



Editorial

Quantifying research activity in the emergency department

As I mentioned recently in another editorial¹, one of the most frequently used data sources for bibliometric analysis is Thomson Scientific (which includes ISI). Recent technological developments allow us to evaluate the visibility of our research work, document by document, based on the number of citations received. This has been made possible with the help of the Spanish Science and Technology Foundation (FECYT), an organisation associated with the Department of Education and Science, which finances and manages access to the Web of Knowledge (WoK) for members of academic and medical institutions in Spain. In my opinion this access is a very positive step given that it helps to rectify the generalised incorrect use of bibliometric indicators including the ongoing confusion between the impact factor of magazines and the impact factor of their individual articles or the superficial and unfair use of these parameters in certain types of evaluations for example². However, as I also mentioned¹, the scope of the citation analysis, which includes the concept of the impact factor, may change in the future due to the emergence of new competitors for ISI, like Google Scholar or Elsevier's Scopus. These are programmes which offer alternative citation counts which obviously do not coincide with ISI's specific strategy.

One of the main limitations of ISI products is that they classify articles by magazine and not according to the specific content of the document. For example, a potentially brilliant research paper on endocrinology, which has been published in JAMA or The Lancet would end up being classified under general or internal medicine according to ISI and would never be found in the scientific area of endocrinology. Therefore, it must be stated that the JCR and other ISI classification subject areas do not accurately represent any particular medical specialisation or scientific field. We have tested different strategies to try to overcome these limitations, from manually filtering the documents (a huge task which requires experts in each discipline and sub-specialisation)⁴ to using algorithms to reclassify documents using reference words from either the title, key words section or the abstract of the article. A good example of this is the map of research groups specialising in the cardio-cerebrovascular field, which we published recently⁵. In order to create this map we started with a collec-

tion of documents which we obtained using search algorithms based on key words. Using this technology we recovered almost 7000 different documents compared to the 2672 documents classified by the ISI Journal of Citation Reports (JCR) under the subject area "cardiovascular system" published during the same period (1996-2004). Furthermore, within the JCR "clinical neurology" subject area, the total number of documents accumulated was 3116⁵ when only one part of the article was related to cerebrovascular research. Consequently, these research strategies which also require experience, resources and external assessment are the only ones that allow us to extract a collection of documents on specific subjects like, for example, an analysis of "disseminated intravascular coagulation" or on specific fields in the case of the emergency department.

We have now published two valuable studies undertaken by Dr Miró and other collaborators^{6,7}, one in our previous edition and another in this edition of EMERGENCIAS. These are considered valuable because they are the first studies which try and embody the research and scope of articles in the field of emergency medicine in Spain and because this kind of work can only be carried out when a medical specialisation has established itself to a certain degree. As Dr Miró and his colleagues highlighted⁶, from 1995 until the present day we have noticed sustained growth in the number of documents signed by Spanish emergency physicians. In fact, the authors have been using an inspired search strategy which involves detecting documents which include the signature of an institution that contains key words related to an emergency department and/or unit. However, the authors also acknowledge the fact that this search strategy has its drawbacks given that it can only detect a subset of documents whose authors identify themselves as part of the emergency department. In other words, this is a search strategy which does not permit the inclusion of other documents on emergency subjects which have been generically signed by medical institutions without specifically stating the medical department or unit even though they have been provided by someone in the emergency department. Furthermore, it does not permit the inclusion of articles written by doctors on duty in the emer-

gency department who belong to other departments when the content of their articles is based on patients or subjects which fall under the category of emergency medicine. Consequently, it is very likely that research activity related to emergency medicine in Spain is higher than expected, although in order to quantify it, an additional, more complex study would be necessary.

The considerable study carried out by Dr Miró and his colleagues^{6,7} which was published in EMERGENCIAS can be validated from our own perspective. In fact, starting with the "Bibliometric map of Spain 1996-2004"³ database and using the same search strategy employed by Dr Miró and his colleagues, we have extracted and analysed the documents signed by the emergency departments in Spain. Therefore, we can check whether the data we have obtained is comparable with the data obtained by Dr Miró and his colleagues⁶ over the last nine years of research. This involves adding further quantitative information to the compared data which corresponds to the cumulative citations received for the documents up until March 2005. The results we obtained included a collection of 277 documents with an average of citations per document (CD) of 3.85, which is higher than the CD of 3.02 of Dr Miró's whole series of documents which spans 30 years of work and includes over 600 documents. It is fair to say that the research work of emergency physicians in the last nine years is much more visible than before, despite being generally below average on the biomedical map (the total average on the map is 8.55). We should add the following factors to the low CD quotient of articles related to emergency medicine over the last nine years; a high non-citation rate (40.1%) and a low international collaboration rate (7.6%). The geographical origins of these 277 documents also coincide with Dr Miró and his colleagues' findings in that the most productive autonomous communities are Catalonia and Andalusia. After that, Madrid and following far behind, the Basque Country and Valencia. When comparing all the data on the biomedical map, Andalusia's position, in second place ahead of Madrid in terms of research activity, stands out and is typical in this medical specialisation. This is a trend that does not appear in other disciplines according to our biomedical map. The articles which contain a signature from a centre in Catalonia have the highest citation/document quotient at 5.19 and have a lower non citation rate (27.4%) which is very similar to the average of the whole biomedical map (27.2%). With regard to the most productive centres over the last nine years of research, Dr Miró and his colleagues' ranking re-emerges with some interesting changes. Although Hospital Clínico in Barcelona

continues to occupy first place (30 documents, CD 6.3), the difference between Hospital Clínico and University Hospital Virgen del Rocío in Seville is much smaller (26 documents, CD 2.59) and University Hospital Virgen de las Nieves in Granada follows on from this (16 documents, CD 6.06). Even when dealing with total numbers of documents, which is an area which should be evaluated with caution, it seems clear that the map of research activity signed by emergency departments has been changing over the last few years because, now, large hospitals in Catalonia, Andalusia and Madrid have become a part of it. In the analysis of Dr Miró and his colleagues⁶ work which spans 30 years of study, the position of Hospital Clínico in Barcelona, which stands way out in front of other large hospitals, demonstrates that this is the Spanish medical centre which has been involved in this kind of research for the longest amount of time. However, we have noticed that other medical centres are beginning to generate an amount of annual research activity which is comparable to that of Hospital Clínico in Barcelona, at least in terms of the number of documents. There are very few additional evaluations that can be carried out with so little information although we will persevere with this task without undervaluing the efforts made in this specialisation to broaden understanding. We also acknowledge the limitations involved in cross-medical and bibliometric research activity which is difficult to quantify.

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