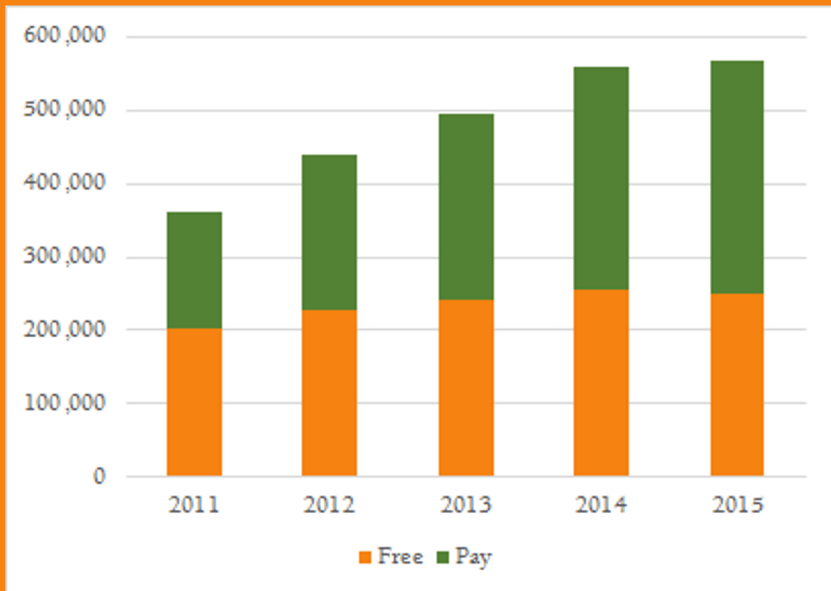


Gold Open Access Journals 2011-2015



Walt Crawford

GOLD OPEN ACCESS JOURNALS 2011-2015

Walt Crawford

Cites & Insights Books
Livermore, California, 2016

Gold Open Access Journals 2011-2015

Corrected growth and shrinkage tables

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This book was prepared entirely in Word 2013, using the licensed typefaces Berkeley Book and Berkeley (bold) for text and Calibri for headings and subheadings. Excel 2013 was used for data gathering and to prepare tables and graphs. The template is a customized version of bk6pv.dotx (modified for different typefaces and slightly different heading practices), a template developed by the author, modified and improved with the cooperation Information Today, Inc. and freely available at waltcrawford.name/bk6pv.dotx. (The template named uses Palatino Linotype for body text and Verdana for headings.) For more about the template and using no-cost methods to produce professional-quality books, read *The Librarian's Guide to Micropublishing*.

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Thanks to Patrick Hogan for publishing *Open-Access Journals: Idealism and Opportunism*, the August/September 2015 *Library Technology Reports* covering some two-thirds of DOAJ journals from 2011 through June 2014, which served as a precursor to this project.

Thanks to the good people at DOAJ for answering questions and improving the directory—and to Heather Morrison for pointing me to a way to get DOAJ metadata into Excel in full Unicode form.

Thanks to Linda Driver for tolerating and even encouraging my ongoing obsession with getting the facts right about real-world open access.

Thanks to loads of LSW folks—John Dupuis, Dorothea Salo, Barbara Fister and many others—for encouraging this work, and to a fair number of people involved with OA who have helped along the way.

The work is my responsibility, as are errors that may have crept in. (See Appendix A for notes on why attempts to replicate this will probably yield different results.)

Links

The data used for this report will be made freely available in some number of ways, always with a Creative Commons BY (attribution) license: you can do what you want with it as long as you properly credit the source. So, too, the PDF version of this book and of planned supplemental books will be issued with CC BY licenses.

In all cases, the links will be found at <http://waltcrawford.name/goaj.html>.

Availability will also be announced on [Walt at Random](#), on my Twitter, Facebook, Google+ and Mokum accounts (I'm waltcrawford pretty much everywhere), and sooner or later in [Cites & Insights](#).

1. The Big Picture

How many open access (OA) articles are published each year? How many open access (OA) journals publish how many OA articles? What proportion of those journals and articles involve fees (usually called Article Processing Charges or APCs)? How much did each article cost?

I can provide answers to those questions for what I'll call serious gold OA, but those answers may be more misleading than informative. For what it's worth, here are my raw answers:

- 566,922 articles in 2015, up from 560,036 in 2014, 493,475 in 2013, 438,644 in 2012 and 360,349 in 2011.
- 10,324 journals, for an average of 55 articles per journal in 2015.
- 71% of those journals do not charge APCs or other fees—and those free-to-submit journals published 44% of the articles in 2015, down from 46% in 2014.
- The average cost in 2015 was no more than \$665, and probably less.

But those numbers are all far too simple, because they treat all of serious gold OA as one fairly homogeneous field, and that's simply not the case. (For that matter, as I discuss a bit later, the very first number is probably low by 5,000 to 15,000 or more.) This book (and two supplemental books) explores the field in some depth, offering a range of ways of looking at gold OA and how it's doing.

The Serious Gold OA Universe

This report is based on an exhaustive study of Gold OA journals as represented by the *Directory of Open Access Journals* (DOAJ) as of December

2 Gold Open Access Journals 2011-2015

31, 2015. I visited (or tried to visit) each journal's home page and answer these questions:

- Does the journal exist?
- Does it charge APCs (or did it in 2015) and, if so, what are they?
- How many articles and reviews did it publish in 2011, 2012, 2013, 2014 and 2015?
- Are there problems that argue against including the journal or require special treatment?

My hope is that this report will help answer some or all of the following questions:

- Is gold OA a significant portion of scholarly publishing—and, if so, how big is it and how fast is it growing?
- How do major subject areas differ in terms of gold OA publishing?
- How much money might be involved in gold OA APCs?
- How many articles are published in a typical OA journal (or, realistically, in various sorts of OA journals)?
- How do OA journals and their policies differ by starting date?
- Are there useful things to say about claimed country of publication or about regional patterns?
- Are there useful distinctions based on type of publisher?
- Beyond major subject areas, do OA journals differ significantly by narrower subject categories?

Those were the questions going in—but some early analysis in an attempt to refine the regions issue uncovered another and possibly more fundamental division within serious gold OA:

- Are there important differences between gold OA as practiced by the largest publishers and all the rest?

Key Definitions

What do I mean by serious gold OA? Gold open access journals that are in the *Directory of Open Access Journals* (DOAJ) or at least were in it as of December 31, 2015, and that aren't excluded for a variety of reasons:

- APC-charging journals that don't clearly state the amount charged.

- Journals that couldn't be reached using the *DOAJ* URL in repeated tries, or that could be reached but couldn't be checked properly, or where the URL yielded a parking page.
- Journals flagged as malware (or as containing malware) by Malwarebytes, Windows Defender, McAfee Site Advisor or Office 2013.
- Journals that didn't appear to be open access journals publishing reviewed or refereed (either prepub or postpub) scholarly material.
- Journals designed such that it was impossible to count articles on a year-by-year basis.
- Journals with no articles during the five-year period.
- Six journals where it seemed too difficult to count articles for each year.
- One journal where I was unable to translate enough of the website to analyze the journal.

So-called “hybrid” journals are also excluded because *DOAJ* doesn't include them.

Gold Open Access

As a reminder, a gold OA journal is one that makes all peer-reviewed articles freely available for online reading as soon as they're published. This time around, I included 26 journals that appear to require free instant registration to read articles (but not to explore tables of contents); those journals published just over 2,000 articles in 2015, so excluding them would make almost no difference in overall numbers.

This report excludes “hybrid” OA. It also excludes green OA (articles available, frequently not in final published form, from an openly accessible repository) and so-called “delayed open access” (embargoed access).

Other Terms and Data Sources

Journal names, publisher names, starting year and country of publication all come directly from the *Directory of Open Access Journals* as of December 31, 2015.

Subjects were assigned based on *DOAJ* subject and keyword fields, and in some cases refined based on scanning article titles. Subject segments were assigned based on subjects.

Regions were assigned based on country of publication, except for the special “region” APCLand, assigned based on publisher characteristics (see Chapter 2).

Publisher categories were assigned based on publisher names and available online information.

APCs include any normally-mandatory submission or publishing fee (including required society membership), as it would be applied for a U.S. author in the most expensive author category, for a 10-page article in the most expensive article category, in U.S. dollars in early 2016.

Articles per year were determined by direct observation, using shortcuts where available (e.g., publication-year or volume searches for SciELO, J-Stage, MDPI and some others, and year or issue counts for Dove, Elsevier, many Iranian journals and others). When manually counted, these counts exclude editorials and other non-reviewed materials; when shortcuts were used, such items may be included.

Revenue is simply APC times the 2015 article count and is always the maximum potential revenue, ignoring waivers, discounts and lower charges for some article or review types. Actual revenues may well be at least 15% lower.

The Biggest Numbers

You’ve already seen the biggest numbers—566,922 articles in 10,324 journals in 2015, with 71% of the journals free, publishing 44% of the articles.

There are other article and journal counts, to be sure:

- Including 112 journals that I believed to have APCs but that didn’t make the amount clear would raise the total to 10,436 journals and 575,788 articles in 2015.
- Including excluded journals, in those cases where I was able to get article counts indirectly (either from *DOAJ* or because a journal changed status during the study) would bring the total to 10,944 journals with 579,933 articles in 2015.

- Including journals that were in DOAJ on June 15, 2015 but not on December 31, 2015 would bring the total to 11,445 journals and 599,554 articles in 2015. (There are 50-odd more journals with just enough articles to break the 600,000 mark, but I believe most or all of those are phantoms: cases where both the journal title and the journal URL changed between June 15, 2015 and December 31, 2015.)

Except for Chapter 3, this book is almost entirely about the biggest group, those coded A or B (discussed below). Table 1.1 shows the key figures for those journals, including the fact that some journals don't publish articles every year.

	Journals	Active 2015	Articles	Art/Jrnl
Free	7,350	6,749	250,954	37.2
Pay	2,974	2,782	315,968	113.6
Total	10,324	9,531	566,922	59.5
Free %	71.2%	70.8%	44.3%	

Table 1.1. Journals and articles, overall

Table 1.2 shows the article counts for each of the past five years and also shows codes for some special categories of journals within the overall serious OA universe.

Code	Count	2015	2014	2013	2012	2011
A	8,977	544,510	523,071	456,849	398,989	325,848
B3	126			1,806	2,358	2,063
B4	459		8,232	9,019	8,443	8,116
BC	285	323	2,036	3,455	4,809	4,525
BF	391	1,077	3,079	3,280	3,599	3,241
BR	60	18,952	21,800	17,133	18,126	14,137
BS	26	2,060	1,818	1,933	2,320	2,419
Total	10,324	566,922	560,036	493,475	438,644	360,349

Table 1.2. Articles per year and special codes

“A” is the catchall code for journals that didn't get any other code.

B codes are journals included in the analysis but with some special characteristics:

6 Gold Open Access Journals 2011-2015

- B3 journals are those with no articles since 2013, which usually suggests the journal's not very viable.
- B4 journals have articles in 2013 but not in 2015. Some of these may be failing; others are annuals with very long delays in posting articles online.
- BC journals either have no articles later than 2012—and can generally be assumed to be shut down—or have been explicitly canceled or merged.
- BF journals have from one to four articles in 2015 (the average is 2.75). These journals, as with B3, B4 and BC, may be subject to removal from *DOAJ* for lack of current content, although some niche journals (mostly in the humanities and social science) can be viable with fewer than five articles per year.
- BR journals are journals consisting entirely or primarily of reviewed conference papers. They were omitted from *The Gold OA Landscape 2011-2014*, as were journal issues consisting of conference papers. On further consideration, that omission made no sense.
- BS journals are those requiring sign-in (thus the S) or free instant registration to read articles, but not to browse contents. Technically, these journals aren't pure OA (and I don't understand what's gained by adding that speedbump to access), but I chose to include them. Note that it's a small group of journals with relatively few articles. (In the previous study there were 39 such journals; 19 of them either changed their policies, fell into some other code, or turned out not to *actually* require registration.)

If you're comparing these codes to the earlier grades and subgrades, the 1,294 journals with A subgrades last time are equivalent to the 1,261 journals with codes B3, B4, BC and BF this time around, with 339 AC (ceased) journals most closely matching 285 BC journals. (Why the drop? Some apparently-gone journals came back; others were removed from *DOAJ* because they'd ceased or gone inactive.)

Other A and B subgrades were removed as irrelevant.

Growth and Flattening

Those who read *The Gold OA Landscape 2011-2014* may be surprised by the apparent growth in 2014 and earlier counts. For 2014, I now show 560,036 total as compared to 482,361 last time around. How can that be?

- This study is a *lot* more complete, fully covering 10,324 “A” and “B” journals compared to 9,512 last time around.
- The newly-added journals (882 of them, most *not* starting in 2015 but newly added to DOAJ) published considerably more articles in 2014 than did those that disappeared (of which only 482 were fully analyzed)—about 8,000 more.
- This time around, I included journals publishing refereed conference papers and a few that require free registration to read articles (but not to see tables of contents: those are still excluded). I also counted issues of other journals that were devoted to conference papers (but not abstracts).
- I was more inclusive in counting, including reviewed/edited book reviews and shorter communications—which I always had done for publishers with article-count shortcuts such as MDPI, Dove, SciELO and many Iranian journals.
- There’s the “late posting” factor, which also relates to the apparent slight drop in free OAWorld article counts (see Chapter 2): quite a few smaller journals, especially HSS journals, are issue-oriented and can take many months after the cover date to post issues.
- Finally—and probably not least—I used a lot fewer approximations (I’d always estimated low when using approximations), with more fairly large journals being counted more precisely. In hundreds of cases I went back at least one year to provide better counts.

In all cases, I believe the new numbers—while still slightly incomplete—are more meaningful.

The Flattening

It would appear that there’s been a trivial 1.2% increase from 2014 to 2015—and, looking ahead to Chapter 2, OAWorld shows essentially no increase, and a slight *decrease* in no-fee articles. Is that real? Has OA growth bottomed out?

I don’t know, but I will note this. At the completion of the first pass of journal visits, which took place from January 2, 2016 to around March 22, 2016, I showed 546,272 articles from 2014. At the end of

the second pass—revisiting some 2,600 journals, including more than 1,000 where it looked as though there might be posting delays, between April 1 and April 21, 2016—I counted 560,036 articles from 2014. Some of that increase came from salvaging difficult-to-count journals, but some came from *very* delayed posting,

For 2015, the count went from 545,363 in the first pass to 566,922 in the second pass. If I was to revisit those journals in, say, October 2016, I would guess the count would go even higher, probably by anywhere from 5,000 to 15,000 articles but possibly by even more: quite possibly enough to show a (small) uptick in free OAWorld publishing, although I wouldn't bet on it.

Overall, there was growth from 2014 to 2015—but only about 6,900 articles or around 1.2%, as compared to 66,561 (or 13%) from 2013 to 2014; 54,831 (or 12.5%) from 2012 to 2013; and 78,295 (21.7%) from 2011 to 2012 (noting that 2011-2013 figures are likely to be somewhat less reliable than 2014-2015 numbers).

Has real growth dropped to somewhere between 1.2% and 4%? Quite possibly, and it's possible that biomed OA publishing has almost completely flattened out. That could be temporary or it could be a serious issue for future changes to scholarly publishing. I'm mostly just trying to describe what's actually happening as thoroughly as possible

Revenues and Costs

While later chapters go into more detail about the potential revenues from, and charges for, articles in APC-charging journals, here's a quick overview.

	2015	2014	2013	2012	2011
Rev.	\$376.733M	\$352.602M	\$275.329M	\$225.818M	\$174.261M
Pay art.	315,968	303,264	252,246	210,233	157,894
\$/art	\$1,192	\$1,163	\$1,092	\$1,074	\$1,104
Tot. art.	566,922	560,036	493,475	438,644	360,349
\$/art	\$665	\$630	\$558	\$515	\$484
Free%	44.3%	45.8%	48.9%	52.1%	56.2%

Table 1.3. Revenue* and cost per article by year

Table 1.3 shows overall revenue-related figures for each year in this report, but the asterisk in the table caption relates to several large caveats in this data:

- Revenue (Rev.) assumes no waivers, discounts or less-expensive categories—and for 2011-2014, it's the APC as of early 2016 and the fee status as of that date. It's stated in millions of dollars.
- Given that some journals (usually growing ones) migrate from free to pay status each year, with far fewer abandoning fees, it's likely that this table overstates not only the revenue but also the pay article counts and cost per article for earlier years.
- In other words: the shifts in percentages and cost per articles are probably *more* dramatic than Table 1.3 suggests.

Starting Dates

Many later chapters include graphs showing starting dates for currently-free and currently-pay journals, usually with starting years clustered into pre-1980, 1980-1989, and two-year groups from 1990-91 through 2014-2015, largely to provide good clarity in the graphs. (Most of these graphs also show free and pay journals as separate lines.) Figure 1.1 shows starting dates for all of the good journals; although only half the data points are labeled, there's a point for each year from 1996 on, for every two years 1990-95, for every three years 1981-89, for every five

years 1971-80, for every decade 1921-1970, and at the far left one group on or before 1900 and one 1901-1920.

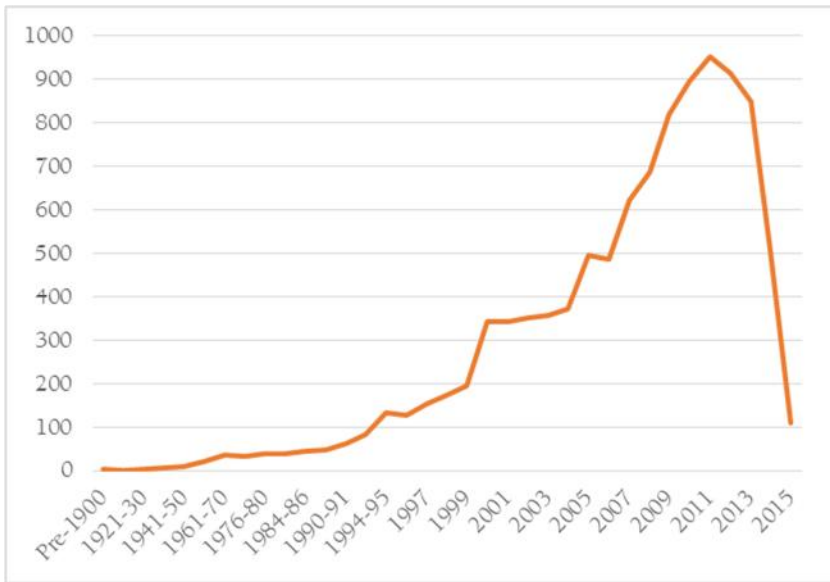


Figure 1.1. OA journals by starting year

Does Figure 1.1 mean that OA journal startups have collapsed entirely? Not really, although they have slowed somewhat from the peak years (820 to 953 journals in each year from 2009 through 2013, with 2011 the highest year) to 507 journals in 2014. The huge drop for 2015 is partly an artifact: most journals aren't submitted to *DOAJ* until they've published a few issues. So, for example, the previous study, based on a June 2015 download, only showed 254 journals starting in 2014: almost exactly half as many as this time around. It's likely that quite a few 2015 journals will show up later.

A quick textual summary of Figure 1.1: 28 currently-OA journals started through 1950; 126 began in 1951-1980; 414 started in 1981-1995. The pace picked up even before OA gained a name, with 904 new journals in 1996-2000 and another 692 in 2001-2002. Since then, most years show growth, with the rate accelerating in 2007: 731 journals in 2003-2004, 982 in 2005-2006—and 1,309 in 2007-2008, 1,717 in 2009-2010, and 1,867 in 2011-2012, the highest two-year period. 2013-2014 moderated to 1,355, a bit higher than 2007-2008.

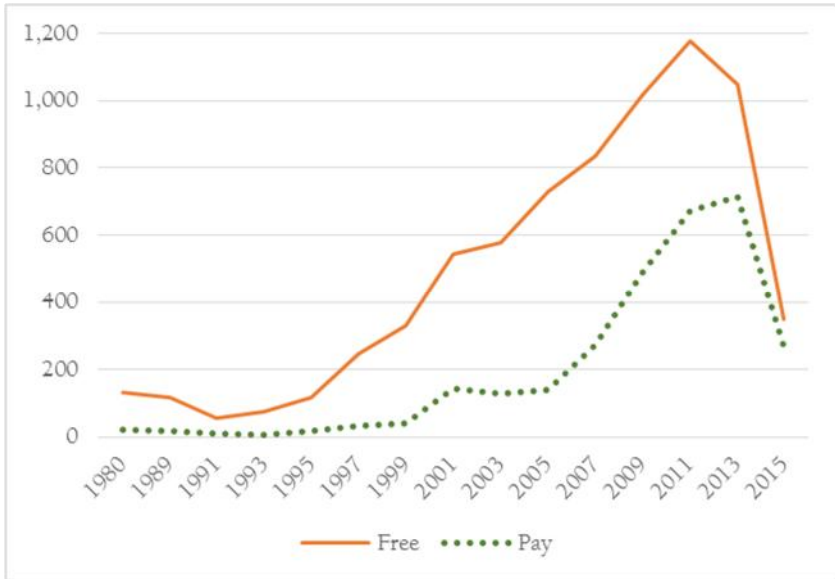


Figure 1.2. Free and pay journals by starting date, overall

Figure 1.2 shows starting dates divided into APC-charging and free journals and uses the template that will be used in the rest of the book. Note that the year in each case is the final year in a range of two years since 1990, longer before.

Article Volume per Year, Free and Pay

Figure 1.3 uses the template that will be used for graphic free-and-pay article comparisons throughout the book. It's in chronological order rather than the newest-first order of most tables, and it uses solid OA gold for no-fee articles and cross-hatched dollar green for articles in journals that currently charge fees. As elsewhere, this arrangement may slightly understate the free count in earlier years. The key fact is clear enough: while no-fee OA has grown somewhat over the past five years—increasing about 27% from 2011 to 2014, but with an apparent small decline in 2015—APC-based OA has *doubled* over those five years.

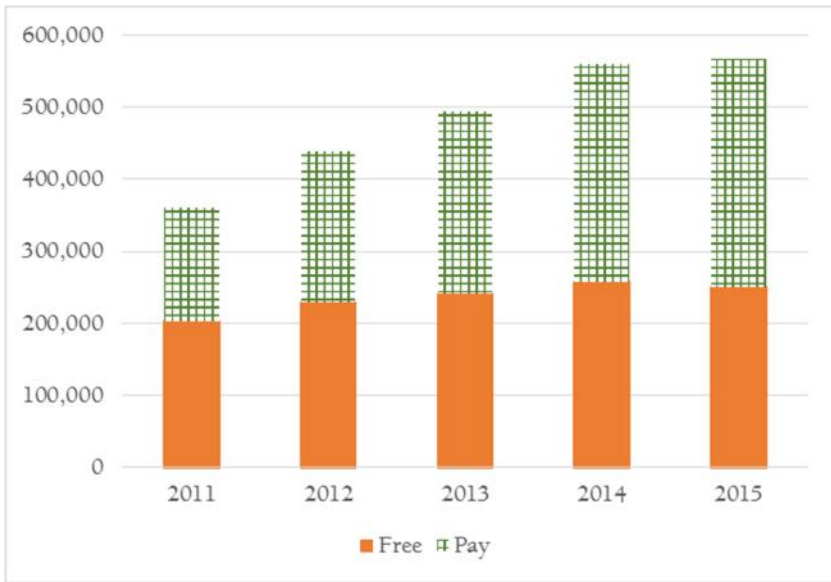


Figure 1.3. Free and pay articles by year, overall

Journal Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	1,582	15.3%	
Grew 25-49.9%	940	9.1%	24.4%
Grew 10-24.99%	965	9.3%	33.8%
Even, ±9.99%	2,234	21.6%	55.4%
Shrank 10-24.99%	1,228	11.9%	67.3%
Shrank 25-49.99%	1,365	13.2%	80.5%
Shrank 50%+	1,610	15.6%	96.1%
No 2014 count	400	3.9%	

Table 1.4. Growth and shrinkage, overall

Table 1.4 shows how journals grew and shrank in number of articles from 2014 to 2015. Extreme changes are about the same in either direction, but more journals shrank moderately than grew moderately—

and most journals either grew or at least didn't shrink significantly. (Table 1.4 does include *PLOS One*, which is in the "even" group).

The Rest of the Book

The rest of this book offers a variety of ways to look at the current state of serious gold OA, beginning with the semi-accidental discovery that may very well offer the most interesting split in the field, especially as groups consider long-term costs and viability. In general, my purpose here is to describe, not prescribe (prescriptive codes for journal quality have been removed except for hidden/absent APCs, although the more serious of such codes were down to only half a dozen journals in any case), but Chapter 2 does include some mild, possibly naïve argumentation.

Chapter 2 discusses APCLand and OAWorld, the fundamental split between eleven publishers who put out lots of journals and have APCs for most of them—and everybody else. It also introduces subject segments.

Chapter 3 covers exclusions in some detail: the journals *not* analyzed in the rest of the book and, briefly, those that disappeared since the previous study.

Chapter 4 introduces the three broad subject segments and looks at journals by article volume.

Chapter 5 looks at journals and articles by APC and revenue.

Chapter 6 looks at journals and articles by type of publisher.

Chapter 7 looks at journals by country of publication (excluding journals in APCLand).

Chapters 9-11 look at journals and articles within each subject segment (Ch. 9-11), with a brief introduction in Chapter 8. A later supplement will expand this to cover each subject.

Chapters 12-19 look at journals and articles by geographic region (Ch. 12) and within each region (Ch. 13-19). A later supplement will expand this to cover each country (with more than a handful of journals) in more detail.

Chapter 20 looks at viability based on existing data.

Chapters 21 and 22 look at the results of DOAJ's enforcement of its criteria and requirement of reapplication, with around 3,000 journals removed in May 2016. How does that mass removal affect the near-term picture for serious gold OA?

Appendix A discusses the survey itself, some of the caveats, and some of the changes since the previous study.

Data

The master spreadsheet for this project, including publishers and journal titles but omitting some calculated figures (e.g., revenue) to save space, will be freely available with a CC BY license. For links to the data (and links to the supplements), go to waltcrawford.name/goaj.html.

2. APCLand and OAWorld

I now believe the most profound division in serious gold OA publishing is not among the three broad segments or even between APC-charging and free journals. Rather, it's between what I'm calling APCLand and OAWorld.¹

APCLand

APCLand consists of eleven publishers, each with more than 5,000 OA articles in 2015, each with a maximum potential 2015 APC revenue of more than \$8 million (the actual revenue may be lower), and each with at least two-thirds of its 2015 articles in OA journals appearing in APC-charging journals,

APCLand accounts for 14% of the fully-analyzed *DOAJ* journals with articles in 2015 and 29% of the 2015 articles in those journals. It also accounts for **74%** of the maximum potential APC revenues.

In other words, although APCLand accounts for one-seventh of the serious gold OA journals and somewhere between one-quarter and one-third of the articles, it takes in nearly **three-quarters** of the revenue.

APCLand includes the following publishers, listed alphabetically and using the publisher names used in *DOAJ* listings: BioMed Central, Dove Medical Press, Elsevier, Frontiers Media S.A., Hindawi Publishing Corporation, MDPI AG, Nature Publishing Group, Oxford University Press, Public Library of Science (PLOS), Springer and Wiley.

¹ Much of this chapter first appeared in somewhat different form in the May 2016 *Cites & Insights*, volume 16 issue 4.

For 2015, APCLand showed 1,302 active gold OA journals (that could be fully analyzed) publishing 163,615 articles, with a total maximum potential APC revenue of \$279,558,871.

Overall, 11% of the journals did not have APCs when checked in early 2016 (including journals funded through SCOAP³), but those journals published only 4% of the articles in APCLand. Average cost per article (assuming no waivers, discounts or less-expensive article categories) was \$1,782; including the no-fee journals brings that down to \$1,709. The average fee-charging journal published 126 articles (an absurd average given *PLOS One*) and the average free journal published 45 articles, for an overall average of 118 articles per journal.

Here's another interesting but largely meaningless figure (given *PLOS One*): the average APC-charging journal could have taken in just over \$225 thousand in 2015.

OAWorld

OAWorld includes thousands of publishers (there are more than 5,400 names in a list of unique *DOAJ* publisher fields, but it's clear that hundreds and possibly more than a thousand of them represent spelling or other minor variations). These publishers accounted for 86% of the active journals and 71% of the articles, but only 26% of the revenues.

OAWorld accounts for 8,229 fully-analyzed active journals in 2015 with 403,307 articles, with a maximum potential revenue of \$97,173,704.

Here's perhaps the key point: in OAWorld, not only do 81% of the journals *not* charge APCs or equivalent fees, those journals account for 61% of the articles. In other words, in OAWorld *most articles did not involve author-side charges*.

Another key figure: for those articles that *did* involve fees, the average cost per article was \$611 (six hundred and eleven dollars: I didn't leave out "1," after the dollar sign), just over one-third the average fee in APCLand. Averaged across *all* articles, the cost per article was \$241—*one-seventh* the going rate for APCLand.

Most gold OA articles are published in OAWorld, but most of the gold goes to APCLand.

Just as free journals tend to publish fewer articles than APC-charging journals, so OAWorld journals publish fewer articles than APCLand journals: an average of 92 articles for fee-charging journals, 34 for free

journal and 45 overall. The average fee-charging OAWorld journal could have taken in just over \$56 thousand.

Discovering APCLand

I'd love to tell you that I discovered APCLand through deeply expert analysis and synthesis of the big spreadsheet. In fact, it's sort of an accident that grew out of the desire to look at OA activity on a regional basis—that is, the idea that OA pricing and other characteristics differ regionally on more than a global-south-versus-north basis (see Chapters 12-19).

As I was gathering a list of countries represented in the fully-analyzed data (124 of them in all), since I'd made the list using a pivot table that also showed journal count and 2015 article count for each country, I was reminded that big publishers, primarily producing international journals, will bias the data for some countries and regions. Discussing this with Raym Crow at SPARC, we agreed that it might make sense to filter out the biggest publishers. In attempting to do that, I found that there was a sharp correlation between size in terms of article volume and “APCness” (tendency to charge APCs and to set them fairly high).

Effects on Country Ranking

Filtering out APCLand journals, the two countries with the most OA journals continue to be Brazil and the United States...but within the top 15 there are some significant changes. The United Kingdom drops from third place to ninth; Egypt drops from fifth to sixtieth; Germany drops from seventh to thirteenth; and Switzerland drops from fifteenth to forty-first. Regions will be affected similarly, more so in Western Europe and the Middle East, less in other regions.

I *believe* the filtered regions are more indicative of general OA in regions (for example, roughly 80% of remaining Middle East OA articles in 2015 didn't involve APCs), and will discuss regions and countries within OAWorld.

Year-by-Year Comparison

Table 2.1 shows for each year the journals actually publishing articles, the number of articles, growth since 2011 (*not* year-to-year growth except in 2012) and average articles per journal,

	2015	2014	2013	2012	2011
APCLand/jrnls	1,302	1,346	1,165	931	803
Growth	62%	68%	45%	16%	
Articles	163,615	157,413	125,588	101,049	71,572
Growth	129%	120%	75%	41%	
Art/J	126	117	108	109	89
OAWorld/jrnls	8,229	8,578	8,403	7,882	7,077
Growth	16%	21%	19%	11%	
Articles	403,307	402,623	367,887	337,595	288,777
Growth	40%	39%	27%	17%	
Art/J	49	47	44	43	41

Table 2.1. Journals and articles by year, APCLand and OAWorld

For journals, percentage growth is much higher in APCLand than in OAWorld—although actual numbers favor OAWorld. Similarly, APCLand more than doubled article production in five years as compared to a modest 40% growth for OAWorld. It's interesting that average articles per journal is growing in both cases, but it's more than twice as high and growing much faster in APCLand.

Segment by Segment

As dramatic as the overall differences between APCLand and OAWorld are, the differences within subject segments are even more dramatic.

Biomed

APCLand is, as you'd expect, a big player here, with 29% of the journals and 39% of the articles. Only 5% of the APCLand biomed journals are free and those journals account for only 2% of the 2015 articles. Average

cost per article among APC-charging journals in 2015 was \$2,035, coming down to \$1,997 overall. APCLand published 80,706 biomed articles in 2015.

In OAWorld, where 126,356 biomed articles appeared in 2015, 68% of the biomed journals were free and those journals published 54% of the articles: even in the most APC-hungry subject segment, a majority of articles did *not* involve payment. Average cost per article among APC-charging journals was \$854; the overall average was \$396.

Science, Technology, Engineering and Mathematics (STEM)

STEM is the largest segment overall, but not for APCLand, and APCLand only accounts for 16% of the journals, although those journals published 33% of the STEM OA articles in 2015. There's still not a lot of free activity in APCLand: 15% of the journals, publishing 6% of the 2015 articles. Average cost per article among APC-charging journals was \$1,518; including free journals brings that down to \$1,432, APCLand published 78,872 STEM articles in 2015—just slightly fewer than for biomed (but in a *lot* fewer journals).

STEM is the largest segment for OAWorld, with 158,916 articles in 2015; 71% of the journals didn't charge APCs, and those journals account for 51% of the articles. Average cost per article among APC-charging journals was \$540; for all journals it was \$263. (While APCLand has only 57% as many STEM journals as biomed journals, OAWorld has 23% more STEM journals than biomed.)

Humanities and Social Sciences (HSS)

APCLand is almost wholly uninterested in the humanities and social sciences: it accounts for only 2% of the journals and 3% of the articles. Although half of those journals don't charge APCs, only 20% of the 4,037 articles in 2015 appeared in free journals. Average cost per article among APC-charging journals was \$1,657; including non-APC journals, the cost per article comes down to \$1,333—not a lot less than for STEM.

OAWorld published 118,035 HSS articles in 2015—the smallest segment but not by much. Very little of that involved APCs: 91% of the journals, publishing 80% of the articles, didn't charge them. Among the journals that did charge, average cost per article was \$231—but the overall average was \$45.

There are considerably more HSS journals than either biomed or STEM: 4,463 in all compared to 2,876 and 2,985 respectively. OAWorld accounts for 4,393 of those 4,463 journals.

The Brembs Dystopia

Björn Brembs set forth a dystopian scenario in an April 7, 2016 post: [“How gold open access may make things worse.”](#) It’s a cautionary tale that suggests, *correctly I believe*, that if all scholarly article publishing “flipped” to a gold OA model, but one in which existing commercial publishers (and especially ones with “aggressive” pricing models) dominated the market and were free to raise APC charges as they saw fit, the result could be spending *even more* money than is now spent on subscriptions and APCs.

He’s right. If we assume (for the sake of the discussion) 2.6 million articles per year and that publishers migrate to \$5,000 APCs, that totals out to \$13 billion, more than the \$10 to \$12 billion currently being spent. (How many articles actually are published each year? I’ve seen estimates from 1.5 million to 2.5 million to “who knows?”)

But that assumes that funding agencies say “Charge whatever you think is appropriate and we’ll pay it” with no controls or counterbalancing efforts. If that happens, we could indeed be worse off.

Let’s see what happens if there *are* some limits, pressure points and countervailing forces. (What if funding sources asked for a clear explanation as to why publishing costs should be higher than, say, \$396—or, for that matter, why biomed articles are more than 50% more expensive to publish than STEM articles, which in turn are at least *four times* as expensive to publish as HSS articles?)

- In the worst case of limiting fees to the average of APCs and charges, 2.6 million times \$1,300 would be \$3.38 billion: a lot, but still a considerable savings.
- If we assume that publishers should be as efficient as those of OAWorld (and remember that *nearly all* gold OA journals in the pricey United States—952 out of 990—are in OAWorld)—we get either \$611 (APCs for everything!) or \$241, or at worst \$854 (paid biomed). That’s \$626 million to \$2.22 billion, with \$1.59 billion as a middle ground.

Yes, it could be worse—but only if there are no limits or pressures. Heck, even paying the average of the *most expensive* APCLand publisher, \$2,294, would “only” cost \$5.96 billion.

I’m neither a Proper Scientist nor a policy-maker, but I see better paths here than Brems’ ruinous possibility, as long as there’s no non-sense about assuring that all “stakeholders” are fully protected, a view of stakeholders that seems to omit the public.

A Graphic View of Free and Pay

Figures 2.1 and 2.2, using the same colors and patterns (but different vertical scales), show the difference between APCLand and OAWorld on a year-by-year basis.

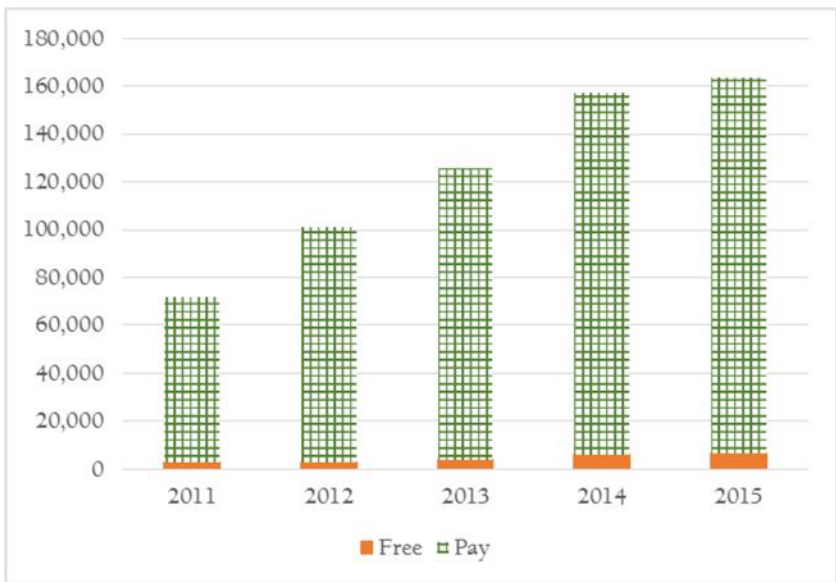


Figure 2.1. APCLand articles

The solid-gold Free area grows over the years, but is dominated by the more rapidly growing crosshatched dollar-green area. Overall growth is rapid, as in Table 2.1.



Figure 2.2. OAWorld articles

In Figure 2.2, overall growth is slower, and while the free segment is always larger, growth is faster in the pay segment.

Starting Dates

Patterns of journal starting dates also differ fairly radically between APCLand and OAWorld, especially taking into account pay status. Figures 2.3 and 2.4 show those patterns. Note that the years here are end dates—thus, 1980 includes all years through 1980.

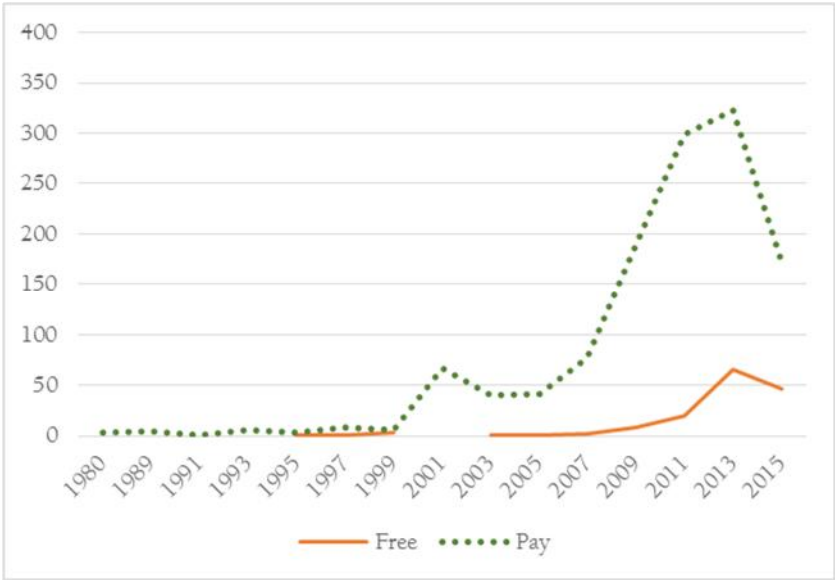


Figure 2.3. APCLand starting dates

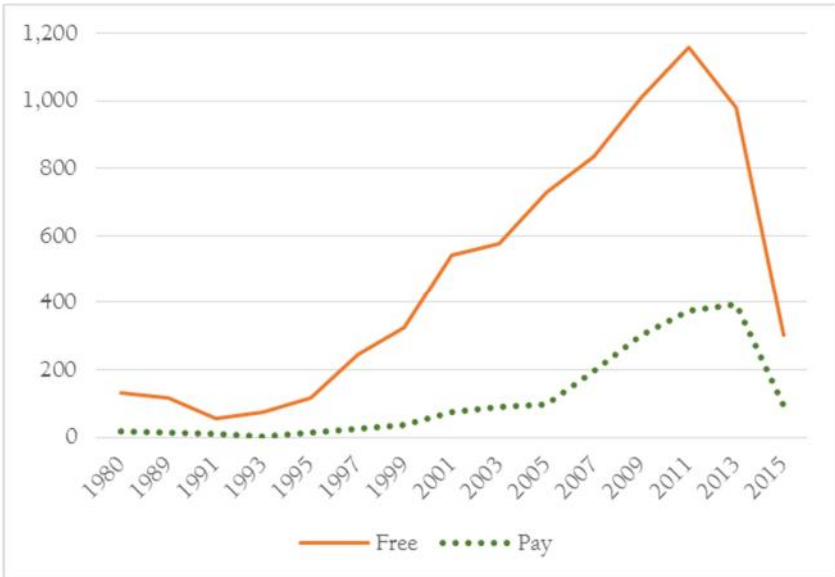


Figure 2.4. OAWorld starting dates

I'm not sure these figures require much commentary. It's clear that APCLand has been adding more journals (almost all with fees) most rapidly since 2008, and even more so since 2010, while the substantial growth in OAWorld journals began around the turn of the century. APCLand had 268 surviving journals before 2008, with 1,124 added since then—more than four times as many. OAWorld had 4,320 surviving journals before 2008, with 4,612 added since then, only 7% more.

Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	233	16.7%	
Grew 25-49.9%	107	7.7%	24.4%
Grew 10-24.99%	113	8.1%	32.5%
Even, ±9.99%	222	15.9%	48.5%
Shrank 10-24.99%	143	10.3%	58.8%
Shrank 25-49.99%	189	13.6%	72.3%
Shrank 50%+	339	24.4%	96.7%
No 2014 count	46	3.3%	

Table 2.2. Growth and shrinkage, APCLand

Change 2014-15	Count	Percent	Cum%
Grew 50%+	1,349	15.1%	
Grew 25-49.9%	833	9.3%	24.4%
Grew 10-24.99%	852	9.5%	34.0%
Even, ±9.99%	2,012	22.5%	56.5%
Shrank 10-24.99%	1,085	12.1%	68.6%
Shrank 25-49.99%	1,176	13.2%	81.8%
Shrank 50%+	1,271	14.2%	96.0%
No 2014 count	354	4.0%	

Table 2.3. Growth and shrinkage, OAWorld

In some ways what's most interesting about Tables 2.2 and 2.3 is the only real difference: most APCLand journals shrank; most OAWorld journals grew or stayed about the same.

What Does It Mean?

I believe looking at APCLand and OAWorld as fundamentally different parts of open access may be helpful in seeing what the future might bring. Beyond that, it's up to readers and those in a position to use this information.

The distinction between APCLand and OAWorld comes into play when we try to define appropriate brackets for journal article volume and for APC amounts. We'll consider that further in Chapters 4 and 5 respectively.

3. Exclusions and Special Cases

You might think of this chapter as one giant footnote to the rest of the book—and you could even skip over it. It's important for several reasons: to provide transparency on research techniques, to spell out clearly what journals are excluded from this report and why, and—for those who've read the 2011-2014 report in some form—to note what's happened to a few hundred journals no longer in *DOAJ*. (Appendix A discusses methodology and changes from the previous report; Chapters 21 and 22 consider a much larger set of journals, those that were in *DOAJ* on December 31, 2015 but either failed to reapply for listing or didn't meet *DOAJ*'s tougher criteria, and so were removed in May 2016.)

The Basics

I visited each journal's website *at least* once and sometimes up to three times while preparing this survey. The first set of visits took place between January 2, 2016 and March 20, 2016. I marked journals that were flagged as exclusions and journals that might not yet have their final 2015 issues posted for revisits; that yielded around 2,600 journals to be revisited. I revisited those journals in April 2016.

Some notes on what visits did and did *not* entail:

- If the Excel-to-default-browser path (Chrome for this project for its translation tools) didn't bring up the site, I copied-and-pasted the URL directly into a new Chrome tab. (At least a dozen journal sites yield errors through the hyperlink route but will open directly.) All sites that didn't work the first time were retried in April 2016.
- I assumed that journals should be professional enough either to report an accurate URL to the *Directory of Open Access Journals* or, if it

became necessary to change that URL, to provide a redirect. Failing to do so implies incompetence to publish an online journal. Redirects are easy; it's just not reasonable to leave readers hanging. I did not search using journal title words.

- The best journal sites have clear statements of APCs or author charges or fees, with a label implying one of those things, either directly on the home page, on the OJS “About” page for journals using Open Journal System software, or in an “About This Journal” or Author Guidelines page. If I was unable to find a clearly-stated fee or an assurance that there was no such fee (a number of OJS-based journals use the *Fee* link, which I suspect is part of the basic template, to state clearly that there are no fees), I proceeded as follows:
 1. If the journal had text indicating that the author or institution might be expected to pay a fee, I coded the journal as CA with “ANS” (Amount Not Stated) as a note.
 2. Otherwise, if the journal was published by a university or association/society, or if it had a clear statement of sponsorship, I assumed that the journal was free.
 3. Otherwise—published by a commercial publisher and without either a statement on fees or an explicit statement of sponsorship—I assumed a hidden fee, coded the journal as CA and added “NI” (No Information) as a note. All CA journals were revisited in April 2016 to search again for information.
- At all times, I used Malwarebytes Pro, Windows Defender, and McAfee SiteAdvisor. On an earlier investigation, one “journal” managed to hit me with a difficult-to-fix piece of malware and at least four others attempted to do so; this time, I wasn't taking any chances. Nor should readers or authors.
- I used Chrome “translate this page” and, in a few obstinate cases, copied-and-pasted text into a Google Translate window. This was overwhelmingly successful; as you'll see later, the number of journals excluded because I couldn't read the site came down from an already-low 20 in 2014 (out of more than 2,000 non-English sites) to a wholly irrelevant *one*.
- I spent even more time trying to count articles in journals I'd previously flagged as opaque or uncountable, bringing the 2014 figure

of 149 opaque journals down to 21: 15 that I believe *can't* be broken down by articles per year and another six that were so cumbersome or difficult that I gave up.

Codes CA and X through XX

Those who saw the 2014 study will note that most C “subgrades” are gone. While that’s partly a deliberate decision not to bring subjective judgment into this report, the fact is that the total count of red-flagged journals *other than those with hidden or missing APCs* was already down to nine: other journals either cleaned up their acts or disappeared.

Code	Journals
CA: APC missing or hidden	112
XE: Empty from 2011 through 2015	40
XI: Impossible to count articles by year	15
XM: Malware encountered	103
XN: Not open access	55
XO: Opaque, too cumbersome to count	6
XP: Parking or ad page	44
XT: Translation inadequate	1
XU: Unworkable site	37
XV: Merged with no way to count	11
XX: Unreachable on repeated efforts	196
Total excluded	620

Table 3.1. Excluded journals

Just as quick comparisons (and noting that this study covers a broader universe), CA is down from 154; XE is up from 20; XI and XO combined are down from 149; XM is up from 65; XN is down from 177; XP is up from 30; XT is down from 30; XU is down from 95; XV is down from 26; and XX is nearly unchanged from 195.

If you’re an optimist, the changes in XN and XU are signs of improvement; if you’re a pessimist, the most worrisome change is the increase in sites with malware—especially since there also appear to be dozens

of Open Journal System sites with rows of tiny-type hotlinked keywords in prime territory on the index screens, where the hotlink appears likely to be malware and is certainly a sign of poor site maintenance.

While many excluded journals couldn't be counted, some could—either indirectly through *DOAJ* or because they were formerly accessible. Table 2.2 shows what I was able to gather as article counts; while the numbers are certainly incomplete, they may be interesting.

Code	2015	2014	2013	2012	2011
CA	8,866	10,170	10,896	10,539	8,816
XE					
XI	95	10	20	33	38
XM	2,054	3,801	3,879	3,661	2,591
XN	200	399	284	182	341
XO		20			
XP	654	861	1,783	723	494
XT					
XU	155	881	880	1,105	697
XV		45	184	157	35
XX	827	4,337	4,641	3,977	3,385
Total	12,851	20,524	22,567	20,377	16,397

Table 2.2. Partial article counts for excluded journals

The following sections offer additional notes on excluded journals.

CA: APC missing or hidden

Slightly more than half of these journals explicitly say that they have charges but don't say what they are. The rest don't provide any information but I believe that they have charges. One of them just hasn't filled in the information yet. That's also the only journal that's in APCLand; the rest are in OAWorld.

These journals come from 23 different countries but there only significant groups in a few countries. Specifically, 49 of them appear to be published in India; 23 are from Pakistan; six are from the United States; five are from Nigeria; four are from United Kingdom; and three are from

Ukraine. Looking at subjects, 42 of these are in biomed, 53 are in STEM fields and 17 are in the humanities and social sciences.

Finally a few of them published quite a few articles, with five publishing more than 500 articles each in 2015 and another six publishing at least 200 articles in 2015. In every case, there doesn't seem to be any real excuse for failing to state a charge: even if journals wish to vary charges they should at least state the maximum charge per article or per page.

XE: Empty from 2011 through 2015

The growth in this group may be slightly misleading. In fact, 26 of these 40 are specific journals that were merged into a more general journal and are counted as part of that journal. It may not surprise you that those 26 are all part of APCLand, although they don't show up in the overall counts. Otherwise, there a few that stopped publishing before 2011 or have been renamed.

XI: Impossible to count articles by year

Why impossible? For a variety of reasons. For five journals, there simply aren't any dates, either on tables of contents or the articles themselves. In one of them the only thing you can get are whole-issue PDFs with no tables of contents (that I could find) and no dates. One journal consists of several ongoing themes, each of which has multiple undated articles. In some cases I either couldn't find the archive or the archive didn't show dates—and in one journal's case all issues carry the same date.

Perhaps not surprisingly, all but three of these journals are in the humanities and social sciences.

XM: Malware encountered

It's sad that there are so many of these; there shouldn't be any. In all, 32 countries are represented, with the largest groups being 14 from India, nine from Germany, seven from Turkey, six each from China, the Russian Federation and the Ukraine, and five each from Romania and the United States. Looking at regions, 26 each come from Asia and Eastern Europe, 19 from Western Europe, 14 from Latin America, and 10 from the Middle East. Finally, 45 are in STEM fields, 38 are in the humanities and social sciences and 20 are in biomed.

XN: Not open access

This motley group includes all sorts of possibilities and some of these may be judgment calls. Looking at notes that cover more than one or two titles, I see three hybrid journals, 20 magazines (rather than scholarly journals) and two newsletters, four member-only publications, five that either explicitly don't review before or after publication or are otherwise not reviewed material, five that aren't OA at all, seven that require registration even to see article names—and some others, including one that's now essentially a single-author journal.²

XO: Opaque, too cumbersome to count

The big drop from the 2011-2014 set of “opaque” journals represents additional effort: I was willing to count articles in whole-issue PDFs and to open (in a couple of cases) fifty or more issues a year to count articles.

Half a dozen journals defeated my best intentions. One had layered archives that seemed implausible to navigate for five years' content; one had monthly PDFs but some of them were unreadable; one came as whole-issue monthly .docx files; one offered each issue as a zipped archive; one seemed to lack a browsable archive; and one—well, my note says “inscrutable.”

XP: Parking or ad page

Most of these represent sloppy support: failure to renew domains. Once in a while, these come back; as with all other X codes, I checked them twice and at least two or three weeks apart.

I found nine ad-filled pages, four blogs (one empty), a couple of odd pages and 29 parking pages—and one case where the underlying platform was decommissioned.

Perhaps surprisingly, the biggest country group is seven from the United States, followed by five from India, four each from Turkey and the United Kingdom, and three from Spain. Fourteen each are (or were) in biomed and HSS, with sixteen in STEM.

² For those who read *Cites & Insights*, note that it has never been submitted to *DOAJ* and never will be—it's single-author, not reviewed and mostly not research.

XT: Translation inadequate

One Italian journal consisting of whole-issue Italian PDFs.

XU: Unworkable site

What makes a site unworkable? I could reach something that appeared to be the journal's site, but couldn't get much further. Reasons included consistent 404 or HTML errors in the archives (or inability to get to the archives at all), database errors, wholly blank sites and PHP or SQL errors. One journal, supposedly started in 2008, had a site consisting entirely of the message "Hello world." The United States, Spain and Malaysia each had four journals with these problems; Colombia and Turkey each had three.

XV: Merged with no way to count

All of these are from the same APCLand publisher (but aren't counted as part of APCLand), merged later than 2010 (which is why they're not XE) but with no clear way to distinguish current articles from the merged count.

XX: Unreachable on repeated efforts

This is a frustrating group, as journals disappear and reappear even over a couple of weeks. More than 70 yielded 404 errors (with four 403/forbidden and a couple of 500s); 79 yielded DNS lookup or timeout errors; half a dozen showed maintenance messages; and there were also refused connections and cases where the URL went to a publishing platform and the desired journal couldn't be located in the menu. (Some of these could be coded as XU; the net effect is the same.)

Gray OA: Journals Removed from DOAJ in late 2015

I was unable to match 566 journals that had been in *DOAJ* on June 8, 2015 with those in *DOAJ* on December 31, 2015—matching first on

URL, then on journal title if no matching URL was found, finally by visual comparison if neither URL nor title matched.³

Inspecting *DOAJ*'s spreadsheet of added and removed titles, I found that 501 of the journals were explicitly removed. I am inclined to believe that most or all of the other 65 are artifacts: journals where both the journal title and the name changed in such a way that I couldn't match them.

DOAJ's reasons for removing the journals appear in Table 3.3.

Reason	Count
Suspected editorial misconduct by publisher	226
Inactive (has not published in the last calendar year)	146
Ceased publishing	37
Journal not adhering to Best practice	36
Web site URL no longer works	24
Journal is no longer open access	17
Website URL no longer works	12
Has not published enough articles this calendar year	2
Removed at publisher's request	1

Table 3.3. Reasons for removing journals from *DOAJ*.

I checked each of these journals in April 2016, adding counts and codes as appropriate—noting that I'm not looking at misconduct or best practices (I could not help but notice that almost all of those are from a handful of publishers I could call the “red group” based on their use of that color on home pages). I found 123 BC (canceled or with no articles later than 2012), 29 with no articles since 2013, 10 with none in 2015 and 11 with fewer than five in 2015. Additionally, six had APCs with no amounts, 20 were not OA by my standards, 45 were unavailable or parking pages, and there were various other problems. It would appear that *DOAJ* has been doing a good job.

Many of these 501 journals are still publishing articles, of course—they're in an area I'll call gray open access, an area that grew considerably in May 2016.

³ The URL and title matches used Excel's VLOOKUP function, which requires a more exact match than a visual comparison.

	2015	2014	2013	2012	2011
Jrnls/free	29	48	89	152	154
Articles/free	1,202	1,453	1,350	2,164	2,290
Jrnls/pay	230	245	256	264	248
Articles/pay	15,926	18,003	17,217	16,371	11,097
Tot. Journals	259	293	345	416	402
Tot. Articles	17,128	19,456	18,567	18,535	13,387
Free%/J	11%	16%	26%	37%	38%
Free%/A	7%	7%	7%	12%	17%

Table 3.4. Journals and articles in gray OA (before May 2016)

Table 3.4 shows the journals within the removed-from-DOAJ group that published articles each year from 2011 through 2015 and how many articles they published. These are almost entirely APC-charging journals, all the more so in recent years.

Fifty-nine countries are represented among the 501 journals in this gray group, but a few were stated as country of publication for the majority of them. Table 3.5 shows the 13 countries identified as publishing six or more of these now-gray journals; among them, they account for 83% of the journals.

Country	Journals
United States	223
Canada	65
India	28
United Kingdom	18
Iran, Islamic Republic of	15
Brazil	12
Italy	12
Australia	8
New Zealand	8
Romania	8
Spain	8
Pakistan	6
Turkey	6

Table 3.5. Country of publication for journals removed from *DOAJ*

4. Journals by Article Volume

Journals, no matter how they're funded, vary wildly in terms of number of articles per year. "Average articles per journal" is almost meaningless as an overall figure, becoming only slightly more meaningful as you narrow the frame of reference.

This chapter looks at journals by article volume, using either 2015 volume or the peak of the period 2011-2015. It should help to clarify what's out there and how pay-versus-free varies by article volume.

There are many ways of determining appropriate groups of journals by volume—it's not hard to come up with a baker's dozen. This chapter looks at some of them and defines the method used for the rest of the book and its supplements.

The Three Segments

First, it's time to introduce three broad subject segments, which will crop up in the next few chapters. While patterns of OA publication and fees vary substantially by individual subject, the three segments seem to have distinctly different characteristics. Most discussions, tables and graphs use abbreviations to refer to the three segments:

- **Biomed:** All of human biology and medicine, the area with by far the most fee revenue.
- **STEM:** Journals in hard sciences (other than human biology), technology, engineering and mathematics, including multidisciplinary journals primarily dealing with science and medicine.
- **HSS:** Humanities and social sciences, as well as multidisciplinary journals that cross over both scientific and other areas.

Note that *PLOS One* is excluded from segment tables and discussions, as it is from the rest of this chapter and Chapter 5: it is so much larger (and with so much more revenue) than any other OA journal that it skews averages and percentiles.

Journals and Articles by Segment

To get a sense of the size of each segment, Table 4.1 breaks out the data in Table 1.1 into the three segments.

	Journals	Act. 2015	Articles	Art/Jrnl
HSS	4,463	4,066	122,072	30
Free	4,060	3,681	95,780	26
Pay	403	385	26,292	68
Free%	91%	91%	78%	
Biomed	2,876	2,687	207,062	77
Free	1,429	1,328	69,280	52
Pay	1,447	1,359	137,782	101
Free%	50%	49%	33%	
STEM*	2,984	2,777	207,973	75
Free	1,861	1,740	85,894	49
Pay	1,123	1,037	122,079	118
Free%	62%	63%	41%	

Table 4.1. Journals and articles by segment (*excluding *PLOS One*)

Biomed has the lowest percentage of free journals, just dropping below half for journals active in 2015, and takes the lead in overall or free articles per journal—but STEM has the most articles per APC-charging journal. Note that the average journal's size in STEM and biomed is more than twice that of HSS.

Article Volume: Defining the Brackets

There are at least fourteen plausible ways to divide article volume (that is, number of articles in each journal in a given year) into a workable set of brackets:

- **Defined brackets:** Levels set arbitrarily, albeit based on scanning the actual data, splitting journals either based on peak year or on 2015 volume.
- **Percentiles by peak year or current year:** That is, to get five rows of data, break them at the 80th, 60th, 40th, and 20th percentile of the ordered list of article volumes (either peak or 2015). Think of this as “the fifth most prolific journals have from X to Y articles per year.”
- **Percentiles by peak year or current year, based on either APCLand or OAWorld:** Same as above, using either the smaller and higher-volume APCLand or larger, lower-volume OAWorld as a basis.
- **Percentiles by cumulative volume in one year:** That is, working from a highest-to-lowest list of article volumes in 2015, add all the figures up to any given journal, then set chunks based on that addition. Think of this as “one-fifth of articles appear in journals with from X to Y articles.”
- **Same, based on either APCLand or OAWorld.**

The first method, defined or arbitrary brackets, doesn’t pretend to put 20% of journals or articles in each bracket. The others come closer—but only for one definition.

Median articles per journal don’t differ enormously among the methods: 30, 31 and 41 respectively for OAWorld, everything, and APCLand using peak years—or 24, 24 and 28 using 2015.

	Jrnl/all	Jrnl/AL	Jrnl/OW	Cum/all	Cum/AL	Cum/OW
Q1	72	118	57	1,120	1,633	733
Q2	40	54	37	371	606	186
Q3	25	31	25	151	210	81
Q4	16	19	16	74	84	39
Q5	1	1	1	1	1	1

Table 4.2. Article volume, quintiles, peak year

The number in each cell is the lower limit for a journal to fall into that bracket—and you can see the enormous range, from 25 to 210 for the third quintile and from 57 to 1,633 for the first quintile.

	Jrnl/all	Jrnl/AL	Jrnl/OW	Cum/all	Cum/AL	Cum/OW
Q1	56	102	52	843	1,662	645
Q2	30	40	30	233	629	151
Q3	19	20	19	85	266	64
Q4	11	8	11	36	93	32
Q5	0	0	0	0	0	0

Table 4.3. Article volume, quintiles, 2015

Using 2015 rather than the peak year (which varies from journal to journal) makes things worse: the range is now 19 to 266 at the third quintile and 52 to 1,662 at the top.

(Read “Cum” as: adding published articles beginning with the most prolific journal, one-fifth of all articles are in Q1.)

Look at those tables again, and you see the difficulties of assigning brackets. For 2015, the lower edge of the *top* bracket is only 56 articles per year: in other words, nearly 80% of the journals published fewer than 56 articles in 2015. Sure, there are megajournals with more than 1,000 articles in 2015, even excluding *PLOS One*—but there aren’t many of them: 49 in all, and only 18 with 2,000 or more. Only 123 out of more than 10,000 journals published 500 articles or more in 2015—and fewer than one out of ten, 916, published more than 100 articles,

Brackets based on number of journals tend overemphasize smaller journals, which don’t publish a substantial portion of OA articles. Brackets based on cumulative volume overemphasize large journals.

There really is no good solution, certainly not one that will work equally well in all segments and for APCLand and OAWorld alike. In the end, the best compromise may be defined brackets modified by cumulative 2015 article volume, as follows:

- **Largest:** 600 or more articles in 2015.
- **Large:** 150 to 599 articles.
- **Medium:** 60 to 149 articles.
- **Small:** 20 to 59 articles.

➤ **Smallest:** 0 to 19 articles.

Journals by Segment

	HSS	Biomed	STEM	Total
Largest: 600+	10	41	51	102
Free%	20%	7%	22%	16%
Large: 150-599	47	253	164	464
Free%	55%	29%	34%	33%
Med.: 60-149	254	534	430	1,218
Free%	80%	51%	55%	58%
Small: 20-59	1,760	1,017	1,076	3,853
Free%	91%	61%	72%	78%
Smallest: 0-19	2,392	1,031	1,263	4,686
Free%	93%	45%	62%	74%

Table 4.4. Journals by segment, 2015

Bigger journals tend to have APCs, no matter what the segment: that and a number of other items seem clear in Table 4.4. Curiously, STEM has the highest percentage of free very large journals, although it's only 23%. Note that most HSS journals in all but the largest size are free—as are most of small and medium-sized journals in all segments. Curiously, most of the smallest biomed journals charge APCs.

Article Volume by Segment

	HSS	Biomed	STEM	Total
Largest: 600+	11,093	49,408	77,618	138,119
Free%	15%	6%	24%	17%
Large: 150-599	12,238	64,813	43,993	121,044
Free%	53%	25%	28%	29%
Med.: 60-149	21,187	47,929	38,594	107,710
Free%	79%	50%	55%	57%
Small: 20-59	55,232	36,566	36,885	128,683
Free%	90%	61%	71%	76%
Smallest: 0-19	22,322	8,346	10,883	41,551
Free%	94%	49%	70%	78%

Table 4.5. Articles by segment, 2015

Table 4.5 translates Table 4.4 into articles, since it's not feasible to show both sets of data in a single nine-row table. The percentages are similar to those in Table 4.4, and that makes sense: paid and free journals already within an article-volume range won't differ all that much.

Small journals publish more articles in the humanities and social sciences than do other sizes; that may not be surprising. Perhaps more interesting: the largest STEM journals publish the most articles *even ignoring PLOS One*, whereas large (but not the largest) biomed journals stand out.

APCLand and OAWorld: Journals

Let's look at APCLand and OAWorld separately, using the same layout and data as for Tables 4.4 and 4.5. As is usually the case, *PLOS One* is excluded from these tables.

	HSS	Biomed	STEM	Total
Largest: 600+	1	22	16	39
Free%	0%	0%	6%	3%
Large: 150-599	1	117	37	155
Free%	0%	0%	11%	3%
Med.: 60-149	5	136	54	195
Free%	40%	6%	15%	9%
Small: 20-59	27	238	129	394
Free%	48%	9%	36%	21%
Smallest: 0-19	36	328	244	608
Free%	56%	4%	6%	8%

Table 4.6. Journals by segment, APCLand

There are no free HSS or biomed journals in APCLand with more than 149 articles in 2015. But, of course, there are very few free journals in APCLand anyway.

	HSS	Biomed	STEM	Total
Largest: 600+	9	19	35	63
Free%	22%	16%	29%	24%
Large: 150-599	46	136	127	309
Free%	57%	54%	40%	49%
Med.: 60-149	249	398	376	1,023
Free%	81%	66%	61%	68%
Small: 20-59	1,733	779	947	3,459
Free%	92%	77%	76%	84%
Smallest: 0-19	2,356	703	1,019	4,078
Free%	94%	64%	76%	84%

Table 4.7. Journals by segment, OAWorld

It may be interesting to compare Table 4.7 to Table 4.4; note the generally higher free-journal percentages for biomed and STEM.

APCLand and OAWorld: Articles

	HSS	Biomed	STEM	Total
Largest: 600+	2,039	25,128	27,771	54,938
Free%	0%	0%	3%	2%
Large: 150-599	366	31,803	9,928	42,097
Free%	0%	0%	9%	2%
Med.: 60-149	384	12,569	5,268	18,221
Free%	34%	5%	15%	9%
Small: 20-59	832	8,564	4,488	13,884
Free%	45%	8%	37%	20%
Smallest: 0-19	416	2,642	1,602	4,660
Free%	67%	5%	11%	13%

Table 4.8. Articles by segment, APCLand

	HSS	Biomed	STEM	Total
Largest: 600+	9,054	24,280	49,847	83,181
Free%	18%	12%	36%	27%
Large: 150-599	11,872	33,010	34,065	78,947
Free%	54%	49%	33%	43%
Med.: 60-149	20,803	35,360	33,326	89,489
Free%	80%	65%	61%	67%
Small: 20-59	54,400	28,002	32,397	114,799
Free%	91%	77%	76%	83%
Smallest: 0-19	21,906	5,704	9,281	36,891
Free%	94%	69%	80%	87%

Table 4.9. Articles by segment, OAWorld

These tables may be somewhat redundant, but also provide useful comparisons.

5. Fees and Maximum Revenue

It takes money to publish even the smallest journal: I don't think there's much question about that. Of course, for very small open access journals run out of a university library the money be may be so small as to be trivial. Quite possibly, the only direct costs are hosting costs absorbed by the institution and a subdomain that doesn't even require registration

Normally, however, there are costs that require money from some source, even if most costs (managing peer review, editorial oversight, posting articles, maintaining the journal site, etc.) are absorbed by a parent institution or automated—and even if the journal handles layout and typesetting by requiring templates and doesn't do copyediting.

Larger journals almost certainly require more funding: it's hard to believe that a journal publishing hundreds of articles each year can survive entirely based on volunteer labor.

You can easily find long lists of all the things publishers may do and long discussions of what constitutes reasonable pricing. I've engaged in those discussions in the past (see, for example, *Cites & Insights* 16.2 and 15.4) and will in the future. This book doesn't say “here's what an article *should* cost” but does offer some data on the maximum amount that journals could be getting from APCs.

Sources of Revenue

Most gold OA journals (seven out of ten) are funded by societies, universities and colleges, libraries, government agencies, grants or subsumed costs, without charging APCs (although a few of those are using temporary no-APC periods to boost article submissions).

But the 29% of journals that *do* charge APCs (and are clear about them) published 56% of the OA articles (in serious journals) in 2015, and assuming level APCs, pay journals have published a majority of OA articles since 2013. It makes sense to look more closely at fee levels for individual journals and possible revenues, especially since such revenues have grown fairly rapidly. This chapter looks at fees and revenues in some detail.

As always, note that revenue figures assume that there are no waivers or discounts and that all papers published in a journal yielded the full APC. Where APCs vary depending on type of paper, length of paper, or the author(s) involved, I made worst-case assumptions: the most expensive kind of paper (usually full research papers), the most expensive kind of authors (usually a “foreign” author from the United States or another developed nation who is not a member, if there’s a society involved), and a moderately long paper (I used ten pages, but with no color graphics). Realistically, almost all actual revenue numbers are lower, possibly considerably lower.

Revenue Ranges

Table 5.1 shows the number of journals and articles in each of a fairly large range of revenue segments—the only time we’ll break out revenues for fee journals beyond four large segments, and the only time *PLOS One* is included in the discussion. Except for the first two rows, revenue brackets are the same as in *The Gold OA Landscape 2011-2014* to provide some comparability. (In 2014, *PLOS One* was the only journal with more than \$6.2 million maximum potential revenue; in 2015, there are four other such journals.)

Revenue	Journals	Cum J	Articles	Art/J
\$44.6 million	1		29,815	29,815
\$4 to \$16.4 million	7	8	27,835	3,976
\$2 to \$3.92 million	18	26	26,287	1,460
\$1 to \$1.96 million	37	63	23,720	641
\$750,000 to \$999,999	21	84	8,044	383
\$500,000 to \$749,999	46	130	15,356	334
\$400,000 to \$499,999	44	174	15,496	352
\$300,000 to \$399,999	55	229	13,841	252
\$250,000 to \$299,999	32	261	7,394	231
\$200,000 to \$249,999	58	319	13,795	238
\$150,000 to \$199,999	78	397	19,777	254
\$100,000 to \$149,999	115	512	16,534	144
\$75,000 to \$99,999	105	617	9,950	95
\$50,000 to \$74,999	144	761	14,068	98
\$40,000 to \$49,999	114	875	10,151	89
\$30,000 to \$39,999	129	1,004	10,087	78
\$25,000 to \$29,999	73	1,077	4,173	57
\$20,000 to \$24,999	116	1,193	6,644	57
\$15,000 to \$19,999	166	1,359	8,063	49
\$10,000 to \$14,999	248	1,607	9,736	39
\$7,500 to \$9,999	146	1,753	6,643	46
\$5,000 to \$7,499	208	1,961	5,567	27
\$2,500 to \$4,999	307	2,268	6,849	22
\$1,000 to \$2,499	278	2,546	4,097	15
\$1 to \$999	236	2,782	2,046	9
\$0 (no 2015 articles)	192	2,974	0	

Table 5.1 Revenue by journal, detailed breakdown

What's clear from Table 5.1, I think, is that APC-based OA publishing isn't an easy way to strike it rich. Only 512 journals could have revenues

of \$100,000 or more in 2015, and only 761 could have \$50,000 or more. Most APC-charging journals took in less than \$15,000 in 2015.

Note that the bottom row includes 103 fee-charging *ex-journals*: journals that either haven't published any articles since 2012 or have explicitly shut down or merged into other journals.

Free for Now

This might be a good place to mention two small groups of journals, those noted as “for now” in the master spreadsheet:

- Twenty-one journals publishing a total of 1,719 articles; these journals had fees (ranging from \$17 to \$2,886) but had either announced 2016 changes or seemed likely to change them soon.
- Ninety-seven free journals, publishing 3,035 articles in 2015, that appeared likely to impose APCs in the future.

The latter group is much smaller than in 2014 (when there were 331 such journals), as more initially-free journals have migrated to APCs.

Detailed APC Breakdown

APCs range from \$2 (yes, \$2) to \$5,000. There are some obvious clusters, for example: 11 journals at \$3,000 with 1,169 articles in 2015; 30 at \$2,450 with 2,043 articles; 178 at \$2,145 with 20,575 articles; 18 at \$2,000 with 10,062 articles; 43 at \$1,958 with 3,221 articles; 51 at \$1,900 with 13,046 articles; 45 at \$1,848 with 607 articles; 52 at \$1,780 with 568 articles; 47 at \$1,500 with 6,541 articles; 24 at \$1,250 with 1,864 articles; 71 at \$1,000 with 2,217 articles; 183 at \$800 with 4,650 articles; 274 at \$600 with 3,839 articles; 47 at \$500 with 3,487 articles; 46 at \$400 with 5,124 articles; 47 at \$325 with 751 articles (of which 648 are in one journal!); 50 at \$300 with 4,208 articles; 65 at \$200 with 5,700 articles; 41 at \$150 with 4,202 articles; 44 at \$120 with 1,938 articles; 83 at \$100 with 11,006 articles; and 60 at \$50 with 3,984 articles.

Two notes: journal counts exclude journals that don't yet show any 2015 articles, and since APCs not stated in U.S. dollars were converted as I encountered them, other journals may actually belong in these clusters.

APC	Journals	Cum J	Articles	Art/J
\$4,200-\$5,000	11		1,965	179
\$3,000-\$3,975	32	43	2,930	92
\$2,500-\$2,975	40	83	15,661	392
\$2,250-\$2,450	76	159	12,289	162
\$2,000-\$2,240	225	384	35,295	157
\$1,750-\$1,995	255	639	31,603	124
\$1,500-\$1,736	91	730	14,452	159
\$1,250-\$1,495	81	811	25,739	318
\$1,000-\$1,235	181	992	9,552	53
\$750-\$995	268	1,260	11,677	44
\$600-\$720	352	1,612	11,130	32
\$400-\$599	248	1,860	19,654	79
\$300-\$399	243	2,103	12,624	52
\$200-\$299	198	2,301	13,622	69
\$100-\$199	357	2,658	36,386	102
\$1-\$99	315	2,973	31,574	100

Table 5.2. APC levels, detailed breakdown

The paragraph full of clusters may be interesting but it's not particularly meaningful. Table 5.2 may be more meaningful, as it shows narrower ranges of APCs than the rest of this study uses. Do note that *PLOS One* is omitted from this table and most future discussion.

Unlike the reasonably good correlation between journal revenue and articles per journal in Table 5.1, there's no clear correlation in Table 5.2. The highest article-per-journal averages are in very expensive (but not the most expensive) journals charging \$2,500 to \$2,975 and in medium-priced journals charging \$1,250 to \$1,495. Journals charging \$300 to \$1,235 generally (except for the group from \$400 to \$599) have fewer articles than journals charging less than \$200. The ranges from \$1 to \$199 and \$1,750 to \$2,240 each include more than 66,000 articles, far more than any other ranges and not much less than half of the total (excluding *PLOS One*).

APC Brackets

There are several ways of grouping APC-charging journals into a small number of brackets—four brackets, since the fifth bracket is for that large number of journals without fees.

	Jrnl/all	Jrnl/AL	Jrnl/OW	Cum/all	Cum/AL	Cum/OW
Q1	\$1,440	\$2,145	\$665	\$2,250	\$2,310	\$2,065
Q2	\$600	\$1,230	\$295	\$1,965	\$2,145	\$1,519
Q3	\$201	\$600	\$110	\$1,500	\$1,750	\$698
Q4	\$2	\$309	\$2	\$2	\$309	\$2

Table 5.3. Lower limits of APC quartiles

Table 5.3 shows six possible sets of brackets, using the same methodology as for journal article volume. That is, Jrnl/all numbers are the actual quartiles for journals, with Jrnl/AL and Jrnl/OW limited to APCLand and OAWorld respectively. The three Cum figures start from the highest APC and accumulate the maximum potential revenues—and, especially for Cum/AL, these are tricky figures, since very expensive journals dominate the revenue picture.

We can dismiss the cumulative brackets immediately: even using the OAWorld version, most journals would wind up in the lowest bracket. Looking at the three journal possibilities, it's clear just how much APCLand and OAWorld are different visions of open access: only 34 OA-World journals, 2%, fall into the top quartile of APCLand—and less than 10% fall into the top quartile overall. Indeed, more than half of the OA-World journals with APCs charge less than the *lowest* APC in APCLand!

Still, it's not practical to use two sets of figures throughout, so the most plausible compromise is also the most obvious one: actual journal quartiles overall—albeit rounded slightly. The huge number of journals with \$600 APCs makes it impossible to get exact quartiles: the second-from-the-top quartile is either too small or too large. In the end, the most plausible quartile ranges are:

- High: \$1,400 and up.
- Medium: \$600 to \$1,399 (the largest group)
- Low: \$200 to \$599.
- Modest: \$2 to \$199.

The two lowest brackets are roughly the same size; the highest bracket is larger than those but smaller than the medium bracket. (Note: these are the same brackets as in 2014, except that the high bracket's been expanded to go down to \$1,400 rather than \$1,420, which only adds two journals and offers a rounder figure.)

Fees and Revenue by Segment

	HSS	Biomed	STEM
\$1,400+	18	603	116
Articles	2,943	84,339	41,515
Revenue	\$5,588,650	\$183,898,752	\$77,407,621
\$600-\$1.399	51	363	353
Articles	1,503	20,025	21,968
Revenue	\$1,466,498	\$19,762,626	\$21,047,716
\$200-\$599	129	250	268
Articles	7,179	15,046	23,675
Revenue	\$2,379,584	\$5,776,317	\$8,413,053
\$2-\$199	187	143	300
Articles	14,667	18,372	34,921
Revenue	\$1,266,068	\$1,789,773	\$3,362,493
Free	3,681	1,328	1,740
Articles	95,780	69,280	85,894

Table 5.4. Articles and revenue by segment, overall

Table 5.4 shows journals that were active in 2015 (excluding those with no articles and also excluding *PLOS One*) by APC bracket including number of articles and maximum revenue. As you'd expect, the highest-priced journals account for most of the revenues—more so in biomed (87%), less so in HSS (53%). Note: some journal counts elsewhere may differ from these slightly (journals with no 2015 articles).

Growth and Shrinkage

Tables 5.5 through 5.8 show article change in each journal from 2014 to 2015 for the five price brackets.

Change 2014-15	Count	Percent	Cum%
Grew 50%+	169	22.5%	
Grew 25-49.9%	80	10.7%	33.2%
Grew 10-24.99%	74	9.9%	43.1%
Even, $\pm 9.99\%$	150	20.0%	63.1%
Shrank 10-24.99%	86	11.5%	74.5%
Shrank 25-49.99%	92	12.3%	86.8%
Shrank 50%+	72	9.6%	96.4%
No 2014 count	27	3.6%	

Table 5.5. Growth and shrinkage, APCs \$1,400 and up

Change 2014-15	Count	Percent	Cum%
Grew 50%+	134	15.5%	
Grew 25-49.9%	37	4.3%	19.8%
Grew 10-24.99%	43	5.0%	24.8%
Even, $\pm 9.99\%$	97	11.2%	36.0%
Shrank 10-24.99%	75	8.7%	44.7%
Shrank 25-49.99%	132	15.3%	60.0%
Shrank 50%+	322	37.3%	97.3%
No 2014 count	23	2.7%	

Table 5.6. Growth and shrinkage, APCs \$600 to \$1,399

The most expensive journals were more likely to grow rapidly or very rapidly from 2014 to 2015 and less likely to shrink rapidly or very rapidly. As Tables 5.7 through 5.9 show, journals in the lowest two price brackets were less likely to grow rapidly, and free journals did better than the two lower levels of APC-charging journals.

Change 2014-15	Count	Percent	Cum%
Grew 50%+	100	14.5%	
Grew 25-49.9%	62	9.0%	23.5%
Grew 10-24.99%	62	9.0%	32.5%
Even, ±9.99%	136	19.7%	52.2%
Shrank 10-24.99%	87	12.6%	64.9%
Shrank 25-49.99%	98	14.2%	79.1%
Shrank 50%+	126	18.3%	97.4%
No 2014 count	18	2.6%	

Table 5.7. Growth and shrinkage, APCs \$200 to \$599

Change 2014-15	Count	Percent	Cum%
Grew 50%+	104	15.5%	
Grew 25-49.9%	56	8.3%	23.8%
Grew 10-24.99%	48	7.1%	31.0%
Even, ±9.99%	129	19.2%	50.1%
Shrank 10-24.99%	78	11.6%	61.8%
Shrank 25-49.99%	116	17.3%	79.0%
Shrank 50%+	121	18.0%	97.0%
No 2014 count	20	3.0%	

Table 5.8. Growth and shrinkage, APCs \$2 to \$199

Change 2014-15	Count	Percent	Cum%
Grew 50%+	1,075	14.6%	
Grew 25-49.9%	705	9.6%	24.2%
Grew 10-24.99%	738	10.0%	34.3%
Even, ±9.99%	1,722	23.4%	57.7%
Shrank 10-24.99%	902	12.3%	70.0%
Shrank 25-49.99%	927	12.6%	82.6%
Shrank 50%+	969	13.2%	95.8%
No 2014 count	312	4.2%	

Table 5.9. Growth and shrinkage, free journals

6. Publisher Category

Do the characteristics of open access journals vary depending on the type of publisher? This chapter explores that question, breaking serious gold OA journals down into five categories, based on the publisher name as it appears in *DOAJ*. The categories are:

- **University, college or institute:** Excluding (as much as possible) “institutes” that don’t have educational or research functions. A university press falls into this category even if it seems to function as a traditional publisher.
- **Societies, associations and government agencies:** There aren’t that many government-published OA journals, not enough to create a separate category.
- **Traditional publishers:** Companies (or publisher names) that publish subscription journals as well as multiple OA journals.
- **Open access publishers:** Publishers that don’t appear to publish subscription journals and publish multiple OA journals.
- **Miscellaneous:** Publisher names (which are frequently journal names) that don’t obviously fall into the first two types and that only have one or two journals.

I searched for information on all non-obvious publisher names with more than two journals and assigned categories appropriately. I’m sure there are quite a few miscellaneous journals that are from universities, colleges, societies, associations or government agencies but where the non-English publisher name didn’t make that obvious—but never more than a couple for each publisher name.

As with most of this book, *PLOS One*—from an OA publisher—is left out of the tables. Thus, the article count for the Open Access row of Table 6.1 should be almost 30,000 higher and the free % even lower.

Category	Journals	%Free	Articles	%Free
Univ/college	4,459	92%	153,138	78%
Miscellaneous	2,012	78%	118,212	51%
Open Access	1,959	20%	150,454	13%
Society/govt	1,086	83%	59,372	61%
Traditional	807	47%	55,931	27%

Table 6.1. Publisher category, overall

Even in Table 6.1 (sorted by number of journals) it's obvious that there are substantial differences. Open Access publishers have the lowest percentage of non-fee journals (quite a few OA journals from traditional publishers are society-sponsored); universities publish the most journals (not the most articles, as adding *PLOS One* would put Open Access publishers ahead) and have the highest percentage of free articles and journals; and so on.

The rest of this chapter is five subchapters with comparable tables and graphs, one for each category, in the same order as above. Another reminder: neither journal nor article counts include excluded journals as defined in Chapter 3.

Universities, Colleges and Institutes

	2015	2014	2013	2012	2011
Journals	4,095	4,297	4,225	4,018	3,663
%Free	92%	92%	92%	92%	92%
Articles	153,138	150,982	139,285	130,791	117,866
%Free	78%	79%	83%	83%	84%

Table 6.2. Journals and articles by year, university-published

University and college publishers accounted for 4,459 journals. Table 6.2 counts journals with at least one article in any given year. Somewhat unusually, the percentage of free journals stayed the same, but a growing percentage of articles are in APC-charging journals.

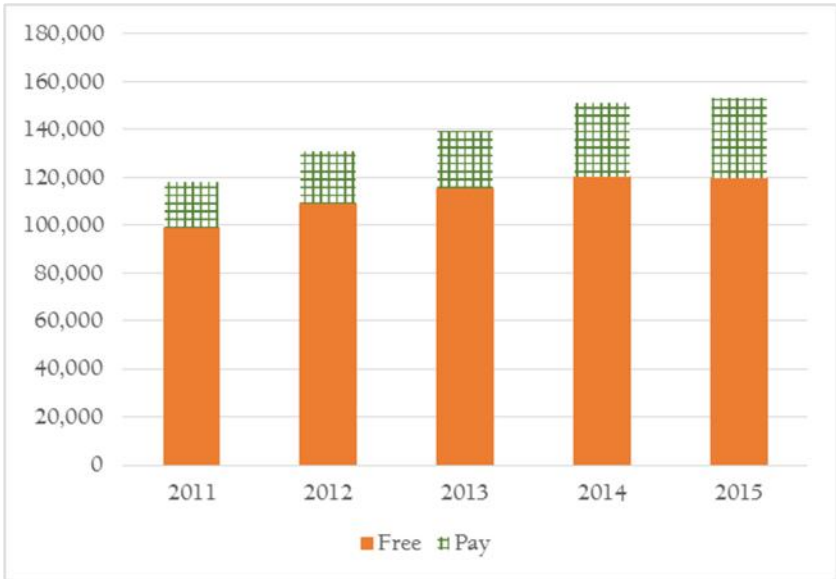


Figure 6.1. Free and pay articles by year, university-published

As Figure 6.1 shows, these publishers have kept growing, although most recent growth has been in APC-charging journals.

	Journals	%Free	Articles	%Free
Largest: 600+	13	31%	18,014	23%
Large: 150-599	84	68%	19,227	64%
Med.: 60-149	417	81%	35,663	81%
Small: 20-59	1,850	92%	60,171	92%
Smallest: 0-19	2,095	96%	20,063	96%

Table 6.3. Article volume, university-published

The percentage changes in Table 6.3 are typical: the largest journals (very few of them) are primarily APC-charging. Most university-published journals are small or very small.

Table 6.4 shows that most APC-charging university-published journals have low or very low charges—but the most expensive ones also publish the most articles per journal. The average cost per article among APC-charging journals is \$722; among all journals it's \$159.

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	16	5%	0%	7,287	22%	5%
\$600-\$1,399	35	10%	1%	3,611	11%	2%
\$200-\$599	88	25%	2%	6,272	19%	4%
\$2-\$199	213	61%	5%	16,509	49%	11%
Free	4,107		92%	119,459		78%

Table 6.4. APC levels, university-published



Figure 6.2. Starting dates, university-published

The story is that rapid growth began in 2000-2001 and peaked in 2010-2011; that there were quite a few early journals (84 up to 1980 and another 77 from 1981 to 1989); and that there never were large numbers of pay journals.

Table 6.5 shows that most university-published journals are in the humanities and social sciences (with almost no revenue)—and that the handful of expensive biomed journals could have yielded serious revenue, as is true for expensive and medium-priced STEM journals.

	HSS	Biomed	STEM
\$1,400+	1	10	5
Articles	14	4,670	2,603
Revenue	\$30,604	\$11,118,840	\$6,342,270
\$600-\$1.399	4	12	19
Articles	235	1,090	2,286
Revenue	\$274,930	\$808,646	\$2,235,088
\$200-\$599	22	24	40
Articles	1,296	1,903	3,073
Revenue	\$450,306	\$666,908	\$1,040,285
\$2-\$199	92	32	78
Articles	4,085	2,030	10,394
Revenue	\$277,655	\$215,261	\$861,931
Free	2,428	465	863
Articles	62,646	22,211	34,602

Table 6.5. Articles and revenue by segment, university-published

Finally, here’s another way of looking at journals, which will be explored in Chapters 12-19: by region (typically geographic, but with APCLand pulled out as a separate “region” and Pacific/English including Australia, New Zealand, Canada and the United States).

Region	Journals	%Free	Articles	%Free
Latin America	1,499	96%	45,401	92%
Eastern Europe	739	90%	30,706	84%
Western Europe	912	96%	20,314	88%
Asia	394	75%	20,220	48%
Middle East	367	89%	15,892	85%
Pacific/English	486	95%	11,729	83%
APCLand	16	19%	6,834	1%
Africa	46	61%	2,042	65%

Table 6.6. Journals by region, university-published

Table 6.6 is arranged by number of articles. It's really not surprising that Latin America leads the list. It may be surprising that a majority of articles from Asia involve APCs or other payments.

Miscellaneous

	2015	2014	2013	2012	2011
Journals	1,864	1,912	1,861	1,714	1,496
%Free	77%	78%	78%	79%	82%
Articles	118,212	120,824	104,516	90,619	68,660
%Free	51%	53%	55%	62%	69%

Table 6.7. Journals and articles by year, miscellaneous

There are 2,012 miscellaneous journals (that is, journals from publishers with only one or two DOAJ journals that aren't obviously university, government or society publishers); as Table 6.7 shows, while more than three-quarters don't charge APCs, the ones that do now publish nearly half of the articles,

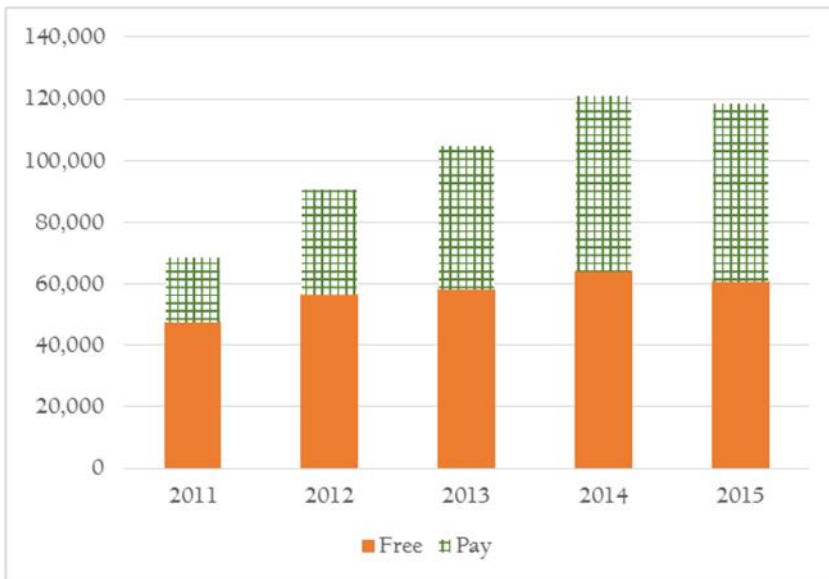


Figure 6.3. Free and pay articles by year, miscellaneous

As Figure 6.3 shows, it's not that the no-fee journals have shrunk all that much, but fee-charging journals are where the growth is.

	Journals	%Free	Articles	%Free
Largest: 600+	30	20%	42,175	32%
Large: 150-599	81	40%	21,310	38%
Med.: 60-149	245	57%	22,206	56%
Small: 20-59	742	82%	24,401	81%
Smallest: 0-19	914	85%	8,120	85%

Table 6.8. Article volume, miscellaneous

Table 6.8 follows the usual pattern, with more journals and a higher free percentage as journals get smaller. In this case, most large journals (and, as usual, most largest) *do* charge APCs.

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	25	6%	1%	5,282	9%	4%
\$600-\$1.399	40	9%	2%	4,230	7%	4%
\$200-\$599	135	30%	7%	12,464	22%	11%
\$2-\$199	250	56%	12%	35,667	62%	30%
Free	1,562		78%	60,569		51%

Table 6.9. APC levels, miscellaneous

As shown in Table 6.9, most fee-charging journals have nominal fees, and in this case the more expensive journals *don't* publish a higher percentage of articles: the least expensive fee-charging journals appear to be more popular. Average fee per article among APC-charging journals is \$390; among all article, it's \$190.

Figure 6.4, free and pay journals by starting year, is fairly typical, which makes sense given the nature of this miscellaneous group.

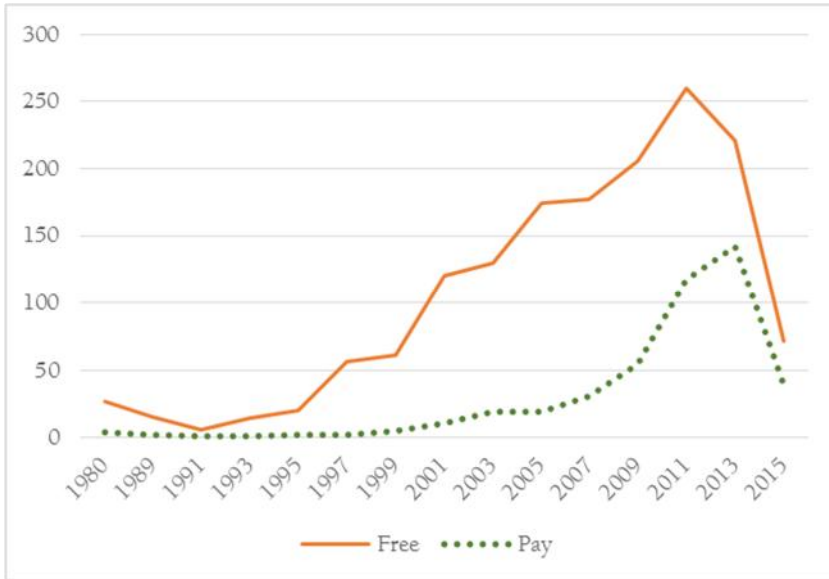


Figure 6.4. Starting dates, miscellaneous

	HSS	Biomed	STEM
\$1,400+	2	18	5
Articles	14	4,587	681
Revenue	\$23,816	\$9,109,885	\$1,364,054
\$600-\$1.399	7	16	17
Articles	149	936	3,145
Revenue	\$161,336	\$1,015,906	\$3,115,322
\$200-\$599	33	39	55
Articles	2,466	3,329	6,669
Revenue	\$680,321	\$1,137,947	\$2,476,122
\$2-\$199	55	63	113
Articles	5,507	11,784	18,376
Revenue	\$464,539	\$1,163,762	\$1,760,995
Free	798	294	349
Articles	22,088	15,242	23,239

Table 6.10. Articles and revenue by segment, miscellaneous

Table 6.10 contains a wealth of information. The big money, as usual, is in biomed and specifically in expensive biomed journals, while—as with university publishers—STEM journals at somewhat lower price levels not only publish more articles but may yield more revenue (the two don't necessarily go together).

Region	Journals	%Free	Articles	%Free
Asia	349	46%	37,589	16%
Western Europe	618	86%	32,531	80%
Eastern Europe	310	85%	16,212	54%
Pacific/English	335	79%	14,844	52%
Middle East	162	86%	7,858	78%
Latin America	193	95%	6,250	86%
Africa	45	49%	2,928	18%

Table 6.11. Journals by region, miscellaneous

Finally (for this category), Table 6.11 shows that, while miscellaneous journals in Western Europe outnumber those in any other region, Asian journals publish the most articles—and those articles are least likely to be free of charges. (By definition, APCLand has no miscellaneous publishers.)

Open Access Publishers

	2015	2014	2013	2012	2011
Journals	1,813	1,902	1,806	1,553	1,352
%Free	21%	20%	19%	20%	20%
Articles	150,454	155,843	129,431	116,813	92,428
%Free	13%	13%	15%	15%	16%

Table 6.12. Journals and articles by year, open access publishers

Given that this category (which actually includes 1,959 journals) is rather startlingly different from the others, remember what it includes: publishers that don't appear to publish subscription journals, that aren't

clearly affiliated with societies or universities, and that have more than two journals in DOAJ.

Startling? Look at the percentages: 79% of the journals, publishing 87% of the articles, charge APCs—and the trend toward all-pay, all the time, has gotten worse.

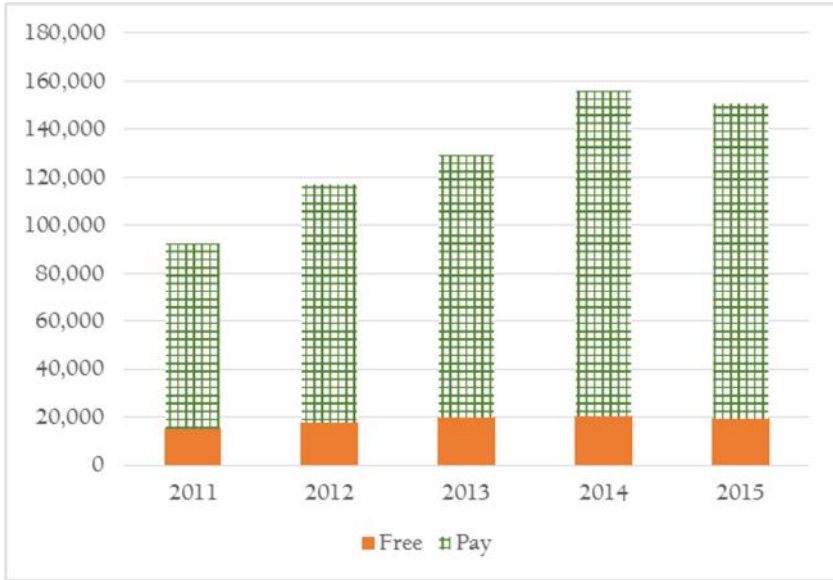


Figure 6.5. Free and pay articles by year, open access publishers

As Figure 6.5 shows, it was also a fairly rapidly growing category through 2014—and nearly all that growth is in pay journals. There’s a slight dropoff in 2015, again in articles involving fees. (As usual, *PLOS One*, which is in this category, is omitted—otherwise the tendency toward fees would be even more pronounced, as would the 2015 drop.)

	Journals	%Free	Articles	%Free
Largest: 600+	45	4%	50,566	3%
Large: 150-599	186	12%	49,487	9%
Med.: 60-149	272	28%	24,625	27%
Small: 20-59	550	29%	19,212	29%
Smallest: 0-19	906	15%	6,564	21%

Table 6.13. Article volume, open access publishers

While there are more very small journals than any other size bracket, the two largest brackets dominate this category—and even fewer of them don't charge fees. That there is *no* bracket in which free journals or articles make up even 30% of the whole says a lot.

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	545	35%	28%	81,778	62%	54%
\$600-\$1,399	536	34%	27%	24,731	19%	16%
\$200-\$599	349	22%	18%	16,362	12%	11%
\$2-\$199	129	8%	7%	8,202	6%	5%
Free	400		20%	19,381		13%

Table 6.14. APC levels, open access publishers

More than one-third of the fee-charging journals are in the most expensive bracket—and those journals publish more than half of *all* articles in this category. You won't be surprised at the very high charges per average article: \$1,496 among journals charging fees and \$1,303 overall.

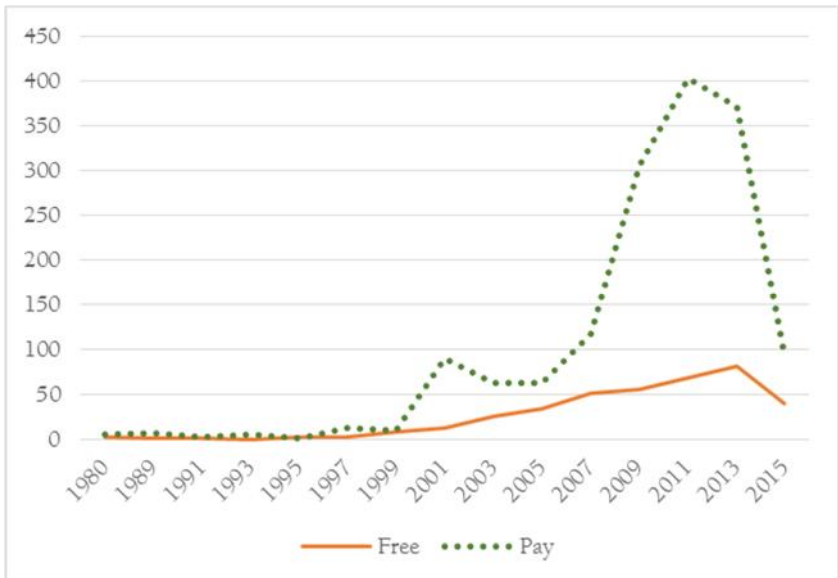


Figure 6.6. Starting dates, open access publishers

Figure 6.6 is entirely different from most starting-year graphs both because there's almost nothing before 2000 and because it's so predominantly OA-charging startups. (Looking at the data, six no-fee journals now published by OA publishers started before 1990 and another 19 started in the 1990s; on the pay side, there were 14 before 1990 and another 35 during the 1990s.)

	HSS	Biomed	STEM
\$1,400+	9	459	70
Articles	2,677	61,016	18,085
Revenue	\$5,018,340	\$127,766,255	\$31,978,593
\$600-\$1.399	15	239	204
Articles	571	13,516	10,644
Revenue	\$447,792	\$13,951,406	\$9,641,501
\$200-\$599	66	138	120
Articles	2,796	5,763	7,803
Revenue	\$1,007,065	\$2,282,955	\$3,082,242
\$2-\$199	23	26	69
Articles	3,555	2,755	1,892
Revenue	\$406,214	\$248,042	\$217,964
Free	74	190	111
Articles	2,039	9,939	7,403

Table 6.15. Articles and revenue by segment, open access publishers

Mostly biomed, mostly very high fees: that's the story and that's where the money is. That's what I see in Table 6.15—along with a near-complete disinterest in HSS (where the money manifestly is *not*).

While APCLand isn't entirely composed of OA publishers (six of the 11 publishers in APCLand are OA publishers), as seen in Table 6.16, APCLand dominates this category, with more than half of the journals and nearly two-thirds of the articles.

Among what's left, Asia has the most journals and articles, but the Pacific/English group has the lowest free percentages. Note Latin America's commitment to free OA even in this category—but there are only a handful of journals and articles. (SciELO and Redalyc are platforms, not publishers.) Notably, OA publishers in Latin America, the Middle

East and Eastern Europe tend to favor no-fee OA, with free majorities for both journals and articles,

Region	Journals	%Free	Articles	%Free
APCLand	1,074	6%	92,520	2%
Asia	261	36%	26,858	26%
Pacific/English	233	12%	11,721	11%
Western Europe	224	48%	11,355	43%
Middle East	67	57%	3,271	56%
Africa	37	41%	2,339	20%
Eastern Europe	55	80%	2,171	67%
Latin America	8	100%	219	100%

Table 6.16. Journals by region, open access publishers

Societies, Associations and Government Agencies

	2015	2014	2013	2012	2011
Journals	1,002	1,050	1,044	1,019	974
%Free	82%	83%	83%	84%	85%
Articles	59,372	57,689	54,768	53,067	50,161
%Free	61%	65%	65%	67%	68%

Table 6.17. Journals and articles by year, society-published

The second smallest group of serious OA journals includes a small number of journals from government agencies but is primarily journals published directly by societies and associations. (There are also quite a few society-sponsored and sometimes –edited journals published by OA and traditional publishers.) There are 1,086 journals in this category; journals are predominantly free and articles are mostly free; article volume has continued to grow at a reasonable pace

Figure 6.7 shows free and pay articles by year; note that article count continues to grow.



Figure 6.7. Free and pay articles by year, society-published

	Journals	%Free	Articles	%Free
Largest: 600+	7	14%	10,152	13%
Large: 150-599	61	57%	15,644	52%
Med.: 60-149	170	72%	15,150	74%
Small: 20-59	415	85%	14,577	84%
Smallest: 0-19	433	90%	3,849	90%

Table 6.18. Article volume, society-published

Table 6.18 shows that most of these journals are smallish—and that only among the largest journals do APCs dominate. It’s the usual pattern, however: the larger the journal, the more likely there’s an APC.

Table 6.19 may not be revelatory, partly because relatively few society-published journals have fees and because it’s typical for the most expensive journals to publish more articles than most less-expensive or free alternatives. Average cost per article in fee-charging journals is \$998 for 2015; including free journals, that comes down to \$387.

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	21	11%	2%	8,124	35%	14%
\$600-\$1,399	24	13%	2%	1,360	6%	2%
\$200-\$599	70	38%	6%	7,313	32%	12%
\$2-\$199	70	38%	6%	6,247	27%	11%
Free	901		83%	36,328		61%

Table 6.19. APC levels, society-published



Figure 6.8. Starting dates, society-published

Figure 6.8 shows not only that now-OA society journals go back a long ways but that they haven't had quite as sharp or short a 2000-2011 growth pattern—especially not APC-charging journals.

Table 6.20 shows a typically atypical picture. This time, most of the relatively modest amount of potential revenue is in STEM rather than biomed. This is one category where most biomed publishing is free, whether you're counting journals or articles.

	HSS	Biomed	STEM
\$1,400+	2	8	11
Articles	123	2,595	5,406
Revenue	\$299,400	\$5,109,291	\$13,656,883
\$600-\$1.399	1	11	11
Articles	60	650	650
Revenue	\$39,000	\$470,396	\$590,956
\$200-\$599	6	23	37
Articles	138	1,890	5,285
Revenue	\$42,262	\$669,965	\$1,450,722
\$2-\$199	13	19	37
Articles	982	1,470	3,795
Revenue	\$89,320	\$130,331	\$450,915
Free	281	288	254
Articles	6,766	18,632	10,930

Table 6.20. Articles and revenue by segment, society-published

Region	Journals	%Free	Articles	%Free
Asia	188	64%	14,134	38%
Pacific/English	180	79%	13,619	40%
Latin America	270	89%	13,355	84%
Western Europe	247	91%	9,123	75%
Eastern Europe	133	86%	5,832	74%
Middle East	60	93%	2,998	91%
Africa	8	75%	311	86%

Table 6.21. Journals by region, society-published

Table 6.21 is unusual in a number of ways. While more journals come from predominantly-free Latin America and Western Europe, more articles come from Asia and the Pacific/English quartet, and there, most articles appear in the minority of fee-charging journals.

Traditional Publishers

	2015	2014	2013	2012	2011
Journals	756	762	631	508	394
%Free	47%	47%	49%	47%	44%
Articles	55,931	42,816	33,966	23,913	17,467
%Free	27%	35%	38%	42%	43%

Table 6.22. Journals and articles by year, traditional publishers

The smallest group of serious OA journals comes from traditional publishers, companies that also publish subscription journals (and aren't in universities or societies). The group had 807 journals in *DOAJ* at the end of 2015. As should be clear, it's a rapidly growing segment, with most of that growth in APC-charging journals, dramatically shown in Figure 6.9. (Some journals are sponsored by societies or otherwise funded.)

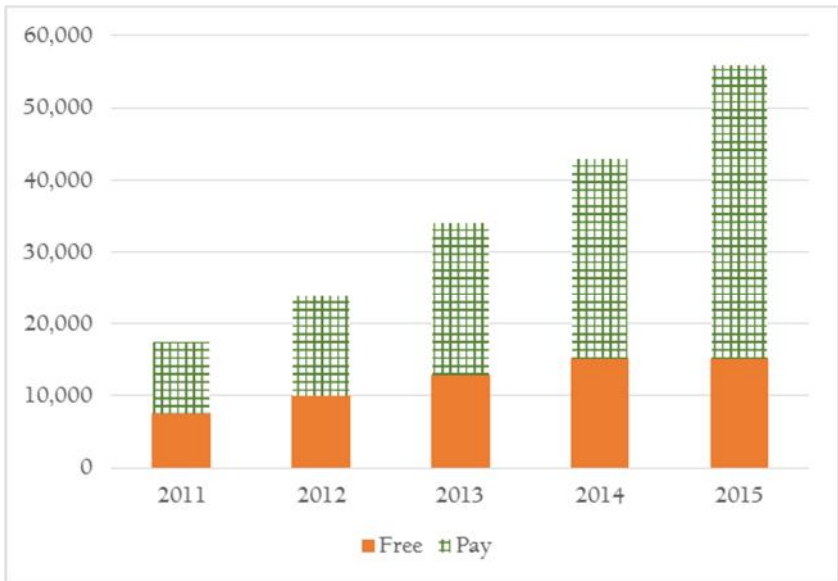


Figure 6.9. Free and pay articles by year, traditional publishers

	Journals	%Free	Articles	%Free
Largest: 600+	7	43%	17,212	19%
Large: 150-599	52	15%	15,376	12%
Med.: 60-149	114	28%	10,066	28%
Small: 20-59	296	55%	10,322	54%
Smallest: 0-19	338	51%	2,955	58%

Table 6.23. Article volume, traditional publishers

Table 6.23 is more or less what you might expect in terms of patterns—except that the free percentages are higher (in smaller journals, which are the vast majority of the journals) than you might expect for subscription publishers.

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	142	33%	18%	26,326	65%	47%
\$600-\$1,399	228	53%	28%	9,564	23%	17%
\$200-\$599	47	11%	6%	3,489	9%	6%
\$2-\$199	10	2%	1%	1,335	3%	2%
Free	380		47%	15,217		27%

Table 6.24. APC levels, traditional publishers

Table 6.24 is more what you might expect for traditional publishers: a full third of APC-charging journals are in the highest price bracket, and those journals publish nearly two-thirds of the fee-charged articles. The average charge per article in fee-charging journals (assuming no waivers, discounts or less expensive article types) is the highest of any category at \$1,629—but there are enough no-fee articles to bring the overall average down to a still-high \$1,186, slightly lower than for OA publishers.

Figure 6.10 is distinctive: nearly all the journals began after 2003 with especially sharp increases in 2010-2013.



Figure 6.10. Starting dates, traditional publishers

	HSS	Biomed	STEM
\$1,400+	4	108	25
Articles	115	11,471	14,740
Revenue	\$216,490	\$30,794,481	\$24,065,821
\$600-\$1.399	24	85	102
Articles	488	3,833	5,243
Revenue	\$543,440	\$3,516,272	\$5,464,849
\$200-\$599	2	26	16
Articles	483	2,161	845
Revenue	\$199,630	\$1,018,542	\$363,682
\$2-\$199	4	3	3
Articles	538	333	464
Revenue	\$28,340	\$32,377	\$70,688
Free	100	91	163
Articles	2,241	3,256	9,720

Table 6.25. Articles and revenue by segment, traditional publishers

Table 6.25 shows a strong push for expensive journals in biomed and STEM, with almost no low-priced journals in any segment but a fair number of no-fee journals in each.

Region	Journals	%Free	Articles	%Free
APCLand	301	27%	34,446	13%
Western Europe	105	42%	7,944	47%
Eastern Europe	237	93%	6,205	86%
Pacific/English	110	3%	3,459	4%
Asia	29	45%	2,475	40%
Middle East	19	63%	1,218	28%
Africa	5	80%	111	87%
Latin America	1	100%	73	100%

Table 6.26. Journals by region, traditional publishers

Some publishers use the home office country for all their journals; some don't—thus the last two rows of Table 6.26. Beyond that, APCLand accounts for many of the journals and *most* of the articles, with Western Europe second for articles and Eastern Europe second for journals. Also possibly noteworthy: almost all of the journals in the Pacific/English region have APCs, and almost none of them in Eastern Europe do.

7. Country of Publication

The set of 10,324 journals covered in this report comes from 124 different countries. A table of those countries takes up five pages, and one table doesn't provide much information.

It appears more useful to look at regions—and to split out APCLand, primarily international publishers, as a region all its own. That's what Chapters 12 through 19 do. (A supplemental book, also free in PDF ebook form, will devote a chapter to each country in OAWorld with more than a few journals, grouping those chapters by region and adding a brief discussion of countries within the region with too few journals for chapters of their own.)

This chapter offers some partial lists: a list of countries in APCLand with journal and article counts, a set of tables showing all countries in OAWorld alphabetically with journal and article counts, and some partial lists of countries ranked in different ways.

APCLand by Country

Table 7.1 shows countries represented in APCLand, this time including *PLOS One*. Some APCLand publishers use the same country for most or all of their journals. Others distribute country names, possibly because the publishers operate in many countries.

As you'd expect, there are six primary countries in APCLand. In descending order by 2015 article volume, they are the United Kingdom, the United States, Switzerland, Egypt, Germany and the Netherlands. An eighth country, New Zealand, has a significant number of journals but very few articles. Only two of the six countries, Netherlands and Germany, have a significant number of free journals.

Country	Journals	%Free	Articles	%Free
Australia	1	0%	58	0%
Chile	1	0%	19	0%
China	7	71%	369	60%
Colombia	1	100%	16	100%
Egypt	494	0%	21,516	2%
France	1	0%	58	0%
Georgia	1	100%	40	100%
Germany	132	32%	7,615	18%
Greece	1	0%	14	0%
Iran, Islamic Republic of	3	67%	118	53%
Italy	1	100%	29	100%
Japan	4	50%	394	49%
Korea, Democratic People's Republic of	1	100%	30	100%
Korea, Republic of	1	100%	36	100%
Netherlands	70	24%	6,726	27%
New Zealand	27	4%	354	7%
Poland	1	100%	41	100%
Singapore	1	100%	84	100%
Spain	5	80%	333	43%
Switzerland	182	27%	29,753	5%
Taiwan, Province of China	1	0%	35	0%
United Kingdom	418	5%	59,104	2%
United States	38	3%	36,873	0%

Table 7.1. Countries in APCLand

OAWorld: The Complete List

Table 7.2a-e shows all countries in OAWorld (that is, with journals not in APCLand) in alphabetic order.

Country	Journals	%Free	Articles	%Free
Albania	4	50%	240	27%
Algeria	5	100%	316	100%
Argentina	159	93%	2,712	89%
Armenia	3	100%	60	100%
Australia	114	86%	3,190	66%
Austria	50	88%	1,297	73%
Azerbaijan	3	100%	174	100%
Bahamas	1	100%	9	100%
Bahrain	1	100%	80	100%
Bangladesh	31	65%	1,278	36%
Barbados	1	100%	29	100%
Belarus	2	100%	49	100%
Belgium	30	97%	535	93%
Bhutan	1	100%	4	100%
Bolivia, Plurinational State of	7	100%	122	100%
Bosnia and Herzegovina	15	93%	290	84%
Brazil	992	94%	40,884	87%
British Virgin Islands	1	100%	6	100%
Brunei Darussalam	1	100%	65	100%
Bulgaria	34	59%	1,479	50%
Burundi	1	100%	10	100%
Cambodia	1	100%	10	100%
Canada	199	78%	6,175	55%
Chile	148	93%	4,991	86%
China	47	51%	9,039	19%
Colombia	263	98%	6,267	99%
Costa Rica	41	100%	946	100%
Croatia	103	95%	3,022	94%

Table 7.2a. Countries in OAWorld, Albania to Croatia

Country	Journals	%Free	Articles	%Free
Cuba	68	100%	2,493	100%
Cyprus	4	100%	55	100%
Czech Republic	87	74%	2,696	48%
Democratic Republic of the Congo	1	100%	3	100%
Denmark	38	100%	619	100%
Dominican Republic	1	100%	30	100%
Ecuador	11	100%	208	100%
Egypt	16	75%	295	80%
Estonia	22	100%	356	100%
Ethiopia	5	100%	194	100%
Finland	37	70%	982	54%
France	175	97%	6,229	98%
Georgia	2	100%	85	100%
Germany	246	84%	12,218	63%
Ghana	1	0%	10	0%
Greece	40	78%	1,230	70%
Guatemala	3	100%	28	100%
Hong Kong	39	51%	3,390	42%
Hungary	33	97%	1,070	92%
Iceland	4	100%	78	100%
India	461	45%	54,650	21%
Indonesia	253	65%	6,329	62%
Iran, Islamic Republic of	297	85%	13,621	77%
Iraq	9	56%	305	63%
Ireland	14	93%	256	100%
Israel	13	85%	352	55%
Italy	303	87%	10,885	86%
Jamaica	2	50%	35	0%

Table 7.2b. Countries in OAWorld, Cuba to Jamaica

Country	Journals	%Free	Articles	%Free
Japan	94	65%	6,907	45%
Jordan	10	70%	973	15%
Kazakhstan	1	100%	31	100%
Kenya	7	71%	87	71%
Korea, Democratic People's Republic of	1	100%	121	100%
Korea, Republic of	6	67%	399	23%
Kosova	2	0%	25	0%
Kuwait	3	100%	167	100%
Kyrgyzstan	2	100%	32	100%
Latvia	6	83%	187	72%
Libya	2	50%	76	43%
Lithuania	35	91%	898	79%
Luxembourg	1	100%	14	100%
Macedonia, the Former Yugoslav Republic of	19	74%	2,268	19%
Madagascar	1	100%	16	100%
Malaysia	63	75%	3,419	89%
Malta	5	100%	63	100%
Martinique	1	100%	30	100%
Mauritius	2	50%	204	5%
Mexico	155	96%	4,068	97%
Moldova, Republic of	12	100%	490	100%
Montenegro	7	100%	302	100%
Morocco	7	71%	971	49%
Nepal	17	88%	555	82%
Netherlands	61	85%	3,633	93%
New Zealand	79	28%	1,126	39%
Nicaragua	4	100%	67	100%
Nigeria	28	18%	1,965	10%

Table 7.2c. Countries in OAWorld, Japan to Nigeria

Country	Journals	%Free	Articles	%Free
Norway	50	94%	807	97%
Oman	2	100%	201	100%
Pakistan	70	51%	5,833	19%
Palestine, State of	1	0%	32	0%
Paraguay	3	100%	87	100%
Peru	45	96%	1,169	95%
Philippines	12	92%	426	56%
Poland	343	91%	12,389	82%
Portugal	80	90%	1,771	82%
Puerto Rico	2	100%	13	100%
Qatar	7	57%	110	54%
Romania	322	84%	12,734	69%
Russian Federation	147	94%	10,625	81%
Rwanda	1	100%	16	100%
Saudi Arabia	5	80%	426	93%
Serbia	102	94%	4,576	71%
Singapore	28	25%	2,248	6%
Slovakia	43	91%	1,172	84%
Slovenia	54	98%	1,437	99%
South Africa	73	55%	2,412	46%
South Korea	40	40%	5,106	11%
Spain	560	98%	13,158	95%
Sri Lanka	12	100%	199	100%
Sweden	69	54%	2,112	38%
Switzerland	43	58%	2,282	38%
Taiwan, Province of China	26	77%	617	69%
Tanzania, United Republic of	1	100%	40	100%
Thailand	15	87%	616	87%

Table 7.2d. Countries in OAWorld, Norway to Thailand

Country	Journals	%Free	Articles	%Free
Tunisia	1	100%	12	100%
Turkey	295	92%	13,838	88%
Uganda	3	67%	1,321	15%
Ukraine	69	90%	4,416	79%
United Arab Emirates	14	21%	823	21%
United Kingdom	300	59%	23,098	54%
United States	952	65%	44,881	41%
Uruguay	10	100%	168	100%
Venezuela, Bolivarian Republic of	53	96%	936	96%
Viet Nam	1	0%	33	0%
Yemen	2	50%	14	64%
Zambia	2	0%	78	0%

Table 7.2e. Countries in OAWorld, Tunisia through Zambia

Countries with the Most Journals and Articles

Table 7.3a-c shows countries with more than four serious OA journals (excluding APCLand), from the most journals to the least. The winner here—with *or* without APCLand—is Brazil, with the United States a close second.

Table 7.4a-c shows the same data, but arranged from highest to lowest percentage of free journals.

Table 7.5a-c shows countries with more than 200 OA articles (excluding APCLand) in 2015, from most articles to least—and here, India is the leader, with the United States and Brazil following.

Finally, Table 7.6a-c shows the same data as Table 7.5a-c, but in order by percentage appearing in free journals.

No textual comments; the tables should provide their own messages.

Country	Journals	%Free
Brazil	992	94%
United States	952	65%
Spain	560	98%
India	461	45%
Poland	343	91%
Romania	322	84%
Italy	303	87%
United Kingdom	300	59%
Iran, Islamic Republic of	297	85%
Turkey	295	92%
Colombia	263	98%
Indonesia	253	65%
Germany	246	84%
Canada	199	78%
France	175	97%
Argentina	159	93%
Mexico	155	96%
Chile	148	93%
Russian Federation	147	94%
Australia	114	86%
Croatia	103	95%
Serbia	102	94%
Japan	94	65%
Czech Republic	87	74%
Portugal	80	90%
New Zealand	79	28%
South Africa	73	55%
Pakistan	70	51%

Table 7.3a. Countries with 70 to 992 OAWorld journals

Country	Journals	%Free
Sweden	69	54%
Ukraine	69	90%
Cuba	68	100%
Malaysia	63	75%
Netherlands	61	85%
Slovenia	54	98%
Venezuela, Bolivarian Republic of	53	96%
Austria	50	88%
Norway	50	94%
China	47	51%
Peru	45	96%
Slovakia	43	91%
Switzerland	43	58%
Costa Rica	41	100%
Greece	40	78%
South Korea	40	40%
Hong Kong	39	51%
Denmark	38	100%
Finland	37	70%
Lithuania	35	91%
Bulgaria	34	59%
Hungary	33	97%
Bangladesh	31	65%
Belgium	30	97%
Nigeria	28	18%
Singapore	28	25%
Taiwan, Province of China	26	77%
Estonia	22	100%

Table 7.3b. Countries with 22 to 69 OAWorld journals

Country	Journals	%Free
Macedonia, the Former Yugoslav Republic of	19	74%
Nepal	17	88%
Egypt	16	75%
Bosnia and Herzegovina	15	93%
Thailand	15	87%
Ireland	14	93%
United Arab Emirates	14	21%
Israel	13	85%
Moldova, Republic of	12	100%
Philippines	12	92%
Sri Lanka	12	100%
Ecuador	11	100%
Jordan	10	70%
Uruguay	10	100%
Iraq	9	56%
Bolivia, Plurinational State of	7	100%
Kenya	7	71%
Montenegro	7	100%
Morocco	7	71%
Qatar	7	57%
Korea, Republic of	6	67%
Latvia	6	83%
Algeria	5	100%
Ethiopia	5	100%
Malta	5	100%
Saudi Arabia	5	80%

Table 7.3c. Countries with five to 19 OAWorld journals

Country	Journals	%Free
Cuba	68	100.0%
Costa Rica	41	100.0%
Denmark	38	100.0%
Estonia	22	100.0%
Moldova, Republic of	12	100.0%
Sri Lanka	12	100.0%
Ecuador	11	100.0%
Uruguay	10	100.0%
Bolivia, Plurinational State of	7	100.0%
Montenegro	7	100.0%
Algeria	5	100.0%
Ethiopia	5	100.0%
Malta	5	100.0%
Colombia	263	98.5%
Slovenia	54	98.1%
Spain	560	97.5%
France	175	97.1%
Hungary	33	97.0%
Belgium	30	96.7%
Venezuela, Bolivarian Republic of	53	96.2%
Mexico	155	96.1%
Peru	45	95.6%
Croatia	103	95.1%
Serbia	102	94.1%
Brazil	992	94.1%
Norway	50	94.0%
Russian Federation	147	93.9%
Bosnia and Herzegovina	15	93.3%

Table 7.4a. Countries with five or more journals, 100% to 93.3% free

Country	Journals	%Free
Chile	148	93.2%
Argentina	159	93.1%
Ireland	14	92.9%
Philippines	12	91.7%
Turkey	295	91.5%
Lithuania	35	91.4%
Slovakia	43	90.7%
Poland	343	90.7%
Portugal	80	90.0%
Ukraine	69	89.9%
Nepal	17	88.2%
Austria	50	88.0%
Italy	303	87.1%
Thailand	15	86.7%
Australia	114	86.0%
Netherlands	61	85.2%
Israel	13	84.6%
Iran, Islamic Republic of	297	84.5%
Romania	322	84.5%
Germany	246	83.7%
Latvia	6	83.3%
Saudi Arabia	5	80.0%
Canada	199	78.4%
Greece	40	77.5%
Taiwan, Province of China	26	76.9%
Egypt	16	75.0%
Malaysia	63	74.6%
Macedonia, the Former Yugoslav Republic of	19	73.7%

Table 7.4b. Countries with five or more journals, 93.2% to 73.7% free

Country	Journals	%Free
Czech Republic	87	73.6%
Kenya	7	71.4%
Morocco	7	71.4%
Finland	37	70.3%
Jordan	10	70.0%
Korea, Republic of	6	66.7%
United States	952	65.2%
Indonesia	253	65.2%
Japan	94	64.9%
Bangladesh	31	64.5%
Bulgaria	34	58.8%
United Kingdom	300	58.7%
Switzerland	43	58.1%
Qatar	7	57.1%
Iraq	9	55.6%
South Africa	73	54.8%
Sweden	69	53.6%
Pakistan	70	51.4%
Hong Kong	39	51.3%
China	47	51.1%
India	461	44.7%
South Korea	40	40.0%
New Zealand	79	27.8%
Singapore	28	25.0%
United Arab Emirates	14	21.4%
Nigeria	28	17.9%

Table 7.4b. Countries with five or more journals, 73.6% to 17.9% free

Country	Articles	%Free
India	54,650	21%
United States	44,881	41%
Brazil	40,884	87%
United Kingdom	23,098	54%
Turkey	13,838	88%
Iran, Islamic Republic of	13,621	77%
Spain	13,158	95%
Romania	12,734	69%
Poland	12,389	82%
Germany	12,218	63%
Italy	10,885	86%
Russian Federation	10,625	81%
China	9,039	19%
Japan	6,907	45%
Indonesia	6,329	62%
Colombia	6,267	99%
France	6,229	98%
Canada	6,175	55%
Pakistan	5,833	19%
South Korea	5,106	11%
Chile	4,991	86%
Serbia	4,576	71%
Ukraine	4,416	79%
Mexico	4,068	97%
Netherlands	3,633	93%
Malaysia	3,419	89%
Hong Kong	3,390	42%
Australia	3,190	66%

Table 7.5a. Countries with 3,190 to 54,650 OAWorld articles in 2015

Country	Articles	%Free
Croatia	3,022	94%
Argentina	2,712	89%
Czech Republic	2,696	48%
Cuba	2,493	100%
South Africa	2,412	46%
Switzerland	2,282	38%
Macedonia, the Former Yugoslav Republic of	2,268	19%
Singapore	2,248	6%
Sweden	2,112	38%
Nigeria	1,965	10%
Portugal	1,771	82%
Bulgaria	1,479	50%
Slovenia	1,437	99%
Uganda	1,321	15%
Austria	1,297	73%
Bangladesh	1,278	36%
Greece	1,230	70%
Slovakia	1,172	84%
Peru	1,169	95%
New Zealand	1,126	39%
Hungary	1,070	92%
Finland	982	54%
Jordan	973	15%
Morocco	971	49%
Costa Rica	946	100%
Venezuela, Bolivarian Republic of	936	96%
Lithuania	898	79%
United Arab Emirates	823	21%

Table 7.5b. Countries with 823 to 3,022 OAWorld articles in 2015

Country	Articles	%Free
Norway	807	97%
Denmark	619	100%
Taiwan, Province of China	617	69%
Thailand	616	87%
Nepal	555	82%
Belgium	535	93%
Moldova, Republic of	490	100%
Philippines	426	56%
Saudi Arabia	426	93%
Korea, Republic of	399	23%
Estonia	356	100%
Israel	352	55%
Algeria	316	100%
Iraq	305	63%
Montenegro	302	100%
Egypt	295	80%
Bosnia and Herzegovina	290	84%
Ireland	256	100%
Albania	240	27%
Ecuador	208	100%
Mauritius	204	5%
Oman	201	100%

Table 7.5c. Countries with 201 to 807 OAWorld articles in 2015

Country	Articles	%Free
Cuba	2,493	100.0%
Costa Rica	946	100.0%
Denmark	619	100.0%
Moldova, Republic of	490	100.0%
Estonia	356	100.0%
Algeria	316	100.0%
Montenegro	302	100.0%
Ireland	256	100.0%
Ecuador	208	100.0%
Oman	201	100.0%
Colombia	6,267	99.3%
Slovenia	1,437	98.7%
France	6,229	98.2%
Mexico	4,068	96.8%
Norway	807	96.7%
Venezuela, Bolivarian Republic of	936	96.3%
Peru	1,169	95.0%
Spain	13,158	95.0%
Croatia	3,022	93.9%
Belgium	535	93.3%
Netherlands	3,633	93.2%
Saudi Arabia	426	92.7%
Hungary	1,070	92.1%
Malaysia	3,419	88.9%
Argentina	2,712	88.5%
Turkey	13,838	88.5%
Thailand	616	86.9%
Brazil	40,884	86.7%

Table 7.6a. Countries with more than 200 2015 OAWorld articles, 86.7% to 100% free

Country	Articles	%Free
Italy	10,885	86.0%
Chile	4,991	85.5%
Slovakia	1,172	84.5%
Bosnia and Herzegovina	290	83.8%
Portugal	1,771	81.8%
Nepal	555	81.8%
Poland	12,389	81.6%
Russian Federation	10,625	81.3%
Egypt	295	80.3%
Ukraine	4,416	78.8%
Lithuania	898	78.6%
Iran, Islamic Republic of	13,621	76.8%
Austria	1,297	72.9%
Serbia	4,576	70.9%
Greece	1,230	69.5%
Taiwan, Province of China	617	69.4%
Romania	12,734	68.5%
Australia	3,190	65.7%
Germany	12,218	62.8%
Iraq	305	62.6%
Indonesia	6,329	62.4%
Philippines	426	56.1%
Canada	6,175	55.4%
Israel	352	55.1%
United Kingdom	23,098	54.0%
Finland	982	53.9%
Bulgaria	1,479	50.4%
Morocco	971	49.3%

Table 7.6b. Countries with more than 200 2015 OAworld articles, 49.3% to 86.0% free

Country	Articles	%Free
Czech Republic	2,696	48.4%
South Africa	2,412	46.3%
Japan	6,907	44.7%
Hong Kong	3,390	42.2%
United States	44,881	40.9%
New Zealand	1,126	38.5%
Switzerland	2,282	38.1%
Sweden	2,112	37.9%
Bangladesh	1,278	35.8%
Albania	240	27.1%
Korea, Republic of	399	23.1%
United Arab Emirates	823	21.1%
India	54,650	21.1%
Pakistan	5,833	18.9%
Macedonia, the Former Yugoslav Republic of	2,268	18.8%
China	9,039	18.6%
Uganda	1,321	15.3%
Jordan	973	14.8%
South Korea	5,106	11.0%
Nigeria	1,965	10.4%
Singapore	2,248	5.8%
Mauritius	204	5.4%

Table 7.6c. Countries with more than 200 2015 OAworld articles, 5.4% to 48.4% free

8. Subject Segments

Since the three broad subject segments were introduced in Chapter 2 and play roles in Chapters 4, 5 and 6, there's no need to spend much space introducing them. A few notes may be in order:

- The subject segments came about while I was writing *Open-Access Journals: Idealism and Opportunism* (ALA, 2015), one of the partial-survey precursors to this report. It seemed like a meaningful way to show substantial differences in OA practice in different subject areas—differences that grew more distinct as the survey became more complete,
- Assignment of journals to one of 28 subjects is tricky and partly subjective. The subject-based supplement will provide more information on what's included in each subject; you can also find that information in *The Gold OA Landscape 2011-2014*.
- Assignment of subjects to segments may also be arguable, at least in the cases of anthropology and psychology, which some might argue belong in STEM and biomed respectively.
- I've used a consistent set of tables and graphs in each of the next three chapters, based on tables and graphs also used in earlier chapters. The hope is to provide varied perspectives without taking up too much space.

9. Biology and Medicine

Biomed—subjects related to human biology and the many subjects related to human medicine, including pharmacies, some aspects of nutrition and most aspects of sports and sports medicine—is distinctly where the money is.

Of the three segments, this one has the fewest journals. It's roughly tied with STEM for most number of articles and percentage of articles in APC-charging journals (although that's without *PLOS One*). But it has *by far* the most revenue: in 2015, more than the other two combined (with *or* without *PLOS One*).

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	1,429	1,328	69,280	52
Pay	1,447	1,359	137,782	101
Total	2,876	2,687	207,062	77
Free%	50%	49%	33%	

Table 9.1. Journals and articles, biomed

Table 9.1 shows that half of the biomed journals in *DOAJ* are free—but just under half of those actually publishing articles are free, and they published only one-third of the articles in 2015. On average, fee-charging journals have just under twice as many articles per year as free ones.

	2015	2014	2013	2012	2011
Journals	2,687	2,793	2,637	2,401	2,140
%Free	49%	50%	50%	51%	52%
Articles	207,062	207,332	167,847	148,951	128,465
%Free	33%	35%	41%	43%	45%

Table 9.2. Journals and articles by year, biomed

There’s been dramatic growth in OA biomed articles in the last four years—and also a substantial drop in the percentage of articles without APCs. Free articles grew about 10% from 2011 to 2012 and more slowly the next two years, falling slightly in 2015. Articles in APC-charging journals grew roughly 20% per year from 2011 to 2013 and around 35% in 2014; growth slowed to slightly more than 2% from 2014 to 2015. Figure 9.1 shows free and pay articles graphically.

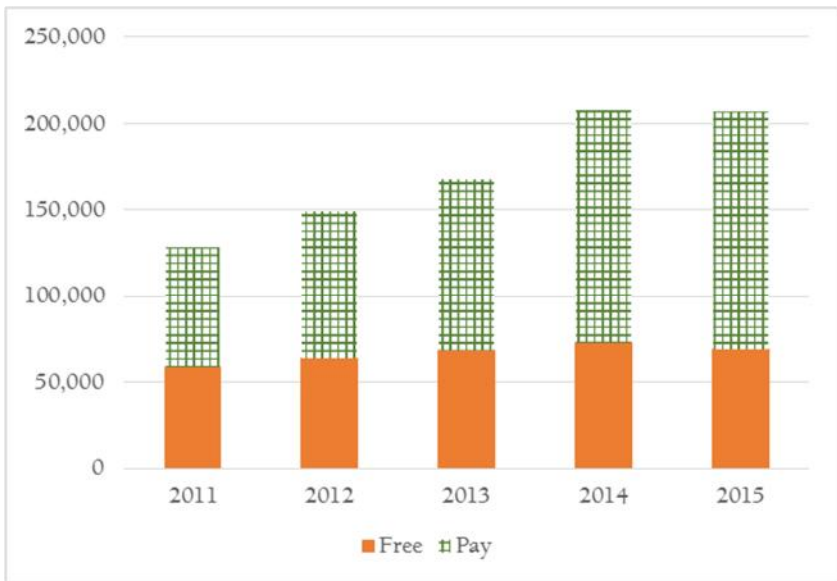


Figure 9.1. Free and pay articles by year, biomed

Article Volume

	Journals	%Free	Articles	%Free
Largest: 600+	41	7%	49,408	6%
Large: 150-599	253	29%	64,813	25%
Med.: 60-149	534	51%	47,929	50%
Small: 20-59	1,017	61%	36,566	61%
Smallest: 0-19	1,031	45%	8,346	49%

Table 9.3. Article volume, biomed

The biggest journals are rarely free: that's much truer for biomed than for other segments. The most articles are in large journals; oddly, the highest percentage of free articles is small rather than smallest journals.

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	615	43%	21%	84,339	61%	41%
\$600-\$1,399	409	28%	14%	20,025	15%	10%
\$200-\$599	271	19%	9%	15,046	11%	7%
\$2-\$199	152	11%	5%	18,372	13%	9%
Free	1,429		50%	69,280		33%

Table 9.4. APC levels, biomed

The first row in Table 9.4 fairly screams “Biomed: it's where the OA money is.” The most articles, the most APC-charging journals, and a much larger portion of the whole than in other segments are in the most expensive bracket. Not surprisingly, the average charge per article is also very high: \$1,533 among articles in APC-charging journals, \$1,020 per article overall.

Starting Date

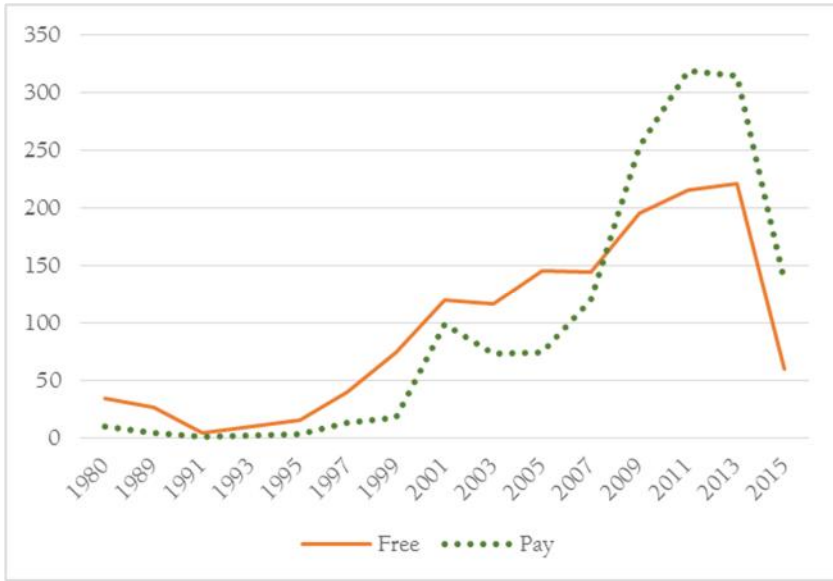


Figure 9.2. Starting dates, biomed

Figure 9.2 shows a fair number of early journals that are now no-fee OA—and an early boomlet in fee-based OA that returns with a vengeance in 2008, much exceeding the growth in no-fee startups.

Region and “World”

Table 9.5 separates out APCLand—the biggest factor in biomed by far—and shows journals and articles by region of OAWorld, sorted by 2015 articles. The free% numbers are interesting, setting aside the fact that nearly all biomed journals in APCLand charge fees: even biomed publishing is predominantly free in Latin America, the Middle East and Eastern Europe, while the minority of APC-charging journals in Asia and Africa publish most of the articles. (Reminder: Pacific/English is Australia, New Zealand, Canada and the United States.)

APCLand	841	5%	80,706	2%
Asia	442	59%	40,785	35%
Pacific/English	366	35%	21,921	31%
Latin America	350	93%	18,980	86%
Western Europe	333	64%	17,353	55%
Middle East	311	89%	16,205	81%
Eastern Europe	194	82%	8,414	78%
Africa	39	67%	2,698	31%

Table 9.5. Journals by region, biomed

Publisher Category

Category	Journals	%Free	Articles	%Free
Open Access	1,004	9%	88,381	6%
Univ/college	883	90%	44,080	78%
Miscellaneous	433	66%	35,243	42%
Traditional	313	26%	22,099	19%
Society/govt	243	74%	17,259	62%

Table 9.6. Publisher categories, biomed

Table 9.6 is also arranged by number of articles. Multijournal OA publishers almost all charge APCs, while roughly one-quarter of journals from traditional publishers don't (many of these are society-sponsored). Not surprisingly, university and institute journals are predominantly free—much more so than society-published journals.

Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	405	14.1%	
Grew 25-49.9%	258	9.0%	23.1%
Grew 10-24.99%	273	9.5%	32.5%
Even, ±9.99%	629	21.9%	54.4%
Shrank 10-24.99%	350	12.2%	66.6%
Shrank 25-49.99%	409	14.2%	80.8%
Shrank 50%+	469	16.3%	97.1%
No 2014 count	83	2.9%	

Table 9.7. Growth and shrinkage, biomed

The picture in Table 9.7 is not much different from OA as a whole.

Subjects

Someone with an understanding of medicine could probably break that subject down into a small number of coherent subgroups, but I lack that understanding. Table 9.8. offers a rough breakdown.

Subject	Journals	%Free	Articles	%Free
Biology	426	37%	33,140	18%
Medicine	2,450	52%	173,922	36%

Table 9.8. Subjects, biomed

Countries in OAWorld (partial)

Country	Journals	%Free	Articles	%Free
India	231	55%	22,771	35%
United States	252	36%	18,116	31%
Brazil	168	89%	12,452	84%
Iran, Islamic Republic of	192	87%	10,108	75%
China	30	33%	7,173	10%
United Kingdom	75	41%	4,916	30%
Turkey	94	99%	4,623	99%
Japan	36	58%	4,125	44%
Poland	67	84%	2,898	73%
Netherlands	7	57%	2,451	96%
Canada	45	49%	2,246	34%
Italy	76	68%	2,232	52%
Switzerland	21	29%	1,801	31%
Spain	52	90%	1,637	87%
Colombia	48	100%	1,535	100%
Cuba	35	100%	1,525	100%
Chile	23	83%	1,348	69%
Uganda	3	67%	1,321	15%
Romania	28	75%	1,318	68%
Indonesia	39	72%	1,297	73%
South Korea	15	33%	1,223	16%
Russian Federation	25	100%	1,133	100%
Pakistan	23	61%	1,131	60%
Sweden	18	17%	1,119	22%
Germany	22	86%	924	81%

Table 9.9. Countries with more than 900 articles, biomed

Table 9.9 shows the countries with the most biomed articles (leaving out APCLand), arranged by number of 2015 articles. This partially

fleshes out Table 9.5. Note, for example, the dominance of free OA in Brazil, Iran, Turkey, Spain, Colombia and Cuba (among others)—and the dominance of APC-charging journals in India and China as well as the United States, United Kingdom and Canada.

10. Science, Technology, Engineering and Math

STEM—in this case, excluding human biology and medicine, as well as social sciences—includes slightly more gold OA journals than biomed, almost the same number of 2014 articles, almost the same percentage of APC-charging journals and articles in those journals—but a *lot* less revenue than biomed. (*PLOS One* is *not* included in these discussions.)

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	1,861	1,740	85,894	49
Pay	1,123	1,037	122,079	118
Total	2,984	2,777	207,973	75
Free%	62%	63%	41%	

Table 10.1. Journals and articles, STEM

Table 10.1 shows that six out of ten STEM journals in *DOAJ* are free, as are almost two-thirds of journals active in 2015—but the APC-charging journals publish almost six out of ten articles. On average, fee-charging journals published 2.4 times as many articles per journal in 2015 as free ones did.

	2015	2014	2013	2012	2011
Journals	2,777	2,879	2,768	2,478	2,193
%Free	63%	62%	63%	65%	68%
Articles	207,973	197,924	178,943	157,026	123,498
%Free	41%	45%	45%	48%	52%

Table 10.2. Journals and articles by year, STEM

STEM article count keeps growing, substantially in 2015 if not quite as dramatically as in 2012-2014. Figure 10.1 shows free and pay articles graphically: free articles rising through 2014 and declining slightly in 2015, pay articles continuing strong growth.



Figure 10.1. Free and pay articles by year, STEM

Article Volume

	Journals	%Free	Articles	%Free
Largest: 600+	51	22%	77,618	24%
Large: 150-599	164	34%	43,993	28%
Med.: 60-149	430	55%	38,594	55%
Small: 20-59	1,076	72%	36,885	71%
Smallest: 0-19	1,263	62%	10,883	70%

Table 10.3. Article volume, STEM

While most of the largest journals charge APCs, there are a significant number of free journals—and those journals are slightly *more* prolific than the average of APC-charging journals. Other patterns are typical, with mostly-free journals and articles in all but the two larger brackets.

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	116	10%	4%	41,515	34%	20%
\$600-\$1.399	401	36%	13%	21,968	18%	11%
\$200-\$599	284	25%	10%	23,675	19%	11%
\$2-\$199	322	29%	11%	34,921	29%	17%
Free	1,861		62%	85,894		41%

Table 10.4. APC levels, STEM

Unlike biomed, STEM has relatively few very expensive journals—but those journals publish one-third of all articles in fee journals. There are a surprising number of journals with very low APCs, publishing more articles than either intermediate group. Average cost per article in APC-charging journals is \$903; for all journals it's \$530.

Starting Date



Figure 10.2. Starting dates, STEM

Figure 10.2 shows steady growth among free journals in most of the late 1990s through 2011, with modest growth in fee-charging journals until a dramatic rise from 2005 through 2013.

Region and “World”

Region	Journals	%Free	Articles	%Free
APCLand	480	15%	49,057	9%
Asia	498	46%	48,936	21%
Western Europe	433	73%	37,194	67%
Eastern Europe	573	87%	25,516	75%
Latin America	502	88%	18,989	80%
Pacific/English	290	53%	17,869	31%
Middle East	161	75%	6,984	69%
Africa	47	47%	3,428	40%

Table 10.5. Journals by region, STEM

As with biomed, APCLand publishes the most STEM articles, but here it's almost tied with Asia, which has more journals. Additionally, Latin America and Pacific/English rank much lower than for biomed, with Western and Eastern Europe both ranking higher.

Publisher Category

Category	Journals	%Free	Articles	%Free
Univ/college	1,085	86%	52,958	65%
Miscellaneous	572	64%	52,110	45%
Open Access	630	18%	45,827	16%
Traditional	325	53%	31,012	31%
Society/govt	372	73%	26,066	42%

Table 10.6. Publisher categories, STEM

Table 10.6, also arranged by 2015 article count, shows a very different picture than for biomed, with universities and colleges publishing the most journals (predominantly free) and articles (two-thirds free), while OA multijournal publishers trail miscellaneous publishers (with one or two journals) in articles, although OA publishers have more journals.

Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	458	15.3%	
Grew 25-49.9%	282	9.4%	24.8%
Grew 10-24.99%	251	8.4%	33.2%
Even, ±9.99%	635	21.3%	54.5%
Shrank 10-24.99%	358	12.0%	66.5%
Shrank 25-49.99%	383	12.8%	79.3%
Shrank 50%+	513	17.2%	96.5%
No 2014 count	105	3.5%	

Table 10.7. Growth and shrinkage, STEM

Table 10.7 is quite similar to Table 9.7, with slightly more extreme growth and extreme shrinkage.

Subjects

Subject	Journals	%Free	Articles	%Free
Agriculture	436	62%	21,939	44%
Chemistry	168	52%	15,015	33%
Computer Science	381	51%	26,271	21%
Earth Sciences	321	78%	10,451	60%
Ecology	256	68%	12,196	55%
Engineering	342	60%	28,044	38%
Mathematics	277	72%	11,239	55%
Other Sciences	195	59%	33,488	25%
Physics	162	51%	22,493	56%
Technology	202	68%	15,700	64%
Zoology	244	59%	11,137	45%

Table 10.8. Subjects, STEM

Table 10.8 is in alphabetic order for easy reference. “Other Sciences” includes multidisciplinary journals that appear predominantly oriented to science and medicine (others appear in “Miscellany” within HSS).

Countries in OAWorld (partial)

Table 10.9, on the next page, shows the OAWorld countries (that is, excluding APCLand) that published at least 1,000 articles in STEM in 2015. India leads the pack and mostly charges fees; the US and UK are nearly tied for second. Among the top ten, Brazil, Poland, Italy, Romania and France stand out for high percentages of free articles and journals.

Country	Journals	%Free	Articles	%Free
India	173	27%	27,269	10%
United States	228	50%	15,888	27%
United Kingdom	56	29%	14,981	58%
Brazil	240	85%	11,899	73%
Germany	95	65%	8,711	51%
Poland	156	90%	6,456	79%
Italy	58	79%	5,052	91%
Pakistan	28	39%	4,187	4%
Romania	114	86%	4,113	77%
France	44	93%	3,593	98%
South Korea	22	41%	3,361	10%
Russian Federation	42	90%	3,157	82%
Turkey	62	84%	2,806	81%
Serbia	43	93%	2,625	54%
Iran, Islamic Republic of	66	76%	2,578	77%
Indonesia	99	57%	2,495	51%
Japan	44	61%	2,471	41%
Malaysia	30	73%	2,423	97%
Spain	84	96%	2,266	91%
Ukraine	35	91%	1,995	93%
Hong Kong	22	55%	1,877	38%
China	15	80%	1,829	50%
Czech Republic	39	67%	1,788	37%
Colombia	69	96%	1,759	99%
Chile	37	86%	1,617	85%
Mexico	47	89%	1,372	92%
Croatia	40	90%	1,236	91%
Singapore	15	13%	1,197	8%
Nigeria	13	15%	1,170	10%
Canada	32	72%	1,053	61%

Table 10.9. Countries in OAWorld (partial), STEM

11. Humanities and Social Sciences

The humanities and social sciences (HSS) have more gold OA journals than other segments (more than 4,000 in all), but they're mostly smaller journals—and very few charge APCs. Total potential revenue is a tiny fraction of either of the other segments, less than one-seventeenth that of biomed.

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	4,060	3,681	95,780	26
Pay	403	385	26,292	68
Total	4,463	4,066	122,072	30
Free%	91%	91%	78%	

Table 11.1. Journals and articles, HSS

APC-charging journals tended to publish 2.6 times as many articles per journal as free journals—but only one out of eleven HSS journals charges APCs, and less than one-quarter of 2015 articles appeared in those journals.

	2015	2014	2013	2012	2011
Journals	4,066	4,251	4,162	3,933	3,546
%Free	91%	91%	91%	92%	92%
Articles	122,072	122,898	115,176	109,226	94,619
%Free	78%	78%	80%	81%	85%

Table 11.2. Journals and articles by year, HSS

HSS article count declined trivially (less than 1%) in 2015, and this is the segment where delayed posting by very small journals is most likely to change the picture (note the decline in journals with 2015 articles: it's a reasonable bet that some of those will show up later).

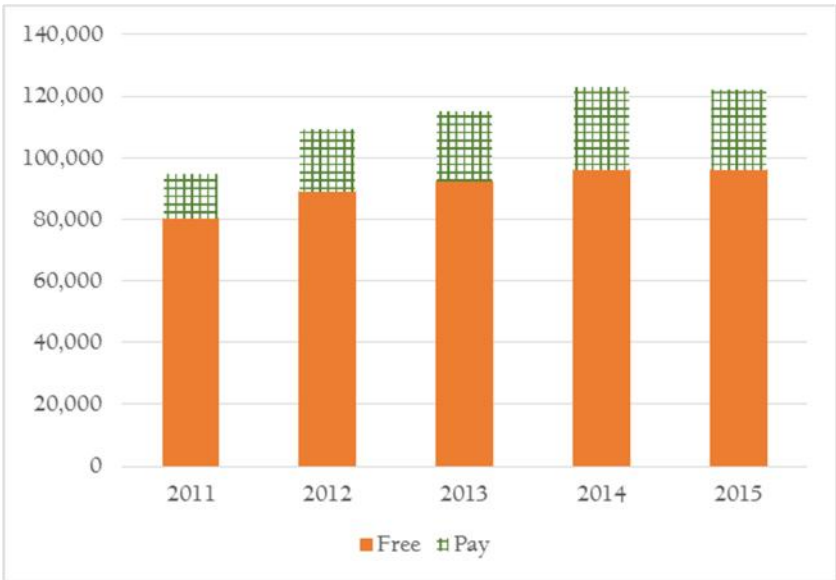


Figure 11.1. Free and pay articles by year, HSS

Figure 11.1 suggests that free articles didn't really decline at all in 2015, and that's about right: they were only down 175, or less than 0.2%. Most of the small and possibly illusory decline was in fee journals.

Article Volume

	Journals	%Free	Articles	%Free
Largest: 600+	10	20%	11,093	15%
Large: 150-599	47	55%	12,238	53%
Med.: 60-149	254	80%	21,187	79%
Small: 20-59	1,760	91%	55,232	90%
Smallest: 0-19	2,392	93%	22,322	94%

Table 11.3. Article volume, HSS

Typically, larger journals are more likely to charge fees and most journals are on the small side—but unlike the other segments, small and, to a lesser extent, smallest journals dominate HSS in terms of total article volume and have even fewer paid instances than in other segments.

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	18	4%	0%	2,943	11%	2%
\$600-\$1,399	53	13%	1%	1,503	6%	1%
\$200-\$599	134	33%	3%	7,179	27%	6%
\$2-\$199	198	49%	4%	14,667	56%	12%
Free	4,060		91%	95,780		78%

Table 11.4. APC levels, HSS

It may be surprising that there are even 18 high-priced HSS journals—and the article count may be misleading, as one psychology journal accounts for two-thirds of the count. The bulk of the small percentage of APC-charging HSS journals have low or nominal fees. Average cost per article for articles in fee-charging journals was \$407 for 2015—but the average for all HSS articles was \$88.

Starting Date



Figure 11.2. Starting dates, HSS

Quite a few early free journals, and a pattern of growth starting in the mid-1990s and continuing until 2011, with some decline since then. Too few APC journals for the pattern to mean very much.

Region and “World”

Region	Journals	%Free	Articles	%Free
Latin America	1,119	99%	27,329	99%
Eastern Europe	707	92%	27,196	73%
Western Europe	1,340	94%	26,720	93%
Pacific/English	688	89%	15,582	77%
Asia	281	68%	11,555	36%
Middle East	203	87%	8,048	82%
APCLand	70	50%	4,037	20%
Africa	55	49%	1,605	32%

Table 11.5. Journals by region, HSS

Table 11.5 is another example of how sharply humanities and social sciences differ from other segments. The largest number of articles come from Latin America, with only 1% APC-charging journals—and Eastern Europe isn't far behind. Neither is Western Europe, with the most journals: consider that only 609 articles separate Western Europe from Latin America, about 2% of each region's output—and Western Europe is nearly as overwhelmingly free as Latin America.

Asia and Africa stand out for relatively low percentages of articles in free journals; APCLand stands out for having so few journals and articles (and, as you'd expect, the lowest free percentage).

Publisher Category

Category	Journals	%Free	Articles	%Free
Univ/college	2,794	96%	68,276	92%
Miscellaneous	980	89%	30,224	73%
Open Access	210	43%	11,638	18%
Society/govt	335	93%	8,069	84%
Traditional	144	75%	3,865	58%

Table 11.6. Publisher categories, HSS

Table 11.6 shows that universities and colleges dominate HSS OA publishing, with more articles (and *many* more journals) than all other categories combined. Even traditional publishers, to the extent they show up at all, mostly publish journals financed by something other than APCs (probably society sponsorship in many cases).

Growth and Shrinkage

Table 11.7 shows one interesting consistency among segments: between 21% and 22% of journals published roughly the same number of articles in-2014 and 2015. Otherwise, HSS shows a slightly lower percentage of journals with very fast shrinkage and a slightly higher percentage with fast growth.

Change 2014-15	Count	Percent	Cum%
Grew 50%+	719	16.1%	
Grew 25-49.9%	400	9.0%	25.1%
Grew 10-24.99%	441	9.9%	35.0%
Even, ±9.99%	970	21.7%	56.7%
Shrank 10-24.99%	520	11.7%	68.3%
Shrank 25-49.99%	573	12.8%	81.2%
Shrank 50%+	628	14.1%	95.2%
No 2014 count	212	4.8%	

Table 11.7. Growth and shrinkage, HSS

Subjects

Subject	Journals	%Free	Articles	%Free
Anthropology	287	90%	6,926	87%
Arts & Architecture	246	95%	5,075	91%
Economics	570	79%	15,859	68%
Education	620	91%	15,698	88%
History	296	99%	7,544	99%
Language & Literature	573	97%	13,298	91%
Law	237	96%	5,239	91%
Library Science	141	97%	2,874	98%
Media & Communications	182	93%	4,560	82%
Miscellany	135	84%	11,451	42%
Philosophy	187	96%	3,336	95%
Political Science	228	94%	5,196	87%
Psychology	177	84%	6,457	58%
Religion	137	88%	3,921	67%
Sociology	447	89%	14,638	74%

Table 11.8. Subjects, HSS

As usual, Table 11.8 is in alphabetic order. “Miscellany” covers multi-disciplinary journals that didn’t seem to be predominantly STEM and biomed, and a few that just didn’t fit anywhere else: notably, it’s the only category in which most articles appeared in-fee-charging journals.

Countries in OAWorld (partial)

Table 11.9, on the next page, shows OAWorld countries with at least 900 articles in 2015 in HSS journals. Brazil leads the pack, with the U.S. a distant second and Spain not far behind—and that’s true for both articles and journals. Of the big three, only the U.S. shows much in the way of fee-based OA, and even that’s only 22% of articles and 12% of journals. There are only four countries where APC-charging journals published a majority of OA articles in HSS in 2015, and in all four cases the free percentage is dramatically below the 60% of the fifth country: India with 20% free, Macedonia with 16% free, South Africa with 24% free—and Singapore with 3% free. India had more articles than the other three combined, but only slightly more.

Country	Journals	%Free	Articles	%Free
Brazil	584	99%	16,533	99%
United States	472	88%	10,877	78%
Spain	424	99%	9,255	97%
Romania	180	85%	7,303	64%
Turkey	139	90%	6,409	84%
Russian Federation	80	94%	6,335	77%
India	57	56%	4,610	20%
Italy	169	98%	3,601	99%
United Kingdom	169	76%	3,201	73%
Poland	120	96%	3,035	95%
Colombia	146	99%	2,973	99%
Canada	122	91%	2,876	70%
Germany	129	97%	2,583	96%
Indonesia	115	70%	2,537	68%
France	126	99%	2,393	100%
Mexico	96	99%	2,370	99%
Ukraine	26	85%	2,029	60%
Chile	88	99%	2,026	97%
Macedonia, the Former Yugoslav Republic of	12	83%	1,982	16%
Australia	80	93%	1,710	82%
Argentina	95	100%	1,435	100%
Croatia	52	98%	1,281	95%
South Africa	39	44%	1,221	24%
Portugal	55	93%	1,186	84%
Serbia	47	96%	1,110	92%
Singapore	13	38%	1,051	3%
Netherlands	42	88%	1,006	87%
Iran, Islamic Republic of	39	87%	935	91%

Table 11.9. Countries in OAWorld (partial), HSS

12. Regions and APCLand

Several earlier chapters have mentioned regions: groupings of countries, usually based on geography. There's good reason to believe that there are regional differences in OA publishing, especially once the eleven publishers in APCLand are removed from the picture.

Region	Journals	%Free	Articles	%Free
APCLand	1,391	11%	133,800	5%
Africa	141	53%	7,731	35%
Asia	1,221	56%	101,276	29%
Eastern Europe	1,474	89%	61,126	75%
Latin America	1,971	95%	65,298	90%
Middle East	675	85%	31,237	79%
Pacific/English	1,344	67%	55,372	44%
Western Europe	2,106	85%	81,267	73%

Table 12.1. Journals and articles by region

Table 12.1 shows the overall picture, including huge differences in extent of open access and prevalence of fees. As usual, *PLOS One* in APCLand is omitted: its inclusion would make the APCLand free-article percentage, already by far the lowest, even lower.

Chapters 13 through 19 focus on each region of OAWorld, using essentially the same format as Chapters 9 through 11, except that there's no region table and there is a segment table in each chapter.

After considering various orders for the chapters (that is, which region is Chapter 13?) I've given up and arranged them alphabetically, as in the table above after APCLand.

APCLand

Some discussion, some of the tables and both figures for this imaginary Region of the Money have already appeared. The rest of this chapter provides the remaining tables.

	Journals	Active 2015	Articles	Art/Jrnl
Free	151	148	6,735	46
Pay	1,240	1,153	127,065	110
Total	1,391	1,301	133,800	103
Free%	11%	11%	5%	

Table 12.2. Journals and articles, APCLand

To the extent that there are free journals in APCLand, they have less than half as many articles (on average) as APC-charging ones.

	2015	2014	2013	2012	2011
Journals	1,301	1,345	1,164	930	802
%Free	11%	10%	9%	7%	5%
Articles	133,800	125,531	94,079	77,608	57,805
%Free	5%	5%	4%	4%	5%

Table 12.3. Journals and articles by year, APCLand

As Table 12.3 shows, APCLand keeps growing, if more slowly—and, unusually, the percentage of free journals is increasing (presumably because of society sponsorships and new journals with free trial periods).

Article Volume

	Journals	%Free	Articles	%Free
Largest: 600+	39	3%	54,938	2%
Large: 150-599	155	3%	42,097	2%
Med.: 60-149	195	9%	18,221	9%
Small: 20-59	394	21%	13,884	20%
Smallest: 0-19	608	8%	4,660	13%

Table 12.4. Article volume, APCLand

Even in APCLand, most journals are small or very small. The scant presence of no-fee journals is mostly in the small range—and the smallest journals are very small (an average of eight articles per journal, compared to 35 for small journals).

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	584	47%	42%	104,841	83%	78%
\$600-\$1,399	551	44%	40%	16,252	13%	12%
\$200-\$599	105	8%	8%	5,972	5%	4%
Free	151		11%	6,735		5%

Table 12.5. APC levels, APCLand

Even without *PLOS One*, the most expensive journals publish three-quarters of the articles and make up nearly half of the fee-charging journals. There are no journals in APCLand with nominal charges, although by APCLand standards \$200-\$599 might be called nominal. The average cost per article in APC-charging journals is \$1,849; including free journals brings that down to \$1,756. (The costs per article in Chapter 2 include *PLOS One* and are therefore somewhat lower.)

Publisher Category

Category	Journals	%Free	Articles	%Free
Open Access	1,074	6%	92,520	2%
Traditional	301	27%	34,446	13%
Univ/college	16	19%	6,834	1%

Table 12.6. Publisher categories, APCLand

There are no real surprises in Table 12.6.

Segments

	HSS	Biomed	STEM
\$1,400+	8	484	84
Articles	2,680	69,361	32,800
Revenue	\$5,060,380	\$154,124,190	\$57,141,057
\$600-\$1.399	13	215	245
Articles	182	5,727	10,343
Revenue	\$180,504	\$5,336,373	\$10,686,735
\$200-\$599	13	57	34
Articles	386	4,126	1,460
Revenue	\$141,176	\$1,747,520	\$567,511
Free	35	40	73
Articles	789	1,492	4,454

Table 12.7. Articles and revenue by segment, APCLand

Biomed is where the big money is, as Table 12.7 reminds us—and in some ways it's amazing that APCLand can dig more than \$5 million out of HSS (almost all of which is one very large psychology journal and one fairly large sociology journal).

Subjects

Table 12.8 shows APCLand publishing by subject (the country list appears in Chapter 7) There's a fair amount of interesting but possibly trivial stuff. For example, biology manages a clean sweep, with every 2015 article appearing in an APC-charging journal (so do language & literature and media & communications, but neither has many articles)—and, conversely, the handful of APCLand journals in library science and political science are all free. All three of them.

Subject	Journals	%Free	Articles	%Free
Agriculture	40	15%	3,518	5%
Anthropology	6	33%	163	17%
Arts & Architecture	4	75%	139	47%
Biology	158	3%	20,154	0%
Chemistry	55	15%	5,587	5%
Computer Science	46	13%	2,535	7%
Earth Sciences	37	11%	1,909	6%
Ecology	34	21%	2,119	11%
Economics	17	76%	323	79%
Education	6	33%	107	17%
Engineering	65	14%	3,495	15%
Language & Literature	2	0%	20	0%
Law	4	50%	100	57%
Library Science	1	100%	20	100%
Mathematics	60	10%	4,625	4%
Media & Communications	2	0%	55	0%
Medicine	683	5%	60,552	2%
Miscellany	3	67%	101	77%
Other Sciences	20	20%	15,369	3%
Philosophy	2	50%	35	43%
Physics	60	20%	5,302	33%
Political Science	2	100%	74	100%
Psychology	6	17%	2,146	1%
Religion	2	50%	103	12%
Sociology	13	38%	651	23%
Technology	33	24%	3,114	13%
Zoology	30	13%	1,484	9%

Table 12.8. Subjects, APCLand

13. Africa

Africa (excluding the Middle East) has a fairly long history of open access publishing, but it's on a relatively small scale, with the fewest journals and articles of any region.

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	75	70	2,715	39
Pay	66	64	5,016	78
Total	141	134	7,731	58
Free%	53%	52%	35%	

Table 13.1. Journals and articles, Africa

Most journals don't charge APCs, but most articles appear in those that do. The average APC-charging journals published twice as many articles in 2015 as the average free journal.

	2015	2014	2013	2012	2011
Journals	134	139	138	132	115
%Free	52%	53%	52%	54%	53%
Articles	7,731	8,621	7,947	9,267	9,096
%Free	35%	33%	30%	26%	22%

Table 13.2. Journals and articles by year, Africa



Figure 13.1. Free and pay articles by year, Africa

The percentage of free articles has increased in recent years—an unusual pattern—but overall OA activity has been up and down, with its peak in 2012 for journals in *DOAJ* as of December 31, 2015.

Article Volume

	Journals	%Free	Articles	%Free
Largest: 600+	2	0%	1,869	0%
Large: 150-599	8	50%	2,125	43%
Med.: 60-149	12	42%	1,100	44%
Small: 20-59	58	48%	2,024	48%
Smallest: 0-19	61	62%	613	59%

Table 13.3. Article volume, Africa

The two largest journals both charge fees—as do at least half of all but the smallest journals.

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$600-\$1.399	11	17%	8%	1,333	27%	17%
\$200-\$599	25	38%	18%	1,183	24%	15%
\$2-\$199	30	45%	21%	2,500	50%	32%
Free	75		53%	2,715		35%

Table 13.4. APC levels, Africa

There are no high-priced African OA journals, and journals with nominal APCs publish almost as many articles as those with low or medium APCs (but free journals publish even more).

Starting Date



Figure 13.2. Starting dates, Africa

Africa's had journals that are now OA for decades, with more activity this century—and it's interesting (and encouraging) that the spike in free journals is more recent than the spike in pay journals.

Segments

	HSS	Biomed	STEM
\$600-\$1.399	4	4	2
Articles	283	278	772
Revenue	\$199,093	\$173,094	\$467,710
\$200-\$599	8	4	13
Articles	384	349	450
Revenue	\$162,572	\$99,250	\$183,007
\$2-\$199	16	4	9
Articles	421	1,239	840
Revenue	\$42,621	\$211,980	\$78,715
Free	24	24	22
Articles	517	832	1,366

Table 13.5. Articles and revenue by segment, Africa

It's interesting that Africa seems to have more money for STEM than for biomed, largely because the most biomed articles appear in journals with nominal APCs.

Publisher Category

Category	Journals	%Free	Articles	%Free
Miscellaneous	45	49%	2,928	18%
Open Access	37	41%	2,339	20%
Univ/college	46	61%	2,042	65%
Society/govt	8	75%	311	86%
Traditional	5	80%	111	87%

Table 13.6. Publisher categories, Africa

Not a lot to say here, other than the large amount of singleton and two-journal publishers and the small role of societies and traditional publishers.

Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	12	8.5%	
Grew 25-49.9%	10	7.1%	15.6%
Grew 10-24.99%	13	9.2%	24.8%
Even, $\pm 9.99\%$	36	25.5%	50.4%
Shrank 10-24.99%	24	17.0%	67.4%
Shrank 25-49.99%	26	18.4%	85.8%
Shrank 50%+	18	12.8%	98.6%
No 2014 count	2	1.4%	

Table 13.7. Growth and shrinkage, Africa

A fair amount of moderate shrinkage, and few rapidly-growing journals, but still more than half of journals were growing or steady.

Countries

Table 13.8 includes all African countries with at least one active OA journal in 2015. It's arranged by number of articles. Four countries show substantial numbers of articles: South Africa, Nigeria, Uganda and Morocco. All four have most 2015 articles appearing in APC-charging journals, although it's a small majority for South Africa and Uganda.

Country	Journals	%Free	Articles	%Free
South Africa	73	55%	2,412	46%
Nigeria	28	18%	1,965	10%
Uganda	3	67%	1,321	15%
Morocco	7	71%	971	49%
Algeria	5	100%	316	100%
Mauritius	2	50%	204	5%
Ethiopia	5	100%	194	100%
Kenya	7	71%	87	71%
Zambia	2	0%	78	0%
Libya	2	50%	76	43%
Tanzania, United Republic of	1	100%	40	100%
Madagascar	1	100%	16	100%
Rwanda	1	100%	16	100%
Tunisia	1	100%	12	100%
Burundi	1	100%	10	100%
Ghana	1	0%	10	0%
Democratic Republic of the Congo	1	100%	3	100%

Table 13.8. Country of publication, Africa

Subjects

Table 15.9 shows subjects covered in African open access journals, arranged by the number of 2015 articles. Medicine has by far the most articles, with technology and agriculture nearly tied but far behind.

Subject	Journals	%Free	Articles	%Free
Medicine	33	73%	2,624	31%
Technology	4	50%	910	47%
Agriculture	7	29%	908	8%
Other Sciences	10	40%	553	65%
Religion	8	38%	544	10%
Zoology	8	50%	267	44%
Computer Science	5	40%	257	5%
Economics	7	29%	211	20%
Ecology	4	75%	188	93%
Engineering	4	75%	166	69%
Language & Literature	8	38%	157	28%
Sociology	6	17%	125	4%
Miscellany	1	100%	123	100%
History	7	86%	111	87%
Chemistry	3	67%	110	73%
Education	5	80%	98	80%
Law	4	50%	80	24%
Biology	6	33%	74	23%
Media & Communications	2	50%	57	25%
Physics	1	0%	57	0%
Political Science	3	67%	50	56%
Psychology	2	50%	37	30%
Library Science	1	0%	12	0%
Mathematics	1	0%	12	0%
Philosophy	1	100%	0	

Table 13.9. Subjects, Africa

14. Asia

Asia publishes more OA articles than any other region in OAWorld—but also has the lowest percentage of articles in free journals. One country, India, accounts for more than half of the articles.

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	683	634	29,138	46
Pay	538	499	72,138	145
Total	1,221	1,133	101,276	89
Free%	56%	56%	29%	

Table 14.1. Journals and articles, Asia

Most journals don't charge APCs, but those that do average 3.1 times as many articles as those that don't, so less than one-third of articles are free.

	2015	2014	2013	2012	2011
Journals	1,133	1,185	1,167	1,067	866
%Free	56%	56%	56%	57%	59%
Articles	101,276	97,894	82,477	68,288	49,919
%Free	29%	30%	35%	38%	44%

Table 14.2. Journals and articles by year, Asia

It's not that free journals have declined—the article count went up through 2014 and decreased only a few hundred in 2015—but that fee

publishing has grown much more rapidly. Figure 14.1 shows this pattern graphically.

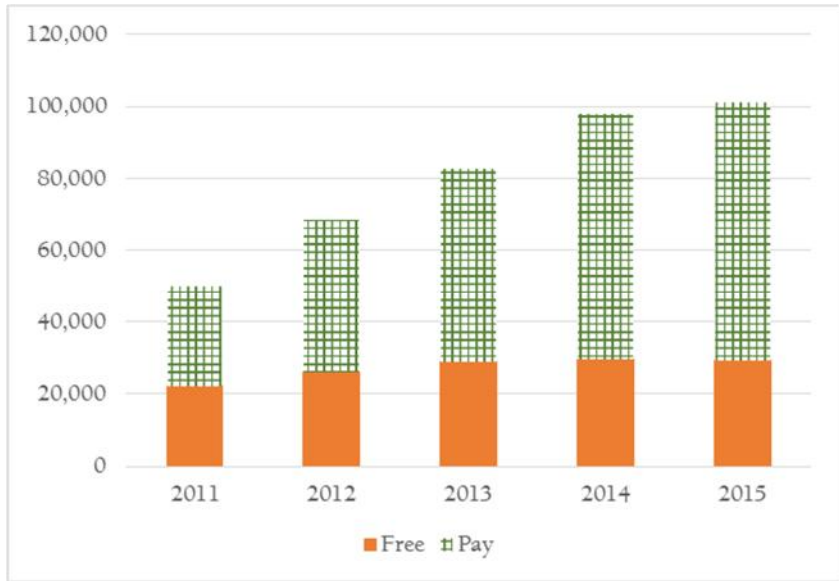


Figure 14.1. Free and pay articles by year, Asia

Article Volume

	Journals	%Free	Articles	%Free
Largest: 600+	30	3%	37,478	5%
Large: 150-599	98	32%	25,585	26%
Med.: 60-149	214	45%	19,417	45%
Small: 20-59	427	62%	14,686	62%
Smallest: 0-19	452	65%	4,110	69%

Table 14.3. Article volume, Asia

The pattern's typical: the larger the journal, the more likely it is to charge.

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	7	1%	1%	4,669	6%	5%
\$600-\$1,399	48	9%	4%	5,850	8%	6%
\$200-\$599	151	28%	12%	18,207	25%	18%
\$2-\$199	332	62%	27%	43,412	60%	43%
Free	683		56%	29,138		29%

Table 14.4. APC levels, Asia

Journals with nominal fees published the most articles, those with relatively high fees the fewest, which is a little unusual. The average cost per article in APC-charging journals is a relatively low \$323; including all journals, it's \$230.

Starting Date

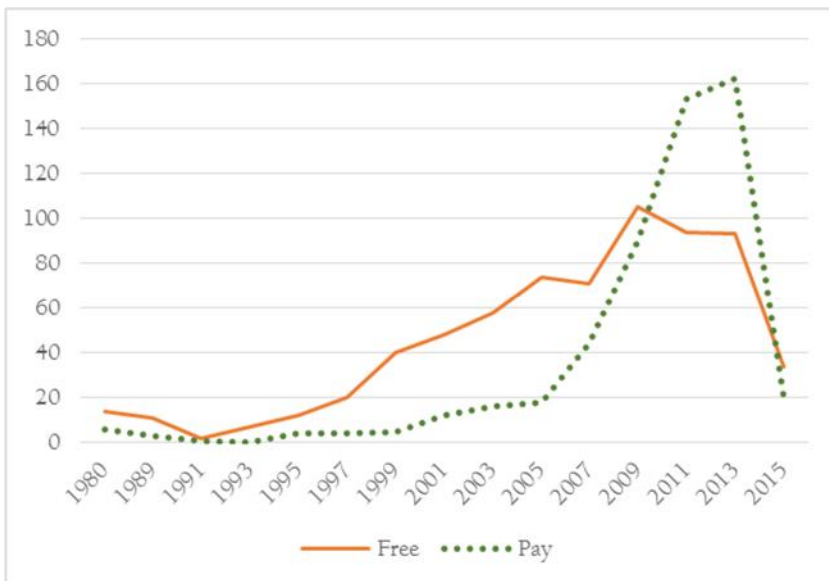


Figure 14.2. Starting dates, Asia

Figure 14.2 is unusual: not only do pay journals shoot up starting in 2006 and continuing to 2013, free journal startups actually *decline* after 2007, with pay (APC-charging) journal startups dominating from 2009 through 2013.

Segments

	HSS	Biomed	STEM
\$1,400+	0	6	1
Articles	0	4,656	13
Revenue	\$0	\$8,740,555	\$19,500
\$600-\$1.399	1	30	16
Articles	60	4,018	1,772
Revenue	\$39,000	\$2,885,244	\$1,366,147
\$200-\$599	19	49	74
Articles	1,454	4,259	12,494
Revenue	\$527,917	\$1,351,047	\$4,308,127
\$2-\$199	60	87	156
Articles	5,880	13,384	24,148
Revenue	\$563,200	\$1,208,422	\$2,256,107
Free	178	241	215
Articles	4,161	14,468	10,509

Table 14.5. Articles and revenues by segment, Asia

Expensive medical journals account for most of the potential revenue (with two journals accounting for two-thirds of the \$8.7 million)—and there aren't any really expensive HSS journals. It appears that the Asian key to revenue in STEM is lots of articles with relatively low APCs.

Publisher Category

Table 14.6 shows a lot of OA publishing and singleton/doubleton publishers; traditional publishers don't play a big role.

Category	Journals	%Free	Articles	%Free
Miscellaneous	349	46%	37,589	16%
Open Access	261	36%	26,858	26%
Univ/college	394	75%	20,220	48%
Society/govt	188	64%	14,134	38%
Traditional	29	45%	2,475	40%

Table 14.6. Publisher categories, Asia

Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	165	13.5%	
Grew 25-49.9%	114	9.3%	22.9%
Grew 10-24.99%	99	8.1%	31.0%
Even, \pm 9.99%	265	21.7%	52.7%
Shrank 10-24.99%	162	13.3%	65.9%
Shrank 25-49.99%	192	15.7%	81.7%
Shrank 50%+	188	15.4%	97.1%
No 2014 count	36	2.9%	

Table 14.7. Growth and shrinkage, Asia

If anything is unusual in Table 14.7, it is that moderate shrinkage (10% to 49%) is a little higher than overall.

Countries

India does the most and mostly charges, even at the journal level. China and Japan are distant second and third for articles, Indonesia and Japan for journals—and Indonesia is unique among Asian countries publishing 5,000 or more articles in 2015 because most of those articles appear in free journals.

Country	Journals	%Free	Articles	%Free
India	461	45%	54,650	21%
China	47	51%	9,039	19%
Japan	94	65%	6,907	45%
Indonesia	253	65%	6,329	62%
Pakistan	70	51%	5,833	19%
South Korea	40	40%	5,106	11%
Malaysia	63	75%	3,419	89%
Hong Kong	39	51%	3,390	42%
Singapore	28	25%	2,248	6%
Bangladesh	31	65%	1,278	36%
Taiwan, Province of China	26	77%	617	69%
Thailand	15	87%	616	87%
Nepal	17	88%	555	82%
Philippines	12	92%	426	56%
Korea, Republic of	6	67%	399	23%
Sri Lanka	12	100%	199	100%
Korea, Democratic People's Republic of	1	100%	121	100%
Brunei Darussalam	1	100%	65	100%
Viet Nam	1	0%	33	0%
Kyrgyzstan	2	100%	32	100%
Cambodia	1	100%	10	100%
Bhutan	1	100%	4	100%

Table 14.8. Country of publication, Asia

Subjects

Finally, Table 14.9 shows subjects in order by 2015 title count. Somewhat typically, medicine is first—but computer science and engineering follow, both charging for at least seven out of eight articles.

Subject	Journals	%Free	Articles	%Free
Medicine	376	63%	37,707	36%
Computer Science	139	29%	16,340	9%
Engineering	72	43%	10,978	12%
Other Sciences	47	40%	6,521	8%
Technology	38	63%	3,842	71%
Agriculture	56	45%	3,268	22%
Miscellany	9	33%	3,237	2%
Biology	66	38%	3,078	28%
Chemistry	31	58%	2,670	45%
Zoology	33	45%	2,451	27%
Economics	53	51%	1,663	39%
Education	62	69%	1,528	57%
Sociology	26	65%	1,033	33%
Ecology	22	45%	853	29%
Earth Sciences	18	78%	761	81%
Mathematics	25	84%	708	91%
Language & Literature	28	82%	669	65%
Media & Communications	6	50%	625	16%
Political Science	6	67%	588	29%
Law	14	79%	570	41%
Physics	17	76%	544	71%
Anthropology	13	62%	479	77%
Religion	17	65%	309	60%
Psychology	10	90%	226	92%
Library Science	13	100%	224	100%
Arts & Architecture	12	83%	181	82%
History	8	75%	171	67%
Philosophy	4	100%	52	100%

Table 14.9. Subjects, Asia

15. Eastern Europe

Eastern Europe is roughly in the middle in terms of OA articles published, and three-quarters of those articles are in free journals. What fees there are, are usually low, with no apparent gold rush in biomed and with universities and colleges dominating OA publishing. Growth seems to have stalled, with 2015 lower than 2013.

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	1,308	1,234	45,659	37
Pay	166	164	15,467	94
Total	1,474	1,398	61,126	44
Free%	89%	88%	75%	

Table 15.1. Journals and articles, Eastern Europe

APC-charging journals published an average of 2.5 times as many articles per journal as free journals, but there aren't a lot of them.

	2015	2014	2013	2012	2011
Journals	1,398	1,426	1,379	1,243	1,108
%Free	88%	89%	89%	89%	88%
Articles	61,126	63,247	62,178	56,466	49,165
%Free	75%	74%	75%	77%	78%

Table 15.2. Journals and articles by year, Eastern Europe



Figure 15.1. Free and pay articles by year, Eastern Europe

Article Volume

	Journals	%Free	Articles	%Free
Largest: 600+	7	29%	6,785	21%
Large: 150-599	36	75%	8,407	70%
Med.: 60-149	215	74%	18,658	73%
Small: 20-59	630	90%	21,200	90%
Smallest: 0-19	586	94%	6,076	94%

Table 15.3. Article volume, Eastern Europe

As Table 15.3 shows, there are *very* few very large OA journals in Eastern Europe and not very many large ones; not only are most journals small or very small, small journals publish the most articles. The usual inverse correlation between size and free percentage holds, but since even the large group is 70% free, it's largely irrelevant.

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	3	2%	0%	262	2%	0%
\$600-\$1.399	11	7%	1%	839	5%	1%
\$200-\$599	47	28%	3%	4,622	30%	8%
\$2-\$199	105	63%	7%	9,744	63%	16%
Free	1,308		89%	45,659		75%

Table 15.4. APC levels, Eastern Europe

When it comes to APCs, the third and fourth lines of Table 15.4 may say it all: nearly two-thirds of all APC-based articles involved nominal fees, and almost all the rest involved fairly low fees. Average cost per article for APC-based journals in 2015 was a very low \$236, dropping to \$60 including all articles.

Starting Date



Figure 15.2. Starting dates, Eastern Europe

Quite a few early journals are now open access, new journal introductions began growing in the mid-90s and, with a blip in 2002-2003, continued growing through 2010-2011—and there never was much growth in APC-charging journals.

Segments

	HSS	Biomed	STEM
\$1,400+	0	2	1
Articles	0	102	160
Revenue	\$0	\$166,872	\$293,120
\$600-\$1.399	2	2	7
Articles	107	216	516
Revenue	\$115,302	\$225,432	\$433,898
\$200-\$599	4	17	26
Articles	1,360	846	2,416
Revenue	\$295,405	\$326,617	\$949,020
\$2-\$199	52	12	39
Articles	5,794	679	3,271
Revenue	\$440,415	\$66,605	\$333,651
Free	604	150	480
Articles	19,935	6,571	19,153

Table 15.5. Articles and revenue by segment, Eastern Europe

Table 15.5 shows how unusual fee-based OA is in Eastern Europe: what little revenue there is, is mostly in medium-priced STEM journals, not in biomed... and there are more HSS articles than there are STEM, and more than three times as many as for biomed.

Publisher Category

Category	Journals	%Free	Articles	%Free
Univ/college	739	90%	30,706	84%
Miscellaneous	310	85%	16,212	54%
Traditional	237	93%	6,205	86%
Society/govt	133	86%	5,832	74%
Open Access	55	80%	2,171	67%

Table 15.6. Publisher categories, Eastern Europe

Most OA publishing in Eastern Europe comes from universities and colleges. The runner-up, miscellaneous publishers with one or two journals, has the lowest percentage of free journals. (The bulk of the traditional-publisher journals are published by De Gruyter Open, a division of a traditional publisher, on behalf of sponsoring societies.)

Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	188	12.8%	
Grew 25-49.9%	131	8.9%	21.6%
Grew 10-24.99%	164	11.1%	32.8%
Even, $\pm 9.99\%$	372	25.2%	58.0%
Shrank 10-24.99%	193	13.1%	71.1%
Shrank 25-49.99%	200	13.6%	84.7%
Shrank 50%+	178	12.1%	96.7%
No 2014 count	48	3.3%	

Table 15.7. Growth and shrinkage, Eastern Europe

Table 15.7 shows a fairly high percentage of even journals, with relatively fewer growing very rapidly or shrinking very rapidly.

Countries

Country	Journals	%Free	Articles	%Free
Romania	322	84%	12,734	69%
Poland	343	91%	12,389	82%
Russian Federation	147	94%	10,625	81%
Serbia	102	94%	4,576	71%
Ukraine	69	90%	4,416	79%
Croatia	103	95%	3,022	94%
Czech Republic	87	74%	2,696	48%
Macedonia, the Former Yugoslav Republic of	19	74%	2,268	19%
Bulgaria	34	59%	1,479	50%
Slovenia	54	98%	1,437	99%
Slovakia	43	91%	1,172	84%
Hungary	33	97%	1,070	92%
Lithuania	35	91%	898	79%
Moldova, Republic of	12	100%	490	100%
Estonia	22	100%	356	100%
Montenegro	7	100%	302	100%
Bosnia and Herzegovina	15	93%	290	84%
Albania	4	50%	240	27%
Latvia	6	83%	187	72%
Azerbaijan	3	100%	174	100%
Georgia	2	100%	85	100%
Armenia	3	100%	60	100%
Cyprus	4	100%	55	100%
Belarus	2	100%	49	100%
Kazakhstan	1	100%	31	100%
Kosova	2	0%	25	0%

Table 15.8. Country of publication, Eastern Europe

Table 15.8, arranged in descending order by 2015 articles, provides some interesting items—for example, Romania’s status as publishing more open access than any of the others, most of it from universities. Also mildly interesting: the mostly-pay status of OA in Macedonia, Albania and Latvia (and the fact that APC-charging journals play a bigger role in Romania than in Poland or the Russian Federation).

Subjects

The next page shows Table 15.8, articles by subject, and while medicine has the most articles it’s a slim lead over economics—but medicine has a higher free-article percentage than economics. The only subject where most articles involve payment is Miscellany, mostly interdisciplinary journals with significant HSS involvement—and that’s mostly two very large “megajournals” and a handful of smaller broad-coverage journals.

Subject	Journals	%Free	Articles	%Free
Medicine	153	84%	6,934	80%
Economics	163	80%	6,128	65%
Miscellany	27	63%	4,689	29%
Agriculture	96	77%	3,867	65%
Engineering	75	91%	3,515	83%
Sociology	52	92%	3,244	64%
Chemistry	35	86%	2,708	55%
Technology	44	86%	2,631	82%
Other Sciences	17	76%	2,550	52%
Language & Literature	96	99%	2,445	98%
Education	52	92%	2,221	96%
Physics	31	94%	2,133	97%
Mathematics	64	95%	2,112	91%
Anthropology	68	93%	2,017	85%
Zoology	43	72%	1,673	56%
Computer Science	57	91%	1,580	86%
Earth Sciences	70	99%	1,482	99%
Biology	41	76%	1,480	71%
Ecology	41	85%	1,265	80%
Political Science	58	98%	1,138	99%
Arts & Architecture	31	97%	981	90%
Law	29	100%	957	100%
History	31	100%	897	100%
Psychology	24	100%	848	100%
Philosophy	31	97%	839	95%
Religion	15	100%	343	100%
Media & Communications	16	100%	235	100%
Library Science	14	100%	214	100%

Table 15.9. Subjects, Eastern Europe

16. Latin America

Latin America, including the Caribbean, has by far the highest percentage of free OA publishing of any region. It's also a prolific region, with the second highest number of journals and third highest number of 2015 articles. It's also a region where one country stands out: Brazil, with considerably more than half of all articles.

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	1,876	1,692	58,540	35
Pay	95	91	6,758	74
Total	1,971	1,783	65,298	37
Free%	95%	95%	90%	

Table 16.1. Journals and articles, Latin America

While the average APC-charging journal does publish twice as many articles as the average free journal, there are so few journals with APCs that it doesn't make much difference.

	2015	2014	2013	2012	2011
Journals	1,783	1,902	1,918	1,864	1,787
%Free	95%	95%	95%	95%	95%
Articles	65,298	67,847	66,044	65,597	62,383
%Free	90%	90%	90%	89%	89%

Table 16.2. Journals and articles by year, Latin America

Article volume has been strong for some time and growing slowly, but slipped somewhat (mostly in free journals, and late posting may cover part of the decline) in 2015.

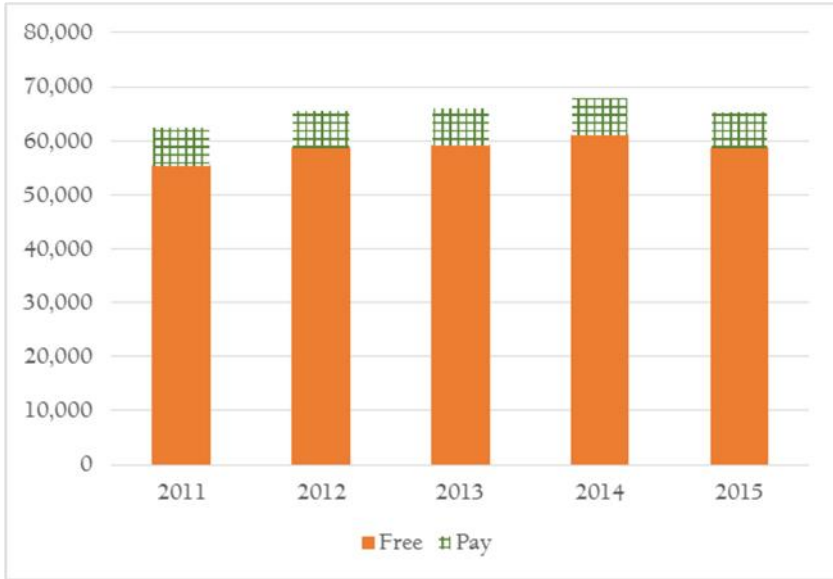


Figure 16.1. Free and pay articles by year, Latin America

Article Volume

	Journals	%Free	Articles	%Free
Large: 150-599	36	75%	8,437	73%
Med.: 60-149	228	85%	19,321	84%
Small: 20-59	925	96%	30,255	96%
Smallest: 0-19	782	98%	7,285	98%

Table 16.3. Article volume, Latin America

As Table 16.3 shows, there are no very large OA journals in Latin America and very few large ones (three journals exceeded 300 articles each in 2015). The biggest group is small journals, nearly all free.

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	3	3%	0%	351	5%	1%
\$600-\$1.399	12	13%	1%	987	15%	2%
\$200-\$599	35	37%	2%	2,534	37%	4%
\$2-\$199	45	47%	2%	2,886	43%	4%
Free	1,876		95%	58,540		90%

Table 16.4. APC levels, Latin America

So few expensive journals that they round off to 0%, and only 1% of articles; the few fee journals are mostly inexpensive. The average cost per article in APC-charging journals is \$372—but the overall average is just \$39.

Starting Date



Figure 16.2. Starting dates, Latin America

As Figure 16.2 shows, OA has deep roots in Latin America, with 76 now-OA journals before 1990 and steadily increasing growth through 2011—and never a significant number of fee-charging startups. New journals did slow somewhat in 2012-2013 and, as elsewhere, sharply in 2014-2015.

Segments

	HSS	Biomed	STEM
\$1,400+	0	3	0
Articles	0	351	0
Revenue	\$0	\$545,530	\$0
\$600-\$1.399	1	6	5
Articles	106	407	474
Revenue	\$109,180	\$287,880	\$483,980
\$200-\$599	5	9	18
Articles	140	868	1,526
Revenue	\$57,705	\$314,796	\$473,282
\$2-\$199	4	7	33
Articles	127	947	1,812
Revenue	\$7,868	\$67,308	\$167,835
Free	998	297	397
Articles	26,956	16,407	15,177

Table 16.6. Articles and revenue by segment, Latin America

Table 16.6 is interesting for what isn't there: *any* expensive STEM journals or any million-dollar revenue cells.

Publisher Category

Category	Journals	%Free	Articles	%Free
Univ/college	1,499	96%	45,401	92%
Society/govt	270	89%	13,355	84%
Miscellaneous	193	95%	6,250	86%
Open Access	8	100%	219	100%
Traditional	1	100%	73	100%

Table 16.6. Publisher categories, Latin America

Mostly universities and colleges: that's the picture in Table 16.6, with society publications a distant second.

Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	246	12.5%	
Grew 25-49.9%	170	8.6%	21.1%
Grew 10-24.99%	202	10.2%	31.4%
Even, \pm 9.99%	543	27.5%	58.9%
Shrank 10-24.99%	234	11.9%	70.8%
Shrank 25-49.99%	246	12.5%	83.3%
Shrank 50%+	261	13.2%	96.5%
No 2014 count	69	3.5%	

Table 16.7. Growth and shrinkage, Latin America

Relatively strong stability marks this region, with more than one of four journals even and fewer growing journals than shrinking ones.

Subjects and Countries

The next two pages show journals and articles by subject and by country of publication.

Subject	Journals	%Free	Articles	%Free
Medicine	309	94%	16,533	90%
Agriculture	127	75%	5,763	59%
Education	140	99%	4,067	99%
Sociology	128	100%	3,260	100%
Economics	153	98%	3,231	97%
Zoology	58	76%	2,940	63%
Language & Literature	106	100%	2,588	100%
Biology	41	83%	2,447	63%
Law	91	100%	2,075	100%
Earth Sciences	79	97%	1,887	98%
Engineering	48	100%	1,859	100%
History	76	100%	1,753	100%
Psychology	59	97%	1,750	93%
Anthropology	67	97%	1,582	96%
Ecology	58	90%	1,495	91%
Other Sciences	35	100%	1,428	100%
Miscellany	46	100%	1,424	100%
Technology	31	97%	1,422	95%
Media & Communications	49	98%	1,267	99%
Political Science	51	100%	1,060	100%
Philosophy	60	100%	1,009	100%
Religion	24	96%	936	97%
Arts & Architecture	42	100%	824	100%
Chemistry	12	92%	808	95%
Computer Science	24	96%	578	96%
Library Science	27	100%	503	100%
Mathematics	21	100%	447	100%
Physics	9	78%	362	91%

Table 16.9. Subjects, Latin America

Country	Journals	%Free	Articles	%Free
Brazil	992	94%	40,884	87%
Colombia	263	98%	6,267	99%
Chile	148	93%	4,991	86%
Mexico	155	96%	4,068	97%
Argentina	159	93%	2,712	89%
Cuba	68	100%	2,493	100%
Peru	45	96%	1,169	95%
Costa Rica	41	100%	946	100%
Venezuela, Bolivarian Re- public of	53	96%	936	96%
Ecuador	11	100%	208	100%
Uruguay	10	100%	168	100%
Bolivia, Plurinational State of	7	100%	122	100%
Paraguay	3	100%	87	100%
Nicaragua	4	100%	67	100%
Jamaica	2	50%	35	0%
Dominican Republic	1	100%	30	100%
Martinique	1	100%	30	100%
Barbados	1	100%	29	100%
Guatemala	3	100%	28	100%
Puerto Rico	2	100%	13	100%
Bahamas	1	100%	9	100%
British Virgin Islands	1	100%	6	100%

Table 16.9. Country of publication, Latin America

Admittedly, a few of these countries—all island nations—are Anglo-
phone or Francophone, but there are too few journals to justify separate
coverage.

17. Middle East

This region is second smallest in terms of both OA journals and 2015 articles. Most OA is free, albeit not as much so as in Latin America. Two countries with nearly identical 2015 article counts dominate OA in this region: Turkey and Iran.

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	574	545	24,558	45
Pay	101	97	6,679	69
Total	675	642	31,237	49
Free%	85%	85%	79%	

Table 17.1. Journals and articles, Middle East

Table 17.1 is unusual in that pay journals average only 1.5 times as many articles as free journals.

	2015	2014	2013	2012	2011
Journals	642	657	626	556	458
%Free	85%	85%	85%	84%	85%
Articles	31,237	30,189	27,457	24,583	19,149
%Free	79%	77%	78%	76%	77%

Table 17.2. Journals and articles by year, Middle East

As Table 17.2 shows, production has grown each year, albeit more slowly from 2014 to 2015 (there was actually a very small *decrease* in APC-based articles in 2015; note the slight rise in the percentage of free articles).

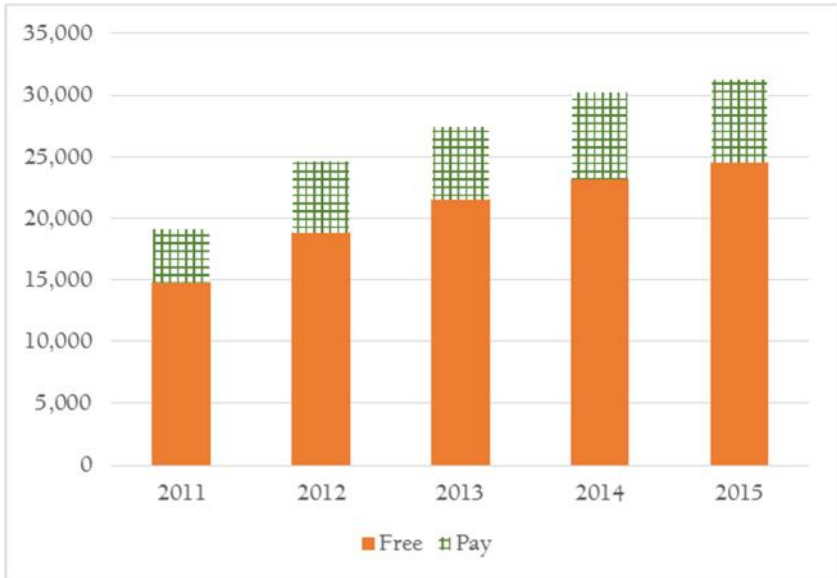


Figure 17.1. Free and pay articles by year, Middle East

Article Volume

	Journals	%Free	Articles	%Free
Largest: 600+	2	100%	1,652	100%
Large: 150-599	28	50%	6,366	47%
Med.: 60-149	105	84%	9,153	84%
Small: 20-59	350	87%	12,236	86%
Smallest: 0-19	190	88%	1,830	91%

Table 17.3. Article volume, Middle East

The two very large journals are both free, and only among large journals are APCs in the majority.

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	1	1%	0%	40	1%	0%
\$600-\$1.399	10	10%	1%	739	11%	2%
\$200-\$599	31	31%	5%	2,457	37%	8%
\$2-\$199	59	58%	9%	3,443	52%	11%
Free	574		85%	24,558		79%

Table 17.4. APC levels, Middle East

The Middle East is another region where, if there are fees at all, they're likely to be on the low side. Average cost per article in pay journals is \$291, but overall it's \$62.

Starting Date



Figure 17.2. Starting dates, Middle East

Some early activity, then growth from 1994 through 2001 and from 2004 through 2011—with most growth in pay journals from 2010 through 2013.

Segments

	HSS	Biomed	STEM
\$1,400+	0	1	0
Articles	0	40	0
Revenue	\$0	\$79,800	\$0
\$600-\$1.399	1	5	4
Articles	116	463	160
Revenue	\$153,120	\$411,294	\$130,371
\$200-\$599	11	12	7
Articles	778	1,243	436
Revenue	\$240,188	\$435,377	\$132,590
\$2-\$199	14	16	26
Articles	588	1,305	1,550
Revenue	\$37,558	\$155,331	\$170,324
Free	166	266	113
Articles	6,566	13,154	4,838

Table 17.5. Articles and revenue by segment. Middle East

The only expensive journal is in biomed, as are half of the less-expensive row. The most revenue in all three segments is from relatively inexpensive journals.

Publisher Category

Category	Journals	%Free	Articles	%Free
Univ/college	367	89%	15,892	85%
Miscellaneous	162	86%	7,858	78%
Open Access	67	57%	3,271	56%
Society/govt	60	93%	2,998	91%
Traditional	19	63%	1,218	28%

Table 17.6. Publisher categories, Middle East

The Middle East is another region where universities and colleges dominate OA publishing.

Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	98	14.5%	
Grew 25-49.9%	85	12.6%	27.1%
Grew 10-24.99%	69	10.2%	37.3%
Even, \pm 9.99%	169	25.0%	62.4%
Shrank 10-24.99%	74	11.0%	73.3%
Shrank 25-49.99%	89	13.2%	86.5%
Shrank 50%+	73	10.8%	97.3%
No 2014 count	18	2.7%	

Table 17.7. Growth and shrinkage, Middle East

More growth than in some regions and less rapid shrinkage, with one-quarter of journals holding steady.

Subjects

Table 17.8 (next page) shows articles and journals by subject. As in most other regions, medicine dominates.

Subject	Journals	%Free	Articles	%Free
Medicine	283	89%	15,070	82%
Education	65	91%	1,839	83%
Agriculture	25	64%	1,317	78%
Economics	30	67%	1,259	44%
Engineering	26	85%	1,228	77%
Biology	28	86%	1,135	71%
Sociology	20	80%	1,134	74%
Other Sciences	18	61%	1,093	37%
Language & Literature	17	88%	1,050	99%
Miscellany	7	100%	1,048	100%
Zoology	20	50%	952	60%
Mathematics	24	88%	666	82%
Computer Science	16	75%	594	55%
Arts & Architecture	13	92%	405	100%
Chemistry	8	100%	389	100%
Anthropology	10	80%	383	67%
History	10	100%	276	100%
Ecology	8	63%	233	49%
Earth Sciences	9	100%	231	100%
Physics	5	100%	206	100%
Library Science	7	100%	150	100%
Political Science	7	100%	137	100%
Religion	7	86%	124	84%
Media & Communications	3	100%	89	100%
Psychology	3	100%	84	100%
Technology	2	100%	75	100%
Philosophy	3	67%	54	85%
Law	1	100%	16	100%

Table 17.8. Subjects, Middle East

Countries

Country	Journals	%Free	Articles	%Free
Turkey	295	92%	13,838	88%
Iran, Islamic Republic of	297	85%	13,621	77%
Jordan	10	70%	973	15%
United Arab Emirates	14	21%	823	21%
Saudi Arabia	5	80%	426	93%
Israel	13	85%	352	55%
Iraq	9	56%	305	63%
Egypt	16	75%	295	80%
Oman	2	100%	201	100%
Kuwait	3	100%	167	100%
Qatar	7	57%	110	54%
Bahrain	1	100%	80	100%
Palestine, State of	1	0%	32	0%
Yemen	2	50%	14	64%

Table 17.9. Country of publication, Middle East

Iran has slightly more journals; Turkey, more articles. Oddities include the low percentages of free articles in Jordan and the United Arab Emirates (and Palestine, but that's a single journal).

18. Pacific/English

This “region” is composed of Australia, Canada (with apologies to Québec), New Zealand and the United States. The United States is the largest OA factor—and, for better or for worse, this is the only region other than Africa with mostly pay articles (although, as with Africa, most OA journals don’t have APCs).

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	897	801	24,325	30
Pay	447	403	31,047	77
Total	1,344	1,204	55,372	46
Free%	67%	67%	44%	

Table 18.1. Journals and articles, Pacific/English

As in most regions, the average APC-charging journal has more than twice as many articles (2.5 times) as the average free journal.

	2015	2014	2013	2012	2011
Journals	1,204	1,279	1,261	1,188	1,085
%Free	67%	66%	66%	67%	69%
Articles	55,372	51,276	46,039	42,991	39,109
%Free	44%	47%	50%	52%	52%

Table 18.2. Journals and articles by year, Pacific/English

While the percentage of free journals has held fairly steady in recent years, the percentage of free *articles* has steadily declined. As you can see in Figure 18.1, that's not because free articles have declined (they've grown every year) but because pay articles have grown faster.

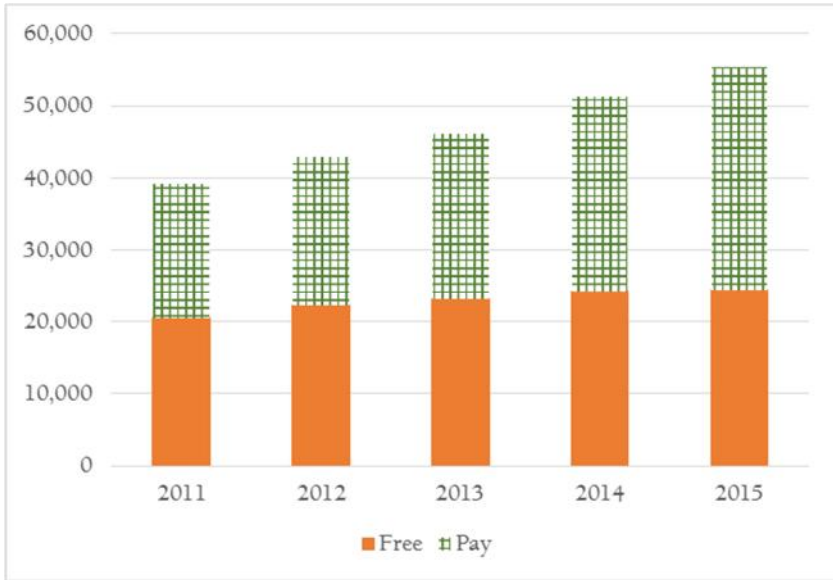


Figure 18.1. Free and pay articles by year

Article Volume

	Journals	%Free	Articles	%Free
Largest: 600+	7	0%	11,938	0%
Large: 150-599	57	40%	15,977	37%
Med.: 60-149	111	56%	10,218	57%
Small: 20-59	334	72%	10,902	71%
Smallest: 0-19	835	69%	6,337	75%

Table 18.3. Article volume, Pacific/English

All of the largest journals in this region have APCs—as do six out of ten large journals. As usual, smaller journals are more likely to be free.

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	97	22%	7%	11,133	36%	20%
\$600-\$1.399	131	29%	10%	11,087	36%	20%
\$200-\$599	169	38%	13%	6,131	20%	11%
\$2-\$199	50	11%	4%	2,696	9%	5%
Free	897		67%	24,325		44%

Table 18.4. APC levels, Pacific/English

There are quite a few expensive journals in Pacific/English countries—and nearly the same number of articles published in each of the two highest-cost brackets. Conversely, there aren't many nominal-price journals and they don't publish many papers: that may not be surprising. Average cost per article in fee journals is a high \$1,300, coming down to \$729 for all articles.

Starting Date

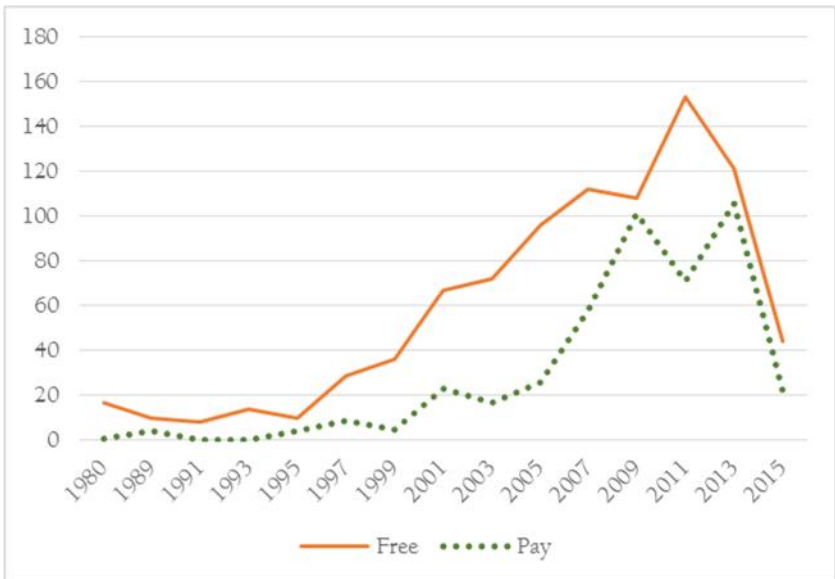


Figure 18.2. Starting dates, Pacific/English

Figure 18.2 shows slightly unusual patterns, with healthy growth rates of free journals from 1996 on being interrupted in 2008-2009, and an odd twin-peaked curve for APC-charging journals, starting in 2005 and dipping in 2010-2011.

Segments

	HSS	Biomed	STEM
\$1,400+	5	68	22
Articles	208	5,271	5,654
Revenue	\$433,650	\$10,308,426	\$14,122,696
\$600-\$1.399	9	69	38
Articles	163	7,572	3,352
Revenue	\$128,970	\$9,168,346	\$3,447,046
\$200-\$599	34	63	49
Articles	1,769	1,843	2,519
Revenue	\$677,986	\$829,151	\$991,533
\$2-\$199	21	11	14
Articles	1,378	502	816
Revenue	\$121,368	\$52,179	\$83,277
Free	537	119	145
Articles	12,064	6,733	5,528

Table 18.5. Articles and revenue by segment, Pacific/English

The biggest money here is in expensive STEM journals, possibly because they published more articles than expensive biomed journals, and there's more money than usual in HSS.

Publisher Category

Category	Journals	%Free	Articles	%Free
Miscellaneous	335	79%	14,844	52%
Society/govt	180	79%	13,619	40%
Univ/college	486	95%	11,729	83%
Open Access	233	12%	11,721	11%
Traditional	110	3%	3,459	4%

Table 18.6. Publisher categories, Pacific/English

This region has quite a few independent journals that, as a whole, publish more articles than any other category—and most of them are free.

Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	280	20.8%	
Grew 25-49.9%	115	8.6%	29.4%
Grew 10-24.99%	102	7.6%	37.0%
Even, \pm 9.99%	217	16.1%	53.1%
Shrank 10-24.99%	138	10.3%	63.4%
Shrank 25-49.99%	166	12.4%	75.7%
Shrank 50%+	261	19.4%	95.2%
No 2014 count	65	4.8%	

Table 18.7 Growth and shrinkage, Pacific/English

OA as a whole continues to grow, with a lot of rapidly-growing journals—but also a high percentage of rapidly-shrinking ones.

Subjects

Table 18.8 shows journal and article publishing by subject, and while medicine is first (as usual), the distant second this time is physics.

Subject	Journals	%Free	Articles	%Free
Medicine	319	34%	19,524	31%
Physics	23	39%	5,514	12%
Education	138	90%	2,533	86%
Computer Science	42	55%	2,517	37%
Biology	47	36%	2,397	25%
Sociology	79	91%	2,373	62%
Language & Literature	82	94%	2,288	64%
Mathematics	47	91%	1,890	98%
History	48	98%	1,805	100%
Engineering	28	36%	1,766	7%
Other Sciences	18	50%	1,735	9%
Economics	63	70%	1,324	77%
Ecology	38	55%	1,217	62%
Religion	34	97%	932	47%
Library Science	38	97%	927	99%
Agriculture	34	44%	901	36%
Chemistry	11	27%	882	19%
Technology	18	61%	728	59%
Media & Communications	29	93%	692	80%
Arts & Architecture	34	94%	630	77%
Political Science	30	90%	564	92%
Zoology	15	27%	441	13%
Law	37	97%	378	100%
Anthropology	19	84%	358	82%
Psychology	21	48%	327	47%
Philosophy	24	96%	309	89%
Earth Sciences	17	47%	278	32%
Miscellany	11	82%	142	63%

Table 18.8 Subjects, Pacific/English

Countries

Country	Journals	%Free	Articles	%Free
United States	952	65%	44,881	41%
Canada	199	78%	6,175	55%
Australia	114	86%	3,190	66%
New Zealand	79	28%	1,126	39%

Table 18.9. Country of publication, Pacific/English

It's somewhat interesting that New Zealand has the lowest percentage of free journals and articles while Australia has the highest.

19. Western Europe

Western Europe has the most open access journals of any OAWorld region and the second most OA articles in 2015. It's fourth in terms of free percentage.

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	1,786	1,625	59,284	36
Pay	320	310	21,983	71
Total	2,106	1,935	81,267	42
Free%	85%	84%	73%	

Table 19.1. Journals and articles, Western Europe

Table 19.1 shows Western Europe as one of few regions where the average APC-charging journal does *not* publish more than twice as many articles as the average free journal, although it's close (1.9).

	2015	2014	2013	2012	2011
Journals	1,935	1,990	1,914	1,832	1,658
%Free	84%	85%	85%	86%	87%
Articles	81,267	83,549	75,745	70,403	59,956
%Free	73%	76%	74%	77%	78%

Table 19.2. Journals and articles by year, Western Europe

Total OA volume declined slightly in 2015 after growing through 2014.

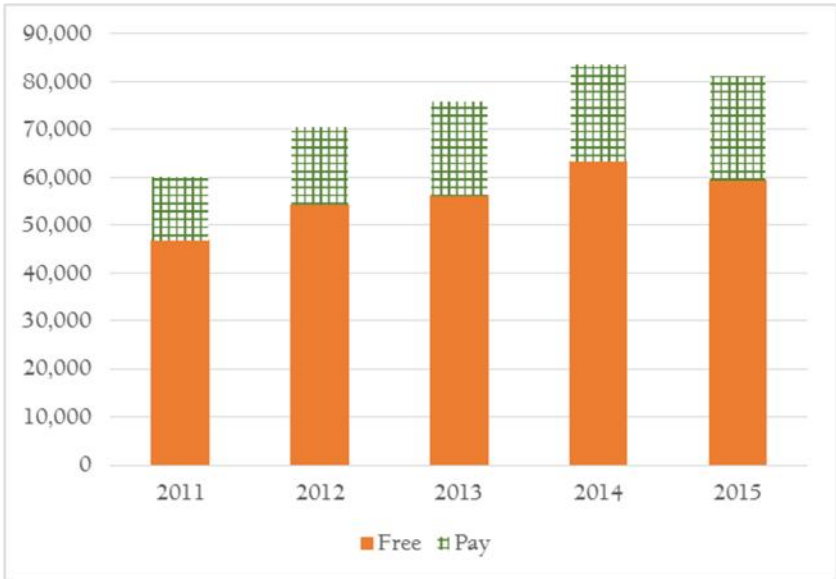


Figure 19.1. Free and pay articles by year, Western Europe

As shown in Figure 19.1, the 2015 decline is entirely in free articles; the pay article count increased slightly in 2015.

Article Volume

	Journals	%Free	Articles	%Free
Largest: 600+	15	67%	23,459	75%
Large: 150-599	46	52%	12,050	45%
Med.: 60-149	138	64%	11,622	64%
Small: 20-59	735	84%	23,496	82%
Smallest: 0-19	1,172	90%	10,640	90%

Table 19.3. Article volume, Western Europe

Table 19.3 breaks from usual patterns: the largest journals are predominantly free, with the next largest group the only one with mostly pay articles. Largest and small journals publish about the same volume.

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	54	17%	3%	7,501	34%	9%
\$600-\$1,399	89	28%	4%	6,409	29%	8%
\$200-\$599	126	39%	6%	4,794	22%	6%
\$2-\$199	51	16%	2%	3,279	15%	4%
Free	1,786		85%	59,284		73%

Table 19.4. APC levels, Western Europe

Western Europe is second only to Pacific/English for expensive OA journals, albeit a distant second—and those journals publish more articles than any other level of APC-charging journals. Average cost per article within APC-charging journals is \$1,083; across all journals it's \$293.

Starting Date



Figure 19.2. Starting dates, Western Europe

Figure 19.2 shows some early OA journals with steadily increasing growth through 2011.

Segments

	HSS	Biomed	STEM
\$1,400+	5	39	8
Articles	55	4,558	2,888
Revenue	\$94,620	\$9,933,379	\$5,831,248
\$600-\$1.399	20	32	36
Articles	486	1,344	4,579
Revenue	\$541,329	\$1,274,963	\$4,031,829
\$200-\$599	35	39	47
Articles	908	1,512	2,374
Revenue	\$276,635	\$672,559	\$807,983
\$2-\$199	20	6	23
Articles	479	316	2,484
Revenue	\$53,038	\$27,948	\$272,584
Free	1,139	191	295
Articles	24,792	9,623	24,869

Table 19.5. Articles and revenue by segment, Western Europe

The biggest clump of paid articles and the most potential revenue are both in expensive biomedical journals.

Publisher Category

Category	Journals	%Free	Articles	%Free
Miscellaneous	618	86%	32,531	80%
Univ/college	912	96%	20,314	88%
Open Access	224	48%	11,355	43%
Society/govt	247	91%	9,123	75%
Traditional	105	42%	7,944	47%

Table 19.6. Publisher categories, Western Europe

While universities and colleges publish more journals, independent journals and publishers account for more articles—and both multijournal open access and traditional publishers charge for most journals and articles.

Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	360	17.1%	
Grew 25-49.9%	208	9.9%	27.0%
Grew 10-24.99%	203	9.6%	36.6%
Even, $\pm 9.99\%$	410	19.5%	56.1%
Shrank 10-24.99%	260	12.3%	68.4%
Shrank 25-49.99%	257	12.2%	80.6%
Shrank 50%+	292	13.9%	94.5%
No 2014 count	116	5.5%	

Table 19.7. Growth and shrinkage, Western Europe

More journals grew rapidly than shrank rapidly.

Countries

Country	Journals	%Free	Articles	%Free
United Kingdom	300	59%	23,098	54%
Spain	560	98%	13,158	95%
Germany	246	84%	12,218	63%
Italy	303	87%	10,885	86%
France	175	97%	6,229	98%
Netherlands	61	85%	3,633	93%
Switzerland	43	58%	2,282	38%
Sweden	69	54%	2,112	38%
Portugal	80	90%	1,771	82%
Austria	50	88%	1,297	73%
Greece	40	78%	1,230	70%
Finland	37	70%	982	54%
Norway	50	94%	807	97%
Denmark	38	100%	619	100%
Belgium	30	97%	535	93%
Ireland	14	93%	256	100%
Iceland	4	100%	78	100%
Malta	5	100%	63	100%
Luxembourg	1	100%	14	100%

Table 19.8. Country of Publication, Western Europe

The UK has the most articles, Spain the most journals—and Switzerland and Sweden are the only countries where most articles are in pay journals.

Subjects

Medicine tops the list as usual, with physics second. Here, most medicine articles don't involve charges—but most biology, computer science and chemistry articles do.

Subject	Journals	%Free	Articles	%Free
Medicine	294	66%	14,978	57%
Physics	16	50%	8,375	86%
Engineering	24	54%	5,037	55%
Ecology	52	81%	4,826	59%
Other Sciences	30	67%	4,239	88%
Language & Literature	234	100%	4,081	100%
Earth Sciences	91	77%	3,903	50%
Education	152	95%	3,305	93%
Technology	32	72%	2,978	83%
Sociology	123	90%	2,818	93%
History	116	100%	2,531	100%
Agriculture	51	71%	2,397	59%
Biology	39	51%	2,375	46%
Anthropology	103	92%	1,944	96%
Arts & Architecture	110	95%	1,915	94%
Computer Science	52	71%	1,870	37%
Chemistry	13	54%	1,861	30%
Economics	84	76%	1,720	65%
Political Science	71	90%	1,585	89%
Media & Communications	75	95%	1,540	96%
Law	57	98%	1,063	99%
Psychology	52	85%	1,039	76%
Philosophy	62	95%	1,038	95%
Zoology	37	86%	929	75%
Library Science	40	95%	824	96%
Mathematics	35	77%	779	70%
Miscellany	31	90%	687	91%
Religion	30	93%	630	94%

Table 19.9. Subjects, Western Europe

20. Viability Notes

How do you measure or predict the viability of open access journals?

What follows is one naïve attempt to do so on a once-over-lightly basis. Is it a successful attempt? Maybe, maybe not.

Methodology

I'd already prepared broad growth/shrinkage ranges, as reported in most chapters. I wanted to arrive at four broad levels: good (no apparent viability issue and seeming strength), neutral (too early to tell, or neither good nor bad indicators), questionable (disturbing signs but not really problematic) and weak (seems likely to have viability issues).

I began with some simplifying assumptions:

- Any journal growing by 25% or more from 2014 to 2015 appears to be in good shape, and any journal shrinking by 25% or more is weak.
- Journals shrinking by 10% to 24.9% are questionable.

For the rest—journals growing by 10% to 24.9%, those that are roughly stable and those that had no 2014 articles—I looked at size, free vs. pay and segment, believing that very small APC-charging journals may be more vulnerable than very small free ones and that small journals are generally more viable for HSS than in STEM or biomed. (Journals growing 10% to 24.9% were either good or neutral and those with no 2014 articles were neutral, questionable or weak; “even” journals could be any of the four.)

Tables 20.1 through 20.4 show the results: journals and articles in 20.1, maximum revenues by segment in 20.2, journals by segment in 20.3 and articles by segment in 20.4. These tables include *PLOS One*.

	Journals	%All	Articles	%All
Good	3,950	38%	342,510	60%
Neutral	1,797	17%	88,884	16%
Quest.	1,314	13%	63,217	11%
Weak	3,263	32%	71,681	13%

Table 20.1. Journals and articles, viability

It's immediately clear that good journals are relatively prolific and weak journals aren't. Is that a tautology given my methods? I'm not sure.

	HSS	Biomed	STEM	Total
Good	\$8,240,109	\$140,848,704	\$90,516,555	\$239,605,368
Neutral	\$755,618	\$17,994,338	\$53,760,569	\$72,510,525
Quest.	\$685,748	\$31,564,787	\$4,377,224	\$36,627,759
Weak	\$1,019,325	\$20,819,639	\$6,149,960	\$27,988,924
Q+W%	15.9%	24.8%	6.8%	17.2%

Table 20.2. Revenues and viability by segment

	HSS	Biomed	STEM
Good	1,652	1,176	1,122
Neutral	889	398	510
Quest.	569	360	385
Weak	1,353	968	942
Q+W%	43.1%	45.8%	44.8%

Table 20.3. Journal viability by segment

	HSS	Biomed	STEM
Good	69,588	130,230	142,692
Neutral	19,000	20,726	49,788
Quest.	16,602	29,470	17,145
Weak	16,882	26,636	28,163
Q+W %	27.4%	27.1%	19.1%

Table 20.4. Article viability by segment

While weaker journals are 43% to 46% of each segment, that represents 19% to 27.4% of articles—a breakdown of Table 20.1, in essence.

And now, a test—of sorts—of these results, looking at journals that are still in *DOAJ* in mid-May 2016 (*DOAJ16*).

DOAJ16?	Yes	Yes%	No	No%
Good	3,077	78%	873	22%
Neutral	1,436	80%	361	20%
Quest.	972	74%	342	26%
Weak	2,198	67%	1,065	33%

Table 20.5. Presumed viability vs. presence in *DOAJ16*

The *DOAJ16* yes/no numbers aren't quite the same as in Chapters 21 & 22: after this analysis was done, I was able to identify nine additional journals in *DOAJ16*. That doesn't change the percentages, so I didn't redo the viability analysis.

An optimist will look at Table 20.5 and see that journals that show as weak in this simple analysis were, in fact, 50% more likely to be delisted than those rated good. A pessimist will say that 50% isn't very good—and that neutral journals fared even better.

As a realist, I'd say that simple viability analysis is a crude but not entirely useless tool, but maybe that's optimistic. Meanwhile, here are some tables and graphs for a hypothetical situation in which only the good and neutral journals remained (excluding *PLOS One* as usual).

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	4,264	4,264	182,700	43
Pay	1,482	1,482	219,509	148
Total	5,746	5,746	402,209	70
Free%	74%	74%	45%	

Table 20.6. Journals and articles, more viable journals

Compare to Table 1.1. Slightly higher free-journal percentage, essentially identical free-article percentage, more articles per journal.

	2015	2014	2013	2012	2011
Journals	5,746	5,646	5,289	4,883	4,368
%Free	74%	74%	75%	76%	77%
Articles	402,209	301,207	266,485	231,003	194,973
%Free	45%	48%	53%	57%	60%

Table 20.7. Journals and articles by year, more viable journals

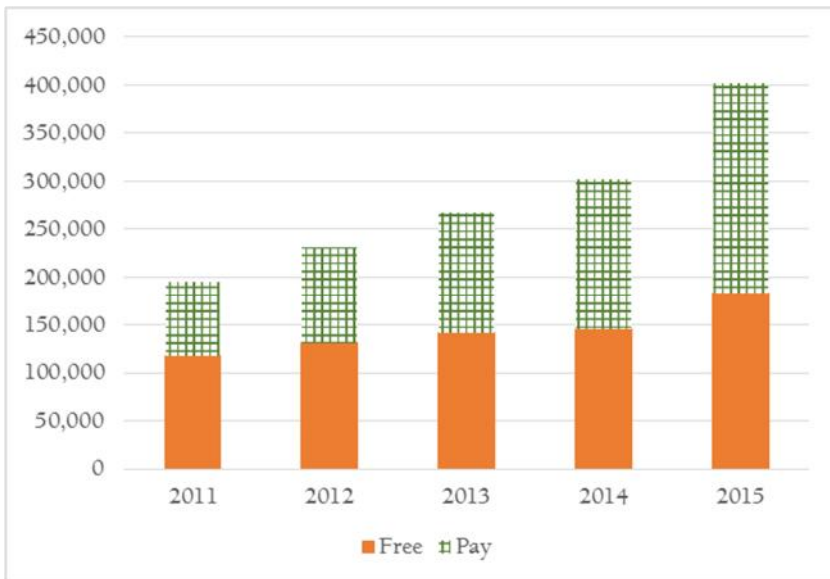


Figure 20.1. Free and pay articles by year, more viable journals

Compare to Figure 1.3, noting that for more viable journals both free and pay articles have kept growing.

Article volumes omitted; the main difference is that medium and smaller journals in the more viable subset are more likely to be free. The overall APC table is omitted; Table 20.8 incorporates that information. Average cost per article for articles in pay journals is \$1,219; overall, the average is \$665.

Starting Date



Figure 20.2. Starting dates, more viable journals

Compare to Figure 1.2. Pay journals didn't rise as rapidly among this subgroup—and, for that matter, neither did free journals.

Segments

Table 20.9 shows APC levels, journals and articles by subject segment, and can compare directly to Table 5.4. I'm surprised how many high-fee journals, especially in biomed, didn't do well in this crude viability test—but maybe I shouldn't be.

	HSS	Biomed	STEM
\$1,400+	16	382	89
Articles	2,911	63,614	39,827
Revenue	\$5,531,046	\$139,452,317	\$74,330,690
\$600-\$1.399	32	128	149
Articles	914	13,118	17,637
Revenue	\$994,904	\$13,671,117	\$17,185,121
\$200-\$599	57	144	151
Articles	4,168	10,858	16,425
Revenue	\$1,559,684	\$4,241,134	\$5,858,277
\$2-\$199	106	83	145
Articles	10,518	14,977	24,542
Revenue	\$910,093	\$1,478,474	\$2,329,611
Free	2,330	837	1,097
Articles	70,077	48,389	64,234

Table 20.9. Articles and revenue by segment, more viable journals

Regions

Region	Journals	%Free	Articles	%Free
APCLand	697	15%	107,682	5%
Asia	647	58%	70,317	28%
Western Europe	1,183	84%	61,400	71%
Latin America	1,160	95%	48,006	90%
Pacific/English	693	71%	43,256	42%
Eastern Europe	867	88%	42,371	75%
Middle East	430	88%	24,234	80%
Africa	69	59%	4,943	38%

Table 20.10. Regions, more viable journals

The comparable overall table is Table 12.1.

Publisher Category

Category	Journals	%Free	Articles	%Free
Univ/college	2,610	92%	116,116	75%
Open Access	887	26%	110,803	12%
Miscellaneous	1,123	80%	83,541	53%
Traditional	491	46%	46,681	25%
Society/govt	635	82%	45,068	58%

Table 20.11. Publisher categories, more viable journals

The comparable overall table is Table 6.1—and what stands out is the relatively low percentage of journals from multijournal open access (non-traditional) publishers that are more viable: 45%, where all the other categories are 55% or higher.

Conclusions

Is crude viability ranking useful or predictive? I honestly don't know.

As for the present and future of gold open access itself, that's a matter for discussion and action elsewhere. The purpose of this study is to provide a set of facts as to what's actually happening, as nearly as can be determined by an outside observer. Perhaps worth noting: I prepared most chapters (except Chapters 1, 3 and 21) using a spreadsheet that did not contain journal titles, publishers or URLs, making it easy to be wholly objective.

This was originally planned as the final chapter—until *DOAJ* announced a date for the cleanup most observers assumed was coming, when journals that failed to reapply and meet the new criteria would be delisted. That date turned out to be May 10, 2016, just as I was writing this report.

I have not changed Chapters 1-19 based on that mass delisting, because it doesn't change the facts: all the delisted journals *were* in *DOAJ* on December 31, 2015. But I have gone to some lengths to match up post-5/11/16 *DOAJ* (actually May 16, 2016, although the comparison in Table 20.5 relied on a May 10, 2011 download and simpler set of matching tests). I offered some observations on those early comparisons in May 2016 blog posts at [Walt at Random](#).

I won't repeat or update those quick notes as such. Instead, Chapter 21 offers some notes about the delisted journals and comparisons that might not show up in the regular set of tables and figures. Chapter 22 offers paired tables and figures, the same set of tables and figures used in other chapters, to allow a direct comparison between "gray OA" (the delisted journals) and "DOAJ16," the set of A&B journals that were in DOAJ on December 31, 2015 and May 16, 2016 (excluding *PLOS One*).

21. Gray OA: The Delisting

The *Directory of Open Access Journals* announced new criteria for inclusion in March 2014. DOAJ asked all publishers to submit new applications following those criteria. They [spent considerable effort](#) trying to get the word out.

I discussed the new criteria in [the January 2015 Cites & Insights](#), finding them generally worthwhile, but questioning the need for five or more articles per year—a criterion that more than 200 niche journals fail to meet.

On May 9, 2016, DOAJ removed journals for which no reapplication had been received (it's regularly turned down inadequate applications, thousands of them, but is still processing some of the received reapplications). A [list of 2,861 delisted journals](#) became available on May 11, 2016 (third tab on the linked spreadsheet). As already noted, I had some early notes on the delisting in early May 2016 at *Walt at Random*.

I did *not* work from that list. Instead, I downloaded the DOAJ metadata a second time, on May 16, 2016, then used a multistep process to determine which journals on my spreadsheet (a deduped version of DOAJ's December 31, 2015 spreadsheet) were still in DOAJ. Briefly, I first matched on URL, checking for sameness of publisher and title; then checked non-matches for title matches, checking for similarity of publisher; then sorted remaining entries by publisher and reviewed manually for possible matches.

In all, I found 7,996 journals still in DOAJ (7,409 with the same URL, title and publisher; 587 with at least one difference) and 2,948 journals that are now part of gray OA. (I'm guessing that the 87-journal discrepancy represents journals removed for other reasons between January 1, 2016 and May 16, 2016; there have been more than 100 such removals).

Codes

Code	GrayOA	Gray%	DOAJ16
A	2,023	23%	6,954
B3: No 2014-15	96	76%	30
B4: No 2015	241	53%	218
BC: Cancelled?	109	38%	176
BF: <5 in 2015	143	37%	248
BR: Conf. reports	13	22%	47
BS: Reg. required	8	31%	18
CA: APC hidden	76	68%	36
XE: Empty	10	25%	30
XI: Impossible to count	11	73%	4
XM: Malware	30	29%	73
XN: Not OA	38	69%	17
XO: Opaque	4	67%	2
XP: Parking page	33	75%	11
XT: Translation issues	1	100%	
XU: Unusable	18	49%	19
XV: Merged, can't count		0%	11
XX: Unreachable	94	48%	102

Table 21.1. Codes and journals, gray OA and DOAJ16

Noting that code A covers all journals that don't have some other code, what may be noteworthy here are the cases where a substantial percentage of journals were delisted (marked as GrayOA), including journals with no recent articles (B3 and B4), two-thirds of journals that appear to have APCs but don't say what they are, and most of the journals that really aren't OA, didn't renew their domains (XP), or were impossible to analyze by articles per year. Unfortunately, only 29% of malware-infected journals were delisted; that's about average for OAWorld journals.

Publishers

Publisher	Gray	Publisher	Gray
Internet Scientific Publications, LLC	46	Scienpress Ltd	6
IACSIT Press	19	University of Toronto	6
NISCAIR	16	Duke University School of Law	5
e-Century Publishing Corporation	14	EMW Publishing	5
Ivy Publisher	14	Escola Superior de Sustentabilidade	5
Asian Network for Scientific Information	13	Astrakhan State Technical University	4
Scientific and Technical Research Council of Turkey	12	College of William and Mary	4
Academic and Business Research Institute	11	Ingenious Knowledge Solutions	4
Editorial Ciencias Médicas	11	Institute of Mathematical Statistics	4
Moscow State Regional University	11	KARE Publishing	4
American V-King Scientific Publishing, LTD	8	Laxmi Book Publication	4
Bioinfo Publications	8	Massey University	4
CIC Edizioni Internazionali	8	Medpharm Publications	4
ECIMED	8	RG Education Society	4
Integrated Publishing Association	7	Universidad Católica del Norte	4
Kamla-Raj Enterprises, Delhi	7	Universiti Putra Malaysia	4
Academia Publishing	6	York University	4
Bonfring	6		

Table 21.2. All-gray publishers, four or more journals

The December 31, 2015 spreadsheet showed 5,826 different “publishers,” that is, strings in the Publisher field that Excel considers unique. Of those, only 4,007 remain. Of the missing 1,819, some 124 had at least two journals. Table 21.2 shows publishers with more than three journals that no longer have any journals in *DOAJ* (with this precise text: there are a *lot* of minor variations!).

Table 21.3, on the next page, shows publishers that *do* still have journals in *DOAJ* but where at least two journals disappeared and at least two-thirds of the journals as of December 31, 2015 disappeared. These publishers are listed in descending order by the percentage of journals delisted.

Do note that, unlike nearly all other portions of this book, Tables 21.2 and 21.3, and the four-part Table 21.4 that finishes this chapter, *do* include journals with codes other than A-BS. As a result, Table 21.4 can't always be compared directly to tables in Chapter 7.

Countries

Table 21.4, beginning on the page after next, lists all countries with one or more journals now in gray OA—and lists them in descending order by the number of journals delisted, also showing what remains (*DOAJ16*) and the percentage of journals that are now gray. Countries with no delisted journals do not appear in Table 21.4. Note also that Table 21.4 includes *APCLand* journals.

You can draw your own conclusions from this multipart table.

Publisher	Gray	D16	Gray %
Baishideng Publishing Group Co. Limited	14	2	87.5%
Ain Shams University	6	1	85.7%
Universidad de Concepción	6	1	85.7%
Universidad de Los Andes (Venezuela)	6	1	85.7%
University of California (UCLA)	5	1	83.3%
AVES Yayincilik	12	3	80.0%
Institute of Advanced Engineering and Science (IAES)	8	2	80.0%
Universidad Austral de Chile	4	1	80.0%
Termedia Publishing House	10	3	76.9%
Ankara University	3	1	75.0%
Centers for Disease Control and Prevention	3	1	75.0%
Humboldt-Universität zu Berlin	3	1	75.0%
Pontificia Universidade Católica do Rio de Janeiro	3	1	75.0%
Universidad de Tarapacá	3	1	75.0%
Universidad Industrial de Santander	3	1	75.0%
Universidade Federal do Espírito Santo	3	1	75.0%
University of Hawaii	3	1	75.0%
Academy Publisher	4	2	66.7%
ESci Journals Publishing	4	2	66.7%
Health and Medical Publishing Group	4	2	66.7%
Kerman University of Medical Sciences	4	2	66.7%
Pontificia Universidad Católica de Valparaíso	4	2	66.7%
Universidad del Valle	4	2	66.7%
Universidade de Caxias do Sul	4	2	66.7%
Universidade Metodista de São Paulo	4	2	66.7%
University of Western Ontario	4	2	66.7%

Table 21.3. Publishers with 2/3 or more gray OA journals

Country	Gray	DOAJ16	Gray%
United States	422	616	41%
Brazil	283	757	27%
India	220	331	40%
Spain	126	475	21%
Turkey	118	198	37%
United Kingdom	102	633	14%
Colombia	98	186	35%
Iran, Islamic Republic of	91	227	29%
Mexico	77	84	48%
Canada	75	132	36%
Germany	75	321	19%
Chile	74	79	48%
Japan	72	27	73%
Romania	64	270	19%
Pakistan	54	48	53%
Argentina	53	119	31%
Italy	52	266	16%
Australia	48	71	40%
Russian Federation	39	119	25%
France	39	142	22%
Poland	39	316	11%
Venezuela, Bolivarian Republic of	37	23	62%
Cuba	37	33	53%
China	30	34	47%
Indonesia	30	235	11%
Singapore	29	2	94%
Croatia	27	77	26%

Table 21.4a. Countries with gray OA journals

Country	Gray	DOAJ16	Gray%
Malaysia	26	45	37%
South Africa	26	49	35%
Portugal	26	60	30%
Netherlands	25	109	19%
Serbia	23	82	22%
Czech Republic	21	69	23%
Egypt	21	533	4%
Bangladesh	18	13	58%
Nigeria	18	18	50%
Denmark	16	22	42%
Greece	16	27	37%
South Korea	16	27	37%
Peru	16	31	34%
Switzerland	16	216	7%
Ukraine	14	67	17%
Finland	13	25	34%
Austria	13	39	25%
New Zealand	13	95	12%
Hungary	11	23	32%
Costa Rica	11	31	26%
Slovenia	11	43	20%
Sweden	11	59	16%
Nepal	10	7	59%
Taiwan, Province of China	10	19	34%
Slovakia	10	33	23%
Hong Kong	9	30	23%
Belgium	8	26	24%

Table 21.4b. Countries with gray OA journals (cont.)

Country	Gray	DOAJ16	Gray%
Norway	8	45	15%
Sri Lanka	7	6	54%
Israel	7	7	50%
Lithuania	7	30	19%
Bolivia, Plurinational State of	6	1	86%
Jordan	5	5	50%
Macedonia, the Former Yugoslav Republic of	5	15	25%
Estonia	5	18	22%
United Arab Emirates	4	10	29%
Thailand	4	11	27%
Bosnia and Herzegovina	4	16	20%
Kuwait	3		100%
Malta	3	2	60%
Ireland	3	11	21%
Belarus	2		100%
Puerto Rico	2		100%
Zambia	2		100%
Tunisia	2	1	67%
Uganda	2	1	67%
Ethiopia	2	3	40%
Saudi Arabia	2	3	40%
Korea, Republic of	2	5	29%
Morocco	2	7	22%
Philippines	2	11	15%
Bahrain	1		100%
Bhutan	1		100%
Dominican Republic	1		100%

Table 21.4c. Countries with gray OA journals (cont.)

Country	Gray	DOAJ16	Gray%
Tanzania, United Republic of	1		100%
Jamaica	1	1	50%
Armenia	1	2	33%
Azerbaijan	1	2	33%
Guatemala	1	2	33%
Oman	1	2	33%
Georgia	1	3	25%
Iceland	1	3	25%
Algeria	1	5	17%
Kenya	1	6	14%
Montenegro	1	6	14%
Qatar	1	6	14%
Ecuador	1	12	8%
Uruguay	1	12	8%
Bulgaria	1	33	3%

Table 21.4d. Countries with gray OA journals (end)

22. Gray OA and DOAJ16

This chapter consists of paired tables and figures to provide quick comparisons between what was removed from *DOAJ* (Gray OA, the first of each pair) and what remains (*DOAJ16*, the second of each pair). These tables and figures are consistent with most of this report. *PLOS One* is excluded, as are journals with codes C-XX.

Journals and Articles

	Journals	Active 2015	Articles	Art/Jrnl
Free	2,101	1,734	67,896	39
Pay	532	460	55,174	120
Total	2,633	2,194	123,070	56
Free%	80%	79%	55%	

Table 22.1a. Journals and articles, gray OA

	Journals	Active 2015	Articles	Art/Jrnl
Free	5,249	5,015	183,058	37
Pay	2,441	2,321	230,979	100
Total	7,690	7,336	414,037	56
Free%	68%	68%	44%	

Table 22.1b. Journals and articles, DOAJ16

What's left is less likely to be without charges.

	2015	2014	2013	2012	2011
Journals	2,194	2,421	2,538	2,486	2,302
%Free	79%	79%	79%	80%	83%
Articles	123,070	124,892	114,655	106,412	92,922
%Free	55%	60%	64%	67%	72%

Table 22.2a. Journals and articles by year, gray OA

	2015	2014	2013	2012	2011
Journals	7,336	7,502	7,029	6,326	5,577
%Free	68%	68%	69%	71%	71%
Articles	414,037	403,262	347,311	308,791	253,660
%Free	44%	45%	48%	51%	53%

Table 22.2b. Journals and articles by year, DOAJ16

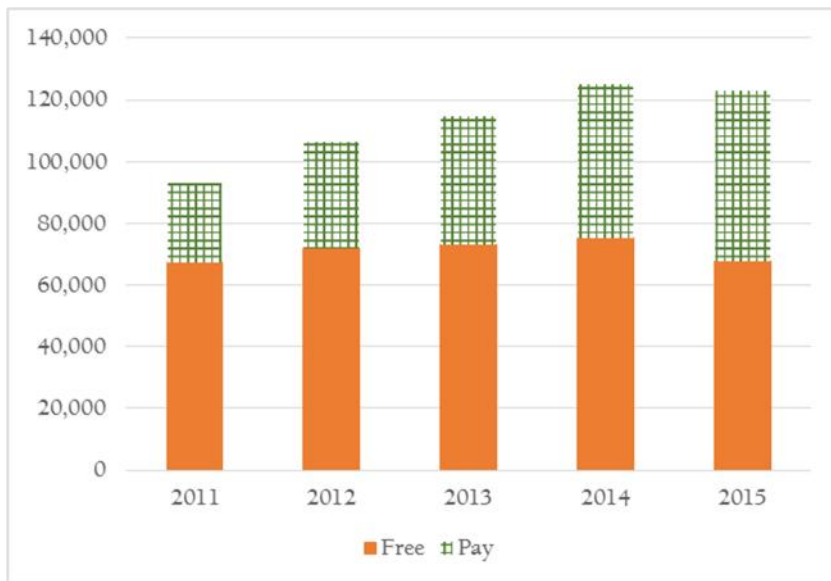


Figure 22.1a. Free and pay articles by year, gray OA



Figure 22.1b. Free and pay articles by year, DOAJ16

Article Volume

	Journals	%Free	Articles	%Free
Largest: 600+	25	12%	35,662	17%
Large: 150-599	91	52%	22,562	49%
Med.: 60-149	292	69%	25,768	68%
Small: 20-59	890	85%	30,279	85%
Smallest: 0-19	1,335	82%	8,799	85%

Table 22.3a. Article volume, gray OA

	Journals	%Free	Articles	%Free
Largest: 600+	77	17%	102,457	17%
Large: 150-599	373	29%	98,482	24%
Med.: 60-149	926	55%	81,942	54%
Small: 20-59	2,963	75%	98,404	74%
Smallest: 0-19	3,351	71%	32,752	77%

Table 22.3b. Article volume, DOAJ16

APC Levels

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	24	5%	1%	4,341	8%	4%
\$600-\$1.399	91	17%	3%	11,404	21%	9%
\$200-\$599	212	40%	8%	14,315	26%	12%
\$2-\$199	205	39%	8%	25,114	46%	20%
Free	2,101		80%	67,896		55%

Table 22.4a. APC levels, gray OA

Average cost per article (gray OA): \$493 for articles in fee journals, \$221 overall.

	Jour.	%APC	%All	Art.	%APC	%All
\$1,400+	725	30%	9%	124,456	54%	30%
\$600-\$1.399	772	32%	10%	32,092	14%	8%
\$200-\$599	477	20%	6%	31,585	14%	8%
\$2-\$199	467	19%	6%	42,846	19%	10%
Free	5,249		68%	183,058		44%

Table 22.4b. APC levels, DOAJ16

Average cost per article (DOAJ16): \$1,320 in fee journals, \$737 overall.

Starting Date



Figure 22.2a. Starting dates, gray OA

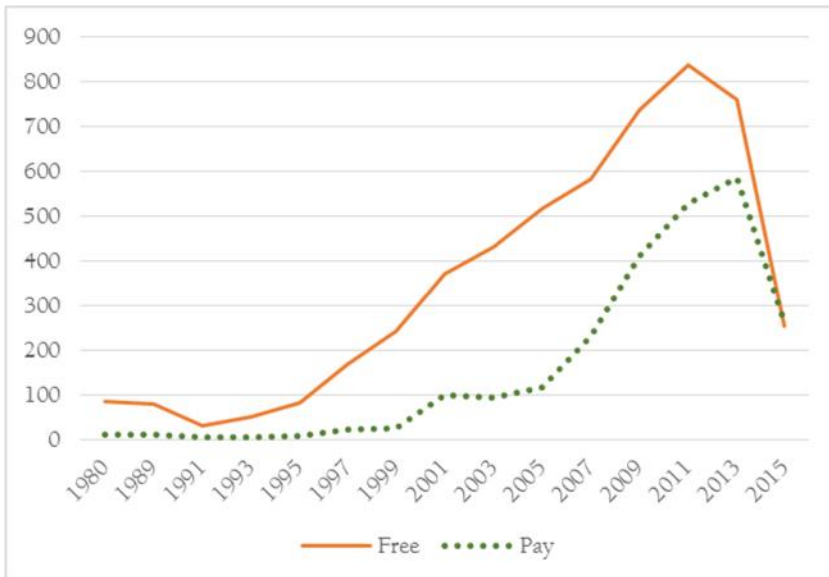


Figure 22.2b. Starting dates, DOAJ16

Segments

	HSS	Biomed	STEM
\$1,400+	1	14	4
Articles	65	4,068	208
Revenue	\$195,000	\$7,634,420	\$398,093
\$600-\$1.399	5	54	21
Articles	143	9,410	1,851
Revenue	\$141,090	\$10,147,051	\$1,424,883
\$200-\$599	43	61	76
Articles	2,132	2,935	9,248
Revenue	\$755,650	\$1,107,838	\$3,145,237
\$2-\$199	42	42	97
Articles	4,847	4,900	15,367
Revenue	\$434,001	\$381,748	\$1,420,054
Free	882	397	455
Articles	22,460	22,199	23,237

Table 22.5a. Articles and revenue by segment, gray OA

	HSS	Biomed	STEM
\$1,400+	17	589	112
Articles	2,878	80,271	41,307
Revenue	\$5,393,650	\$176,264,332	\$77,009,528
\$600-\$1.399	46	309	332
Articles	1,360	10,615	20,117
Revenue	\$1,325,408	\$9,615,575	\$19,622,833
\$200-\$599	86	189	192
Articles	5,047	12,111	14,427
Revenue	\$1,623,934	\$4,668,479	\$5,267,816
\$2-\$199	145	101	203
Articles	9,820	13,472	19,554
Revenue	\$832,067	\$1,408,025	\$1,942,439
Free	2,799	931	1,285
Articles	73,320	47,081	62,657

Table 22.5b. Articles and revenue by segment, DOAJ16

Table 22.5 is fairly striking, but perhaps not surprising. Is it more surprising that only one out of 18 expensive HSS journals and four of 118 expensive STEM journals were delisted—or that *any* were?

Regions

Region	Journals	%Free	Articles	%Free
Asia	430	47%	47,063	20%
Pacific/English	519	71%	18,864	49%
Latin America	653	95%	18,300	91%
Western Europe	479	90%	14,398	88%
Eastern Europe	266	93%	11,549	77%
Middle East	222	91%	10,891	86%
Africa	43	70%	1,876	77%
APCLand	21	10%	129	12%

Table 22.6a. Journals by region, gray OA

Region	Journals	%Free	Articles	%Free
APCLand	1,370	11%	133,671	5%
Western Europe	1,627	83%	66,869	70%
Asia	791	61%	54,213	36%
Eastern Europe	1,208	88%	49,577	74%
Latin America	1,318	95%	46,998	89%
Pacific/English	825	64%	36,508	41%
Middle East	453	82%	20,346	75%
Africa	98	46%	5,855	22%

Table 22.6b. Journals by region, DOAJ16

Among other things, note that the handful of delisted APCLand journals published almost nothing in 2015 (in fact, only two published more than nine articles in 2015).

Publisher Category

Category	Journals	%Free	Articles	%Free
Univ/college	1,219	94%	43,109	74%
Miscellaneous	655	78%	34,948	49%
Society/govt	427	84%	23,185	66%
Open Access	264	22%	19,587	16%
Traditional	68	46%	2,241	33%

Table 22.7a. Publisher categories, gray OA

Category	Journals	%Free	Articles	%Free
Open Access	1,695	20%	130,867	12%
Univ/college	3,240	91%	110,029	80%
Miscellaneous	1,357	78%	83,264	52%
Traditional	739	47%	53,690	27%
Society/govt	659	82%	36,187	58%

Table 22.7b. Publisher categories, DOAJ16

Journals published by or at universities and colleges suffered more than most from delisting, moving to second place in 2015 article count.

Growth and Shrinkage

Change 2014-15	Count	Percent	Cum%
Grew 50%+	315	12.0%	
Grew 25-49.9%	217	8.2%	20.2%
Grew 10-24.99%	214	8.1%	28.3%
Even, $\pm 9.99\%$	514	19.5%	47.9%
Shrank 10-24.99%	298	11.3%	59.2%
Shrank 25-49.99%	334	12.7%	71.9%
Shrank 50%+	529	20.1%	91.9%
No 2014 count	212	8.1%	

Table 22.8a. Growth and shrinkage, gray OA

Change 2014-15	Count	Percent	Cum%
Grew 50%+	1,267	16.5%	
Grew 25-49.9%	723	9.4%	25.9%
Grew 10-24.99%	751	9.8%	35.6%
Even, $\pm 9.99\%$	1,720	22.4%	58.0%
Shrank 10-24.99%	930	12.1%	70.1%
Shrank 25-49.99%	1,031	13.4%	83.5%
Shrank 50%+	1,081	14.1%	97.6%
No 2014 count	188	2.4%	

Table 22.8b. Growth and shrinkage, DOAJ16

Although my numbers-based attempt at evaluating viability wasn't wildly successful, it is true that delisted journals tended more toward shrinkage those still in DOAJ.

Subjects and Countries

Tables 22.9a-b and 22.10a-b, next four pages, finish this chapter. Draw your own conclusions, if any. Countries are within OAWorld only.

Subject	Journals	%Free	Articles	%Free
Medicine	590	72%	40,104	52%
Computer Science	116	49%	9,223	15%
Engineering	78	68%	8,608	23%
Other Sciences	48	60%	8,592	45%
Agriculture	131	68%	5,215	53%
Economics	162	73%	4,174	63%
Chemistry	39	72%	4,019	53%
Technology	45	64%	3,934	80%
Sociology	117	91%	3,825	72%
Education	166	91%	3,782	87%
Biology	81	56%	3,408	38%
Miscellany	37	89%	3,386	30%
Language & Literature	149	97%	3,094	81%
Zoology	67	66%	2,998	59%
Mathematics	85	92%	2,877	97%
Anthropology	77	91%	1,697	91%
Physics	37	76%	1,629	82%
Earth Sciences	62	90%	1,529	87%
Law	81	100%	1,413	100%
History	67	97%	1,363	97%
Ecology	52	77%	1,287	61%
Religion	36	94%	1,128	52%
Political Science	51	98%	1,076	100%
Arts & Architecture	62	97%	1,058	90%
Library Science	43	98%	963	99%
Media & Communications	51	94%	929	85%
Psychology	44	91%	890	94%
Philosophy	59	97%	869	92%

Table 22.9a. Subjects, gray OA

Subject	Journals	%Free	Articles	%Free
Medicine	1,860	46%	133,818	32%
Biology	345	33%	29,732	16%
Other Sciences	147	59%	24,896	18%
Physics	125	44%	20,864	54%
Engineering	264	57%	19,436	44%
Computer Science	265	52%	17,048	24%
Agriculture	305	59%	16,724	41%
Education	454	91%	11,916	89%
Technology	157	69%	11,766	59%
Economics	408	81%	11,685	69%
Chemistry	129	46%	10,996	26%
Ecology	205	66%	10,909	55%
Sociology	330	88%	10,813	74%
Language & Literature	424	96%	10,204	94%
Earth Sciences	259	75%	8,922	56%
Mathematics	192	64%	8,362	40%
Zoology	177	56%	8,139	40%
Miscellany	98	82%	8,065	47%
History	229	99%	6,181	99%
Psychology	133	82%	5,567	52%
Anthropology	209	89%	5,229	86%
Political Science	177	93%	4,120	84%
Arts & Architecture	184	95%	4,017	91%
Law	156	94%	3,826	88%
Media & Communications	131	92%	3,631	81%
Religion	101	85%	2,793	74%
Philosophy	128	96%	2,467	96%
Library Science	98	97%	1,911	98%

Table 22.9b. Subjects, DOAJ16

Country	Journals	%Free	Articles	%Free
India	163	35%	22,540	10%
United States	392	66%	15,703	46%
Brazil	267	94%	7,944	88%
China	26	27%	7,012	9%
Japan	71	68%	5,894	44%
Turkey	109	95%	5,299	94%
Iran, Islamic Republic of	84	89%	4,106	85%
Italy	46	89%	3,882	97%
Pakistan	25	40%	3,279	4%
Chile	73	90%	2,920	82%
Spain	111	95%	2,791	92%
Romania	62	92%	2,594	82%
Malaysia	20	90%	2,322	99%
Singapore	27	22%	2,229	5%
Russian Federation	34	97%	2,217	99%
Colombia	89	97%	2,132	99%
Canada	71	87%	2,022	61%
Poland	36	81%	1,696	59%
Mexico	74	95%	1,668	96%
Serbia	21	95%	1,616	48%
Netherlands	23	91%	1,606	96%
Cuba	36	100%	1,475	100%
Germany	69	99%	1,450	100%
United Kingdom	79	72%	1,249	56%
South Korea	14	36%	1,096	12%
Australia	45	87%	946	76%

Table 22.10a. Countries with 900+ 2015 articles in delisted journals, gray OA

Country	Journals	%Free	Articles	%Free
Brazil	725	94%	32,940	86%
India	298	50%	32,110	29%
United States	560	65%	29,178	38%
United Kingdom	221	54%	21,849	54%
Germany	177	78%	10,768	58%
Poland	307	92%	10,693	85%
Spain	449	98%	10,367	96%
Romania	260	83%	10,140	65%
Iran, Islamic Republic of	213	83%	9,515	73%
Turkey	186	89%	8,539	85%
Russian Federation	113	93%	8,408	77%
Italy	257	87%	7,003	80%
Indonesia	228	69%	5,872	65%
France	139	96%	5,535	98%
Canada	128	73%	4,153	53%
Colombia	174	99%	4,135	99%
South Korea	26	42%	4,010	11%
Ukraine	57	88%	3,809	75%
Hong Kong	30	47%	2,973	37%
Serbia	81	94%	2,960	83%
Pakistan	45	58%	2,554	38%
Croatia	77	94%	2,423	92%
Mexico	81	98%	2,400	97%
Australia	69	86%	2,244	61%
Macedonia, the Former Yugoslav Republic of	15	67%	2,154	15%
Chile	75	96%	2,071	90%
China	21	81%	2,027	52%
Netherlands	38	82%	2,027	91%

Table 22.10b. Countries with 2,000+ 2015 articles in journals in DOAJ16

Appendix A. Methods, Changes and Caveats

The Investigations

Much of this research carried over from an earlier investigation (based on DOAJ as of May 7, 2014) reported in *Open-Access Journals: Idealism and Opportunism*, published as the August/September 2015 issue of *Library Technology Reports*. I recommend that issue for its compact coverage of the field and especially for Chapters 6, 7 and 8, which deal with issues not discussed here.

That study omitted journals that did not appear to have English-language interface options (I'm monolingual) and, given its deadline, only covered the first six months of 2014 (along with all of 2011, 2012 and 2013). In all, the study covered 7,301 journals, of which 6,490 received full coverage (811 were excluded for various reasons).

After completing that study, I returned to the 6,490 journals, filling in article counts for all of 2014 (and revisiting and refining some cases where I'd estimated article counts). The results of that revisit appeared as a series of blog posts at *Walt at Random* for each of some 28 broad subject categories. Those posts remain available.

In the summer of 2015—beginning June 15, 2015 and ending around August 15, 2015—I expanded the study once again, as follows:

- I downloaded DOAJ metadata on June 15, 2015. Where URLs in the previous study's master worksheet (including only fully analyzed journals—those with grades A through D) matched the new metadata, or a manual comparison of titles yielded clear matches with minor changes in URLs, I retained the previous data (with current URLs). That left 80 journals in the older study that don't seem

to be in DOAJ as of June 2015; these have either changed names or disappeared.

- For *all* remaining rows in the DOAJ metadata, including those that would match excluded journals in the previous study (such as journals I couldn't reach, that didn't appear to be OA or that had garbled archives), I redid the analysis from scratch. In the process, I marked the "excluded" spreadsheet from the earlier study, flagging 702 of the 811 excluded journals. The other 109 have presumably disappeared; many of them were already unreachable.
- I used Chrome as my browser for this work (under Windows 8.1) for a simple reason: it includes Google translation tools. I was hoping to be able to make sense of some of the 2,400 to 3,000 journals lacking English-language interfaces. In the end, I was able to analyze all but 20 reachable journals, although some of those required a two-step process (copying text from the website into a separate Google Translate page, usually because the site's language codes prevented translation).

There's a little more to it, but of 10,603 journals that began in 2014 or earlier, I was able to fully analyze 9,824 as compared to 6,490 in the earlier report: in other words, 51% more journals. Most of *The Gold OA Landscape 2011-2014*, the report from the extended study, did *not* include all 9,824 journals. Instead, it included 9,512 journals graded A and B: journals that appear to be appropriate OA resources, a few of them with mild caveats. I mostly ignored 312 journals graded C—journals with at least one obvious problem that made them, in my opinion, questionable publications probably best avoided. The comparable figure for the earlier study was 6,196 journals (graded A, B or D); thus, the bulk of that report covered 53.5% more journals than the previous study. That's 90% of what was in DOAJ when downloaded and 97% of all journals that could plausibly be included. It was, as far as I can tell, the broadest survey of OA journals and their article counts.

Changes from *The Gold OA Landscape 2011-2014*

After reviewing the numbers in *The Gold OA Landscape 2011-2014* and considering what I can and, more significantly, *cannot* reasonably ascertain and judge in non-English journals and in short visits to websites, and in consultation with SPARC contacts, I made a number of changes in grades and, as a result, in exclusions.

I did *not* change the list of subjects and segments, although a few journals may have been assigned new subjects—and, as in the previous study, *PLOS One* is omitted from subject and segment figures but included in overall discussions.

The fundamental meaning of Grade B has changed from “deserves attention” to “might be excluded from *DOAJ* or in some versions of Open Access.”

Changes in Grade A Codes

All codes for Grade A have been eliminated. Subgrade C (ceased) is now a code in Grade B. Subgrades D, E, H, O and S—all cases where *some* year other than the first had fewer than five articles—have been collapsed into Grade B, code F (few or no 2015 articles) if the article count for 2015 is less than 5 and simply Grade A otherwise.

Changes in Grade B Codes

Grade B consists of journals that may or may not belong, either in *DOAJ* or in a study of open access, depending on your definitions. The old subgrades all have to do with mild visual or editorial issues that now seem as though they’re imposing my own values inappropriately.

There are six new codes—two from Grade A and two from Grade X, albeit with different letters.

- **BC: Ceased**—journals that published at least one article later than 2010 but explicitly ceased during or before 2015, have merged with other journals, or show no articles more recent than 2012.
- **BF: Few or no 2015 articles**—journals that published at least one article later than 2012 and published one to five articles in 2015. (By current *DOAJ* rules, these are subject to delisting.)

- **B3 and B4: No articles since 2013 or 2014**—journals with no recent articles.
- **BR: Conference and other reports**—journals consisting entirely or primarily of conference papers and other reports. These were previously excluded, in code XN, as not OA.
- **BS: Signin or registration required**—journals that require some form of registration before reading articles. These were previously excluded, also in code XN, as not OA.

Changes in C Codes

Grade C, “avoid this journal,” has been narrowed somewhat, specifically to eliminate subgrades that involve personal judgment or have so few journals that they’re hardly worth noting. Only one is left: CA, stated or probable APC with no amount provided,

Changes in X Codes

Grade X, excluded journals, retains the same codes—but the two largest categories within code XN (not OA) have been moved to codes BR and BS.

More Notes

Chapter 3 includes more discussion of how this investigation was done.

Caveats

If you attempt to replicate this study, you will probably achieve slightly different results. That was true even before May 9, 2016, when the DOAJ universe shrank significantly. Why is that?⁴

- **Inclusiveness:** Which items in journals—and which journals—do you include? The 2014 count tended to be more exclusive when I

⁴ This discussion originally appeared in slightly different form in the April 2016 *Cites & Insights*.

had to count each article individually; the 2015 count tends to include all items subject to some form of review, including book reviews and brief reports. Similarly, the 2015 report includes journals that consist of (reviewed) conference reports.

- **Shortcuts:** I did not in fact look at each and every item in each and every issue of each and every journal, compare it to that journal's own criteria for reviewed or peer-reviewed, and determine whether to include it. To do that, I'd estimate that a single year's count would require at least 2,000 hours exclusive of determining APC existence and levels and all other overhead—and, of course, a five-year study would require four times that amount (fewer journals and articles in earlier years). That's not plausible under any circumstances. Instead, I used every shortcut I could: publication-date indexes or equivalent for SciELO, J-Stage, MDPI, Dove and several others; DOI numbers when it's clear they're assigned sequentially; numbered tables of contents; Find (Ctrl-F) counts for distinctive strings (e.g., "doi:" or "HTML") after quick scans of the contents tables. For the latter, I did make rough adjustments for clear editorials and other overhead.
- **Estimates:** In some cases—a lot fewer in 2015 than in 2014, but still some—I had to estimate. For example when a journal with no other way of counting publishes hundreds of articles each year and maintains page numbering throughout a dozen issues. I might count the articles in one or two issues, determine an average article length, and estimate the year's total count based on that length. I also used counts from DOAJ in many cases, when those counts were plausible based on manual sampling.
- **Errors:** I'm certain that my counts are off by one or two in some cases; that happens.
- **Late additions:** Some journals, especially those that are issue-oriented and still include print versions, post online articles very late. Even though I retested all cases where the "final issue" of 2015 seemed to be missing when checked in January-March 2016, it's nearly certain that somebody looking at some journals in, say, August 2016 will find more 2015 articles than I did.

In practice, I doubt that any two counts of a thousand or more OA journals will yield precisely the same totals. I'd guess that I'm very slightly

overcounting articles in some journals that provide convenient annual totals—and undercounting articles in some journals that don't.

For this analysis, and for any analysis others are likely to do, these “errors” shouldn't matter. If somebody claimed that overall numbers were 5% lower or 5% higher, my response would be that this is quite possible. I doubt the differences in counts would be greater than that, at least for aggregated data.

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