampling errors	Non-sampling errors ¹⁾				Model-assumption Errors ¹⁾	Perceived direction of the error ²⁾
		Coverage errors	Measurement errors	Processing errors	Non response errors		
Total intramural R&D expenditure	4	4	4	4	3	-	+
Total R&D personnel in FTE	4	4	3	5	3	-	+
Researchers in FTE	4	4	3	5	4	-	+

1) Ranking of the type(s) of errors that result in over/under-estimation, from the most important source of error (1) to the least important source of error (5). In the event that errors of a particular type do not exist, is used the sign '-'.
 2) The perceived direction of the 'overall' error using the signs "+" for over estimation, "-" for under estimation and "+/-" when assumption of the direction of the error cannot be made for R&D.

13.1.2. Assessment of the accuracy with regard to the main indicators

Indicators	5 (Very Good) ¹⁾	4 (Good) ²⁾	3 (Satisfactory) ³⁾	2 (Poor) ⁴⁾	1 (Very poor) ⁵⁾
Total intramural R&D expenditure		x			
Total R&D personnel in FTE		x			
Researchers in FTE		x			

1) 'Very Good' = High level of coverage (annual rate of substitution in the target population lower than 5%). High average rates of response (>80%) in census and sample surveys (BES R&D). Full data consistency with reference to totals and relationships between variables in the dataset sent to Eurostat.

2) 'Good' = In the event that at least one out of the three criteria above described would not be fully met.

3) 'Satisfactory' = In the event that the average rate of response would be lower than 60% even by meeting the two remaining criteria.

4) 'Poor' = In the event that the average rate of response would be lower than 60% and at least one of the two remaining criteria would not be met.

5) 'Very Poor' = If all the three criteria are not met.

13.2. Sampling error

That part of the difference between a population value and an estimate thereof, derived from a random sample, which is due to the fact that only a subset of the population is enumerated.

13.2.1. Sampling error - indicators

The main indicator used to measure sampling errors is the coefficient of variation (CV).

Definition of coefficient of variation:

CV= (Square root of the estimate of the sampling variance) / (Estimated value)

13.2.1.1. Variance Estimation Method

PROC SURVEYMEANS-SAS 9.1

13.2.1.2. Coefficient of variation for key variables by NACE

	Industry sector ¹	Services sector ²	TOTAL
R&D expenditure	0.015	0.039	0.021
R&D personnel (FTE)	0.014	0.012	0.009

1) Industry sector (NACE Rev. 2: 01-03, 05-09, 10-33, 35, 36-39, 41-43)

2) Services sector (NACE Rev 2.: 45-47,49-53,55-56,58-63,64-66 68,69-75,77-82,84,85,86-88,90-93,94-96,97-98,99)

13.2.1.3. Coefficient of variation for key variables by Size Class

	0-9 employees and self-employed persons (optional)	10-49 employees and self-employed persons	50-249 employees and self-employed persons	250- and more employees and self-employed persons	TOTAL
R&D expenditure	0.068	0.070	0.136	0.006	0.021
R&D personnel (FTE)	0.056	0.058	0.042	0.006	0.009

13.3. Non-sampling error

Non-sampling errors occur in all phases of a survey. They add to the sampling errors (if present) and contribute to decreasing overall accuracy. It is important to assess their relative weight in the total error and devote appropriate resources for their control and assessment.

13.3.1. Coverage error

a) Description/assessment of coverage errors:

Coverage errors (or frame errors) are due to divergences between the target population and the frame population. The frame population is the set of target population members that has a chance to be selected into the survey sample. It is a listing of all items in the population from which the sample is drawn that contains contact details as well as sufficient information to perform stratification and sampling.

b) Measures taken to reduce their effect:

The magnitude of the error is computed as a percentage of the relative difference between the indicator's expected "true values" based on the target population and the indicators observed values in the frame population.

Magnitude of error(%)=(Observed Value-True Value)/True Value (%)

Note:non-responding units are not considered omitted

13.3.1.1. Over-coverage - rate

Magnitude of error (%) = (Observed Value-True Value)/ True Value (%)

13.3.1.1.1. Over-coverage rate - groups

	Groups	Magnitude – R&D expenditure	Magnitude – Total R&D personnel (FTE)
Groups/categories of the frame population that were not covered or were partly covered in the target population (unknown R&D performing enterprises)	Not the case		
Groups/categories in the target population that were covered while they should not (i.e. units surveyed that should belong to another sector of performance than BES)	Not the case		

13.3.1.2. Common units - proportion

Not requested.

13.3.1.3. Frame misclassification rate

Misclassification rate measures the percentage of enterprises that changed stratum between the time the frame was last updated and the time the survey was carried out. It is defined as the number of enterprises that changed stratum divided by the number of enterprises which belong to the stratum, according to the frame. The rate can be estimated based on the characteristics of the surveyed enterprises.

By size class for the Industry Sector					
	0-9 employees and self-employed persons (optional)	10-49 employees and self-employed persons	50-249 employees and self-employed persons	250-and more employees and self-employed persons	TOTAL
Number or surveyed enterprises in the stratum (according to frame)	942	1869	1695	763	5269
Number of surveyed enterprises that have changed stratum (after inspection of their characteristics)	113	158	105	85	461
Misclassification rate	0.11996	0.08454	0.06195	0.11140	0.08749

By size class for the Services Sector					
	0-9 employees and self-employed persons (optional)	10-49 employees and self-employed persons	50-249 employees and self-employed persons	250-and more employees and self-employed persons	TOTAL
Number or surveyed enterprises in the stratum (according to frame)	1388	2561	1397	409	5755
Number of surveyed enterprises that have changed stratum (after inspection of their characteristics)	198	191	48	15	452
Misclassification rate	0.14265	0.07458	0.03436	0.03667	0.07854

13.3.2. Measurement error

Measurement errors occur during data collection and generate bias by recording values different than the true ones (e.g. difficulty to distinguish intramural from extramural R&D Expenditure). The survey questionnaire used for data collection may have led to the recording of wrong values, or there may be respondent or interviewer bias.

a) Description/assessment of measurement errors:

Few processing or measurement errors

b) Measures taken to reduce their effect:

The measures for reducing errors consisted in selection of staff with knowledge in R&D methodology and experience in data entry and validation checks for online questionnaires. Also, we developed detailed methodological notes regarding the new terms and their definition.

We recontact the respondents for supplementary clarifications.

13.3.3. Non response error

Non-response occurs when a survey failed 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 elements of non-response:

- **Unit non-response**, which occurs when no data (or so little as to be unusable) are collected on a designated population unit.
- **Item non-response**, which occurs when data only on some, but not all survey variables are collected on a designated population unit.

The extent of response (and accordingly of non-response) is also measured with response rates.

13.3.3.1. Unit non-response - rate

The main interest is to judge if the response from the target population was satisfying by computing the weighted and un-weighted response rate.

Definition:

Eligible are the sample units which indeed belong to the target population. Frame imperfections always leave the possibility that some sampled units may not belong to the target population. Moreover, when there is no contact with sample units and no other way to establish their eligibility they are characterised as 'unknown eligibility units'

Definition:

Un-weighted Unit Non- Response Rate = $1 - (\text{Number of units with a response}) / (\text{Total number of eligible and unknown eligibility units in the survey})$

Weighted Unit Non- Response Rate = $1 - (\text{Total weighted responding units}) / (\text{Total weighted number of eligible / unknown eligibility units in the sample})$

13.3.3.1.1. Unit non-response rates by Size Class

	0-9 employees and self-employed persons (optional)	10-49 employees and self-employed persons	50-249 employees and self-employed persons	250-and more employees and self-employed persons	TOTAL
Number of units with a response in the realised sample	2061	4032	2893	1109	10095
Total number of units in the sample	2330	4430	3092	1172	11024
Unit Non-response rate (un-weighted)	0.1155	0.0898	0.0644	0.0538	0.0843
Unit Non-response rate (weighted)	0.1584	0.1209	0.1191	0.0763	0.1296

13.3.3.1.2. Unit non-response rates by NACE

	Industry ¹⁾	Services ²⁾	TOTAL
Number of units with a response in the realised sample	4868	5227	10095
Total number of units in the sample	5269	5755	11024
Unit Non-response rate (un-weighted)	0.0761	0.0917	0.0843
Unit Non-response rate (weighted)	0.1277	0.1309	0.1296

1) Industry (NACE Rev. 2: 01-03, 05-09,10-33,35,36-39,41-43)

2) Services (NACE Rev 2.: 45-47,49-53,55-56,58-63,64-66 68,69-75,77-82,84,85,86-88,90-93,94-96,97-98,99)

13.3.3.1.3. Recalls/Reminders description

Two reminders.

13.3.3.1.4. Unit non-response survey

Conduction of a non-response survey	It was not necessary a non-response survey
Selection of the sample of non-respondents	Not applicable
Data collection method employed	Not applicable
Response rate of this type of survey	Not applicable
The main reasons of non-response identified	Not applicable

13.3.3.2. Item non-response - rate

Definition:

Un-weighted Item non-Response Rate (%) = 1-(Number of units with a response for the item) / (Total number of eligible , for the item, units in the sample) * 100

13.3.3.2.1. Un-weighted item non-response rate

	R&D Expenditure	R&D Personnel (FTE)	Researchers (FTE)
Item non-response rate (un-weighted) (%)	Not applicable	Not applicable	Not applicable
Imputation (Y/N)	Not applicable	Not applicable	Not applicable
If imputed, describe method used, mentioning which auxiliary information or stratification is used	Not applicable	Not applicable	Not applicable

13.3.3.3. Magnitude of errors due to non-response

	Magnitude of error (%) due to non-response
Total intramural R&D expenditure	0
Total R&D personnel in FTE	0
Researchers in FTE	0

13.3.4. Processing error

Between data collection and the beginning of statistical analysis, data must undergo a certain processing: coding, data entry, data editing, imputation, etc. Errors introduced at these stages are called processing errors. Data editing identifies inconsistencies or errors in the data.

13.3.4.1. Identification of the main processing errors

Data entry method applied	Data entry method used is data keying and responses through electronic online questionnaire.
Estimates of data entry errors	0,1%
Variables for which coding was performed	The variables for which coding was performed have been: Product field
Estimates of coding errors	0,01%
Editing process and method	The editing method is a combination of automated and manual methods. We are applying a value range checked for every variable and compared with data from previous collection of the same statistics.
Procedure used to correct errors	Re-contact units.

13.3.5. Model assumption error

Not requested.

14. Timeliness and punctuality

[Top](#)

14.1. Timeliness

Timeliness and punctuality refer to time and dates, but in a different manner: the timeliness of statistics reflects the length of time between their availability and the event or phenomenon they describe. Punctuality refers to the time lag between the release date of the data and the target date on which they should have been delivered, with reference to dates announced in the official release calendar.

14.1.1. Time lag - first result

Time lag between the end of reference period and the release date of the results:
Indicator: (Release date of provisional/ first results) - (Date of reference for the data)

- a) **End of reference period:** 31.12.2021
- b) **Date of first release of national data:** 16.11.2022
- c) **Lag (days):** 320

14.1.2. Time lag - final result

- a) **End of reference period:** 31.12.2021
- b) **Date of first release of national data:** 25.11.2022
- c) **Lag (days):** 329

14.2. Punctuality

Punctuality refers to the time lag between the release date of data and the target date on which they were scheduled for release as announced officially.

14.2.1. Punctuality - delivery and publication

Punctuality of time schedule of data release = (Actual date of the data release) - (Scheduled date of the data release).

14.2.1.1. Deadline and date of data transmission

	Transmission of provisional data	Transmission of final data
Legally defined deadline of data transmission (T+_ months)	10	18
Actual date of transmission of the data (T+x months)	10	18
Delay (days)	-	-
Reasoning for delay	-	-

15. Coherence and comparability

[Top](#)

Comparability aims at measuring the impact of differences in applied statistical concepts and definitions on the comparison of statistics between geographical areas, non-geographical domains or over time. It is the extent to which differences between statistics are attributed to differences between the true values of the statistical characteristics.

The factors that may cause two statistical figures to lose comparability are attributes of the surveys that produce them. These attributes may be grouped into two major categories: (a) concepts of the survey and (b) measurement / estimation methodology.

The two following sections present lists of key attributes. Information on some of the attributes will have already been reported in previous sections of this report but they are repeated here for completeness of the lists. We provide references to the relevant earlier sections and you do not need to provide the information again.

The coherence of statistics is their adequacy to be reliably combined in different ways and for various uses. It is, however, generally easier to show cases of incoherence than to prove coherence.

When originating from a single source, statistics are coherent in that elementary concepts can be combined reliably in more complex ways. When originating from different sources, and in particular from statistical surveys of different frequencies, statistics are coherent insofar as they are based on common definitions, classifications and methodological standards. The messages that statistics convey to users will then clearly relate to each other, or at least will not contradict each other. The coherence between statistics is orientated towards the comparison of different statistics, which are generally produced in different ways and for different primary uses.

The definition of coherence: The extent to which the statistical characteristics confirm with those in other statistics such that the statistics can be expected to be used together in conjunction with, or as an alternative to.

15.1. Comparability - geographical

See below.

15.1.1. Asymmetry for mirror flow statistics - coefficient

Not requested.

15.1.2. General issues of comparability

Previous 1993 R&D data could not be recomputed according with Frascati Manual due to the inclusion of other activities that did not belong to Frascati Manual;

Since 1993 R&D data are in concordance to international classifications and respect recommendations of Frascati Manual except the following:

- military defense R&D (defense R&D data include only civil defense R&D);
- R&D data for sector of performance abroad (and funded nationally-Table CE13-Joint OECD/Eurostat questionnaire)

15.1.3. Survey Concepts Issues

The following table lists a number of key survey concepts and conceptual issues; it gives reference to the Commission Implementing Regulation (EU) No 2020/1197 or Frascati manual and [EBS Methodological Manual on R&D Statistics](#) paragraphs with recommendations about these concepts / issues.

Concept / Issues	Reference to recommendations	Deviation from recommendations	Comments on national definition / Treatment – deviations from recommendations
R&D personnel	<i>FM2015 Chapter 5 (mainly paragraph 5.2).</i>	NO	
Researcher	<i>FM2015, §5.35-5.39.</i>	NO	
Approach to obtaining Headcount (HC) data	<i>FM2015, §5.58-5.61 (in combination with Eurostat's EBS Methodological Manual on R&D Statistics).</i>	NO	
Approach to obtaining Full-time equivalence (FTE) data	<i>FM2015, §5.49-5.57 (in combination with Eurostat's EBS Methodological Manual on R&D Statistics).</i>	NO	
Reporting data according to formula: Total R&D personnel = Internal R&D personnel + External R&D personnel	<i>FM2015, §5.25</i>	NO	
Intramural R&D expenditure	<i>FM2015 Chapter 4 (mainly paragraph 4.2).</i>	NO	
Special treatment for NACE 72 enterprises	<i>FM2015, § 7.59.</i>	NO	
Statistical unit	<i>FM2015 Chapter 7 (mainly paragraphs 7.3 and 7.7 in combination with Eurostat's EBS Methodological Manual on R&D Statistics).</i>	NO	
Target population	<i>FM2015 Chapter 7 (mainly paragraph 7.7 in combination with Eurostat's EBS Methodological Manual on R&D Statistics).</i>	NO	

Identification of not known R&D performing or supposed to perform R&D enterprises	<i>FM2015 Chapter 7 (mainly paragraph 7.7 in combination with Eurostat's EBS Methodological Manual on R&D Statistics).</i>	NO	
Sector coverage	<i>FM2015 Chapter 3 (mainly § 3.51-3.59) in combination with Eurostat's EBS Methodological Manual on R&D Statistics).</i>	NO	
NACE coverage and breakdown	<i>Reg. 2020/1197 : Annex 1, Table 18</i>	NO	
Enterprise size coverage and breakdown	<i>Reg. 2020/1197 : Annex 1, Table 18</i>	NO	
Reference period for the main data	<i>Reg. 2020/1197 : Annex 1, Table 18</i>	NO	
Reference period for all data	<i>Reg. 2020/1197 : Annex 1, Table 18</i>	NO	

15.1.4. Deviations from recommendations

The following table list a number of key methodological issues, which may affect the international comparability of national R&D statistics. The table gives the references in the Frascati manual, where related recommendations are made. Countries are asked to report on the existence of any deviations from existing recommendations and comment upon.

Methodological issues	Deviation from recommendations	Comments on national treatment / treatment deviations from recommendations
Data collection preparation activities	NO	
Data collection method	NO	
Cooperation with respondents	NO	
Follow-up of non-respondents	NO	
Data processing methods	NO	
Treatment of non-response	NO	
Data weighting	NO	
Variance estimation	NO	
Data compilation of final and preliminary data	NO	
Survey type	NO	
Sample design	NO	
Survey questionnaire	NO	

15.2. Comparability - over time

See below.

15.2.1. Length of comparable time series

See below.

15.2.2. Breaks in time series

	Length of comparable time series	Break years ¹	Nature of the breaks
R&D personnel (HC)		NONE	
Function		NONE	N/A
Qualification		2003	1993-2003 first stage tertiary education theoretical (ISCED-5A) and practical (ISCED-5B) were surveyed together; since 2003 we have comparable data as they were surveyed separately.
R&D personnel (FTE)		NONE	
Function		NONE	N/A
Qualification		2003	1993-2003 first stage tertiary education theoretical (ISCED-5A) and practical (ISCED-5B) were surveyed together; since 2003 we have comparable data as they were surveyed separately.
R&D expenditure		NONE	
Source of funds		1994, 1993	during 1993 - 1994 we have data breakdown only by sources of funds for the current costs
Type of costs		1994, 1993	there are included only current costs and not sub-total capital expenditures
Type of R&D		1994, 1993	we have only total expenditures and not breakdown by sectors of performance
Other		1996, 2011	-first year for total intramural expenditures by main field of science - Researchers by age, citizen and nationality, not included - SEO objectives, not included - FOS only for one digit level

1) Breaks years are years for which data are not fully comparable to the previous period.

15.2.3. Collection of data in the even years

This part deals with any national coherence assessments which may have been undertaken. It reports results for variables which are the same or relevant to R&D statistics, from other national surveys and / or administrative sources and explains and comments on their degree of agreement with R&D statistics.

15.3. Coherence - cross domain

This part deals with any national coherence assessments which may have been undertaken. It reports results for variables which are the same or relevant to R&D statistics, from other national surveys and / or administrative sources and explains and comments on their degree of agreement with R&D statistics. Intramural R & D expenditure (code 230101 in the Commission Implementing Regulation (EU) 2020/1197) and R & D personnel (code 230201) are surveyed also in foreign-controlled EU enterprises statistics (inward FATS).

The [Community innovation survey 2020 \(CIS2020\) \(inn_cis12\) \(europa.eu\)](#) also collects the R&D expenditure of enterprises that form the coverage of the CIS2020 survey.

15.3.1. Coherence - sub annual and annual statistics

Not requested.

15.3.2. Coherence - National Accounts

R&D statistics for BES sector of performance are compiled in according with institutional BES sector as defined based on the System of National Account (SNA).

15.3.3. National Coherence Assessments

Variable name	R&D Statistics - Variable Value	Other national statistics - Variable value	Other national statistics - Source	Difference in values (of R&D statistics)	Explanation of / comments on difference
N/A					

15.3.4. Coherence – Foreign-controlled EU enterprises – inward FATS

For R& D Expenditure in FATS, the same confidentiality rules are apply as in SBS statistics.
Data for R& D Expenditure in FATS are provided from R&D Expenditure in R &D statistics.

15.4. Coherence - internal

See below.

15.4.1. Comparison between preliminary and final data

This part compares key R&D variables as preliminary and final data.

	Total R&D expenditure (in 1000 of national currency)	Total R&D personnel (in FTEs)	Total number of researchers (in FTEs)
Preliminary data (<i>delivered at T+10</i>)	3394736	13711	6335
Final data (<i>delivered T+18</i>)	3394736	13711	6335
Difference (of final data)	-	-	-

15.4.2. Consistency between R&D personnel and expenditure

	Average remuneration (cost in national currency)
Consistency between FTEs of internal R&D personnel and R&D labour costs (1)	123461
Consistency between FTEs of external R&D personnel and other current costs for external R&D personnel (2)	1703450

(1) Calculate the average remuneration (cost) of individuals belonging to the internal R&D personnel, excluding those who are only formally 'employees' (university students, grant holders, etc.).

(2) Calculate the average remuneration (cost) of individuals belonging to the external R&D personnel (FTEs/other current R&D costs for external R&D personnel).

16. Cost and Burden

[Top](#)

The assessment of costs associated with a statistical product is a rather complicated task since there must exist a mechanism for appointing portions of shared costs (for instance shared IT resources and dissemination channels) and overheads (office space, utility bills etc). The assessment must become detailed and clear enough so that international comparisons among agencies of different structures are feasible.

16.1. Costs summary

	Costs for the statistical authority (in national currency)	% sub-contracted¹⁾
Staff costs	62911 estimate only for NIS central staff	NO
Data collection costs		NO
Other costs		NO
Total costs	62911 estimate only for NIS central staff	NO
Comments on costs		

1) The shares of the figures given in the first column that are accounted for by payments to private firms or other Government agencies.

16.2. Components of burden and description of how these estimates were reached

	Value	Computation method
Number of Respondents (R)	281	Dedicated question related number of respondents in BES questionnaire
Average Time required to complete the questionnaire in hours (T)¹	9	Dedicated question related time required to complete questionnaire in BES questionnaire
Hourly cost (in national currency) of a respondent (C)	Not available	
Total cost	Not available	

1) T = the time required to provide the information, including time spent assembling information prior to completing a form or taking part in interview and the time taken up by any subsequent contacts after receipt of the questionnaire ('Re-contact time')

17. Data revision

[Top](#)

17.1. Data revision - policy

Not requested.

17.2. Data revision - practice

Not requested.

17.2.1. Data revision - average size

Not requested.

18. Statistical processing

[Top](#)

Annexes:

[CD_HES_2021_national_language](#)

18.1. Source data

Several separate activities are used for the collection of raw data or pre-compiled administrative data and statistics related to R&D. For simplicity, we call them surveys irrespective of whether they are sample surveys, censuses, collections of administrative data/pre-compiled statistics. This section presents the names of the surveys by sector of performance as well as methodological information for each survey. Depending on the type of survey and sector of performance, only the sections corresponding to that survey and sector are filled in.

18.1.1. Data source – general information

Survey name	CDI-BES
Type of survey	SRS+CENSUS
Combination of sample survey and census data	yes
Combination of dedicated R&D and other survey(s)	
Sub-population A (covered by sampling)	4884 units
Sub-population B (covered by census)	6140 units
Variables the survey contributes to	
Survey timetable-most recent implementation	

18.1.2. Sample/census survey information

	Stage 1	Stage 2	Stage 3
Sampling unit			
Stratification variables (if any - for sample surveys only)	NACE+SIZE CLASS+REGION		
Stratification variable classes			
Population size	57985 units		
Planned sample size	11000 units		
Sample selection mechanism (for sample surveys only)			
Survey frame			
Sample design	in accordance with the requirements		
Sample size	11024		
Survey frame quality	good		

18.1.3. Information on collection of administrative data or of pre-compiled statistics

Source	Information are collected from R&D survey only and not from administrative data
Description of collected data / statistics	Not used these methods
Reference period, in relation to the variables the survey contributes to	2021

18.2. Frequency of data collection

See 12.3.3.

18.3. Data collection

See below.

18.3.1. Data collection overview

Realised sample size (per stratum)	10095, at least 3 units/stratum
Mode of data collection	Web online portal or selfregister by paper
Incentives used for increasing response	Not applicable for mandatory survey
Follow-up of non-respondents	For non-responses, the units are contacted again for 2-3 times
Replacement of non-respondents (e.g. if proxy interviewing is employed)	In case for the non-response unit, it can be replaced with another known unit from the same stratum, if available
Response rate (ratio of completed "interviews" over total number of eligible enterprises or enterprises of unknown eligibility)	91.6%
Non-response analysis (if applicable -- also see section 18.5. Data compilation - Weighting and Estimation methods)	N/A

18.3.2. Questionnaire and other documents

Annex	Name of the file
R&D national questionnaire and explanatory notes in English:	-
R&D national questionnaire and explanatory notes in the national language:	CD BES
Other relevant documentation of national methodology in English:	-
Other relevant documentation of national methodology in the national language:	-

18.4. Data validation

For survey, data are collected online using the Portal WEB application and self - administrated method. We have an IT solution developed to find out measurement and processing errors occurred in different stages of the survey. The application was designed for online data collection and validation.

The IT solution allowed to perform online data entry and validation at unit level. Also, solution allowed to perform data entry and validation questionnaires received on paper by post/email from all our 42 counties.

The IT solution contained the following categories of logical sets to check:

- the primary data from the questionnaires
- the logical flows among the questionnaire chapters
- the data integrity and correctness
- the data comparability between indicators related personnel and expenditures

18.5. Data compilation

See below.

18.5.1. Imputation - rate

Imputation is the method of creating plausible (but artificial) substitute values for all those missing.

Definition:

Imputation rate (for the variable x) % = (Number of imputed records for the variable x) / (Total number of possible records for x)*100

18.5.1.1. Imputation rate (un-weighted) (%) by Size class

	0-9 employees and self-employed persons (optional)	10-49 employees and self-employed persons	50-249 employees and self-employed persons	250-and more employees and self-employed persons	TOTAL
R&D expenditure	N	N	N	N	N
R&D personnel (FTE)	N	N	N	N	N

18.5.1.2. Imputation rate (un-weighted) (%) by NACE

	Industry ¹	Services ²	TOTAL
R&D expenditure	N	N	N
R&D personnel (FTE)	N	N	N

1) Industry (NACE Rev. 2: 01-03, 05-09,10-33,35,36-39,41-43)

2) Services (NACE Rev 2.: 45-47, 49-53, 55-56, 58-63, 64-66 68, 69-75, 77-82, 84, 85, 86-88, 90-93, 94-96, 97-98, 99)

18.5.2. Data compilation methods	
Data compilation method - Final data (between the survey years)	Every year we carry out a dedicated R&D survey
Data compilation method - Preliminary data	In accordance with the Romanian Statistical Program approved by the Government and published in the Official Journal within 10 months of the reference period we provide data for the previous year which are final data.
18.5.3. Measurement issues	
Method of derivation of regional data	Each unit from sample has a specific code in order to regional identification
Coefficients used for estimation of the R&D share of more general expenditure items	Not applicable
Inclusion or exclusion of VAT and provisions for depreciation in the measurement of expenditures	Exclusion of VAT and depreciation
Differences between national and Frascati Manual classifications not mentioned above and impact on national statistics	No differences
18.5.4. Weighting and estimation methods	
Weight calculation method	The method used for weights calculation was the calculation of the inverse of the sampling fraction using turnover and average number of employees
Data source used for deriving population totals (universe description)	The universe is formed of the enterprises belonging to the whole industry and services selected from National Business Register. The data source for the totals is represented by the population of the enterprises used in Structural Business Survey (SBS).
Variables used for weighting	The variables used for weighting were turnover and the number of employees.
Calibration method and the software used	VFP software SEGuide
Estimation	Estimation is solved at the receiving of data in the period of validation after the comparison with Business Structural Survey and Labour Force Survey through the delivering of data provided, keeping the structure of the indicators obtained from units.
18.6. Adjustment	
Not requested.	
18.6.1. Seasonal adjustment	
Not requested.	

19. Comment

[Top](#)

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[CHESTIONAR_CD_BES_2021](#)

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[Top](#)

Annexes

[Top](#)