

## Countries emerging as major scientific powers

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The last issue emphasized the changes taking place in the *Revista Brasileira de Hematologia e Hemoterapia* (RBHH) and discussed the reasons that the Associação Brasileira de Hematologia e Hemoterapia (ABHH) and her two sister societies decided to internationalize the journal.<sup>(1-3)</sup> It was pointed out that one of the primary reasons for this was the new Qualis classification by the Brazilian further education council (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Capes). In several articles, editors of many Brazilian journals voiced their unanimous disagreement at the use of just the Thomson-Reuters impact factor in the preparation of this new classification.<sup>(4,5)</sup>

The impact factor has long been used inappropriately to assess the productivity of individual researchers and professors and consequently in academic decisions related to promotion. Thus, several reports exorcise the Thomson-Reuters impact factor and recommend that other indices, such as those of SCImago and SciELO, should also be used in the classification of scientific journals.<sup>(6,7)</sup> This is justified and so the objective of the Brazilian editors was to valorize national production and Brazilian journals.

In June, Crossref Quarterly, the e-letter of one of the institutions that attribute Digital Object Identifiers (DOIs) to scientific publications on the internet, reported on the Brazilian evolution over the last two years in respect to the number of requests for DOIs.<sup>(8)</sup> Crossref cites Brazil because of the recent increase in membership; the RBHH is one of these new members.

Another article from the Royal Society entitled “Knowledge, Networks and Nations: Global scientific collaboration in the 21<sup>st</sup> century” identifies the new emerging countries of great scientific power led by China and including Brazil and also throws light on the growing scientific production of countries that are not normally mentioned such as Iran, Turkey and Tunisia.<sup>(9)</sup>

China is now the second highest producer of scholarship articles worldwide and the fourth in medicine.<sup>(10)</sup> Eleven years ago it was the nineteenth in the ranking of SCImago in medicine, that is, behind Brazil which was the seventeenth (Table 1). China's contribution has accompanied its intense economic progress that has been observed over the last fifteen years.

Table 1 – Scientific publications in medicine – 1996 to 2010<sup>(10)</sup>

	Country	Documents	Documents Citable	Citations	Self-Citations	Citations per Document	H Index
1	United States	1.514.274	1.313.135	28.165.451	13.539.970	20,21	784
2	United Kingdom	458.293	369.155	7.162.643	1.680.729	16,90	508
3	Germany	367.212	319.858	4.786.364	1.170.324	13,84	420
4	Japan	328.347	309.148	3.510.661	929.502	10,84	312
5	France	252.332	214.868	3.233.920	623.881	13,52	413
6	Italy	231.275	203.536	3.041.336	591.409	14,35	385
7	Canada	193.968	170.116	3.494.854	586.841	20,99	433
8	China	167.757	162.571	602.479	189.767	6,06	152
9	Spain	162.084	136.311	1.482.646	312.223	10,35	285
10	Australia	146.251	124.101	2.059.298	383.769	16,56	313
11	Netherlands	139.657	123.833	2.615.527	442.472	21,30	380
12	Turkey	93.670	84.048	443.296	87.157	5,88	115
13	India	92.838	77.532	419.141	113.046	5,69	125
14	Switzerland	85.801	75.281	1.454.760	167.724	18,79	317
15	Sweden	85.521	78.780	1.679.066	254.349	21,08	322
16	Brazil	80.958	74.791	544.358	147.804	8,85	173
17	Belgium	67.969	60.234	1.151.911	137.729	18,47	300
18	South Korea	60.086	56.657	474.879	75.442	11,39	146
19	Taiwan	56.647	52.835	479.331	88.977	10,08	152
20	Israel	51.088	46.026	707.404	82.306	14,74	222

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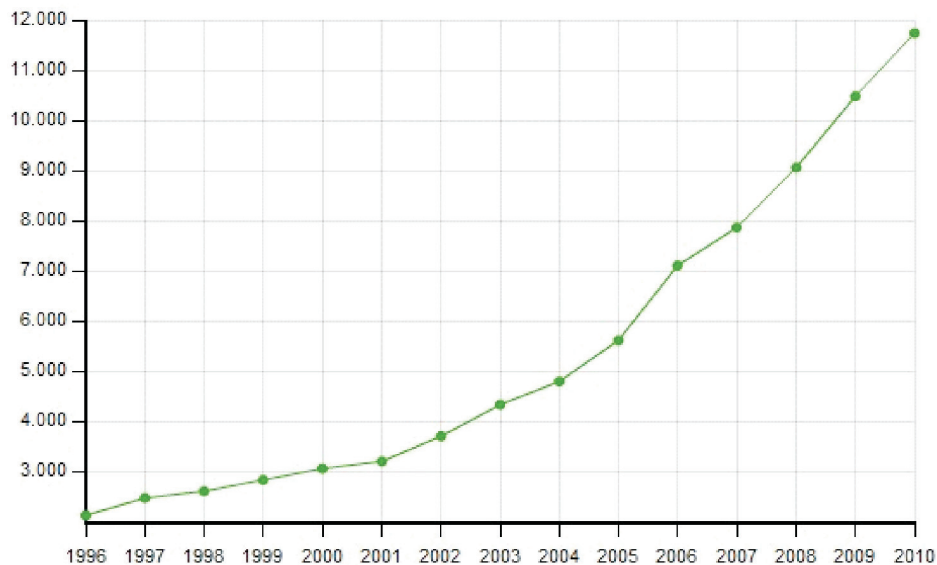


Figure 1– Evolution of scientific production in Brazil between 1996 and 2010<sup>(10)</sup>

Albeit not so evident, a similar evolution has happened in Brazil, with a significant improvement in the rankings giving a larger slice of the share in these years (Figure 1). Today, both in general publications and in medicine, we are in the thirteenth position according to the SCImago Journal Rank (SJR - Table 1).

And how is the production of Hematology? Table 2 is the cumulated publications from 1996 to 2010. In 2009 and 2010 there was intense and comparable production in Italy, the UK and Germany; these countries produced the highest

number of articles after the USA. Between 1999 and 2009 China climbed from the twenty-fifth place to the seventh place giving it an aggregate position of thirteenth in 2010 (Table 2).

In the same period, Brazil moved from twenty-fourth to fourteenth position and its aggregate position for 1996 to 2010 is eighteenth. This is important but it is even more significant if we look at the production of Brazil in 2010 when it is in the twelfth position and not so far behind countries such as Australia and Spain (Table 3).

Table 2 – Scientific publications in hematology – 1996 to 2010<sup>(10)</sup>

	Country	Documents	Documents Citable	Citations	Self-Citations	Citations per Document	H Index
1	United States	47.963	43.395	1.005.199	465.787	22,67	248
2	Italy	14.835	12.720	254.780	56.467	18,10	151
3	Germany	14.397	13.002	271.615	64.473	20,33	158
4	United Kingdom	14.317	12.515	289.715	56.467	20,90	163
5	Japan	12.525	11.275	169.750	44.593	13,31	115
6	France	11.489	10.144	214.646	39.423	19,06	151
7	Netherlands	6.998	6.382	155.519	26.040	23,75	136
8	Canada	6.034	5.515	110.718	17.002	20,50	117
9	Spain	4.939	4.316	79.830	12.122	16,49	104
10	Sweden	3.738	3.474	77.560	11.647	21,74	106
11	Austrália	3.469	3.026	63.650	9.618	20,78	100
12	Turkey	3.222	2.709	14.466	3.480	5,36	38
13	China	2.989	2.766	20.463	5.868	12,05	51
14	Switzerland	2.903	2.623	61.795	6.630	24,11	104
15	Austria	2.662	2.371	49.056	6.072	19,55	92
16	Belgium	2.603	2.380	54.760	5.881	22,05	97
17	Israel	2.436	2.204	42.352	5.468	18,54	78
18	Brazil	1.997	1.734	14.947	3.291	11,93	48
19	India	1.961	1.630	10.106	3.086	7,37	33
20	Greece	1.908	1.635	19.204	3.045	11,21	56

Table 3 – Scientific publications in hematology – 2010<sup>(10)</sup>





















	Country	Documents	Documents Citable	Citations	Self-Citations	Citations per Document	H Index
1	 United States	4.154	3.388	6.740	3.543	1,62	248
2	 Germany	1.194	1.005	2.381	606	1,99	158
3	 Italy	1.193	930	1.911	493	1,60	151
4	 United Kingdom	1.121	931	2.351	568	2,10	163
5	 France	907	730	1.676	329	1,85	151
6	 Japan	751	595	809	173	1,08	115
7	 China	647	586	383	98	0,59	51
8	 Netherlands	604	515	1.089	217	1,80	136
9	 Canada	571	490	819	161	1,43	117
10	 Spain	381	324	814	111	2,14	104
11	 Austrália	379	289	640	130	1,69	100
12	 Brazil	345	283	193	52	0,56	48
13	 Turkey	344	297	139	27	0,40	38
14	 Switzerland	314	259	706	96	2,25	104
15	 Sweden	306	268	579	91	1,89	106
16	 Austria	259	204	439	54	1,69	92
17	 Iran	257	155	56	20	0,22	23
18	 India	247	197	106	30	0,43	33
19	 Israel	214	172	379	56	1,77	78
20	 South Korea	212	173	226	33	1,07	46

Table 4 - Percentage of publications in hematology compared to the overall scientific publications in medicine of each country in 1999, 2004, 2009, cumulative of 2006 to 2009 and the year of highest productivity<sup>(10)</sup>

Country	1999 %	2004 %	2009 %	1996-2009 %	Year > %
USA	2.23	2.58	2.5	2.23- 5.27	2001
Italy	5.73	5.19	4.99	4.7- 7.61	2001
China	1.64	1.29	2.01	0.90 - 3.59	2000
Brazil	1.43	1.86	2.24	1.11- 3.18	2001

However we can improve as is clear on comparing the percentage of production in hematology in respect to the overall production of documents in Medicine. Table 4 is a simple comparison of evolution of randomly chosen years of the countries that lead aggregate ranking in Hematology as well as China and Brazil. What is observed is that every year the percentage contribution of the USA and Italy in the field of hematology compared to its overall scientific production in medicine is higher than China and Brazil which shows we can and should improve.

At this point we should emphasize that the RBHH has an important role in the evolution of hematology in Brazil; it is publishing most of the citable and cited documents which make up the score of the ranking of the SJR.

These data can be challenged or considered irrelevant, but should be viewed as a stimulus; an encouragement to

continue with changes to transform the Revista Brasileira de Hematologia e Hemoterapia.

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