

In this publication, the State Statistical Office is publishing data on research and development activity in the Republic of North Macedonia.

The survey is conducted annually.

In 1998, for the first time, the methodology of this survey was modified and harmonized with the international definitions and standards. Methodological changes were also made in 2016 in line with the Frascati Manual.

The changes in the survey were necessary for systematic development and compliance with the methodology of OECD - Frascati Manual, to provide data with greater international comparability.

The data are presented at the country level, based on the statistical analysis of the annual reports collected from business entities that have performed research and development activity in the Republic of North Macedonia.

We expect that the publication will fulfil its function and provide users with sufficiently detailed statistical information on research and development activity.

All remarks, proposals, and suggestions for improving the publication would be greatly appreciated.

Methodological notes

Coverage

The data presented in this publication are the result of the annual statistical survey on the research and development activity in the Republic of North Macedonia. Major methodological changes were introduced in 2016 with respect to observing reporting units by sector in which research and development activity is performed, classifying them in three different sectors, which complete different data collection forms:

- Business entities fill out report IR.1.
- Non-profit and government organizations fill out the report IR.2 and
- Higher education institutions fill out report IR.3.

Reporting units are entities that are:

- registered for research activity (registered in the Register of scientific institutions at the Ministry of Education and Science, in accordance with the Law on Scientific and Research Activity).
- not registered at the Ministry of Education and Science.
- research organizations under a special law (Macedonian Academy of Science and Arts - MASA, higher education institutions and academies).
- higher education institutions.
- business entities - not registered for scientific and research activity.

Definitions and explanations

The definitions in the field of research and development are created in accordance with the international methodology Frascati Manual.

Research and development activity consists of creative and systematic work that is undertaken to increase the stock of knowledge, to acquire new knowledge, including knowledge of humankind, culture, and society, and using this knowledge to find new inventions in order to raise the general level of development of society and use of these skills in all areas of social development.

For an activity to be considered a research and development activity, it must meet the following five main criteria:

- Novel
- Creative
- Uncertain
- Systematic
- Transferable and/or reproducible

Novel - The activity should focus on new discoveries. New knowledge is an expected objective of an R&D project.

Creative - New concepts and ideas improve existing knowledge, modify products or processes and, therefore, human input is inherent to creativity in R&D.

Uncertain - The activity should be uncertain about the final result. For R&D in principle, there is uncertainty about the costs and time needed to achieve the expected results, as well as about whether its objectives can be achieved to any degree at all.

Systematic - The activity should be systematic and financed. R&D is a formal activity that is performed systematically. This means that this is done gradually/systematically and that records are kept of the implemented procedures and the results.

It is necessary to define the purpose of the R&D project and the sources from which the implementation/execution of the R&D activities will be financed.

Transferable and/or reproducible - The activity should lead to results that are repetitive. An R&D project should enable the transfer of new knowledge, ensuring its use and allowing other researchers to reproduce the result as part of their R&D activity.

Scientific activity is carried out through basic research, applied research and experimental development and training of personnel for scientific and research work.

Basic research is systematic creative activity undertaken to acquire new knowledge of the underlying foundation of phenomena and facts, without any application or use in view. The results of basic research are usually formulated as basic principles, theories, and laws.

Applied research is carried out to determine the possibility of using the results of basic research in terms of its practical application, or to derive new methods or ways of achieving some predetermined objective. This research is based on existing knowledge and its extension to solve specific problems.

Experimental developmental is systematic creative activity based on the results of basic and applied research and practical experience aimed at introducing new materials, products, devices, processes, and methods.

The business sector comprises business entities in the field of economy, organizations, and institutions whose primary activity is production of goods and services (other than higher education) for sale.

The government sector includes all institutions (except higher education institutions) that provide, but do not sell, common services, as well as those that carry out governmental economic and social policy. This sector also includes non-profit institutions financed by the government, while public enterprises are included in the business sector.

The private non-profit sector covers all private non-profit institutions that supply private businesses and households with non-market goods and services.

The higher education sector includes all universities and other institutions where education is carried out regardless of their funding sources or their legal status. It also includes research institutes, experimental stations or clinics operating under the direct supervision of or administered by or associated with higher education institutions.

Classification of activity - for better international comparability in the business sector, and in accordance with the new version of the international methodology Frascati Manual, 60 special activity groups were created, which are in line with the NKD (NACE) and ISIC classifications.

Gross expenditure on research and development represents the total intramural expenditure on research and development on the national territory during the reporting calendar year. It is composed of current expenditures and capital expenditures in gross amounts.

Socio-economic objectives represent the basic objectives of the funds for research and development, which are set up by OECD and divided into 13 categories.

Researchers are persons who are actively engaged in research and development.

Expert personnel and technicians are persons who directly collaborate with researchers and are actively engaged in scientific and technical work related to research work.

Other supporting staff includes persons engaged in organizational, managerial, administrative, financial, or auxiliary work related to research work.

Full-time equivalence (FTE) represents the time, as a share of full working time, during which persons in employment are engaged in activities related to research and development (e.g. if a person was engaged full-time in research and development activities for six months, it is expressed as 0.5 full-time equivalent - 0.5 FTE).

Published research works are those published during the reporting year.