

Indicators of national focus of the research published by Public Health journals edited in Brazil

Abel Laerte Packer ¹

Abstract *This report presents a set of bibliometric indicators and statistics which explain the high level of production of articles on research in public and collective health in Brazil which are published in the main nationally edited journals in the field. The predominance of publications in the Portuguese language by Brazilian authors results in a lower impact in terms of citations received as measured by the bibliometric indexes Scimago/Scopus and JCR/WoS. These bibliometric indexes are used to measure the production and performance of research and journals. Nevertheless, the performance of these same journals stands out in SciELO, and is competitive internationally in the broader context of Google Scholar Metrics. The challenge faced by journals in Brazil is developing and applying editorial policies for the valuation of research with a national focus, and its internationalization.*

Key words *Scientific journals, Indexing, Bibliometric indicators*

¹ Fundação de Apoio à Universidade Federal de São Paulo. R. Dr. Diogo de Faria 1087/810, Vila Clementino. 04037-003 São Paulo SP Brasil. abel.packer@scielo.org

Introduction

Public and collective health represents an important dimension in national and global public issues and policies, and as such stands out as an area of research whose communication, influence and impact involves around 2% of the journals and articles indexed annually internationally, according to the Scimago/Scopus and Journal Citation Reports/Web of Science Core Collection (WoS) bibliometric indexes. These indexes are used internationally as benchmarks for measuring the production and performance of scientific research since their indicators feed the many different academic rankings produced globally.

Brazil is among the largest producers of articles in this field, ranking fifth in WoS and seventh in ScimagoScopus. However, among the countries with the largest production, Brazil slips to last place in these indexes in terms of citations received per article. The main aspect of this bipolar performance comes from the fact that research in public and collective health in Brazil, although indexed and measured internationally, is communicated primarily by journals published in Brazil in Portuguese, thus limiting the readership and, as a consequence, limiting being cited internationally. These journals publish more than 60% of the articles from Brazil in WoS that are indexed as public health. Public health ranks first in SciELO Brazil in terms of the number of articles if the same WoS thematic categories are considered.

The low performance in the WoS and Scopus indicators negatively affects perceptions of the relevance of journals of Brazil both internationally and nationally. In Brazil, such perceptions influence the Qualis system, among others, because it uses these indicators as a proxy for the evaluation of research performed in graduate programs. In fact, despite the reality that Brazilian public and collective health journals are indexed quite broadly internationally, they continue to publish predominantly national research and are thus classified from the second Qualis category on down. Internationally, this influence can be seen by the low number of submissions received from abroad. However, the relative performance of the Brazilian public health journals is significantly better in the SciELO index, which publishes in open access and in Google Scholar since these two indexes cover a much wider universe of journals available on the Web related to public and collective health.

This report gathers statistics and quantitative bibliometric indicators that represent a prepon-

derance of national focus on the research communicated by journals of Brazil indexed in SciELO in the area of public and collective health, aiming at serving as a basis for the debate about their internationalization and appropriate assessment.

Methodology

All the public health journals published in Brazil and indexed in SciELO are considered here as a representative information source for identifying the national focus of the research in the area, notwithstanding its multidisciplinary and interdisciplinary approach. This assumption has its basis in the strict quality control which the SciELO Program applies to the admission and retention of journals in its collections, and from the number of articles the journals publish and their extensive indexing in other international bibliographic indexes used as benchmarks for a bibliometric comparison of the performance of subject areas and author affiliation.

In the article by Madel T. Luz¹ on the complexities of the field of public health, in addition to acknowledging books in the subject, all the articles cited are from journals in SciELO. However, since the SciELO index is limited to journals, it is not an exhaustive representation of the intellectual output in public health. It does not include books and other types of documents from the Social Sciences and Humanities which should not be ignored². Another important limitation in this coverage comes from the identification of the articles in the field as those that are published in journals which are indexed as public health, a classification which is used by the bibliometric indexes accessed in this article. In other words, articles related to public health published in journals classified under other fields are not taken into account. However, the citations received and their associated indicators do take into account all citing articles, regardless of the journal in which they are published.

In January 2015, there were 13 journals in public health indexed in SciELO Brazil; however to provide a better comparison between journals and thematic areas, journals in the SciELO Brazil collection in 2011, 2012 and 2013 were taken into consideration, and only those texts identified as articles or reviews. These selection criteria result in 245 journals out of the 280 indexed in SciELO in January 2015. Of these, ten journals are classified as public health within the broad category of health and human sciences, of which four are

indexed in JCR, five in WoS, seven in Scimago/Scopus, five in PubMed, and all in Lilacs (Table 1). The journals are distributed in three groups according to the number of indexes in which they appear. The journals in the first group, CSP, C&SC and RSP, are present in all indexes.

The Scimago/Scopus and JCR/WoS Core Collection (WoS) bibliometric indexes used internationally as benchmarks in measuring the production and performance of scientific research confirm the relative importance of the respective categories of research related to public health out of all international scientific production, reaching 2.1% and 2.2%, respectively, of the journals indexed, and 2% and 1.7%, respectively, of the total number of articles. To better appreciate these percentages, it is worth mentioning that, in the case of JCR/WoS, the area related to public health ranks 9th and 22nd in the number of journals and articles, respectively, out of 226 categories that are ranked. In this context, out of all the 323 Brazilian journals indexed in Scimago/Scopus, and the 116 Brazilian journals indexed in JCR/WoS, 8(1.8%) and 4(2.5%) respectively are in the public health categories and represent 5% and 7%, respectively, of the total number of articles published by journals of Brazil and indexed in the respective databases. The predominance of articles with Brazilian affiliation results in Brazil ranking 7th and 5th in terms of number of articles

in public health in the respective world rankings. This is well ahead of its rank of 13th place when all subject areas are considered. In SciELO Brazil, the journals in public health are the ones which publish articles the most when looking at the same thematic categories that are in WoS.

The relative performance of Brazilian public health journals, as measured by citations received in the respective subject areas of the SciELO, Scimago and JCR indexes, can be observed in their Impact Factor distribution and in the number of articles with one or more citations. Since these indexes have a selective coverage in terms of journals considered, Google scholar Metrics (GSM) was used as a comprehensive source of information to assess the relative performance of the ten journals of Brazil in public health within the SciELO collection, as well as of the GSM subset of public health journals in English.

Results and observations

The evolution in the number of articles

The evolution in the number of articles indexed in the ten journals in public health in SciELO Brazil in 2011, 2012 and 2013 is shown in Table 2. Of the total of 245 journals indexed during those three years, 82 (33%) are in health

Table 1. Journals in public health and where they are indexed.

Journal	Index								Total
	Qualis Capes	LILACS	SciELO Brazil	SciELO Public Health	Medline	WoS	JCR	Scimago /Scopus	
Cadernos de Saúde Pública - CSP	A2	1	1	1	1	1	1	1	7
Ciência & Saúde Coletiva - C&SC	B1	1	1	1	1	1	1	1	7
Revista de Saúde Pública - RSP	A2	1	1	1	1	1	1	1	7
Interface - Comunicação, Saúde, Educação - ICSE	B1	1	1	1	0	1	0	1	5
Revista Brasileira de Epidemiologia - RBE	B1	1	1	1	1	0	0	1	5
Saúde e Sociedade - SeS	B2	1	1	0	0	1	1	1	5
Physis: Revista de Saúde Coletiva - PRSC	B1	1	1	0	0	0	0	1	3
Revista Brasileira de Saúde Materno Infantil - RBSMI	B2	1	1	0	0	0	0	1	3
Revista Brasileira de Saúde Ocupacional - RBSO	B2	1	1	0	0	0	0	0	2
Trabalho, Educação e Saúde - TES	B2	1	1	0	0	0	0	0	2
Total		10	10	5	4	5	4	8	

Sources: Qualis, LILACS, SciELO, MEDLINE, WoS, Scimago, March 2015.

sciences and 72 (29%) are in human sciences. All the journals in public health are classified by SciELO under the broad category of health sciences, and some are also classified under human sciences. They represent 4% of all the journals in SciELO Brazil and 12% of those in health sciences. In terms of the number of articles published over those three years, the ten journals represent 7% of the total, and 16% of the total in health sciences.

There is a drop in the number of articles in the ten public health journals in SciELO Brazil over the course of the three year period considered here, except in the journals in the human sciences where there is an increase of 4%. The public health journals published 11% fewer articles in 2013 than in 2011. This represents the sharpest relative drop of all set of journals considered in the study. This drop occurred principally between 2011 and 2012, and changed little between 2012 and 2013, yet was not enough to affect the high level of article production in the

area, and does not, at least for the time being, indicate a downward trend in the production of articles in the area. In addition to operational reasons or reasons of greater quality control by the journals, this kind of drop in the number of articles also comes from the migration to publishing in other journals, be it for greater visibility or even ease and speed of publication.

C&SC remained as the journal which published the most articles, not only amongst those in public health but also in the entire SciELO Brazil collection, ahead of the journals *Ciência Rural* and *Química Nova* which published an average of 344 and 300 articles, respectively. C&SC publishes 2.2% of the articles in the SciELO Brazil collection and virtually a third of the articles in public health. Together with CSP and RSP, they account for 65% of all the articles in public health indexed in SciELO. Thus, these three journals are key to the aggregate indicators in this field in SciELO, and principally in Scopus and WoS. They are also crucial in the formulation of new policies to ad-

Table 2. The evolution in the number of articles in public health indexed in SciELO Brazil 2011 - 2013 for all journals, for those in Health Sciences, Human Sciences, and other areas.

Thematic area and journals in public health	Journals		articles								
			year			difference					
			n	%	2011	2012	2013	variation ^a	average		
									n	% ^b	% ^c
Total	245	100	19,110	18,510	17,869	-7%	18,496	100%			
Health Sciences	82	33	8,527	8,056	7,773	-9%	8,118	44%			
Human Sciences	72	29	3,340	3,534	3,475	4%	3,449	19%			
Other thematic areas	111	45	8,871	8,539	8,198	-8%	8,536	46%			
Public Health	10	4	1,380	1,212	1,228	-11%	1,273	7%	100%		
Ciência & Saúde Coletiva - C&SC	1		488	345	386	-17,4%	406	2,2%	31,9%		
Cadernos de Saúde Pública - CSP	1		292	250	263	-9,2%	268	1,4%	21,1%		
Revista de Saúde Pública - RSP	1		144	140	153	6,5%	145	0,8%	11,4%		
Saúde e Sociedade - SeS	1		86	121	99	22,5%	102	0,6%	8,0%		
Revista Brasileira de Epidemiologia - RBE	1		81	78	92	14,2%	83	0,4%	6,5%		
Interface - Comunicação, Saúde, Educação - ICSE	1		93	90	81	-13,2%	88	0,5%	6,9%		
Physis: Revista de Saúde Coletiva - PRSC	1		80	82	66	-17,0%	76	0,4%	6,0%		
Trabalho, Educação e Saúde - TES	1		45	34	37	-15,6%	38	0,2%	3,0%		
Revista Brasileira de Saúde Materno Infantil - RBSMI	1		40	37	29	-29,1%	35	0,2%	2,7%		
Revista Brasileira de Saúde Ocupacional - RBSO	1		31	35	22	-24,2%	29	0,2%	2,3%		

^a Sum of the % variation of (2012-2011) and (2013-2012). ^b The percentages refer to the average of all articles. ^c The percentages refer to the average of all articles in public health.

vance scholarly communication in the field. This scholarly communication framework in the field benefits, for example, the future development of C&SC as a megajournal operated by a community of editors given its thematic scope and its institutional affiliation to the scientific association in the field, and the progressive specialization of the other journals focused on quality control for the publication of high impact research.

Internationalization – language of publication

Internationalization is one of the most important transformations which quality journals of Brazil have been promoting in editorial policies as measured by, among other indicators, the proportion of articles in other languages, of foreign authors, and the origins of citations. Improving internationalization is driven by the institutions responsible for the journals and their editors, and is in line with the recommendations of programs which fund research and scholarly communication, such as the SciELO Program of FAPESP.

Table 3 shows the distribution of the 245 SciELO Brazil journals by language of publication and by the broad thematic areas of health and human sciences, and more specifically the sub-area of public health. Between 2011 and 2013, the number of journals publishing at least 50% of their articles in Portuguese decreased from 195 to 176 or, in relative terms, from 80% to 72% of the total, representing a drop of 10% in favor of other languages, thus reflecting progress in internationalization. In fact, the proportion of journals that published more than 50% of their articles in English or another language grew from

33% to 44% of the total in the collection, equivalent to a variation of 31%.

Among the articles published in a foreign language over the three year period in question, English dominates with an average of 97% of the total – 99% in health sciences journals, 91% in public health and 72% in human sciences. The difference in percentages between the journals that decreased publication in Portuguese and those that increased publication in English is due in large part to an accumulated increase of 37% (26 to 34, then to 36) in the number of journals that publish articles simultaneously in Portuguese and another language.

The journals in health sciences, which overall have the greatest presence in the SciELO Brazil collection, are the ones which have transitioned the most to no longer publishing in Portuguese, resulting in a decrease of articles in Portuguese of 16%. These journals are also the ones which, in 2013, represented the highest proportion (78%) of those that published 50% or more of their articles in a language other than Portuguese. However, among the journals in public health there was no change at all in the widespread adoption of another language. All the journals continued to publish more than 50% of their articles in Portuguese and only two, RSP and RBE published more than 50% of their articles in other languages. Thus, in terms of the adoption of English as an editorial policy of internationalization, the journals in public health are more similar to the journals in the human sciences which have only 8 out of 72 journals that publish predominantly in other languages.

Editorial decisions to publish in English have always been controversial in public health, as well as in other areas of scholarly communication in

Table 3. The evolution in the number of journals in SciELO Brazil by most used language during the period 2011 - 2013 for all journals, for those in Health Sciences, Human Sciences, and Public Health.

Thematic area and journals in Public Health	Journals												
	total	50% or more articles in Portuguese				50% or more articles in another language				50% or more articles in Portuguese and another language			
		2011	2012	2013	var	2011	2012	2013	var	2011	2012	2013	var
Total	245	80%	76%	72%	-10%	33%	39%	44%	31%	11%	14%	15%	37%
Health Sciences	82	72%	67%	61%	-16%	60%	67%	78%	29%	29%	34%	37%	24%
Human Sciences	72	96%	96%	93%	-3%	7%	11%	11%	60%	1%	4%	4%	200%
Other thematic areas	111	71%	67%	64%	-10%	31%	36%	40%	28%	1%	3%	4%	233%
Public Health	10	100%	100%	100%	0%	20%	20%	20%	0%	20%	20%	20%	0%

Source: SciELO, March 2015.

Brazil, in the face of cultural and social factors, the close relationship of research objectives with the practice in the field, the need to enrich scientific semantics in Portuguese, and the monopoly of English in the international bibliographic indexes³. In this context, bilingual publication in Portuguese and English is emerging as an option to strengthening the internationalization of national research without abandoning publication in Portuguese. Brazil is the country that is practicing multilingualism the most in the SciELO Network, and probably in the world, in the journals that it publishes.

The increase in the proportion of articles in English is the most significant indicator for assessing the progress of internationalization in the research reported by Brazilian journals. As shown in Table 4, between 2011 and 2013, the trend in all major areas is a decrease in the percentage of articles in Portuguese and an increase in the percentage articles in English and other languages, albeit at differing rates. Here as well, the numerical difference between the decrease on the one hand, and the increase on the other hand, is due to the growth in simultaneous publication in Portuguese and other languages, especially amongst the journals in the health sciences.

The number of articles published in Portuguese remained unchanged in public health jour-

nals, and follows the general trend of an increase in articles in other languages, especially multilingual publication. However, the proportion of articles in other languages, basically determined by the journals RSP and RBE, is less than half of the articles published in other languages by all the journals in health sciences. As stated previously, the journal C&SC, which shows a declining trend in articles in other languages with barely 9% in 2013, is the journal which best characterizes the situation and the future of the internationalization of research in public health as a whole, followed by the journal CSP. In fact, the adoption by C&SC from 2015 onwards of bilingual publication in Portuguese and English will promote a radical change in the international profile of the whole subject area.

Internationalization – author affiliation

Another indicator of internationalization analyzed in this study is the proportion of national and foreign authors. In general, submissions of papers with foreign authors presupposes their publication in English or another language. Table 5 shows the distribution of author nationality taking into consideration only articles with country affiliation, as defined and validated by

Table 4. The evolution in the number of articles in SciELO Brazil by language used during the period 2011 to 2013 for all journals, for those in Health Sciences, Human Sciences and Public Health.

Thematic area and journals in Public Health	articles								
	Portuguese			other language			Portuguese and other language		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Total	66%	62%	59%	48%	53%	57%	14%	15%	16%
Health Sciences	63%	59%	57%	65%	71%	77%	29%	30%	34%
Human Sciences	86%	87%	83%	18%	19%	23%	4%	6%	6%
Other thematic areas	56%	51%	47%	45%	51%	55%	1%	1%	2%
Public Health	85%	86%	86%	28%	29%	35%	13%	16%	21%
Cadernos de Saúde Pública - CSP	65%	70%	69%	35%	30%	34%	1%	1%	3%
Ciência & Saúde Coletiva - C&SC	88%	90%	92%	12%	18%	9%	0%	8%	2%
Interface - Comunicação, Saúde, Educação - ICSE	95%	96%	95%	18%	19%	21%	13%	14%	16%
Physis: Revista de Saúde Coletiva - PRSC	96%	99%	98%	4%	1%	2%	0%	0%	0%
Revista Brasileira de Epidemiologia - RBE	94%	86%	79%	59%	72%	100%	53%	58%	79%
Revista Brasileira de Saúde Materno Infantil - RBSMI	80%	84%	76%	20%	19%	28%	0%	3%	3%
Revista Brasileira de Saúde Ocupacional - RBSO	100%	100%	100%	0%	0%	0%	0%	0%	0%
Revista de Saúde Pública - RSP	83%	79%	82%	95%	88%	96%	78%	67%	78%
Saúde e Sociedade - SeS	94%	97%	91%	7%	9%	41%	1%	6%	32%
Trabalho, Educação e Saúde - TES	100%	94%	97%	0%	9%	3%	0%	3%	0%

Source: SciELO, March 2015.

Table 5. The evolution in the distribution of national and foreign affiliation of authors of articles published in public health journals during the period 2011 - 2013 for all journals, for those in Health Sciences, Humans Sciences and other areas.

Thematic area and journals in Public Health	Author country affiliation											
	Brazil				Foreign				Brazil and foreign			
	2011	2012	2013	var	2011	2012	2013	var	2011	2012	2013	var
Total	90%	90%	88%	-3%	14%	15%	18%	22%	5%	5%	6%	19%
Health Sciences	91%	90%	88%	-5%	15%	16%	19%	24%	5%	6%	7%	21%
Human Sciences	88%	87%	86%	15%	16%	15%	18%	31%	3%	3%	4%	37%
Other thematic areas	89%	88%	87%	-7%	16%	17%	19%	14%	5%	5%	6%	14%
Public Health	94%	93%	95%	-8%	11%	11%	13%	5%	5%	5%	8%	60%
Cadernos de Saúde Pública - CSP	96%	94%	97%	-16%	11%	13%	15%	10%	7%	7%	13%	68%
Ciência & Saúde Coletiva - C&SC	91%	92%	96%	-13%	11%	13%	7%	-59%	3%	4%	3%	-7%
Interface - Comunicação, Saúde, Educação - ICSE	97%	98%	95%	-15%	7%	5%	12%	92%	3%	2%	6%	117%
Physis: Revista de Saúde Coletiva - PRSC	94%	97%	95%	-9%	9%	3%	10%	133%	3%	0%	5%	0%
Revista Brasileira de Epidemiologia - RBE	100%	94%	97%	15%	6%	12%	16%	147%	6%	5%	13%	180%
Revista Brasileira de Saúde Materno Infantil - RBSMI	95%	92%	90%	-28%	13%	18%	10%	-17%	8%	11%	0%	-67%
Revista Brasileira de Saúde Ocupacional - RBSO	97%	89%	96%	-19%	3%	14%	17%	300%	0%	4%	13%	0%
Revista de Saúde Pública - RSP	93%	93%	94%	16%	15%	16%	19%	37%	8%	9%	13%	76%
Saúde e Sociedade - SeS	90%	95%	89%	30%	12%	7%	17%	93%	2%	2%	6%	200%
Trabalho, Educação e Saúde - TES	100%	93%	100%	94%	0%	7%	0%	0%	0%	0%	0%	0%

Source: SciELO, March 2015.

this study. On average, about 93% of the articles indexed in the three year period in question meet this condition. The most relevant data, and all too well known, is the predominance of authors from Brazil in the SciELO collection as a whole, as well as in the different thematic sets of journals. There was a gradual decline in Brazilian authorship over the three year period (-3%), dropping to an average of 88% of articles in 2013. The increase in the proportion of foreign authorship was somewhat more pronounced (22%) and reached an average of 18% in 2013. Journals in the human and health sciences show an improved performance in the internationalization of authorship over the three year period in question, with increases of 31% and 24% in foreign authors, respectively. Articles authored by both Brazilian and foreign authors in journals of Brazil reached 6 % of the total in 2013, thus reflecting on and contributing to the low international collaboration of Brazilian research that has been indexed, ranking it below Argentina, Chile and

Mexico and, among the major producers, with China, India and South Korea⁴.

Author affiliation and language of publication indicators confirms that the editorial policies of the journals in the health sciences are directed almost exclusively towards national research, with 95% of articles in 2013 having national authorship and 13% having foreign authorship, with a notable increase of 60% in international collaboration. Again, for public health as a whole, the journals CSP, and mostly C&SC, are the leading channels for disseminating predominantly national authors. The relative growth in foreign authors during the period in question was more pronounced in the journals RBE and RBSO while RSP, which has been in the international indexes much longer and which has been publishing in English for ten years now, has the highest level of internationalization in the table, with 19% of its articles having foreign authors and 13% having international collaboration.

Internationalization – citations, impact, and source of measurement

Outgoing and incoming citations in articles make clear the relationship among research projects and results and their level of inclusion in the different communities, while the distributions of the origins and destinations of citations are indicators of internationalization.

In this regard, the distribution of citations in articles from Brazilian journals in SciELO in the field of public health was analyzed (Table 6). An indicator used in the table is the proportion of citations given to journals - to those indexed in WoS but not in SciELO, in SciELO, and in both WoS and SciELO. For the journals in WoS only, the relationship of national research with research indexed internationally can be seen, while together with SciELO the relationships with research indexed in restrictive indexes can be seen. Citations to books follows the pattern of research in the human sciences⁵. No journal had more than 50% of its citations going to foreign journals indexed in WoS. On the one hand, RSP, CSP and RBE stand out with more than 50% of their citations going to journals indexed in either WoS

or SciELO, while on the other hand PRSC, ICSE and TES cite more books than journals. C&SC holds an intermediate position. Self-citation is generally minimal when considering all the citations to all types of documents, and grows in article indexes which have fewer related journals.

The predominance of research with a national focus and with national authorship in journals of Brazil in public health is reflected in the low performance of the journals in terms of international impact as measured by citations. In fact, the median Impact Factors in 2013 of journals in public health as given by Scimago and Social Sciences/JCR are 1.0 and 1.3, respectively. Most journals of Brazil are found below the Scimago and JCR median Impact Factors -75% and 100%, respectively. This reflects upon and contributes to the low performance of the journals in terms of citations per article of articles with Brazilian authorship in public health and the other areas. Among the 50 countries in the Scimago index with the highest production in public health, Brazil ranks last in terms of citations per article, regardless of the journal in which the article was published.

Excluding the values of the Impact Factor itself which is determined by a fraction of articles

Table 6. The distribution of the types of documents cited by SciELO journals in the health sciences for the period 2009 - 2014.

Journal	type of document cited										Total n° of citations
	journals										
	all		WoS +	WoS		SciELO		others	books	other	
	all	self-cited	SciELO	WoS	self-cited	SciELO	self-cited		types		
Revista de Saúde Pública - RSP	85%	8%	66%	40%	16%	26%	26%	19%	12%	3%	19,127
Cadernos de Saúde Pública - CSP	73%	9%	57%	34%	20%	22%	30%	16%	20%	7%	52,580
Revista Brasileira de Epidemiologia - RBE	73%	3%	53%	30%		23%	9%	20%	16%	12%	13,976
Ciência & Saúde Coletiva - C&SC	56%	8%	37%	17%	27%	20%	24%	19%	33%	11%	59,984
Revista Brasileira de Saúde Ocupacional - RBSO	46%	5%	28%	11%		18%	12%	18%	37%	18%	4,788
Saúde e Sociedade - SeS	43%	5%	28%	9%	23%	20%	10%	15%	41%	16%	15,344
Physis: Revista de Saúde Coletiva - PRSC	43%	3%	27%	9%		17%	7%	16%	43%	14%	11,519
Interface - Comunicação, Saúde, Educação - ICSE	39%	8%	24%	7%		17%	18%	15%	48%	13%	13,722
Trabalho, Educação e Saúde - TES	34%	5%	19%	2%		17%	10%	14%	52%	14%	5,746

Sources: SciELO, March 2015; WoS, March 2015.

with a higher number of citations, a simple indicator of the extent of the influence of research published by the journals is the percentage of their articles which receive one or more citations, and the number of citing journals. Table 7 shows this distribution for original articles and reviews in journals in public health indexed in SciELO and the WoS Core Collection.

As expected, all the articles from all the public health journals indexed in WoS have a better performance than those in public health journals in SciELO. Among the reasons for this is that the universe of journals in WoS is larger than it is in SciELO. However, the four Brazilian journals CSP, C&SC, RSP and SeS, indexed in both WoS and SciELO, have a better relative performance in SciELO which reflects the predominance of domestic citations due to the greater number of citing journals of Brazil in SciELO, and the limited number of citations received from articles in foreign journals indexed in WoS.

In the context of SciELO, the performance of the public health journals stands out, and is much better than those in the health sciences which have the best performance in SciELO as a subject area compared to journals in the other broad subject areas. In the context of WoS, C&SC has the best performance in terms of the percentage of articles with one or more citations,

although both RSP and CSP have a better performance in terms of the total number of citations per article. Close to 72% of these citations are to RSP and CSP and come from articles with at least one Brazilian author. This percentage increases to 80% and 100% for C&SC and SeS, respectively. In SciELO, in addition to C&SC, CSP and RSP, TES and RBE stand out.

Also, in the context of WoS, the national focus of the four journals of Brazil stands out when compared with public health journals from other countries which have a tradition of research in the area, whose language is not English and dealing with the editorial management of journals published nationally. Table 8 shows this comparison with selected journals from Canada, France, Mexico and Spain. As expected, journals with more authors from abroad and with national authors in international collaboration receive more citations from abroad, with *Salud Pública de Mexico* standing out. Nevertheless, RSP has the best performance in all bibliometric indicators, followed by CSP due to the more citations received.

Next to SciELO, the relative performance of the same journals in public health notably improves in the wider context of documents on the Web as indexed by Google Scholar Metrics (GSM), an index which is not commonly used as a bibliometric index because it does not have

Table 7. The distribution in the percentage of articles with at least one citation in the period 2011 - 2013 in SciELO and WoS for journals in the health sciences and public health.

Thematic area and journals in public health	2011		2012		2013	
	SciELO	WoS	SciELO	WoS	SciELO	WoS
Health Sciences - Brazil	56%	82%	39%	75%	18%	64%
Public Health - total of articles	75%	87%	59%	80%	31%	67%
The four journals in public health indexed in WoS	80%	65%	63%	56%	37%	35%
Ciência & Saúde Coletiva - C&SC	77%	62%	70%	60%	46%	41%
Cadernos de Saúde Pública - CSP	85%	71%	70%	61%	37%	37%
Revista de Saúde Pública - RSP	83%	69%	62%	66%	31%	35%
Saúde e Sociedade - SeS	73%	48%	31%	22%	16%	8%
The nine journals in public health indexed in SciELO	75%		59%		31%	
Ciência & Saúde Coletiva - C&SC	77%		70%		46%	
Cadernos de Saúde Pública - CSP	85%		70%		37%	
Revista de Saúde Pública - RSP	83%		62%		31%	
Trabalho, Educação e Saúde - TES	60%		58%		21%	
Revista Brasileira de Epidemiologia - RBE	69%		55%		13%	
Interface - Comunicação, Saúde, Educação - ICSE	60%		47%		15%	
Saúde e Sociedade - SeS	73%		31%		16%	
Revista Brasileira de Saúde Ocupacional - RBSO	60%		43%		11%	
Physis: Revista de Saúde Coletiva - PRSC	58%		36%		5%	

Sources: SciELO, March 2015; WoS, March 2015.

quality control features on its database and on its annual series of indicators. GSM uses the h5-index as its indicator which is simply the H index applied to articles from journals published in full over the last five year period. Table 9 shows the distribution of the median h5-index for the different groups of journals in SciELO for 2012 and

2013 which have published in full over the last five year period as registered by GSM.

The health sciences journals have the best performance amongst all the journals considered in this study. The journals in public health, particularly CSP, RSP and C&SC which rank as the first three in the h5-index rankings of all SciELO

Tabela 8. Selected journals in public health indexed in WoS by number of articles published in 2011, 2012 and 2013, number of citing journals and articles by national and international origin and bibliometric indicators

Journal	articles published				citing journals		
	% authorship affiliation				% afiliação		
	total	national	foreign	both	total	national	foreign
Saúde e Sociedade - SeS	294	89%	14%	4%	33	48%	52%
Ciência & Saúde Coletiva - C&SC	1105	92%	12%	4%	238	15%	85%
Cadernos de Saúde Pública - CSP	714	94%	15%	9%	355	10%	90%
Revista de Saúde Pública - RSP	434	93%	18%	11%	326	10%	90%
Gaceta Sanitaria	293	94%	16%	10%	305	10%	90%
Canadian Journal of Public Health	260	97%	14%	11%	361	6%	94%
Revue d'Épidémiologie et de Santé Publique	172	65%	38%	10%	148	11%	89%
Salud Pública de Mexico	280	76%	42%	24%	234	3%	97%

Journal	citing articles					bibliometric indicators			
	% journal affiliation				%	Scimago		WoS	GSM
	total	national	auto	foreign	national author	Impact SJR	Impact factor	Impact factor	h5
Saúde e Sociedade - SeS	113	85%	27%	15%	100%	0,367	0,250	0,174	18
Ciência & Saúde Coletiva - C&SC	922	67%	34%	33%	82%	0,635	0,750	0,572	37
Cadernos de Saúde Pública - CSP	1174	50%	17%	50%	73%	0,673	1,070	0,888	39
Revista de Saúde Pública - RSP	870	46%	10%	54%	72%	0,807	1,340	1,219	37
Gaceta Sanitaria	666	36%	15%	64%	70%	0,434	1,160	1,250	19
Canadian Journal of Public Health	664	17%	0%	83%	54%	0,569	1,180	1,094	22
Revue d'Épidémiologie et de Santé Publique	204	16%	5%	84%	51%	0,305	0,690	0,656	11
Salud Pública de Mexico	460	22%	17%	78%	50%	0,491	0,890	1,034	26

Sources: WoS, March 2015; Scimago, March 2015; Google Scholar, January 2015.

Table 9. The distribution of the Google Metrics h5-index for the years 2012 and 2013 for all journals, for those in SciELO, Health Sciences, Human Sciences and Public Health.

Metric	Google Scholar Metrics - h5-index Journals									
	Total		Health Sciences		Human Sciences		Other areas		Public Health	
	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013
max	38	39	38	39	21	23	32	33	38	39
Q1	16	15	21	22	13	13	15	14	34	37
Median	11	10	16	16	10	8	10	9	19	17
Average	13	11	16	16	10	9	11	10	21	20
Q3	7	6	10	8	5	4	6	6	12	10
Min	2	1	4	2	2	2	2	1	8	2
IQR	10	10	12	15	9	10	10	10	23	28

Source: Google Scholar, January 2015.

journals, contribute in an important way to this result. Table 10 lists the individual performances for 2012 and 2013 of the journals in the health sciences. The majority of them show an improvement in their respective h5-index for 2013. Only two journals have an h5-index below the median for journals in the health sciences. This notable impact in terms of citations of the journals of

Brazil in public health as measured in the broad universe of journals available on the Web indexed by Google Scholar demonstrates the importance and magnitude of the influence of the research these journals publish. Despite their predominantly national character, the three journals with the highest impact have a h5 sufficiently high to be a part of the GSM list of the 20 highest impact journals in public health which publish in English and whose h5 ranges between 69 and 31.

The last indicator treated by this report refers to accesses to the research published by journals in public health as measured by number of downloads. This is made up of accesses, either via the SciELO interface or direct access to the server file system, to the abstracts and full texts in HTML and PDF which are hosted on the SciELO servers. Table 11 shows the distribution of downloads of documents in 2014 for documents published in 2011, 2012 and 2013. The extensive visibility of SciELO on the Web is also confirmed by another indicator - the Webometrics global ranking of academic document portals, operated by the *Consejo Superior de Investigación Científica* in Spain. SciELO ranks 3rd in the Webometrics ranking.

The journals in health and human sciences, among which are those in public health, show the

Table 10. The distribution of the Google Metrics h5-index for journals in the SciELO Health Sciences for 2012 and 2013.

Journal	GSM h5-index	
	2012	2013
Cadernos de Saúde Pública - CSP	38	39
Ciência & Saúde Coletiva - C&SC	35	37
Revista de Saúde Pública - RSP	34	37
Interface - Comunicação, Saúde, Educação - ICSE	21	23
Revista Brasileira de Epidemiologia - RBE	22	20
Saúde e Sociedade - SeS	16	18
Physis: Revista de Saúde Coletiva - PRSC	13	16
Revista Brasileira de Saúde Ocupacional - RBSO	8	11
Trabalho, Educação e Saúde - TES	9	10

Source: Google Scholar, January 2015.

Table 11. Downloads and accesses per document^a in 2014 in SciELO Brazil for documents published in the period 2011 - 2013, by thematic area and by journal in public health.

Thematic area and journals in public health	Downloads per document in 2014		
	year of publication		
	2011	2012	2013
Total	883	826	776
Health Sciences	1077	999	906
Human Sciences	961	874	793
Other	621	602	617
Public Health	994	908	870
Revista Brasileira de Saúde Ocupacional - RBSO	1280	1515	1289
Saúde e Sociedade - SeS	941	903	1083
Revista Brasileira de Saúde Materno Infantil - RBSMI	900	722	1059
Trabalho, Educação e Saúde - TES	1123	1083	1048
Ciência & Saúde Coletiva - C&SC	1129	1019	919
Revista de Saúde Pública - RSP	1098	960	871
Revista Brasileira de Epidemiologia - RBE	946	884	823
Physis: Revista de Saúde Coletiva - PRSC	787	787	765
Cadernos de Saúde Pública - CSP	826	768	732
Interface - Comunicação, Saúde, Educação - ICSE	805	715	653

^a Includes all types of documents.

Source: SciELO, March 2015.

best performance in SciELO in terms of downloads per document. For documents published in the three years considered here, the performance of the journals RBSO, TES, and C&SC stands out with an average of more than one thousand downloads per document in 2014. However, if articles published in 2013 are also included, this same average number of downloads per document is attained by RBSO, SeS, RBSMI and TES. Since the journals in SciELO are published in open access, many of them have their full texts available on their own journal portals as well as in other repositories, meaning that the statistics presented here are limited to the downloads and accesses through the SciELO portal. Based on Google Analytics statistics, close to 75% of the accesses originate in Brazil, which demonstrates the national focus of most of the journals, in particular those in public health.

Conclusions

The panorama of statistics and quantitative bibliometric indicators of Brazilian research in public and collective health presented here highlights, as expected, the high level of article production, the national focus of the research, and its communication predominantly via nationally edited journals. These known characteristics are one of the strengths of the area of public and collective health, and position it at the heart of the debate on scientific productivism, systems of evaluation and the internationalization of Brazilian research.

These journals are an integral and essential part of this debate since they face the fundamental question of how to overcome the disadvantages placed upon them by the major systems of evaluation, and how to transcend editorial passivity in the face of what they are subject to publish, and move on to develop and apply proactive editorial policies which contribute to improving article quality and the balance between a domes-

tic focus and being part of the international flow of scholarly communication.

How can Brazilian research in public and collective health, which is reported by Brazilian journals whose background is the virtues and problems of the National Health System, contribute more significantly to the research of other countries? How can some of this research become an international benchmark? And in this sense, how can the international scrutiny of publishers and reviewers be taken advantage of to assess what and how to publish? What strategies and mechanisms will help to increase the number of submissions of quality manuscripts from foreign authors?

Knowing that the application and advancement of these policies should take place within the institutions responsible for the journals and their editorial boards, the updating of national research and funding agency policies to support the journals in communicating the research outputs is essential to creating the conditions for the improvement of the journals. It is with this in mind that one hopes, for instance, for a renewed and agile Qualis system.

The SciELO Program has been promoting the professionalization, internationalization and financial sustainability of journals as essential conditions for being indexed in SciELO. The plan over the next three years at SciELO is to index journals produced according to the international state of the art in methods and technologies, and increase the proportion of indexed articles in English, as well as the number of manuscripts assessed by editorial boards and reviewers with a greater participation from foreign researchers.

It is incumbent on Abrasco (*Associação Brasileira de Saúde Coletiva*) to accelerate the debate that it has been promoting for years now and enrich it, on the one hand, with in-depth studies on the quality and performance of the research communicated by journals in Brazil and abroad and, on the other hand, internationalizing the debate itself.

Acknowledgments

To Fabio Batalha Cunha dos Santos and Rogerio Mugnaini for their work in gathering and tabulating the SciELO data, and to Nicholas Cop for the review and translation of the manuscript into English.

References

1. Luz MT. Complexidade do campo da Saúde Coletiva: multidisciplinaridade, interdisciplinaridade, e transdisciplinaridade de saberes e práticas - análise sócio-histórica de uma trajetória paradigmática. *Saúde Soc* 2009; 18(2):304-311.
2. Hicks DM. The Four Literatures of Social Science. In: Moed HF, Glänzel W, Schmoch U, editors. *Handbook of Quantitative Science and Technology Research*. Houten: Springer; 2004. p. 473-496.
3. Meneghini R, Packer AL. Is there science beyond English? *EMBO Reports* 2007; 8(2):112-116.
4. Adams J. Collaborations: The fourth age of research. *Nature* 2013; 497(7451):557-560.
5. Mugnaini R, Meneghini R, Packer AL. Citation profiles in Brazilian journals of the SciELO database in different scientific areas. In: *Proceedings of the 11th International Conference of the International Society for Scientometrics and Informetrics*. Madrid: CINDOC-CSIC; 2007. p. 904-905.

Article submitted 17/03/2015

Approved 28/04/2015

Final version submitted 30/04/2015