

Title:

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

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

ABSTRACT

The goal of this work was to show, through a case study involving the *Revista Española de Enfermedades Digestivas* (REED), the potentialities offered by the SciELO network indicators for the management of scientific journals. SciELO offers indicators (production, collaboration, use) that complement the conventional analysis indices used for written science. In order to illustrate their uses a bibliometric, descriptive study was undertaken of the scientific production published by the above-mentioned journal over the period 2004-2018. In the last 5 years REED received 3,976,685 visits. The second issue of 2007 is the most widely accessed sample to this day. 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 60 % of self-citation. Of all published documents, 42 % originate 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.

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-speaking countries (1,2). Conceived as a project to overcome the phenomenon known as “lost science”(3), and 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; 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 % pertain 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, 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 that 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 be performed for one or more headings over several years, which allows to analyze any specific theme area or group of journals. In a journal's own pages in SciELO bibliometric indicators are included in the "SciELO Metrics" section. 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), official mouthpiece of the *Sociedad Española de Patología Digestiva*, continuously published since 1935 on a monthly basis, 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 our specialty published as originals, reviews, case reports, etc., representing multiprofile contents.

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

MATERIALS AND METHODS

For this analysis data from the 2004-2018 period 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 *Biblioteca Nacional de Ciencias de la Salud, 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/accesses?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 5 years the journal received a total of 3,976,685 visits (almost 1 million yearly). As shown in Graph 1, the journal received 1.5 million visits, approximately, during 2017 and 2018.

Access to issues

We may also learn which issues were 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 tables of contents, abstracts and articles, both in the pdf and html formats. The present case involves issue 2 of volume 99, published in 2007, with a total of 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, which may be useful for the publishers and editors to learn which topics are most interesting to readers, and for authors as a means to quantify the impact of their contributions in the SciELO network. Thus, we may see that the first 10 places in the ranking pertain to the "Patient information" section, with the paper titled "*Preparación para la colonoscopia*", published in 2017, being the most consulted contribution during the 15 years that REED has been available in SciELO Spain, with a total of 181,215 visits. By clicking on the title we may 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 graph, 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. Let us recall that half-life is a bibliometric indicator to measure ageing rate in journal documents based on citation numbers. Saying that a journal has a 3-year half-life in 2019 means that half of the citations received by said journal in 2019 refer to articles published within the previous 3 years (9). In this case we should replace citation numbers with paper access numbers.

Thus, last year, most visited documents included those published in 2007 and 2010 (Graph 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: type of published documents, use licenses, languages, year of publication, country of authors affiliation, distribution of signatures per document, and number of bibliographic references per document. Thus we may observe that during its 15 years in SciELO Spain REED has published 173 issues, 1,810

articles (that is, “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 11, 10, and 8 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; 1 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 articles increased by 268 %, from 92 published in 2004 to 247 in 2017, with no changes in regularity, and with an overall mean of 10.5 articles per issue. Graph 3 shows the relationship between articles and documents during said period.

Distribution per document type (Graph 4) shows concentration around case reports, research articles, and letters to the Editor. English is the language that predominates (1,984 documents (67 %) versus 942(32 %) in Spanish and 1 in Portuguese.

Geographical origin of authors

The geographical distribution of undersigned authors (Graph 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 data, 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 additional documents from this

country have been published since then. It is possible that these data bear a strong relationship to language—the journal has always been published in Spanish, and in bilingual Spanish and English format since 1997, which likely poked the interest of researchers in other regions to consider REED a means to circulate their work.

A total of 15,005 authors have signed the published papers, with a minimum of 1 and a maximum of 52 per article (Graph 6), and a median and mode of 5; the 25th percentile corresponds to 3 authors and the 75th to 7 authors. No author was recorded in 20 papers.

As may be seen in graph 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), which is the primary indicator of collaboration in reported scientific production, is 5.12, very similar to the previous bibliometric study about REED (7).

Citation indicators

The third bibliometric reports module deals with journal citation indicators: source data (number of installments, articles, and citations), impact factor (referred to 2- and 3-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 2 years and the total number of articles published in those same 2 years (for the denominator only so-called “citable articles”, that is, 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 we may access the IF of any specific journal, based on the number of articles indexed in databases and for a period of 2 or 3 years. In REED's case, graph 7 shows the evolution of its IF over 2 and 3 years; maximum values were reached in 2008, with an IF of 0.492 at 2 years and of 0.4576 at 3 years. In 2018 REED achieved an IF of 0.28, with 1.9 being the maximum recorded in the health sciences category.

Since IF calculation is based on figures obtained in the previous 2 or 3 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 2- and 3-year periods.

Half-life

Another calculated indicator is citation half-life, which measures the obsolescence of scientific literature and, as was 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 cumulative percentage of citations in a given year for articles published during the specified period. REED articles half-life oscillates between 3 years for 1999 and 7 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 of 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 (Graph 8). The number of citations received and the citing journals are provided in the result. REED has received a total of 3,613 citations, 60 % of these from articles published in REED (self-citations); furthermore, the Brazilian *Arquivos de Gastroenterologia* is the journal with 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, when observing graph 8, received citations plots exhibit, in virtually all cases, a decreasing trend over more recent years, which 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 said journal. Thus, REED gave a total of 45,970 citations. The most cited publication, with 2,276 (5 %) citations, is *Gastrointestinal Endoscopy*, followed by REED and 8 additional journals in the Gastroenterology and Hepatology field.

Also possible is insight into the 100 most widely cited articles by a given journal. In REED's case we may see that the most cited articles primarily include articles published in foreign journals not included in the SciELO network. Excluding REED, not a single SciELO journal may be found among the 100 most cited publications, and only three titles are Spanish: *Gastroenterología y Hepatología*, *Cirugía Española*, and *Medicina Clínica*.

The number of works cited by authors in their papers oscillates between 0 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, which 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 in the recognition of REED among foreign researchers, not only in Iberoamerica but also in other regions, may be said to have increased, although the number of articles with foreign affiliation remains scarce—an aspect, we suggest, that should be discussed by the journal's editorial team.

Most cited journals belong in the Gastroenterology and Hepatology field, and, as is also the case in other medical science areas (14), it is journals at the top in the JCR ranking that concentrate the highest number of citations. This is once more an acknowledgement of the significance authors place on the impact factoras calculated based on journals indexed in WOS.

Another relevant element is the persistence of high self-citation rates, which should be solved in order to achieve a 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 committeeas 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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Table 1: REED production during the period 2004-2018 (source: SciELO Spain)

	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

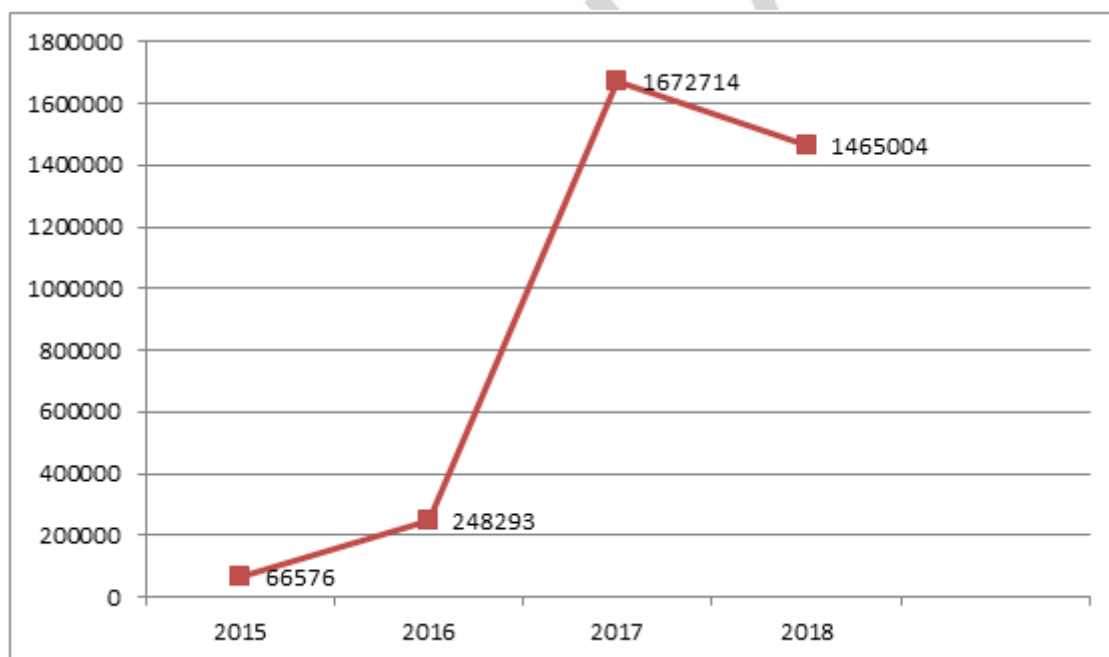
Table 2: The journals that cite REED the most within SciELO

	Citing journal title	Granted citations
1.	REVISTA ESPAÑOLA DE ENFERMEDADES DIGESTIVAS	2187
2.	ARQUIVOS DE GASTROENTEROLOGIA	78
3.	REVISTA COLOMBIANA DE GASTROENTEROLOGIA	69
4.	GEN	63
5.	REVISTA DE GASTROENTEROLOGIA DEL PERU	60
6.	ANALES DE MEDICINA INTERNA	57
7.	GE-PORTUGUESE JOURNAL OF	48

	GASTROENTEROLOGY	
8.	REVISTA CHILENA DE CIRUGIA	43
9.	REVISTA CUBANA DE CIRUGIA	41
10.	NUTRICION HOSPITALARIA	36
11.	JOURNAL OF COLOPROCTOLOGY (RIO DE JANEIRO)	33
12.	REVISTA COLOMBIANA DE CIRUGIA	31
13.	ANALES DEL SISTEMA SANITARIO DE NAVARRA	30
14.	REVISTA MEDICA DE CHILE	28
15.	REVISTA DO COLEGIO BRASILEIRO DE CIRURGIOES	27
16.	ABCD. ARQUIVOS BRASILEIROS DE CIRURGIA DIGESTIVA (SAO PAULO)	24
17.	REVISTA MEDICA ELECTRONICA	24
18.	REVISTA ARCHIVO MEDICO DE CAMAGUEY	23
19.	REVISTA CUBANA DE MEDICINA	23
20.	MEDISAN	22

(source:

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

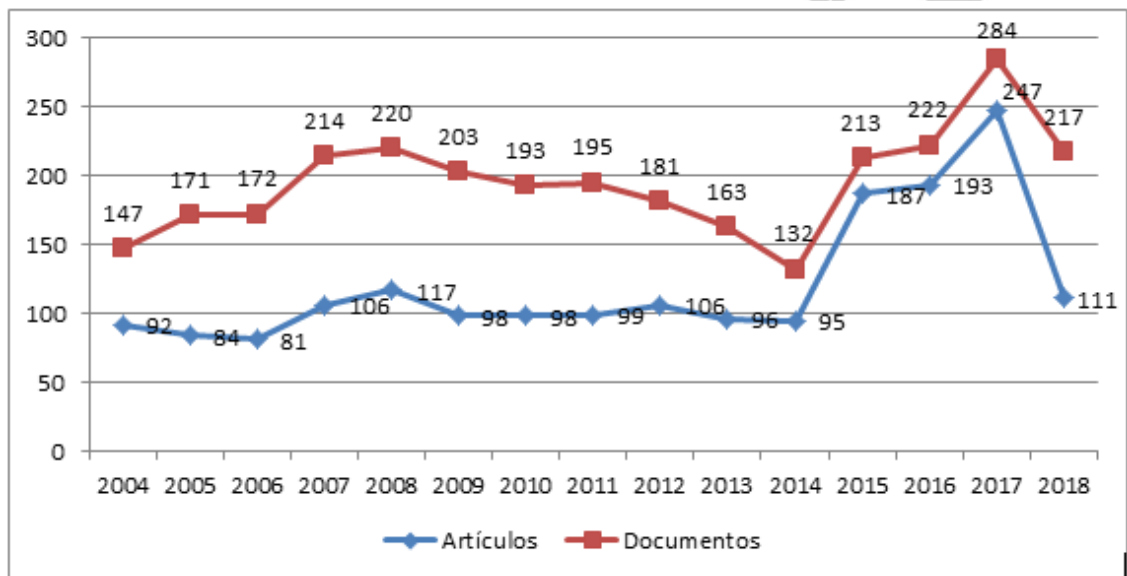


Graph 1: Number of accesses to REED in 2015-2018 (source: own elaboration).

Articles lifetime by number of accesses at 2019

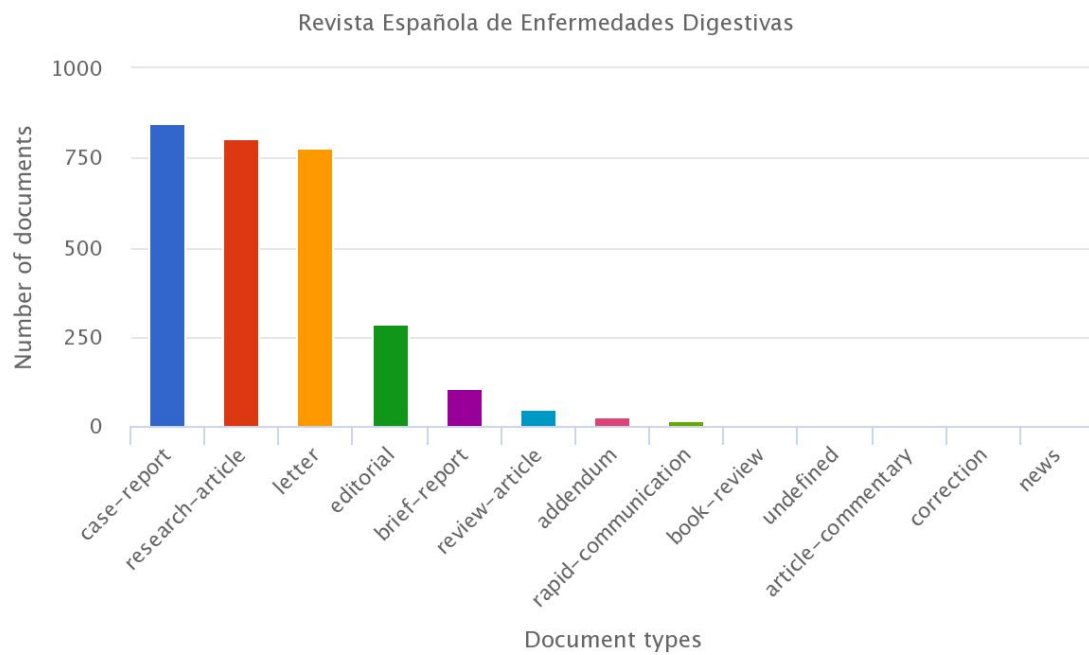


Graph 2: Article half-lives by number of accesses in 2019



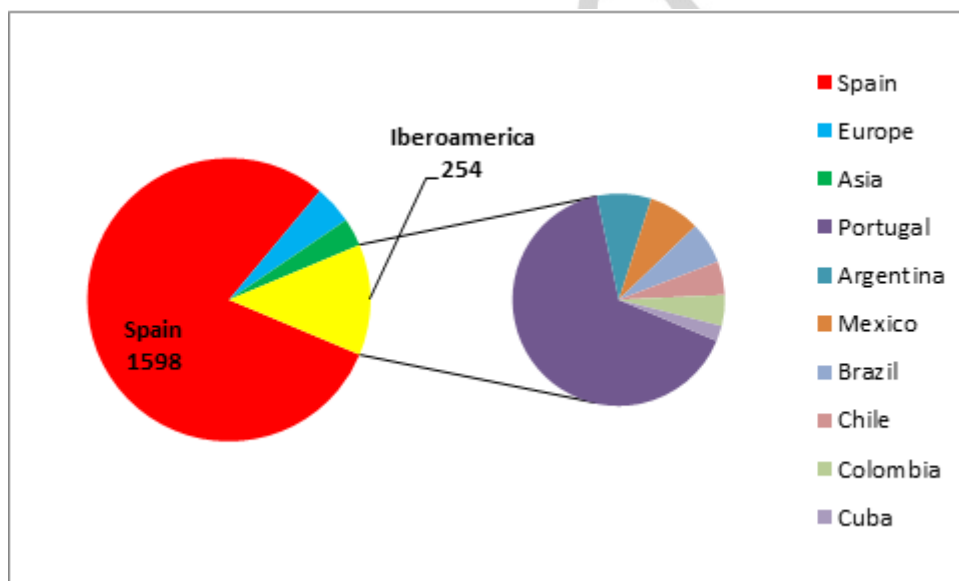
Graph 3: Relationship between articles and published documents

Documents distribution by document type



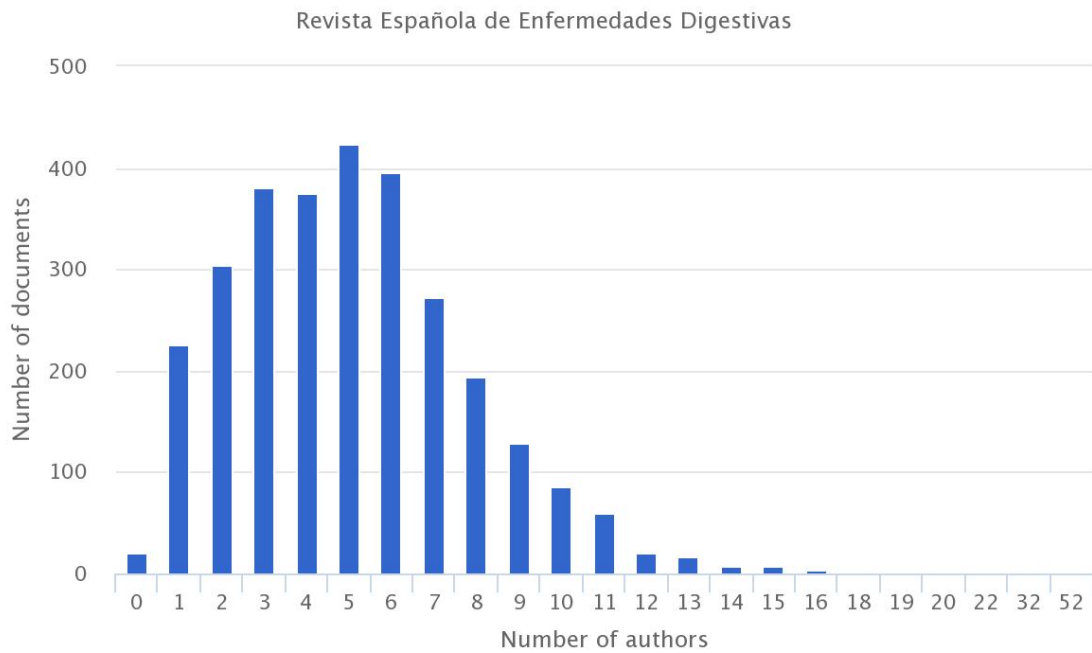
Source: SciELO.org

Graph 4: Distribution by type of document published by REED



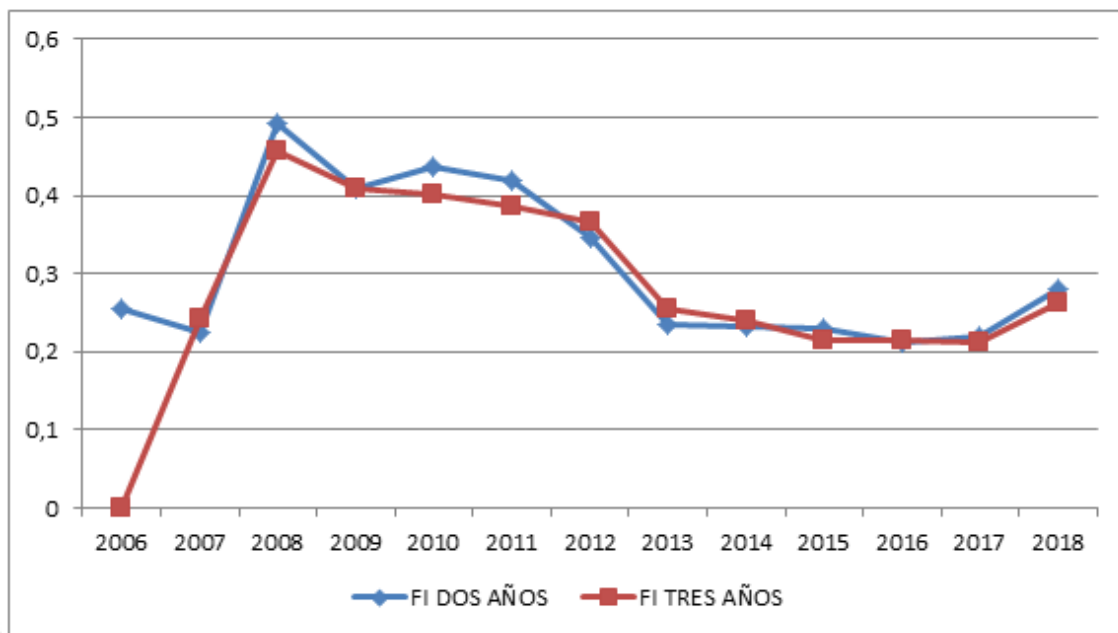
Graph 5: Institutional affiliation of REED authors

Documents distribution by number of author

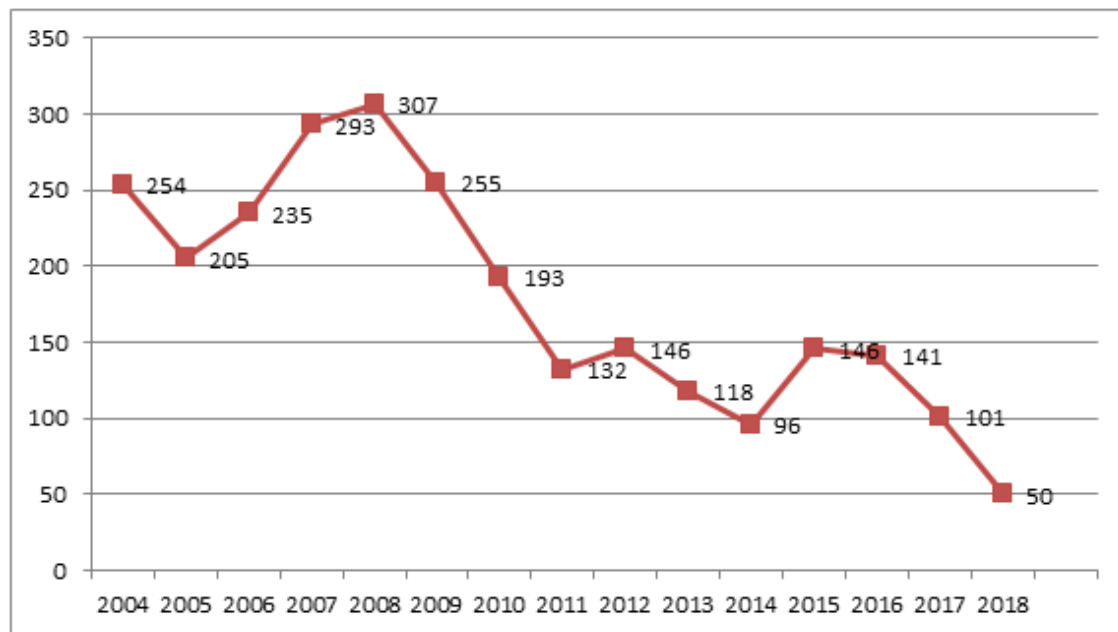


Source: SciELO.org

Graph 6: Number of authors distribution



Graph 7: Evolution of REED's IF in SciELO



Graph 8: Total number of citations received by REED