Cites & Insights

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This issue consists of the first seven chapters of *GOAJ2: Gold Open Access Journals 2011-2016*. Except for page footers and page numbers, these pages are *precisely* identical to those of the book—and thus slightly different than the usual *Cites & Insights* page (one pica or 12 points narrower and with a binding margin, for sticklers).

The complete book—free as a PDF ebook, $6 as a trade paperback—is available and includes Chapters 8-20, a preface (and acknowledgments), a table of contents and an index of tables and figures.

You'll find links to the ebook, the print book, and the dataset (freely available for downloading) at the ongoing Gold Open Access Journals project page, http://waltcrawford.name/goaj.html

That page will be updated when *The Countries of OAWorld 2011-2016* becomes available. A future issue of *Cites & Insights* may feature (or consist of) subject chapters that supplement the single page on each subject in *GOAJ2*.

This project was sponsored by SPARC.

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?

Here are the answers for serious gold OA—journals in the *Directory of Open Access Journals* as of January 1, 2017—noting that these broad numbers may be misleading:

- 523,205 articles in 2016, up from 486,511 in 2015; 461,986 in 2014; 395,056 in 2013; 342,105 in 2012 and 273,734 in 2011. (As with all numbers in this book, the numbers can't be compared directly to those in *Gold Open Access Journals 2011-2015* because 2,861 journals were removed from *DOAJ* in May 2016.).
- 8,992 journals, of which 8.431 published articles in 2016 for an average of 62 articles per journal in 2016.
- 68% of those journals do not charge APCs or other fees—and those free-to-submit journals published 43.0% of the articles in 2016, down slightly from 43.9% in 2015.
- The average cost in 2016 was no more than $803 per article, and probably less.

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. This book 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 12:30 a.m.

UMT on January 1, 2017. I visited (or tried to visit) each journal's home page to determine charges and article counts from 2011 through 2016.

My hope is that this updated 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)?
- Are there useful things to say about claimed country of publication or about regional patterns?
- Are there useful distinctions based on type of publisher?
- Are there important differences between gold OA as practiced by the largest fee-based 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) as of January 1, 2017, and that aren't excluded for a variety of reasons—see Chapter 3.

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. I included seven journals that appear to require free instant registration to read articles (but not to explore tables of contents); those journals published just 1,144 articles in 2016, 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 January 1, 2017.

Subjects were assigned based on *DOAJ* subject and keyword fields, and in some cases refined based on scanning article titles. Some of them are probably erroneous. 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 2017.

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) and Find counts when feasible (e.g., when each article has "PDF" as a text tag). 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 2016 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 Big Numbers

You've already seen the biggest numbers—523,205 articles in 8,992 journals in 2016, with 68% of the journals free, publishing 43% of the articles. I did not attempt to count articles in unavailable journals (which might be feasible through *DOAJ* counts); for earlier years, these may total around 5,000 articles. Most of this book (except Chapter 3) also ignores "CA" journals—those that don't state APCs—which published a total of 6,263 articles in 2016; 5,523 in 2015; 5,145 in 2014; 4,046 in 2013; 3,334 in 2012 and 2,373 in 2011.

There are, to be sure, other article and journal counts, discussed in "The Biggest Numbers" near the end of this chapter.

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 2016	Articles	Art/Jrnl
Free	6,157	5,770	224,808	39
Pay	2,835	2,661	298,397	112
Total	8,992	8,431	523,205	62
Free %	68%	68%	43%	

Table 1.1. Journals and articles, overall

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

	Count	2016	2015	2014	2013	2012	2011
A	7,962	490,160	457,314	429,960	365,698	315,119	250,826
B3	11				194	174	277
B4	57			1,463	1,232	1,189	1,155
B5	281		5,385	6,167	4,982	4,242	3,504
BC	267	2,549	2,261	4,327	4,641	3,899	2,442
BF	246	701	1,815	2,076	2,224	2,201	1,707
BR	40	24,408	14,824	13,273	11,279	10,802	9,488
BS	7	1,144	1,206	1,095	1,231	1,455	1,551
BX	121	4,243	3,706	3,617	3,575	3,024	2,784
Total	8,992	523,205	486,511	461,986	395,056	342,105	273,734

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 in the analysis with special characteristics:

- B3 journals have no articles since 2013, which usually suggests the journal's not very viable.

- B4 journals have no articles since 2014. Most of these are also probably failing.
- B5 journals have articles in 2015 but not in 2016. Some may be failing; others are very late to post articles online; a few operate on an every-other-year schedule.
- 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 very few articles—from one to four articles in 2016 (the average is 2.84).
- BR journals are journals consisting entirely or primarily of reviewed conference papers.
- 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 tiny group of journals with relatively few articles.
- BX is a new code: journals that were not reachable or had apparent malware via the URL in *DOAJ* but that could be reached through a journal title search.

These codes are not used in the remainder of this book, since none of them imply anything negative about the journals during the years they publish articles. BX was an experiment that proved worthwhile, returning 121 journals to full inclusion—roughly one-quarter of those that would be excluded otherwise.

Overall Growth

If you take a quick look at *Gold Open Access Journals 2011-2015*, you may note that the figures in Table 1.2 are lower than last year. That shrinkage is explained in Chapters 21 and 22 of the earlier work: some 2,861 journals were removed from *DOAJ*—and while hundreds of journals have been restored and added during 2016, the total is still lower.

Enough new journals that began prior to 2016 were added to bring the total with 2015 articles up 18% and the article count for 2015 up a similar 18%.

Serious gold OA shows growth each year: 25% in 2012, 15% in 2013, 17% in 2014, 5% in 2015 and 8% in 2016.

Revenue and Costs

	2016	2015	2014	2013	2012
Revenue	$419,887K	$383,956K	$348,280K	$272,192K	$215,279K
Pay art.	298,397	272,950	260,771	216,783	179,689
$/art	$1,407	$1,407	$1,336	$1,256	$1,198
Tot. art.	523,205	486,511	461,986	395,056	342,105
$/art	$803	$789	$754	$689	$629
Free%	43.0%	43.9%	43.6%	45.1%	47.5%

Table 1.3. Revenue* and cost per article by year, 2012-2016

Table 1.3 shows overall revenue-related figures for each year in this report (with revenues in thousands of dollars to avoid very small type), but the asterisk in the table caption relates to several caveats in this data:

- Revenue (Rev.) assumes no waivers, discounts or less-expensive categories—and for 2011-2016, it's the APC as of early 2017 and the fee status as of that date.
- Given that some journals (usually growing ones) migrate from free to pay status each year (with far fewer abandoning fees) and that many more journals raise APCs than lower them, it's likely that this table overstates not only the revenue but also the pay article counts and cost per article for earlier years.

Here and in some other cases, 2011 data is omitted from the table because of space limitations: including the extra column would require using seven-point type. The 2011 figures for each row are $139,294K; 133,651; $1,192; 273,734; $582; and 51.2%.

Starting Dates

Many later chapters include graphs showing starting dates for currently-free and currently-pay journals, usually with starting years clustered into pre-1981, 1981-1990, and two-year groups from 1991-92 through 2015-2016, 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.

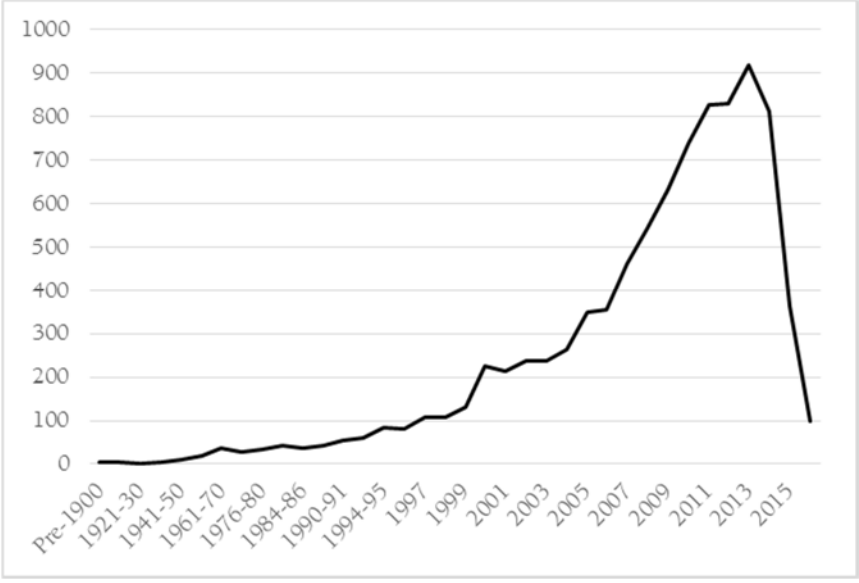

Figure 1.1. OA journals by starting year

Does Figure 1.1 mean that OA journal startups have collapsed entirely? Not really, although they have slowed from the peak years (826 to 917 journals in each year from 2011 through 2014, with 2013 the highest year) to 365 journals in 2015 and 100 in 2016. The drops for 2015 and 2016 are partly artifact—as should be obvious from the fact that 2014, with 507 in last year's report, now shows 813 journals. Most journals aren't submitted to *DOAJ* until they've published a few issues.

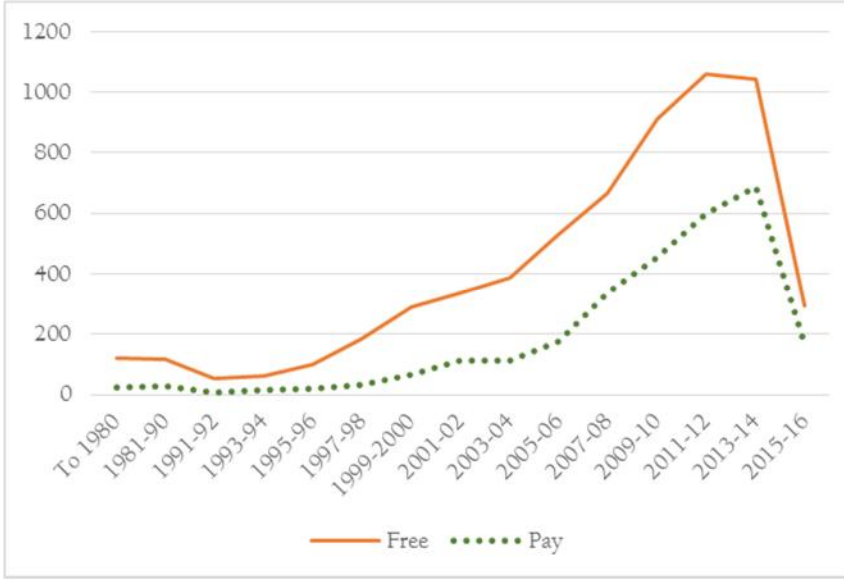

Figure 1.2. Free and pay journals by starting date, overall

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.

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 each year (60% more articles in 2016 than

in 2011), APC-based OA has grown much more rapidly (more than doubling over the six years).

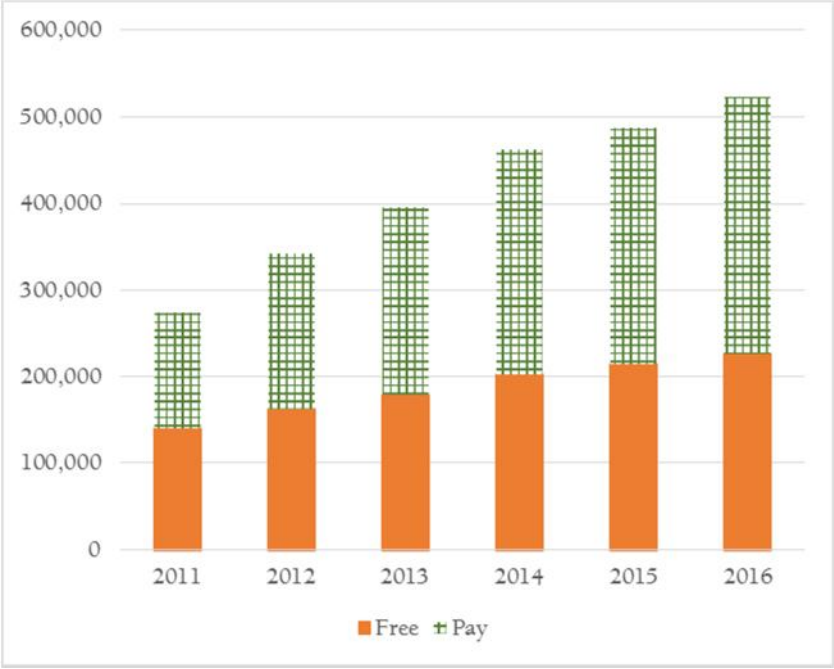

Figure 1.3. Free and pay articles by year, overall

Journal Growth and Shrinkage

Change 2015-16	Count	Percent	Cum%
Grew 50%+	1,537	17.1%	
Grew 25-49.9%	889	9.9%	27.0%
Grew 10-24.99%	1,027	11.4%	38.4%
Even, ±9.99%	2,172	24.2%	62.6%
Shrank 10-24.99%	1,020	11.3%	73.9%
Shrank 25-49.99%	1,107	12.3%	86.2%
Shrank 50%+	1,240	13.8%	

Table 1.4. Growth and shrinkage, overall

Table 1.4 shows how journals grew and shrank in number of articles from 2015 to 2016. Slightly more journals grew than shrank. (The 149 journals that either began in 2016 or had articles in 2016 but not in 2015 are included in "Grew 50% or more"—a change from last year's separate row.)

The Biggest Numbers

There's a lot of gold OA publishing that's *not* represented in *DOAJ*, either because journals don't meet the criteria or haven't applied. I chose to update 2016 counts for those journals removed from *DOAJ* in 2016, and separately looked at OA journals included in certain former blacklists. In the latter case, where original counts only ran through June 2016, I recounted the 2,200 or so that had at least 10 articles in the first half of 2016, found that most had roughly twice as many articles for the full year (as you'd expect), and applied that doubling to the remaining journals with *any* articles in the first half of 2016.

	2016	**2015**	**2014**	**2013**	**2012**
DOAJ	523,205	486,511	461,986	395,056	342,105
Gray 1	141,400	146,785	146,844	136,093	127,105
Gray 2	151,183	134,654	121,241	87,719	60,360
Gray 3	146,382	138,746	109,397	76,584	48,935
Total	962,170	906,696	839,468	695,452	578,505

Table 1.5. All known gold OA articles 2012-2016

Table 1.5 shows the results. Gray 1 is composed of journals that were in *DOAJ* on January 1, 2016 but not on January 1, 2017. Gray 2 is journals included in a blacklist where the blacklisting was not based on any stated evidence at all, and where my casual scan did not reveal an issue. Finally, Gray 3 is journals where some reason was given for blacklisting the publisher or journal or where I saw an issue. (Gray 2 and 3 are probably undercounted by about 10% for 2012-2015 because of the methodology used this time around.)

This is, I believe, a one-time overview: it's hard to see how it could be repeated.

The Megajournals

Finally, a note about two megajournals—ones publishing more than 20,000 articles in 2016 (the next highest figure is under 7,000). Last year, there was only one megajournal, and it was excluded from many discussions and tables. This year, there's no such exclusion.

Those two journals do affect overall figures quite substantially. Table 1.6 shows article counts and free article percentages for 2012 through 2016 with those two journals omitted.

	2016	**2015**	**2014**	**2013**	**2012**
Articles	475,510	445,757	426,083	360,994	317,857
%Free	47%	48%	47%	49%	51%

Table 1.6. Article counts and free percentage without two megajournals

Note that the free percentage jumps from 43% to 47% and that a majority of articles are free as recently as 2012. As for revenues and average maximum cost per article, the remaining journals show a maximum total revenue for 2016 of $344,793,343 and an average article cost of $725, a significant change.

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. My purpose here is to describe, not prescribe.

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.

Chapter 4 discusses 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.

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 predictability based on existing data or, really, whether knowing a journal's pattern for two or more years makes it plausible to project publication levels for the next year.

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'll continue to split serious gold OA into two groups: APCLand and OAWorld. But the population of APCLand has grown, with BMJ added since total 2016 articles exceed 5,000. The criteria have changed slightly (Elsevier and Springer now publish enough non-APC journals to bring the APC percentage below two-thirds but still a majority: all others are at least 90% APC).

APCLand

APCLand consists of twelve publishers, each with more than 5,000 OA articles in 2016, each with a maximum potential 2016 APC revenue of more than $8.8 million (actual revenue may be lower), and each with a majority of its 2016 articles in OA journals appearing in APC-charging journals.

APCLand accounts for 19% of the fully-analyzed *DOAJ* journals with articles in 2016 and 39% of the 2015 articles in those journals. It also accounts for **83%** of the maximum potential APC revenues.

In other words, although APCLand accounts for one-fifth of the serious gold OA journals and less than two-fifths of the articles, it takes in more than **four-fifths** of the revenue.

APCLand includes these publishers, listed alphabetically and using publisher names used in DOAJ listings: BioMed Central, BMJ Publishing Group, 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.

For 2016, APCLand included 1,571 active gold OA journals publishing 204,318 articles, with a total maximum potential APC revenue of $349.172 million.

Overall, 17% of the APCLand journals publishing 2016 articles did not have APCs when checked in early 2017 (including journals funded through SCOAP[3]), but those journals published only 8% of the articles in APCLand. Average cost per article (assuming no waivers, discounts or less-expensive article categories) was $1,867; including the no-fee journals brings that down to $1,709. The average fee-charging journal published 145 articles and the average free journal published 61 articles, for an overall average of 130 articles per journal.

OAWorld

OAWorld includes thousands of publishers (more than 4,300 names in a list of unique *DOAJ* publisher fields, but it's clear that some of them represent spelling or other minor variations). These publishers accounted for 81% of the active journals and 61% of the articles, but only 17% of the revenues.

OAWorld accounts for 7,276 fully-analyzed active journals in 2016 with 318,887 articles, with a maximum revenue of $70.715 million.

Here's perhaps the key point: in OAWorld, not only do 80% of the journals active in 2016 *not* charge APCs or equivalent fees, those journals account for 65% of the articles, In other words, in OAWorld *most articles—nearly two-thirds—did not involve author-side charges*.

Another key figure: for those articles that *did* involve fees, the average cost per article was $635, just over one-third the average fee in APCLand. Averaged across *all* articles, the cost per article was $222—barely more than one-eighth (13%) 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 81 articles for fee-charging journals, 38 for free journal and 46 overall. The average fee-charging OAWorld journal could have taken in around $51.5 thousand.

APCLand and OAWorld in this book

Gold Open Access Journals 2011-2015 discusses my discovery of APCLand as a significant concept and its significant effect on country ratings; that discussion is not repeated here.

Except for this chapter and Chapter 4, the APCLand-OAWorld distinction plays out primarily in Chapters 7 and beyond.

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,

	2016	2015	2014	2013	2012	2011
APCLand/jrnls	1,571	1,607	1,575	1,279	1,025	871
Growth	80%	85%	81%	47%	18%	
Articles	204,318	189,005	175,852	134,619	107,693	76,040
Growth	169%	149%	131%	77%	42%	
Art/J	130	118	112	105	105	87
OAWorld/Jrnls	6,860	7,074	6,861	6,366	5,748	5,048
Growth	36%	40%	36%	26%	14%	
Articles	318,887	297,506	286,134	260,437	234,412	197,694
Growth	61%	50%	45%	32%	19%	
Art/J	46	42	42	41	41	39

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 much more than doubled article production in six years as compared to 61% 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 39% of the journals and 50% of the articles. Only 11% of the active APCLand biomed journals are free and those journals account for only 6% of the 2016 articles. Average cost per article among APC-charging journals in 2016 was $2,039, coming down to $1,910 overall. APCLand published 93,519 biomed articles in 2016.

In OAWorld, where 94,675 biomed articles appeared in 2016, 67% of the active 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 $866; the overall average was $397. Biomed is the smallest segment for OAWorld.

Science, Technology, Engineering and Mathematics (STEM)

STEM is the largest segment overall and—in 2016—for APCLand as well, although APCLand only accounts for 22% of the journals. Those journals published 47% of the STEM OA articles in 2016. There's not a lot of free activity in APCLand: 23% of the journals, publishing 9% of the 2016 articles. Average cost per article among APC-charging journals was $1,709; including free journals brings that down to $1,551. APCLand published 105,415 STEM articles in 2016.

STEM is also the largest segment for OAWorld, with 120,176 articles in 2016; 70% of the journals didn't charge APCs, and those journals account for 59% of the articles. Average cost per article among APC-charging journals was $555; for all journals it was $230.

Humanities and Social Sciences (HSS)

APCLand is almost wholly uninterested in the humanities and social sciences: it accounts for 3% of the active journals and 5% of the articles. Although 56% of those journals don't charge APCs, only 31% of the 5,384 articles in 2016 appeared in free journals. Average cost per article

among APC-charging journals was $1,903; including non-APC journals, the cost per article comes down to $1,306.

OAWorld published 104,036 HSS articles in 2016. Very little of that involved APCs: 90% of the journals, publishing 83% of the articles, didn't charge them. Among the journals that did charge, average cost per article was $302—but the overall average was $53.

There are considerably more active HSS journals than either biomed or STEM: 3,608 in all compared to 2,416 and 2,407 respectively. OA-World accounts for 3,497 of those 3,608 journals.

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.

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 2007, and even more so since 2011, while the substantial growth in OAWorld journals began around the turn of the century. APCLand had 246 surviving journals started before 2007, with 1,470 added since then—six times as many. OAWorld had 2,524 surviving journals started before 2007, with 4,752 added since then.

Growth and Shrinkage

Change 2015-16	Count	Percent	Cum%
Grew 50%+	343	20.0%	
Grew 25-49.9%	168	9.8%	29.8%
Grew 10-24.99%	180	10.5%	40.3%
Even, ±9.99%	322	18.8%	59.0%
Shrank 10-24.99%	190	11.1%	70.1%
Shrank 25-49.99%	223	13.0%	83.1%
Shrank 50%+	290	16.9%	

Table 2.2. Growth and shrinkage, APCLand

Change 2015-16	Count	Percent	Cum%
Grew 50%+	1,194	16.4%	
Grew 25-49.9%	721	9.9%	26.3%
Grew 10-24.99%	847	11.6%	38.0%
Even, ±9.99%	1,850	25.4%	63.4%
Shrank 10-24.99%	830	11.4%	74.8%
Shrank 25-49.99%	884	12.1%	86.9%
Shrank 50%+	950	13.1%	

Table 2.3. Growth and shrinkage, OAWorld

I don't see significant differences between these two patterns.

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 look at 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 skip over it. It's here to provide transparency on research techniques and to spell out clearly what journals are excluded from this report and why. (Appendix A discusses methodology and changes from the previous report.)

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, 2017 and March 24, 2017. I marked around 1,400 journals—those flagged as exclusions and journals that might not yet have their final 2016 issues posted—for revisits. I revisited those journals in the second half of April 2017.

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. (One national journal platform doesn't seem to work using the Excel-to-Chrome path.) All sites that didn't work the first time were retried in April 2017.
- 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. I checked *DOAJ* itself. Most recently-verified journals explicitly show the APC or lack thereof. If it was there, I used it.
2. 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. There were 21 of these.
3. 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.
4. 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. Nineteen of these.
5. *All* CA journals were revisited in late April 2016 to search again for information.

- At all times, I ran 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; only one journal (*Anusandhan Vigyan Shodh Patrika*) was impossible to analyze.

- I spent even more time trying to count articles in journals I'd previously flagged as opaque or uncountable, eventually eliminating *all* "opaque" cases and leaving five that were impossible to count.
- Between improvements in *DOAJ* standards and the "BX" retries, the total number of excluded journals was reduced by 40%, to less than 4% of all candidate journals (excluding duplicates).

Codes CA and X through XX

Table 3.1 summarizes excluded journals by type.

Code	Count
CA: APC missing or hidden	40
XE: Empty from 2011 through 2016	46
XI: Impossible to count articles by year	5
XM: Malware encountered	67
XN: Not open access	17
XP: Parking or ad page	31
XT: Translation inadequate/impossible	1
XU: Unworkable site	21
XV: Merged with no way to count	30
XX: Unreachable on repeated efforts	116
Total excluded	**374**

Table 3.1. Excluded journals

Compared to last year, CA is down from 112; XE is up from 40; XI and XO combined are down from 21; XM is down from 103; XN is down from 55; XP is down from 44; XT is the same; XU is down from 95; XV is up from 11; and XX is down from 196. These are generally promising figures, especially the reductions in CA and XM.

Code	2016	2015	2014	2013	2012	2011
CA	6,263	5,523	5,145	4,046	3,334	2,373
XP		410	942	920	657	595
XU		575	877	943	1031	295
XV			42	135	154	35
XX		1984	2886	2860	2574	2221
Total		8,492	9,892	8,904	7,750	5,519

Table 3.2. Partial article counts for excluded journals

I did count articles in CA journals and had some numbers for previous years for some X journals. summarized in Table 3.2; as should be clear, omitted journals would never add much to the total.

The following sections offer additional notes on excluded journals.

CA: APC missing or hidden

These journals come from 11 different countries but there only significant groups in two countries: 16 from India and 12 from South Korea. Looking at subjects, 13 of these are in biomed, 21 are in STEM fields and 6 are in the humanities and social sciences. Subjects are clear enough: 13 (with 1,755 articles in 2016) in medicine and 11 (with 2,739 articles in 2016) in computer sciences.

XE: Empty from 2011 through 2016

Some of these were merged into other journals or changed titles.

XI: Impossible to count articles by year

For these journals, there simply aren't any dates, either on tables of contents or the articles themselves. In at least one case, there aren't individual articles as such.

XM: Malware encountered

While there are fewer of these than there used to be, 67 is still far too many. Admittedly, a few of these are really journals with no servers (McAfee Site Adviser sometimes traps these as malware)—but that's not much better.

While XM journals come from 27 countries, there are only six with more than two such journals: Romania with 11, Germany with 10, Indonesia with 8, India with 5, the Russian Federation with 4 and Turkey with three. Only eight biomed journals show signs of malware, compared to 31 STEM and 28 HSS.

Here's a list of the journals apparently infected with malware as of April 2017. These all need to be fixed.

Acta Iassyensia Comparationis, Advanced Computational Techniques in Electromagnetics, Agrárinformatika Folyóirat, Agrisost, AgroLife Scientific Journal, Al-Albab, Alternatives Rurales, Anale : Seria Ştiinţe Economice. Timişoara, Andhra Pradesh Journal of Psychological Medicine, Annals of Research in Antioxidants, Anuario de la Facultad de Ciencias Económicas y Empresariales, Arheologia Moldovei, At-Turats, Basic Research Journal of Agricultural Science and Review, Beder University Journal of Educational

Sciences, Boletim Petróleo, Royalties e Região, Boletín Geográfico, Communications in Numerical Analysis, Cultural Tourism, Currículo sem Fronteiras, Data Envelopment Analysis and Decision Science, Dentino Jurnal Kedokteran Gigi, Dynamic Relationships Management Journal (DRMJ), Earth System Science Data, Enviroscienteae, European Agrophysical Journal , European Journal of Environmental Sciences, European Journal of Investigation in Health, Psychology and Education, Human : Research in Rehabilitation, Hyperion Economic Journal, International Journal of Educational Research and Technology, International Journal of Electronics and Telecommunications, International Journal of Finance & Banking Studies, International Journal of Medical Research and Health Sciences, International Journal of Research In Business and Social Science, Journal of Copyright in Education and Librarianship, Journal of Evidence Based Medicine and Healthcare, Journal of Fuzzy Set Valued Analysis, Journal of Intelligence Studies in Business, Journal of Interpolation and Approximation in Scientific Computing, Journal of Molecular Biochemistry, Journal of Nonlinear Analysis and Application , Journal of Numerical Mathematics and Stochastics, Journal of Soft Computing and Applications, Journal of Wetlands Environmental Management, Jurnal Hutan Tropis, KLIK: Kumpulan jurnaL Ilmu Komputer, Lambung Mangkurat Law Journal, Linguagem: Estudos e Pesquisas, Mathematics Education Trends and Research, Métodos de Información, Nesne Psikoloji Dergisi, Present Environment and Sustainable Development , Revista Portuguesa de Educação Artística, Romanian Journal of Society and Politics, Sanglap: Journal of Literary and Cultural Inquiry, Scientific Bulletin Biotechnology : Series F, Scientific Papers Series : Management, Economic Engineering in Agriculture and Rural Development, Scientific Papers: Series B. Horticulture, Tekhnologiya i Konstruirovanie v Elektronnoi Apparature, Terrestrial, Atmospheric and Oceanic Sciences, The Romanian Economic Journal, Vestnik Volgogradskogo Gosudarstvennogo Universiteta. Seriâ 10. Innovacionnaâ Deâtel'nost', Vestnik Volgogradskogo Gosudarstvennogo Universiteta. Seriâ 2. Âzykoznanie, Vestnik Volgogradskogo Gosudarstvennogo Universiteta. Seriâ 4. Istoriâ, Regionovedenie, Meždunarodnye Otnošeniâ, Vestnik Volgogradskogo Gosudarstvennogo Universiteta. Serija 1. Mathematica. Physica, Zeitschrift für die Welt der Türken.

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 four hybrid journals, four magazines (rather than scholarly journals) three blogs and a handful of others.

The BX Saves

Of the journals changed to BX—because a title search yielded a different URL that was countable, but not linked from the original—original situations included 52 with 404 errors, 40 with no DNS, eight that weren't reachable and three that weren't findable from parent directories, six with malware, four parking pages and a handful of others.

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 2016 volume or the peak of the period 2011-2016. It should help clarify what's out there and how pay-versus-free varies by article volume.

Gold Open Access Journals 2011-2015 discussed various ways to determine appropriate groups of journals by volume. There's no "best" way, so for the sake of consistency this chapter (and the rest of the book) uses the same five-part breakdown as last year: Largest (600 or more articles in peak year); Large (150 to 599 articles); Medium (60 to 149 articles); Small (20 to 59 articles); Smallest (1 to 19 articles).

Detailed Breakdown of Journals by Peak Volume

Table 4.1 offers a detailed breakdown of journals by peak article volume, showing for each range the number of journals, how many journals published articles in 2016, the percentage of those journals that don't charge APCs (%Free), the number of articles in 2016, the percentage of articles appearing in non-APC journals, and the percentage of all 2016 articles represented in this bracket. The peak number is the *lower* limit of the row—thus, the first row is 20,000 articles and up, while the second is 2,000 to 19,999 (actually 2,000 to 6,731).

Peak	Journals	Act. 16	%Free	Articles	%Free	% of articles
20,000	2	2	0.0%	47,695	0.0%	9.12%
2,000	22	22	18.2%	51,644	31.7%	9.87%
1,000	35	34	17.6%	31,976	19.5%	6.11%
800	24	24	25.0%	16,803	21.1%	3.21%
600	34	33	15.2%	18,090	14.5%	3.46%
400	84	84	17.9%	30,927	15.6%	5.91%
300	97	97	29.9%	24,942	28.3%	4.77%
200	212	210	36.7%	37,443	35.1%	7.16%
150	205	203	40.4%	25,645	40.0%	4.90%
125	199	197	48.2%	18,982	48.3%	3.63%
100	324	312	53.8%	25,162	54.8%	4.81%
80	419	408	54.2%	26,048	54.6%	4.98%
60	718	700	57.1%	36,281	58.9%	6.93%
50	534	523	70.9%	20,754	71.8%	3.97%
40	880	837	73.4%	28,768	74.4%	5.50%
30	1,244	1,188	77.2%	31,320	79.4%	5.99%
20	1,851	1,740	78.2%	32,233	80.7%	6.16%
15	929	836	77.9%	10,731	80.8%	2.05%
10	785	689	79.7%	6,254	82.5%	1.20%
5	373	277	68.2%	1,466	73.9%	0.28%
1	21	15	73.3%	41	78.0%	0.01%

Table 4.1. Journals and articles by detailed peak volume

Non-APC journals tend to be smaller: that's clear. Note the breakpoints: for journals with 400 or more articles, no more than one-quarter of journals are free, while for those with fewer than 124 articles, more than half of journals and articles are free.

The Three Segments

Chapter 2 introduced the three subject segments used throughout, but it's worth adding a few notes about each segment:

- **Biomed**: All of human biology and medicine, the segment 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. The segment with the most articles.
- **HSS**: Humanities and social sciences, as well as multidisciplinary journals that cross over both scientific and other areas. Fewest articles but most journals of any segment.

Journals and Articles by Segment

To get a sense of the size of each segment, Table 4.2 breaks out the data in Table 1.1 into the three segments.

	Journals	Act. 2016	Articles	Art/Jrnl
Biomed	**2,562**	**2,416**	**188,194**	**78**
Free	1,156	1,099	57,201	52
Pay	1,406	1,317	130,993	99
Free%	45%	45%	30%	
STEM	**2,566**	**2,407**	**225,591**	**94**
Free	1,530	1,446	80,049	55
Pay	1,036	961	145,542	151
Free%	60%	60%	35%	
HSS	**3,864**	**3,608**	**109,420**	**30**
Free	3,471	3,225	87,558	27
Pay	393	383	21,862	57
Free%	90%	89%	80%	

Table 4.1. Journals and articles by segment

Biomed has the lowest percentage of free journals, the only segment with more than half of journals charging APCs, while STEM has the most articles per journal across the board. (Note that the two true mega-journals both fall into STEM.)

Journals by Segment

	Biomed	**STEM**	**HSS**	**Total**
Largest: 600+	50	58	7	115
Free%	8%	22%	57%	18%
Large: 150-599	322	201	71	594
Free%	27%	36%	78%	34%
Medium: 60-149	663	553	401	1,617
Free%	44%	50%	78%	55%
Small: 20-59	1,039	1,135	2,114	4,288
Free%	55%	67%	91%	76%
Smallest: 0-19	342	460	1,015	1,817
Free%	43%	70%	92%	77%

Table 4.3. Journals by segment, 2016

Bigger journals are more likely to have APCs, no matter what the segment: that and a number of other items seem clear in Table 4.3. Note that most HSS journals across the board are free—as are most small journals in all segments.

Article Volume by Segment

	Biomed	STEM	HSS	Total
Largest: 600+	45,796	113,314	7,098	166,208
Free%	5%	21%	32%	17%
Large: 150-599	64,460	42,683	11,814	118,957
Free%	24%	33%	50%	30%
Medium: 60-149	45,621	36,015	24,837	106,473
Free%	45%	52%	77%	55%
Small: 20-59	29,149	29,202	54,724	113,075
Free%	59%	69%	91%	77%
Smallest: 0-19	3,168	4,377	10,947	18,492
Free%	49%	76%	92%	81%

Table 4.4. Articles by segment, 2016

Table 4.4 translates Table 4.3 into articles, since it's not feasible to show both sets of data in a single table. The percentages are similar to those in Table 4.4, except for the largest HSS journals, where two-thirds of articles have fees even though 57% journals are free.

Small journals publish more articles in the humanities and social sciences than do other sizes; that may not be surprising. Perhaps more interesting: large (but not largest) biomed journals stand out—whereas the largest STEM journals would have the most articles *even without the two megajournals*.

APCLand and OAWorld: Journals

Let's look at APCLand and OAWorld separately, using the same layout and data as for Tables 4.3 and 4.4.

	Biomed	STEM	HSS	Total
Largest: 600+	38	26	1	65
Free%	3%	8%	0%	5%
Large: 150-599	159	61	3	223
Free%	5%	16%	33%	9%
Medium: 60-149	254	103	10	367
Free%	11%	22%	50%	16%
Small: 20-59	364	259	65	688
Free%	15%	28%	58%	24%
Smallest: 0-19	121	75	32	228
Free%	7%	17%	56%	17%

Table 4.5. Journals by segment, APCLand

	Biomed	STEM	HSS	Total
Largest: 600+	12	32	6	50
Free%	25%	34%	67%	36%
Large: 150-599	163	140	68	371
Free%	49%	44%	62%	50%
Medium: 60-149	409	450	391	1,250
Free%	64%	57%	79%	66%
Small: 20-59	675	876	2,049	3,600
Free%	76%	79%	93%	86%
Smallest: 0-19	221	385	983	1,589
Free%	63%	80%	93%	86%

Table 4.6. Journals by segment, OAWorld

It may be interesting to compare Table 4.6 to Table 4.3; note the generally higher free-journal percentages for biomed and STEM.

APCLand and OAWorld: Articles

	Biomed	STEM	HSS	Total
Largest: 600+	31,932	77,395	2,128	111,455
Free%	0%	4%	0%	3%
Large: 150-599	33,932	14,119	473	48,524
Free%	4%	17%	11%	8%
Medium: 60-149	16,996	7,031	685	24,712
Free%	14%	24%	59%	18%
Small: 20-59	9,631	6,366	1,748	17,745
Free%	20%	38%	58%	30%
Smallest: 0-19	1,028	504	350	1,882
Free%	8%	22%	65%	22%

Table 4.7. Articles by segment, APCLand

The 0% for Free%/Largest/Biomed is correct: the single very large free biomed journal published considerably less than one-half of one percent of all the articles for largest biomed journals (0.2%, actually).

	Biomed	STEM	HSS	Total
Largest: 600+	13,864	35,919	4,970	54,753
Free%	17%	58%	46%	47%
Large: 150-599	30,528	28,564	11,341	70,433
Free%	46%	40%	52%	44%
Medium: 60-149	28,625	28,984	24,152	81,761
Free%	64%	59%	78%	66%
Small: 20-59	19,518	22,836	52,976	95,330
Free%	78%	77%	93%	86%
Smallest: 0-19	2,140	3,873	10,597	16,610
Free%	68%	83%	93%	87%

Table 4.8. 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. For small open access journals run out of a university library or department the costs 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 require registration.

Normally, 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 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 may be getting from APCs.

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. Except for the first two rows (and slight modifications at the top of ranges to reflect reality), revenue brackets are the same as in *Gold Open Access Journals 2011-2015* to provide some comparability.

Revenue	Journals	Cum J	Articles	Art/J
$18 to $40 million	3		51,381	17,127
$4 to $6 million	6	9	13,052	2,175
$2 to $3.96 million	16	25	23,757	1,485
$1 to $1.88 million	44	69	30,470	693
$750,000 to $999,999	25	94	9,675	387
$500,000 to $749,999	52	146	18,315	352
$400,000 to $499,999	33	179	9,685	293
$300,000 to $399,999	59	238	12,002	203
$250,000 to $299,999	29	267	4,481	155
$200,000 to $249,999	62	329	12,914	208
$150,000 to $199,999	75	404	9,783	130
$100,000 to $149,999	134	538	12,792	95
$75,000 to $99,999	104	642	10,025	96
$50,000 to $74,999	178	820	15,386	86
$40,000 to $49,999	115	935	6,018	52
$30,000 to $39,999	150	1,085	10,617	71
$25,000 to $29,999	98	1,183	5,685	58
$20,000 to $24,999	117	1,300	5,989	51
$15,000 to $19,999	154	1,454	6,633	43
$10,000 to $14,999	221	1,675	6,563	30
$7,500 to $9,999	161	1,836	5,124	32
$5,000 to $7,499	165	2,001	4,872	30
$2,500 to $4,999	230	2,231	5,904	26
$1,000 to $2,499	229	2,460	4,506	20
$40 to $999	201	2,661	2,768	14
$0 (no 2016 articles)	174	2,835	0	0

Table 5.1 Revenue by journal, detailed breakdown

What's clear from Table 5.1 is that APC-based OA publishing isn't an easy way to strike it rich. Only 538 journals could have revenues of

$100,000 or more in 2016, and only 820 could have $50,000 or more. Most APC-charging journals took in less than $20,000 in 2016.

Max. 2016 Revenue	Publishers	Total
APCLand: $8-$66M	12	$341,996,697
$2-$6 Million	10	$27,215,427
$1-$1.9 Million	9	$13,282,276
$500K-$960K	18	$12,681,261
$250K-$498K	20	$7,178,855
$100K-$249K	52	$7,845,713
$50K-$99K	55	$3,852,963
$25K-$49K	74	$2,625,291
$15K-$24K	59	$1,112,667
$10K-$14K	55	$680,931
$5K-$9K	116	$860,767
$2K-$4K	126	$421,554
$40-$1,999	136	$133,045

Table 5.2 Maximum potential 2016 revenue by publisher, unnormalized

What about revenues by publishers? Table 5.2 shows a very rough set of figures and brackets—but publisher names weren't normalized or grouped, which is why the total for the twelve publishers with potential revenues greater than $8 million (that is, APCLand) is lower than the total given in Chapter 2. Even without such normalization and grouping, the results are fairly clear: only 31 publishers with at least $1 million in potential revenues and only 18 more with at least $500,000. More than 3,000 publisher names show no revenue at all.

Detailed APC Breakdown

APCs range from $4 (yes, four dollars) to $5,200. Table 5.3 offers a fairly detailed set of APC ranges. (*All* APC-charging journals are included throughout, a change from last year.)

APC	Journals	Cum J	Articles	Art/J
$4,000-$5,200	14		6,112	437
$3,000-$3,975	38	52	4,076	107
$2,500-$2,975	46	98	10,574	230
$2,250-$2,490	95	193	22,372	235
$2,000-$2,240	264	457	36,732	139
$1,750-$1,995	262	719	27,655	106
$1,500-$1,725	100	819	36,304	363
$1,250-$1,495	92	911	41,707	453
$1,000-$1,235	232	1,143	13,534	58
$750-$997	261	1,404	11,281	43
$600-$749	293	1,697	4,840	17
$400-$599	218	1,915	15,482	71
$300-$399	170	2,085	11,028	65
$200-$299	142	2,227	14,071	99
$100-$199	308	2,535	22,224	72
$1-$99	300	2,835	20,405	68

Table 5.3. APC levels, detailed breakdown

Unlike the reasonably good correlation between journal revenue and articles per journal in Table 5.1, there's no clear correlation in Table 5.3. The highest article-per-journal averages are in the most expensive journals and in medium-priced journals charging $1,250 to $1,725. Journals charging $600 to $1,235 have *fewer* articles per journal than journals charging less than $400.

For consistency, the APC brackets in the remainder of this chapter and the rest of the book are the same as last year:

- High: $1,400 and up (the most articles involving APCs)
- Medium: $600 to $1,399 (the most journals with APCs)
- Low: $200 to $599
- Modest: $2 to $199

Fees and Revenue by Segment

	Biomed	STEM	HSS
$1,400+	663	145	24
Articles	88,668	83,831	3,272
Revenue	$195,765,728	$157,598,067	$7,560,594
$600-$1.399	321	337	62
Articles	13,998	23,228	2,190
Revenue	$13,146,494	$25,190,933	$2,181,899
$200-$599	208	219	94
Articles	16,909	16,529	7,143
Revenue	$6,183,376	$6,120,951	$2,019,830
$2-$199	125	260	203
Articles	11,418	21,954	9,257
Revenue	$1,141,318	$2,224,048	$754,209
Free	1,099	1,446	3,225
Articles	57,201	80,049	87,558

Table 5.4. Articles and revenue by segment, overall

Table 5.4 shows journals that published articles in 2016 by APC bracket, including number of articles and maximum revenue. As you'd expect, the highest-priced journals account for most of the revenues: 91% in biomed, 82% in STEM and 60% in HSS. Note: some journal counts elsewhere, including Tables 5.5 to 5.9, differ from these (because they include journals with no 2016 articles).

Growth and Shrinkage

Tables 5.5 through 5.8 show article change in each journal from 2015 to 2016 for the five price brackets.

Change 2015-16	Count	Percent	Cum%
Grew 50%+	171	20.3%	
Grew 25-49.9%	88	10.4%	30.7%
Grew 10-24.99%	101	12.0%	42.7%
Even, ±9.99%	174	20.6%	63.3%
Shrank 10-24.99%	105	12.5%	75.8%
Shrank 25-49.99%	126	14.9%	90.7%
Shrank 50%+	78	9.3%	

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

Change 2015-16	Count	Percent	Cum%
Grew 50%+	186	21.8%	
Grew 25-49.9%	55	6.4%	28.2%
Grew 10-24.99%	79	9.3%	37.5%
Even, ±9.99%	127	14.9%	52.3%
Shrank 10-24.99%	59	6.9%	59.3%
Shrank 25-49.99%	107	12.5%	71.8%
Shrank 50%+	241	28.2%	

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 2015 to 2016 and less likely to shrink rapidly or very rapidly—and, as you can see by comparing Table 5.6 with Tables 5.7-5.9 (next page), medium-priced journals were more likely to shrink than any other category.

Change 2015-16	Count	Percent	Cum%
Grew 50%+	87	16.4%	
Grew 25-49.9%	61	11.5%	27.9%
Grew 10-24.99%	64	12.1%	40.0%
Even, ±9.99%	138	26.0%	66.0%
Shrank 10-24.99%	74	14.0%	80.0%
Shrank 25-49.99%	66	12.5%	92.5%
Shrank 50%+	40	7.5%	

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

Change 2015-16	Count	Percent	Cum%
Grew 50%+	102	16.8%	
Grew 25-49.9%	41	6.7%	23.5%
Grew 10-24.99%	66	10.9%	34.4%
Even, ±9.99%	156	25.7%	60.0%
Shrank 10-24.99%	83	13.7%	73.7%
Shrank 25-49.99%	90	14.8%	88.5%
Shrank 50%+	70	11.5%	

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

Change 2015-16	Count	Percent	Cum%
Grew 50%+	991	16.1%	
Grew 25-49.9%	644	10.5%	26.6%
Grew 10-24.99%	717	11.6%	38.2%
Even, ±9.99%	1,577	25.6%	63.8%
Shrank 10-24.99%	699	11.4%	75.2%
Shrank 25-49.99%	718	11.7%	86.8%
Shrank 50%+	811	13.2%	

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 but do publish multiple OA journals.
- **Miscellaneous**: Publisher names (frequently journal names) that don't obviously fall into the other types and that only have one or two journals.

I searched for information on 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.

Category	Journals	%Free	Articles	%Free
Open Access	2,062	29%	174,885	14%
Univ/college	3,962	89%	132,527	77%
Traditional	796	36%	93,357	26%
Miscellaneous	1,441	79%	82,722	62%
Society/govt	731	82%	39,714	57%

Table 6.1. Publisher category, overall

Even in Table 6.1 (sorted by number of articles) 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) 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. Neither journal nor article counts include excluded journals as defined in Chapter 3, and journal counts in some tables are for journals publishing articles in 2016, rather than the total counts in Table 6.1.

Open Access Publishers

	2016	2015	2014	2013	2012	2011
Journals	1,880	1,946	1,925	1,748	1,437	1,251
%Free	30%	30%	27%	26%	25%	23%
Articles	174,885	169,850	172,881	148,877	125,286	92,927
%Free	14%	14%	13%	14%	15%	16%

Table 6.2. Journals and articles by year, open access publishers

Given that this category (which actually includes 2,062 journals) is 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: 70% of the active journals, publishing 86% of the articles, charge APCs—and the trend toward all-pay, all the time, has gotten slightly worse over time.

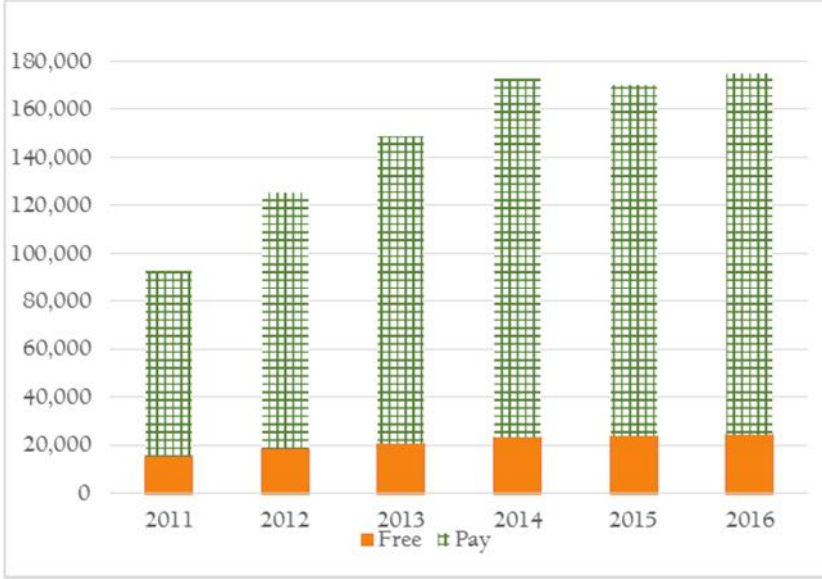

Figure 6.1. Free and pay articles by year, open access publishers

As Figure 6.1 shows, it was also a fairly rapidly growing category through 2014—and nearly all that growth is in pay journals. The slight article drop in 2015 was more than made up for in 2016.

	Journals	%Free	Articles	%Free
Largest: 600+	56	5%	77,486	2%
Large: 150-599	234	16%	49,343	14%
Med.: 60-149	414	23%	25,667	26%
Small: 20-59	796	36%	19,150	41%
Smallest: 0-19	380	37%	3,239	45%

Table 6.3. Article volume, open access publishers

While there are more 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 are a majority says a lot.

	Jour.	%APC	%All	Art.	%APC	%All
$1,400+	573	39%	28%	112,614	75%	64%
$600-$1.399	546	37%	26%	17,951	12%	10%
$200-$599	234	16%	11%	13,533	9%	8%
$2-$199	108	7%	5%	6,259	4%	4%
Free	601		29%	24,528		14%

Table 6.4. APC levels, open access publishers

More than one-third of the fee-charging journals are in the most expensive bracket—and those journals publish nearly two-thirds of *all* articles in this category. You won't be surprised at the very high charges per average article: $1,611 among journals charging fees and $1,385 overall.

Figure 6.2. Starting dates, open access publishers

Figure 6.2 is different from most starting-year graphs because there's so little before 1999 and because it's predominantly OA-charging startups.

	Biomed	STEM	HSS
$1,400+	481	71	14
Articles	62,902	46,903	2,809
Revenue	$134,632,715	$77,347,262	$6,545,255
$600-$1.399	201	191	25
Articles	6,418	10,744	789
Revenue	$6,222,120	$11,262,531	$667,383
$200-$599	104	83	46
Articles	5,689	5,045	2,799
Revenue	$2,170,221	$1,827,710	$889,791
$2-$199	35	48	21
Articles	4,226	1,307	726
Revenue	$358,525	$156,408	$91,836
Free	203	200	157
Articles	11,375	9,643	3,510

Table 6.5. Articles and revenue by segment, open access publishers

Mostly biomed, mostly high fees: that's the story and that's where the money is. That's what I see in Table 6.5—along with general disinterest in HSS (where the money manifestly is *not*).

Region	Journals	%Free	Articles	%Free
APCLand	1,110	5%	123,733	2%
Eastern Europe	344	83%	9,244	75%
Western Europe	231	46%	12,058	45%
Asia	145	54%	14,677	49%
Pacific/English	144	15%	10,390	8%
Middle East	45	53%	2,878	37%
Africa	38	53%	1,639	46%
Latin America	5	100%	266	100%

Table 6.6. Journals by region, open access publishers

While APCLand isn't entirely composed of OA publishers, as seen in Table 6.6, APCLand dominates this category, with more than half of the journals and seven out of ten articles.

Among what's left, Asia has the most articles and Eastern Europe the most journals, 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.

Universities, Colleges and Institutes

	2016	2015	2014	2013	2012	2011
Journals	3,720	3,866	3,765	3,531	3,235	2,870
%Free	89%	89%	89%	90%	90%	90%
Articles	132,527	133,500	126,620	112,605	103,942	90,886
%Free	77%	77%	76%	79%	77%	78%

Table 6.7. Journals and articles by year, university-published

University and college publishers accounted for 3,962 journals. Table 6.7 counts journals with at least one article in any given year. The very high percentage of free journals and articles has stayed nearly constant over the years.

As Figure 6.3 (next page) shows, these journals grew steadily through 2015 and were essentially flat for 2016; since so many university journals are small with slow production schedules, it's possible that post-April 2017 to 2016 volumes will increase both journals and articles enough to make up the apparent losses.

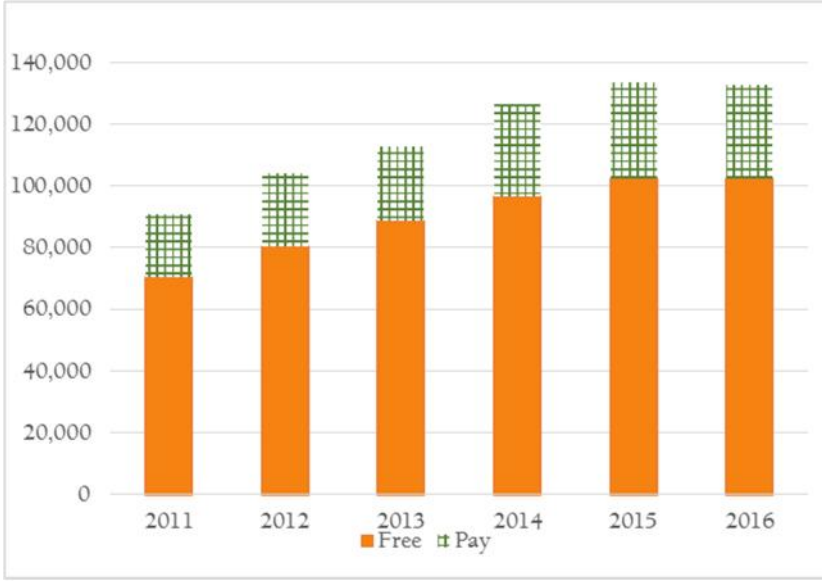

Figure 6.3. Free and pay articles by year, university-published

	Journals	%Free	Articles	%Free
Largest: 600+	11	36%	8,233	15%
Large: 150-599	125	62%	20,536	57%
Med.: 60-149	584	77%	37,546	76%
Small: 20-59	2,118	92%	56,473	92%
Smallest: 0-19	882	94%	9,739	94%

Table 6.8. Article volume, university-published

The percentage changes in Table 6.8 are typical: the largest journals (very few of them) are primarily APC-charging. Most university-published journals are small or very small.

Table 6.9 shows that most APC-charging university-published journals have very low charges—but the most expensive ones also publish by far the most articles per journal. The average cost per article among APC-charging journals is $697; among all journals it's $159.

	Jour.	%APC	%All	Art.	%APC	%All
$1,400+	23	5%	1%	6,278	21%	5%
$600-$1.399	32	8%	1%	3,591	12%	3%
$200-$599	95	23%	2%	6,851	23%	5%
$2-$199	271	64%	7%	13,583	45%	10%
Free	3,541		89%	102,224		77%

Table 6.9. APC levels, university-published

Figure 6.4. Starting dates, university-published

The story is that rapid growth began in 2003-2004 and peaked in 2011-2012; that there were quite a few early journals; and that there never were large numbers of pay journals.

Table 6.10 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.

	Biomed	STEM	HSS
$1,400+	12	9	2
Articles	3,205	2,963	110
Revenue	$7,429,869	$6,731,250	$187,594
$600-$1.399	13	18	1
Articles	1,150	2,433	8
Revenue	$1,017,643	$2,556,385	$5,200
$200-$599	23	45	25
Articles	2,328	3,354	1,169
Revenue	$655,568	$1,179,163	$330,040
$2-$199	40	102	123
Articles	2,276	6,022	5,285
Revenue	$247,307	$458,806	$335,314
Free	401	732	2,174
Articles	17,672	26,006	58,546

Table 6.10. Articles and revenue by segment, university-published

Region	Journals	%Free	Articles	%Free
Latin America	1,275	95%	42,111	88%
Western Europe	795	96%	20,457	84%
Eastern Europe	643	86%	24,250	76%
Asia	541	75%	14,547	70%
Middle East	341	87%	15,002	75%
Pacific/English	303	93%	8,463	83%
Africa	35	57%	1,910	57%
APCLand	29	28%	5,787	6%

Table 6.11. Journals by region, university-published

Table 6.11 is arranged by number of articles. It's not surprising that Latin America leads the list.

Traditional Publishers

	2016	2015	2014	2013	2012	2011
Journals	780	769	695	471	385	291
%Free	36%	36%	37%	36%	36%	34%
Articles	93,357	71,559	52,579	34,555	23,542	16,211
%Free	26%	26%	30%	27%	31%	33%

Table 6.12. Journals and articles by year, traditional publishers

The second-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 796 journals in *DOAJ* at the end of 2016. It's a fast-growing segment, although journal growth slowed in 2016. Not surprisingly, nearly two-thirds of journals and three-quarters of articles involve APCs. (Some journals are sponsored by societies or otherwise funded.)

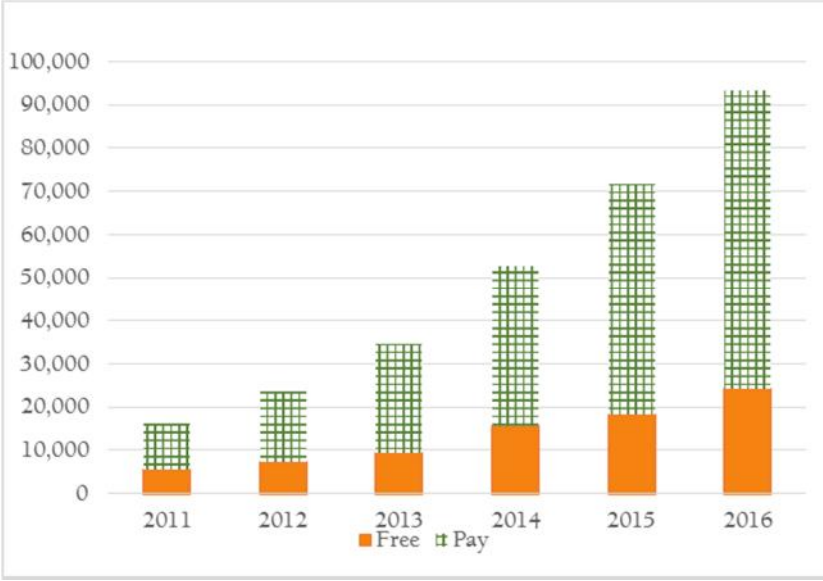

Figure 6.5. Free and pay articles by year, traditional publishers

	Journals	%Free	Articles	%Free
Largest: 600+	21	24%	47,666	20%
Large: 150-599	81	23%	18,045	23%
Med.: 60-149	206	33%	15,658	34%
Small: 20-59	363	42%	10,934	44%
Smallest: 0-19	109	31%	1,054	35%

Table 6.13. Article volume, traditional publishers

Table 6.13 is more or less what you might expect in terms of patterns, with mostly fee-based journals, although there are a healthy number of small non-APC journals.

	Jour.	%APC	%All	Art.	%APC	%All
$1,400+	211	41%	27%	49,697	72%	53%
$600-$1.399	225	44%	28%	12,458	18%	13%
$200-$599	61	12%	8%	5,614	8%	6%
$2-$199	15	3%	2%	1,539	2%	2%
Free	284		36%	24,049		26%

Table 6.14. APC levels, traditional publishers

Table 6.14 is what you might expect for traditional publishers: more than two-fifths of APC-charging journals are in the highest price bracket, and those journals publish nearly three-quarters 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 $1,847—but there are enough no-fee articles to bring the overall average down to a still-high $1,371, just less than OA publishers.

Figure 6.6 is distinctive: nearly all the journals began after 2004 with especially sharp increases in 2011-2014.

Figure 6.6. Starting dates, traditional publishers

	Biomed	STEM	HSS
$1,400+	153	48	6
Articles	18,338	31,191	168
Revenue	$45,038,436	$66,793,971	$297,280
$600-$1.399	86	104	31
Articles	4,898	6,474	1,086
Revenue	$4,448,346	$7,361,894	$1,254,175
$200-$599	28	28	4
Articles	2,402	2,774	438
Revenue	$1,149,174	$1,293,763	$195,616
$2-$199	9	3	2
Articles	733	746	60
Revenue	$72,510	$109,556	$8,440
Free	113	106	59
Articles	6,384	15,928	1,737

Table 6.15. Articles and revenue by segment, traditional publishers

Table 6.15 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. Note that, somewhat atypically, most revenue is in STEM rather than biomed.

Region	Journals	%Free	Articles	%Free
APCLand	576	38%	74,787	20%
Western Europe	108	31%	12,838	63%
Pacific/English	56	4%	1,561	4%
Eastern Europe	28	50%	1,774	30%
Middle East	16	63%	674	35%
Asia	8	25%	1,572	14%
Latin America	3	100%	141	100%
Africa	1	0%	10	0%

Table 6.16. Journals by region, traditional publishers

APCLand accounts for most of the journals and three-quarters of the articles, with Western Europe second for both.

Miscellaneous

	2016	2015	2014	2013	2012	2011
Journals	1,356	1,386	1,346	1,233	1,096	918
%Free	78%	79%	79%	79%	79%	81%
Articles	82,722	74,470	73,178	63,837	56,646	43,651
%Free	62%	61%	60%	62%	64%	70%

Table 6.17. Journals and articles by year, miscellaneous

There are 1,441 miscellaneous journals as Table 6.17 shows, more than three-quarters don't charge APCs—and, consistently, at least three of five articles don't involve APCs. As Figure 6.7 shows, both free and fee growth has continued every year, although growth was minimal from 2014 to 2015.

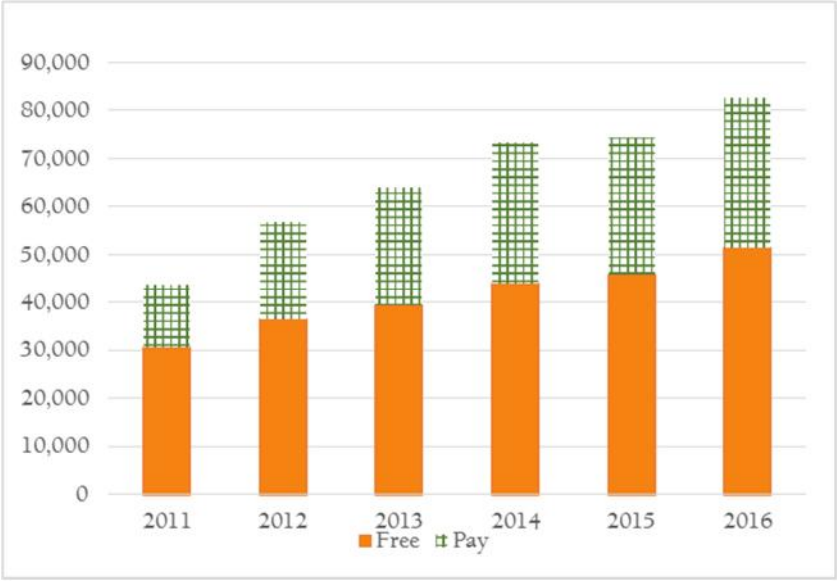

Figure 6.7. Free and pay articles by year, miscellaneous

	Journals	%Free	Articles	%Free
Largest: 600+	21	43%	27,488	60%
Large: 150-599	92	42%	18,476	39%
Med.: 60-149	252	63%	16,449	63%
Small: 20-59	681	86%	17,288	86%
Smallest: 0-19	310	87%	3,021	87%

Table 6.18. Article volume, miscellaneous

	Jour.	%APC	%All	Art.	%APC	%All
$1,400+	16	5%	1%	2,990	10%	4%
$600-$1.399	30	10%	2%	2,306	7%	3%
$200-$599	95	31%	7%	10,733	34%	13%
$2-$199	166	54%	12%	15,358	49%	19%
Free	1,134		79%	51,335		62%

Table 6.19. APC levels, miscellaneous

Figure 6.8, free and pay journals by starting year, is fairly typical, which makes sense given the nature of this miscellaneous group.

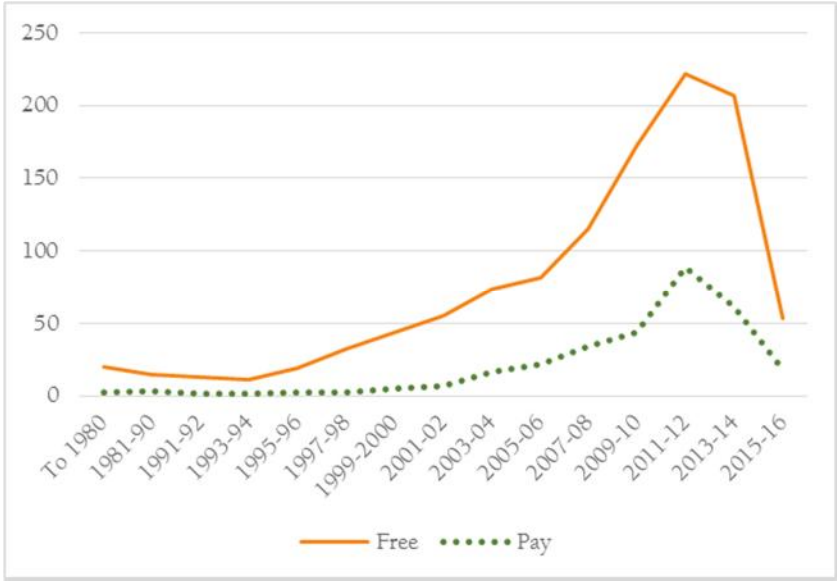

Figure 6.8. Starting dates, miscellaneous

The articles-and-revenue-by-segment table is omitted to save space; in this mostly-free category it doesn't say much anyway.

Region	Journals	%Free	Articles	%Free
Western Europe	456	84%	28,730	85%
Eastern Europe	263	83%	12,664	58%
Asia	247	58%	19,154	31%
Pacific/English	203	78%	8,999	52%
Latin America	124	90%	4,981	81%
Middle East	124	86%	6,623	70%
Africa	24	58%	1,571	18%

Table 6.20. Journals by region, miscellaneous

Finally (for this category), Table 6.20 shows that, after the 2016 delisting, Western Europe has the most journals *and* the most articles.

Societies, Associations and Government Agencies

	2016	2015	2014	2013	2012	2011
Journals	695	714	705	662	620	589
%Free	81%	82%	82%	82%	84%	85%
Articles	39,714	37,132	36,728	35,182	32,689	30,059
%Free	57%	62%	60%	57%	60%	62%

Table 6.21. Journals and articles by year, society-published

The 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 731 journals in this category; journals are predominantly free and articles are mostly free; article volume has continued to grow.

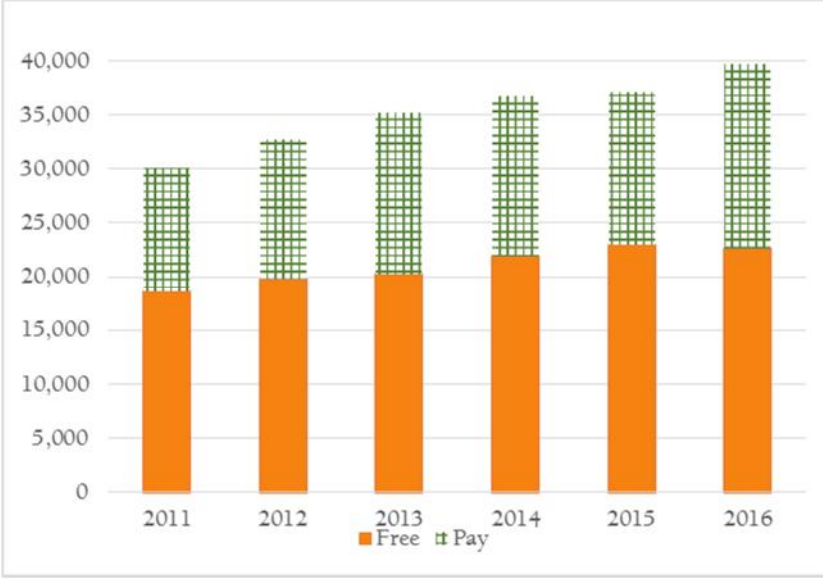

Figure 6.9. Free and pay articles by year, society-published

	Journals	%Free	Articles	%Free
Largest: 600+	6	0%	5,335	0%
Large: 150-599	62	47%	12,557	42%
Med.: 60-149	161	71%	11,153	71%
Small: 20-59	330	89%	9,230	88%
Smallest: 0-19	136	93%	1,439	95%

Table 6.22. Article volume, society-published

Table 6.22 shows that most of these journals are smallish—and that only among larger journals do APCs dominate. It's the usual pattern, however: the larger the journal, the more likely there's an APC.

	Jour.	%APC	%All	Art.	%APC	%All
$1,400+	20	15%	3%	4,192	25%	11%
$600-$1.399	21	16%	3%	3,110	18%	8%
$200-$599	45	34%	6%	3,850	23%	10%
$2-$199	48	36%	7%	5,890	35%	15%
Free	597		82%	22,672		57%

Table 6.23. APC levels, society-published

Average cost per article in fee-charging journals is $899 for 2016; including free journals, that comes down to $386.

Figure 6.10 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.

Figure 6.10. Starting dates, society-published

	Biomed	STEM	HSS
$1,400+	8	11	1
Articles	1,976	2,128	88
Revenue	$4,199,590	$5,504,750	$167,200
$600-$1.399	7	13	0
Articles	573	2,537	0
Revenue	$477,925	$2,994,706	$0
$200-$599	17	25	2
Articles	1,312	2,463	75
Revenue	$458,973	$840,046	$36,463
$2-$199	10	30	7
Articles	877	4,823	190
Revenue	$73,128	$552,955	$21,238
Free	164	165	235
Articles	9,287	7,059	6,326

Table 6.24. Articles and revenues by segment, society-published

Table 6.24 shows a typically atypical picture. This time, more 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.

Region	Journals	%Free	Articles	%Free
Western Europe	194	89%	7,806	62%
Latin America	165	87%	9,760	80%
Pacific/English	126	74%	9,448	32%
Asia	108	63%	7,191	34%
Eastern Europe	108	86%	4,184	78%
Middle East	26	96%	1,117	100%
Africa	4	75%	208	77%

Table 6.25. Journals by region, society-published

Table 6.25 speaks for itself.

7. Country of Publication

The set of journals covered in this report comes from 117 different countries. A table of those countries takes up four or 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 table showing all countries in OAWorld alphabetically with journal and article counts, and partial lists of countries ranked in different ways.

APCLand by Country

Table 7.1 shows the 32 countries represented in APCLand. 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 2016 article volume, they are the United Kingdom, the United States, Switzerland, Egypt, Germany and the Netherlands. Only two of the six countries, Netherlands and Germany, have a significant number of free journals.

Country	Journals	%Free	Articles	%Free
Australia	4	50%	172	77%
Brazil	1	100%	50	100%
Chile	1	0%	13	0%
China	29	69%	1,797	65%
Colombia	1	100%	16	100%
Egypt	533	5%	20,210	9%
France	1	0%	120	0%
Georgia	1	100%	44	100%
Germany	148	39%	11,190	41%
Hong Kong	6	67%	579	83%
India	2	100%	106	100%
Iran, Islamic Republic of	7	86%	234	89%
Ireland	1	0%	110	0%
Italy	4	75%	81	77%
Japan	3	33%	303	27%
Korea, Republic of	13	92%	556	91%
Lithuania	1	100%	59	100%
Netherlands	116	36%	10,606	34%
New Zealand	3	33%	87	29%
Peru	1	100%	12	100%
Poland	2	100%	62	100%
Qatar	1	100%	30	100%
Russian Federation	1	100%	22	100%
Saudi Arabia	13	100%	973	100%
Singapore	3	100%	96	100%
South Africa	1	0%	62	0%
Spain	13	92%	516	76%
Switzerland	197	18%	38,302	3%
Taiwan, Province of China	6	83%	313	88%
Thailand	1	0%	8	0%
United Kingdom	529	6%	80,809	2%
United States	73	3%	36,780	0%

Table 7.1. Countries in APCLand

OAWorld: The Complete List

Table 7.2 shows all countries in OAWorld.

Country	Jour	%Fre	Art.	%Fre
Albania	3	33%	193	15%
Algeria	8	100%	793	100%
Argentina	126	94%	2,485	92%
Armenia	2	100%	42	100%
Australia	77	84%	2,738	56%
Austria	45	87%	1,362	68%
Azerbaijan	2	100%	49	100%
Bahamas	1	100%	9	100%
Bangladesh	17	71%	677	70%
Barbados	1	100%	30	100%
Belarus	5	100%	267	100%
Belgium	30	97%	642	94%
Bolivia, Plurinational State of	3	100%	55	100%
Bosnia and Herzegovina	13	69%	300	60%
Brazil	879	92%	39,60	82%
British Virgin Islands	1	100%	11	100%
Brunei Darussalam	1	100%	22	100%
Bulgaria	36	58%	1,867	32%
Cambodia	1	100%	11	100%
Cameroon	1	0%	88	0%
Canada	137	75%	4,892	53%
Chile	80	94%	2,119	81%
China	35	51%	4,130	27%
Colombia	220	99%	5,377	99%
Congo, the Democratic Republic of the	1	100%	109	100%
Costa Rica	38	100%	1,086	100%
Croatia	86	94%	2,706	93%
Cuba	29	100%	1,398	100%
Cyprus	4	100%	67	100%
Czech Republic	82	76%	2,132	65%
Denmark	25	96%	313	93%
Ecuador	21	100%	544	100%

Country	Jour	%Fre	Art.	%Fre
Egypt	7	71%	141	71%
El Salvador	1	100%	35	100%
Estonia	16	100%	259	100%
Ethiopia	3	100%	91	100%
Finland	24	79%	564	64%
France	167	92%	10,80	97%
Georgia	1	100%	66	100%
Germany	182	74%	13,09	57%
Ghana	1	100%	24	100%
Greece	27	85%	738	83%
Guam	1	100%	5	100%
Guatemala	3	100%	12	100%
Hong Kong	31	45%	2,725	41%
Hungary	26	96%	812	90%
Iceland	5	100%	360	100%
India	282	53%	29,88	36%
Indonesia	473	73%	11,43	67%
Iran	1	100%	39	100%
Iran, Islamic Republic of	281	82%	12,15	70%
Iraq	15	60%	1,008	28%
Ireland	13	92%	173	100%
Israel	5	80%	71	100%
Italy	273	83%	7,526	79%
Jamaica	1	0%	7	0%
Japan	21	52%	899	29%
Jordan	2	50%	593	6%
Kazakhstan	1	100%	15	100%
Kenya	5	60%	128	19%
Korea, Republic of	33	79%	1,757	73%
Kosova	2	0%	39	0%
Kyrgyzstan	2	100%	29	100%
Latvia	9	78%	304	59%

Country	Jour	%Fre	Art.	%Fre
Lebanon	1	100%	19	100%
Libya	2	50%	78	42%
Lithuania	35	86%	748	78%
Luxembourg	2	100%	21	100%
Macedonia, the Former Yugoslav Republic	10	60%	307	28%
Madagascar	1	100%	11	100%
Malaysia	44	86%	1,028	81%
Malta	1	100%	9	100%
Mauritius	2	50%	107	11%
Mexico	97	92%	2,623	91%
Moldova, Republic of	15	67%	531	61%
Montenegro	3	100%	130	100%
Morocco	5	80%	114	63%
Nepal	10	90%	277	71%
Netherlands	42	81%	2,085	91%
New Zealand	62	18%	821	19%
Nicaragua	4	100%	57	100%
Nigeria	7	29%	540	12%
Norway	51	88%	756	82%
Oman	2	100%	157	100%
Pakistan	45	62%	2,798	37%
Palestine, State of	1	100%	0	
Paraguay	4	100%	117	100%
Peru	30	100%	742	100%
Philippines	11	91%	345	72%
Poland	380	84%	12,31	71%
Portugal	75	89%	1,980	81%
Qatar	6	67%	261	82%
Romania	273	82%	8,415	71%
Russian Federation	145	90%	9,972	64%
Saudi Arabia	2	50%	156	79%
Serbia	73	92%	2,677	72%

Country	Jour	%Fre	Art.	%Fre
Singapore	1	100%	18	100%
Slovakia	40	90%	957	89%
Slovenia	44	93%	1,243	81%
South Africa	63	48%	2,376	43%
Spain	484	96%	12,15	93%
Sri Lanka	7	100%	80	100%
Sweden	65	54%	2,136	35%
Switzerland	34	44%	1,995	25%
Taiwan, Province of China	18	78%	356	64%
Thailand	16	88%	610	91%
Tunisia	2	100%	15	100%
Turkey	221	90%	11,45	77%
Uganda	1	0%	864	0%
Ukraine	80	75%	5,701	71%
United Arab Emirates	6	17%	222	0%
United Kingdom	238	53%	25,16	63%
United States	556	68%	30,41	37%
Uruguay	11	100%	208	100%
Venezuela, Bolivarian Republic of	21	90%	739	97%
Viet Nam	1	0%	58	0%
Yemen	2	50%	26	69%

Table 7.2. Countries in OAWorld, alphabetic

Countries with the Most Journals and Articles

Table 7.3 shows OAWorld countries with at least four serious OA journals, from the most journals to the fewest. Table 7.4 shows the same data, arranged from highest to lowest percentage of free journals. Table 7.5 shows countries with more than 200 OA articles in 2016, from most articles to fewest. Finally, Table 7.6 shows the same data as Table 7.5, but in order by percentage appearing in free journals.

No comments; the tables should yield their own messages.

Country	Journals	%Free
Brazil	879	92%
United States	556	68%
Spain	484	96%
Indonesia	473	73%
Poland	380	84%
India	282	53%
Iran, Islamic Republic of	281	82%
Italy	273	83%
Romania	273	82%
United Kingdom	238	53%
Turkey	221	90%
Colombia	220	99%
Germany	182	74%
France	167	92%
Russian Federation	145	90%
Canada	137	75%
Argentina	126	94%
Mexico	97	92%
Croatia	86	94%
Czech Republic	82	76%
Chile	80	94%
Ukraine	80	75%
Australia	77	84%
Portugal	75	89%
Serbia	73	92%
Sweden	65	54%
South Africa	63	48%
New Zealand	62	18%
Norway	51	88%

Country	Journals	%Free
Austria	45	87%
Pakistan	45	62%
Malaysia	44	86%
Slovenia	44	93%
Netherlands	42	81%
Slovakia	40	90%
Costa Rica	38	100%
Bulgaria	36	58%
China	35	51%
Lithuania	35	86%
Switzerland	34	44%
Korea, Republic of	33	79%
Hong Kong	31	45%
Belgium	30	97%
Peru	30	100%
Cuba	29	100%
Greece	27	85%
Hungary	26	96%
Denmark	25	96%
Finland	24	79%
Ecuador	21	100%
Japan	21	52%
Venezuela, Bolivarian Republic of	21	90%
Taiwan, Province of China	18	78%
Bangladesh	17	71%
Estonia	16	100%
Thailand	16	88%
Iraq	15	60%
Moldova, Republic of	15	67%

Country	Journals	%Free
Bosnia and Herzegovina	13	69%
Ireland	13	92%
Philippines	11	91%
Uruguay	11	100%
Macedonia, the Former Yugoslav Republic of	10	60%
Nepal	10	90%
Latvia	9	78%
Algeria	8	100%
Egypt	7	71%
Nigeria	7	29%
Sri Lanka	7	100%
Qatar	6	67%
United Arab Emirates	6	17%
Belarus	5	100%
Iceland	5	100%
Israel	5	80%
Kenya	5	60%
Morocco	5	80%
Cyprus	4	100%
Nicaragua	4	100%
Paraguay	4	100%

Table 7.3. OAWorld countries with four or more journals, ranked by journals

Country	Journals	%Free
Costa Rica	38	100%
Peru	30	100%
Cuba	29	100%
Ecuador	21	100%
Estonia	16	100%
Uruguay	11	100%
Algeria	8	100%
Sri Lanka	7	100%
Belarus	5	100%
Iceland	5	100%
Cyprus	4	100%
Nicaragua	4	100%
Paraguay	4	100%
Colombia	220	99%
Belgium	30	97%
Spain	484	96%
Hungary	26	96%
Denmark	25	96%
Croatia	86	94%
Chile	80	94%
Argentina	126	94%
Slovenia	44	93%
Ireland	13	92%
France	167	92%
Brazil	879	92%
Serbia	73	92%
Mexico	97	92%
Philippines	11	91%
Turkey	221	90%

Country	Journals	%Free
Venezuela, Bolivarian Republic of	21	90%
Russian Federation	145	90%
Slovakia	40	90%
Nepal	10	90%
Portugal	75	89%
Norway	51	88%
Thailand	16	88%
Austria	45	87%
Malaysia	44	86%
Lithuania	35	86%
Greece	27	85%
Australia	77	84%
Poland	380	84%
Italy	273	83%
Romania	273	82%
Iran, Islamic Republic of	281	82%
Netherlands	42	81%
Israel	5	80%
Morocco	5	80%
Finland	24	79%
Korea, Republic of	33	79%
Taiwan, Province of China	18	78%
Latvia	9	78%
Czech Republic	82	76%
Canada	137	75%
Ukraine	80	75%
Germany	182	74%
Indonesia	473	73%
Egypt	7	71%

Country	Journals	%Free
Bangladesh	17	71%
Bosnia and Herzegovina	13	69%
United States	556	68%
Moldova, Republic of	15	67%
Qatar	6	67%
Pakistan	45	62%
Iraq	15	60%
Macedonia, the Former Yugoslav Republic of	10	60%
Kenya	5	60%
Bulgaria	36	58%
Sweden	65	54%
India	282	53%
United Kingdom	238	53%
Japan	21	52%
China	35	51%
South Africa	63	48%
Hong Kong	31	45%
Switzerland	34	44%
Nigeria	7	29%
New Zealand	62	18%
United Arab Emirates	6	17%

Table 7.4. Countries with four or more OA journals ranked by free journal %

Country	Articles	%Free
Brazil	39,600	82%
United States	30,410	37%
India	29,886	36%
United Kingdom	25,163	63%
Germany	13,091	57%
Poland	12,317	71%
Spain	12,157	93%
Iran, Islamic Republic of	12,150	70%
Turkey	11,451	77%
Indonesia	11,435	67%
France	10,807	97%
Russian Federation	9,972	64%
Romania	8,415	71%
Italy	7,526	79%
Ukraine	5,701	71%
Colombia	5,377	99%
Canada	4,892	53%
China	4,130	27%
Pakistan	2,798	37%
Australia	2,738	56%
Hong Kong	2,725	41%
Croatia	2,706	93%
Serbia	2,677	72%
Mexico	2,623	91%
Argentina	2,485	92%
South Africa	2,376	43%
Sweden	2,136	35%
Czech Republic	2,132	65%
Chile	2,119	81%

Country	Articles	%Free
Netherlands	2,085	91%
Switzerland	1,995	25%
Portugal	1,980	81%
Bulgaria	1,867	32%
Korea, Republic of	1,757	73%
Cuba	1,398	100%
Austria	1,362	68%
Slovenia	1,243	81%
Costa Rica	1,086	100%
Malaysia	1,028	81%
Iraq	1,008	28%
Slovakia	957	89%
Japan	899	29%
Uganda	864	0%
New Zealand	821	19%
Hungary	812	90%
Algeria	793	100%
Norway	756	82%
Lithuania	748	78%
Peru	742	100%
Venezuela, Bolivarian Republic of	739	97%
Greece	738	83%
Bangladesh	677	70%
Belgium	642	94%
Thailand	610	91%
Jordan	593	6%
Finland	564	64%
Ecuador	544	100%
Nigeria	540	12%

Country	Articles	%Free
Moldova, Republic of	531	61%
Iceland	360	100%
Taiwan, Province of China	356	64%
Philippines	345	72%
Denmark	313	93%
Macedonia, the Former Yugoslav Republic of	307	28%
Latvia	304	59%
Bosnia and Herzegovina	300	60%
Nepal	277	71%
Belarus	267	100%
Qatar	261	82%
Estonia	259	100%
United Arab Emirates	222	0%
Uruguay	208	100%

Table 7.5. OAWorld countries with 200+ 2016 articles, ranked by article count

Country	Articles	%Free
Cuba	1,398	100%
Costa Rica	1,086	100%
Algeria	793	100%
Peru	742	100%
Ecuador	544	100%
Iceland	360	100%
Belarus	267	100%
Estonia	259	100%
Uruguay	208	100%
Colombia	5,377	99%
France	10,807	97%
Venezuela, Bolivarian Republic of	739	97%
Belgium	642	94%
Spain	12,157	93%
Croatia	2,706	93%
Denmark	313	93%
Argentina	2,485	92%
Mexico	2,623	91%
Thailand	610	91%
Netherlands	2,085	91%
Hungary	812	90%
Slovakia	957	89%
Greece	738	83%
Qatar	261	82%
Norway	756	82%
Brazil	39,600	82%
Chile	2,119	81%
Malaysia	1,028	81%
Slovenia	1,243	81%

Country	Articles	%Free
Portugal	1,980	81%
Italy	7,526	79%
Lithuania	748	78%
Turkey	11,451	77%
Korea, Republic of	1,757	73%
Philippines	345	72%
Serbia	2,677	72%
Poland	12,317	71%
Romania	8,415	71%
Nepal	277	71%
Ukraine	5,701	71%
Bangladesh	677	70%
Iran, Islamic Republic of	12,150	70%
Austria	1,362	68%
Indonesia	11,435	67%
Czech Republic	2,132	65%
Finland	564	64%
Taiwan, Province of China	356	64%
Russian Federation	9,972	64%
United Kingdom	25,163	63%
Moldova, Republic of	531	61%
Bosnia and Herzegovina	300	60%
Latvia	304	59%
Germany	13,091	57%
Australia	2,738	56%
Canada	4,892	53%
South Africa	2,376	43%
Hong Kong	2,725	41%
United States	30,410	37%

Country	Articles	%Free
Pakistan	2,798	37%
India	29,886	36%
Sweden	2,136	35%
Bulgaria	1,867	32%
Japan	899	29%
Macedonia, the Former Yugoslav Republic of	307	28%
Iraq	1,008	28%
China	4,130	27%
Switzerland	1,995	25%
New Zealand	821	19%
Nigeria	540	12%
Jordan	593	6%
Uganda	864	0%
United Arab Emirates	222	0%

Table 7.6. OAWorld countries with 200+ 2016 articles, ranked by free %

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