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Fallen Journals 2023. Implications for Spanish science of the expulsion of journals from the Web of Science

Fallen Journals 2023. Implicaciones para la ciencia española de la expulsión de revistas en Web of Science

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Abstract

This work analyzes the impact of the expulsion of 82 journals (15 of them mega-journals) from Web of Science on March 20, 2023, on the science produced in Spain. It shows their weight by universities and focuses on the production of International Journal of Environmental Research and Public Health -IJERPH (MDPI), the journal with the most Spanish publications in recent years and that has been expelled. If mega-journals account for 62%, IJERPH has 78.5% of the total. Private and smaller universities seem to have more dependence on these journals. Only in IJERPH, Spanish articles have had a total cost above 12 million euros in the last 5 years. The document reflects on the perversions derived from the Spanish evaluation system, its protagonists and how these demerits are encouraged, by not being persecuted, but rewarded.

Keywords

Scientific Journals; Web of Science, Expelled Journals, Scientific Fraud, Science Policy, Spain.

Resumen

Este trabajo presenta cómo afecta a la ciencia producida en España la caída de estas revistas fraudulentas, viendo su peso por universidades. Además, se profundiza en la producción de la revista International Journal of Environmental Research and Public Health -IJERPH (MDPI), revista donde más españoles han publicado en los últimos años y que también ha sido expulsada. Si las mega-journals suponen el 62% de los artículos de este conjunto IJERPH tiene un 25,4% del total, sin embargo, representa el 78,5% de los artículos españoles. Son las universidades privadas y más pequeñas las que parecen tener más dependencia de estas revistas. Tan sólo en IJERPH se estima que los artículos españoles han tenido un coste total por encima de los 12 millones de euros en los últimos 5 años. Al final del documento se reflexiona sobre las perversiones derivadas del sistema español de evaluación, de sus protagonistas y de cómo se fomentan estos deméritos, al no ser perseguidos, sino recompensados.

Palabras clave

Revistas Científicas; Web of Science, Revistas Expulsadas, Fraude Científico, Políticas Científicas, España

1. Introduction

On 20 March 2023, controversy erupted in a post by Nandita Quaderi, editor-in-chief and vice president of Web of Science. The post was entitled "Supporting the integrity of scholarly records: Our commitment to curation and selection in Web of Science" in which it was announced in the subtitle that "More than 50 journals were delisted this year for not meeting our quality selection criteria" (Quaderi, 2023a).

The announcement came as a surprise for at least three reasons. The first has to do with timing. Usually, the lists of expelled journals or journals placed under surveillance are published together with the interim edition of the Journal Citation Reports, at the beginning of the summer (the last one was on 28 June 2022). The second has to do with the volume of the list, which, as will be seen later, far exceeds the figures of the last editions. The figure contrasts sharply if we compare it with the 8 publications that were expelled in the last edition (Clarivate, 2022). One has to go back to the beginning of the last decade to find similar numbers. For example, in the 2012 edition, 65 titles were listed (Clarivate, 2012). However, the number may be even higher. The Clarivate post notes that they are using an AI to identify fraudulent behaviour, and that they have flagged more than 500 possible cases. Finally, the third is that the list is not accompanied by the exact causes of the delisting. In previous editions, and in accordance with Clarivate's policies, the two main causes of delisting were identified as the exchange of citations and excessive self-citation (Clarivate, 2021).

Well, perhaps the first and most repeated headline has been the expulsion of 19 journals from Hindawi. In fact, media such as Retractionwatch (Kincaid, 2023) and Times Higher Education (Grove, 2023) quickly echoed this. Yet, the list is much longer and hides other facts worth bringing to light. The first is that there are actually 82 journals included in the list. The second and fundamental fact is that one of the expelled journals is the International Journal of Environmental Research and Public Health (IJERPH), the journal that has brought together the largest number of Spanish papers in the last two years, the second journal in the world in total production in the year 2022. It is also the journal that has benefited, indirectly, from the largest amount of economic funds earmarked for Spanish projects, both from national plans and European projects. As the reader will understand, this fact requires a more detailed and contextualised study of the Spanish context.

It is assumed that what is important in the national environment is not the number of publishers, nor their names, but rather their presence in Spanish science, or rather the other way round, the presence of Spaniards in these poor-quality journals. For this reason, we wanted to carry out a brief study of how this expulsion affects the Spanish field and thus delve deeper to see the casuistry behind these bad practices, which in some cases were known and denounced, but which in recent years have not only increased but have also attracted a legion of researchers who, under the promise of an easy and quick review, do not hesitate to spend money, almost always foreign and public, to publish works that in many cases have been rejected in the traditional prestigious journals (Björk, 2015). Authors who, before finding themselves in infinite predicaments, prefer to "grab the small handles", as the singer Juan Luis Guerra would say.

2. Methodology

The proposal made in this article is simple. On the one hand, we identify the expelled journals, we complete the information provided and, on the other hand, we delve into a specific case of interest to Spain, that of the journal IJERPH. This work is a descriptive bibliometric analysis of the production of these journals that goes deeper into and contextualises the data, especially those referring to Spanish participation.

The complete list of journals that will continue, for the time being, in Journal Citation Reports has been provided by Alina Botezat, who has obtained it by comparing the absences in the current Master Journal List of Web of Science with the immediately previous version. Of these journals, we identify which are mega-journals, considered as such those that are one or two orders of magnitude above the average of their respective areas.

To better understand the incidence of this expulsion, the production of these journals in the last complete five-year period in Web of Science (2018-2022) has been obtained, as these practices have not occurred in one year. In addition, the production of papers produced from Spain has been identified. In the case of IJERPH, Spanish institutions have also been analysed in order to be able to analyse the impact of these journals on universities, and the 20 largest producers of articles in the period, their subject area, affiliation, total production in Web of Science and total production in articles published in MDPI and indexed in Web of Science have also been identified.

Through the "funding" field, the main Spanish institutions that have provided funding in the period 2018-22 are studied. It should be noted that Web of Science does not have this field standardised, so the institutions have previously had to be standardised and grouped. A representation of the most

significant types of institutions is shown. On the other hand, an approximation has been made of the cost of articles in IJERPH of 1,800 €. On 27 March, the journal presented an APC of 2,500 Swiss francs, warning that it would rise to 2,750 from June onwards. Three days later, and due to the collapse of the journal, the costs were reduced to 2,000 Swiss francs (2,008.07 €). It should be borne in mind that this journal discounts the cost to authors for revisions made and also that there is a discount for universities with an agreement of between 10 and 15 per cent. We have therefore estimated the cost to be around €1,800, 28% less than originally advertised. Unfortunately, the amount that Spanish scientists have spent on this journal is not public and is only known to the publisher (this is a dimension of open science that APC journals are not interested in developing).

3. Results

The 82 journals studied belong to the databases of the Core Collection of Web of Science. By index, 2 belong to the Arts & Humanities Citation Index, 35 to the Emerging Sources Citation Index, 6 to the Social Sciences Citation Index, 37 to the Sciences Citation Index Expanded, and 2 simultaneously to both indexes. In terms of subject areas, Computer Science (7) and Education & Educational Research (6) are the ones that have suffered the greatest falls, with the latter category all belonging to the Emerging Source Citation Index (ESCI).

Among the journals listed, at least 15 are identified as mega-journals (Table 1), meaning, for the purposes of this paper and as indicated above, those whose publication volume in the year 2022 is between one and two magnitudes above the average of the rest of the journals in at least one of the subject categories in which Web of Science classifies them.

Table 1. Mega-journals expelled from the Web of Science (2023)

Journal	Publisher	Index	Mode	Articles (2022)
<i>International Journal of Environmental Research and Public Health</i>	MDPI	SSCI	Gold	16,889
<i>Computational Intelligence and Neuroscience</i>	Hindawi	SCIE	Gold	3,188
<i>Mathematical Problems in Engineering</i>	Hindawi	SCIE	Gold	2,951
<i>Wireless Communications & Mobile Computing</i>	Wiley-Hindawi	SCIE	Gold	2,497
<i>Evidence-Based Complementary and Alternative Medicine</i>	Hindawi	SCIE	Gold	1,973
<i>Biomed Research International</i>	Hindawi	SCIE	Gold	1,908
<i>Mobile Information Systems</i>	Hindawi	SCIE	Gold	1,793
<i>Computational and Mathematical Methods in Medicine</i>	Hindawi	SCIE	Gold	1,493
<i>Security And Communication Networks</i>	Wiley-Hindawi	SCIE	Gold	1,294
<i>Annals of Translational Medicine</i>	Ame Publishing Company	SCIE	Gold	1,282
<i>Fresenius Environmental Bulletin</i>	Parlar Scientific Publications	SCIE	Gold	1,276
<i>Oxidative Medicine and Cellular Longevity</i>	Hindawi Ltd	SCIE	Gold	1,249
<i>Food Science and Technology</i>	Soc Brasileira Ciencia Tecnologia Alimentos	SCIE	Gold	1,065
<i>Journal of Healthcare Engineering</i>	Hindawi	SCIE	Gold	1,062
<i>Scientific Programming</i>	Hindawi	SCIE	Gold	1,060

As noted above, Clarivate has not mentioned the reasons for the proposed removal of these journals from the indexes. However, in 15 of them it has been possible to verify that they are journals that have ceased publication, either because they are continued by other titles (7) or because they have stopped publishing altogether (8). The majority of the journals that are still alive are publications that allow some form of open access. Forty-one of them publish using the Gold path, with Articles Processing Charge (APC) ranging from 215 to 2,500 euros. Another 4 publish in Hybrid Gold path (transformative) and 7 publish in Diamond path. Finally, 16 media outlets make their content available on subscription, free of charge, or with open licences, but without being very clear about who bears the publishing costs.

As already noted, 45 journals belong to SCIE, SSCI or both, i.e., those with an Impact Factor in the current edition of the JCR. Of these 45, there are at least 7 titles that have been discontinued and/or have undergone a change of title. Of the remaining 38, Hindawi being the most affected, there is no shortage of titles from other major publishers such as Springer, Taylor and Francis, Routledge, Sage, MDPI or BMJ, all with one title, and again Wiley-Hindawi with 4 more. Behind this expulsion of journals lies a more significant truth for Spanish science: among the 82 journals listed is the journal where most Spaniards have published in the last five years, a mega-journal called International Journal of Environmental Research and Public Health. Moreover, one of these journals is Spanish, the Revista Electrónica de Investigación y Docencia Creativa, whose articles had not been registered by Web of Science for years, despite being indexed.

If we analyse the Spanish production in these expelled journals during the period 2018-22 (Table 2), we find a very significant fact: these journals have published 189,298 papers in the last five years, of which 7,011 were Spanish (3.7%). However, what is worrying is that of these 7,011, 77.5% (5,437) have been published in a single journal, MDPI's International Journal of Environmental Research and Public Health. The mega-journals identified above alone account for 117,317 articles, 62% of the total.

Table 2. Spanish and total output (2017-22) in the publishers of journals expelled from Web of Science (March 2023)

Publisher	Nº journals	Spanish articles	Total articles	% spanish
MDPI	2	5,495	50,033	10.98%
HINDAWI LTD	19	678	64,926	1.04%
Ame Publishing Company	2	152	9,365	1.62%
Elsevier	2	42	8,358	0.50%
Springer	4	29	3,505	0.83%
Sage	3	2	306	0.65%
Other Publishers (50)	50	613	52,631	1.16%
Total	82	7.011	189,298	3.70%

*. For reasons of space, an aggregated analysis has been carried out for publishers. The table broken down by journal can be found in the dataset of the article.

Which universities are most affected by this expulsion? The profile of universities with the most articles in relation to their total production is made up of small universities, with little scientific muscle, which tend to occupy the last positions in the rankings (when they appear). In this case, Universidad Pontificia de Salamanca, Universidad Internacional de Valencia, Universidad Europea del Atlántico, Universidad Loyola de Andalucía and Universidad Europea de Madrid are the five centres, all private, that stand out the most. If one looks at the overall list, this is common among the small private and some peripheral public universities. If the total number of articles is studied, several public universities are the most important, led by the University of Granada (where the area of Education has a great weight), followed by Valencia, Extremadura, Seville and Almería.

On the other hand, the universities with the lowest incidence in relative numbers are the three large Catalan universities: the Polytechnic University, the Autonomous University and Barcelona, together with the University of La Laguna and the University of Navarre (Table 3). It should be noted that the University of Navarre is far behind the results of the rest of the private universities. On the other hand, it can be seen that, in these universities, most of the production in the expelled journals was concentrated in IJERPH,

with the International University of Valencia being the one with the highest production in relation to its total production. Of the major producers, the universities of Almeria and Extremadura stand out.

Table 3. Spanish universities with different degrees of production (2018-22) in journals expelled from WoS (March 2023)

Universities	Total Prod.	Prod. exp.	% in exp.	Prod. in IJERPH	% in IJERPH	Estim. Cost (€)
TOP 5 Universities with a higher percentage of production in rev. expelled						
Univ. Internacional de Valencia Viu	650	54	8.31%	49	7.54%	88,200
Pontifical University of Salamanca	423	34	8.04%	31	7.33%	55,800
Univ Europea Atlantico	263	20	7.60%	15	5.70%	27,000
Universidad Loyola Andalucia	1028	74	7.20%	71	6.91%	127,800
European University of Madrid	2536	179	7.06%	164	6.47%	295,200
TOP 5. Universities with the highest production in expelled journals						
University of Granada	21314	644	3.02%	496	2.33%	892,800
University of Valencia	23024	546	2.37%	427	1.85%	768,600
Universidad de Extremadura	6534	372	5.69%	335	5.13%	603,000
University of Sevilla	18704	360	1.92%	301	1.61%	541,800
Universidad de Almeria	4707	326	6.93%	311	6.61%	559,800
TOP 5. Universities with the lowest production in expelled journals						
Universitat Politecnica de Catalunya	12940	63	0.49%	35	0.27%	63,000
Universidad de La Laguna	7770	48	0.62%	38	0.49%	68,400
Autonomous University of Barcelona	30188	222	0.74%	176	0.58%	316,800
University of Barcelona	40509	302	0.75%	259	0.64%	466,200
University of Navarre	7913	60	0.76%	40	0.51%	72,000

Note: The names of the universities in Web of Science are retained to facilitate data replication. The full dataset can be found in the dataset of the paper.

3.1. International Journal of Environmental Research and Public Health IJERPH

We focus on this journal because, in terms of the volume of articles produced and the presence of Spanish authors, it is the most significant. If we analyse the articles published by the expelled journals in the period 2018-2022, this journal accumulates 48,190 works, i.e., 25.4% of the total, and, furthermore, if in total Spaniards published 7,011 articles in the five-year period studied, 5,437 works belonged to this journal, i.e., this adds up to 78.4% of the weight. If we estimate that each article costs €1,800, the sum of the articles published in these five years exceeds €12 million.

Monographs as a form of growth. One of the most criticised policies of the MDPI publishing house is the monographic model, in which anyone, without the need to corroborate experience or academic authority, can propose a monographic or is proposed for a monographic. A study of Spanish production in Sustainability in 2020 shows that 86% of Spanish papers were in monographic issues and 63% were in monographs edited by compatriots, many of them colleagues at the centre (Repiso, et al. 2021a). One of the authors of this paper, Rafael Repiso, was proposed by MDPI years ago to edit an issue on High Energies, something strange since his profile belongs to the field of Information Sciences.

A week before the expulsion of these journals, a scandal broke out in a Latin American forum that in another MDPI journal, in this case Sustainability, a monograph edited by three Peruvian authors and entitled "Achieving Sustainable Development Goals in COVID-19 Pandemic Times" had 16 articles

published, 15 of which belonged to one of the three editors. Very similar dynamics have been found in the Spanish scientific production in the "International Journal of Environmental Research and Public Health". In a superficial review, we have found the same dynamics, authors who edit monographs, who take advantage of the opportunity to publish their own work and that of their departmental colleagues, which is an obvious form of inbreeding.

We can see how the vast majority of the work published by Spaniards in IJERPH (2018-2022) is subsidised by public institutions; the contribution of private companies or foundations is minimal. In general terms, the group with the largest contribution is that of European funds. In second place, it is the Spanish government, through ministries or the autonomous communities via the different regional ministries that contribute the most, where the leadership of Andalusia, Extremadura, Catalonia and Aragon stands out. To a lesser extent, these articles are financed with the universities' own funds. Of course, the Instituto de Salud Carlos III is the research institute that has financed the most articles in this period (208), far more than any other university; by comparison, the CSIC has only financed 3 articles. The University of Malaga stands out as the university that has funded the greatest number of articles with its own budget, followed by the University of Granada.

Table 4. Main sources of funding for Spanish articles published in IJERPH (2018-2022)

Institutions	Arts.	Institutions	Arts.
European Funds	814	Provincial Government of Guipúzcoa	7
Spanish Government	776	Carlos III Health Institute	208
Regional Government of Andalusia	121	La Caixa Foundation	38
Regional Government of Extremadura	103	La Marató De Tv3 Foundation	8
Government of Catalonia	96	University of Malaga	38
Government of Aragon	82	University of Granada	23
Government of Galicia	50	Jaume I University	20
Government of the Basque Country	38	University of Almeria	16
Government of Valencia	20	University of Castilla La Mancha	16
Community of Madrid	18	University of Valencia	16
Government of Castile and León	18	University of the Basque Country	13
Principality of Asturias	9	Polytechnic University of Madrid	11
Region of Murcia	8	San Vicente Mártir Catholic University	10
Government of Castilla la Mancha	6	Rovira I Virgili University	9
Government of the Canary Islands	3	University of Alicante	9
Government of the Balearic Islands	2	University of Cordoba	9
Government of Cantabria	2	University of Oviedo	8

If we study who are the authors with the highest production in IJERPH over the last five years, we find that the Top 20 is made up of people who in this period have between 22 and 43 papers in this journal (Table 5). Another very significant aspect is that, in the same way that they have a high production in IJERPH, 15 of these profiles also have a high production in other journals of the MDPI publishing house, above 30%, 10 of them above 50%. Even at the end of the Top 20, we begin to find cases of researchers who have practically only published in MDPI, which is something very frequent in the total list, researchers who outside Spanish journals have only published in MDPI (in many cases in their own monographs or in those of their departmental colleagues).

In the Top 20 there are hardly any women, only 3 in positions 16, 19 and 20. What does appear is an extraordinary concentration of professors belonging to the Department of Didactics of Musical, Plastic and Bodily Expression, with 9 out of 20, 8 of whom belong to the University of Extremadura. It should be noted that the areas from which it is published are Education, Nursing, Sport, in short, in this journal

those Spaniards who belong to secondary areas, areas that come from the old university schools where research was something exceptional, have stood out as exceptional researchers.

Finally, estimating the cost at €1,800, we can see that in the last 5 years the investment by these super-authors in these journals has ranged from €39,600 to €77,400. Keeping the estimate at €1,800 for all MDPI journals, we find that there are 9 authors whose total estimated costs for all their articles are above €90,000.

Table 5. Top 20 most prolific Spanish authors in IJERPH (2018-2022). Total production, production in MDPI and estimated costs.

Author	Univ.	Department	Arts. IJERPH	Cost IJERPH	Prod. WOS	Prod .MDPI	% MDPI	Cost MDPI
1	UNEX	Did. Musical Expression, Plastic Arts...	43	77,400	146	64	43.8%	115,200
2	UAL	Educational and Developmental Psychology	37	66,600	103	49	47.6%	88,200
3	UNEX	Did. Musical and Plastic Expression...	36	64,800	92	51	55.4%	91,800
4	UEM	Sports Science	34	61,200	204	67	32.8%	120,600
5	ULOYOLA	Business Organisation	33	59,400	146	80	54.8%	144,000
6	UNEX	Did. Musical Expression, Plastic Arts...	31	55,800	89	61	68.5%	109,800
7	UHU	Nursing	31	55,800	214	82	38.3%	147,600
8	UBU	Educational and Developmental Psychology	31	55,800	88	58	65.9%	104,400
9	UNEBRIJA	Physical Education	29	52,200	81	54	66.7%	97,200
10	URJC	Physiotherapy, Occupational Therapy	28	50,400	717	94	13.1%	169,200
11	VIU	Nursing	28	50,400	74	41	55.4%	73,800
12	URJC	Nursing	28	50,400	150	23	15.3%	41,400
13	UNEX	Did. Musical Expression, Plastic Arts...	26	46,800	195	52	26.7%	93,600
14	URJC	Nursing	26	46,800	99	46	46.5%	82,800
15	UNEX	Did. Musical Expression, Plastic...	26	46,800	136	67	49.3%	120,600
16	UNEX	Did. Musical Expression, Plastic...	24	43,200	42	41	97.6%	73,800
17	UNEX	Did. Musical Expression, Plastic...	23	41,400	35	33	94.3%	59,400
18	UGR	Did. Musical Expression, Plastic...	23	41,400	102	41	40.2%	73,800
19	UNEX	Did. Musical Expression, Plastic...	22	39,600	36	32	88.9%	57,600
20	UBU	Health Sciences	22	39,600	64	44	68.8%	79,200

Note: Authors are highlighted in red. Production in IJERPH is reduced to the period 2018-22, but the total in Web of Science and MDPI covers the entire database.

4. Discussion and conclusions

As we have seen, this expulsion of journals from Web of Science is historic in number. For the first time Clarivate is confronting the mega-journals and their bad practices. It is also historic because many of these journals belong to that cursed list of predatory journals that Jeffrey Beall prophesied years ago and which caused him so much displeasure. Because among these journals is the second publication with the most jobs in the world (in the year 2022) and the first one with articles by Spaniards. Undoubtedly,

because in view of the future changes to Web of Science, which will include all the databases of the Web of Science Core Collection in the Journal Citation Reports (Quaderi, 2023b), the platform will have to clean up its act or the results will be a clear manifestation of the product's weaknesses. Moreover, this expulsion of journals shows that "something smells rotten" in Spanish academia and that this stench, which many of us have been denouncing for years, is being perceived outside our borders.

The main problem is undoubtedly a derivative of the current system of scientific evaluation, which prioritises the value of the publication medium over the research actually published. In this sense, much of the anomalous behaviour seems to be located in journals that are funded by the authors, via APC. In these journals there is a poorly resolved ethical tension, the elimination of the objective figure of the reader/subscriber of the journal, who was the one who decided (although only to a certain extent, remember the practically non-existent existence of individual subscribers and the policy of the publishing oligopoly of bundling journals, the "big deals") whether or not to pay for the work. In the search for the elimination of barriers to open access to knowledge generated in the scientific sphere and in the policy of not letting the large commercial publishers (including scientific societies) fall and in refusing to take a decisive step towards changing the model of scientific evaluation, a model is created in which the support (and profit) of the publications passes from the hands of the subscriber (mostly institutional) to the author who, using largely external funds, now becomes the main decider of the destination of these funds through the payment of APCs. In other words, the reader, who was the final recipient of the works and the main judge of their quality, is no longer relevant. This leaves the system in the hands of two actors with subjective interests: authors who want to publish and are willing to pay for it (usually with other people's money), and publishers who want as many articles as possible to be published in their journals and whose only concern is to maintain a prominent position in the impact indices in order to be able to set high prices. Apart from this ethical tension, there is an important underlying philosophical question: where is the value of an article? Certainly not in the journal that publishes it. And, most worryingly, why should the author pay to publish - should open science be accessible to all but the content creator, the author?

In conversations with young colleagues who have published in these journals, they justified their perspective on the need and the unfavourable situation of those who do not. This system of publication makes it possible to obtain quick merits of the first order, especially affecting the careers of young researchers and academics in precarious situations, who see how other researchers who publish work of dubious quality in these journals manage to gain accreditation in a short time and normalise their contracts in competitive positions. This is forcing young researchers to participate in these dynamics under unequal conditions in order to compete for the normalisation of their contracts, in many cases adding publication costs to their meagre salaries as an investment for the future. In other words, it is damaging and corrupting a generation.

A clear toxic effect of how evaluation policies modify and corrupt the behaviour patterns of researchers (Delgado-López-Cózar, et. al., 2021) is the case of monographs, promoted by ANECA and which have gone from being something anecdotal, around 20% of the mass of a journal (Repiso et. al., 2021b), to being the main form of publication in many Spanish journals and in the large mega-journals. Isidro Aguillo aptly compares this practice to a pyramid scheme of gigantic proportions (Aguillo, 2021), where any author, no matter how little authority they possess, can propose, invite and evaluate papers for their monographs. At the end of March 2023, the journal IJERPH has 3,099 special issues open for the current year! Paolo Crosetto already warned us two years ago that MDPI was moving from being a journal with very aggressive methods to a predatory one, most of his analyses being based on the study of monographs (Crosetto, 2021). Furthermore, to underpin the danger of monographs, it has been studied how monographs are used by the so-called article factories at Hindawi publishing house to massively "place" these works in monographs, with the collaboration of the monograph editors (Bishop, 2023).

These fraudulent publishers harm the community, institutions and states in general, but first and foremost the authors who publish in them. Good researchers who have papers in these journals will no longer have a problem, as their prestige is not based on these papers, and this gap dissolves between the main journals. In the end, each author will have to answer for the quality of his or her work. The problem will be for those researchers who have to justify empty careers outside these journals or significant excesses in their output, and a rigorous examination of their contributions shows that they have contributed little or nothing to scientific progress or that the quality of their work was deficient. Good and bad papers are published in these journals, the problem is that the journals are not guarantors of quality, as happens in serious journals, but that quality depends directly on the author and his or her conscience. There are some very good papers published in these journals, but there are also some bad ones, and in worrying numbers. Evaluation agencies, universities and other centres that carry out recruitment processes and allocate research funds have a great deal of evaluation work ahead of them. The first is not to take for granted, by default, the works that come from these journals, and the second is for experts to evaluate the content of the works and not to place the weight of their expert judgement solely on quantitative indicators aimed at other objects of evaluation.

It is striking that it is the universities with a lower profile in research that resort to these fraudulent journals with the highest incidence. It seems as if they want to spend on publishing the resources that they have saved in the research process. On the other hand, the centres with the lowest incidence are clearly the universities where scientific policies are clear, efficient and ethical, with several Catalan public universities and the University of Navarre standing out as representative of the private centres. Those responsible for the scientific policy at universities should be aware that investment in research and the generation of knowledge are medium to long-term processes and that short-term policies rarely work and in many cases their results only expose the prestige of the centre to shame and ignominy, the exact opposite of what they were intended to achieve.

This study raises new questions about this fact. Firstly, there is a great absence of studies that analyse the consequences for a journal of being expelled from prestigious databases such as Web of Science or its analogue Scopus. Secondly, a study would be very interesting to know the opinion of the authors affected by these expulsions, especially the motivation to publish in the mega-journals by those authors who in principle do not respond to the fields of the journals and who nevertheless publish in an exaggerated way in these journals. What we do know is that these mega-journals offer advantages such as laxer reviews, focusing on the methodological validity of the work rather than its potential scientific impact (Björk; Catani, 2016), higher than normal acceptance rates, and a faster publication speed (Repiso et al. 2021A).

5. Recommendations

The scientific policies of universities, the National Agency for Quality Assessment and other autonomous institutions should, among other objectives, try to prevent publication in these low-quality journals, whose processes are so well known by the community that in a short time a tide of papers is created. It seems that the scientific leaders are the last to know what the entire scientific community, in these journals, publishes easily and quickly by paying for it. Not only is the prestige of Spanish science at stake, but, as we have seen, we are losing millions of euros by paying to publish bad work, and it is also negatively affecting the new generations of researchers, who feel forced to publish in these journals in order to maintain a competitive production in this new poisonous context. Effort, merit and quality are disappearing in the face of those who have the resources to publish in first-rate journals but do not consider the quality of their work. There is an urgent need for a reform of the scientific evaluation in Spain.

Evaluation agencies and research institutions must stop their list of merits and start creating a list of demerits. A demerit is to be an editor of a journal that is open to the publication of any number of monographs at the request of the aspiring editor, as opposed to journals that publish a tiny part of their work in special issues and with very demanding criteria for the selection of publishers. One demerit is to try to sell that one has published in an international journal when the reality is that one has published in one's own monograph (sometimes several articles), or in a monograph edited by one's partner, a regular co-author or a departmental colleague. This is not merit, it is inbreeding. The expert commissions are aware of these demerits, but they are limited to applying the merits of all types and order registered in the applications. In the Spanish case, ANECA is encouraging these bad practices by not sanctioning them. If bad practices are not pointed out and penalised, they are encouraged, and it is the laxity of the Spanish evaluation system that has led us to this situation. At this point, it is worth pointing out that not wanting to invest in evaluation, to take the middle road, has enormous costs, and not only reputational costs, as is becoming evident.

Evaluation agencies, universities and other bodies with evaluation or recruitment responsibilities must open the door to expert advice in the quantitative field, beyond the knowledge that specialists in the different areas of knowledge can provide. The errors and aberrations published year after year in the BOE and aid documents regarding bibliometric sources, tools and indicators must cease. The Impact Factor is as bad as the "metric salads" without rhyme or reason. The signing of declarations and manifestos must go hand in hand with the implementation of advised changes.

Spanish institutions must publicly break agreements with these suspicious publishers, agreements that in the case of universities have been signed unthinkingly, in most cases, by university libraries, at the expense or with the knowledge of the vice-rectorships for research (those who are responsible for science policy). These agreements have a negative impact on the institution and its researchers; agreements that de facto whitewash these publishers by giving them legitimacy in the eyes of the institution's researchers. It is difficult for a university to complain to a researcher about bad practices carried out by these publishers if the institution has an agreement with the publisher. There are many cases in which the institutions themselves not only provide financial support, but also institutional support, through agreements, advertisements and events, to these publishers.

It is also the responsibility of reference catalogues to combat malpractice. Just as Clarivate has decided to confront plagiarism, one would expect Elsevier to begin to confront these bad practices, although

it is doing so, but for the moment with journals isolated from the scientific periphery. Years ago, DOAJ changed its criteria and carried out a clean-up of its journals because it was infected by predatory journals. It is necessary to review the criteria once again and to go deeper into the data of the journals the publisher possesses, because in its catalogue there are once again journals that carry out unethical practices and that, being mega-journals, increase the problem substantially. But, in general, no product is exempt from this warning, even the regional and less affected ones such as Dialnet, REDALYC, SciELO, etc. Reference catalogues must carry out exhaustive monitoring and identify, denounce and sanction bad practices, in a preventive manner, because in every reference database, to a greater or lesser extent, there are journals with bad practices. We have malpractices in the first and second division of journals, only that those in the first division affect a larger number of people, in a much higher order of magnitude. Another worrying issue is the presence of these journals in COPE (Committee on Publication Ethics) and the silence of this institution in cases related to its member journals.

6. Contributions

Contributions	Authors' names and surnames in each case
Research design	1 and 2
Documentary search	1 and 2
Data collection	1 and 2
Critical data analysis and interpretation	1 and 2
Review and approval of versions	1 and 2

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