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Portuguese Scientific Production: Volume indicators

Catarina Carreira[1], Cristiana Agapito[2]

[1]*catarina.carreira@dgeec.medu.pt*, [2]*cristiana.agapito@dgeec.medu.pt*
Directorate General of Education and Science Statistics (DGEEC), Av. 24 de Julho, n.º 134, 1399-054 Lisbon (Portugal)

Introduction

In Portugal, one of the main goals of data related to scientific production is to provide essential tools for the processes of diagnosis, evaluation, and monitoring of national scientific system for the implementation of public policies. Bibliometric analysis uses data on the number of publications and citations, allowing us to understand the dynamics of different research areas, as well as observe the research outcomes of institutions, researchers, and countries within scientific system. These data also allow the identification of national and international collaboration networks and the flow of knowledge among them, thereby providing a perspective on the globalization of science. DGEEC presents some indicators related to scientific publication volume, namely the number of publications in which at least one of the authors is affiliated with a national institution. The data include all types of documents, except for the indicators on international comparisons and Sustainable Development Goals (SDGs), where the bibliographic records was limited to citable documents classified as articles and reviews. The presented data are the result of analysis conducted on the international platform *InCites*, a product of Clarivate Analytics, and are based on the *Web of Science* (core collection) data source.

A global scenario

In 2023, the number of publications with Portuguese affiliation indexed in the Web of Science was 27,646, an increase of 33% compared to 2013. Of these publications, 66% were open access, demonstrating the consolidation of new publishing practices within the scientific community, in which research results are made available free of charge and online. Considering publications classified by scientific area (FORD), there has always been a predominance of the natural sciences, medical and health sciences and engineering and technology sciences, something that should not be dissociated from the fact that there is a greater representation of these areas in this data source.

The highest average annual growth rates between 2013 and 2023 were 4.5% for publications classified as agricultural and veterinary sciences, 4.3% for publications in the social sciences and 4.0% for publications in medical and health sciences.

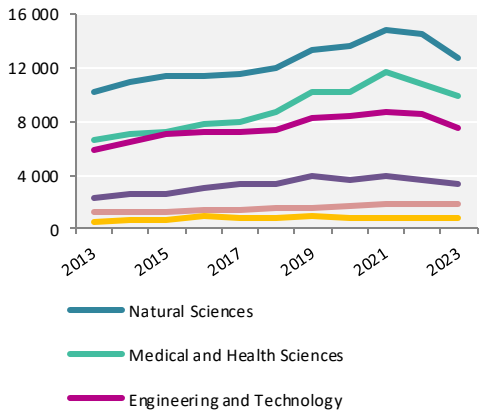


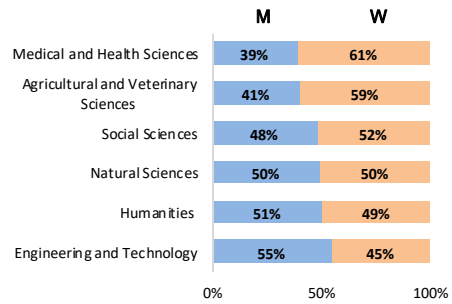
Figure 1. Portuguese Publications, by scientific area (2013-2023).

In 2023, more than half (57%) of Portuguese publications were co-authored with institutions from other countries, an increase of 12 percentage points compared to 2013 (45%). In 2023, Portugal collaborated with 198 countries, with Spain, the United Kingdom and the United States of America having the highest number of co-authored publications.

Gender Indicators

Gender statistics and indicators are important tools to promote gender equality and measure gender gaps (EIGE, 2019). Between 2018 and 2022, authors with Portuguese affiliation who published on the Web of Science were mostly women (53%). Men mostly play the role of last author (55%), correspondence author (51%) and unique author (58%). In the articles published, women assume a greater weight in the position of 1st author (53%).

Publications in Engineering Sciences and Technology have mostly male authors (55%). The Medical Sciences and Health Sciences have the highest % of women as authors (61%).



* In publications from 2018 to 2022, 50% of authors with at least one Portuguese affiliation were classified by sex. The data presented are based on these classified authors

Figure 2. Portuguese affiliated author, by sex and scientific area (2018-2022).

Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) were established by the United Nations (UN) in 2015, with the aim of guiding actions towards a more sustainable future for people and the planet. Adopted by all Member States of the United Nations, the 2030 Agenda represents a call to action by all countries - developed and developing - for a global partnership around common goals and targets to end poverty, protect the planet, and ensure peace and prosperity by 2030.

Given the fundamental role of science in achieving the goals and targets associated with the SDGs, it is important to publish data on Portuguese scientific production in this area. The data presented refers to the volume of Portuguese scientific production, indexed in the Web of Science, published between 2019 and 2023, referring to each of the SDGs. 96% of Portuguese publications belong to Objective 3 – Good Health and Well-Being. Secondly, 16% of the publications are related to Objective 14 – Life Below Water and Objective 15 – Life on Land.

International comparison

To compare the volume of scientific production between European Union countries, a normalised indicator is presented. The normalization considers the population aged between 25 and 64 with tertiary education.

This indicator seeks to measure the intensity of the production of scientific articles in the country among the population group that, from the outset, would be most able to participate directly in scientific activities, in other words, it is an indicator of the intensity of scientific production among the "target" population group.

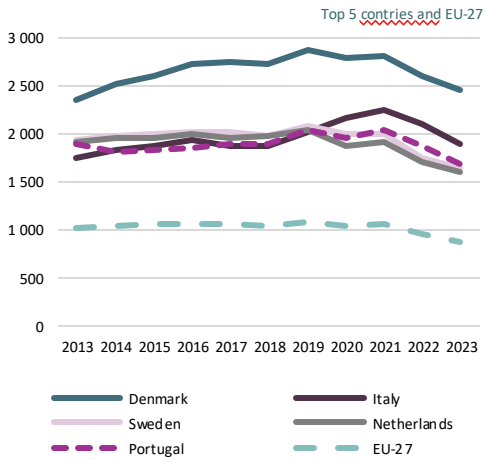


Figure 3. Number of publications per 100,000 inhabitants, aged between 25 and 64, with Tertiary Education.

In this indicator, Portugal is in 5th place with an average of 1.882 publications per 100.000 inhabitants aged between 25 and 64 with Tertiary Education. In the top two places are Denmark and Italy, with an average of 2.645 and 1.953 publications respectively.

This short summary of the Portuguese panorama regarding the volume of scientific publications is just a sample of indicators that have been made available in more depth in general and thematic publications that can be

consulted on the DGEEC website at https://www.dgeec.medu.pt/.

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