

EVALUATION OF RESEARCH IN SPAIN: BIBLIOMETRIC INDICATORS USED BY MAJOR SPANISH RESEARCH ASSESSMENT AGENCIES

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Introduction

One of the most important current applications of bibliometrics is assessment of research, and bibliometric indicators can be considered as tools for the evaluation of the scientific productivity of an individual researcher, a group or an institution.

Taking this as a starting point, we would like to check who is setting the patterns for scientific output evaluation in Spain in the area of biomedicine: What indicators have been used in recent years by funding and evaluating institutions in Spain? Are these institutions appropriately exploiting the resources provided by the bibliometry? What factors should be taken into account when defining indicators? What are the most accurate indicators for measuring research and performance? In brief, our objective is to observe the indicators and criteria that are being used by the main Spanish Agencies for the evaluation of researchers and institutions in Spain.

Methods

This study analyses the evaluation criteria and indicators used by the major agencies of the Spanish research

evaluation system. They are the National Assessment and Planning Agency (ANEP), the National Evaluation Commission for Research Activity (CNEAI) and the National Agency for Quality Assessment and Accreditation (ANECA). We compared the indicators used with the main characteristics of scientific communication and publications in the area of health sciences and we make some recommendations for measuring science in a more accurate way.

Research Evaluation in Spain: Results

Research assessment in Spain for a long time had two broad objectives: the pre-evaluation of research projects for financing and the external evaluation of the research activity of individual researchers over six-year periods, called *sexenios*. In recent years, we have seen the introduction of other kinds of evaluation, for example to provide accreditation to institutions of excellence or simply to measure research activity.

Regarding the indicators and criteria used, the quantity of publications is the most demanded criteria for being evaluated. The majority of the evaluation programs in Spain consider

absolute data (number of publications, IF, citations, etc.), do not take into account normalized indicators.

Table 1. Main objectives of Spanish Agencies for evaluation of researches.

ANECA Since 2002	CNEAI Since 1989	ANEP Since 1986
<ul style="list-style-type: none"> • Offers external quality assurance to the university system. • Evaluates and accredits university lecturers in order to integrate the Spanish system into the European Higher Education Area 	<ul style="list-style-type: none"> • Performs an annual evaluation of research activity of university researchers and scientists in the CSIC (Spanish National Research Council) • Incentivizes research work and its diffusion both nationally and internationally 	<ul style="list-style-type: none"> • Evaluates scientific & technical quality of proposals seeking public funding or financing • Improves the capacity of the public Science and Technology system

Types and proportions of collaborations, as well as productivity calculated by counting the number of publications per person and year. The impact factor (IF) of the journals is other of the most important criteria used. The most common database used in Spain is the ISI WoS.

Table 2. Main Indicators used by Spanish Agencies for evaluation of researches.

Indicators used	ANECA	CNEAI	ANEP
Output	✓	✓	✓
Normalized Impact			✓
High Quality Publications (Q1/D1)		✓	✓
Leadership			✓
Cites per Document		✓	✓

Conclusions and recommendations

The employment of excellence indicators (10% most cited papers in their respective fields or in top-journals), should be more extended. Moreover, other aspects as leadership and visibility should be also bear in mind.

For measuring individual investigators other indicators as the h-index or normalized indicators as the crown or the SNIP should be recommendable. Moreover, self-citations are usually not considered and much less uncitedness, which is not considered at all. It would be also interesting to think about the number and percentage of documents cited and not cited.

In order to have a more global and complete evaluation it would be essential to combine different indicators and develop an evaluation program allowing a multidimensional, comprehensive assessment, depending on the needs and objectives of the assessment. Furthermore, differences should be taken into account within different subject areas. For instance, as indicated by the ANEP, in the context of health sciences it should be considered if the results of basic research and preclinical are transferred to clinical or applied science (e.g. through clinical guidelines) and to innovation. To that effect, the number of patents or utility models should also be taken into consideration.

Recent recommendations, as the "San Francisco Declaration on Research Assessment", confirm the high importance to review the way scientific research is evaluated.

As a final point, other alternative sources and toolkits, for instance the F1000 Journal Rankings, ALTmetrics or Article-Level Metrics, should be also taken into account as an alternative approach to evaluate the scientific impact of scholarly communications.

Finally, the way scientific production is measured in Spain seem not to be really accurate and the instruments used are not taking advantage of the real evolution of Bibliometrics science. Perhaps current development of bibliometric units in universities and research institutions could help to

maximize benefits from the bibliometrics advances.

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