

# Bibliometric Analysis of the *Journal of Medicine and Movies* (2005-2008)

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## Summary

The purpose of the paper was to characterise the *Journal of Medicine and Movies* by carrying out an exploratory study of the articles published during 2005-2008. The data were obtained from the journal by extracting information about *articles, authorships, bibliographic references, key words and covers*. Quantitative bibliometric production and consumption indicators were calculated.

Original papers were recorded in a percentage of 54%; concerning authorships, a cooperation index of 1.82 authors/article was stated and 52% were signed by a single author. The authors' geographical place of origin showed a predominance of Salamanca, followed by a growing participation of authors from other places in Spain.

The average number of quotes per article was about 8, comparable to the results of the bibliometric map of Spain, Price Index being close to 39%.

The most indexed documents were books and articles from scientific journals and 47% of the total of the references came from documents in Spanish.

The *Journal of Medicine and Movies* has evolved satisfactorily, keeping within the general indicators of other stronger scientific journals and can be considered a landmark for the use of film as a means of access to medical knowledge.

**Keywords:** Journal of Medicine and Movies, Bibliometry, Periodical publications, Cooperation, References.

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## Introduction

The bibliographic databases have a structure and organisation in normalised fields (authors, title, editorial, name of the magazine, publication year, workplace, descriptors, bibliography) that are not only one of the main information sources on publications, but also offer a great variety of retrieval elements for the elaboration of bibliometric studies<sup>1</sup>.

Bibliometry studies a discipline's nature and progress by means of the analysis of the different aspects of written communication<sup>2</sup>. In this sense, it is noted that such studies are in themselves a discipline with a multidisciplinary scope that, through the analysis of variables present in publications, enables a closer approach to the situation of a scientific field<sup>3</sup>.

Bibliometric studies can stem from both the analysis of the total bibliographic production of a scientific branch, and from more specific analysis units such as books, magazines, doctoral dissertations, articles in magazines, scientific terms, authors, disciplines or university departments. Within them we can identify two different fields: Descriptive Bibliometry, which comprises papers concerning quantitative aspects, and Assessment Bibliometry, which adds the assessment of the scientific activity to the description, going into the analysis of the content, which is an important contribution for the creation of the so called "invisible schools", circles or networks that help in the development of an area of knowledge<sup>4</sup>.

In recent years, an important number of bibliometric studies in the field of biomedicine have been published in Europe and America as testified, among

others, by the contributions made by Cruz<sup>5</sup> and Ramos et al<sup>6</sup>. In Spain such studies were introduced three decades ago<sup>7</sup> and, from then on, several health magazines have spread them<sup>8-14</sup>.

The *Journal of Medicine and Movies* is a Spanish bilingual publication whose main purpose is to form, inform, arouse the critic spirit and observation ability and enable the expression of capacities and interests in a sector of the health care professions that is interested in assessing the approach of films to medical aspects<sup>15</sup>.

On completing the second volume, its editors assessed it, dealing with quantitative aspects as well as reflecting on its progress<sup>15</sup> and, in that sense, the purpose of this paper is to characterise the journal by performing a descriptive bibliometric study of the sectors which the content of each number comprises, starting from articles published during all the years it has existed.

## Material and Methods

The *Journal of Medicine and Movies* is a bilingual publication (Spanish–English), with free distribution and electronic subscription. It started in 2005, edited by Ediciones Universidad de Salamanca (*ISSN 1885-5210*) and in it film material is presented and analysed for its subsequent use as an education tool to teach different aspects linked to health processes – illness.

The publication appears regularly, it is released every three months and 16 numbers have already been edited (4 a year). Its content is structured in the following sub-sections: *Editorial comment*, *Editorial*, *Originals*, *Editors' forum* and *Medicine in stills*. Some numbers also include *Medicine in film scenes* and *Correspondence* and, since 2007, *On the cover*.

In order to carry out a descriptive-retrospective bibliometric study of all the available collection, the material to be analysed consisted of the articles published between 2005 and 2008, corresponding to volumes 1 to 4, defining as an article that which provides contents that have not been previously published and that have been subjected to peer review.

The data were obtained from the journal's web page (<http://www.usal.es/revistamedicinacine>), extracting the following information:

- *On the articles*: Number per volume, number and sub-section.
- *On the authorship*: Number of authors in each sub-section, number of signatures per volume and place of origin.
- *On the bibliographic references*: Number of quotes per article, number of references per volume and number, amount depending on language, publication year and documentary type, which in this paper is coded in journals, books, dissertations, conferences and presentations of papers at scientific congresses, press articles, official data and bases or web pages.
- *On key words*: Number per article and per volume and number.
- *On the covers*: Record of their description.

Quantitative bibliometric production indicators were calculated as well as the cooperation index or number of signatures/paper and that of the references per article/year and of consumption as well as the Price Index consisting in the percentage of references that do not date back more than 5 years<sup>16,17</sup>.

Basic descriptive statistics were obtained (average and standard deviation) for the quantitative variables, and frequency distributions were obtained for qualitative variables with the purpose of carrying out an exploratory analysis to describe the behaviour of the available information.

## Results

### *On the articles*

During the 2005-2008 period the *Journal of Medicine and Movies* has published 99 papers. Table 1 shows the distribution per volume and total number of articles that made up the analysis units for this paper, the average  $\pm$  standard deviation being  $5.25 \pm 0.50$ ,  $5.75 \pm 0.50$ ,  $6.75 \pm 0.50$  and  $7.00 \pm 0.82$  articles for each volume with a total number of  $6.31 \pm 0.87$  articles per volume.

The distribution of the articles in sub-sections is part of the general structure of the journal, reckoning a total of 19 *Editorial comments* and/or *Editorials* (19%), 53 *Originals* (54%), 13 *Editors' forums*

Table 1. Distribution of the number of articles published per volume and number in the *Journal of Medicine and Movies*

Volume	Number	Number of articles/Number	Total per volume
1 2005	1	5	21
	2	6	
	3	5	
	4	5	
2 2006	1	5	23
	2	6	
	3	6	
	4	6	
3 2007	1	7	27
	2	7	
	3	6	
	4	7	
4 2008	1	7	28
	2	8	
	3	7	
	4	6	
<b>Total</b>		<b>99</b>	<b>99</b>

(13%), 12 articles concerning *Medicine in stills* and *Medicine in film scenes* (12%) and 2 *Correspondences* (2%) in the 16 numbers.

*On the authorship*

Concerning the authors' participation in the elaboration of the documents, tables 2 and 3 show the distribution of the papers according to the number of signatures, classified by year of publication and by sub-section.

The average cooperation index was 1.82 authors per article (standard deviation 1.08) and in table 2 it can be seen that most of the papers are signed by one (52%), followed by three (25%) and two (20%), the participation of more authors being very low (four 2% and eight 1%).

In the table above it can be appreciated that single authorship predominates among the *Originals* (37/53x100=70%) while the participation of two authors predominates among the *Editorial comments*

and/or *Editorials* (12/19 x100=63%), corresponding precisely to those signed by the Journal's Editors.

The distribution of the authors according to their geographical origin per volume appears in table 4. In it a clear predominance of signatories from Salamanca can be appreciated (56% of the papers) followed, as the years go by, by an increasing participation of authors from other places in Spain and other countries.

*On the bibliographic references*

In 86 papers belonging to the sub-sections *Editorial comment* and *Editorial* (17), *Originals* (53), *Editors' forum* (13), *Medicine in film scenes* and *Correspondence* (3) a total of 667 bibliographic quotes were included. Table 5 shows the distribution per volume, the index of references per article and the Price index. From it we can draw the conclusion that the highest number of quotes took place in 2007 and 2008, with 217 and 215 references, from 22 and 23 papers respectively. The average of quotes per article is 7.76 in the 4 years of publication, this number ranging between a maximum of 9.86 in 2007 and a minimum of 5.29 in 2005.

Concerning the obsolescence of the quotes, 258 not dating back more than 5 years were counted, which settles a Price index of 38.68%. The distribution of this index in years was similar to that of the whole (Table 5), being slightly higher in 2007 (45.16%).

The distribution of the references by type of document (Table 6) shows that 43.03% and 42.73% come, respectively, from *books* and *scientific journals*. The following most quoted type are *databases* and *web pages on the internet* (9.89%). *Statistics, reports, files* and *official legal rules* (1.65%), *Dissertations* and *Conferences and Presentations of Papers at Congresses* (1.35%) and *articles in newspapers* (1.35%) were indexed to a far lesser extent.

As far as language is concerned, (Table 6), 47.08% of the references come from documents in Spanish, 36.58% from documents in English, 13.79% from Spanish-English bilingual documents (which corresponds precisely to the *Journal of Medicine and Movies*) and 2.55% come from documents in other languages such as Italian, Portuguese and German. Spanish predominates in the quotes from *books* (218/287x100=76%), *Dissertations and Conferences and presentations of papers in congresses* (8/9 x100=89%) and *articles in newspapers* (9/9 x100=100%), and English prevails in

Table 2. Distribution of the number of authors per article in each volume of the *Journal of Medicine and Movies*

N°of authors/ paper	Volume 1	Volume 2	Volume 3	Volume 4	Total
1	9	12	16	14	51
2	7	4	4	5	20
3	4	6	7	8	25
4	1	1	-	-	2
8	-	-	-	1	1
Total	21	23	27	28	99

Table 3. Distribution of the number of authors per article in each sub-section of the *Journal of Medicine and Movies*

N° of authors/paper	Editorial Comment and Editorial	Originals	Editors' forum	Medicine in stills and in film scenes	Correspondence	Total
1	5	37	6	1	2	51
2	12	5	3	1	-	21
3	2	9	3	10	-	24
4	-	1	1	-	-	2
8	-	1	-	-	-	1
Total	19	53	13	12	2	99

*Scientific journals* (130/ 285 x100=46%), *Databases and web pages on the Internet* (40/66 x100=61%), and *Statistics, reports, files and official legal rules* (11/11 x100=100%).

Concerning the type of article, table 7 shows that the index of quotes per paper was higher in the sub-section Editors' forum (11.23%) and lower in Medicine in film scenes and Correspondence (3.33%), the values of Editorial comment and Editorial (6%) and of Originals (7.72%) being similar to the general index (7.76%).

#### On key words

In the sub-sections whose articles included key words the number per article was counted, resulting in an average of 4.97 per paper (standard deviation 1.52). The frequency distribution according to sub-

section and articles in general is shown in table 8, proving that papers with 4 and 5 key words make up 66% of the total.

#### On the covers

From the year 2007 onwards, a sub-section called *On the cover* was included in each number of the journal, in which its content is briefly described as transcribed in table 9.

#### Discussion

Bibliometric studies, whose purpose is the treatment and quantitative analysis of scientific publications, are part of science's social studies<sup>3</sup> using indicators that are valid measures to assess, among others, the levels of scientific production of a country, an establishment, an author or a publication<sup>13</sup> and to clas-

Table 4. Distribution of the geographical origin of the authors of the articles published in the *Journal of Medicine and Movies* according to volume

Country	City	2005	2006	2007	2008	Total per city	Total per country
Spain	Salamanca	17	13	15	10	55	83
	San Sebastián	-	-	2	4	6	
	Barcelona	-	1	2	1	4	
	Madrid	-	1	1	1	3	
	Leioa	-	-	1	2	3	
	León	1	-	-	-	1	
	Sevilla	-	1	-	-	1	
	Valencia	-	-	1	-	1	
	Barañain	-	-	1	-	1	
	Granada	-	-	1	-	1	
	Toledo	-	-	1	-	1	
	Santiago de Compostela	-	-	-	1	1	
	Ourense	-	-	-	1	1	
	Zamora	-	-	-	1	1	
	Girona	-	-	-	1	1	
	Valladolid	-	-	-	1	1	
Malaga	-	-	-	1	1		
Portugal	Lisboa	1	1	-	-	2	2
Argentina	Buenos Aires	1	3	2	1	7	13
	Rosario	1	2	-	2	5	
	Corrientes	-	-	-	1	1	
Bolivia	La Paz	-	1	-	-	1	1
Total		21	23	27	28	99	99

Table 5. Distribution of the number of references per article and Price Index according to volume of the *Journal of Medicine and Movies*

Volume	Nº of articles with references	Nº references <sup>a</sup>	Reference Index/ article	References < 5 years <sup>b</sup>	Price Index (a/b%)
1	21	111	5.29	42	37.84
2	20	124	6.20	47	37.90
3	22	217	9.86	98	45.16
4	23	215	9.35	71	33.02
Total	86	667	7.76	258	38.68

Table 6. Distribution of the number of references according to language and type of document in the *Journal of Medicine and Movies*

Language	Spanish	English	Spanish and English	Others	Total
Books	218	62	-	7	287
Scientific journals	53	130	92*	10	285
Databases and web pages on the internet	26	40	-	-	66
Statistics, reports, files and official legal rules	-	11	-	-	11
Dissertations and Conferences and presentations of papers in congresses	8	1	-	-	9
Articles in newspapers	9	-	-	-	9
Total	314	244	92	17	667

\*Corresponds to the *Journal of Medicine and Movies*

Table 7. Distribution of the number of references according to sub-section in the *Journal of Medicine and Movies*

Nº of quotes	Editorial Comment and Editorial	Originals	Editors' forum	Medicine in film scenes and Correspondance	Total of articles/nº of quotes
1	1	3	-	1	5
2	2	3	1	1	7
3	-	2	1	-	3
4	4	6	-	-	10
5	2	8	-	-	10
6	1	3	2	-	6
7	3	4	2	1	10
8	-	3	2	-	5
9	2	4	-	-	6
10	-	2	-	-	2
11	-	4	2	-	6
12	-	1	-	-	1
13	2	5	-	-	7
15	-	2	-	-	2
16	-	1	-	-	1
18	-	1	-	-	1
19	-	1	-	-	1
20	-	-	1	-	1
21	-	-	1	-	1
36	-	-	1	-	1
Total articles	17	53	13	3	86
Total of quotes/subsection	102	409	146	10	667
Index of quotes/article	6	7.72	11.23	3.33	7.76

Table 8. Distribution of the number of key words according to sub-section in the *Journal of Medicine and Movies*

Nº of keywords/ paper	Originals	Forum	Correspondence	Total of articles per keyword
1	-	-	1	1
3	3	1	1	5
4	17	4	-	21
5	19	5	-	24
6	7	2	-	9
7	4	1	-	5
9	2	-	-	2
11	1	-	-	1
Total	53	13	2	68

Table 9. Description of the covers of the 2007 and 2008 volumes of the *Journal of Medicine and Movies*

Volume	Number	Description
3 2007	1	University of Salamanca: detail of the façade of the historical building (16th century), the famous frog.
	2	University of Salamanca: façade of the Colegio Mayor Arzobispo Fonseca (16th century), now teachers' residence.
	3	University of Salamanca: Palacio de Anaya (18th century), staircase to access the first floor.
	4	University of Salamanca: Patio de Escuelas Menores (15th century).
4 2008	1	Baroque façade of the Universidad Pontificia de Salamanca (1617-1754), designed by the royal architect Juan Gómez de Mora.
	2	Palacio de Don Diego Maldonado. Plateresque façade designed by Juan de Álava (1530-1531). To be Centre of Brazilian Studies of the University of Salamanca.
	3	Palacio de Anaya (18th century). Neoclassical style. Architects: José Hermosilla and Sandoval (beginning of the 18th century – 1776) and Juan de Sagarvinaga (1710 – 1797). It is now the Faculty of Philology of the University of Salamanca.
	4	Casa de Francisco de Solís. Plateresque façade (16th century). It now harbours Ediciones Universidad de Salamanca.

sify scientific journals according to their production, circulation and impact<sup>16</sup>. In this sense, an analysis of the *Journal of Medicine and Movies* related to the articles published in it, the authorships, the bibliographic references and the key words has been made using both

production and consumption indicators.

Concerning the type of document, the result was 54% of original papers, placing this journal in an intermediate position between the 42% obtained by

the *Spanish Paediatric Annals*<sup>14</sup> and the 56% of the Spanish scientific production in the cardiovascular area<sup>18</sup> or the 59% of *Mappfre Medicine*<sup>19</sup>. Nevertheless, the fact that the *Journal of Medicine and Movies* has published a considerable number of originals would point towards an editorial policy targeted at spreading new production among the scientific community while widening its offer with the publication of other types of document such as *Editorial comments* and/or *Editorials*, *Editors' forums*, *Medicine in stills* and *Medicine in film scenes* or *Correspondences*.

Concerning the analysis of the authorships, the average cooperation index of 1.82 authors per article is slightly above the average of 1.51 signatures/paper in *Science*, *Hispanic-American journal of pure and applied sciences*<sup>20</sup> and the *Psychology Yearbook*<sup>21</sup> and close to the 2.22 value of the *Spanish journal of drug addiction*<sup>22</sup> and that of 2.27 signatures/article of *Psicothema*<sup>23</sup>. However, it is noticeably below that of other Spanish journals such as the Spanish Journal of Public Health with an average of 4.5<sup>13</sup> and the total Spanish average of the biomedical area which is between 3 and 3.5 authors/paper<sup>24</sup>.

Although shared authorship is more frequent nowadays<sup>25</sup>, the distribution of the papers according to the number of signatures allowed us to see that most of them (52%) were signed by a single author. Given the fact that similar situations have been recorded for publications such as *Psychology Yearbook* and *Journal of Sex Research*, with the highest percentage of all the papers with single authorship (68% and 39% respectively)<sup>21,26</sup>, it is possible to think that the kind of articles in these journals, as opposed to what takes place in experimental sciences, favours a special form of individual reflection.

The authors' geographical place of origin shows a predominance of Salamanca – city where the journal is published – followed, as the years go by, by a growing participation of authors from other parts of Spain. Concerning other countries, some Hispanic ones take part, as in the *Spanish Journal of Public Health*<sup>25</sup> and, mainly *the Argentinean connection*<sup>27</sup> which made a contribution of 14% of the overall production. In this sense, the prospects and opening towards other horizons of this publication have been very positively appreciated by editors<sup>15</sup>.

The bibliographic references are a source of data that allows the knowledge of what kind of information the authors consume and of how fast that

information becomes outdated<sup>9</sup>. The average number of quotes per article in the *Journal of Medicine and Movies* is approximately 8, comparable to the result shown in the bibliometric map of Spain for the 1994-2002 period, which is situated at 7.6 references per document<sup>28</sup>, and evidently below that obtained in studies on medical areas, with values of 21<sup>29</sup>, 24<sup>12</sup> o 25.7 references per paper<sup>30</sup>.

The consumption indexes such as the Price Index provide information on the obsolescence of scientific production. The estimated value close to 39% cannot be considered low for this type of publication, being similar to that obtained in other studies, with Price indexes higher than 35%<sup>31</sup> or 40%<sup>30</sup> and higher than the 28% obtained by the references in *Science*, *Hispanic-American journal of pure and applied sciences*<sup>20</sup> even when articles referring to very dynamic fields, which usually have very high numbers, are published in them.

Concerning the type of document indexed, books and articles from scientific journals were the most quoted (43% for both), followed by databases and web pages on the internet (10%), the use of other types of document being much less frequent. The predominance of quotes from other journals is in accordance with most of the publications, although it tends to be higher as in the case of the 68% obtained by the *Spanish journal of public health*<sup>30</sup>, while the high percentage in the use of books could be justified by the main purpose of the *Journal of Medicine and Movies* which is to form, inform, and arouse the critic spirit and observation ability<sup>15</sup> that would find support in works of longer endurance.

As far as publication language is concerned, 47% of the total of the references came from documents in Spanish, a similar figure to the 51% in the quotes of the *Spanish Journal of Public Health*<sup>30</sup>, but much higher than the data from other Spanish journals like the 20% obtained by *Clinical Medicine*<sup>32</sup> or the 8% of the more specialised *Dermosyphiliographic Records*<sup>33</sup>. However, if we divide it according to the type of document, Spanish predominates among the quotes from books (78%) and English, as the official language of science, was the most frequently used among the references of periodical publications (78% including the bilingual journal).

As far as key words are concerned, an average of 5 per article was proved, making their usefulness evident for the analysis of papers according to



subject and for the description of aspects which could be of interest to the readers<sup>1</sup>.

Finally, a special reference should be made, from my point of view, to the valuable covers of the collection. In each of them there are photos of historical and very beautiful buildings in Salamanca, which favours the knowledge and disclosure of beauties both from the historical University and from the city.

It could be concluded that, in general, the *Journal of Medicine and Movies* has evolved satisfactorily, keeping within the general indicators of other stronger scientific journals. Although a quantitative bibliometric analysis does not provide direct elements to assess the quality of the production of a publication<sup>13</sup>, the study carried out can be used as an indicator of the scientific-humanistic activity which has taken place during the last 4 years with the use of film as an element for the creation of attitudes towards science and as a means of access to knowledge<sup>34</sup>.

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Translation by the team of the Languages Service of the University of Salamanca.

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