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Gold Open Access Journals 2011-2015

It's out—*Gold Open Access Journals 2011-2015*, that is.

If not by the time you read this, then certainly within a day or so.

And it's *free*—that is, the PDF ebook version and the dataset. CC BY (attribution) license: it doesn't get much freer than that.

(There's also a trade paperback for a nominal price, just higher than production costs, for those who like print books. Except for grayscale figures instead of the color figures in the ebook, it's *identical*: the same PDF file is used for both, with a cover page added to the ebook.)

It's free thanks to SPARC's sponsorship. It's happened at all thanks to SPARC's sponsorship, for that matter.

How to get it: You'll find links for all available versions at the study's webpage, http://waltcrawford.name/goaj.html.

I'm providing that link rather than individual links because there may be multiple download locations, because I suggest an alternate route for the paperback to take advantage of Lulu's frequent sales, and because I add a few notes about "proprietary" data formats.

And because there will almost certainly be two book-length supplements, both free as PDF ebooks and nominally-priced paperbacks, following over the next couple of months. The first will add 28 subject chapters to the three subject-segment chapters in the book; the second will add some number of country-level chapters to the region-level chapters in the book. The supplements will be announced on the webpage, in the social media I use (always waltcrawford, on Twitter, Facebook and Google+), on Walt at Random and, eventually, here.

By the way, if you want the background and comparison of the prior study, *The Gold OA Landscape 2011-2014*, I've cut the price in half to $30 paperback, $27.50 PDF. That book may disappear when it's gone six months without a sale.

That's the news. Here's the short version of the book…

What follows is about one-third of *Gold Open Access Journals 2011-2015*, reformatted slightly. Entirely missing: Chapters 2 (APCLand and OAWorld—for which an earlier version is in Cites & Insights 16.4), 3 (Exclusions and Special Cases), 8-11 (subject segments) and 13-19 (region articles). Most of Chapter 6 (publisher categories) has been omitted, as have portions of Chapter 1. The full book is freely available.

As always, you're better off reading this in the single-column form, since that's the same size as the book (but with slightly different typography). In order to save space (and given the two different formats), I've made no efforts to keep tables on single pages (as they are in the book) or to even out columns. (Some tables in the two-column version have *very* small type!) This is a shorter version—you're better off with the *free* ebook. Did I mention that it's free—and that there will be at least one version that doesn't require an account or registration and doesn't use cookies?

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 31, 2015. [Section omitted]

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:

- 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.

[Section omitted]

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.

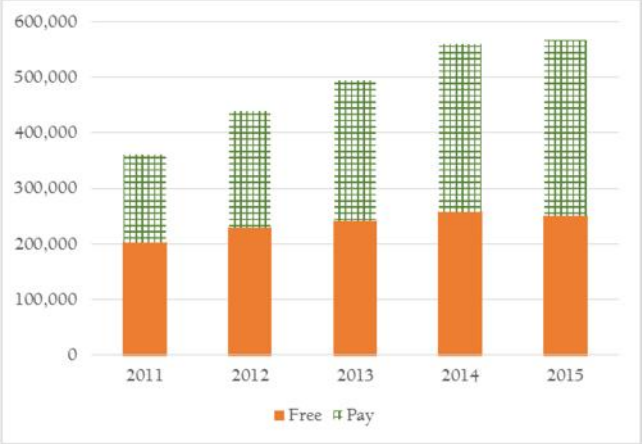

Figure 1.3. Free and pay articles by year, overall

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 shrunk significantly. (Table 1.4 *does* include *PLOS One*, which is in the "even" group).

[Section omitted, as are Chapters 2 & 3]

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 OAWorld 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 OAWorld 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, ±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, ±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 less likely to grow rapidly or very rapidly from 2014 to 2015 and more likely to shrink rapidly or very rapidly—and as Tables 5.7 through 5.9 show, journals in the lowest two price brackets were also more likely to grow rapidly—and even free journals, although free journals lagged behind 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.

[Rest of chapter—five subchapters—omitted.]

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

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

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

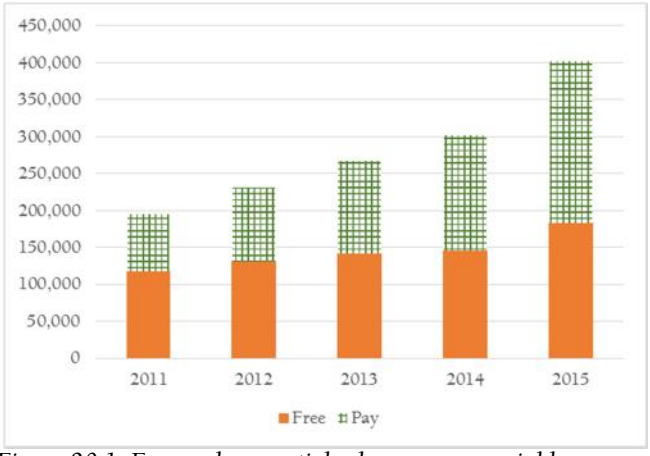

Figure 20.1. Free and pay articles by year, more viable journals

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

Compare Figure 20.2 to Figure 1.2. Pay journals didn't rise as rapidly among this subgroup—and, for that matter, neither did free journals.

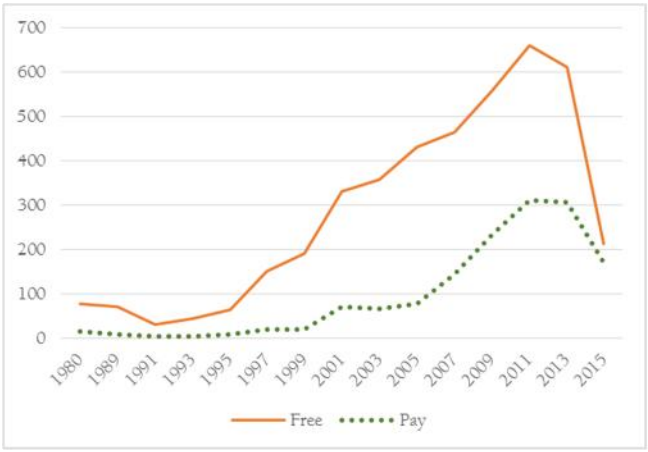

Figure 20.2. Starting dates, more viable journals

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. requied	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 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%
Pontifícia 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%
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%

Table 21.4a. Countries with gray OA journals

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

[Two figures omitted]

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

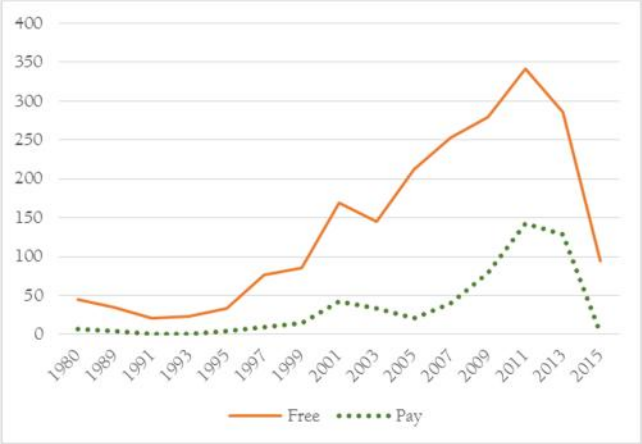

Figure 22.2a. Starting dates, gray OA

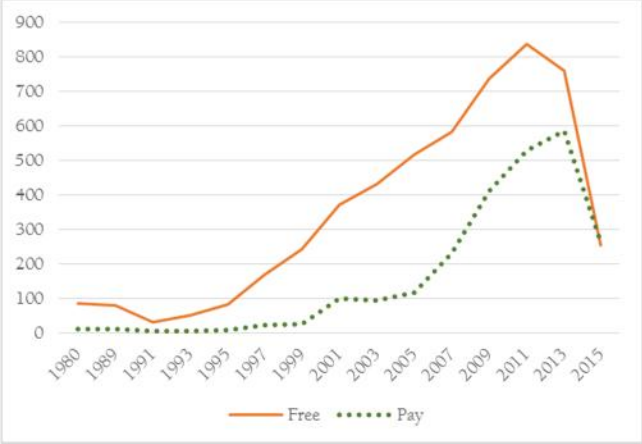

Figure 22.2b. Starting dates, DOAJ16

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, ±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, ±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

My numbers-based attempt at evaluating viability wasn't wildly successful even though delisted journals had lower percentages with good growth factors and higher percentages of shrinking journals.

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	Journls	%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

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