

Open Access Journals in the ISI Citation Databases:
Analysis of Impact Factors and Citation Patterns
A citation study from Thomson Scientific

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Abstract:

The value and viability of Open Access (OA) journals remain prominent topics of debate in the library and publishing communities for many months now. In the time since Thomson Scientific (a Thomson business) first studied the citation impact of Open Access (OA) journals using the 2002 *Journal Citation Reports*® (*JCR*®), discussion of the value and viability of this access model has continued. When the 2003 *JCR* was published in June 2004, we took the opportunity to re-examine the coverage and citation performance of OA journals in the ISI® citation databases in the context of the emerging issues in the open access debate. We have also broadened the study to consider not only OA journals, but the potential influence of other types of OA publishing on the availability of materials covered by Thomson products.

An increasing number of journals covered in the ISI citation databases are adopting an OA distribution model. In addition, we continue to evaluate and select new OA journals. Although the largest number of OA journals is in Medicine and Life Sciences, OA journals in Physics, Engineering & Mathematics are more frequently among the highest ranking journals in their categories.

It is still the case that more of the currently available OA journals rank in the lower half of their subject category, despite the presence of some OA journals in the top ranks. Within the collection of OA titles, however, there is a notable tendency to rank higher by Immediacy Index than by Impact Factor, irrespective of the subject.

Open Access journals are not necessarily new publications. In fact, Open Access at the journal level comprises a complex picture of availability. Many established journals make only a few recent years of content available online, while the majority of their content is accessible only through traditional access paths. Other established journals, having moved to OA distribution, offer access to many years of older content as well.

The evolving environment of scholarly publishing includes additional avenues for making content openly available. Our findings suggest that over 55% of the journals and over 65% of the articles indexed in *Web of Science*® in 2003 are produced by publishers who permit some form of self-archiving, and could be made OA by author archiving.

Coverage of Open Access Journals:

The mission of Thomson Scientific is to maintain a database of world-wide scholarly content that helps researchers find the highest quality literature relevant to their work. To fulfill this mission, our staff of editors evaluates over two thousand new and established journals each year to assess their value to the database as a whole.¹ Only about 10% of these journals are selected for coverage. Journals in all disciplines in science, social sciences, and arts and humanities that meet and maintain high standards in their publication practices and editorial content are selected for coverage, and are indexed in Thomson products. Citation data are also considered in the review of a title as it presents an independent demonstration by the scholars in the subject that the content of a journal is relevant and valuable to their work. The evaluation process is independent of the journal's business or access model.

Based on the 2002 *JCR*, in April of this year, we published an initial study of the OA journals that appear in Thomson ISI products and found that 192 OA journals are indexed for our products. The journals were distributed across many subjects, and showed a wide range of values for their journal Impact Factor—a key performance metric for the ranking and comparison of journals.² The principle finding of the study was that an OA distribution model did not appreciably alter the performance of a journal, either positively or negatively. At that time, the majority of the OA journals covered were ranked in the lower half of journals in their subject when ranked by Impact Factor. However, there were some very notable exceptions; in each of the broad subject areas studied there was at least one OA title that ranked at or near the top of its field.

For this study, we used the same on-line resources as in the previous work to create a list of available OA journals: the DOAJ (www.doaj.org), J-STAGE (www.jstage.jst.go.jp) and SciELO (www.scielo.br).³ At the time of our analysis, these three sites listed a total of 1190 unique titles. Of these, 239 (nearly 20%), are currently indexed in our ISI citation databases. These 239 titles represent approximately 2.6% of the nearly 9000 journals in the *Web of Science* and approximately 1% of the 20,000 journals in *ISI Web of Knowledge*SM. An additional eight titles are listed in one or more of the online OA directories, and appear in previous years' content of *Web of Science*, but are not currently indexed either because the title of the serial was changed (where the new title will be counted as current coverage), ceased publication, or was removed from coverage. Appendix A contains a list of the OA journals indexed for the ISI citation databases.

Open Access coverage increased by 43 titles between February and June of 2004. However, only six OA titles were selected for coverage *de novo* in 2004. The remaining 37 journals either recently shifted to an OA distribution model, or were recently recognized as OA by one of the resources analyzed. It was not possible to distinguish between these mechanisms in our analysis.

Figure 1 compares the number of OA journals covered in each of six major subject areas: Chemistry; Physics, Engineering & Mathematics; Medicine; Life Sciences; Social Sciences; and Arts & Humanities.

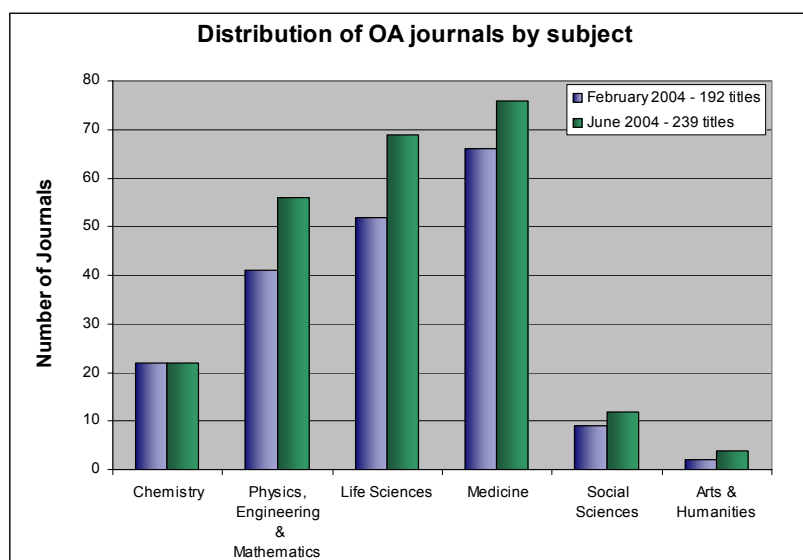


Figure 1: Change in coverage of OA journals from February 2004 to June 2004.

Five of six subject areas show an increase in the number of OA journals. Chemistry is the exception, showing no increase in the number of OA journals. The largest increase was in Physics, Engineering & Mathematics, with an increase of 16 titles. Medicine showed a net increase of 14 titles. In contrast, Social Sciences, and Arts & Humanities with few OA titles, added only four and two titles, respectively.

Open Access Journals by Region

We analyzed the OA journals by region, taking the publisher's country as the point of origin of each journal (see Figure 2).

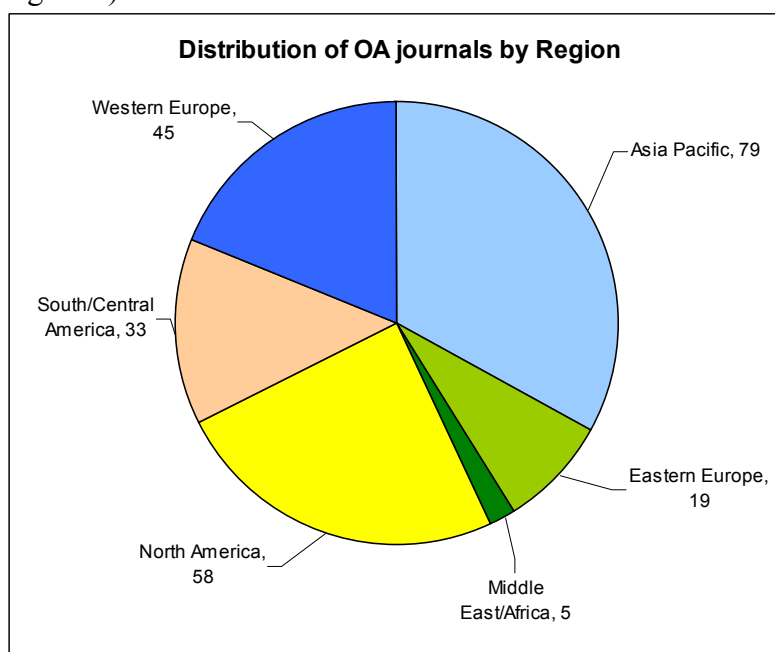


Figure 2: Distribution of OA journals by region.

Just over one-third of OA journals in this study are published in Asia-Pacific, while North America and Western Europe (including the United Kingdom) together account for approximately 40% of OA titles. This distribution differs strongly from the ISI citation databases as a whole, where North America and Western European publishers provide nearly 90% of the journal titles, although journals from over 70 countries are covered.

We considered the number of OA journals from a region relative to the total coverage of journals from that region in the ISI citation databases (see Table 1). This reveals a striking result. Nearly 15% of the covered titles from Asia-Pacific are available as OA, and over 40% of the titles from Central or South America are OA journals. In contrast, OA journals from North American and Western Europe comprise 1.5% and 1.1%, respectively, of the total coverage from those regions. For many journals, providing free content online expands their access to an international readership.

Region	Number of OA Journals	Number of Journals	% OA
Asia-Pacific	79	530	14.9%
Eastern Europe	19	282	6.7%
Middle East/Africa	5	57	8.8%
North America	58	3910	1.5%
South/Central America	33	78	42.3%
Western Europe	45	3961	1.1%
Whole database	239	8818	2.7%

Table 1: Proportion of OA journals from each region compared to all journals covered in the ISI citation databases.

Open Access Journals: Rank by Impact Factor and by Immediacy Index

Immediacy Index and *JCR* Impact Factor are considered to be critical journal performance metrics, as they reflect the citation activity for journal articles one to three years after their initial publication. An Immediacy Index considers only one year of data and can be calculated after a journal has been indexed and cited for one full year. Because it considers citations to articles in the same year as their publication, the Immediacy Index is an indication of the speed with which items published in the journal are incorporated into other literature's references. A high Immediacy Index suggests that the journal's content is quickly noticed, highly valued and topical within its field⁴. Immediacy Index considers only same-year citations, and does not always capture even the most rapid acknowledgement of articles published late in the year.

Impact Factor calculation requires three years of data, since it considers citations to articles two or three years after their publication⁵. This is a period of rapidly increasing citation activity for articles in all subjects. When a journal has data sufficient for the calculation of an Journal Impact Factor, that, and all other citation data are published in the *Journal Citation Reports*, allowing the journal to be ranked by these metrics among journals of similar subject.

In this study, we present Impact Factors and Immediacy Indexes from the 2003 *JCR*, as well as Immediacy Index data for newly covered journals that have not yet appeared in the *JCR*. A list

of the newly covered journals, along with their 2003 citation counts and calculated Immediacy Indexes is presented in Appendix B.

Each of the 239 OA journals was considered within its index category or categories. Of the 239 OA journals, 197 had sufficient data by the end of 2003 for the calculation of an Journal Impact Factor, and 219 had data sufficient for the calculation of an Immediacy Index⁶. Because publication and citation practices differ between subjects, Immediacy Index and Journal Impact Factor must be considered within a category, alongside journals of similar subject. While the majority of the OA journals (79%) are ranked in one category only, 51 of the OA journals (21%) are indexed in two or more categories. The rank of each OA journal was considered separately in each of its assigned categories (see Figure 3).

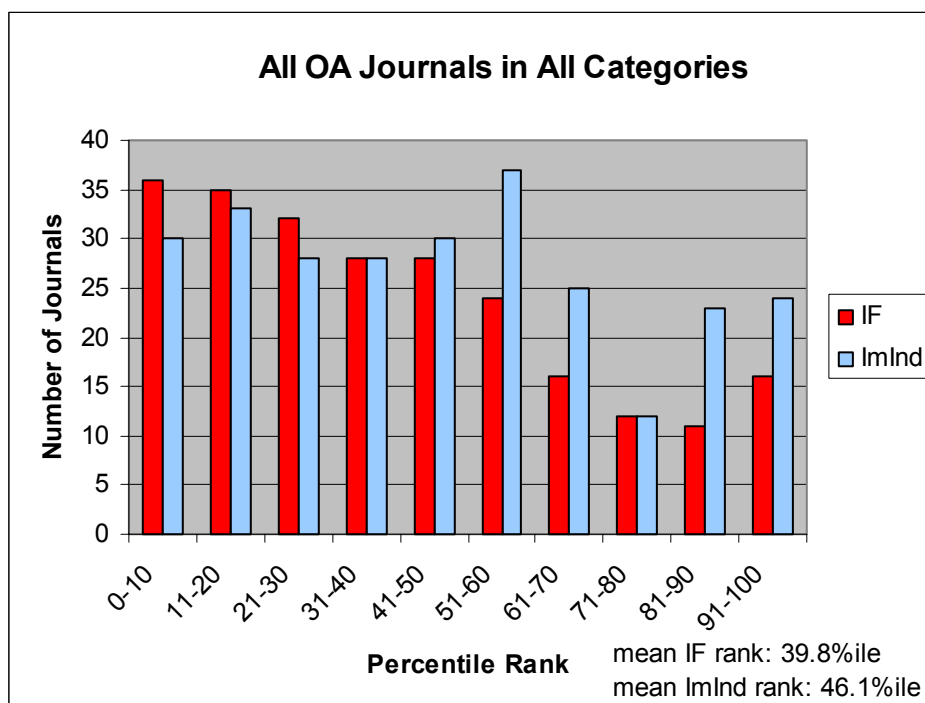


Figure 3: Rank of OA journals according to Immediacy Index and Journal Impact Factor. To allow comparison of rank among categories of different sizes, all ranks were converted to percentile rank as follows:

$$\text{Percentile rank} = [1 - (\text{rank in category} / \text{number of journals in category})] * 100$$

The 99th percentile is the highest-ranking journal in the category.

When ranked by Impact Factor, OA journals are represented more heavily among the lower-ranking journals in their subjects, despite important exceptions. There are 14 OA journals that rank in the top 10% of journals in their subject category. Two of these journals rank among the top 10% in two categories. However, the mean percentile rank by Journal Impact Factor is 39.8%ile, and two-thirds of the journals are below the 50th percentile in rank.

OA journals rank noticeably higher by Immediacy Index than by Journal Impact Factor. The mean percentile rank of OA journals by Immediacy Index is 46thile. Twenty OA journals ranked in the top 10% of their categories by Immediacy Index, with four journals ranked in the top 10% in more than one category. While 50% of the OA journals rank below the 50th percentile by Immediacy Index, it is often the case that an OA journal will rank higher in category by Immediacy Index than by Journal Impact Factor. This may suggest that OA journals' content is more rapidly accessed and cited than comparable traditional access journals. One of the factors that can affect Immediacy Index is how long, within the first calendar year, an article is available. Therefore Immediacy Index can be influenced by frequency of publication as well as by the lag between acceptance and publication. This metric does show a type of rapid citation acknowledgement of articles, but it is limited to brief period of the article's availability.

These data have included all journals in Science and Social Sciences categories, since journals in both these types of subjects are analyzed and ranked by Immediacy Index and Impact Factor. However, Social Sciences journals have very different citation characteristics than the physical and life sciences. Further, it is difficult to draw conclusions based on the small population of OA journals in Social Sciences. Therefore, the remainder of the analysis in this paper will concentrate on the 219 journals in Science categories.

OA Journals by Subject Group

In our previous study, we noted a marked difference between the relative performance of OA journals in different subject areas. We repeated that analysis in this study, placing the OA journals in one or more of the following four subject areas according to each category in which they are indexed for the ISI Citation Databases: Life Sciences, Medicine, Chemistry and Physics, Engineering & Mathematics. The distribution of the journals according to their percentile rank by Journal Impact Factor and by Immediacy Index is presented in Figure 4.

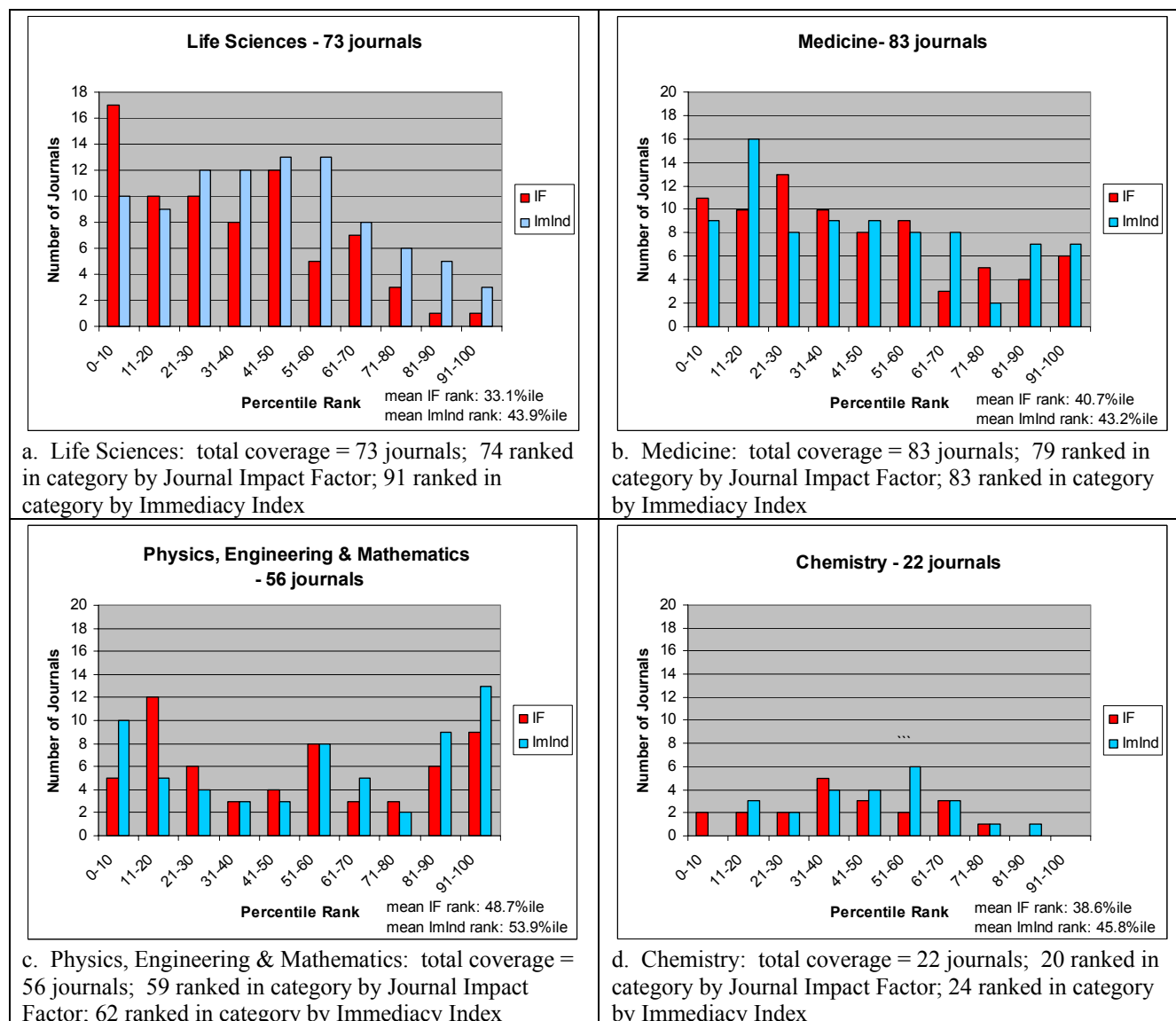


Figure 4: Rank of OA journals by Journal Impact Factor and Immediacy Index, broken down by field: The rank for each journal was considered separately for each category in which it is indexed. An individual journal can appear, therefore, in more than one subject group or in more than one category within a subject group. To simplify comparison between subjects, the y axis scale is the same for all graphs.

Our analysis shows that high-ranking OA journals are not evenly distributed among the subject fields in our analysis. Only one of the 22 OA Chemistry journals is among the top 20% of their categories when ranked by Immediacy Index or by Journal Impact Factor. Furthermore, the mean rank by Journal Impact Factor is approaching the lowest one-third of coverage. In contrast, a significant number of OA journals in Physics, Engineering & Mathematics place among the top 20% in their categories, and their mean rank by Journal Impact Factor is near the midpoint. This suggests a basic difference in the degree of acceptance of OA publishing in these two general areas.

Open Access is well-established in certain segments of the mathematics, physics and engineering communities through the long history and prominence of pre-print servers such as arXiv (<http://arxiv.org/>). There is, at the present time, no similar model of pre-print publishing in chemistry. Although pre-print servers contain articles, not journals, it is conceivable that scholars' experience in accessing materials through these servers has made them more ready to accept OA for an entire journal. This effectively lowers the barriers to new OA journals, or to the conversion of existing journals to an OA distribution model.

Open Access journals in the Life Sciences and Medicine coverage show distributions unlike either Chemistry, or Physics, Engineering & Mathematics. These subjects do have OA journals that are ranked among the highest 20 percent in their category. However, each of the subjects' OA journals are more heavily represented among the lower half of coverage in their category. Medicine journals are somewhat more evenly distributed across the rankings than are Life Sciences journals, where a strong majority are in the lowest 30% of their category.

A consistent feature among the four subject areas is that the mean rank of OA journals by Immediacy Index is higher than that for Journal Impact Factor. Thus, on average, an OA journal's rank by Immediacy Index will be higher than its rank by Journal Impact Factor. This effect is most noticeable in the Life Sciences journals, where a 10-percentile difference between the mean rank by Immediacy Index (43.9 %ile) and the mean rank by Journal Impact Factor (33.0 %ile). In Medicine, the mean rank by Immediacy Index and by Journal Impact Factor is nearly the same, 43/3%ile and 40.7%ile, respectively. Both Chemistry and Physics, Engineering & Mathematics OA journals have a higher mean rank by Immediacy Index than do the OA journals in either Life Sciences or Medicine, despite the rapid development of the literature in these subjects.

Citation Characteristics of OA Journals

On average, OA journals rank higher by Immediacy Index than by Journal Impact Factor. To understand more about the citation dynamics to OA journals, we examined the number of citations to recent materials as a proportion of total citations. In Figure 5, we show the age of materials in OA journals that were cited in 2003. To accommodate the number of OA journals, citations were normalized to a span of four years.

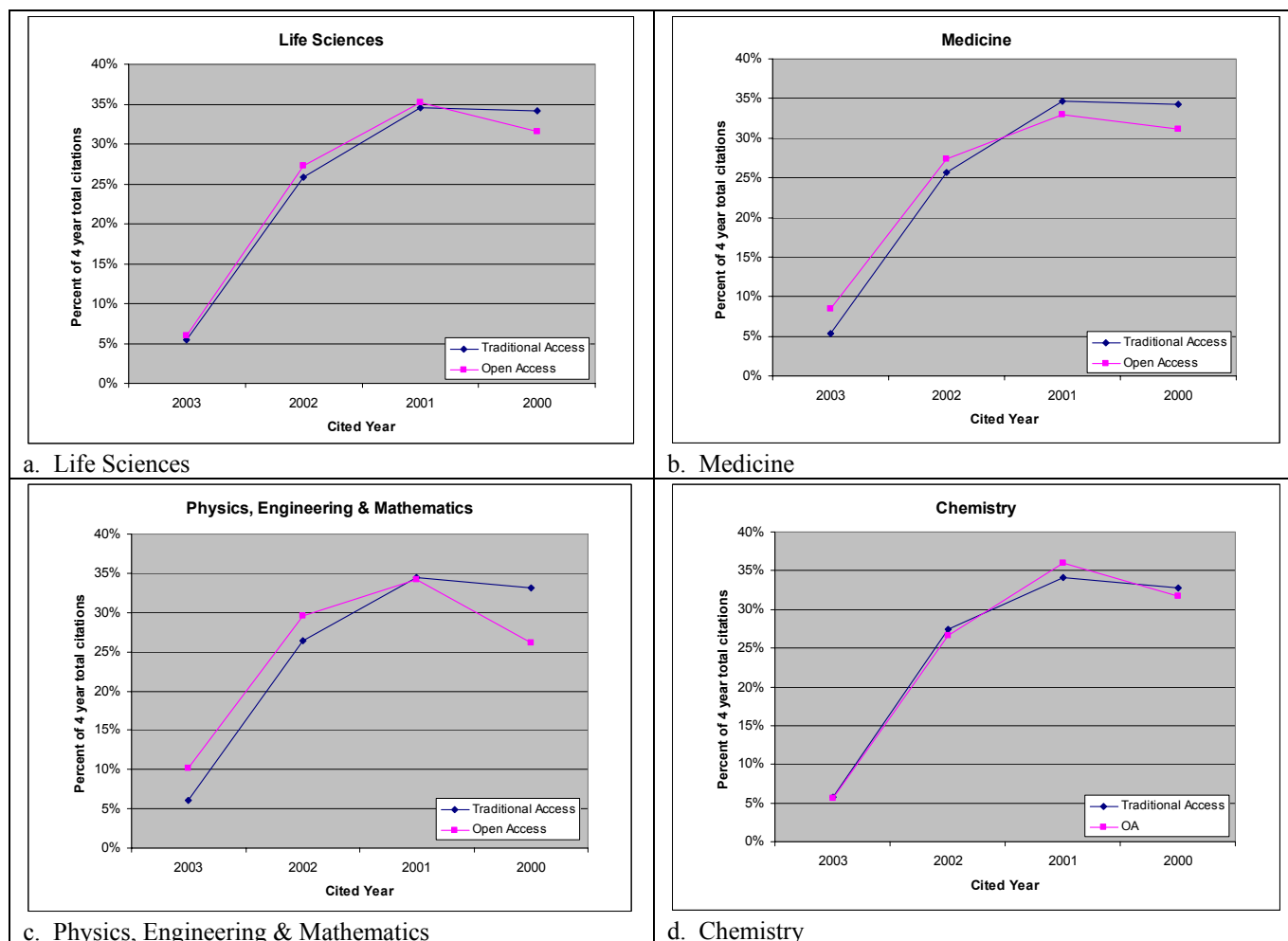


Figure 5: Time characteristics of citations in 2003 to prior years' content.

In Physics, Engineering & Mathematics, and in Medicine, recent articles in OA journals receive a higher percentage of total citations than recent articles in traditional access journals. Interestingly, this effect extends through articles that are two or three years old, effectively covering the period of analysis of both key journal performance metrics, Immediacy Index and Journal Impact Factor. In Chemistry, and Life Sciences, there is no indication of a difference between OA journals and traditional access journals in the age of cited articles.

Online file depth

Most often, when OA publishing is discussed, comparisons are made between OA and traditional access journals. In this study, as in our previous study, we defined OA journals as those titles for which the most recent content is immediately available on-line without charge to the reader.

This definition did not consider the access model or availability of prior years' content, nor the complex range of access options that are beginning to appear. Many of the journals that are now considered OA, are long-standing, well-established journals that offer their most recent content, and some, variable number of years of back-file content as OA.

Citations contributing to the Immediacy Index or Impact Factor are a subset of the journal's total citation activity. An interval of 2-3 years was chosen for Impact Factor calculation to capture a period of most active development of citations. However, even in rapidly-moving subject areas, articles can be cited for many years after publication. For each of the OA journals in the four subject groups in our analysis, we looked at the 20 years of content from 1984-2003 to determine the relative proportion of OA content and older, traditional access content. This was compared to the cited $\frac{1}{2}$ life of all the cited materials in the subject area. The results are presented in Figure 6.

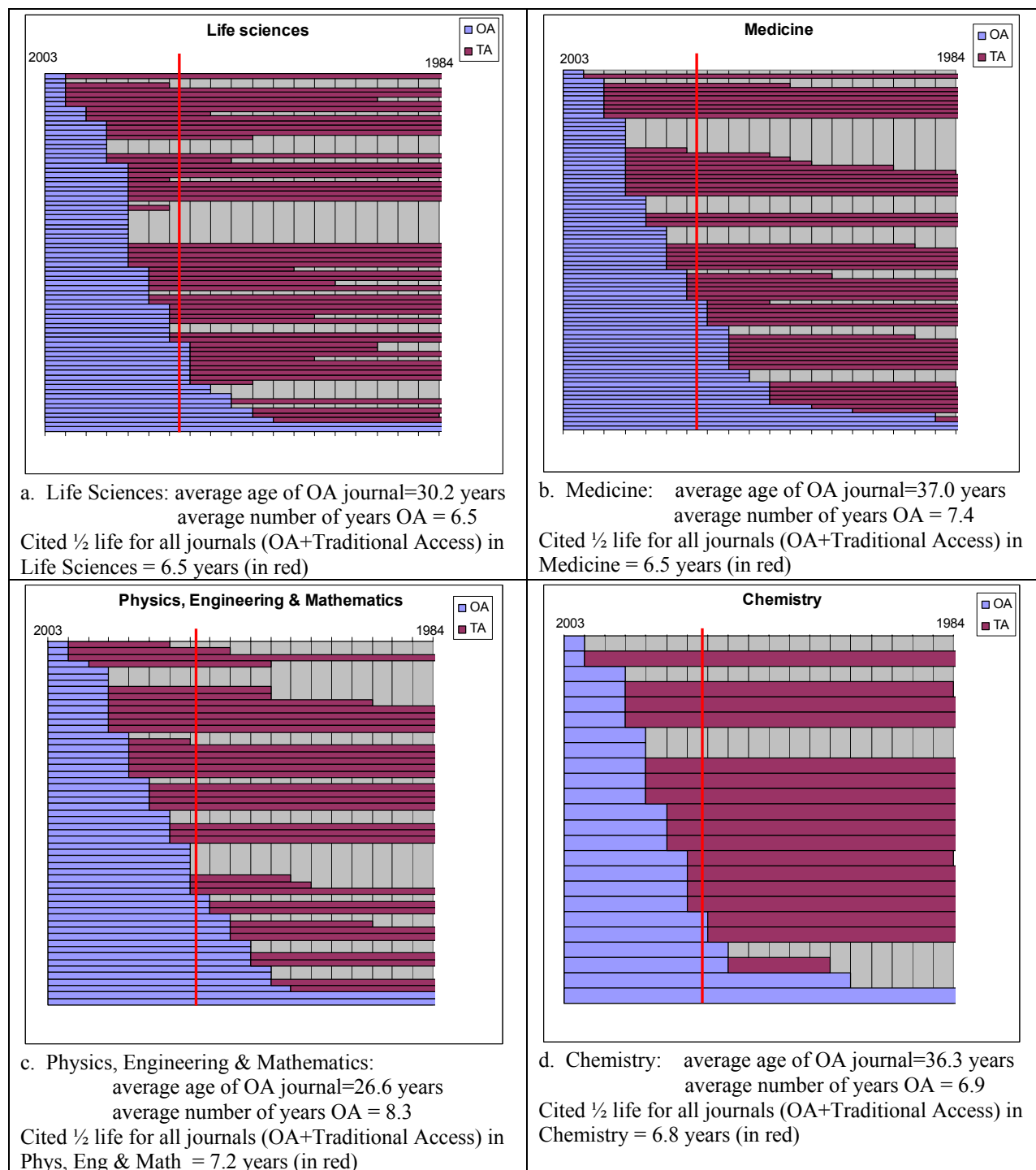


Figure 6: Number of years of OA content. Each horizontal bar represents a unique journal title. The blue portion of the bars represent years of OA content for each journal; the maroon portion of the bars represent additional journal content that is not OA. In each group, half of the articles cited in 2003 were older than the cited half-life. The Cited $\frac{1}{2}$ life is marked on each graph as a red vertical line to indicate how much of each journal's OA content is included in the first $\frac{1}{2}$ life of citation activity for an aggregate of all journals in the subject.

For all four subject areas, the profile of OA and traditional access content is complex. There are journals that were launched within the past 10 years and have always had their content available as OA. Other journals are characterized by many years of traditional access, and only the most recent one or two years available as OA. Each field also has at least one journal where 20 or more years of the back-file are offered as OA content. For most journals, the content that accounts for roughly half of the cited material in 2003 is a mixture of OA and traditional access content.

Top Ranked OA Journals

We examined the list of journals ranked among the top 10% in their category (or categories) to see whether they were new all-OA journals or journals with some portion of older content available only through traditional access. The lists are presented in Table 2 – top ranked journals by Journal Impact Factor, and Table 3 – top ranked journals by Immediacy Index.

Title	Launch year	Earliest OA content	Category	Rank by IF
ANNALS OF MATHEMATICS	1884	2001	Mathematics	0.96552
BRITISH MEDICAL JOURNAL	1832	1994	Medicine, General & Internal	0.94118
BULLETIN OF THE AMERICAN MATHEMATICAL SOCIETY	1894	1992	Mathematics	0.99425
CA-A CANCER JOURNAL FOR CLINICIANS	1950	1990	Oncology	0.98333
CANADIAN MEDICAL ASSOCIATION JOURNAL	1911	1997	Medicine, General & Internal	0.92157
EMERGING INFECTIOUS DISEASES	1995	1995	Infectious Diseases	0.90244
ENVIRONMENTAL HEALTH PERSPECTIVES	1972	1972	Environmental Sciences	0.9542
IBM JOURNAL OF RESEARCH AND DEVELOPMENT	1957	1957	Multidisciplinary Sciences	0.91304
			Computer Science, Hardware & Architecture	0.93617
IBM SYSTEMS JOURNAL	1962	1995	Computer Science, Software Engineering	0.92308
JOURNAL OF CLINICAL INVESTIGATION	1924	1996	Medicine, Research & Experimental	0.95833
JOURNAL OF MACHINE LEARNING RESEARCH	2000	2000	Automation & Control Systems	0.97778
			Computer Science, Artificial Intelligence	0.97403
MRS INTERNET JOURNAL OF NITRIDE SEMICONDUCTOR RESEARCH	1996	1996	Materials Science, Multidisciplinary	0.9548
OPTICS EXPRESS	1997	1997	Optics	0.90566
RESPIRATORY RESEARCH	2000	2000	Respiratory System	0.93548

Table 2: OA journals in the top 10% of their category (categories) – Ranked by Journal Impact Factor. Journals that were launched as OA are noted in red. Journals with their current and all previous content available as OA are noted in blue.

Title	Launch year	Earliest OA content	Category	Rank by ImmInd
ANNALS OF MATHEMATICS	1884	2001	Mathematics	0.99
ATMOSPHERIC CHEMISTRY AND PHYSICS	2001	2001	Meteorology & Atmospheric Science	0.98
BRITISH MEDICAL JOURNAL	1832	1994	Medicine, General & Internal	0.93
BULLETIN OF THE AMERICAN MATHEMATICAL SOCIETY	1894	1992	Mathematics	0.98
CA-A CANCER JOURNAL FOR CLINICIANS	1950	1990	Oncology	0.99
CANADIAN JOURNAL OF PSYCHIATRY-REVUE CANADIENNE DE PSYCHIATRIE	1956	1996	Psychiatry	0.98
CANADIAN MEDICAL ASSOCIATION JOURNAL	1911	1997	Medicine, General & Internal	0.96
CORTEX	1964	1997	Behavioral Sciences	0.95
EMERGING INFECTIOUS DISEASES	1995	1995	Infectious Diseases	0.93
			Immunology	0.90
ENVIRONMENTAL HEALTH PERSPECTIVES	1972	1972	Environmental Sciences	0.98
ETRI JOURNAL	1979	1994	Telecommunications	0.95
			Engineering, Electrical & Electronic	0.92
IBM JOURNAL OF RESEARCH AND DEVELOPMENT	1957	1957	Computer Science, Hardware & Architecture	0.96
IBM SYSTEMS JOURNAL	1962	1995	Computer Science, Information Systems	0.99
			Computer Science, Theory and Methods	0.97
			Computer Science, Software Engineering	0.97
INTERNATIONAL JOURNAL OF ONCOLOGY	1992	2001	Oncology	0.90
JOURNAL OF CLINICAL INVESTIGATION	1924	1996	Medicine, Research & Experimental	0.97
JOURNAL OF MACHINE LEARNING RESEARCH	2000	2000	Automation & Control Systems	0.96
JOURNAL OF THE CERAMIC SOCIETY OF JAPAN	1995	2003	Materials Science, Ceramics	0.92
JOURNAL OF THE JAPAN PETROLEUM INSTITUTE	1958	2003	Energy & Fuels	0.98
			Engineering, Petroleum	0.96
MALARIA JOURNAL	2002	2002	Parasitology	0.91
OPTICS EXPRESS	1997	1997	Optics	0.92

Table 3: OA journals in the top 10% of their category (categories) – Ranked by Immediacy Index. Journals that were launched as OA are noted in red. Journals with their current and all previous content available as OA are noted in blue.

Four of the fourteen journals ranking in the top 10% by Journal Impact Factor were launched within the past ten years, and were OA from their inception, and two more have loaded their complete contents as OA. The remaining eight journals are established titles that offer some recent content as OA. Four of the 20 journals ranked among the top 10% by Immediacy Index

were launched as OA journals within the past ten years, and an additional two journals have loaded their completed contents as OA. The remaining ten journals having only a subset of their previous content available as OA.

It is interesting to note that all of the OA journals ranking high by Journal Impact Factor have OA content at least back to 2001, meaning that their OA content encompasses the entire window of articles considered in the Journal Impact Factor calculation. One hundred seventy-one of the OA journals covered by Thomson ISI have at least this depth of file available as OA. The other 68 journals are both new OA journals with less than 3 years of content in total (19 journals launched in 2001, 2002 or 2003), or journals only recently making content available through OA (49 journals, ranging in age from over 100 years to 6 years in 2003).

As a group, journals that have adopted an OA distribution model have not achieved significantly greater citation impact. However, individual OA journals are appearing among the highest ranked journals, even within a few years of their launch. We are tracking some of the newest OA titles with great interest, as their early citation performance has been exceptional. ***PLOS Biology***, launched in the latter part of 2003 achieved rapid and wide-spread notice. This is well-reflected in its year-to-date citations in 2004. As of September 24, 2004, ISI citation databases had indexed over 400 total citations to the title.

The potential importance of self-archiving in Thomson ISI Citation databases

As noted above, OA journal publishing is a complicated mixture of freely available content and older content that may or may not be OA. At the journal level, however, OA publishing is only one mechanism by which content (old or new) can be offered to readers without charge. Although the issues around the economics and sustainability of OA journal publishing are far from resolved, another avenue for OA exists at the level of individual articles. Author or institutional archiving has been proposed as a more likely path by which the majority of scholarly content can be made freely available to readers worldwide⁷. We have shown that OA publishing is growing slowly, both by creation of new titles and conversion of established titles. In this model, the basic characteristics of the journal, its citation dynamics and performance metrics seem not to be affected by the type of access. Journals with outstanding content are well-cited and show high Journal Impact Factor and Immediacy Index.

Researchers have begun to compile data on the citation impact of an article's availability through author or institutional archiving. They have demonstrated a significant increase in the number of citations to articles that are available through archives, compared to articles in the same (non OA) journals that are only available through traditional access routes^{8 9}.

We examined the amount of content in ISI citation databases that could possibly be made available through author self-archiving based on publishers' available policy on archiving. We reviewed the over 1,300 unique publisher names with content in the Science Edition of the 2003 *Journal Citation Reports*, and compared that list to the publisher policies according to Project ROME¹⁰ (see figure 7).

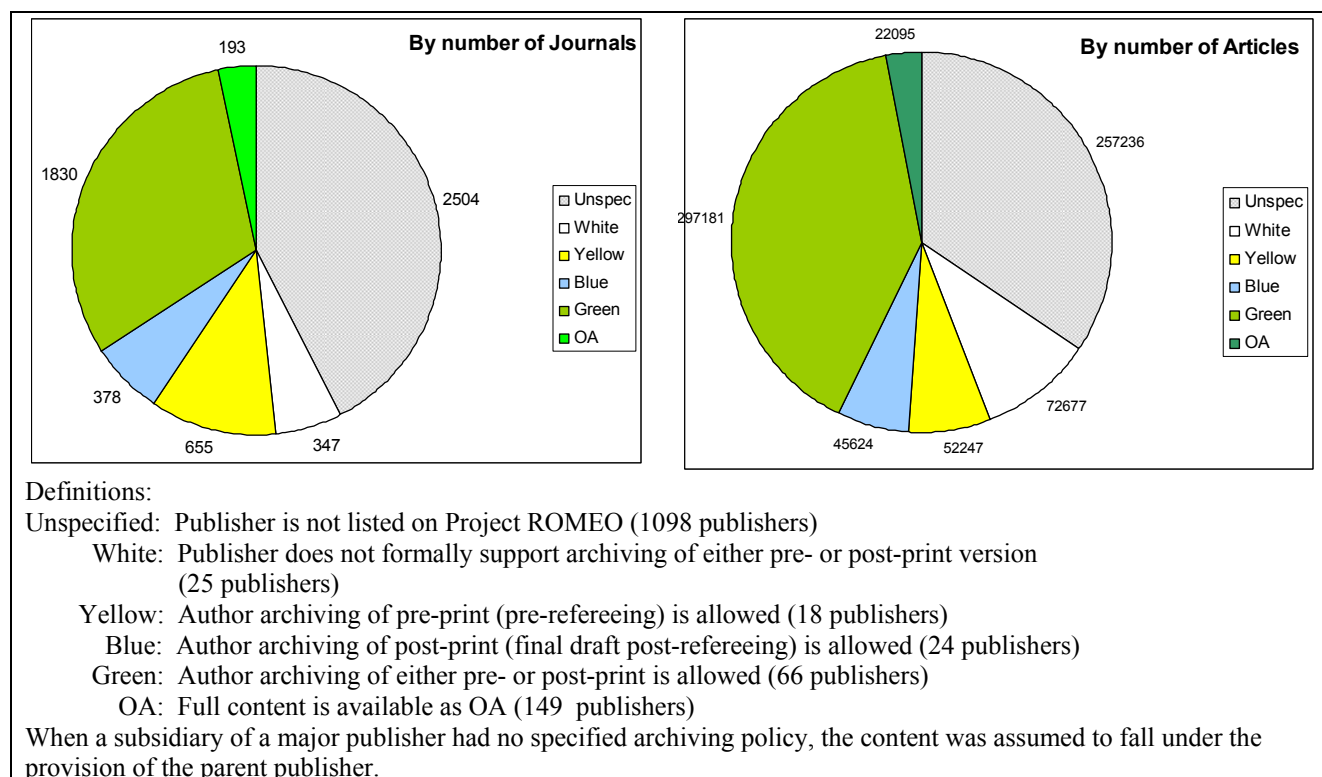


Figure 7: Volume of material available under current self-archiving policies. Data on publisher policy were taken from the ROME0 project ([URL here](http://www.romeo-project.org/)). The number of articles reflects the content of each journal in the Science edition of the year 2003 *Journal Citation Reports – Science Edition*.

The majority of publishers have only one or a few journals in the Thomson ISI citation databases, and were not listed on the Project Romeo site. We found 133 publishers (and/or their subsidiaries) with information on author archiving policy. Of these publishers, 108 have a stated policy permitting some type of author archiving. Along with the publishers of the covered OA journals, publishers supporting some form of author archiving produce nearly 52% of the journals in the 2003 *JCR Science Edition*. It is possible that some of the publishers with no archiving policy yet listed on Project ROME0 would allow self-archiving by their authors, which would further increase the number of journals whose content is available for author archiving.

Because archiving is accomplished at the article level, we calculated the number of articles in journals that allow author archiving: 395,052 (53%) of 747,060 “citable items” in the 2003 *Journal Citation Reports* could be available, theoretically, for authors to post to individual or institutional archives. When the 22,095 articles and reviews in OA journals in 2003 are considered, the findings suggests that fully 56% of the article content indexed by Thomson could be deposited in one or more institutional archives.

Discussion and Conclusions

The number of OA journals that are covered in Thomson ISI citation databases continues to increase both through the creation of new OA journals that are then selected for coverage, as well as the conversion of established publications to an OA distribution model. At the end of June 2004, 239 OA journals were indexed in the Web of Science, an increase of 43 OA titles in the three months since our previous analysis in February 2004.

The recent move to provide scientific and scholarly materials free through “open access” is one of the most exciting and radical events in publishing in recent years. Electronic publishing changed the way most scholars access literature in their field. Now Open Access is changing the way electronic materials are distributed. Access method, however, affects only the path a researcher takes to get the literature. It does not alter the nature of their interaction with the materials once they are located. Literature that is deemed by an author to be the most significant, the most scientifically sound, and the most relevant to their current work is not only accessed, it is read and retained. A subset of these valued articles exerts some influence on the research path. Finally, those articles with the greatest influence and relevance are cited when subsequent research is later published. Access to an article, by any path, is a necessary pre-condition for citation, but access, by itself, is not sufficient for citation. Each article must be found to provide some specific value to the work under consideration before it is cited and thus entwined with other published works.

Thomson Scientific is in a unique position to examine the current status of OA publishing, using citation as the research community’s implicit statement of value of a published work. We found that the currently available OA journals are more often among the lower-ranking journals in the field by Journal Impact Factor, and Immediacy Index, although three of the four subject groups studied have one or more OA journals among the top 9% of the category. We also discovered that many OA journals rank higher by Immediacy Index than by Journal Impact Factor. The distribution by rank differs greatly by field, with high-ranking OA journals being most frequent in the Physics, Engineering & Mathematics subjects.

The 239 OA journals are international, but their relative frequency within some regions varies greatly. OA journals comprise over 40% of the indexed journals from Central and South America, but only 1-2 % of those covered from North America or Western Europe. At present, publishers located in the Asia Pacific are producing the largest number of OA journals selected for coverage by Thomson ISI. Rather than being a uniform movement to create new journals, OA is also evolving as a means by which existing journals are offering their content to a wider audience.

The age of content that is available in OA journals varies greatly across the population of journals we studied. Although some journals are launched as OA, many of the OA journals currently available are established titles that offer some or all of their prior contents through OA. For example, the *British Medical Journal*, with over 170 years of continuous publication, is one of the oldest titles in ISI citation databases; its 11 years of free content online represents only 6% of the content of the journal. Over one-third of last year’s citations to *British Medical Journal* reference articles older than the journal’s OA file. Thus, a journal is designated “Open Access” based on the most recent content’s accessibility, but the citation life-span of its articles can

exceed the age of the OA content. Even in rapidly-moving subjects in biomedicine, more than half the articles cited in 2003 had been published prior to 1998. As the OA publishing environment continues to evolve over the next several years, it likely that there will be significant variability in the depth of freely available content for any given OA journal.

Finally, we estimated the volume of content that could become freely available through author or institutional self-archiving. The vast majority of publishers who have journals indexed by Thomson Scientific do not have a well-known or formal policy on whether they permit authors to deposit some version of their articles in a freely available repository. Nevertheless, over 55% of the article content indexed by Thomson ISI in 2003 was produced by a publisher that allows some form of author-archiving. OA journals account for a small proportion of the content that could become OA at the article level.

Thomson Scientific will continue to review OA journals and will select and index those that contribute best to our goal of delivering the world's most important scholarly publications to the research community world-wide.

Acknowledgements: James Pringle and James Testa contributed invaluable input to this research; they, along with Maureen Handel, provided extensive review of the text.

¹ An essay on the journal selection process can be found at: <http://www.thomsonisi.com/selection>

² "The Impact of Open Access Journals." J. Testa and M.E. McVeigh. 2004. www.isinet.com/oaj

³ For the purposes of this study, we defined an Open Access journal as one that does not charge the reader or his/her institution for the right to access, download, copy, print, distribute or search the most recent content. All of the OA journals are electronically available, peer-reviewed publications. To obtain a list of OA journals, we downloaded the titles listed in the following resources:

- Directory of Open Access Journals (www.doaj.org) hosted at Lund University
- Scientific Electronic Library Online (SciELO) (www.scielo.br) developed by developed by the Fundação de Amparo à Pesquisa do Estado de São Paulo, in partnership with BIREME - the Latin American and Caribbean Center on Health Sciences Information. Since 2002, the Project is also supported by CNPq - Conselho Nacional de Desenvolvimento Científico e Tecnológico
- Japan Science and Technology Information Aggregator, Electronic (J-STAGE) (www.jstage.jst.go.jp) was developed by the Japan Science and Technology Agency (JST).

All three resources were downloaded on June 26, 2004 and the remainder of the study will reflect the content of those resources as of the date of download. We combined the titles from these resources and compared the resulting list to the coverage in ISI citation databases.

⁴ 2003 Immediacy Index = (number of citations in 2003 to items published in 2003)/(number of articles or reviews published in 2003)

⁵ 2003 Impact Factor = (number of citations in 2003 to items published in 2002 or 2001)/(number of articles or reviews published in 2002 or 2001)

⁶ Note: Impact Factor and Immediacy Index are not calculated for journals in the Arts & Humanities Citation Index. The four OA journals in the Arts & Humanities are, therefore, not included in analysis of citation performance.

⁷ Harnad, S. et al (1994). "Scholarly Journals at the Crossroads: A Subversive Proposal for Electronic Publishing. An Internet Discussion about Scientific and Scholarly Journals and Their Future." Available at: <http://www.arl.org/scomm/subversive/toc.html>

⁸ Harnad, S. and Brody T (2004). "Comparing the Impact of Open Access (OA) vs. Non-OA Articles in the Same Journals. *D-Lib Magazine* 10: 6. Available at: <http://www.dlib.org/dlib/june04/harnad/06harnad.html>

⁹ Antelman, K (2003). "Do Open Access Articles have a Greater Research Impact?" College and Research Libraries, Septembere 2004. Available at: http://www.lib.ncsu.edu/staff/kantelman/do_open_access_CRL.pdf

¹⁰ <http://www.sherpa.ac.uk/romeo.php>

Appendix A: List of OA journals covered in the ISI Citation Databases as of June 30, 2004

Title	Category/Categories
AAPS PHARMSCI	Pharmacology & Pharmacy
ACOUSTICS RESEARCH LETTERS ONLINE-ARLO	Acoustics
ACTA BIOCHIMICA POLONICA	Biochemistry & Molecular Biology
ACTA BOTANICA SINICA	Plant Sciences Biochemistry & Molecular Biology
ACTA CHIMICA SLOVENICA	Chemistry, Multidisciplinary
ACTA CHROMATOGRAPHICA	Chemistry, Analytical
ACTA HISTOCHEMICA ET CYTOCHEMICA	Cell Biology
ACTA MEDICA OKAYAMA	Medicine, Research & Experimental
ACTA NEUROBIOLOGIAE EXPERIMENTALIS	Neurosciences
ACTA PHARMACOLOGICA SINICA	Chemistry, Multidisciplinary Pharmacology & Pharmacy
ACTA PHYSICA POLONICA B	Physics, Multidisciplinary
ACTA VETERINARIA BRNO	Veterinary Sciences
ADVANCES IN PHYSIOLOGY EDUCATION	Physiology
AMERICAN FAMILY PHYSICIAN	Medicine, General & Internal
AMERICAN JOURNAL OF ARCHAEOLOGY	Archaeology
ANAIS DA ACADEMIA BRASILEIRA DE CIENCIAS	Multidisciplinary Sciences
ANALYTICAL SCIENCES	Chemistry, Analytical
ANGLE ORTHODONTIST	Dentistry, Oral Surgery & Medicine
ANNALES ACADEMIAE SCIENTIARUM FENNICAE-MATHEMATICA	Mathematics
ANNALES GEOPHYSICAE	Astronomy & Astrophysics Geosciences, Multidisciplinary Meteorology & Atmospheric Science
ANNALS OF AGRICULTURAL AND ENVIRONMENTAL MEDICINE	Environmental Sciences Public, Environmental & Occupational Health
ANNALS OF MATHEMATICS	Mathematics
ANNALS OF NUCLEAR MEDICINE	Radiology, Nuclear Medicine & Medical Imaging
ANNALS OF SAUDI MEDICINE	Medicine, General & Internal
ANTHROPOLOGICAL SCIENCE	Anthropology
APPLIED ENTOMOLOGY AND ZOOLOGY	Entomology
ARCHIVES OF HISTOLOGY AND CYTOLOGY	Cell Biology
ARCHIVOS DE MEDICINA VETERINARIA	Veterinary Sciences
ARCHIVOS LATINOAMERICANOS DE NUTRICION	Nutrition & Dietetics
ARKIVOC	Chemistry, Organic
ARQ	Architecture
ARQUIVO BRASILEIRO DE MEDICINA VETERINARIA E ZOOTECNIA	Veterinary Sciences
ARQUIVOS DE NEURO-PSIQUIATRIA	Neurosciences Psychiatry
ASIAN JOURNAL OF ANDROLOGY	Andrology Reproductive Biology Urology & Nephrology
ATMOSPHERIC CHEMISTRY AND PHYSICS	Meteorology & Atmospheric Science
AVIAN DISEASES	Veterinary Sciences
BIBLICA	Religion

Title	Category/Categories
BIOLOGICAL & PHARMACEUTICAL BULLETIN	Pharmacology & Pharmacy
BIOLOGICAL RESEARCH	Biology
BIOSCIENCE BIOTECHNOLOGY AND BIOCHEMISTRY	Biochemistry & Molecular Biology Biotechnology & Applied Microbiology Chemistry, Applied Food Science & Technology
BIOTECHNOLOGY AND DEVELOPMENT MONITOR	Biotechnology & Applied Microbiology
BMC BIOINFORMATICS	Biochemical Research Methods Biotechnology & Applied Microbiology
BMC BIOTECHNOLOGY	Biotechnology & Applied Microbiology
BMC CANCER	Oncology
BMC CELL BIOLOGY	Cell Biology
BMC EVOLUTIONARY BIOLOGY	Evolutionary Biology Genetics & Heredity
BMC GASTROENTEROLOGY	Gastroenterology & Hepatology
BMC GENETICS	Genetics & Heredity
BMC GENOMICS	Biotechnology & Applied Microbiology Genetics & Heredity
BMC HEALTH SERVICES RESEARCH	Health Care Sciences & Services
BMC INFECTIOUS DISEASES	Infectious Diseases
BMC MICROBIOLOGY	Microbiology
BMC MOLECULAR BIOLOGY	Biochemistry & Molecular Biology
BMC MUSCULOSKELETAL DISORDERS	Orthopedics Rheumatology
BMC NEUROSCIENCE	Neurosciences
BMC PUBLIC HEALTH	Public, Environmental & Occupational Health
BOLETIN DE LA SOCIEDAD CHILENA DE QUIMICA	Chemistry, Multidisciplinary
BRAZILIAN ARCHIVES OF BIOLOGY AND TECHNOLOGY	Biology
BRAZILIAN JOURNAL OF CHEMICAL ENGINEERING	Engineering, Chemical
BRAZILIAN JOURNAL OF MEDICAL AND BIOLOGICAL RESEARCH	Biology Medicine, Research & Experimental
BRAZILIAN JOURNAL OF MICROBIOLOGY	Microbiology
BRAZILIAN JOURNAL OF PHYSICS	Physics, Multidisciplinary
BREEDING SCIENCE	Agronomy Plant Sciences
BRITISH MEDICAL JOURNAL	Medicine, General & Internal
BULLETIN OF MATERIALS SCIENCE	Materials Science, Multidisciplinary
BULLETIN OF THE AMERICAN MATHEMATICAL SOCIETY	Mathematics
BULLETIN OF THE CHEMICAL SOCIETY OF JAPAN	Chemistry, Multidisciplinary
BULLETIN OF THE KOREAN CHEMICAL SOCIETY	Chemistry, Multidisciplinary
BULLETIN OF THE WORLD HEALTH ORGANIZATION	Public, Environmental & Occupational Health
BUNSEKI KAGAKU	Chemistry, Analytical
CA-A CANCER JOURNAL FOR CLINICIANS	Oncology
CANADIAN ASSOCIATION OF RADIOLOGISTS JOURNAL-JOURNAL DE L ASSOCIATION CANADIENNE DES RADIOLOGISTES	Radiology, Nuclear Medicine & Medical Imaging
CANADIAN FAMILY PHYSICIAN	Medicine, General & Internal

Title	Category/Categories
CANADIAN JOURNAL OF PSYCHIATRY-REVUE CANADIENNE DE PSYCHIATRIE	Psychiatry
CANADIAN JOURNAL OF SURGERY	Surgery
CANADIAN MEDICAL ASSOCIATION JOURNAL	Medicine, General & Internal
CELL RESEARCH	Cell Biology
CELL STRUCTURE AND FUNCTION	Cell Biology
CELLULAR & MOLECULAR BIOLOGY LETTERS	Biochemistry & Molecular Biology Cell Biology
CHEMICAL & PHARMACEUTICAL BULLETIN	Chemistry, Medicinal Chemistry, Multidisciplinary Pharmacology & Pharmacy
CHEMICKE LISTY	Chemistry, Multidisciplinary
CHEMISTRY LETTERS	Chemistry, Multidisciplinary
CHINESE JOURNAL OF CHEMISTRY	Chemistry, Multidisciplinary
CHINESE JOURNAL OF PHYSICS	Physics, Multidisciplinary
CIRCULATION JOURNAL	Cardiac & Cardiovascular Systems
CLINICAL AND INVESTIGATIVE MEDICINE-MEDECINE CLINIQUE ET EXPERIMENTALE	Medicine, Research & Experimental
CORTEX	Behavioral Sciences Neurosciences
CROATIAN MEDICAL JOURNAL	Medicine, General & Internal
CROATICA CHEMICA ACTA	Chemistry, Multidisciplinary
CURRENT CONTROLLED TRIALS IN CARDIOVASCULAR MEDICINE	Cardiac & Cardiovascular Systems
CURRENT SCIENCE	Multidisciplinary Sciences
DADOS-REVISTA DE CIENCIAS SOCIAIS	Social Sciences, Interdisciplinary
DISCRETE MATHEMATICS AND THEORETICAL COMPUTER SCIENCE	Mathematics
DUKE LAW JOURNAL	Law
ECLITICA QUIMICA	Chemistry, Multidisciplinary
EDUCATIONAL TECHNOLOGY & SOCIETY	Education & Educational Research
ELECTRONIC JOURNAL OF BIOTECHNOLOGY	Biotechnology & Applied Microbiology
ELECTRONIC JOURNAL OF COMBINATORICS	Mathematics Mathematics, Applied
ELECTRONIC RESEARCH ANNOUNCEMENTS OF THE AMERICAN MATHEMATICAL SOCIETY	Mathematics
ELECTRONIC TRANSACTIONS ON NUMERICAL ANALYSIS	Mathematics, Applied
EMERGING INFECTIOUS DISEASES	Immunology Infectious Diseases
ENDOCRINE JOURNAL	Endocrinology & Metabolism
ENVIRONMENTAL HEALTH PERSPECTIVES	Environmental Sciences Public, Environmental & Occupational Health
E-POLYMERS	Polymer Science
ETRI JOURNAL	Engineering, Electrical & Electronic Telecommunications
EURE-REVISTA LATINOAMERICANA DE ESTUDIOS URBANO REGIONALES	Urban Studies

Title	Category/Categories
EUROPEAN PHYSICAL JOURNAL A	Physics, Nuclear Physics, Particles & Fields
EXPERIMENTAL AND MOLECULAR MEDICINE	Biochemistry & Molecular Biology Medicine, Research & Experimental
EXPERIMENTAL ANIMALS	Veterinary Sciences Zoology
FAMILY MEDICINE	Medicine, General & Internal
FIBRES & TEXTILES IN EASTERN EUROPE	Materials Sciences, Textiles
FISHERY BULLETIN	Fisheries
FLORIDA ENTOMOLOGIST	Entomology
GENES & GENETIC SYSTEMS	Biochemistry & Molecular Biology Genetics & Heredity
GENETICS AND MOLECULAR BIOLOGY	Genetics & Heredity
GEODIVERSITAS	Paleontology
GEOMETRY & TOPOLOGY	Mathematics
HYPERTENSION RESEARCH	Peripheral Vascular Disease
IBM JOURNAL OF RESEARCH AND DEVELOPMENT	Computer Science, Hardware & Architecture Multidisciplinary Sciences
IBM SYSTEMS JOURNAL	Computer Science, Information Systems Computer Science, Software Engineering Computer Science, Theory and Methods
IMF STAFF PAPERS	Business, Finance Economics
INFORMATION RESEARCH-AN INTERNATIONAL ELECTRONIC JOURNAL	Information Science & Library Science
INTERCIENCIA	Multidisciplinary Sciences
INTERNATIONAL JOURNAL OF MOLECULAR MEDICINE	Medicine, Research & Experimental
INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES	Chemistry, Multidisciplinary
INTERNATIONAL JOURNAL OF ONCOLOGY	Oncology
IRISH JOURNAL OF PSYCHOLOGICAL MEDICINE	Psychology, Multidisciplinary
ISRAEL MEDICAL ASSOCIATION JOURNAL	Medicine, General & Internal
JAPANESE CIRCULATION JOURNAL-ENGLISH EDITION	Peripheral Vascular Disease
JAPANESE HEART JOURNAL	Cardiac & Cardiovascular Systems
JAPANESE JOURNAL OF APPLIED ENTOMOLOGY AND ZOOLOGY	Entomology
JAPANESE JOURNAL OF INFECTIOUS DISEASES	Infectious Diseases
JAPANESE JOURNAL OF PHARMACOLOGY	Pharmacology & Pharmacy
JASSS-THE JOURNAL OF ARTIFICIAL SOCIETIES AND SOCIAL SIMULATION	Social Sciences, Interdisciplinary
JOURNAL FOR THE STUDY OF RELIGIONS AND IDEOLOGIES	Religion
JOURNAL OF ARTIFICIAL INTELLIGENCE RESEARCH	Computer Science, Artificial Intelligence
JOURNAL OF ASTROPHYSICS AND ASTRONOMY	Astronomy & Astrophysics
JOURNAL OF ATHLETIC TRAINING	Sport Sciences
JOURNAL OF BIOCHEMISTRY AND MOLECULAR BIOLOGY	Biochemistry & Molecular Biology

Title	Category/Categories
JOURNAL OF BIOSCIENCE AND BIOENGINEERING	Biotechnology & Applied Microbiology Food Science & Technology
JOURNAL OF BIOSCIENCES	Biology
JOURNAL OF CHEMICAL ENGINEERING OF JAPAN	Engineering, Chemical
JOURNAL OF CLINICAL INVESTIGATION	Medicine, Research & Experimental
JOURNAL OF HEALTH SCIENCE	Toxicology
JOURNAL OF KOREAN MEDICAL SCIENCE	Medicine, General & Internal
JOURNAL OF LIE THEORY	Mathematics
JOURNAL OF MACHINE LEARNING RESEARCH	Automation & Control Systems Computer Science, Artificial Intelligence
JOURNAL OF NEPHROLOGY	Urology & Nephrology
JOURNAL OF NUCLEAR SCIENCE AND TECHNOLOGY	Nuclear Science & Technology
JOURNAL OF OCCUPATIONAL HEALTH	Public, Environmental & Occupational Health
JOURNAL OF PESTICIDE SCIENCE	Entomology
JOURNAL OF PHARMACOLOGICAL SCIENCES	Pharmacology & Pharmacy
JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES	Pharmacology & Pharmacy
JOURNAL OF PHYSIOLOGY AND PHARMACOLOGY	Physiology
JOURNAL OF PSYCHIATRY & NEUROSCIENCE	Neurosciences Psychiatry
JOURNAL OF RADIATION RESEARCH	Biology Radiology, Nuclear Medicine & Medical Imaging
JOURNAL OF REHABILITATION RESEARCH AND DEVELOPMENT	Rehabilitation
JOURNAL OF REPRODUCTION AND DEVELOPMENT	Agriculture, Dairy & Animal Science Reproductive Biology
JOURNAL OF RESEARCH OF THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY	Engineering, Multidisciplinary Multidisciplinary Sciences
JOURNAL OF THE AMERICAN BOARD OF FAMILY PRACTICE	Medicine, General & Internal
JOURNAL OF THE BRAZILIAN CHEMICAL SOCIETY	Chemistry, Multidisciplinary
JOURNAL OF THE CERAMIC SOCIETY OF JAPAN	Materials Science, Ceramics
JOURNAL OF THE CHILEAN CHEMICAL SOCIETY	Chemistry, Multidisciplinary
JOURNAL OF THE JAPAN PETROLEUM INSTITUTE	Energy & Fuels Engineering, Petroleum
JOURNAL OF THE MEDICAL LIBRARY ASSOCIATION	Information Science & Library Science
JOURNAL OF THE METEOROLOGICAL SOCIETY OF JAPAN	Meteorology & Atmospheric Science
JOURNAL OF THE SERBIAN CHEMICAL SOCIETY	Chemistry, Multidisciplinary
JOURNAL OF THE SOCIETY OF RHEOLOGY JAPAN	Mechanics Polymer Science
JOURNAL OF VETERINARY MEDICAL SCIENCE	Veterinary Sciences
JOURNAL OF VISION	Ophthalmology
JSME INTERNATIONAL JOURNAL SERIES A-SOLID MECHANICS AND MATERIAL ENGINEERING	Engineering, Mechanical Materials Science, Multidisciplinary
JSME INTERNATIONAL JOURNAL SERIES B-FLUIDS AND THERMAL ENGINEERING	Engineering, Mechanical Thermodynamics

Title	Category/Categories
KOREAN JOURNAL OF RADIOLOGY	Radiology, Nuclear Medicine & Medical Imaging
LANGUAGE LEARNING & TECHNOLOGY	Applied Linguistics Education & Educational Research
MALARIA JOURNAL	Parasitology Tropical Medicine
MEDICAL JOURNAL OF AUSTRALIA	Medicine, General & Internal
MEMORIAS DO INSTITUTO OSWALDO CRUZ	Parasitology Tropical Medicine
MICROBIOLOGY AND IMMUNOLOGY	Immunology Microbiology
MOLECULAR VISION	Biochemistry & Molecular Biology Ophthalmology
MOLECULES	Chemistry, Organic
MOUNT SINAI JOURNAL OF MEDICINE	Medicine, General & Internal
MRS INTERNET JOURNAL OF NITRIDE SEMICONDUCTOR RESEARCH	Materials Science, Multidisciplinary
NEUROLOGY INDIA	Neurosciences
NEW JOURNAL OF PHYSICS	Physics, Multidisciplinary
NIHON REOROJI GAKKAISHI	Mechanics Polymer Science
NONLINEAR PROCESSES IN GEOPHYSICS	Geochemistry & Geophysics
OCEANOLOGIA	Oceanography
ONCOLOGIST	Oncology
ONCOLOGY REPORTS	Oncology
OPTICAL REVIEW	Optics
OPTICS EXPRESS	Optics
PACIFIC JOURNAL OF MATHEMATICS	Mathematics
PESQUISA AGROPECUARIA BRASILEIRA	Agriculture, Multidisciplinary
PESQUISA VETERINARIA BRASILEIRA	Veterinary Sciences
PHYSICAL REVIEW SPECIAL TOPICS- ACCELERATORS AND BEAMS	Physics, Nuclear Physics, Particles & Fields
PHYSICIAN AND SPORTSMEDICINE	Sport Sciences
PHYSIOLOGICAL RESEARCH	Physiology
PLANT PRODUCTION SCIENCE	Agronomy
PLOS BIOLOGY	Biology
POLISH JOURNAL OF PHARMACOLOGY	Pharmacology & Pharmacy
POLYMER JOURNAL	Polymer Science
POSTGRADUATE MEDICINE	Medicine, General & Internal
PRAMANA-JOURNAL OF PHYSICS	Physics, Multidisciplinary
PROCEEDINGS OF THE INDIAN ACADEMY OF SCIENCES-CHEMICAL SCIENCES	Chemistry, Multidisciplinary
PROCEEDINGS OF THE INDIAN ACADEMY OF SCIENCES-EARTH AND PLANETARY SCIENCES	Geosciences, Multidisciplinary
PROCEEDINGS OF THE INDIAN ACADEMY OF SCIENCES-MATHEMATICAL SCIENCES	Mathematics
PROCEEDINGS OF THE JAPAN ACADEMY SERIES B- PHYSICAL AND BIOLOGICAL SCIENCES	Biology Multidisciplinary Sciences

Title	Category/Categories
PRODUCTIONS ANIMALES	Agriculture, Dairy & Animal Science Veterinary Sciences
PROGRESS OF THEORETICAL PHYSICS	Physics, Multidisciplinary
PSYCOLOQUY	Psychology, Multidisciplinary
QUIMICA NOVA	Chemistry, Multidisciplinary
RESPIRATORY RESEARCH	Respiratory System
REVISTA BRASILEIRA DE CIENCIA DO SOLO	Agriculture, Soil Science
REVISTA BRASILEIRA DE ZOOTECNIA-BRAZILIAN JOURNAL OF ANIMAL SCIENCE	Agriculture, Dairy & Animal Science Veterinary Sciences
REVISTA CHILENA DE HISTORIA NATURAL	Biodiversity Conservation Ecology
REVISTA DE BIOLOGIA TROPICAL	Biology
REVISTA DE INVESTIGACION CLINICA	Medicine, General & Internal
REVISTA DE SAUDE PUBLICA	Public, Environmental & Occupational Health
REVISTA GEOLOGICA DE CHILE	Geology
REVISTA MEDICA DE CHILE	Medicine, General & Internal
SADHANA-ACADEMY PROCEEDINGS IN ENGINEERING SCIENCES	Engineering, Multidisciplinary
SALUD PUBLICA DE MEXICO	Public, Environmental & Occupational Health
SCOTTISH MEDICAL JOURNAL	Medicine, General & Internal
SENSORS	Chemistry, Analytical Electrochemistry Instruments & Instrumentation
SOUTH AFRICAN JOURNAL OF ANIMAL SCIENCE	Agriculture, Dairy & Animal Science
SURGEON-JOURNAL OF THE ROYAL COLLEGES OF SURGEONS OF EDINBURGH AND IRELAND	Surgery
SWISS MEDICAL WEEKLY	Medicine, General & Internal
TAIWANESE JOURNAL OF MATHEMATICS	Mathematics
TEXAS HEART INSTITUTE JOURNAL	Cardiac & Cardiovascular Systems
TOHOKU JOURNAL OF EXPERIMENTAL MEDICINE	Medicine, General & Internal Medicine, Research & Experimental
TURKISH JOURNAL OF PEDIATRICS	Pediatrics
VETERINARNI MEDICINA	Veterinary Sciences
WATER SA	Water Resources
WORLD JOURNAL OF GASTROENTEROLOGY	Gastroenterology & Hepatology
YAKUGAKU ZASSHI-JOURNAL OF THE PHARMACEUTICAL SOCIETY OF JAPAN	Pharmacology & Pharmacy
YONSEI MEDICAL JOURNAL	Medicine, General & Internal
ZOOLOGICAL SCIENCE	Zoology
ZOOSYSTEMA	Zoology

Appendix B: Immediacy Index data for newly covered OA journals

Title	2003 Total cites	03 Immediacy Index	Launch year
JOURNAL OF THE CHILEAN CHEMICAL SOCIETY	5	0.07	2003
JOURNAL OF PHARMACOLOGICAL SCIENCES	12	0.07	2003
MALARIA JOURNAL	64	0.60	2002
E-POLYMERS	102	0.29	2001
BMC EVOLUTIONARY BIOLOGY	108	0.80	2001
BMC GASTROENTEROLOGY	39	0.03	2001
BMC MICROBIOLOGY	138	0.28	2001
BMC BIOTECHNOLOGY	79	0.30	2001
SENSORS	161	0.07	2001
BMC NEUROSCIENCE	114	0.30	2000
RESPIRATORY RESEARCH	466	0.07	2000
BMC GENETICS	149	0.02	2000
BMC GENOMICS	141	0.41	2000
BMC BIOINFORMATICS	245	0.28	2000
BMC MOLECULAR BIOLOGY	70	0.64	2000
BMC MUSCULOSKELETAL DISORDERS	41	0.04	2000
BMC BIOINFORMATICS	245	0.28	2000
BMC MUSCULOSKELETAL DISORDERS	41	0.04	2000
INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES	106	0.20	2000
ELECTRONIC JOURNAL OF BIOTECHNOLOGY	45	0.14	1998
DISCRETE MATHEMATICS AND THEORETICAL COMPUTER SCIENCE	46	0.17	1997
INFORMATION RESEARCH-AN INTERNATIONAL ELECTRONIC JOURNAL	75	0.48	1995
ELECTRONIC TRANSACTIONS ON NUMERICAL ANALYSIS	147	0.27	1993