

A bibliometric study of *Revista Española de Enfermedades Digestivas* (REED) based on SciELO indicators for the period 2004-2018

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ABSTRACT

The aim of this study was to show the potentialities offered by the SciELO network indicators for the management of scientific journals, via a case study involving the *Revista Española de Enfermedades Digestivas* (REED). SciELO offers indicators (production, collaboration, use) that complement the conventional analysis indices used for written science. In order to illustrate their use as a bibliometric, a descriptive study was performed of the scientific production published by the above-mentioned journals during the period 2004-2018. In the last five years, REED received 3,976,685 visits. The second issue from 2007 was the most widely accessed sample to date. A total of 173 issues, 1,810 citable articles, 2,927 documents and 47,645 references have been published, with the number of published papers increasing by 268 %. Clinical case reports make up the highest number. REED received a total of 3,613 citations, with a self-citation rate of 60 %. Of all published documents, 42 % originated in Spain and 10.6 % abroad. Group authorship predominates over individual authors, with a median and mode of 5. The cooperation index was 5.12. The highest impact factor was 0.492 in 2008. The journals most commonly cited by REED are all foreign publications in the Gastroenterology and Hepatology section of the Science Citation Index.

Keywords: Scientific and technical publications. Bibliometrics. Bibliometric indicators. SciELO.

INTRODUCTION

SciELO was developed in Brazil more than 20 years ago when international indices restricted their coverage to the so-called mainstream journals. Thus, ignoring a whole universe of publications in developing and non-English-speak-

ing countries (1,2). SciELO was conceived as a project to overcome the phenomenon known as "lost science" (3), to offer solutions for the lack of indexation and the resulting lack of visibility, use and impact of their journals (1,2). SciELO was fostered by the Centro Latinoamericano y del Caribe de Información en Ciencias de la Salud (Bireme/OPS/OMS) in collaboration with the Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) based on two innovative approaches. On the one hand, indexation of national quality journals as a supplement to international indices, and on the other hand, publication of freely available full-text papers on the Internet in the modality now known as "golden road" (4). Today, SciELO operates as a large network of national collections from 14 Iberoamerican countries plus South Africa, and includes the international themed collection called SciELO Public Health. As a whole, this network indexes over 1,700 journals from all areas (approximately 30 % related to health science journals) and provides access to more than 870,000 articles. With a mean growth rate of over 40,000 articles per year, the mean daily downloads amount to in excess of 1.5 million (4).

In parallel, SciELO has set up a database for bibliometric indicators and journal use, citation, impact and co-authorship markers, which may be used for editorial management studies or reports to supplement those provided by other databases such as Web of Science (WoS) and Scopus. As in all databases, these indicators exclusively reflect the citations received from other journals registered in the SciELO system. SciELO's Reports Module includes all indicators available for the whole journal collection and searches may

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be performed for one or more headings over several years, which allows the analysis of any specific topic area or group of journals. The SciELO bibliometric indicators are included in the "SciELO Metrics" section in the journal's own page. Available indicators for every journal in the collection include: site use reports (with data on access to journals, installments, and articles); publication statistics (with access to the SciELO Analytics portal: <https://analytics.scielo.org/?collection=esp>); and journal citation reports (impact factor over two years, impact factor over three years, half-life, citations received and given).

The *Revista Española de Enfermedades Digestivas* (REED), the official body of the Spanish Society for Digestive Diseases (SEPD), has continuously been published on a monthly basis since 1935. It is one of the most representative Spanish health science journals, both at a national and international level (5,6), and a key instrument in the development of digestive medicine in Spain. It includes papers concerning all branches of the specialty published as original, reviews, case reports, etc., representing multi-profile contents.

The goal of this study was to demonstrate the potentiality of SciELO bibliometric and journal use indicators available at the metrics section in the SciELO Spain collection, in order to update the data reported by previous assessments (7,8). REED was taken as a reference, being one of the longest-standing journals in the database.

MATERIALS AND METHODS

For this analysis, data from 2004-2018 were collected from SciELO Spain. The data collection date was February 21-23, 2020.

RESULTS

REED has been in the SciELO Spain collection, maintained by the National Library of Health Sciences, Instituto de

Salud Carlos III, since 2004 and is one of the longer-standing journals in the Spanish database. Currently, 173 issues are available, which represent 1,810 articles, 2,927 documents and 3,610 received citations.

Journal use indicators

Journal accesses

Using SciELO Analytics for the Spanish collection (<https://analytics.scielo.org/w/accesos?journal=1130-0108&collection=esp>), we may gain insight into REED accesses starting from October 2015, with the possibility of selecting specific months. Over the last five years, the journal received a total of 3,976,685 visits (almost one million yearly). As shown in figure 1, the journal received approximately 1.5 million visits during 2017 and 2018.

Access to issues

We may also learn which issues are most commonly accessed within a specific period or rank the 100 most widely visited issues since indexation in SciELO, using the access-to-issues indicator. The indicator considers accesses to the tables of content, abstracts and articles, both in the PDF and html formats. The present case involves issue 2 of volume 99, published in 2007, with 210,784 visits.

Access to articles

The third indicator available in the site's usage reports module is access to articles, including the ranking of the 100 most consulted papers. This may be useful for the publishers and editors to learn which topics are the most interesting to readers and for authors as a means to quantify the impact of their contributions in the SciELO network. The first ten places in the ranking pertain to the "Patient information" section. The paper titled "*Preparación para la colonoscopia*", published in 2017, has been the most con-

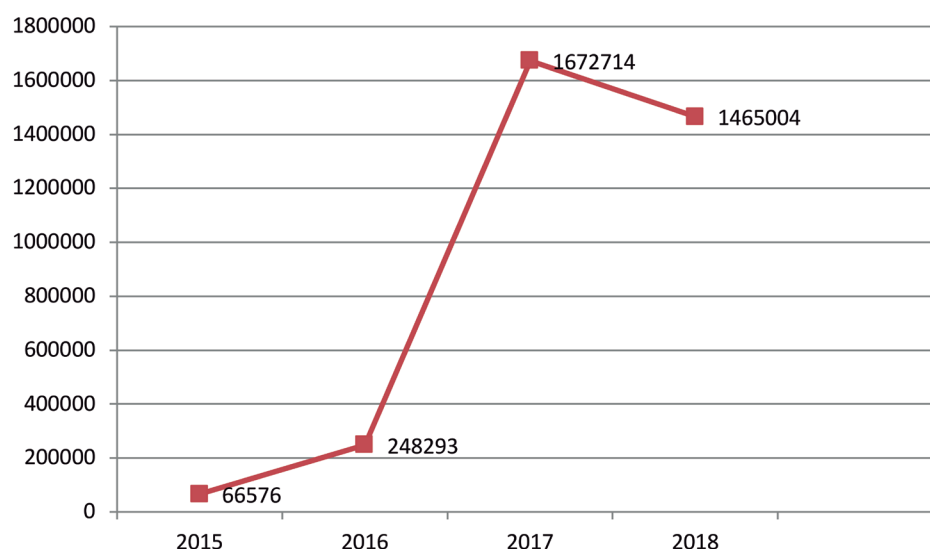


Fig. 1. Number of accesses to REED in 2015-2018. Source: own elaboration.

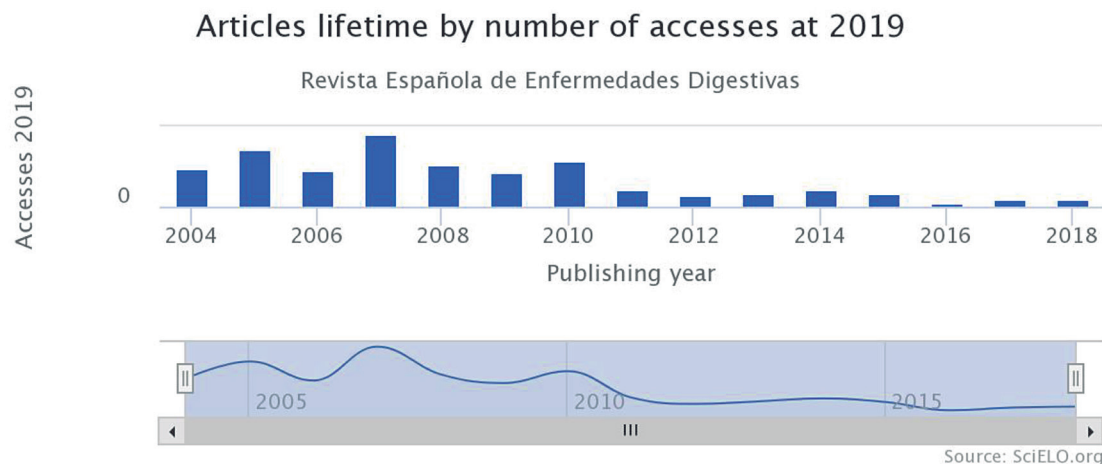


Fig. 2. Article half-lives by number of accesses in 2019. Source: <https://analytics.scielo.org/w/accesses#gráfico-de-tiempo-de-vida-de-los-documentos-por-el-número-de-acc>.

sulted contribution during the 15 years that REED has been available in SciELO Spain, with 181,215 visits. By clicking on the title, we see the indicators for this document (received quotations, number of accesses, altmetrics, etc.).

Half-life

Another item of interest offered by the indicators module is the article half-life graphic, with a variant as compared to the half-life estimated in the citations module. Here, calculations are based on the number of accesses received from 2015 onwards. We should recall that half-life is a bibliometric indicator to measure the ageing rate in journal documents based on citation numbers. Thus, a journal with a three-year half-life in 2019 means that half of the citations received by this journal in 2019 refer to articles published within the previous three years (9). In this case, we should replace citation numbers with paper access numbers. Thus, the most visited documents last year included those published in 2007 and 2010 (Fig. 2).

Production indicators (publication statistics)

Scientific production

Using the publication statistics module offered by SciELO Spain, data related to scientific production may be looked up. This includes the type of published documents, use of licenses, languages, year of publication, country of authors' affiliation, distribution of signatures per document and number of bibliographic references per document. Thus, during its 15 years in SciELO Spain, REED has published 173 issues, 1,810 articles (i.e., "citable" documents with bibliographic references) and 2,927 documents, and has generated 47,645 references. Periodicity has been monthly during all these years, except for 2012, 2013 and 2014, where eleven, ten, and eight issues were published, respectively. The most productive year during the study period was 2017, with 247 articles. The type and number of papers published per issue remains nearly constant: 5-6 originals;

one review; 4-5 clinical notes and 3-4 letters to the editor (Table 1).

The "Total documents" column includes the total number of papers published in any modality: articles, editorials, reviews, obituaries, etc. In REED's case, the annual total of

Table 1. REED production during the period 2004-2018

	No. of issues	No. of articles	No. of documents	Average articles per issue
2004	12	92	147	7.67
2005	12	84	171	7.00
2006	12	81	172	6.75
2007	12	106	214	8.83
2008	12	117	220	9.75
2009	12	98	203	8.17
2010	12	98	193	8.17
2011	12	99	195	8.25
2012	11	106	181	9.64
2013	10	96	163	9.60
2014	8	95	132	11.88
2015	12	187	213	15.58
2016	12	193	222	16.08
2017	12	247	284	20.58
2018	12	111	217	9.25
Total	173	1,810	2,927	10.46

Source: SciELO Spain.

articles increased by 268 %, from 92 published in 2004 to 247 in 2017, with no changes in regularity and an overall mean of 10.5 articles per issue. Figure 3 shows the relationship between articles and documents during this period. Distribution per document type (Fig. 4) shows the concentration around case reports, research articles and letters to the editor. The English language predominates, with 1,984 documents (67 %), *versus* 942 (32 %) in Spanish and one in Portuguese.

Geographical origin of authors

The geographical distribution of the authors (Fig. 5) occurs primarily within Spain, with 1,598 documents (42 %) from Spanish institutions *versus* 406 documents by foreign authors (10.6 %). In all, 47 % of documents (1,804) do not

include author affiliation, which should be borne in mind by the people responsible for the journal in order to correct this. Of note, the total number of documents according to author affiliation does not match the total number listed in table 1, since documents may have more than one author and more than one country of origin. For instance, a paper signed by authors from Italy, France and Spain would count three times, since the signatures would involve three different countries.

Of the 406 documents signed by foreign authors, 62 % correspond to Iberoamerican countries, primarily Portugal. This represents a highly sizeable increase in foreign authorship when compared to the 2 % found by Delgado López-Cózar et al. (7). In 2010, REED published its first paper from China and 45 documents from this country have been published since then. It is possible that these data bear a

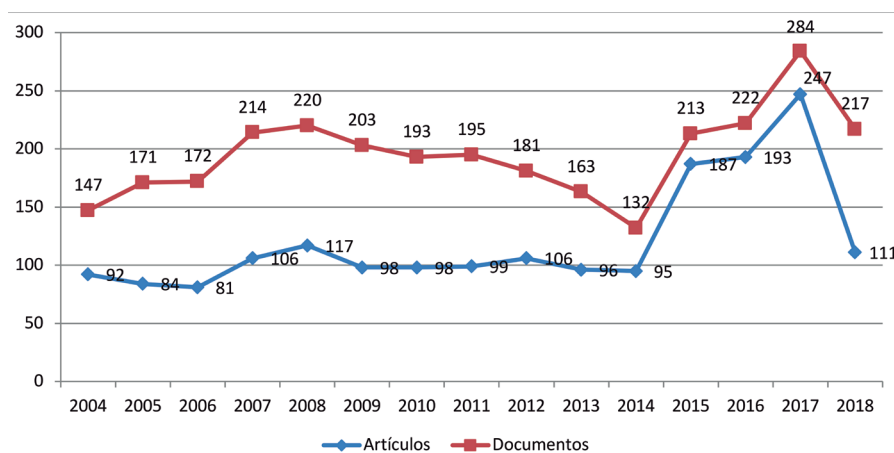
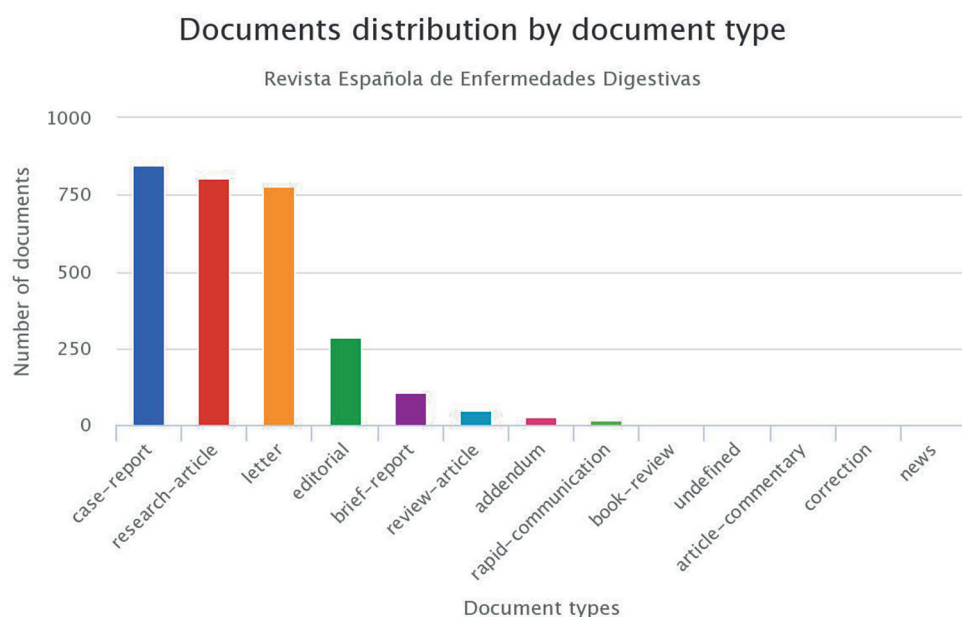


Fig. 3. Relationship between articles and published documents. Source: own elaboration.



Source: SciELO.org

Fig. 4. Distribution by type of document published by REED. Source: <https://analytics.scielo.org/w/publication/article?journal=1130-0108&collection=esp#document-types>.

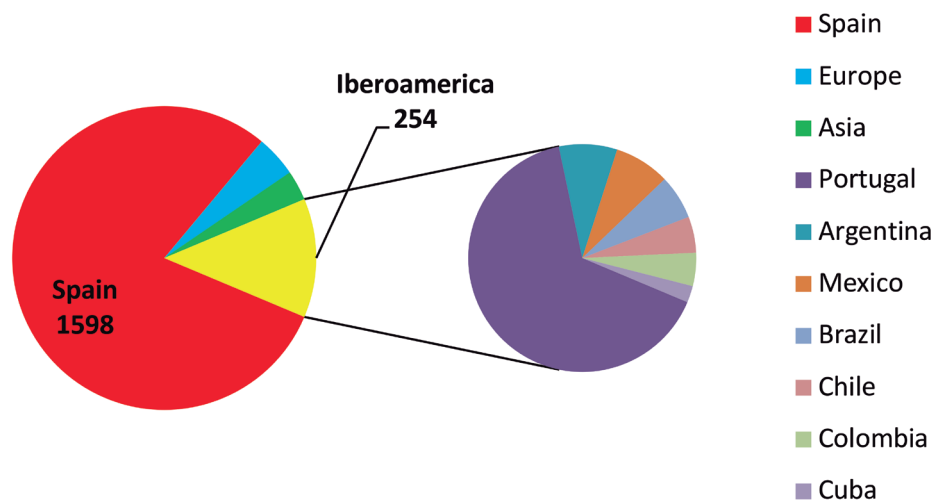


Fig. 5. Institutional affiliation of REED authors. Source: own elaboration.

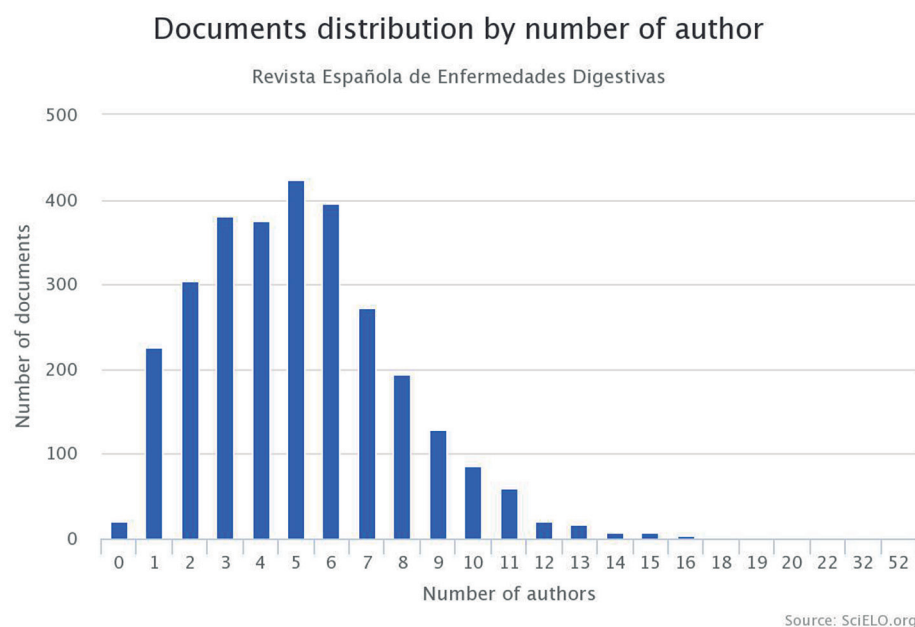


Fig. 6. Number of authors distribution. Source: <https://analytics.scielo.org/w/publication/article?journal=1130-0108&collection=esp#number-of-authors>.

strong relationship to language, as the journal has always been published in Spanish, but there is a bilingual Spanish and English format since 1997. This likely increased the interest of researchers in other regions to consider REED as a means to circulate their work.

A total of 15,005 authors have signed the published papers, with a minimum of one and a maximum of 52 per article (Fig. 6), and a median and mode of 5; the 25th percentile corresponds to three authors and the 75th to seven authors. No author was recorded in 20 papers.

As may be seen in figure 6, group research predominates over individual research. In this respect, REED displays the characteristic behavior of medical science journals at present.

Collaboration index

The collaboration index (ratio between number of authors/signatures and number of documents) is the primary indicator of collaboration in reported scientific production. The value was 5.12, which is very similar to the previous bibliometric study about REED (7).

Citation indicators

The third bibliometric report module deals with journal citation indicators such as source data (number of installments, articles, and citations), impact factor (referred to two- and three-year periods), article half-life, received citations and given citations.

Impact factor

The impact factor (IF) was devised by Eugene Garfield in 1955 (10) to measure the influence and impact of journals among the scientific community. It is estimated based on the number of citations received for published articles in a given journal. For a given year, the IF is the ratio between the number of citations received in a journal within the previous two years and the total number of articles published in those same two years (for the denominator only so-called "citable articles", i.e., originals and reviews are considered). Despite multiple criticisms because of its limitations (11,12), it is deemed the most widely used indicator to assess the quality of scientific journals, to allot resources by funding agencies and to evaluate production by scientists and institutions (13). Today, the IF is annually reported in the Journal Citation Reports (JCR) based on the data collected by the Science Citation Index and Social Sciences Citation Index (all of them are included in the so-called Web of Science [WoS], currently owned by Clarivate Analytics).

From SciELO, the IF of any specific journal can be accessed, based on the number of articles indexed in databases and for a period of two or three years. In the case of REED, figure 7 shows the evolution of its IF over two and three years. The maximum values were reached in 2008, with an IF of 0.492 at two years and of 0.4576 at three years. In 2018, REED achieved an IF of 0.28, with 1.9 being the maximum recorded in the health sciences category.

Since the IF calculation is based on figures obtained in the previous two or three years, no data are available for years 2004 and 2005, when REED was included in SciELO Spain. In 2006, the required cumulative number of citations is already present and the indicator becomes available. The graph shows no significant difference in IF between the two- and three-year periods.

Half-life

Another calculated indicator is citation half-life, which measures the obsolescence of scientific literature and as

mentioned above, refers to the number of years it takes a journal to receive 50 % of citations. In the SciELO database, this is expressed as a cumulative percentage of citations in a given year for articles published during the specified period. The half-life of REED articles oscillate between three years for 1999 and seven for 2019. Thus, 50 % of the citations received by the journal in 2019 referred to articles published from 2012 to 2019.

Citations received and given

SciELO quantifies the citations received from all journals within the SciELO network. The number of both received and given citations by REED may be requested and the year(s) of publication and article citation may be selected. When several or all years are selected, the system provides the cumulative total of received citations and so individual year-by-year requests are needed to obtain the evolution of citations on a yearly basis (Fig. 8). The number of citations received and the citing journals are provided in the result. REED received 2,672 citations, 60 % of these from articles published in REED (self-citations). Furthermore, the Brazilian *Arquivos de Gastroenterologia* journal had most citations to REED. Table 2 lists the 20 headings that most often cited REED during the period 2004-2018.

The year where published articles were most cited was 2008. Of note, according to figure 8, the received citations plots exhibit a decreasing trend over more recent years in virtually all cases. This is normal and does not necessarily mean that journal impact is ebbing, since citation behavior is cumulative in nature. Journals start to receive citations after inclusion in databases and they accumulate as years go by and subsequent articles provide citations.

In SciELO's case, the indicator for citations in journal articles shows the cited journal's title in one year or in total, the source where in the cited journal is indexed and the total number of citations given to this journal. Thus, REED gave a total of 45,970 citations. The most cited publication, with 2,276 (5 %) citations, was *Gastrointestinal Endoscopy*, followed by REED and eight additional journals in the Gastroenterology and Hepatology field.

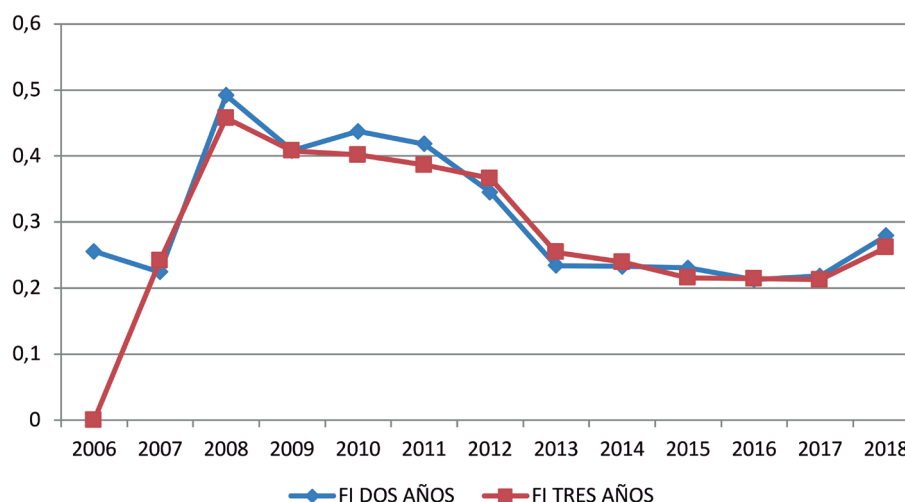


Fig. 7. Evolution of REED's IF in SciELO. Source: own elaboration.



Fig. 8. Total number of citations received by REED. Source: own elaboration.

An insight into the 100 most widely cited articles by a given journal is also possible. In the case of REED, the most cited articles primarily include articles published in foreign journals not included in the SciELO network. Excluding REED, no other SciELO journal was among the 100 most cited publications and only three titles were in Spanish: *Gastroenterología y Hepatología*, *Cirugía Española* and *Medicina Clínica*.

The number of works cited by authors in their papers oscillates between zero references in 548 documents and 39 references in 21 documents, with an average of 10.81 references per published paper and a median of 6. To be precise, REED guidelines currently allow a maximum of 35 references, although this figure was 50 in other periods.

FINAL CONSIDERATIONS

The usage and impact indicators described in the present paper for the journals in SciELO Spain may supplement those provided by the JCR and Scopus databases. These are more commonly used, as they inform on how a journal is doing within the SciELO platform, which provides a better coverage of how information is produced, disseminated and used in the Iberoamerican region.

From the data discussed here, the recognition of REED among foreign researchers, not only in Iberoamerica but also in other regions, has increased. However, the number of articles with foreign affiliation remains scarce, which is an aspect that should be discussed by the journal's editorial team.

The most cited journals originate in the Gastroenterology and Hepatology field and, as in other medical science areas (14), journals at the top of the JCR ranking have the highest number of citations. This is once more an acknowledgment of the significance authors place on the impact factor, as calculated based on journals indexed in WoS.

Another relevant element is the persistence of high self-citation rates, which should be resolved in order to achieve a

Table 2. The journals that cite REED the most within SciELO

	Citing journal title	Granted citations
1.	<i>Revista Española de Enfermedades Digestivas</i>	2,187
2.	<i>Arquivos de Gastroenterologia</i>	78
3.	<i>Revista Colombiana de Gastroenterología</i>	69
4.	<i>GEN</i>	63
5.	<i>Revista de Gastroenterología del Perú</i>	60
6.	<i>Anales de Medicina Interna</i>	57
7.	<i>GE-Portuguese Journal of Gastroenterology</i>	48
8.	<i>Revista Chilena de Cirugía</i>	43
9.	<i>Revista Cubana de Cirugía</i>	41
10.	<i>Nutrición Hospitalaria</i>	36
11.	<i>Journal of Coloproctology (Rio de Janeiro)</i>	33
12.	<i>Revista Colombiana de Cirugía</i>	31
13.	<i>Anales del Sistema Sanitario de Navarra</i>	30
14.	<i>Revista Médica de Chile</i>	28
15.	<i>Revista do Colégio Brasileiro de Cirurgiões</i>	27
16.	<i>ABCD. Arquivos Brasileiros de Cirurgia Digestiva (São Paulo)</i>	24
17.	<i>Revista Médica Electrónica</i>	24
18.	<i>Revista Archivo Médico de Camagüey</i>	23
19.	<i>Revista Cubana de Medicina</i>	23
20.	<i>Medisan</i>	22

Source: http://statbiblio.scielo.org/stat_biblio/index.php?no=09.xml&state=09&lang=es&issn=1130-0108.

greater impact at the international level. The data obtained on scientific production and collaboration index are similar to those of other journals dealing with health sciences in the Iberoamerican region (14,15).

We believe that the present analysis will be useful to the journal's editorial committee as it provides information on its outreach in the Iberoamerican region, which may prompt strategies to enhance its influence within the appropriate scientific community.

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