

Open Access: What Comes Next after 2004 *

(Revised Version of **Open Access: What Comes Next**)

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Some portions have been presented by the author at the 2004 Charleston Conference. Nov. 3-5, 2004, and some of the background aspects are similar to the author's article cited in note (2).

This is a revised version of

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The present revision adjusts the figures, their corresponding legends, and discussion to match the *Note added in proof* in the published article. The published article itself has the *Note added in proof* only, since it was not practical to adjust the figures. The changes here are sufficiently great that the author considers this version independent, and has consequently given it an altered title.

Revision completed Jan. 13, 2005.

See: *Note added in proof for the Revised article* (p.2).

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Abstract

This article examines the effects that present decisions about Open Access (OA) will have over the next ten years. It will be shown that the consequences are affected both by deliberate choices of policy by librarians and publishers, as well as by the adoption of various alternatives by scientific authors. The eventual result could be excellent, or quite otherwise.

Note added in proof (for the original article):

On Nov. 8, 2004, the UK released the Report giving the negative government response to the open access recommendations of the House of Commons Science and Technology Committee

(<http://www.publications.parliament.uk/pa/cm200304/cmselect/cmsctech/1200/120002.htm>)

From this response it is clear that mandatory OA will not be generally achieved in the UK at the beginning of 2005, though individual UK research councils may introduce it during that year. The discussion below should be read with the assumption that the UK will introduce OA one year after the US, but otherwise following the original UK plan. The graphs [in this version](#) have been adjusted to reflect the changed expectations.

Note added in proof (for the Revised article):

In the author's judgment, the NIH's vacillations in January, 2005 are not likely to produce outcomes that will affect either his data or his discussion.

Introduction

This article was originally written in early October 2004, when it was not yet known whether Open Access according to either the US NIH model or the UK model will be officially adopted. The details and the speed of implementation are currently unknown. The intention here is to examine what will follow after the decision; delays in starting will affect the timing, but not the nature, of the events that follow.

The merits of the various plans are not examined here. (1) Their advantages and defects are not relevant, since the proposed plans have been specified and will be adopted based on their political attractiveness, not

their merits. This is not an argument about whether to adopt them, but a discussion of what will happen after that.

This article studies the possible effect of OA under different assumptions, and attempts to encompass the widest and most extreme range of consequences. It is recognized that less extreme situations may well happen, but it is hoped that their effects will be clear from the cases given.

It should be noted that the author is a supporter of Open Access, but also has expressed strong reservations about the advisability of some of the provisions of each country's plan.(2) This is nonetheless intended to be an objective discussion of the positive and negative consequences of these plans, and examples have been selected yielding very different results. I hope I have avoided the trap of predicting whatever it is I would most like to see.

Background

The model as proposed in both countries is a variety of "Green" Open Access where the material is published in a journal, and also in some type of repository. Both plans provide only for the publication of primary research in scientific journals, but not review articles, books, or paid editorial material. Only the minimum discussion will be presented here.(3)

In both plans, the requirement is that OA be provided, at least, for the author's final version after peer review but before further editing. In the US, the requirement only applies to research sponsored by the NIH, and the OA version is to be placed in the NIH database PubMedCentral. In the UK, it would apply to all government-financed science, and the OA version would be placed in Institutional Repositories at each author's institution. In the US, the copyright holder may postpone OA for up to six months; in the UK, it would be postponed for six months unless the author uses government money to pay for publication, in which case it would be available immediately. These differences between the plans are not large. The only significant one is the subject coverage, and it is generally assumed that if successful, the US plan will be extended to all government-financed sciences. It is anticipated that compliance with the plan will be required only for new grants, not existing ones. It is also expected that philanthropic foundations and other providers of research money will follow the governmental policy of OA.

Both plans are based upon the proposal widely disseminated by Stevan Harnad and others associated with the *Budapest Open Access Initiative*.(4) It is sometimes known as " self-archiving." Quite independently of

any mandate, self-archiving can be carried out on a voluntary basis, and that was the original proposal. Many who support OA find the government versions too weak, and object to various elements. Most object to the six-month embargo; some object to the use of the author's final version, instead of the final copy-edited version as published. Some also distrust the stability of any plan depending upon diverse repositories rather than central ones; others insist upon institutional repositories and not central ones.

Both the US and the UK plans would rely on the established scientific journals for providing archiving, copy-editing, and the critical quality control function of peer-review. Nonetheless, there is considerable opposition from the publishers. They depend to varying extents on subscription income for performing these functions, and they understandably fear that the provision of any free versions of the articles will encourage the discontinuation of subscriptions and lead to the financial collapse of the journals. The six-month embargo, and the required deposit of merely the author's unedited version, are government attempts to protect the publishers' subscription base. These steps may prove adequate, or they may not--each possibility will be shown.

In addition to the proposed government plans, there are at least two other methods that are possible in case the plan as chosen should yield unfortunate results. They are not explicit parts of the government plans, though they are generally recognized as alternatives that could have been adopted.

We could have a system of journals each consisting entirely of OA articles, generally called an Open Access Journal (OAJ) --sometimes called "Gold OA." Publication generally would be paid for by fees collected "on behalf of the author" unlike conventional subscriptions that are paid for "on behalf of the reader". The BOAI, in compromise, accepted that such journals are at least as good as "Green" OA. Such OA Journals have the obvious advantage that they will continue the existing journal system, and the obvious problem that such a transition can not be rapid, since the manner of payment must be shifted from subscriptions to author/institutional fees. There are already a small number of such titles, some intended to be inexpensive, and some more elaborate.(5)

Alternatively, we could have a system completely independent of journals, in which articles are published in a database. Some near approaches to such databases already exist, although presently almost all of their articles are also published conventionally in journals. The extent to which they presently carry out the conventional peer-review, copy-editing, and archival functions of journals is limited. In these respects, they are all inferior to a first-rate journal, but some are already superior to many conventional titles. The term "Article Databases" will be used for those that are of equivalent quality.(6)

Article Databases have an obvious advantage in their low cost; however, the ability of the database to develop the full panoply of quality control and access functions of the journal system is unknown, and such a plan would obviously mean the ending of the present journal system. So-called "overlay journals" could continue, as a title page with links to selected articles in the Article Database, peer-reviewed or chosen on other bases. It is also possible that a mixed system might develop, such as OA Journals for the major titles of widest interest in each field, and Article Databases for the lesser ones and the most specialized. The possible stability of mixed systems will not be studied here.

Assumptions

See Above, Note Added In Proof, and Note Added in proof for the Revised article (p.2)

As the basis of this argument, it is now assumed that the NIH measures will be adopted by the end of 2004, and will apply to new grants only. There will thus be an extended period of phase-in, as existing grants come up for renewal: I will assume a five-year period. It is further assumed that the US will extend such measures to all government-financed research by the following year, and that philanthropic foundations and other providers of research money will adopt the governmental policy of OA. It will be further assumed that the UK will follow within a year or two, and that the UK / US differences will soon be harmonized. The discussion assumes that the publishers provide OA to the degree the law requires, and only to that degree. As it is possible that some or all will see the wisdom of a more preemptively liberal policy, the case is also considered where the publishers in both countries might extend OA immediately to all articles, without embargo periods, using the final published version.

It is clear that the decision for OA in either the US or the UK will inevitably bring about its adoption by the other country, as authors will want the same wide distribution as their counterparts. I think that the adoption of required OA in any major scientific country, like France or Germany, will also cause the US and UK to conform, for the same reason. The rates of change under such country by country adoption need discussion, but it will not be attempted here. However, the possibility that both government plans are defeated is included as a special case, to see whether even this might yield satisfactory results.

Library Subscription Decisions

The key factor determining the overall results is whether or not libraries will maintain their journal subscriptions even after the introduction of OA. Traditionally, libraries subscribe until forced to cancel by rising costs. Publishers' costs have almost always increased faster than library budgets. This is due to positive feedback: publishers' costs increase each year; they know that a comparable price increase will cause a certain number of subscribers to cancel, and therefore they increase the price to cover both. The obvious result is accelerating cancellations in all following years.

The arithmetic conventionally used by libraries in deciding about subscriptions will not be affected by OA. In general, for a library that is a subscriber to a journal, the key figure examined during cancellations is the cost per use, however measured or estimated. Under OA, users associated with subscribing libraries will find themselves directed by the existing linking systems to the publishers' official sites. If, as seems increasingly to be the case, they identify their articles using the Web, (7) they may be initially directed either to the publishers' site or the OA site, but the OA site will contain a link to the official one. Thus the use of the publishers' sites will either remain the same or actually increase. For non-subscribers, systems and links will hopefully direct them to the OA site.

Therefore, library discontinuations of journals will be proactive, and represent decisions about how material can most efficiently be accessed given the available budget and the journal costs. Research libraries and non-research libraries are in different situations. For non-research libraries, few still subscribe to more than the central titles in each subject, and almost no title is truly indispensable; the cutoff will vary with the budget and the availability of alternatives. Rapid cancellation of many of the titles, especially any remaining expensive ones, would be the rational course for such libraries. Libraries without research needs are expected to consider Interlibrary Loan or article-by-article purchase adequate during the embargo period if publishers' versions are required, just as they use it now for unsubscribed titles. They will have the further option of OA access to available equivalents.

For research libraries, while only a small fraction of material in each journal is available OA, as would be the case during the slow development of voluntary OA, or during the earliest years of the phase-in, only those libraries that have truly marginal need for a journal would discontinue. Once most material in a journal is available as OA, as provided in these mandates, most libraries might also discontinue those titles for which they do not have a demonstrable research need. This is the reason for the provision of the six-month embargo and the limitation of quality to the pre-copyedited version: they are intended to keep research libraries subscribing--but they will be effective only for the core research titles.

Even for research libraries, not all the titles to which they subscribe are of equal importance to them. Any actual university has subject fields of only peripheral interest to the research program. In any research field, some journals are of extremely limited value, and probably no library has a truly complete collection of all such journals. For both groups of titles, even a very good library might consider the limited OA access as sufficient, and will use it to concentrate its resources in the truly central areas.

The embargo will be the first factor to consider: during the initial 6 or 12 months, the suitability of Interlibrary Loan or article-by-article purchase may extend to the least important titles in research libraries. The acceptability of such substitutes depends on the extent of need, and the speed and cost of these alternatives; the details will not be discussed in this paper. The second factor is the degree to which the users prefer or need to use the official form. If they do, research libraries will retain them to the extent finances permit. If they do not, there will be very little reason to retain them. Some libraries will feel the need to maintain an archive of all possible titles, but few will want to do so in all subjects. Some may maintain subscriptions out of tradition as long as funding permits; others may seize the first excuse to cancel. Once some key libraries cancel, others will, especially the lesser ones. Publishers have relied on the effect of mutual encouragement in consortia to hasten the spread of subscription plans; the same collective effect will also work in the other direction.

Publisher Decisions

The commercial publishers, having generally large financial resources and profits that provide a considerable cushion, are characteristically taking the position that while the OA plan is not necessary, or even desirable, they will be well-prepared to comply with it. They normally consider the alternative of OA Journals possible, and they have the capital to sustain their titles during the administrative transition.

The academic societies, which publish the great majority of the highest-rank journals, have minimal financial resources. (There are some exceptions.) Thus, they consider themselves unable to switch to OA journals: they already often charge author fees, and they regard further increases as impossible for their authors. They regard any loss of subscriptions as financially perilous: one-third of them already have no profit from their publishing activities.⁽⁸⁾ Their titles are less expensive than corresponding ones from the commercial publishers, and their hope is that the cancellations will fall on the more expensive commercial titles. It is paradoxical that some such societies, especially in biomedicine, themselves already allow full access after an embargo period, while continuing to oppose one as a mandate.

Methods

The projections have been constructed informally, assuming likely rates of change by the various components. Publishers and libraries do not quickly change in the absence of external constraints, and developments left up to them are assumed to proceed initially in a linearly increasing fashion. Once a new system has been demonstrated as necessary or successful, adoption can sometimes develop quite rapidly, and I assume in those cases an increasingly rapid change, whereby seemingly successful methods become universally adopted within a few years.

Though the results are being presented as graphs, they are not really quantitative. It is probably impossible to be more specific in advance, as the key decisions cannot be exactly predicted. We may look forward to proper analysis of the actual results after the fact.

The graphs present the expected proportionate share of each of the publishing methods. If there is a large overall increase in the amount of publication, we might see an increase in the proportion of informal publication without a corresponding decline in the absolute number of conventional subscriptions; this is not taken into account. Some publishers fear a net decrease in total publishing opportunities (by which they mean decline in the number of journals), but it would be expected that such decline would merely increase nonconventional publishing.

A increase in the total funding for science would benefit publishers as well. This might come from an increasing support from the wealthier nations, or, more likely, a gradual increase from the less wealthy as they develop. This would likely affect non-conventional publishing first: most developing nations subsidize their journals sufficiently so that many are OA.

Cases

I consider six possibilities:

1.

The desired favorable case where OA is adopted, and the journals continue to publish. This may be caused by user preference for the official form, by conservative decision-making by the libraries, or by supplemental funding to encourage this result.

2.

The undesired unfavorable case where OA is adopted, but many journals do not continue to publish. This may be caused by user lack of demand for the official form, or by greater cost sensitivity by the libraries.

3.

A variant of case 2, where the journals as they fail to survive are replaced as rapidly as practicable by Open Access Journals (OAJs), paid for on behalf of the authors.

4.

Another variant of case 2, where the journals as they fail to survive are replaced as rapidly as practicable by placing articles in an Article Database.

5.

A variant of case 1, where the journals permit full OA to all their articles immediately in their published form, and survive by achieving lower prices through greater efficiency (7), or through lower profits, or through fewer journals, or possibly through direct subsidy.

6.

The case where mandated OA is not adopted, and "self-archiving" remains voluntary.

Key to the figures.

Note that all cases indicate the relative proportion of articles, not of journals.

For figs. 1a through 6a

(i.) The gray line with the open squares labeled "Conv. Jls" shows the percentage of articles that are published in "paid-on-behalf-of-the-subscriber" conventional journals, and not self-archived.

(ii) The light green line with the filled circles labeled "Jls + self-a." shows the percentage of articles that are published according to "Green" OA, in "paid-on-behalf-of-the-subscriber" conventional journals. and also in some version available free to all in institutional or national repositories.

(iii) The red line with the squares labeled "'self-a only" shows the percentage of articles that are published only in repositories, not journals, and where the repositories are un-controlled self-archiving, that do not meet the quality standards of Article Databases or good journals.

(iv) The dark green line with the triangles labeled "Art. DBs" shows the percentage of articles that are published in OA Article Databases that are similar in standards to good journals.

v) The gold line with the diamonds labeled "OA Jls" shows the percentage of articles that are published according to "Gold" OA, in "paid-on-behalf-of-the-author" OA Journals.

For figs 1b through 6b

The red line with the open circles labeled "subscr. J" represents the total percentage of articles that are published in "paid-on-behalf-of-the-subscriber" conventional journals, whether or not they are also available in some form as OA. It is the sum of lines (i) and (ii) in figs. 1a-6a.

The green line with the vertical bars labeled "total J" represents the total percentage of articles that are published in journals of any sort, conventional, "Green" or OA Journals. It is the sum of lines (i) , (ii), and (v) in figs. 1a-6a.

The blue line with the crosses labeled "% OA" represents the total percentage of articles that are published in one or another form of OA, whether OA Journal, "Green" journal, Article Database, or even uncontrolled "self-archiving" It is the sum of lines (ii), (iii), (iv), and (v) in figs. 1a-6a.

The area above the blue line with the crosses represents the total percentage of articles that are published without any form of OA. Its area equals the area beneath line (i) in figs. 1a-6a.

Case One: Required OA; Journals Continue

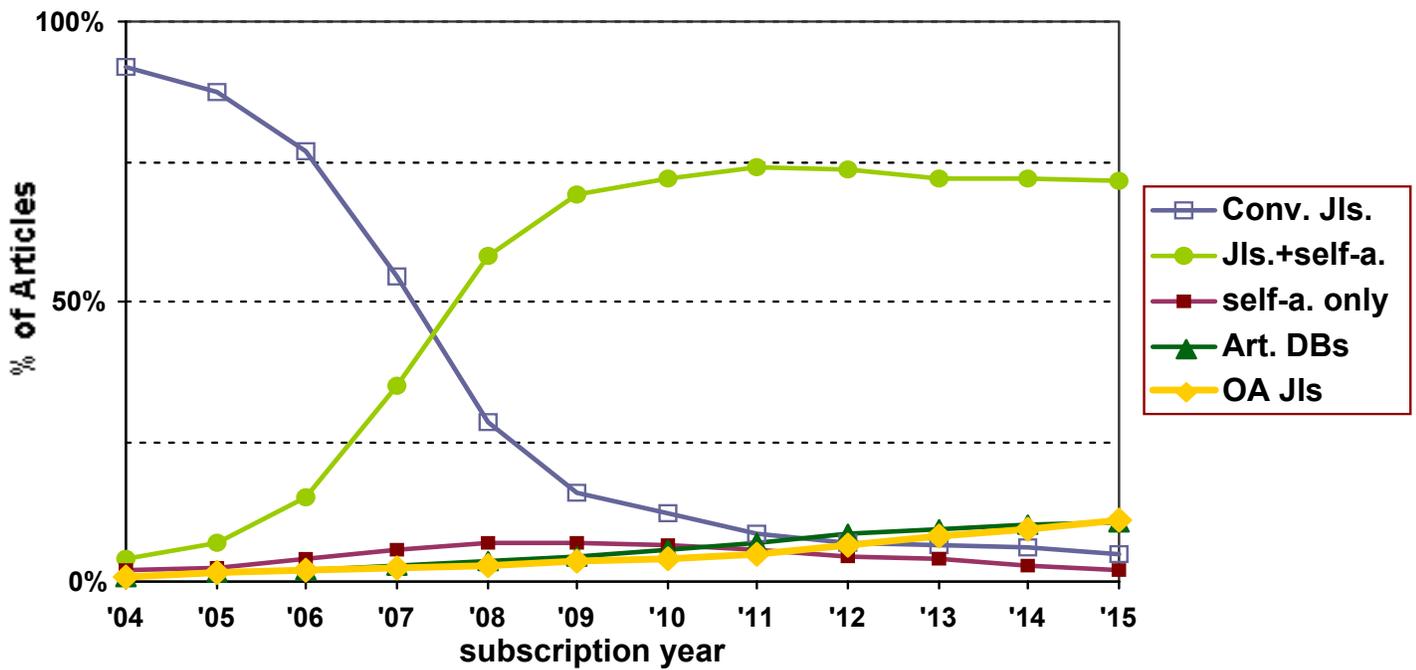


Fig. 1a: Required OA; Journals Continue

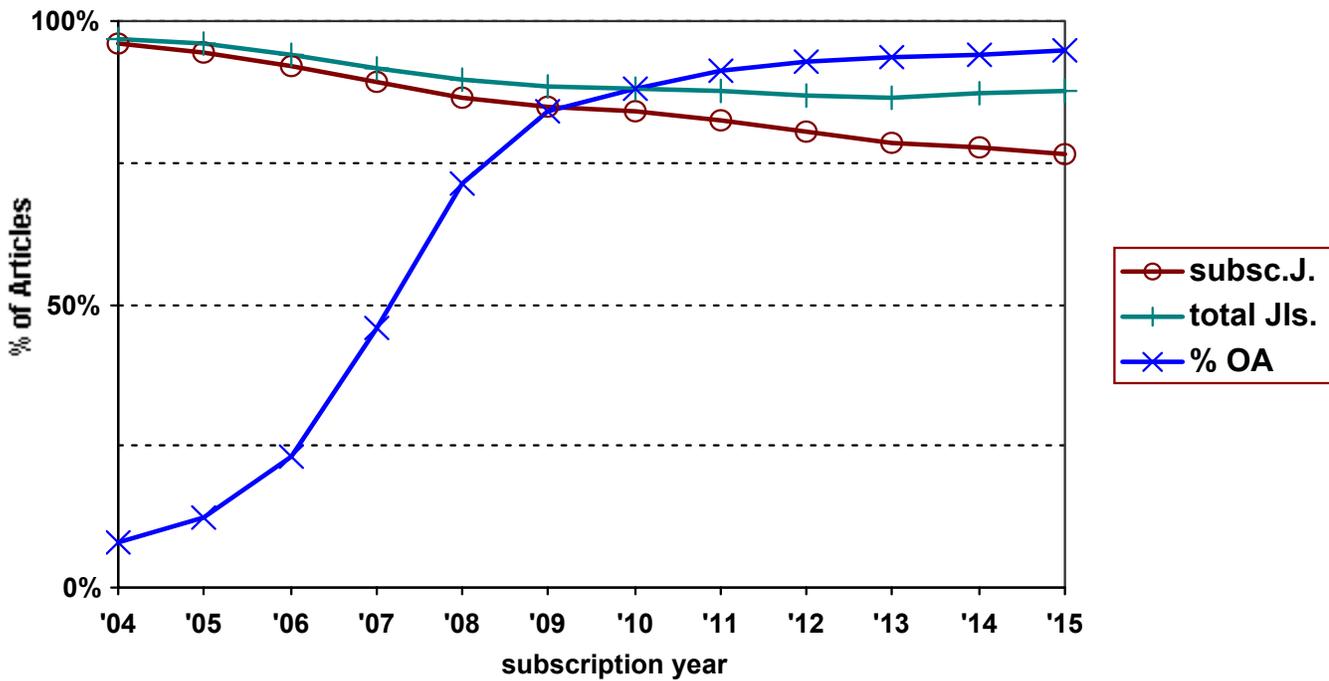


Fig. 1b: Required OA; Journals Continue

In this case, the subscription years 2005 through 2009 are accompanied by the phased-in required transition to "Green" OA. OA does not reach quite 100% because there remain a few articles that are based on privately-funded research, or are review articles while the plans require only primary research articles to be OA. (Though most of these too may choose to be OA.). There will possibly be an increasing number of authors who prefer to publish in the repositories only, but this should decrease with the slow development of the superior methods--OA Journals and Article Databases. There certainly will be authors in some fields who will choose Articles Databases over all possibilities. The possibility for co-existence of "Green" and "Gold" OA Journals is unknown, but there should be room for a small number of "Gold" OA titles, probably , just as now, subsidized completely rather than author-paid.

The proponents of the official plans claim that this case will certainly prevail, and often do not consider other possibilities. They typically argue that only the true research libraries have kept most of these journals so far, and will not now discontinue them if it can be prevented. It is true that if users and authors insist on the higher quality of the publishers' versions, and funding remains available for the normal price increases, the number of core subscribers may remain stable. Proponents claim to consider any less satisfactory result impossible; those less committed are beginning to consider such results openly. (9)

Case Two: Required OA; Journals Cease

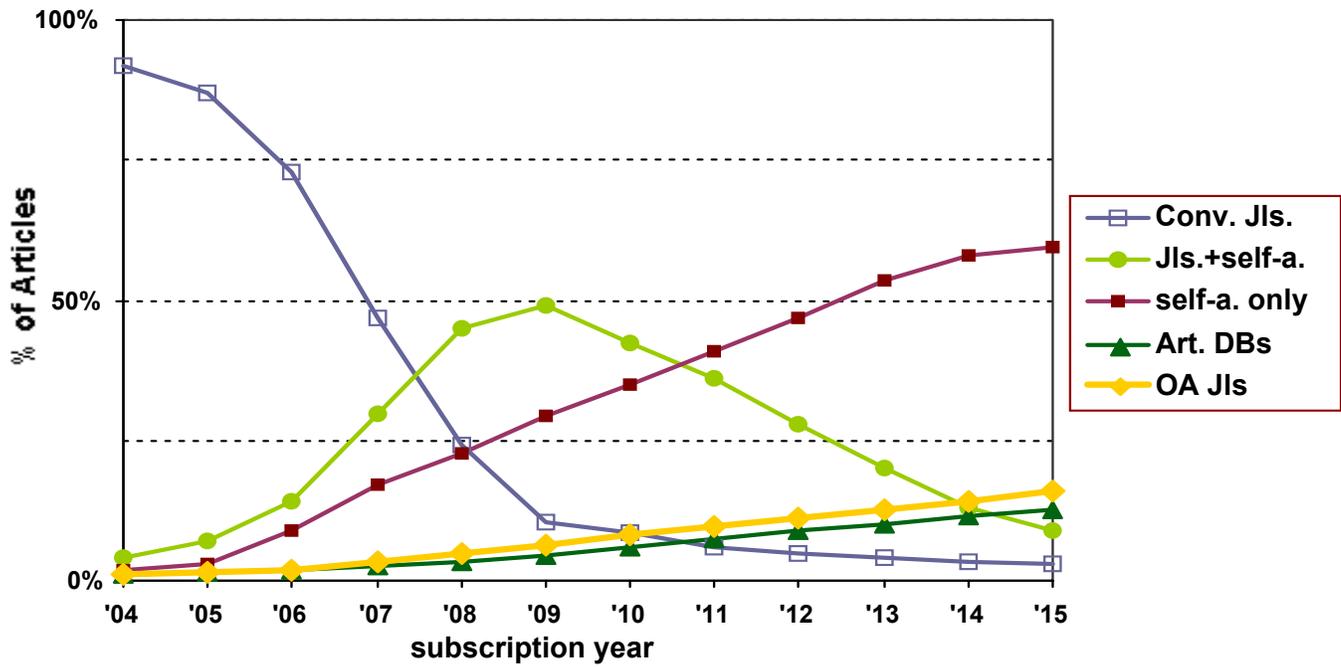


Fig. 2a: Required OA; Journals Fail

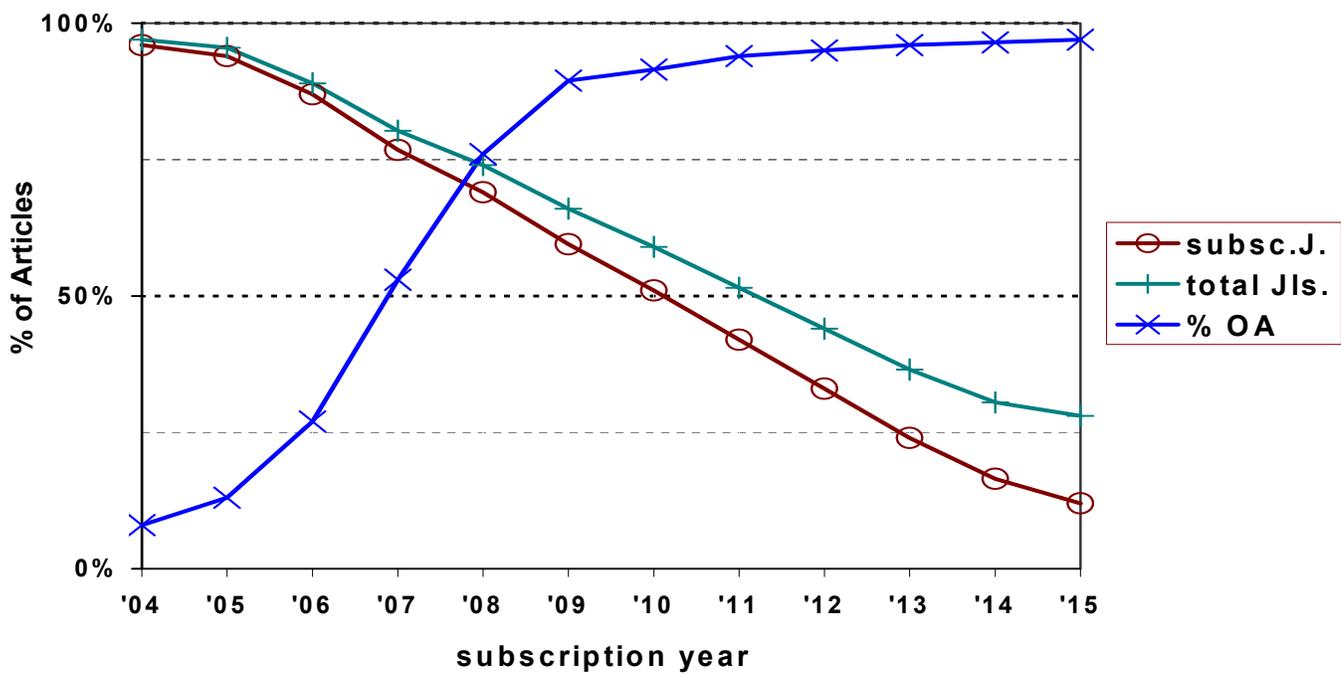


Fig. 2b. Required OA; Journals Fail

This is the opposite case from the one above. In this case also, the subscription years 2005 through 2009 are accompanied by the phase-in of the required transition to "Green" OA. The normal pace of journal price increases will cause a decrease in the number of subscriptions just as it always has, and the willingness of a library to cancel will surely be a least slightly greater when there is an alternative in OA, rather than just ILL. As the proportion of OA articles increase, so will the attractiveness of OA.. If readers accept the lower quality material provided by "self-archiving" only, the number of truly necessary core journals in libraries may be very small.

Discontinuing low quality journals will not affect the better journals. However, discontinuing high quality but out-of-field titles will also begin to affect the better journals. As the process continues, the prices increase, and the number of subscriptions decreases to the point where publication cannot be continued. This will affect low quality journals initially, and then the ones at successively higher quality levels.

The figure shows subscription titles still continuing to publish 24% of the articles in 2013, as some of the conventional titles should be strong enough to operate even under these conditions. It shows the same slow increase in OA Journals and Article Databases as in the previous case. The lack of other possibilities results in more than half the articles being published only by uncontrolled self-archiving by 2013. The exact percentage published in this sub-standard manner is very sensitive to future author and reader preferences; the amount might vary; what would not vary is the corresponding lack of peer review and other journal functions, as the journals previously doing them and paying for them no longer exist. Fortunately, there are two good ways to avoid this dismal situation.

Case Three: Required OA; Journals Cease, But Are Replaced By OAJs

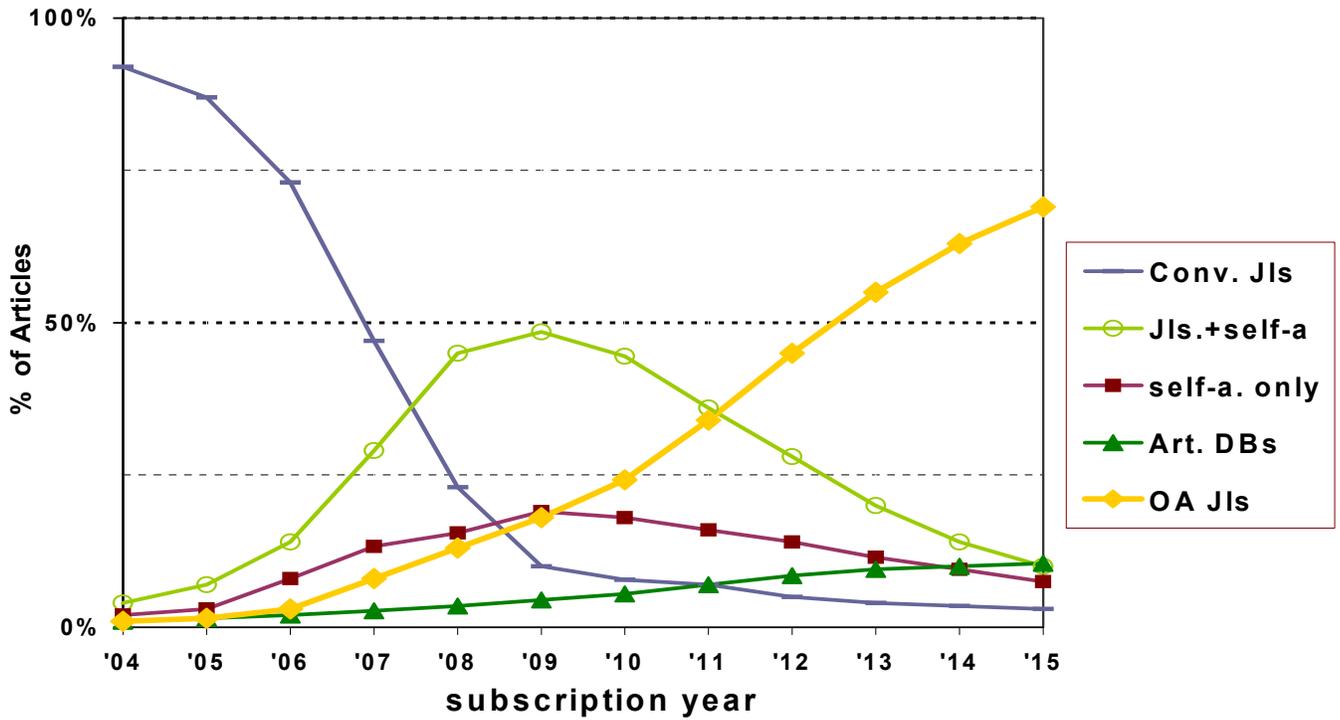


Fig. 3a. Required OA; Journals Fail + OAJ

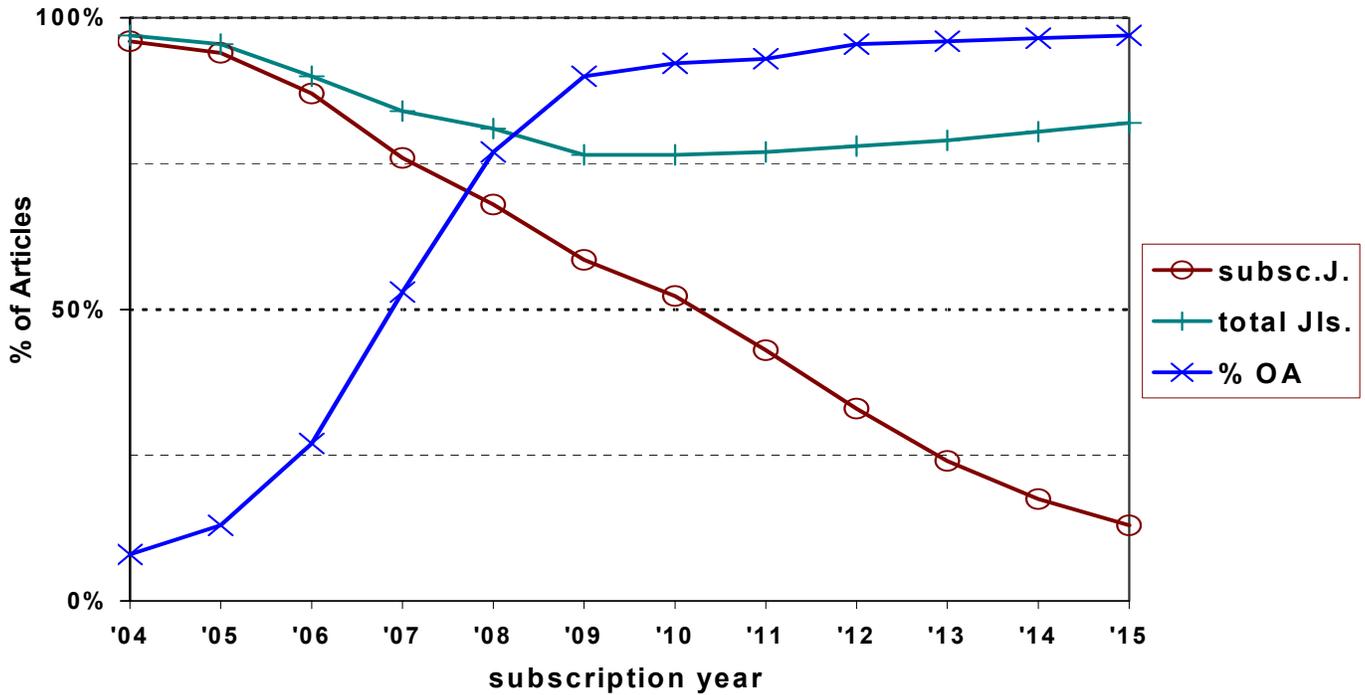


Fig. 3b. Required OA; Journals Fail + OAJ

In this case, the money formerly used to buy journals that now no longer exist is used to fund OA Journals. If we show foresight, we will plan this in advance, and begin developing OA Journals immediately, without waiting for the collapse of subscription titles. This development could be done by publishers converting existing journals, or by the formation of titles that either parallel existing titles or are altogether new. (10) This is shown by an initially very slow but accelerating increase in the proportion of publication in such journals; they take some time to start or convert. There will probably be an interim period when the conventional journals have begun to fail, but not enough OA Journals have been started or converted to accommodate the need. This is indicated by a temporary increase in the proportion of articles published by "self-archiving" only. This unfavorable effect can be decreased by specific financial support from granting agencies to facilitate the transition. As before, there remains some subscription-only publication as review journals or other special cases. There also certainly will be authors in some fields who will choose Articles Databases over all possibilities.

There might be essentially trivial but insurmountable difficulties: the non-commercial publishers could probably not effect such a change without at least temporary financial assistance, and the slow pace of change in academic institutions will greatly handicap the necessary change in financial arrangements. Repeated doubts have been expressed that the 'payments on behalf of the author' could ever be administered fairly. (11) If necessary, there is a more radical alternative.

Case Four: Required OA; Journals Fail, But Are Replaced By Article Databases

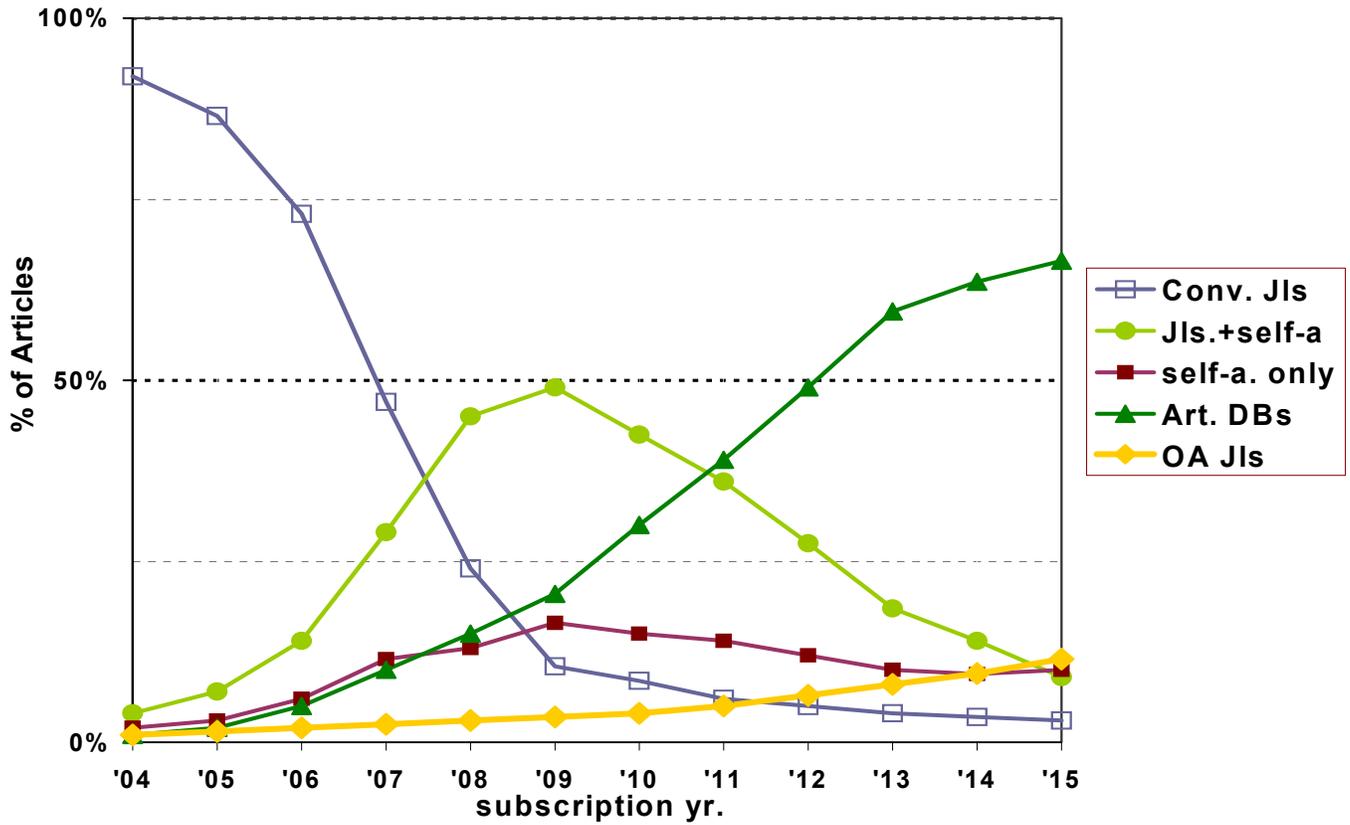


Fig. 4a: Required OA; Journals Fail + Art.DBs

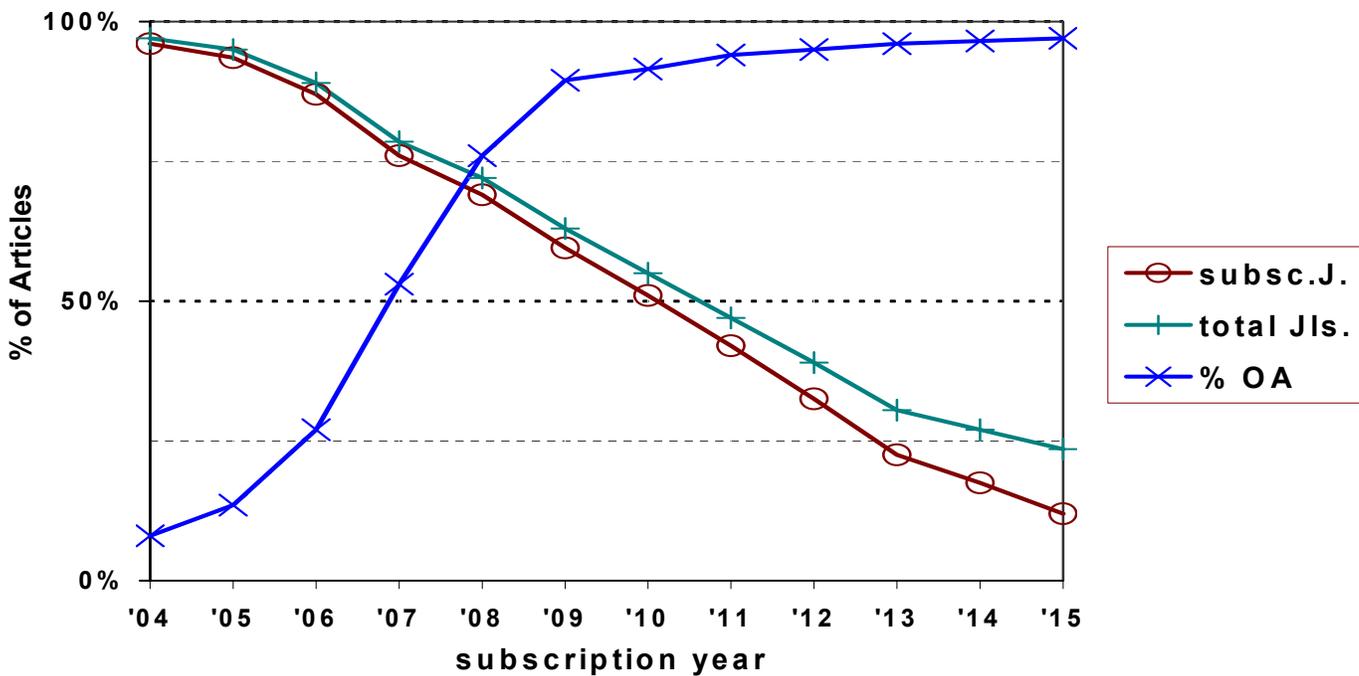


Fig. 4b: Required OA; Journals Fail + Art.DBs

This is the same situation as in the previous case, except that instead of changing to OA Journals to fill the gap, authors instead adopt the use of true Article Databases. These can be established and operated much less expensively than journals, but there will be an inevitable lag in changing the behavior of academic administrators.

Universities presently rely upon the peer-review for journal publication to provide the principal criterion for academic appointments and promotions. Appropriate quality control measures could be achieved by Article Databases—probably taking the form of overlay journals—but the change in the traditional criteria would appear exceedingly slow to those not familiar with academic institutions. Therefore, the figure shows a similar lag period as in the previous case, covered by a temporary increase in the proportion of articles published by self-archiving only. As before, there remain some articles published in subscription journals as reviews or other special cases.

The compatibility of OA Journals for the elite articles, and Article Databases for the remainder, and also a the main publication medium in fields where preferred, is an interesting possibility. Its stability is unknown. It is not shown specifically here: it would be an intermediate between Cases Three and Four.

The most significant difference between Case Three and Case Four is that the OA Journals in Case Three could be operated essentially as journals now are, with the same staff, publishers, and titles. On the other hand, there is no real place for academic publishers in the Article Databases of Case Four, except the possible subsidiary vestigial roles of operating services for copy-editing, and structures for peer-review. Since the change to Article Databases can be accomplished by the academic faculty and administrators alone, even over any possible opposition of the publishers, this would appear to give publishers every reason to assist in the rapid achievement of other forms of OA.

Case Five: Full OA

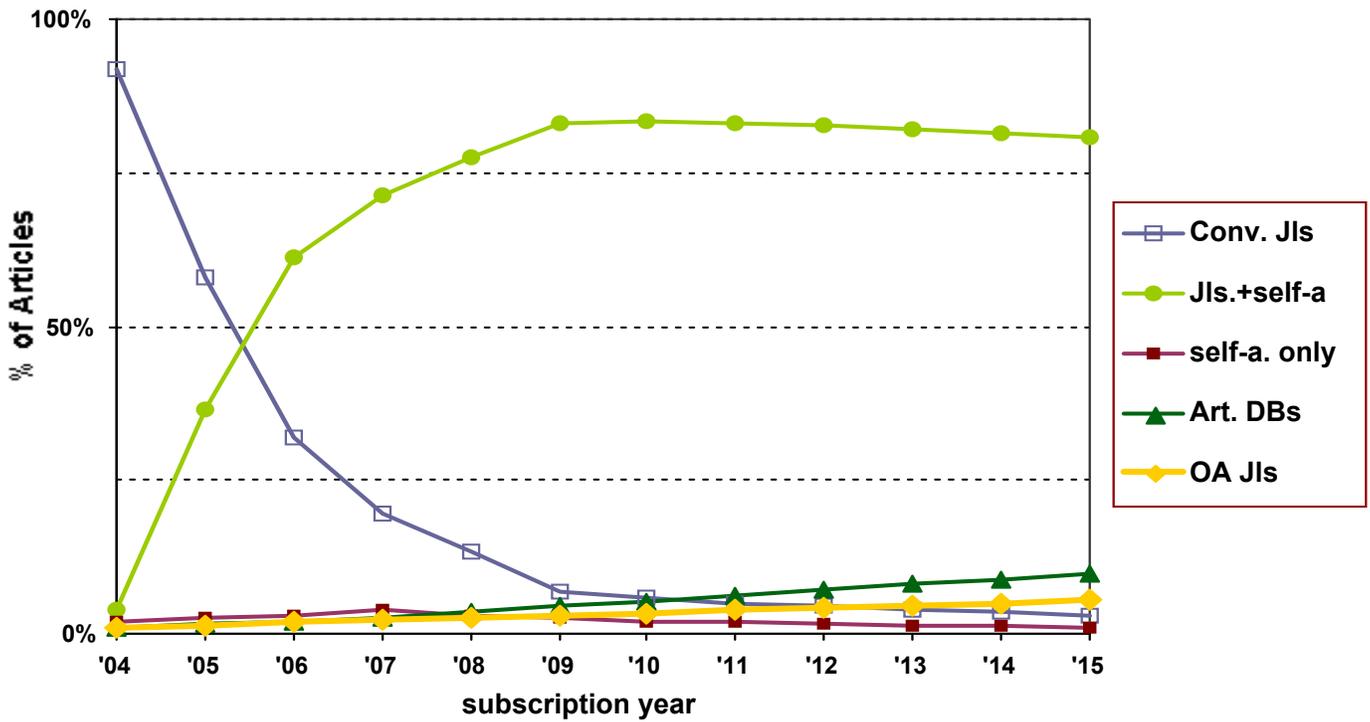


Fig. 5a. Full OA; Journals Optimized.

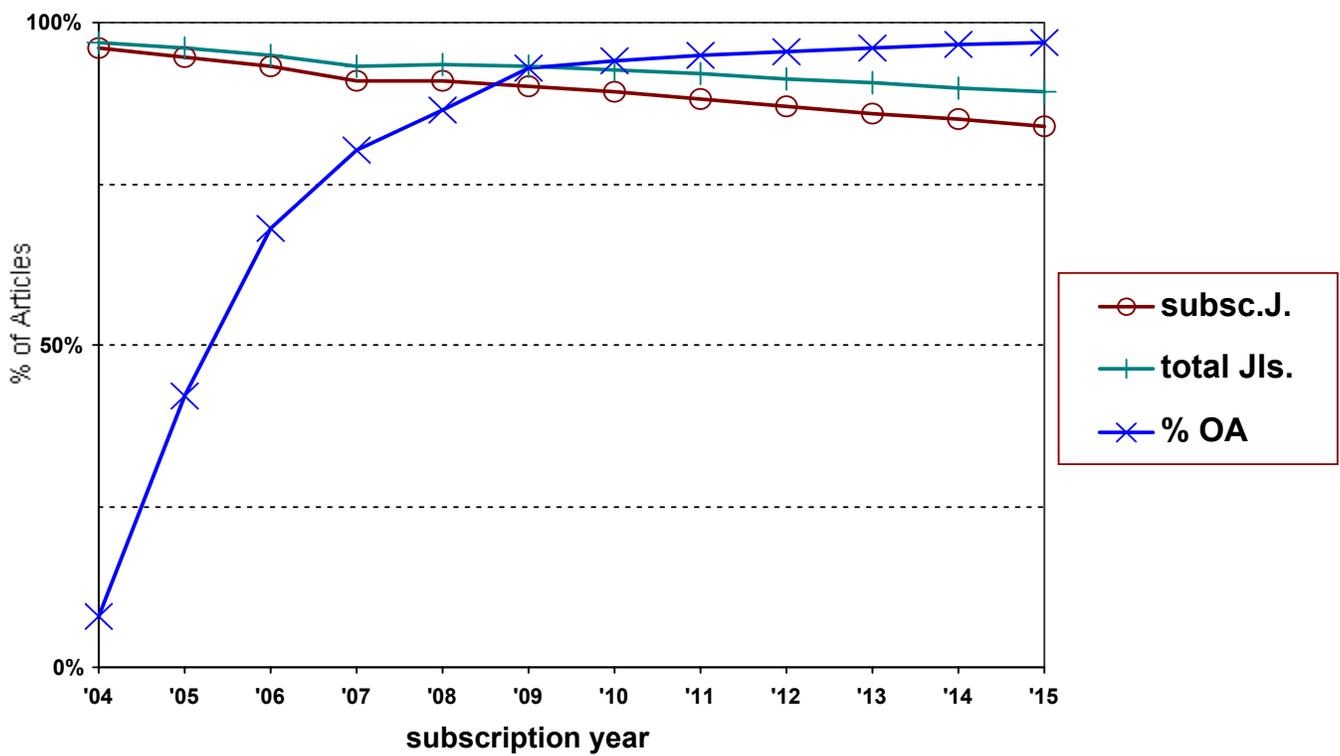


Fig. 5b. Full OA; Journals Optimized

This case is an attempt to provide the optimal conditions for "Green" OA--subscription journals for quality control supplemented by repositories for universal access. .

In this case the publishers do not wait for the pace of the regulatory action, but immediately provide OA through institutional or centralized repositories for all articles in all subjects. They further encourage OA by permitting OA to the authentically published form of their articles, for all articles published. They survive by making full use of opportunities for greater efficiency to lower prices,(12) thus operating the positive feedback cycle in the opposite direction: The slightly decreasing prices will encourage institutions not to discontinue the journals and will encourage some to add borderline titles they had previous discontinued. The slightly greater number of subscriptions will permit yet lower prices, and the effect will increase for each succeeding year.

Some titles may have too few potential subscribers for viability, and their articles will instead be published in Article Databases. In some subjects too, the authors may always prefer Article Databases. There should certainly be room for a small number of "Gold" OA titles, probably subsidized completely just as now, rather than author-paid.

This plan does seem utopian to an unlikely degree, considering the present lack of cooperation between publishers, libraries, authors, and users. But there does not appear any intrinsic impossibility. The initiative rests with the publishers, and the question is whether they will be enlightened enough to seize it—and seize it quickly, because they must act more generously than the legal minimum, or the other parties will control the developments.

Case Six: OA Measures Are Not Enacted

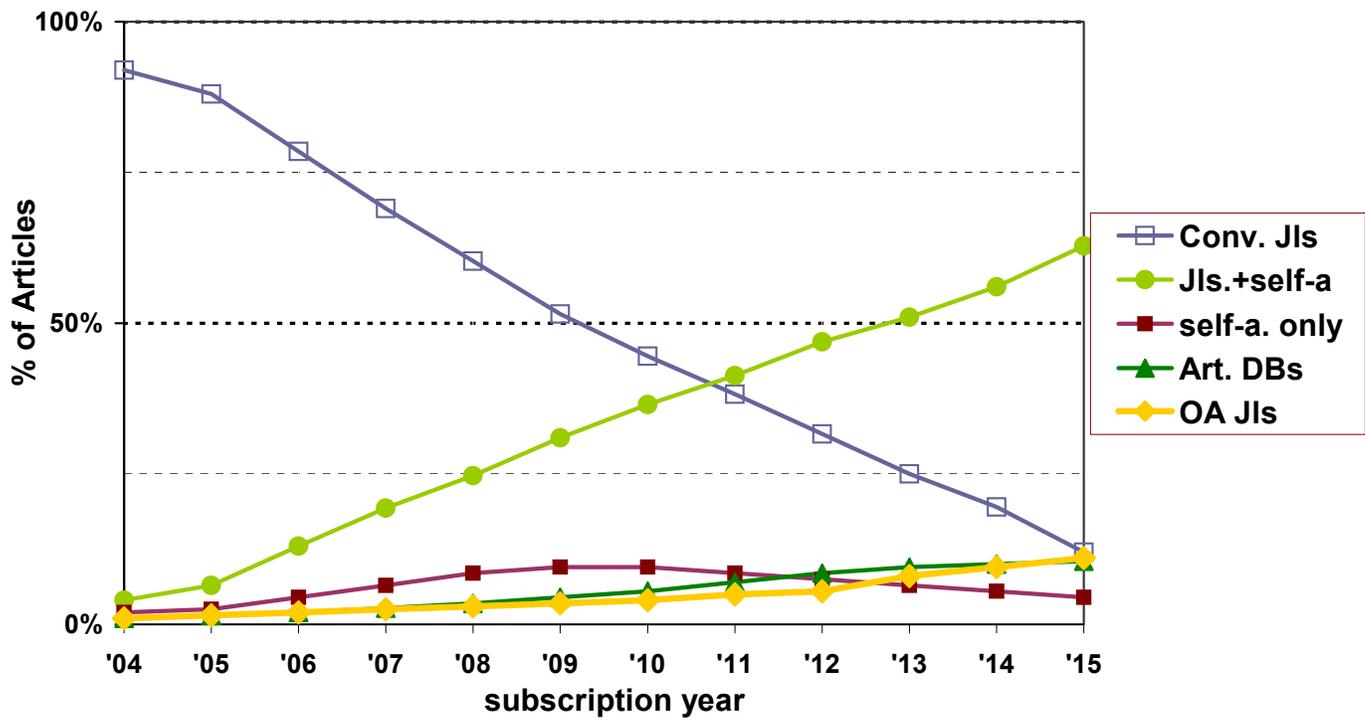


Fig. 6a: OA Measures Not Enacted .

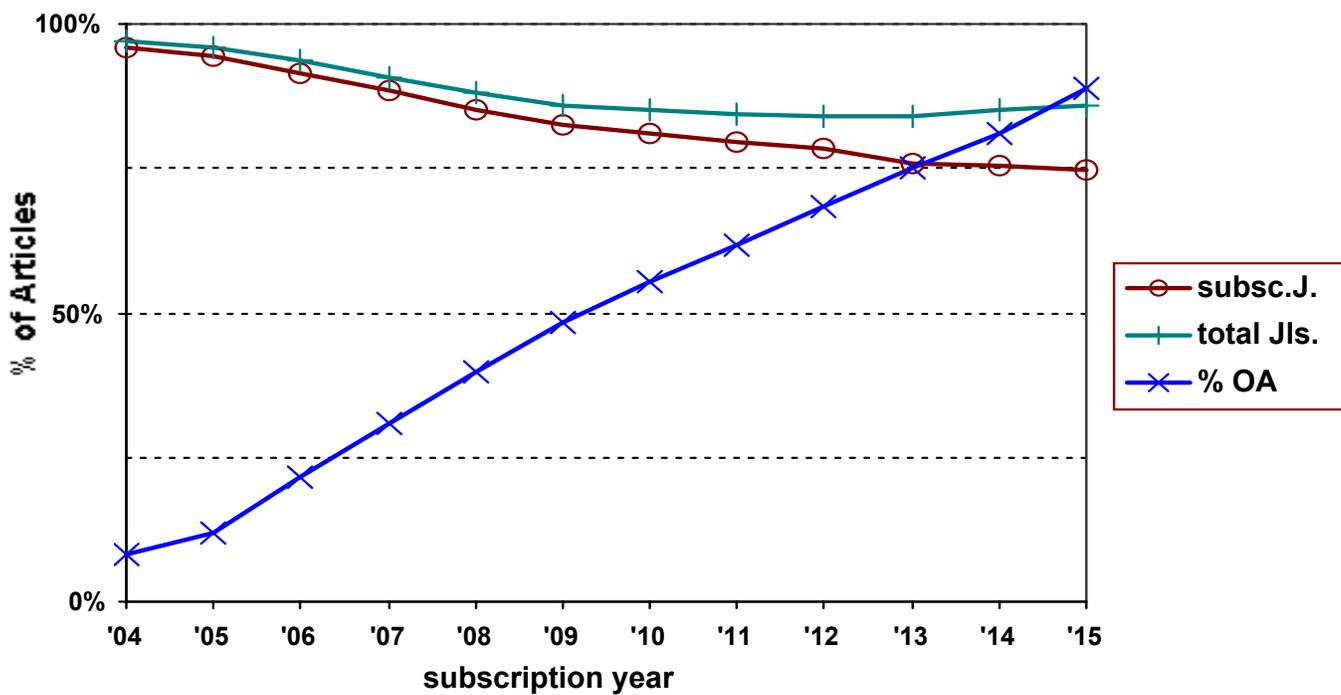


Fig. 6b. OA Measures Not Enacted .

The OA legislation may fail in both the US and the UK. Possibly it may be re-introduced and succeed in following years, after which the developments should be similar to those shown above. (We need not consider the case of success in one country only: competitive pressures to retain the best authors will cause rapid spread to the other.) This case, however, considers the possibility that both mandates will never pass. and that there will be little pressure from other countries. All of the factors that encourage authors to provide OA will still be present; all the factors causing users to want OA will be present; all of the factors increasing journal prices so that libraries cannot provide access without OA will be present. All of the factors inducing publishers to experiment with limited forms of OA will also be present: the need to attract authors and readers. Assuming a gradual growth of "Green" OA, of OA Journals, and of Article Databases, and a continuing trend for authors to publish only via repositories, the conclusion is that OA will be delayed, but will come, at least for most scientific fields. The extent of the delay allows only guesses at the preferred forms of publication, and thus only one representative case with moderate increase in all four is presented. A time for reaching OA for the majority of items is visible in the figure, but will depend strongly upon author choices. The time for almost-complete OA, totally dependant upon author choices is subject to so many possible factors as to require extrapolation beyond even the bounds of this paper.

Conclusions

When will we achieve OA? The existence of special publication circumstances may prevent a literal 100% OA, so three dates are shown: the year for the 50% point, (the time when half the articles become OA), the year for 90%, and the year for 95%. It must be emphasized that the estimates are imprecise to the level of plus or minus a year at least; they are based on the previous graphs. .

	50%	90%	95%
1 Mandated OA, Journals Continue	2007-8	2010	2015
2. Mandated OA, Journals Fail	2007	2009-10	2012
3. OA Journals	2007	2010	2012
4. Article Databases	2007	2010	2012
5. Full OA	2005-6	2008-9	2011
6. Mandates Fail	2009-10	2015?	>2015

Table 1: Time when OA is achieved

The table indicates that the mandates, if adopted, will bring about 50% OA in 2007-8, 90% in 2010, and 95% in 2015. These dates are independent of what course is followed after the adoption of the requirement for OA. The system may be satisfactory or unsatisfactory in other respects, but OA to scientific research articles will be present. If the publishers should preempt the legislation by being even more generous than it requires, they will advance the date by one year for 50% and for 90%, by four years for 95%. The motivation for them to do so is to retain enough control over the succeeding events and preserve journal publishing as a system. It will not surprise avid proponents of OA to find that it will be achieved even without government action. The 50% point will be delayed perhaps two years, the 90% and 95% points cannot really be predicted, but OA will be achieved. The transmission of scientific information requires producers and users. It also requires some form of intermediary, but not necessarily the present ones, and some form of system, but not necessarily like the present. If publishers permit critical developments to fall out of their control, they themselves may fall out of the system.

References

(all web sources accessed during October 1 - October 10, 2004)

- (1) The best single source is the archives of *liblicense-l*, www.library.yale.edu/~llicense/ListArchives
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- (3) For details see the *SPARC Open Access Newsletter* <http://www.earlham.edu/~peters/fos>
- (4) <http://www.soros.org/openaccess/>
- (5) See *PLoS* as described in <http://www.plos.org>, as compared to *Scielo*, www.scielo.br/scielo.php/
- (6) They were first advocated as a government requirement by Harold Varmus, as described in Kling, R. et al. 'The Real Stakes of Virtual Publishing: The Transformation of e-Biomed into PubMed Central,' *Journal of the American Society for Information Science and Technology* 55, no.2 (2004):127-148
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- (8) Baldwin, Christine. 'What Do Societies Do with Their Publishing Surpluses?' <http://www.alpsp.org.uk/news/NFPsurvey-summaryofresults.pdf>
- (9) Quinn, Barbara. 'Future of the NIH Open Access Policy' *Information Today* 21(9) Oct. 2004 <http://www.infotoday.com./it/oct04/quint.shtml>
- (10) Discussed in the Soros Foundation guides at <http://www.soros.org/openaccess/oajguides/>
- (11) See many of the opinions in the articles in the *Nature Web Focus* 'Access to the literature: the debate continues...' <http://www.nature.com/nature/focus/accessdebate/>
- (12) That this decrease in prices is possible is shown by the 1 to 3 percent price decrease announced by the American Physical Society, and their anticipation that such decrease will continue, as stated in <https://librarians.aps.org/2005pricing.htm>