

Research letter

Global productivity of dermatological research: a bibliometric analysis from 1985 to 2014

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DEAR EDITOR, Bibliometrics is the quantitative study of literature according to bibliographies, intended to provide evolutionary models of science, technology and scholarship through an objective evaluation of the performance and impact of research activity in the studied field.¹ In recent years, bibliometric methods have been increasingly used to evaluate scientific production in numerous medical fields, including anaesthesiology, ophthalmology, psychiatry and orthopaedics.^{2–5}

Studies on dermatological literature have been conducted in central European, Nordic and Organisation for Economic Co-operation and Development countries.^{6–8} However, no global, long-term bibliometric studies have so far been conducted in this field.

To explore systematically the worldwide development of dermatological research, we performed a bibliometric study of papers published from 1985 to 2014. All papers published in all the journals listed under the subject category of

'dermatology' in Web of Science were collected. We also used a keyword search to target dermatological papers published in nondermatological journals. The distribution of article classifications, countries and institutions were each analysed in order to determine the characteristics of dermatological research activity.

We found that the average number of citations per paper (CPP) of papers published in dermatological journals was 8.63, while the top 10% most highly cited papers had a mean CPP of 45.12. Dermatological papers published in nondermatological journals had an average CPP of 16.18, whereas the top 10% had a mean CPP of 70.86. This indicates that a substantial number of high-impact dermatological papers were not published in dermatological journals. In addition, citations from the top 27.5% of papers contributed to 88.0% of total citations, indicating a centralized distribution.

The papers collected in our study were distributed across seven classifications, comprising 98.6% of all papers: original articles (OAs); proceedings papers; editorial material; letters; meeting abstracts; notes; reviews. Of all seven types, OAs were the most common (approximately 49.0% of all papers). The paper types in dermatology research varied more widely than

Table 1 The total numbers of papers and citations per paper of the top 20 h-index-ranked countries 1985–2014

Rank	Country	h-index	Number of papers			Times cited		
			1985–94	1995–2004	2005–14	1985–94	1995–2004	2005–14
1	U.S.A.	237	20 598	24 379	48 472	330 947	438 305	420 315
2	U.K.	158	6110	7603	15 483	93 281	137 586	128 465
2	Germany	158	5798	9709	22 061	61 344	153 704	161 577
4	France	133	4096	6531	10 143	44 779	75 989	79 105
5	Netherlands	127	1651	1924	3895	26 638	47 637	54 295
6	Japan	115	3096	6935	12 484	38 416	97 035	78 452
7	Italy	112	2235	4052	8138	26 102	58 551	71 376
7	Canada	112	972	1406	4126	15 857	34 029	45 505
9	Switzerland	106	1209	1891	3196	17 073	31 900	39 124
9	Sweden	106	1228	1396	2048	23 979	33 726	31 716
11	Australia	105	400	1056	4452	9213	30 494	45 354
12	Denmark	95	986	920	2126	19 735	23 579	27 402
13	Austria	93	1160	1646	3124	15 604	24 960	26 141
14	Belgium	83	797	1158	1752	11 069	19 514	20 800
14	Spain	83	1096	2148	5379	11 589	28 928	34 642
14	Finland	83	632	789	918	13 043	17 239	12 900
17	Israel	66	723	913	1501	7775	14 334	14 884
18	Norway	63	233	241	534	3672	6781	6840
19	Ireland	60	81	238	957	1384	4947	11 120
20	South Korea	58	139	1178	6489	1607	12 867	26 934

Table 2 Total numbers of papers and citations per paper of the top 20 h-index-ranked institutions 1985–2004

Rank	Institution	h-index	Number of papers			Times cited		
			1985–94	1995–2004	2005–14	1985–94	1995–2004	2005–14
1	Harvard University	113	701	1218	2069	17 504	32 133	31 577
2	University of California – San Francisco	108	946	1195	1946	19 418	32 207	27 505
3	Massachusetts General Hospital	101	437	645	1056	10 114	21 667	17 903
4	University of Pennsylvania	97	620	785	1682	13 353	16 351	22 771
5	University of Michigan – Dearborn	94	816	540	850	18 885	15 417	11 663
6	The University of Texas – El Paso	92	990	1203	600	17 641	27 788	11 430
7	Free University of Berlin	81	435	686	1719	5967	14 345	19 546
7	New York University	81	559	475	1003	10 666	10 674	12 992
9	Humboldt University of Berlin	80	63	758	1655	576	16 374	18 978
10	Ludwig Maximilian University of Munich	77	816	732	1223	8915	12 999	12 949
11	Yale University	76	533	443	866	9457	8786	10 670
12	National Cancer Institute	75	98	408	722	7178	11 861	9681
13	Johns Hopkins University	74	443	415	760	8447	11 110	11 781
14	University of California – Los Angeles	73	333	346	806	7353	9777	11 146
15	The University of Manchester	72	59	306	1277	772	8544	14 039
15	University of Copenhagen	72	241	373	961	4499	10 915	14 725
17	University of Amsterdam	70	229	234	521	4134	8365	7583
17	Stanford University	70	422	515	935	6995	7561	11 578
19	University of Colorado – Colorado Springs	69	274	323	599	5757	8989	8035
19	Karolinska Institutet	69	156	301	733	2778	8112	7903

those in other fields (e.g. electronic health record research, for which > 80.0% of papers are OAs), and the proportion of meeting abstracts was also substantially higher.⁹

To determine the distribution and impact for countries and institutions, we ranked them according to their total number of published papers. The h-index was used to determine the number and quality of citations of a researcher or institution. When a certain country or institute was given 'h' as its h-index, it was defined as 'the number of papers with a citation number $\geq h$ '.¹⁰ In this analysis, we used the h-index of the period 1984–2015 to rank and understand the geographical distribution. The only Asian countries in the top 20 h-index-ranked countries were Japan and the Republic of Korea (Table 1). Although China was not in the top 20, it exhibited a high rate of increase, with 4899 published papers and 24 198 citations in 2005–14, ranking ninth and seventeenth, respectively. The number of citations of most countries decreased in the last decade as there less time to accumulate citations, but this does not mean there was a decrease in impact.

We also found that the quality of papers from northern Europe was higher than those from other regions; Sweden and Norway ranked in the top 20 list despite a low number of published papers. Their CPPs were 15.5 and 12.8, respectively, which are much higher than other countries on the list; for example, the U.S.A. had a CPP of only 8.67.

A bibliometric study of the orthopaedic literature revealed that the top 10 countries publishing orthopaedic papers constituted 81.4% of the total orthopaedic papers from 2000 to 2011.⁵ In our study, we observed a similar proportion, with the top 10 countries constituting 78.6% of published papers. These papers accounted for 98.8% of total citations.

The top 20 institutions were also ranked according to their h-index from 1984 to 2015 (Table 2). All institutions in the list were from North America and Europe, with 13 institutions in the top 20 being from the U.S.A. Germany was ranked second, with three institutions. Other countries had far fewer institutions in the top 20 list. The U.K., the Netherlands, Sweden and Denmark had one institute each in the list.

The bibliometric method has rarely been adopted in medical fields and in dermatological research. Therefore, a head-to-head comparison between fields is nearly impossible. Hence, two possible outcomes of our study are to introduce the bibliometric method to researchers in medicine and encourage similar studies in other fields to create a comprehensive understanding of research activities in all medical fields.

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