

Model of the productivity and scientific impact of Spanish emergency physicians

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Bibliometric evaluation of scientific activities has increased in recent years due to increasing access to databases through the Internet and the fact that some authors publish data and indicators drawn from indexed work. There are various sources of data, such as the Web of Science (WOS) and Scopus, which are multidisciplinary, and in the biomedical field, PubMed. To publish work in journals included in these databases is a major aspiration of researchers, particularly in WOS because productivity and citation data from this database are used to calculate journal impact factors and other indicators, published annually in the Journal Citation Reports (JCR) of Thomson Reuters. Scientific community interest in bibliometric studies is evident from data published in Pubmed, which in early July 2013 allowed access to 5431 MeSH bibliometric records, which went from 189 papers indexed in 2001 to about 600 in 2012. The combination of this MeSH with those describing the different facets of Emergency Medicine yields 50 articles, most of them related to the quality of publications, impact factor, the most cited papers and the subsequent publication of communications presented at congresses.

Bibliometric analysis of productivity and the impact of research activity focused on the authorship of publications is infrequent for several reasons. First, for the numerous errors in the denomination of author names in different databases, which causes loss of information and possible distortion of the results. Secondly, for author reticence about publicly disclosing such data. Finally, because the evaluation of research activity is all the more complex as the entity being measured becomes smaller, so it is more difficult to evaluate individual scientists than large institutions or com-

munities. Thus, the recent work by Burbano et al¹ on the production and scientific impact of a group of Spanish emergency physicians (EPs) is an innovative contribution to the field of bibliometric studies which complements previous works, some of which have been published in EMERGENCIAS². The working assumption is that the gross output of an author, without considering other contextual parameters, is not an accurate reflection of his/her research career and worth. The uniqueness of the contribution is that it provides a model that predicts the scientific production and quality of the authors in subsequent years. One of its strengths is that it allows assessment of the worth of junior researchers, as opposed to "classic" indicators which may underestimate their real relevance because of their disadvantage with respect to investigators with a prolonged trajectory¹. In addition, the model can detect alterations in the rate of scientific production by the researchers.

There are many interesting results of the study, one of which is striking for us: that the journal EMERGENCIAS was not the leading journal selected by researchers to publish their work, but rather "Medicina Clínica", with lower ranking in its category (Medicine, General & Internal). This does not coincide with the results of a previous study comparing the scientific production of Spanish EPs in recent 5-year periods², where EMERGENCIAS monopolized about 40% of the production, compared with 8% for "Medicina Clínica". This may be due to the latter's wider scope and more prolonged trajectory, with about 19,000 records in the Web of Science since 1973, compared with almost 700 of EMERGENCIAS since 2008. It is also evidence of the variability of bibliometric indicators depending on the source of data extraction.

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Another result that deserves to be highlighted and at the same time is worrying is the poor international visibility of our publications. Thus, although the authors indicate that half of the journals are Spanish and half are foreign, judging from Figure 1 of the article, most of the work has been published in Spanish journals (*Medicina Clínica*, *EMERGENCIAS*, *Revista Clínica Española*, *Revista Española de Cardiología*).

The previously mentioned study² found that none of the top 10 indexed journals selected were English language publications. Therefore, despite having at their disposal a specific high-impact journal in Spanish (*EMERGENCIAS* 2012 impact factor is 2.578 and is in the top three of its category)³, our EPs should also submit their work to English language journals as this is the international language of science, with greater visibility and impact^{4,5}.

The limitations of the study are those of its source of data WOS with a marked bias in favor of the English language journals, although WOS has tried to compensate for this in recent years introducing the program Web of Science Content Expansion of Thomson Reuters⁶. This program has allowed the inclusion of more than 1,600 new journals during the period 2007-2009, including *EMERGENCIAS* and other Spanish journals. Other important limitations, mentioned by the authors, are due to the nature of the indicators derived from citations⁷, which place junior researchers at a disadvantage with respect to established researchers¹. Finally, the role of other variables such as researcher gender is unknown, but some studies⁸⁻¹⁰ published in biomedical journals have shown inequality between men and women, with the phenomenon known as the "scissors effect", ac-

ording to which, as the number of papers published increases, the number of women authors decreases. This vertical segregation phenomenon produces marked differences in productivity and impact between researchers and should also be taken into account¹¹.

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