Current Comments®

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Why Are the Impacts of the Leading Medical Journals So Similar and Yet So Different? Item-by-Item Audits Reveal a Diversity of Editorial Material

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The following article[1] was published in the *Annals of Internal Medicine* last year and is reprinted here in an abridged form with the permission of that journal. Using the 1981 and 1982 *Science Citation Index®* (*SCI®*) and other citation data, we examined in detail the top 5 of 78 general and internal medicine journals—*Annals of Internal Medicine*, *British Medical Journal*, *The Journal of the American Medical Association*, *The Lancet*, and *The New England Journal of Medicine*. An article-by-article audit enabled us to differentiate the impact of different types of editorial material. For example, letters play an important role in current medical literature.

We now have 1985 data available for the journals listed in the article. Despite the passage of several years, however, the impact, citation, and immediacy rankings have not changed significantly. Consequently, we have chosen not to publish the new data here, but rather have left the original tables in place. In addition, to save space, we provide data for only the top 40 journals. Most of these data are available by referring to the *Journal Citation Reports®* volumes of the 1985 *SCI*. Thirty-six of the 40 journals are currently covered in the Clinical Medicine edition of *Current Contents®* (*CC®/CM*). Twenty-three of these 36 are also listed in the Life Sciences edition of *CC* (*CC/LS*).

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1. Garfield E. Which medical journals have the greatest impact? *Ann. Intern. Med.* 105(2):313-20, 1986.

Which Medical Journals Have the Greatest Impact?

by Eugene Garfield, Ph.D.

High-impact medical journals are identified using data from the 1981 and 1982 *Journal Citation Reports®* (*JCR®*). The *JCR* is an annual supplement to the *Science Citation Index®*. Journals publish different types of editorial matter, much of which does not report substantive research. A special algorithm is used to calculate the number of substantial, or "meaty," items. In 1981 *The Lancet* and *The New England Journal of Medicine* ranked highest among 40 journals in citations received, 53 945 and 47 887, respectively. These journals also have the highest 1982 impact factor, the average number of 1982 citations received by items in a journal's 1980 and 1981 issues. The *British Medical Journal* was highest in 1981 immediacy index, the measure of how quickly a journal's 1981 items were cited in 1981.

Introduction

Most physicians could probably name a handful of medical journals that they deem most influential. Clearly, such notions of influence or importance are subjective. However, in the past several years, much work has been done to provide objective measures of the impact of various journals (1, 2). Most of these studies use citation analysis to quantify various measures of importance. When a physician or a biomedical researcher cites a journal article, it indicates that the cited journal has influenced him or her in some manner. The more frequently that a journal is cited, the more often the worldwide medical community indicates that journal's influence or impact.

The impact of 40 general and internal medicine journals is examined using data reported in the 1981 and 1982 *Journal Citation Reports®* (*JCR®*). In addition, Table 1 provides data for five journals for 1977 to 1982. The *JCR*, which lists the summarized data used in this study, is the last volume in each year's *Science Citation Index®* (*SCI®*). Data from the *JCR* combined for 1981 and 1982 cover approximately 18 million references from over 1 600 000 "source items" published in the 1981 and 1982 issues of over 12 600 journals indexed in the *SCI*, the *Social Sciences Citation Index®* (*SSCI®*), and the *Arts & Humanities Citation Index™* (*A&HCI™*).

Methods

Source item counts in the *JCR* include the number of original research articles, technical notes, reviews, and papers presented as proceedings. The counts do not include editorials and letters unless these contain results of substantive research. All items are individually coded by type according to the definitions listed in Table 2, during editorial processing of the journals. This manual process is inevitably both subjective and subject to human variations. The decision to code an item as a letter, article, note, and so on, is often difficult. There is also considerable variation in individual journal styles and nomenclature, as well as each journal's definition of a letter to the editor and other items. For example, a letter to the editor of *Nature* is different from the typical letter appearing in the correspondence sections of most journals. The former will be identified in the *JCR* as a research article for reasons explained below. But the typical letter to the editor of a medical journal is coded as such.

Recently, our research and development staff developed an improved method for identifying journal items that contain substantive research whether they are letters, articles, or other material. An algorithm is used that weights the various characteristics of an item. This point system was determined based on our past experience with items indexed in the *SCI*. Each of several qualities of an article is graded. "Points" are allocated according to the amount and type of information the article contains (Table 3). For example, an anonymous item loses one point. An article with two or more authors receives one point. Similarly, if an author address is provided the item receives another point. Other weighting criteria include page length, number of references, and page overlap, which occurs when two or more items share the same page. This is a characteristic typical of letters and notes.

We have found that an item that receives four or more points is usually "meaty." To illustrate, a 1981 letter to the editor of *The New England Journal of Medicine* (3) was evaluated using the algorithm shown in Table 3. This letter has three authors, provides their addresses, and lists over eight references; it receives a total of five points. One point must be subtracted, however, because the letter shares the page with the end of another letter. This letter's total value according to the algorithm is four, the minimum needed to qualify as a research article in the *JCR*. (The letter discusses the effects of intrathecal interferon in patients with meningeal leukemia.) Conversely, another 1981 letter published in the same volume of *The New England Journal of Medicine* (4) is graded -1 point because it has just one author, includes only one reference, and shares the page with two other overlapping letters. This letter briefly discusses the legal and ethical considerations in the care of the elderly.

For the journals examined in this study, the algorithm was used to recalculate the published *JCR* values for each journal's 1980 and 1981 source item counts. The only journals that were measurably affected by the algorithm calculation were the *British Medical Journal*, *The Lancet*, and *The New England Journal of Medicine*, three journals that publish a significant number of letters. Their original 1980 and 1981 combined source item counts were 1779, 1236, and 738, respectively. But after using the algorithm these figures were 1027, 934, and 1012. For these three journals we used the latter figures in the calculations included in the tables.

Results

The 40 journals examined are shown in Table 4, ranked by the total number of citations they received in 1981. The number of references that the journals included and the number of source items that cited these references are also provided. The two journals that clearly dominate the list are *The Lancet* and *The New England Journal of Medicine*. These two journals together account for over one third of all the 1981 citations. The *British Medical Journal* and *The Journal of the American Medical Association* account for about another 19 percent.

An item-by-item breakdown for material published from 1977 to 1980 in the top five journals shown in Table 4 (*The Lancet*, *The New England Journal of Medicine*, *British Medical Journal*, *The Journal of the American Medical Association*, and *Annals of Internal Medicine*) is shown in Table 1, along with their respective 1977 to 1982 citation counts. Four source and six citation years were used so that the analysis would not be limited to a single year. Letters to the editor account for the greatest number of items in all five journals. But overall, articles received the greatest percentage of citations. These data, then, show one of the reasons we exclude non-substantive research items, such as "typical" letters to the editor, from our *JCR* source counts: A small number of journals publish large numbers of short letters. Although each letter may not produce many citations, the collective count can significantly affect the annual citation counts for the journal, as well as distort the count of research or review articles.

Impact factor is the frequency of citation for an "average" journal item. Note that two impact factors—total impact and cited impact—are listed for each journal in the table. An explanation of these calculations is provided in Table 1. In most cases cited impact will be higher than total impact for obvious mathematical reasons. In some

Table 1. Analysis of Source Items from 1977 to 1980 and Their Citation Rate from 1977 to 1982 from Five Journals

	Total Items	Percent of Total Items	Number of Items Cited 1977-1982	Percent Cited*	Citations from 1977-1982	Percent of Total Citations	Cited Impact Factor†	Total Impact Factor‡
Annals of Internal Medicine								
Articles	607	23.5	584	96.2	15 122	56.0	25.8	24.9
Editorials	175	6.8	134	76.6	1105	4.1	8.2	6.3
Letters	1101	42.6	435	39.5	1534	5.7	3.5	1.3
Notes	446	17.3	400	89.7	4318	16.0	10.7	9.6
Reviews	91	3.5	85	93.4	3293	12.2	38.7	36.1
Proceedings	93	3.6	83	89.2	1183	4.4	14.2	12.7
Discussions	15	0.6	15	100.0	448	1.7	29.8	29.8
All others	55	2.1	3	5.5	5	...	1.7	0.1
Total	2583	100	1739	67.3	27 008	100	15.5	10.5
British Medical Journal								
Articles	1828	13.2	1586	86.8	19 980	58.5	12.5	10.9
Editorials	2097	15.1	259	12.4	672	2.0	2.5	0.3
Letters	8334	60.0	2663	32.0	5680	16.6	2.1	0.6
Notes	1389	10.0	1168	84.1	7085	20.8	6.0	5.1
Reviews	53	0.4	51	96.2	447	1.3	8.7	8.4
Proceedings	29	0.2	23	79.3	256	0.8	11.1	8.8
Discussions	11	0.1	4	36.4	7	...	1.7	0.6
All others	158	1.1	4	2.5	5	...	1.2	...
Total	13 899	100	5758	41.4	34 132	100	5.9	2.5
The Journal of the American Medical Association								
Articles	1239	20.1	1073	86.6	11 609	57.1	10.8	9.3
Editorials	594	9.6	321	54.0	1060	5.2	3.3	1.7
Letters	3071	49.8	714	23.2	1538	7.6	2.1	0.5
Notes	1065	17.3	930	87.3	5295	26.1	5.6	4.9
Reviews	6	0.1	5	83.3	70	0.3	14.0	11.6
Proceedings	76	1.2	69	90.8	752	3.7	10.8	9.8
Discussions	...	...	...	...	...	...	...	...
All others	118	1.9	...	...	...	...	...	...
Total	6169	100	3112	50.4	20 324	100	6.5	3.3
The Lancet								
Articles	1891	15.2	1773	93.8	45 209	58.8	25.4	23.9
Editorials	1678	13.5	129	7.7	522	0.7	4.0	0.3
Letters	8048	64.7	5219	64.8	28 893	37.6	5.5	3.5
Notes	659	5.3	126	19.1	1772	2.3	14.0	2.6
Reviews	4	...	4	100.0	159	0.2	39.7	39.7
Proceedings	19	0.2	18	94.7	342	0.4	19.0	18.0
Discussions	...	...	...	...	...	...	...	...
All others	136	1.1	7	5.2	8	...	1.1	...
Total	12 435	100	7276	58.5	76 905	100	10.5	6.2
The New England Journal of Medicine								
Articles	1237	17.6	1200	97.0	49 747	67.2	41.4	40.2
Editorials	707	10.1	593	83.9	4674	6.3	7.8	6.6
Letters	4535	64.5	1706	37.6	6918	9.3	4.0	1.5
Notes	25	0.4	21	84.0	117	0.2	5.5	4.6
Reviews	97	1.4	94	96.9	5809	7.8	61.7	59.8
Proceedings	131	1.9	129	98.5	5099	6.9	39.5	38.9
Discussions	231	3.3	135	58.4	1643	2.2	12.1	7.1
All others	65	0.9	4	6.2	4	...	1.0	0.1
Total	7028	100	3882	55.2	74 011	100	19.0	10.5

*The percent cited is calculated using the number of cited items and the total number of items.

†The cited impact is calculated using the number of citations from 1977 to 1982 to those items from 1977 to 1980 that were cited.

‡The total impact is an average calculated using the number of citations from 1977 to 1982 to all items published in that journal from 1977 to 1980.

Table 2. Definitions of Journal Items Processed by the Institute for Scientific Information®

Chronologies—articles that mainly contain lists of events in the sequence in which they occurred.

Corrections, additions—corrections of errors found in articles that were previously published and that have been made known after that article was published, and additions of information to articles that were previously published and that have become available after those articles were published.

Discussions, conferences—items in which one or more persons pass comment on a paper, case, or topic.

Editorials, interviews—articles that give the opinions of persons, groups, or organizations.

Individual items—articles focusing on the life of a person and articles that are tributes to or commemorations of a person, for example, obituaries and short biographies.

Letters—contributions or correspondence from the readers to the journal editor concerning previously published material.

Meeting abstracts—general summations of completed papers that were or will be presented at a symposium or conference. The items are usually less than one page.

Notes, brief reports, communications—technical comments shorter than an article and restricted in scope.

Proceedings papers—complete papers that were or will be presented at a symposium or conference.

Research reports, papers—articles reporting the results of original work. Most primary research articles fall into this category.

Reviews, bibliographies—critical or analytical examinations of material previously published. Review articles may draw profound conclusions but usually do not include new research data; and bibliographic lists, often with descriptive or critical notes, of writings relating to a particular subject. In clinical medicine, the term "review of the literature" may cover a wide range involving a few published case reports to comprehensive analyses of a vast literature.

Table 3. Grading System Used in Algorithm for Determining Substantial Articles

Information Supplied	Points Received
Author	
Anonymous	-1
One author	0
More than one author	+1
Address	
No address	0
Any address	+1
Pages	
Less than two	0
Two	+1
Three	+2
Four	+3
Five or more	+4
References	
Less than two	0
Two to four	+1
Five to eight	+2
More than eight	+3
Page overlap	
No article overlap	0
End overlaps next article	-1
Start overlaps previous article	-1
Start overlaps and end overlaps	-2

cases, a journal that publishes a large number of uncited items may include a few that are highly cited, thus inflating the journal's cited impact factor. Calculating total impact can help put the journal's overall citation pattern in perspective. If a journal has very similar cited and total impacts, however, most of its published articles are being cited.

The impact factors in Table 1 differ from those listed later in Table 5, the list of general and internal medicine journals with impact factors of 0.6 or more, because they are based on different years of data. In Table 5, 1982 impact is based on 1982 citations to 1980 and 1981 items. The 1982 impact was calculated in Table 5 because this paper deals primarily with 1981 source items.

By providing average measures of citation activity, impact factor calculations help eliminate the bias created by examining only citation or source item counts for journals. Such numbers favor larger or older journals that have published many items. More recently established journals have usually published fewer items. In this study, *The Lancet* has the greatest 1982 impact, at 11.6; *The New England Journal of Medicine* is second highest (11.4), followed by *Annals of Internal Medicine* (6.4), and *Medicine* (5.3).

When the data in Tables 4 and 5 are compared, the most important journals in medicine are also those that are highly cited. But, there are unquestionably highly useful medical journals that are not cited as frequently, but are clearly of high impact. Consider, for example, that *Medicine* was cited just 3463 times but had an impact of 5.3. The *Annual Review of Medicine* received 1118 citations in 1981 but had an impact of 2.9. Both of these journals are in the top 10 of the 40 journals examined in this analysis when ranked by 1982 impact factor. But, as seen in Table 4, these journals are not among the top 10 when ranked by the number of citations received in 1981.

A sample of high-impact journals selected from all the biomedical journals indexed in the *SCI* is shown in Table 6. Based on 1982 impact values, the top journal in this list is *Pharmacological Reviews* (30.2). But *The Lancet* and *The New England Journal of Medicine* are sixth and seventh, respectively. They rank among the highest in science, although comparisons across disciplines can be invidious.

Table 4. General and Internal Medicine Journals Ranked by Citations Received in 1981, Based on 1981 Data from the *Journal Citation Reports*®

Journal	Citations Received in 1981	References Included in Each Journal in 1981	1981 Source Items Published
The Lancet	53 945	8814	567*
The New England Journal of Medicine	47 887	11 079	525*
British Medical Journal	28 805	7715	492*
The Journal of the American Medical Association	21 594	7305	541
Annals of Internal Medicine	17 747	7688	265
American Journal of Medicine	14 747	9941	313
Proceedings of the Society for Experimental Biology and Medicine	14 418	5975	283
Archives of Internal Medicine	7773	5253	296
Acta Medica Scandinavica	5331	7102	331
Deutsche Medizinische Wochenschrift	3898	7177	370
Medical Journal of Australia	3520	3909	320
Canadian Medical Association Journal	3511	4693	217
Medicine	3463	2949	30
American Journal of the Medical Sciences	2717	1019	46
Nouvelle Presse Medicale	2665	5147	382
Klinische Wochenschrift	2651	5889	179
Mayo Clinic Proceedings	2591	2701	107
Journal of Chronic Diseases	2321	1246	62
Quarterly Journal of Medicine	2294	1222	34
South African Medical Journal	2183	6184	483
British Medical Bulletin	2172	2759	47
Schweizerische Medizinische Wochenschrift	2169	8148	344
Postgraduate Medical Journal	2135	3621	267
Southern Medical Journal	1939	6305	466
Medical Clinics of North America	1666	5204	75
European Journal of Clinical Investigation	1574	1994	70
Israel Journal of Medical Sciences	1347	3754	199
Indian Journal of Medical Research	1233	5197	353
Munchener Medizinische Wochenschrift	1181	4642	526
New York State Journal of Medicine	1123	3524	213
Annual Review of Medicine	1118	2837	44
Postgraduate Medicine	902	1580	134
Medizinische Klinik	895	2057	170
Terapevticheskii Arkhiv	894	8333	429
Semaine des Hopitaux	892	7617	347
New Zealand Medical Journal	881	1818	174
Australian and New Zealand Journal of Medicine	779	2524	124
Wiener Klinische Wochenschrift	690	4878	178
Preventive Medicine	613	1492	62
Bulletin of the New York Academy of Medicine	612	1436	91

*Adjusted *Journal Citation Reports* value.

Another measure of a journal's citation activity is its immediacy index; that is, how quickly current items are cited the same year they are published. Because 1981 is the most current source year in this study, items from that year were used to determine immediacy. This index is calculated in Table 7 by dividing the number of citations to a journal's 1981 items by the number of items the journal published that year. The *British Medical Journal* has the highest 1981 immediacy at 5.2, followed by *The Lancet* (3.4) and *The New England Journal of Medicine* (2.4).

Discussion

The reviewing policies of *The Lancet* and *The New England Journal of Medicine*, the two leading journals shown in the tables, were once widely divergent. But today the policies are less disparate. *The New England Journal of Medicine*'s articles have always been extensively refereed (5), whereas, up until a few years ago, most of the articles submitted to *The Lancet* were evaluated only in-house. Today, however, 90 percent of *The Lancet*'s published papers are peer-reviewed out of house (6).

It is hard to judge if refereeing policies affect journal impact. However, the refereeing process itself affects immediacy because the delay it causes can be as long as one year, thus lessening the immediate impact of a paper's findings. On the other hand, if copies of papers submitted for publication circulate among reviewers for six months or more, the refereeing process may improve imme-

Table 5. General and Internal Medicine Journals with 1982 Impact Factors Greater Than or Equal to 0.6, Based on 1982 *Journal Citation Reports*® Data in Descending Order by Rank

Journal	1982 Impact Factor	Citations in 1982 to 1980-1981 Items	Number of 1980-1981 Items
The Lancet	11.6*	10 846	934*
The New England Journal of Medicine	11.4*	11 510	1012*
Annals of Internal Medicine	6.4	3637	565
Medicine	5.3	320	60
British Medical Journal	4.8*	4972	1027*
American Journal of Medicine	4.6	2628	577
Annual Review of Medicine	2.9	246	84
The Journal of the American Medical Association	2.9	3180	1102
European Journal of Clinical Investigation	2.8	393	142
British Medical Bulletin	2.6	237	92
Mayo Clinic Proceedings	2.6	530	204
Preventive Medicine	2.2	300	138
Quarterly Journal of Medicine	2.1	147	71
Archives of Internal Medicine	1.6	949	584
Canadian Medical Association Journal	1.4	587	430
Journal of Chronic Diseases	1.4	183	133
Klinische Wochenschrift	1.4	501	356
Medical Clinics of North America	1.3	177	140
Proceedings of the Society for Experimental Biology and Medicine	1.3	763	585
Acta Medica Scandinavica	1.0	561	565
Nouvelle Presse Medicale	1.0	775	759
American Journal of the Medical Sciences	0.9	93	98
Deutsche Medizinische Wochenschrift	0.9	709	763
Journal of the Royal Society of Medicine	0.9	281	297
Medical Journal of Australia	0.8	523	658
Australian and New Zealand Journal of Medicine	0.7	173	232
Johns Hopkins Medical Journal	0.7	65	100
Danish Medical Bulletin	0.6	61	100
Internist	0.6	141	230

*Adjusted *Journal Citation Reports* value.

Table 6. Biomedical Research Journals Ranked by 1982 Impact Factor Based on 1982 *Journal Citation Reports*® Data

Journal	Impact Factor
Pharmacological Reviews	30.2
Physiological Reviews	20.6
Cell	16.4
Microbiological Reviews	15.0
Journal of Experimental Medicine	11.7
The Lancet	11.6*
The New England Journal of Medicine	11.4*
Journal of Cell Biology	9.4
Proceedings of the National Academy of Sciences of the USA—Biological Sciences	9.2
CRC Critical Reviews in Biochemistry	8.9
Nature	8.7
CRC Critical Reviews in Toxicology	7.5
Journal of Cerebral Blood Flow and Metabolism	7.4
Circulation	6.8
Journal of Clinical Investigation	6.8
Science	6.8
Journal of Immunology	6.5
Annals of Internal Medicine	6.4
Journal of Molecular Biology	6.3
Journal of Neuroscience Research	6.2
Neuroscience Research Program Bulletin	6.2
Progress in Biophysics and Molecular Biology	6.2
American Journal of Cardiology	6.1

*Adjusted *Journal Citation Reports* value.

diacy because researchers will be aware of the work and will be able to cite it as soon as it is published. I discussed these issues in detail in a two-part 1986 *Current Contents*® essay on peer review (7).

The editorial policies of *The Lancet* and *The New England Journal of Medicine* have been highly successful and have made them the most influential journals in clinical research. This measure of influence must be carefully distinguished from that obtained by measuring readership or circulation. It is also possible that the clinically oriented articles published in these journals may have more influence on current medical practice than do their research reports.

It is also important to judge journals by criteria other than citation data. Thorn and colleagues (8) recently studied the statistical and research quality of the medical and pharmacy literature. They chose from each area two journals that were high in impact. Two of their journals, *Annals of Internal Medicine* and *The New England Journal of Medicine*, also appear in our paper. The other two, the *American Journal of Hospital Pharmacy* and *Drug Intelligence and Clinical Pharmacy*, are indexed in the *SCI*. The researchers categorized the citable items from each journal as evaluative research reports, review articles, editorials, letters, and so on, using descriptive information that included total citations and number of references. Those items classified as original evaluative research reports were then studied in relation to their experimental design and research goals. The ar-

Table 7. General and Internal Medicine Journals with 1981 Immediacy Indexes Greater Than or Equal to 0.2, Based on 1981 *Journal Citation Reports*® Data, In Descending Order by Rank

Journal	1981 Immediacy	1981 Citations to 1981 Items	Total 1981 Items
British Medical Journal	5.2*	2552	492*
The Lancet	3.4*	1935	567*
The New England Journal of Medicine	2.4*	1248	525*
Annals of Internal Medicine	1.4	381	265
Preventive Medicine	0.9	56	62
British Medical Bulletin	0.8	36	47
American Journal of Medicine	0.6	193	313
The Journal of the American Medical Association	0.6	320	541
Medicine	0.6	17	30
Mayo Clinic Proceedings	0.5	50	107
Medical Journal of Australia	0.5	164	320
Canadian Medical Association Journal	0.4	92	217
Deutsche Medizinische Wochenschrift	0.4	129	370
Journal of the Royal Society of Medicine	0.4	63	143
New Zealand Medical Journal	0.4	69	174
South African Medical Journal	0.4	185	483
Archives of Internal Medicine	0.3	90	296
British Journal of Hospital Medicine	0.3	42	136
Danish Medical Bulletin	0.3	13	45
European Journal of Clinical Investigation	0.3	21	70
Japanese Journal of Medical Science and Biology	0.3	13	42
Nouvelle Presse Medicale	0.3	112	382
Quarterly Journal of Medicine	0.3	10	34
Acta Medica Scandinavica	0.2	70	331
Annual Review of Medicine	0.2	9	44
Israel Journal of Medical Science	0.2	43	199
Klinische Wochenschrift	0.2	44	179
Medicina—Buenos Aires	0.2	24	117
Proceedings of the Koninklijke Nederlandse Akademie van Wetenschappen Series C—Biological and Medical Sciences	0.2	9	37
Revista de Investigacion Clinica	0.2	13	59
Western Journal of Medicine	0.2	57	219

*Adjusted *Journal Citation Reports* value.

ticles were also rated for appropriateness of statistical testing and overall research quality. Interestingly, *The New England Journal of Medicine* and *Annals of Internal Medicine* had the highest number of reports "for which statistical methods were rated as correct but also had the most reports for which statistical methods could not be rated as a result of incomplete documentation or publication errors. [But] reports in the medical journals had conclusions based on a logical progression of hypothesis, methods, and analysis of results more frequently than did reports in pharmacy journals" (8).

Another point worth examining is the language in which a journal is published. English predominates among the journals discussed in this paper. But this is not surprising, since the United States and the United Kingdom dominate medical publishing. While nearly every significant medical journal is covered in the *SCI*, the selection policy is deliberately slanted towards material most widely used and with highest impact. The data merely reflect the fact that English is the language of contemporary medical research.

Most of the vernacular journals of medicine are of primary interest to local physicians and drug firms. Although German publishers produce a number of significant scientific journals (mainly in English) (9), only one German-language journal appears in the top 10 in Table 4—*Deutsche Medizinische Wochenschrift*. This journal appears in Spanish, Italian, and Japanese editions as well. It is not surprising that there are no non-English-language journals among the top 10 in Tables 5 and 7. As reported in a study of French literature (10), the most important research results based on citation data are reported in the international journals published in English.

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