EDITORIAL

Notes on the Bibliometric Context of *Revista Española de Cardiología*

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In bibliometrics, one of the most widely used sources is Thomson-ISI, the company that continues to be considered a world leader in its field, among other reasons, because its databases have been collecting bibliographic references of publications since the early 1980s. Recent technological developments at Thomson-ISI enable everyone to evaluate individually the visibility of their research by analyzing the number and nature of the citations their publications receive. In Spain, individual analysis of publications is possible thanks to support we receive from the government foundation for science and technology (Fundación Española de Ciencia y Tecnología or FECYT), an organization funded by the Spanish Ministry of Education and Science that provides access to the "Web of knowledge" (WoK) for members of Spanish academic and healthcare institutions. Thru access to the WoK, perhaps already one of the most popular Thomson-ISI products, Spanish authors can learn whether their publications have been cited, and verify the origin of these citations. The fact that this knowledge is currently available to individual authors is highly positive in that it contributes to correct the widespread abuse of bibliometric indicators seen, for example, in the permanent confusion between the impact factor of journals and the impact of individual's publications, or the superficial and unjust application of these parameters in certain types of evaluation.[1] However, the scope of citation analysis, including the concept of impact factor, may change in the future due to the appearance of competitors such as Google Scholar or Elsevier's Scopus, for the monopoly currently held by Thomson-ISI. These initiatives offer alternative citation rankings that, logically, do not coincide with the Thomson-ISI strategy.

From another perspective, as we know, the impact factor of journals is calculated from the citation ranking received. This consolidated indicator is a reference for scientific publications analyzed annually in the Thomson-ISI Journal of Citation Reports (JCR). In the JCR for 2005, *Revista Española de Cardiología* had an impact factor of 1.769 and can be said to be in very good health. Other bibliometric data corroborate this, so we invite readers to examine the position of *Revista Española de Cardiología* in the Thomson-ISI databases and the field of Spanish biomedical production. To do so, we turn to the information added to the bibliometric map of Spanish scientific production in biomedicine and health sciences, recently updated to cover 1996-2004.[2] In this update, *Revista Española de Cardiología* is the Spanish language biomedical journal with the highest impact factor and, together with *Revista de Neurología, Medicina Clínica,* and *Revista Clínica Española,* it is one of the 4 largest, Spanish contributors of biomedical documents to the Thomson-ISI databases. In fact, between 1996 and 2004, of move than 84 000 documents recorded on the biomedicine map, 1077 correspond to documents from *Revista Española de Cardiología*. To a greater or lesser degree, most of these 1077 documents originate from the same institutions that produce most documents on cardiovascular topics recorded in these databases and published in English-language journals, ie, hospitals such as the Clínic, Barcelona; Gregorio Marañón, Madrid; Vall d'Hebron, Barcelona; Clínico San Carlos, Madrid; Sant Pau, Barcelona; or La Paz, Madrid, to mention some of the most active.[2] If we compare the list of most productive centers on cardiovascular topics on the biomedical map, including international journals, with the list of most productive centers in *Revista Española de Cardiología*, as reported by Valderrama-Zurián et al in the present issue,[3] we find that the order is rather different in consonance with the different nature of the more prolific research groups in Spain and their publication habits.

In the Thomson-ISI databases, *Revista Española de Cardiología* is classified thematically in the discipline "Cardiovascular system." During 1996-2004, 2868 documents by authors resident in Spain were recorded in this field and these documents received 17 129 citations. Logically, *Revista Española de Cardiología* is the publication that contributed the greatest number of documents to this area: the 1077 documents already

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mentioned make up 37.6% of all documents on cardiovascular topics and almost 90% of documents on cardiovascular topics originating in Spanish-language journals. However, the number of citations collected by these documents (1844) represented only 10.8% of the total in the field, which is below the international mean, although this is logical given the nature of the journal. In line with this, the percentage of documents not cited in the subgroup corresponding to *Revista Española de Cardiología* was higher than the mean (40.7%) and the percentage of documents representing international collaborations, much lower (2.6%). During the period 1996-2004, authors resident in Spain publishing in international English-language journals mostly appeared in *American Journal of Cardiology, Journal of the American College of Cardiology, European Heart Journal, Cardiovascular Research, International Journal of Cardiology, American Heart Journal* (in each case with >50 documents in this period). In terms of visibility, based on the number of citations received, Spanish publications on cardiovascular topics in *The Lancet* (11 documents), *New England Journal of Medicine* and *JAMA* (5 documents each) stand out. The fact that the proportion of citations per document received by the original articles in *Revista Española de Cardiología* should be inferior to that of more competitive cardiovascular journals is coherent with the opportunities available to a Spanish-language journal despite its international nature. As it originally publishes in Spanish, *Revista Española de Cardiología*, fulfills a very clear objective in the field of Spanish cardiology that cannot be achieved by other journals in the field publishing in English. It would be interesting to conduct a detailed citation analysis to learn to what extent the inclusion of articles translated into English via the *Revista Española de Cardiología* web has contributed to wider international dissemination of articles published in the journal. In any case, absolutely no conflict arises between journals that publish in Spanish and those that publish in English, as each fulfills its own objectives. In the light of the results and the evolution observed, if *Revista Española de Cardiología* did not exist or were to change its orientation (and with this change achieve greater international success), another Spanish journal in the field of cardiology would have to appear to fill the gap that it currently covers.

In the present issue, Valderrama-Zurián et al[3] publish an interesting bibliometric study on the importance of scientific collaboration as the cornerstone of documents published in *Revista Española de Cardiología* during the period 2000-2005. They present an authentic x-ray of the authors who shape *Revista* and confirm its specific function within the Spanish scientific and health care community. Some findings in Valderrama-Zurián et al[3] serve to examine the similarities and differences in document types published in *Revista Española de Cardiología* by comparison with parameters obtained in other English-language international journals. Again, we return to the data added to the biomedical map[2] about documents on cardiovascular topics published by authors from Spain during the period 1996-2004. With regard to the importance and nature of collaboration, we can only compare Valderrama-Zurián et al's conclusions[3] with our data on collaboration within regions (or autonomous communities) and internationally. We cannot undertake analysis of collaboration between institutions in the same city or the same autonomous community due to the fact that Thomson-ISI does not link addresses with authors. Thus, it is impossible to distinguish between the increasingly frequent occurrence of authorship by a particular individual (a physician at a hospital who at the same time is a university professor) and actual collaboration between research groups at 2 different institutions within the same region. Valderrama-Zurián et al[3] calculate mean collaboration between autonomous communities as 15.41% for the period 2000-2005. This is comparable with the 12.0% observed in the biomedical map for *Revista Española de Cardiología* if we bear in mind that, in our case, we included all documents published in the *Revista*, ie, including those conducted in unacknowledged collaboration between Spanish institutions.[2] What is clear is that this type of collaboration has increased notably over time. According to our data, throughout Spanish biomedicine, collaboration between regions has grown from 3.1% in 1981-1985 to 12.5% in 1996-2004.[2] In 1994-2000, collaboration between autonomous communities was already 7.9%,[4] so incentives to collaboration, such as the network initiatives of the Instituto de Salud Carlos III (Madrid), must be succeeding. However, from a bibliometric point of view, collaboration between autonomous communities per se does not attract more citations, whereas international collaboration does.

In effect, in bibliometrics the phenomenon by which documents produced in international collaboration (studies authored by individuals from different countries) are well-known to receive much higher mean citation rates. For example, in Spain, 27.1% of biomedical documents are published in international collaboration, and this subgroup accumulates >47% of the citations received. This asymmetry is an international phenomenon that reflects the transformation of the social structure of scientific endeavor, the greater need for collaboration that science currently demands, the disappearance of barriers, availability of new technologies, and recent governmental policies on science and technology. In a word, bibliometrics follows the concept of international collaboration as an indicator of globalization. According to regularly-published, US National Science Foundation indicators,[5] international coauthorship in the world has grown from 8% in 1988 to 20% in 2003. In Spain, international collaboration in biomedical documents has grown from 6% in 1981-1985 to 27.1% in 1996-2004[2]; a figure that has yet to reach the mean of 30%-40% typical of most European countries.[6,7] According to our data, the

rate of international collaboration of *Revista Española de Cardiología* would be 2.6%, with a maximum of 5.2% in 2003; data coherent with the 4.02% for 2000-2005 that Valderrama-Zurián et al[3] obtain.

We have yet to evaluate the more than 70 very productive authors in *Revista Española de Cardiología*, as well as the 25 groups of authors described by Valderrama-Zurián et al.[3] To be exact, the profile of these authors and of the groups detected is as much what defines the *Revista* as is its function. This is not an exact photograph of cardiovascular research in Spain in that some specific, highly prolific authors in *Revista Española de Cardiología* do not demonstrate a comparable level of activity in English-language journals in the discipline. Moreover, in Spain, there are certainly some very active cardiovascular research groups who publish little in *Revista Española de Cardiología*. Shortly, we will present a map of cardiovascular research groups in Spain, commissioned by the National Center for Cardiovascular Research (Centro Nacional de Investigaciones Cardiovasculares). Using algorithms that analyze the frequency of coauthorship of publications, and with the direct participation of Dr Ginés Sanz as subject area expert, we have detected and defined >90 groups in what can be broadly-defined as cardiovascular research, (including cerebrovascular). By comparing both spectrums we will have new data to categorize the extraordinary function that the highly respectable *Revista Española de Cardiología* covers.

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