

**RESEARCH AND DEVELOPMENT IN MALTA (GOVERNMENT SECTOR) 2018**

**NATIONAL REFERENCE METADATA IN SINGLE INTEGRATED METADATA STRUCTURE (SIMS)**

**CONCEPT 1 - CONTACT**

**Sub-Concept 1.1: Contact organisation**

National Statistics Office (Malta)

**Sub-Concept 1.2: Contact organisation unit**

Public Finance Unit

**Sub-Concept 1.3: Contact name**

Mark Galea

**Sub-Concept 1.4: Contact person function**

Head of Unit

**Sub-Concept 1.5: Contact mail address**

National Statistics Office (NSO),  
Lascaris, Valletta,  
VLT2000

**Sub-Concept 1.6: Contact e-mail address**

mark.b.galea@gov.mt

**Sub-Concept 1.7: Contact phone number**

+356 2599 7240

**CONCEPT 2 – METADATA UPDATE**

**Sub-Concept 2.1: Metadata last certified**

22<sup>nd</sup> November 2019.

**Sub-Concept 2.2: Metadata last posted**

4<sup>th</sup> January 2021.

**Sub-Concept 2.3: Metadata last update**

4<sup>th</sup> January 2021.

## **CONCEPT 3 – STATISTICAL PRESENTATION**

### **Sub-Concept 3.1: Data description**

Research and Development is defined as creative work undertaken on a systematic basis to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications. This collection provides users with data concerning R&D expenditure and R&D personnel broken down by the following institutional sectors: business enterprise (BES), government (GOV), higher education (HES), private non-profit (PNP) with the total of sectors.

This metadata file covers the GOV and HES sectors. For further information on BES refer to metadata file: <https://metadata.nso.gov.mt/Default.aspx>

In Malta, the PNP sector is not captured as it is considered to be negligible.

All data are broken down by the sectors of performance. The R&D expenditure for GOV and HES sectors is further broken down by source of funds, by type of costs, by type of R&D, by fields of science, by socio-economic objectives. R&D personnel data are available in full-time equivalent (FTE) and in head count (HC). The data are further broken down by occupation, by qualification, by gender, by size class, by citizenship, by age groups and by fields of science.

The periodicity of R&D data are biannual except for the key R&D indicators (R&D expenditure, R&D personnel and Researchers by sectors of performance) which are transmitted annually by the EU Member States on the basis of a legal obligation from 2003 onwards. Some other breakdowns of the data may appear on annual basis based on voluntary data provisions.

The objective of the European R&D statistics is to cover all intramural R&D activities. In line with this objective, for the GOV and HES sector, all units forming part of the General Government sector are surveyed once a year by means of an electronic questionnaire.

### **Sub-Concept 3.2: Classification system**

R&D statistics are compiled in line with international statistical classifications such as: Frascati Manual (FM) 2015, Statistical Classification of Economic Activities in the European Community (NACE Rev.2, 2008), Field of science and technology classification (FOS 2007), Nomenclature for the analysis and comparison of scientific programmes and budgets (NABS 2007) and International Standard Classification of Education (ISCED 2011).

### **Sub-Concept 3.3: Sector coverage**

R&D statistics are compiled for three institutional sectors of performance: Business Enterprise (BES), Government (GOV), and Higher Education (HES). Private Non-Profit (PNP) is considered to be negligible.

### **Sub-Concept 3.4: Statistical concepts and definitions**

Main concepts and definitions used to produce R&D statistics are given by the [Frascati Manual](#) - the "Proposed standard practice for surveys of research and experimental development", OECD 2002, which is internationally recognized standard methodology for collecting R&D statistics.

Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications." (§ 63, Frascati Manual, OECD 2002).

Intramural R&D expenditures are all expenditures for R&D performed within a statistical unit or sector of the economy during a specific period, whatever the source of funds." (§ 358, Frascati Manual, OECD 2002).

R&D personnel include all persons employed directly on R&D, as well as those providing direct services such as R&D managers, administrators, and clerical staff. Those providing an indirect service, such as canteen and security staff, should be excluded." (§ 294 - 295, Frascati Manual, OECD 2002).

Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned." (§ 301, Frascati Manual, OECD 2002).

### **Sub-Concept 3.5: Statistical unit**

The statistical units used in order to compile R&D statistics are institutional units classified inside the General Government Sector according to the ESA 2010.

### **Sub-Concept 3.6: Statistical population**

R&D statistics are compiled for R&D activity performed in the whole economy.

This metadata file covers the GOV and HES sectors. For further information on BES refer to metadata reports on the NSO's website: <https://metadata.nso.gov.mt/Default.aspx>

### **Sub-Concept 3.7: Reference area**

Malta.

### **Sub-Concept 3.8: Time coverage**

R&D data for GOV and HES sector are available from 2004 onwards.

### **Sub-Concept 3.9: Base period**

Not applicable.

## **CONCEPT 4 – UNIT OF MEASURE**

R&D expenditure is available in the following units:

- National currency (MIO\_NAC);
- Euro (MIO\_EUR);
- Percentage of GDP (PC\_GDP).

R&D personnel data are available in:

- Full-time equivalent (FTE);
- Head count (HC).

## **CONCEPT 5 – REFERENCE PERIOD**

The reference period is the calendar year.

## **CONCEPT 6 – INSTITUTIONAL MANDATE**

### **Sub-Concept 6.1: Legal acts and other agreements**

The Malta Statistics Authority (MSA) Act empowers the NSO to collect, compile, extract and release official statistics related to demographic, social, environment, economic and general activities and conditions of Malta.

As a member of the European Union (EU), Malta has to observe the Council Regulations. Until 2003 R&D data were collected under gentleman's agreement. In 2003, Decision No 1608/2003/EC of the European parliament and of the Council of 22 July 2003 concerning the production and development of community statistics on science and technology was adopted. Between reference years 2003 to 2011 the data collection was based on the Commission Regulation No 753/2004 on statistics on science and technology (OJ L 118, page 23 from 23 April 2004), and as amended by the Commission Regulation (EC) No 973/2007 (OJL 216, page 10 from 21 August 2007). From the reference year 2012 onwards, the Commission Implementing Regulation on statistics science and technology No 995/2012 (OJ L 299, page 18 from 27 October 2012) applies.

### **Sub-Concept 6.2: Data sharing**

Not applicable.

## **CONCEPT 7 - CONFIDENTIALITY**

### **Sub-Concept 7.1: Confidentiality – Policy**

At National level:

The NSO requests information for the compilation of official statistics according to the articles of the MSA Act – Cap. 422 and the Data Protection Act – Cap. 586 of the Laws of Malta implementing the General Data Protection Regulations (GDPR).

Article 40 of the MSA Act stipulates the restrictions on the use of information while Article 41 stipulates the prohibition of disclosure of information. Furthermore, Section IX of the Act (Offences and Penalties) lays down the measures to be taken in case of unlawful exercise of any officer of statistics regarding confidentiality of data.

Since its inception, the NSO has always assured that all data collected remains confidential and that it is used for statistical purposes only according to the articles and derogations stipulated in the laws quoted above. The Office is obliged to protect the identify of data providers and refrain from divulging any data to third parties that might lead to the identification of persons or entities.

During 2009, the NSO has set up a Statistical Disclosure Committee to ensure that statistical confidentiality is observed, especially when requests for microdata are received.

Upon employment, all NSO employees are informed of the rules and duties pertaining to confidential information and its treatment. In line with stipulations of the MSA Act, before commencing work, every employee is required to take an oath of secrecy whose text is included in the same Act.

An internal policy on anonymisation and pseudo-anonymisation is in place to ascertain that adequate methods are used for the protection of data which the office collects and shares with the public in its capacity as the National Statistics Office. The policy is meant to safeguard confidentiality of both personal and business data entrusted to the NSO. The document provides guidance for all NSO employees who process data on a daily basis as to how anonymisation and pseudo-anonymisation methods should be applied. The policy applies to all confidential, restricted and internal information, regardless of form (paper or electronic documents, applications and databases) that is received, processed, stored and disseminated by the NSO.

At European level:

[Regulation \(EC\) No 223/2009](#) on European statistics (recital 24 and Article 20(4) of 11 March 2009 (OJ L 87, p. 164), stipulates the need to establish common principles and guidelines ensuring the confidentiality of data used for the production of European statistics and the access to those confidential data with due account for technical developments and the requirements of users in a democratic society.

### **Sub-Concept 7.2: Confidentiality – Data Treatment**

Data are only disseminated in aggregate form and no statistical disclosure control is applied onto it, however, data received are treated as confidential and names of entities are never disclosed.

## **CONCEPT 8 – RELEASE POLICY**

### **Sub-Concept 8.1: Release Calendar**

An advance release calendar is maintained by the NSO and published on the NSO website. The calendar projects three months of news releases (including the current and two subsequent months).

### **Sub-Concept 8.2: Release Calendar access**

[https://nso.gov.mt/en/News\\_Releases/Release\\_Calendar/Pages/News-Release-Calendar.aspx](https://nso.gov.mt/en/News_Releases/Release_Calendar/Pages/News-Release-Calendar.aspx)

### **Sub-Concept 8.3: User access**

An internal policy on dissemination is in place to govern the dissemination of official statistics in an impartial, independent and timely manner, making them available simultaneously to all users.

The NSO's primary channel for the dissemination of official statistics is the NSO website. Tailored requests for statistical information may also be submitted through the NSO website.

Moreover, dedicated news releases are available in electronic format on the NSO website.

## **CONCEPT 9 – FREQUENCY OF DISSEMINATION**

R&D data are published annually in July.

## **CONCEPT 10 – ACCESSIBILITY AND CLARITY**

### **Sub-Concept 10.1: News release**

A news release on R&D statistics, illustrating both government and businesses R&D, is released in July/August in the form of tables following the transmission to Eurostat. In every news release a set of methodological notes are created, including definitions on R&D, major fields of science, as well as definitions on the types of costs and which types of departments are classified within the government sector.

The news release, which covers a period of three years, consists of:

- A brief commentary on the main highlights of the R&D expenditure, employment and GBARD;
- Table on the total R&D expenditure by sector as a % of GDP;
- Total expenditure on R&D by type of activity and sector;
- Total expenditure on R&D by type of costs and sector;
- Total expenditure on R&D by major field of science and sector;
- Source of funds of R&D expenditure;
- Employment in R&D by sex, occupation and sector (headcount);
- R&D employment by major field of science by sector;
- GBARD.

News Releases may be found at the following link:

[http://nso.gov.mt/en/News\\_Releases/View\\_by\\_Unit/Unit\\_A2/Public\\_Finance/Pages/Research-and-Development-in-Malta.aspx](http://nso.gov.mt/en/News_Releases/View_by_Unit/Unit_A2/Public_Finance/Pages/Research-and-Development-in-Malta.aspx)

### **Sub-Concept 10.2: Publications**

Not applicable. Data are only published in form of a news release.

### **Sub-Concept 10.3: Online Database**

The news release is uploaded on the NSO's website for future reference. Transmission tables sent to Eurostat are uploaded on the Eurobase under "Science and technology" at the following link:  
<http://ec.europa.eu/eurostat/data/database>

### **Sub-Concept 10.4: Micro-data access**

Not applicable. Data are always disseminated in aggregate form.

### **Sub-Concept 10.5: Other**

R&D data are disseminated in policy papers issued by the Malta Council for Science and Technology and various other Government Ministries and Departments.

### **Sub-Concept 10.6: Documentation on methodology**

R&D data collection and dissemination follow the guidelines set out in the OECD Frascati Manual downloadable at the following link:

<https://www.oecd-ilibrary.org/docserver/9789264239012-en.pdf?expires=1575883953&id=id&accname=guest&checksum=578DF6DFFDFB178DD4A8AEFD300EF16>

This is a proposed standard practice for surveys on research and experimental development.

As indicated in Sub-concept 10.1, a set of methodological notes are presented at the back of every news release, including guidelines on concepts and definitions used as well as specific methodological issues.

Work processes and procedures for the compilation of R&D statistics (Government) are documented in a standardised reporting template and aligned to the GSBPM model. The model covers all phases of the statistical production process, from the initial stages of identifying what statistics are needed and the scope of the particular survey, to the final stages of dissemination and evaluation. The GSBPM report is only available internally and may be accessed by all NSO employees.

#### **Sub-Concept 10.6.1: Metadata completeness rate**

Information about all required metadata concepts (and sub-concepts thereof) are provided.

### **Sub-Concept 10.7: Quality Documentation**

Dedicated SIMS reports are available to the public on the [NSO's metadata website including concepts related to metadata and quality](#).

Quality Reports are provided to Eurostat systematically once in two years at the minimum.

The NSO has developed an internal Quality Management Framework (QMF) which is built on common requirements of the ESS Code of Practice (ESS CoP). A document was prepared to include a set of general quality guidelines spanning over all statistical domains. Assuring methodological soundness is an integral part of the QMF, nonetheless, the document spans also on other areas related to institutional aspects.

## **CONCEPT 11 – QUALITY MANAGEMENT**

### **Sub-Concept 11.1: Quality Assurance**

The NSO ensures that the statistical practices used to compile national R&D data follow the Frascati Manual recommendations. Quality evaluation of R&D statistics is carried out by Eurostat based on the information provided in the national quality reports sent by the countries in addition to the regular metadata provision.

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Every five to seven years, the NSO participates in a Peer Review exercise through which the compliance of its operations with principles of the ESS CoP is assessed by an expert team. Peer Reviews are indeed part of the European Statistical System (ESS) strategy to implement the ESS CoP. Each NSI is expected to provide information as requested by a standard self-assessment questionnaire. Following this an expert team visits the office to meet NSI representatives and main stakeholders. Peer Reviews result in a compliance report and the listing of a set of Improvement Actions which need to be followed up by the NSI. The next round of Peer Reviews is planned to be carried out in 2022.

### **Sub-Concept 11.2: Quality Assessment**

Quality assessment is provided by Eurostat based on the information provided in the quality report. There are no completeness or coverage issues for Malta.

## **CONCEPT 12 - RELEVANCE**

### **Sub-Concept 12.1: User needs**

- Malta Council for Science and Technology - public body established by the central government with the mandate of advising government on science and technology policy. Detailed data on capacity and trends of Malta's R&D performance for R&D and innovation and education policy decisions and strategy planning.
- Parliament, Ministries, political parties, government departments and International Organisations
- Media for general public - Analysis of changes in Malta's R&D performance together with international comparisons.
- Researchers and students - Statistics and analysis.

### **Sub-Concept 12.2: User satisfaction**

The last User Satisfaction Survey was held in 2014 with the aim to collect information about key users' satisfaction with statistical output.

The NSO keeps record of the number of News Releases and publications disseminated on its website; the users to whom statistical products are provided; as well as the number of requests that are processed every year.

News Releases and tailor-made statistical outputs were assessed on account of their quality, timeliness, and on their ability to meet users' needs.

### **Sub-Concept 12.3: Data Completeness**

Data completeness of both preliminary and final mandatory data is 100% satisfied.



## **CONCEPT 13 – ACCURACY AND RELIABILITY**

### **Sub-Concept 13.1: Overall accuracy**

Questionnaires are vetted individually upon receipt. Since the number of R&D performers in the GOV and HES sectors is small, interaction with respondents by telephone or email is made easier. Therefore, any missing information or need for clarity is discussed personally with the persons responsible for R&D in the respective entity. To ensure consistency, data are compared with previous years and any major developments are queried.

For non-responding units, data for the previous year are considered.

All efforts are done to ensure that data reported are as accurate as possible.

### **Sub-Concept 13.2: Sampling errors**

Data are collected through a census questionnaire and therefore there are no sampling errors.

### **Sub-Concept 13.3: Non-sampling errors**

Non-sampling errors may arise due to wrong data provided by respondents. Manual data entry errors have been eliminated in the new R&D IT system. The Eurostat Transmission tables are automatically generated from the new IT system thus coding or classification errors are avoided.

#### **Sub-Concept 13.3.1: Coverage error**

Data for GOV and HES is collected through a census questionnaire across all Government Ministries, Departments, entities and Local Government sector. All units forming part of General Government and the Higher Education Sector are eligible to participate in the survey (even units that are not engaged in R&D) therefore there is no coverage error.

##### **Sub-Concept 13.3.1.1: Over Coverage**

Not applicable.

##### **Sub-Concept 13.3.1.2: Common Units Proportion**

Not applicable.

#### **Sub-Concept 13.3.2: Measurement error**

Validation checks were in-built in the new excel version of the questionnaire, so such errors are minimised. If inconsistencies and errors are still found, respondents are contacted accordingly.

#### **Sub-Concept 13.3.3: Non-response error**

In case of non-respondents, an estimate based on figures reported in the previous year's questionnaire is made.

#### **Sub-Concept 13.3.3.1: Unit non-response**

Non-respondents engaged in R&D are chased to improve the overall response rate. In cases when the latter does not lead to successful responses, an estimate is provided. In addition, in Malta, 80% of the R&D is carried out by one entity and thus the net effect of non-response from the remaining entities is not very significant.

#### **Sub-Concept 13.3.3.2: Item non-response**

Respondents engaged in R&D activities who leave out important information are re-contacted, yielding a 0% item non-response rate.

#### **Sub-Concept 13.3.4: Processing error**

Thanks to the development of the new R&D IT system and the time invested in testing this system, the possibility of having processing errors has been eliminated.

#### **Sub-Concept 13.3.5: Model assumption error**

Not applicable.

### **CONCEPT 14 – TIMELINESS AND PUNCTUALITY**

#### **Sub-Concept 14.1: Timeliness**

Provisional data are provided by the entities after 3 to 5 months and final data are provided after 15 to 17 months.

#### **Sub-Concept 14.2: Punctuality**

Data are provided in a timely manner and there is therefore no time-lag.

### **CONCEPT 15 – COHERENCE AND COMPARABILITY**

#### **Sub-Concept 15.1: Comparability – Geographical**

Data are comparable across, as all Member States use the harmonised Frascati Manual.

#### **Sub-Concept 15.2: Comparability - Over Time**

In previous years, compilation of the Government Budget Appropriations of R&D (GBAORD) data was done by reporting the figure of total expenditure by socio-economic objective hence including all expenditure, both government and foreign funds. From 2010, following the Eurostat grant on Innovation and R&D statistics addressing GBAORD data, compilation of GBAORD has started to exclude foreign funding and report only expenditure funded by the government. This arrangement has been applied backwards until 2006. Moreover, from 2007, the Public Finance Unit started including the amount of public funding towards private enterprises engaged in EUREKA projects whereas from 2010, data are inclusive of public funding towards private enterprises under the National R&I programme.

Length of comparable time series is from 2007 onwards.

### **Sub-Concept 15.3: Coherence – Cross Domain**

There exists no other source for aggregate results, only the NSO collects R&D data from individual government departments and entities and hence R&D data are not available from other data sources. In the case of individual reporting units, some data on expenditure can be compared with figures in annual reports or with those available on the institution's website. These aggregated data are then transmitted to Eurostat for publication.

Comparisons between R&D statistics and relevant statistics from other domains are relevant mainly for the business enterprise sector, for which R&D statistics are also collected through the Innovation Survey.

#### **Sub-Concept 15.3.1: Coherence – Sub-Annual and Annual statistics**

Not applicable given that R&D data are only published once a year.

#### **Sub-Concept 15.3.2: Coherence – National Accounts**

Data on R&D for the general government sector are provided to the National Accounts unit by the Public Finance Unit, hence perfect coherence with National Accounts data is expected.

### **Sub-Concept 15.4: Coherence – Internal**

The Public Finance Unit is responsible for all data that relate to the General Government Sector and hence is the sole unit responsible for the collection of data on R&D activities engaged into by the government sector. Hence, internal coherence is not applicable.

## **CONCEPT 16 – COST AND BURDEN**

The only cost involved in the process of R&D data collection is the time spent by one statistician in collecting, analysing and reporting data. Questionnaires are sent by email and the responses are also sent back by email so printing and postage costs are kept at a minimum.

## **CONCEPT 17 – DATA REVISION**

### **Sub-Concept 17.1: Data revision – Policy**

At the NSO, there is currently no internal policy governing revisions that occur for all statistics produced. Nonetheless, a revisions policy is being drafted to safeguard a coordinated revisions system across statistical domains.

This policy will take account of the need and causes for revisions; time and frequency of revisions; data and other statistical products affected by such revisions; and length of periods revised.

### **Sub-Concept 17.2: Data revision – Practice and Data Revision**

Data for a reference year are collected twice; the first time, provisional, at t+1 year, while final data are collected at t+2 years. Provisional data are subject to change, but revisions are very minimal.

No further revisions are collected for past years unless brought forward by the entity.

## **CONCEPT 18 – STATISTICAL PROCESSING**

### **Sub-Concept 18.1: Source data**

The R&D data covered by this metadata file can be broken down into 3 categories; Government R&D, Higher Education R&D and GBARD. Data for all 3 are collected by means of an annual questionnaire.

The data collected include:

1. The number of R&D personnel, by FT/PT, by field of science, by categories of R&D personnel, by gender, by level of qualification in the end of year;
2. The researchers, by FT/PT, by gender, by citizenship in the end of year;
3. The intramural expenditure devoted to R&D by field of science, by sources of financing (local and foreign sources further split into more sources), by type of costs, by type of R&D activities, by socio-economic objectives.

### **Sub-Concept 18.2: Frequency of data collection**

The R&D questionnaire is sent out once a year collecting provisional data for t-1 and final data for t-2.

### **Sub-Concept 18.3: Data Collection**

An R&D annual questionnaire is sent out to all government ministries, departments, entities and Local Councils. Questionnaires are sent automatically by email through the new IT system, either to the person directly responsible for R&D or to the Director Corporate Services.

As regards government funding towards private enterprises for R&D purposes, data are provided from two administrative sources; Malta Enterprise and Malta Council for Science and Technology (for the National R&I Programme).

### **Sub-Concept 18.4: Data Validation**

Data from providers' reports are checked, analysed and aggregated to produce R&D statistics for domestic and international use. Any corrections, if needed, are agreed upon with respondent. If no contact with the data providers can be made, estimations are carried out using past data until the actual data are received. Questionnaires are automatically loaded to the R&D IT system and checked for validation. Each questionnaire is analysed thoroughly to determine whether the reported projects fall under the definition of R&D or not. In cases of difficulties, we contact the entity and discuss any issues directly with the respondents.

### **Sub-Concept 18.5: Data Compilation**

Data compilation is done automatically by the R&D IT system, data are loaded, validated, aggregated and Eurostat tables are filled in.

#### **Sub-Concept 18.5.1: Imputation**

Respondents who are engaged in R&D activities providing inadequate or missing information are re-contacted and this results in a consistent response to every item in the questionnaire.

**Sub-Concept 18.6: Adjustment**

Not applicable.

**Sub-Concept 18.6.1: Seasonal Adjustment**

Not applicable.

**CONCEPT 19 - COMMENT**

No further comments.