Metadata

Statistics Iceland

Research and Development (R&D)	
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2. Metadata update	
2.3 Metadata last update	15.01.2021
3. Statistical presentation	

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3.1 Data description	The production and development of Community statistics on science and technology are, within the European Union and the European Economic Area, subject to Commission Implementing Regulation (EU) No 995/2012, which covers official statistics on: • research and development (R & D); • government budget appropriations or outlays on research and development (GBAORD); • innovation. Commission regulation 995/2012 states that these statistics shall be based on harmonised concepts and definitions, contained in the most recent version of the OECD's Frascati Manual in the case of R&D statistics, and the Oslo Manual (published jointly by of the OECD and Eruostat) in the case of innovation statistics. The latest edition of the Frascati manual is the seventh, from 2015. Its updated definitions were introduced into the data collection of Statistics Iceland in 2016, for the reference years of 2015 and 2016 for both the business enterprise sector and private non-profit organisations, whereas data was only collected for the year 2015 from the higher education sector and the government sector that year. Up until that point, the collection and production of the statistics had been based on the sixth edition of the Frascati manual, from 2002.
3.2 Classification system	ISAT2008 is the Icelandic statistical classification system of economic activities. It is based on the European NACE, rev. 2 statistical classification system, which is the standard for the European Economic Area. ISAT2008 is a five-digit classification system, where the first four digits correspond to NACE rev. 2. In the nationally published R&D statistics, on the website of Statistics Iceland, breakdown by economic activity is by section, except in the case of section C, manufacturing (excluding class C10.2, Processing and preserving of fish, crustaceans and molluscs), which is broken down by two-digit NACE. Class C10.2, 'Processing and preserving of fish, crustaceans and molluscs' is grouped with section A, 'Agriculture, foresting and fishing'.

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3.3 Sector coverage

R&D statistics cover any activity that qualifies as research and experimental development under the definitions of OECD's Frascati Manual. Statistics Iceland maintains its own internal database for R&D performers. The statistics are performer-based, as the data is collected from R&D performers, without any consideration of which unit is financing the R&D or has requested it.

Data on R&D expenditures is collected from four sectors, in accordance with Commission Regulation 995/2012: the business enterprise sector, private non-profit organizations, the higher education sector, and the government sector. However, neither the collection nor the reporting of figures on private non-profit organizations is separate from the business enterprise sector and therefore the total number of sectors in the Icelandic statistics is three.

Data is collected via questionnaires, where the questions are mainly focused on in-house R&D. The goal of the data collection is to get a coverage of all units that are performing R&D, in accordance with the underlying definition, within a particular reference period. Values are imputed for non-response units.

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3.4 Statistical concepts and definition

Definitions of key concepts are based on OECD's Frascati Manual; Guidelines for collecting and reporting data on research and experimental development. The latest edition of the Frascati manual is the seventh, from 2015. Its updated definitions were introduced into the data collection of Statistics Iceland for the reference year of 2015. A break in time-series was avoided by revising previously released data.

Research and experimental development: The acronym 'R&D' is used in the Frascati manual precisely and interchangeably to refer to *research and experimental development*. The specification of ‚experimental' development can be viewed as distinguishing the concept from *research and development* as defined by other standards that aren't subject to the definitions of the Frascati manual (such as IFRS, the international accounting standard). The Icelandic translation used by Statistics Iceland is based on the official translation of 'experimental development' in the records of the Translation Centre of The Ministry of Foreign Affairs, as 'þróunarstarf'.

In the introduction to the seventh edition of the Frascati Manual, research and experimental development is referred to as the creation of knowledge that has the potential to meet national needs and global challenges. R&D is described as having the potential to make significant contribution to economic growth and prosperity, affecting individuals, institutions, economic sectors and countries. R&D is defined as creative and systematic work undertaken in order to increase the stock of knowledge and to devise new applications of available knowledge.

Whether a given activity can be considered R&D or not is determined by five core criteria that have to be satisfied. The activity must be: novel, creative, uncertain, systematic and transferable and/or reproducible. The following summaries for each of these items reflect the definitions from the Frascati Manual as presented to the respondents in Icelandic:

Novel: R&D is aimed at making new discoveries, or to generate knowledge that is new to the business and not already in use in the industry (in the case of the business enterprise sector). Excluded from R&D are thus activities undertaken to adopt (referred to in the Frascati Manual as: to copy, imitate or reverse engineer) anything that already exists on the market. As R&D is the formal creation of knowledge, the measurement focus is on the new knowledge, not the new or significantly improved products or processes resulting from the application of the knowledge.

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Creative: That R&D is specifically creative work means that excluded from R&D are any routine changes to products or processes. Human input is inherent to creativity in R&D. As a result, an R&D project requires the contribution of a researcher.

Uncertain about the final outcome: At the outset of an R&D project, outcome and cost cannot be precisely determined relative to the goals.

Systematic: R&D is conducted in a planned way, with records kept of both the process followed and the outcome. The availability of such records is consistent with an R&D project that is aimed at addressing specific needs and has its own human and financial resources.

Transferable and/or reproducible: An R&D project should result in the potential for the new knowledge to be transferred, ensuring its use and allowing other researchers to reproduce the results as part of their own R&D activities. This includes R&D that has negative results, in the case that an initial hypothesis fails to be confirmed or a product cannot be developed as originally intended.

Respondents are instructed to exclude from their R&D reporting: the main activity of the enterprise, unless it is within the appropriate category; general purpose data collection/processing, e.g. monitoring; market surveys and related data collections; routine compliance with public inspection control, enforcement of standards, regulations; software development, unless its completion is dependent on a scientific or technological advance, and the aim of the project must be the systematic resolution of a scientific and/or technological uncertainty. The use of software for a new application or purpose does not by itself constitute an advance. It is furthermore specified that R&D is generally the initial stage of innovation, although it can also be called upon at any point up to implementation, then in an effort to address problems or uncertainties. Product design is generally not considered R&D, though the R&D criterion can possibly be met, outside of the production process.

Enterprise: The concept of an enterprise covers all legal units that have as their principle activity producing goods or services. Included in this category in the publication of R&D statistics by Statistics Iceland is private non-profit institutions serving households.

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Higher education sector: In R&D statistics, the higher education sector is composed on all universities and other institutions providing formal tertiary education programmes, and all research institutes, centres, experimental stations and clinics that have their R&D activities under the direct control of, or administration by, tertiary education institutions.

Government sector: In accordance with the Frascati Manual, “he Government sector thus comprises all units of central (federal), regional (state) and municipal (local) government, including social security funds, except those units that fit the description of higher education institutions”.

Gross domestic production: In accordance with the definition provided by the European Commission, “GDP is a measure for the economic activity. It is defined as the value of all goods and services produced less the value of any goods or services used in their creation.”

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3.5 Statistical unit	The statistical units are R&D performers, regardless of which other units are financing the R&D work or requesting it, among the business enterprise sector, higher education sector, government sector and private non-profit sector.
3.6 Statistical population	The statistical population is all units of the business enterprise sector, higher education sector, government sector and private non-profit sector, which perform R&D, without any consideration to which unit provides funding or has requested the R&D.
3.7 Reference area	Iceland
3.8 Time coverage	2013-2019
3.9 Base period	Data is collected for a reference year, annually from the higher education sector and government sector, for the calendar year before, but every other year from the business enterprise sector, for the calendar year before, as well as an estimation for the R&D expenses of the current year.
4. Unit of measure	
4. Unit of measure	Total R&D expenditures in a reference year, total number of persons employed in R&D in a reference year, and average percentage of time spent on R&D (which is transformed into full-time equivalence in the published statistics).
5. Reference period	
5. Reference period	The calendar year before, and estimated expenditures for the current year in the case of the business enterprise sector.
6. Institutional mandate	

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6.1 Legal acts and other agreements	REGLUGERÐ FRAMKVÆMDASTJÓRNARINNAR (EB) nr. 753/2004 frá 22. apríl 2004 um framkvæmd ákvörðunar Evrópuþingsins og ráðsins nr. 1608/2003/EB að því er varðar hagskýrslur um vísindi og tækni COMMISSION IMPLEMENTING REGULATION (EU) No 995/2012 Of 26 October 2012 Laying down detailed rules for the implementation of Decision No 1608/2003/EC of the European Parlimentary and of the Council concerning the production and development of Community statistics on science ande tecnology
7. Confidentiality	
7.1 Confidentiality - policy	https://hagstofan.s3.amazonaws.com/media/public/2019/6d8c9437-2f2f-4aa6-93bf-22f20bac5c84.pdf
7.2 Confidentiality – data treatment	The microdata is treated as confidential. Access to the data is limited to the employees of Statistics Iceland who have the role of working with the data. Statistics Iceland does not give access to microdata, but tailored statistics can be requested, given that certain conditions are met. See, for more information: https://statice.is/services/
8. Release policy	
8.1 Release calendar	-
8.2 Release calendar access	The release calendar of Statsitics Iceland is available at: https://statice.is/publications/news-archive/advance-release-calendar/
8.3 User access	Published figures are available to users on the website of Statistics Iceland: https://statice.is/statistics/business-sectors/science-and-technology/rd/
9. Frequency of dissemination	
9. Frequency of dissemination	Annual.

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10. Accessibility and clarity	
10.1 News release	New releases are published on the website of Statistics Iceland.
10.2 Publication	Publications are published on the website of Statistics Iceland.
10.3 On-line database	Statistics are available on: https://statice.is/statistics/business-sectors/science-and-technology/rd/
10.4 Micro-data access	-
10.5 Other	Data is submitted to Eurostat and can be found at: https://ec.europa.eu/eurostat/web/main/data/database Data is submitted to the OECD and can be found at: https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm
10.6 Documentation on methodology	OECD's Frascati Manual 2015; Guidelines for Collecting and Reporting Data on Research and Experimental Development: https://www.oecd.org/publications/frascati-manual-2015-9789264239012-en.htm
10.7 Quality documentation	No documentation on quality available.
11. Quality management	
11.1 Quality assurance	See, general quality assurance of Statistics Iceland: https://statice.is/about-statistics-iceland/quality-and-security-policy/
11.2 Quality assessment	-
12. Relevance	

12.1 User needs	Commission regulation 995/2012 states that these statistics shall be based on harmonised concepts and definitions, contained in the most recent version of the OECD's Frascati Manual in the case of R&D statistics, and the Oslo Manual (published jointly by of the OECD and Eruostat) in the case of innovation statistics. The latest edition of the Frascati manual is the seventh, from 2015. Its updated definitions were introduced into the data collection of Statistics Iceland in 2016, for the reference years of 2015 and 2016 for both the business enterprise sector and private non-profit organisations, whereas data was only collected for the year 2015 from the higher education sector and the government sector that year. Statistics Iceland aims to collect and compile statistics that are comparable to the same statistics of other countries, however, approaches may be subject to specific country conditions, as by the assessment of the experts of Statistics Iceland.
12.2 User satisfaction	No assessment of user satisfaction has been made.
12.3 Completeness	-

13. Accuracy and reliability

13.1 Overall accuracy	Statistics Iceland manages its own internal database on possible R&D performers, through recurring data collection, in association with the Business Register of Statistics Iceland, and incorporating information from The Icelandic Centre for Research on applicants of relevant grants and tax deduction for R&D. Statistics Iceland then aims to reach a certain response rate in groups of enterprises, where the groups are determined by the enterprises' importance, by relevant expenditures in previous years. In the data collection of 2020, for the reference period 2019-2020m the response rate was 83% for the total number of enterprises, but those enterprises covered 89% of the total R&D expenditures in the last data collection before that. Expenditures and other values are imputed for non-respondents. It is not assumed that the imputed value have any significant impact on the overall accuracy.
13.2 Sampling errors	As it is a census survey, sampling errors don't apply.
13.3 Non-sampling errors	-

14. Timeliness and punctuality

14.1 Timeliness	Final results are published no later than 18 months after the end of the reference year.
14.2 Punctuality	In accordance with the publication schedule of Statistics Iceland. The schedule is released in October of each year.
15. Coherence and comparability	
15.1 Comparability – geographical	By following the guidelines of the OECD's Frascati Manual, which is the basis of these statistics both within the OECD and Eurostat, comparability with these statistics for other OECD and EU/EEA countries is ensured.
15.2 Comparability – over time	These statistics have been managed by Statistics Iceland since 2014, which marked the beginning of new time-series in each subject area. The disruption in procedures caused by the field being moved from one statistical producer to another, concerning underlying methodological matters, meant that previous time-series had to be discontinued. The reference year of Statistics Iceland's initial data collection was 2013 for research and development, but the reference period for innovation was 2012-2014.
15.3 Coherence – cross domain	-
15.4 Coherence – internal	-
16. Cost and burden	
16. Cost and burden	-
17. Data revision	
17.1 Data revision - policy	See the policy and objectives on revision: https://statice.is/about-statistics-iceland/revision-policy/
17.2 Data revision -practice	Released figures are subject to revision with every new publication, as described in chapter 13, on Accuracy and reliability.
18. Statistical processing	

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18.1 Source data	Data is collected with questionnaires from possible R&D performers.
18.2 Frequency of data collection	Every other year from the business enterprise sector og the private non-profit sector, but annually from the higher education sector and government sector.
18.3 Data collection	Data is collected from the business enterprise sector and the private non-profit sector by the Data collection unit of Statistics Iceland, while the data from the higher education sector and the government sector is collected by the expert within Statistics Iceland (contact person).
18.4 Data validation	Administrative data of Statistics Iceland's Business Register and microdata on R&D expenditures from previous years are used for validation of responses. Response units may contacted for confirmation in cases of uncertainty regarding validity of responses.
18.5 Data compilation	Data compilation is aimed at honouring obligations of Iceland towards Eurostat and publications of Statistics Iceland are based on the same variables.
18.6 Adjustment	-
19. Comment	
19. Comment	-