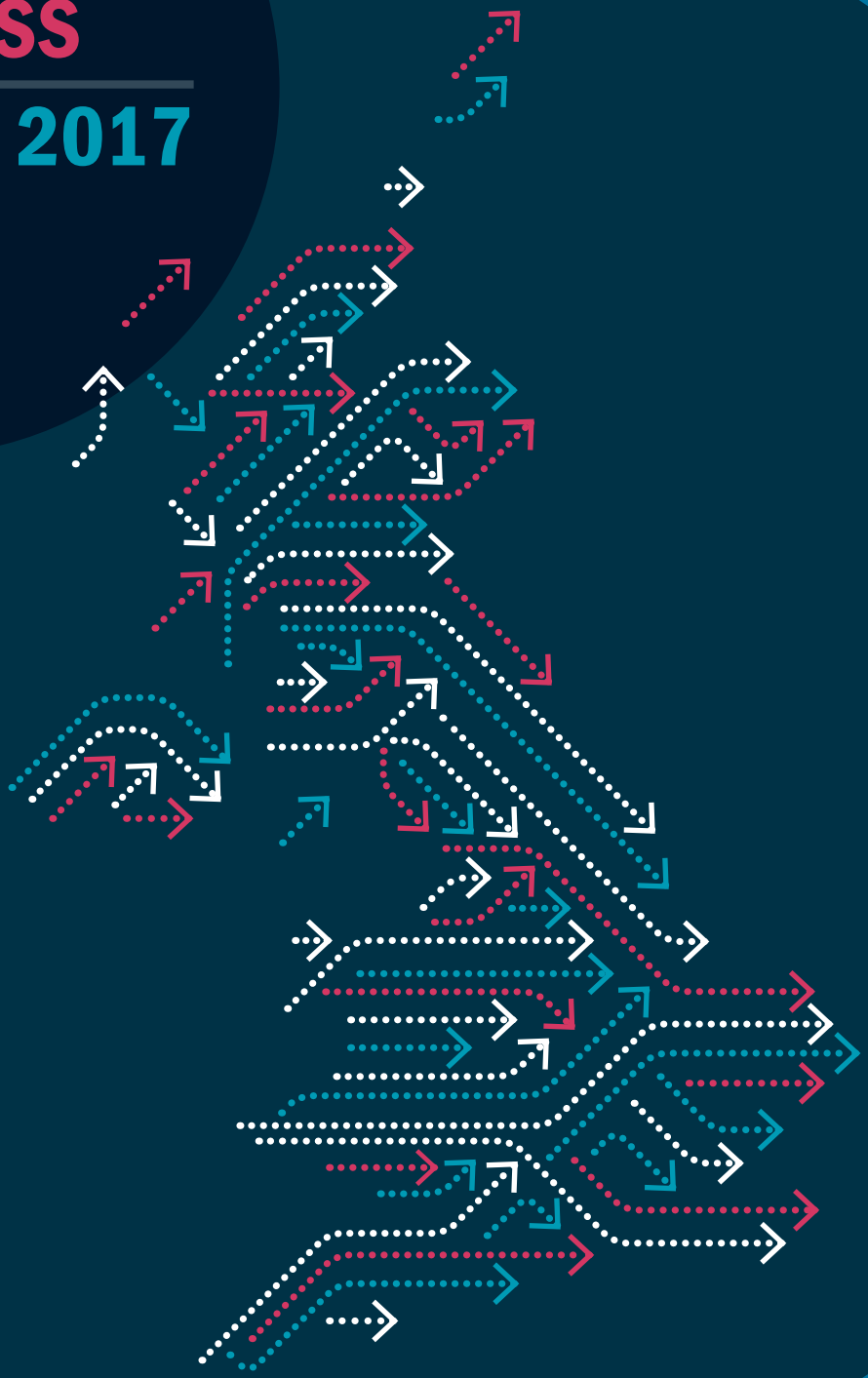
MONITORING THE TRANSITION TO OPEN ACCESS

DECEMBER 2017



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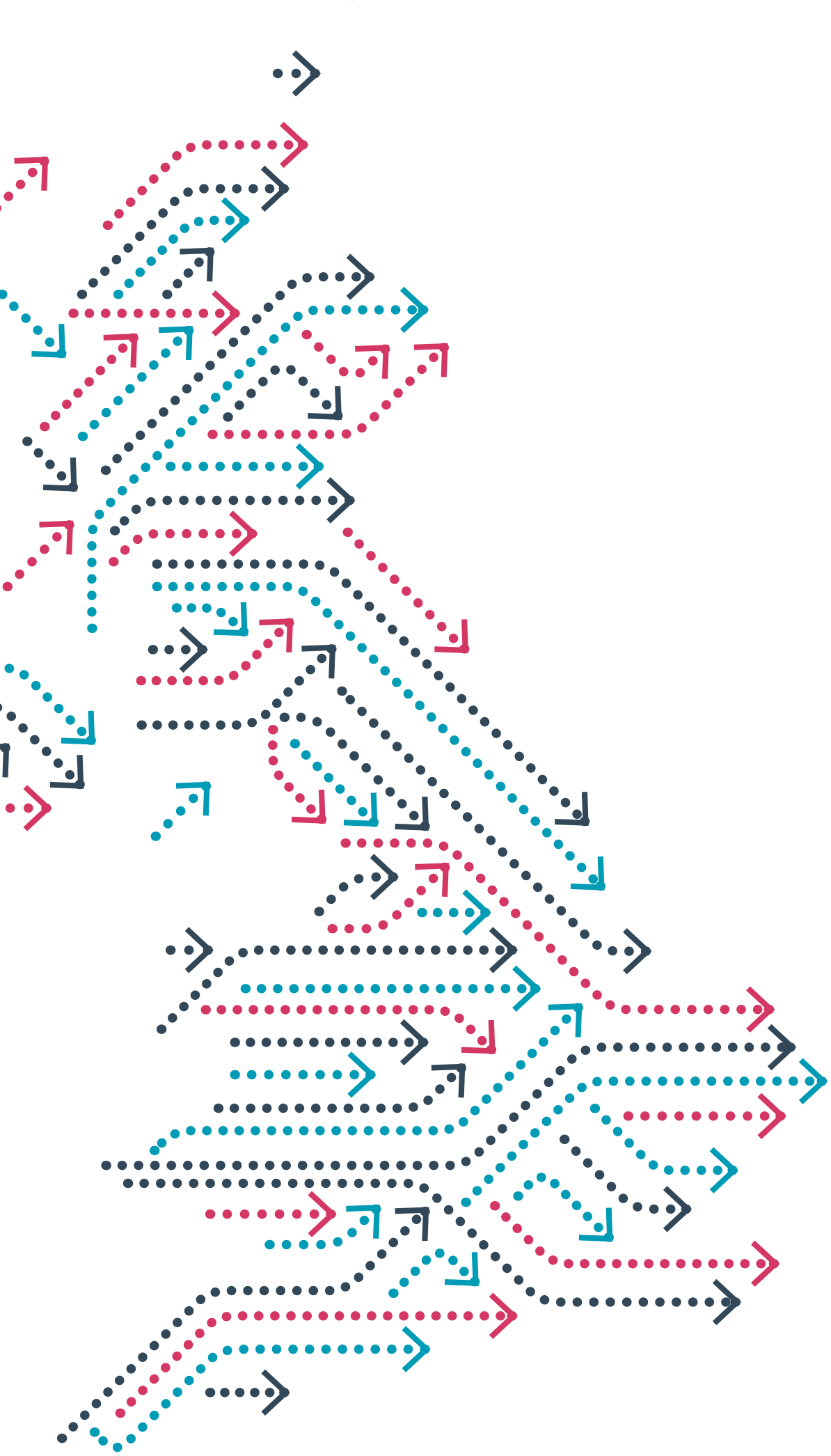
Acknowledgements

The studies on which this report is based were undertaken by a team led by Michael Jubb and comprising Andrew Plume, Stephanie Oeben and Lydia Brammer, Elsevier; Rob Johnson and Cihan Bütün, Research Consulting; Stephen Pinfield, University of Sheffield.

We take collective responsibility for the findings and for this report. A full account of our methodologies can be found in *Annexe 1* of this report,[1] and some speculative projections can be found in *Annexe 2*, based on our findings about the development of open access over the next five years.[2] We wish to thank staff at publishers, learned societies, universities, Jisc and others who have made data available to us; and members of the Universities UK Open Access Coordination Group who made useful comments and suggestions in response to an early presentation of our findings.

1 *www.universitiesuk.ac.uk/policy-and-analysis/Documents/2017/monitoring-transition-open-access-annexe-1-methodology.pdf*
2 *www.universitiesuk.ac.uk/policy-and-analysis/Documents/2017/monitoring-transition-open-access-annexe-2-projection.pdf*



Foreword

Professor Adam Tickell
Chair, Universities UK
Open Access
Coordination Group

Vice-Chancellor,
University of Sussex

The UK research base is one of our nation's greatest assets. The quality of our research outputs is world-leading, and our researchers are among the most productive of any nation. Their expertise is also highly diverse, multidisciplinary, and increasingly collaborative. Individually and collectively, we should value the UK's contribution to the advancement of knowledge, and be proud of its real-world impact.

To respond to pressing issues such as social harmony, human prosperity, and the very security of our planet's ecosystem, it is vitally important that all research – in any discipline – is of the highest standard, is open to wide critique, and is accessible to everyone, from anywhere with an internet connection, for free. It is also what we should expect from public investment in research.

It is therefore right that we are undergoing a transition towards open access (OA) in the UK, and as this report shows, we are increasing the proportion of our research which is available via open access at a considerable rate. We now make 37% of our outputs freely available to the world immediately at publication, and this increases to 53% after 24 months.

The UK is well above global averages of open access publishing, and is at the forefront of a significant global movement which is fundamentally changing the way that research is conceived, conducted, disseminated and rewarded. We owe this success to the various stakeholders involved at every stage of the scholarly communications process, for their dedicated work in support this important transition.

These stakeholders include (but are not limited to): academics; research support staff; librarians; technicians and infrastructure providers; university leaders; the national and research funding councils; charitable funders of research; the national academies; learned and professional societies; publishers; and of course, members of the public.

Through a collaborative and constructive approach to aligning efforts, we have all contributed to advancing open access – and it is clear that such engagement will continue to be important to ensure that the transition to open access is maintained, is financially sustainable, and that the benefits to research and to society are maximised.

To that end, I would like to extend my thanks to Dr Michael Jubb and his colleagues for the rigorous analysis presented in this report, and to the members of the Universities UK Open Access Coordination Group and the organisations they represent, without whom this timely, authoritative – and openly available – report would not exist.

Contents

Acknowledgement

Foreword

Introduction and summary

Definitions

10 *Chapter 1*
Open access options available to authors

20 *Chapter 2*
Accessibility: authors' take-up of open access options

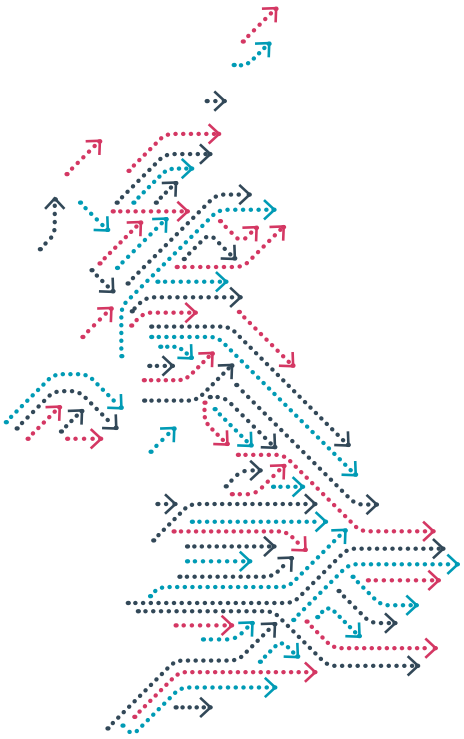
28 *Chapter 3*
Use of open access articles

36 *Chapter 4*
Financial implications for universities and research funders in the UK

44 *Chapter 5*
Implications for learned societies

Introduction & summary

MONITORING THE TRANSITION TO OPEN ACCESS



Following the Finch Report in 2012, Universities UK established an Open Access Coordination Group to support the transition to open access (OA) for articles in scholarly journals. The Group commissioned an initial report published in 2015 to gather evidence on key features of that transition. This second report aims to build on those findings, and to examine trends over the period since the major funders of research in the UK established new policies to promote OA.

Like the initial report, our work is structured around five strands:

a. the OA options available to authors
b. the take-up of those options
c. levels of downloads of OA and non-OA articles
d. financial implications for funders and universities
e. implications for learned societies

Different members of the team have taken lead responsibility for each of the strands, and details of the methodologies we have adopted are available at *Annexe 1 (see p. 2)*. We take collective responsibility for our findings. We are aware of the limitations of the data we have collected, but also of the complex patterns of change that they reveal across different subjects and disciplines, universities, publishers and other stakeholders. The data underlying the findings presented here are available at *figshare*.[3]

We focus in this short report on the central findings in each of our five strands. Notwithstanding the complexities, some clear trends are evident.

a. OA options

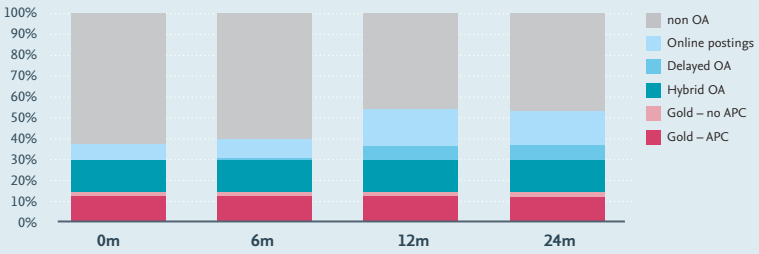
The numbers and proportions of OA and hybrid journals have continued to rise, and almost all of them allow articles to be published with a CC BY licence. Headline levels of article publishing charges (APCs) have continued to rise, and journals' policies relating to the posting of articles on websites, repositories and other sites have become more complex.

- The proportions of journals published globally offering immediate OA rose from under 50% in 2012 to just over 60% in 2016; and to nearly 70% for those journals in which UK authors have published. As a consequence, the proportion of subscription-only journals has fallen.

- Headline APCs remain higher for hybrids than for fully OA journals; and for both kinds of journals they have continued to rise.

3 *https://figshare.com/s/4715015f007fac04a7d6*

Proportion of UK-authored articles in 2016 published under immediate Gold OA or accessible within 24 months through Green OA online postings in line with journal policies



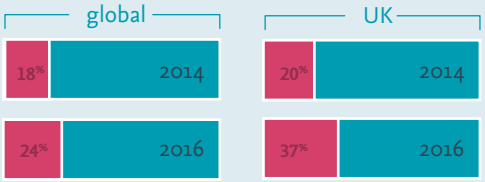
In 2016 **48%** of UK-authored subscription-based articles were made accessible online **within 24 months of publication**

headline APCs remain **higher for hybrids than for fully OA journals**; and for both kinds of journals they have **continued to rise.**

37% of UK-authored articles in 2016 were openly accessible immediately on publication,

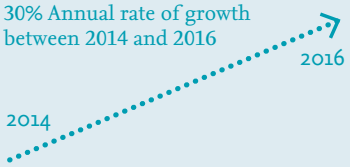
54% within 12 months

Proportion of all articles accessible immediately on publication



Proportion of UK-authored articles published on immediate Gold OA

30% Annual rate of growth between 2014 and 2016

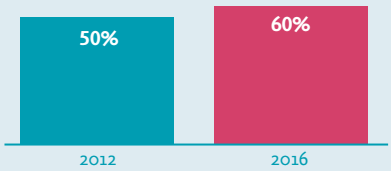


APCs for hybrid and fully OA journals

28% Difference in APCs between hybrid journals and fully OA journals in 2016

the number of **APCs paid by a sample** of 10 UK universities rose more than **fivefold** between 2013 and 2016

proportions of journals published globally offering immediate OA



- Almost all fully-OA and hybrid journals allow articles to be published under a CC BY licence.
- Policies for the posting of articles on websites, repositories and elsewhere are becoming more complex, especially in relation to scholarly collaboration networks such as ResearchGate.

b. *Take-up*

The numbers and proportions of articles published on immediate Gold OA terms is rising, and the take-up by UK authors of Gold OA in hybrid journals is rising especially sharply. More subscription-based articles are also being made accessible via repositories and other services. Well over a third of all UK-authored articles are accessible immediately either on the publisher's or on some other platform.

- The global proportion of articles published on immediate Gold OA terms rose from 12% in 2012 to 19% in 2016, but the rate of growth slowed between 2014 and 2016.
- The proportion of UK-authored articles published on immediate Gold OA terms rose from 12% in 2012 to 30% in 2016, an annual growth rate of over 30% sustained throughout the period.
- More than half of UK articles in 2016 were published in hybrid journals, and the proportion of such articles published on immediate Gold OA terms rose from 6% in 2012 to 28% in 2016.
- The global proportion of subscription-based articles accessible in some version, on Green OA terms, within 24 months of publication via a non-publisher website, repository or elsewhere, rose from 19% in 2014 to 38% in 2016; and the UK proportion rose from 23% to 48% in the same period.
- The global proportion of *all* articles accessible *immediately* on publication, either on Gold or Green OA terms rose from 18% in 2014 to 25% in 2016; the UK proportion rose from 20% to 37%.

- The global proportion of articles accessible after 12 months via Gold or Green OA rose from 25% to 32%; and the UK proportion from 32% to 54%.

- The figures cited in the previous two points do not take account of articles posted illicitly in contravention of journal policies, or of those harvested illegally by SciHub and other sites.

c. Downloads

OA articles are downloaded from publishers' sites more than non-OA articles. Downloads from UK institutional repositories are small by comparison, but nevertheless are rising; and downloads per article from PubMed Central rose by two-thirds between 2012 and 2016.

- Evidence from publishers indicates that while patterns of downloads from their own platforms for individual journals and articles are complex, *on average* OA articles are downloaded between twice and four times as much as non-OA articles.

- The number of full-text articles in UK institutional repositories (IRs) increased by more than 60% between 2014 and 2016, while the number of downloads more than doubled from 6 to 12 million. This suggests that downloads per article are increasing.

- Downloads from UK IRs are small in comparison with those from publishers' platforms and subject repositories; and they are highly skewed to individual articles and titles.

- The number of articles in PubMed Central rose by 56% between 2012 and 2016; and the average number of downloads per article rose from 127 to 209.

d. Financial implications

There is wide variation between universities, but overall expenditure on APCs is rising, and so are APC prices; but the gap between hybrid and fully-OA journals is narrowing. And although subscription expenditure is rising too, APCs represent a sharply rising proportion of all expenditure on journals. Research Councils UK (RCUK) is the major source of support for APC expenditure; and more than half of that expenditure goes to three publishers.

- The number of APCs paid by a sample of 10 UK universities rose more than fivefold between 2013 and 2016; and the average cost of an APC rose by 16% (as compared with a rise of 5% in the consumer price index (CPI)). APCs for hybrid journals in 2016 were on average 28% higher than for fully-OA journals; while for hybrids they rose by 14% in the three years from 2013, for fully-OA journals they rose by 33%.

- For the payments that universities make to the seven largest publishers, the ratio between subscriptions and APCs is 5:1.

- Our estimates of expenditure on APCs are understated, since they do not take account of the amounts paid by departments and teams from funds other than those held centrally by universities, or of the proportions of subscription expenditure that relates to provision for APCs under publishers' various offsetting arrangements.

- A high proportion of the APCs paid by universities are met out of funds provided by RCUK, the Wellcome Trust and other medical research charities.

- More than half the expenditure on APCs in 2016 went to the three major publishing groups, Elsevier, Springer Nature, and Wiley, with a particularly sharp rise for Elsevier since 2014.

e. Learned societies

The financial health of UK learned societies remains sound in aggregate, although margins from publishing declined in the period 2011–2015. Societies continue to see OA as a medium-term risk, but we have identified no evidence of systemic risk to UK learned societies or their broader financial sustainability, whether from OA or other factors.

- Learned societies' publishing revenues rose by almost 20% between 2011 and 2015; but rising costs put their margins under pressure.

- Except in the arts and humanities, publishing surpluses form a high but falling proportion of societies' expenditure on other charitable activities.

- The number of learned societies showing an annual deficit in their accounts rose sharply between 2012 and 2015.

- With some exceptions, most societies saw a steady rise in their net assets over the same period.

Definitions

Journals and Articles

Journals
Sources indexed in Scopus (Elsevier's abstract and citation database)

Articles
Published works in the form of articles, reviews and conference papers as indexed in Scopus

Journal and article publishing model

Gold or immediate OA: Journals and articles that are freely accessible on the publisher's platform immediately on publication.

Gold – APC
Articles in fully-OA journals that charge an APC

Gold – no APC
Articles in fully-OA journals that do not charge an APC

Gold – Hybrid
Articles in hybrid journals available OA by payment of an APC

Subscription-based: Journals and articles that are accessible on the publisher's platform only on payment of a subscription.

Hybrid-subscription
Articles in hybrid journals available by subscription

Delayed OA
Articles made accessible on the publisher's platform at a defined time after publication, typically less than 24 months

Subscription only
Articles in subscription journals

Green OA

The posting of a version of a published article so that it is accessible via a website, institutional or subject repository, scholarly collaboration network or other service

Article version

Preprint (PP)
Author's version prior to submission for publication

Accepted Author Manuscript (AAM)
Author's version accepted for publication after peer review and which incorporates any revisions required

Version of Record (VoR)
Published version, complete with volume/issue/pagination and the imprimatur of the journal and its publisher

Posting location

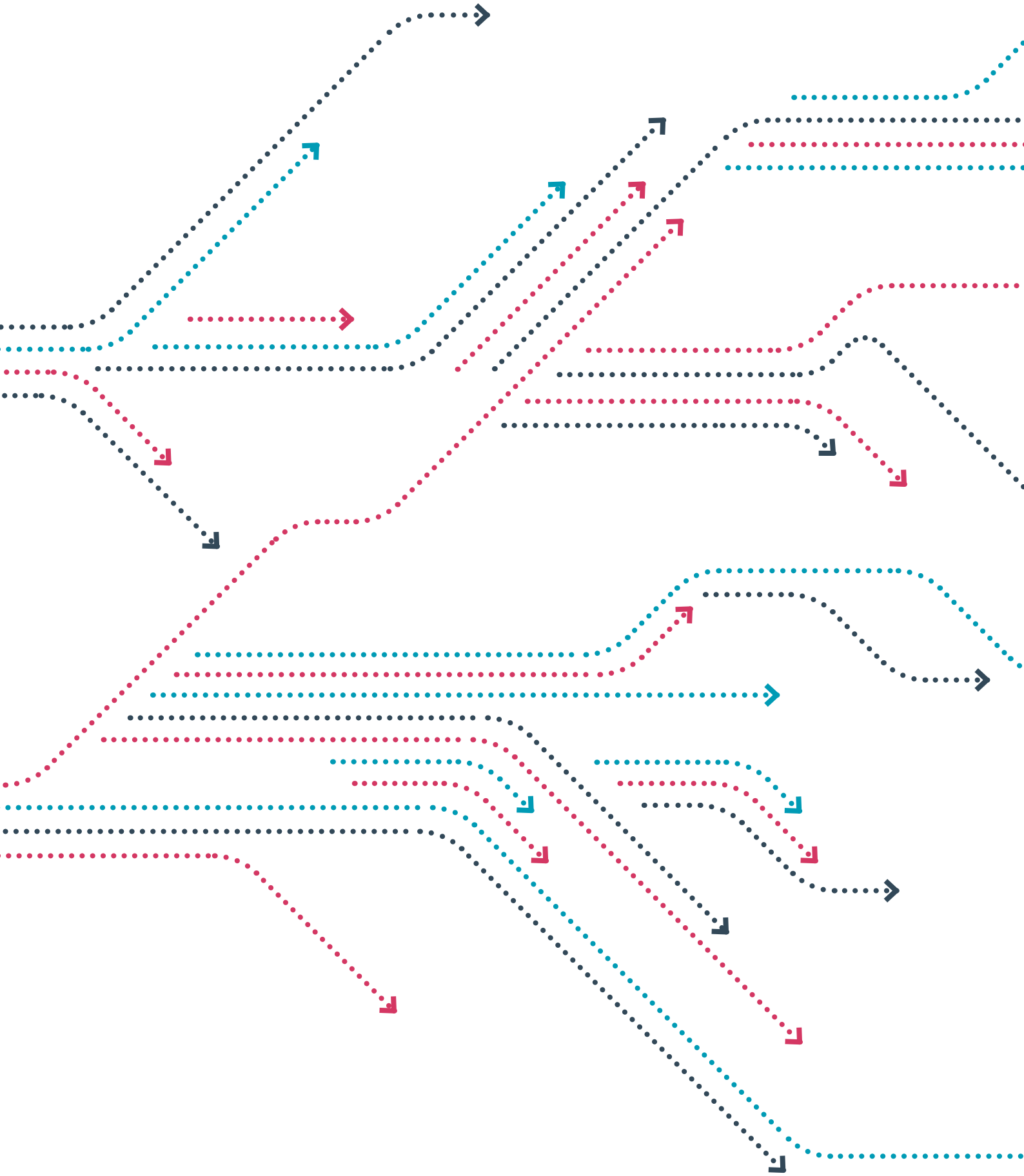
Social Sharing Network or Scholarly Collaboration Network
Services that facilitate collaboration and the sharing of documents between researchers. Examples include ResearchGate, Academia.edu, and Social Science Research Network

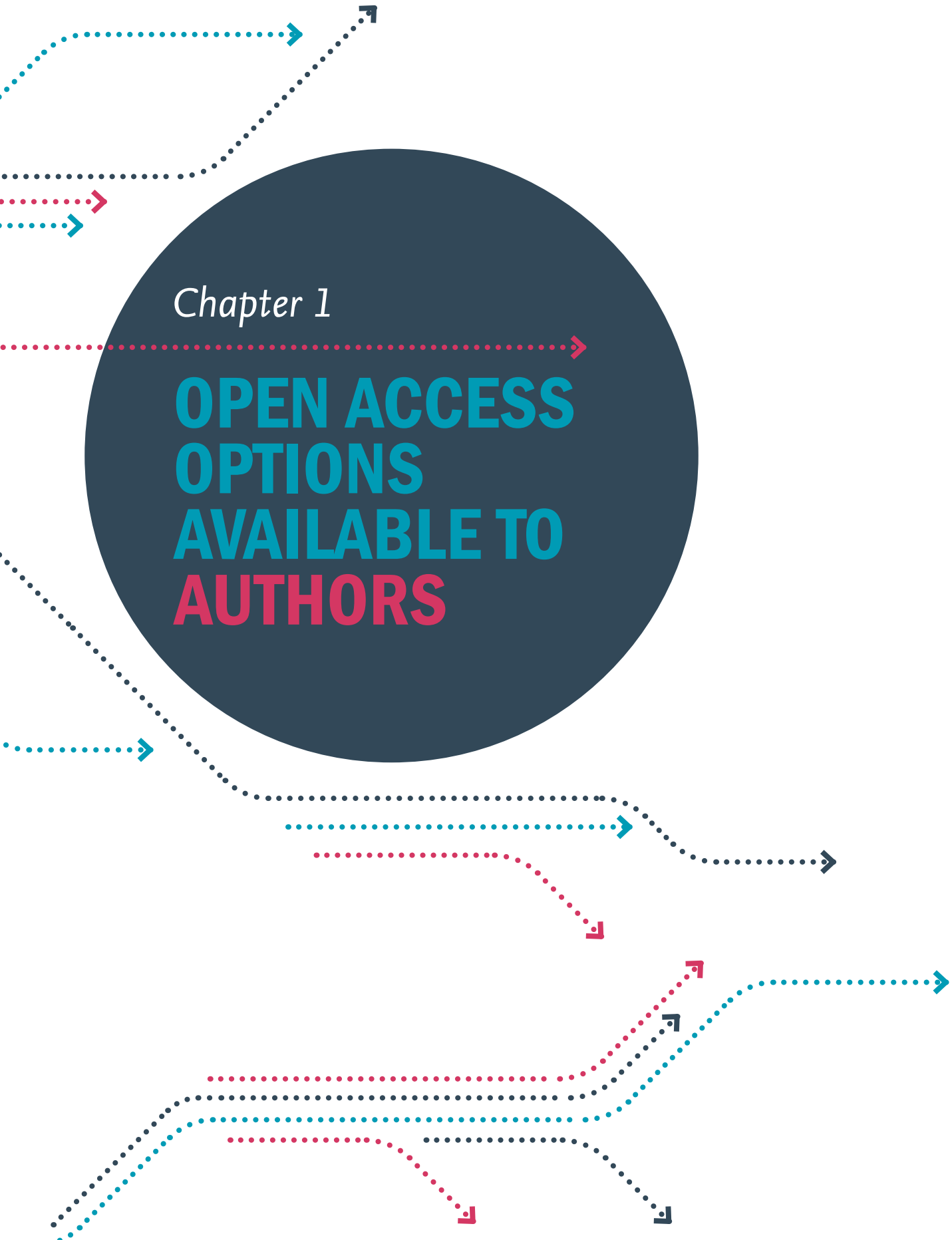
Personal or departmental website
Websites and pages controlled by researchers or their departments, and which are used to present information about them

Institutional repository
An online archive from a university or other research institution

Subject Repository
An online archive for collecting, preserving, and disseminating digital copies of articles and other content produced by scholars in a particular area. Examples include PubMedCentral and Research Papers in Economics (RePEc).

File sharing
Includes websites with filesharing as their primary purpose such as Figshare, Docsford, Docslide, doc88.com and journal-dl.com





Chapter 1

OPEN ACCESS OPTIONS AVAILABLE TO AUTHORS

1.1 Introduction

The transition to OA depends critically on the options made available to authors across the range of journals in which they may wish to publish. We have therefore sought to examine, as in 2015:

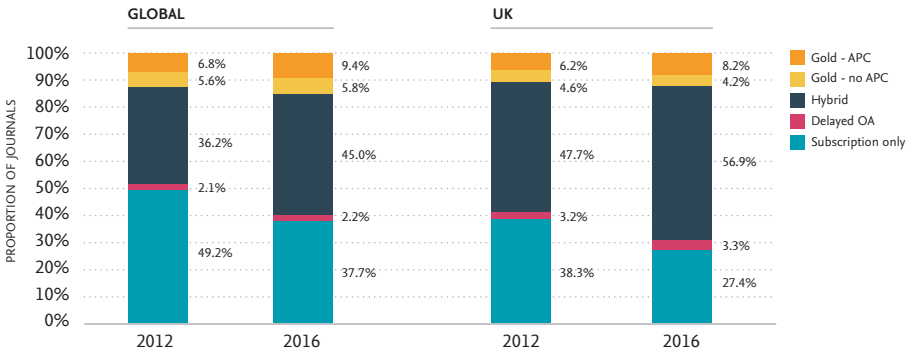
- the numbers of fully-OA and hybrid journals
- the levels of APCs and the availability of CC BY licences for articles in those journals
- the length of embargo periods for subscription-based articles posted in repositories and elsewhere

Our analysis is based on evidence from the Scopus database, from a sample of 40 publishers, and from the 120 journals most popular with UK authors across four broad subject areas.

1.2 The proportion of journals that offer immediate OA is rising

Analysis of the publishing models for journals indexed in Scopus indicates (*Figure 1.1*) that the proportions of such titles globally offering immediate OA rose from under 50% in 2012 to just over 60% in 2016; and to nearly 70% for journals in which UK authors have published. As a consequence, the proportion of subscription-only journals has fallen.

Figure 1.1 – *Proportion of journals by publishing models, global and UK*



Analysis of the journals published by 40 publishers, including those responsible for the titles most popular with UK authors across four Research Excellence Framework (REF) panel areas, shows even sharper changes between 2015 and 2017 (*Figure 1.2*): while the numbers of fully-OA journals rose by 11%, and hybrids by 17%, the number of subscription-only titles fell by 37%. Subscription titles now represent only 9% of all the titles from these publishers, as compared with 15% in 2015.

Figure 1.2 – *Publishing models for forty publishers, 2015 and 2017*

Figure 1.2.1 – *Categories of journals from 40 publishers*

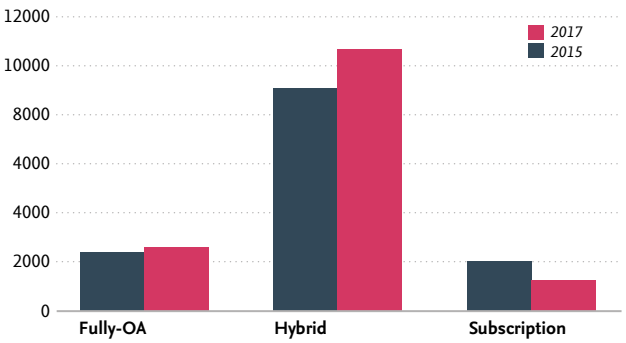


Figure 1.2.2 – *Categories of journals from 40 publishers, 2017*

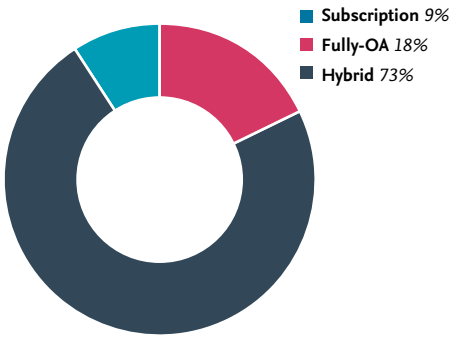
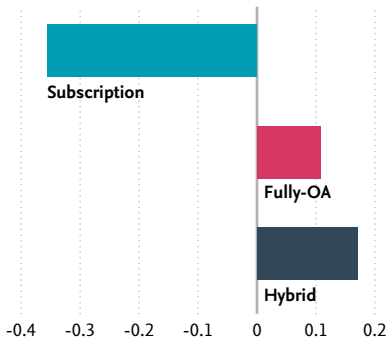


Figure 1.2.3 – *Changes in categories of journals from 40 publishers, 2015 to 2017*



For 40 major publishers, the numbers of fully OA journals rose by 11% and hybrids by 17%, between 2015 and 2017, while subscription-only titles fell by 37%.

These overall figures mask significant differences between publishers. For the top four publishers, the proportions of subscription-only journals range in 2017 from 3% to 18%, and the proportions of fully-OA journals from 5% to 20%. Similarly diverse patterns can be seen across other publishers.

Examination of the titles most popular with UK authors (*Figure 1.3*) reveals some change in recent years in the individual *titles* that are most popular, but relatively little change in the *categories* of titles which UK authors tend to favour. The only consistent pattern is the growth in the use of hybrid journals, especially in the social sciences.

***Figure 1.3** – Categories of journals popular with UK authors*

***Figure 1.3.1** – Categories of journals popular with UK authors, 2010 to 2014*

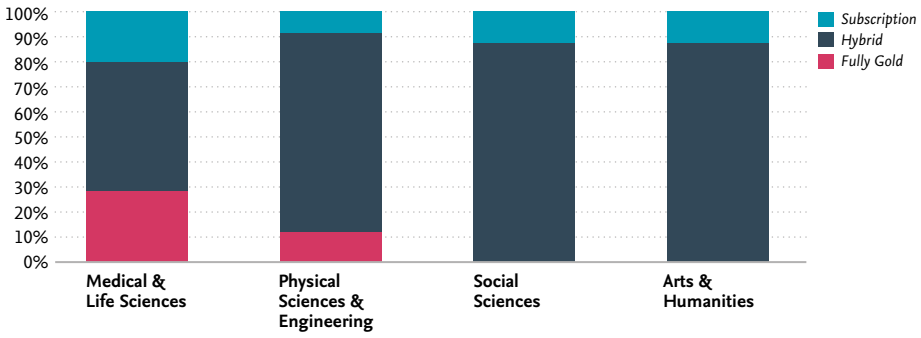
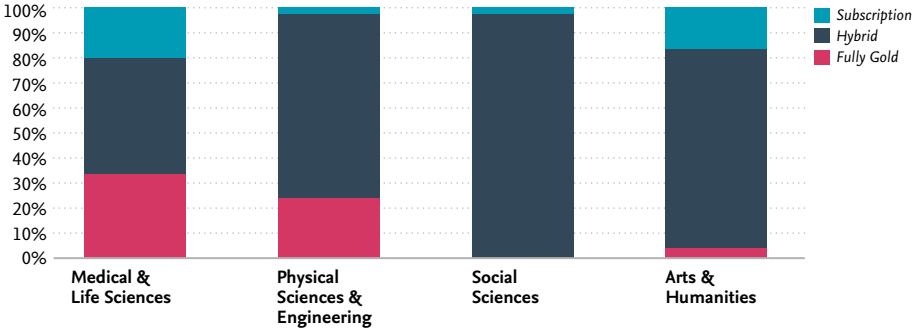


***Figure 1.3.2** – Categories of journals popular with UK authors, 2013 to 2015*

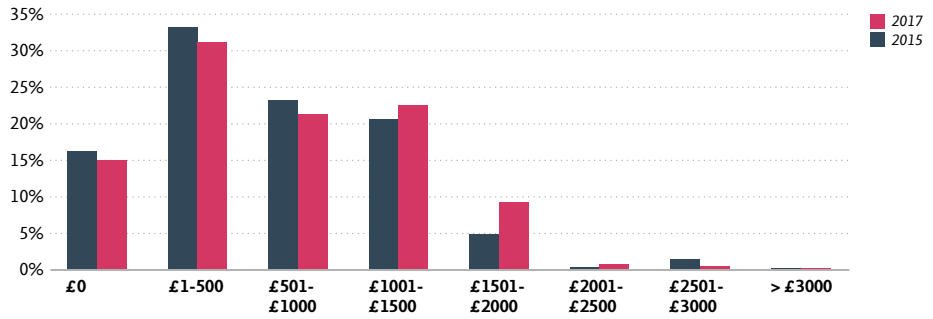


1.3 Published APCs for fully-OA journals are lower than for hybrid journals

1.3.1 Fully-OA journals

Thirty-three publishers in our sample publish at least one fully-OA journal, and roughly half of those journals charge either no APC, or amounts up to £500 *(Figure 1.4)*. Most of the rest charge between £501 and £1,500, though there has been a slight shift towards higher rates. Only very small numbers of fully-OA journals have APCs of more than £2,000.

Figure 1.4 *– APC price bands for fully OA journals from 32 publishers, 2015 and 2017*

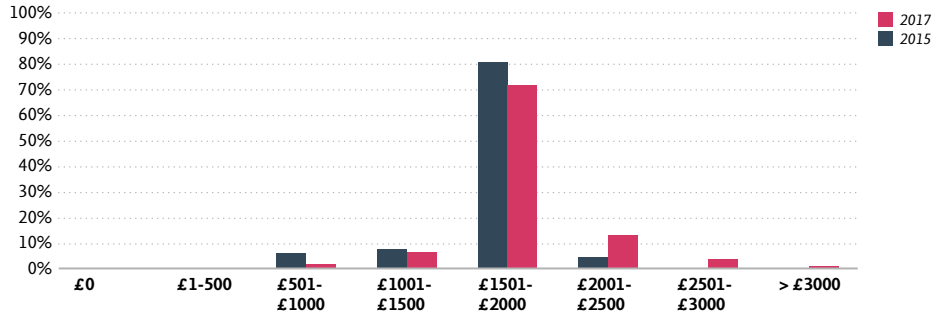


1.3.2 Hybrid journals

APC levels for hybrid journals tend, as is well-known, to be higher than for fully-OA journals. Again, patterns vary significantly between different publishers. But pricing between £1,501–£2,000 remains the most popular, though some publishers have moved significant numbers of journals to higher rates; and the numbers at lower rates have fallen *(Figure 1.5)*.

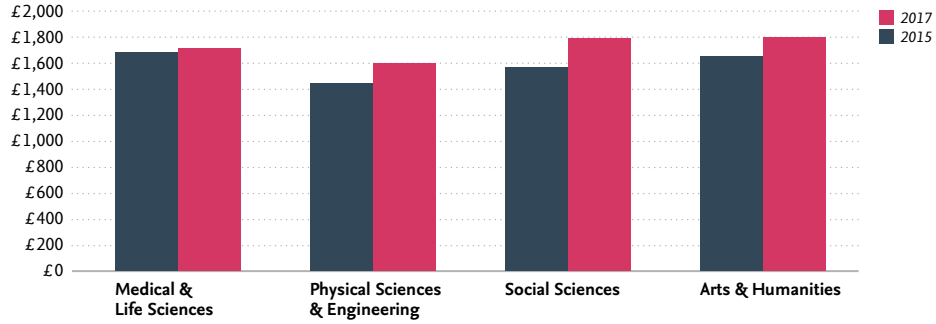
The published APC for most hybrid journals is between £1500 and £2000.

Figure 1.5 *– APC price bands for hybrid journals from 32 publishers, 2015 and 2017*



APCs for the OA and hybrid journals popular with UK authors tend to be slightly higher in the arts, humanities and social sciences, than in the medical and physical sciences. The median level rose across all subject areas between 2015 and 2017 *(Figure 1.6)*.

Figure 1.6 *– Median levels of APCs in four subject areas, 2015 and 2017*



1.4 Nearly all OA and hybrid journals allow for the use of the CC BY licence; but few hybrid journals require its use

All the major publishers of fully-OA journals at the least *allow* for the publication of articles under a CC BY licence, which means that the only restriction on re-use is a requirement to attribute the original authors. The rise in the numbers of fully-OA journals has been accompanied by a very slight decline between 2015 and 2017 in the proportions of titles that *require* the use of CC BY, and a commensurate rise in the proportions that *allow* its use. But for hybrid journals, the picture is very different: CC BY is again *allowed* in almost all cases (sometimes depending on the payment of an additional fee); but despite a small increase between 2015 and 2017, it is rarely set as a requirement *(Figure 1.7)*.

Figure 1.7 *– Licensing for fully-OA and hybrid journals, 2015 and 2017*

Figure 1.7.1 – CC BY for fully-OA journals

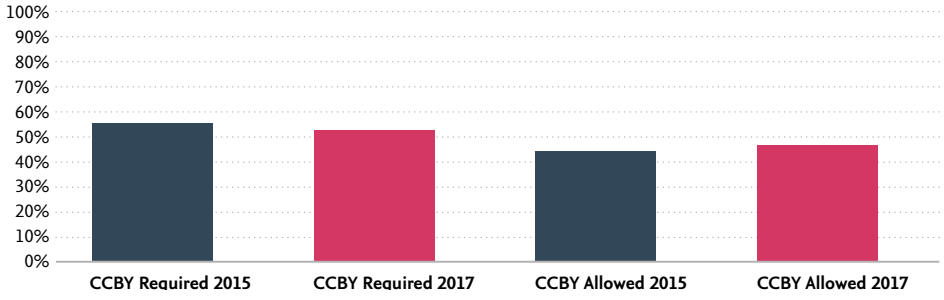
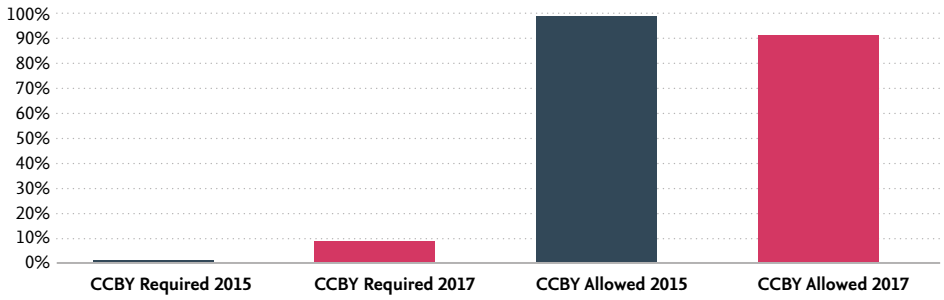
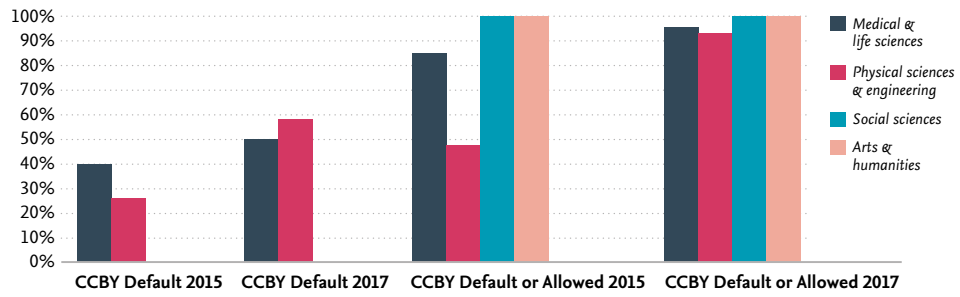


Figure 1.7.2 – CC BY for hybrid journals



CC BY is not a requirement for any of the fully-OA and hybrid titles popular with UK authors in the arts, humanities and social sciences; but by contrast it *is* a requirement for OA articles in half or more of such journals in science, technology, engineering and medicine (STEM) subjects. And it is now at least an *option* in 90% or more of journals in all subject area, with a sharp increase between 2015 and 2017 in its availability in the physical sciences and engineering *(Figure 1.8)*.

Figure 1.8 *– CC BY options for fully-OA & hybrid journals popular with UK authors, 2015 and 2017*



Almost all fully-OA and hybrid journals allow articles to be published under a CC BY licence; but very few hybrid journals require its use.

1.5 Posting policies for Greeen OA are becoming more complex, and very few journals allow the posting of versions of record.

Policies for the posting of articles on websites, repositories and elsewhere are becoming more complex, especially for accepted authors' manuscripts (AAMs).

Policies relating to the posting of subscription-based articles on websites, repositories, and other locations still vary widely across publishers and individual journals; and they are not always easy for authors to find or to understand. The pattern of variation is complex; but in general terms, policies are more permissive for pre-prints and for accepted manuscripts than for published versions of record; and there is a similar gradation in moving from postings on websites through institutional and subject repositories to other sites, particularly those seen as commercial operations.

Few publishers now make any attempt to restrict the posting of *preprints*, though many of them require authors to provide a citation and link once an article has been accepted for publication.

Detailed requirements associated with policies for a*ccepted authors' manuscripts (AAMs)* have tended to increase since 2015, especially for deposit in subject repositories and sharing sites. Some publishers allow deposit in subject repositories only when mandated by funders; and the STM Association's *Voluntary principles for article sharing on scholarly collaboration networks,* published in 2015, have led many publishers to amend their policies to allow deposit on such sharing sites as have adopted those principles. Some restrict deposit to non-commercial sites, while others restrict it to sites with which they have bilateral agreements. Yet others have policies forbidding 'systematic distribution'; and some require licences for posted articles that restrict specific kinds of re-use.

These variations, and differences in terminology, make for difficulties in analysing the policies on a consistent basis. But examination of embargo periods for AAMs of articles in nearly twelve thousand hybrid and subscription journals (from our sample of 33 publishers of such journals) indicates that *(Figure 1.9)*:

- Three-quarters of such journals allow AAMs to be made immediately accessible on *personal websites* with a slight rise between 2015 and 2017; but for the minority that impose an embargo, there has been a trend towards longer periods.
- Only a sixth of journals allow access for postings in *institutional repositories* with no embargo, and that proportion has fallen since 2015. Around half set an embargo of 12 months, but the proportion setting a longer embargo has risen, from 24% to 31%.
- For postings in *subject repositories*, embargoes of less than 12 months are rare; and the proportion of titles setting a longer embargo has risen Between 5% and 8% of journals either restrict any posting in subject repositories, or leave the question unclear.

Among journals popular with UK authors, titles in the arts, humanities and social sciences are much more likely than in STEM subjects to allow access with no embargo via personal websites or institutional repositories *(Figure 1.10)*. And while in the medical and health sciences the proportion of titles allowing zero embargoes via personal websites or institutional repositories rose between 2015 and 2017, in the physical sciences it fell. For subject-based repositories the picture is more complex: zero embargoes are more common in the medical and physical sciences than in the arts, humanities and social sciences; and embargoes of 24 months or more have become more common in the social sciences than they were in 2015.

Sci-Hub

Since its inception in 2011, Sci-Hub has become a controversial part of the online scholarly information landscape. The site functions as an online search engine with over 55 million articles available for download, bypassing publisher paywalls. New papers are uploaded daily when accessed through educational institution proxies, and papers stored in the LibGen repository. Recent analysis[1] shows that Sci-Hub hosts version of record copies of practically all subscription-based publications since 2015, and also large portions of earlier literature. Analysis of Sci-Hub usage data shows that users come from all parts of the world, including countries in which subscription access is widely available.[2] Downloads from the UK are in line with the global average, relative to population size.[3]

Subscription-based publications added to Sci-Hub are harvested illegally using the access credentials of legitimate users, but despite legal injunctions and ongoing court proceedings (at the time of writing), Sci-Hub remains available to users in much of the world. Owing to its illegal nature, accessibility via Sci-Hub is not included in any of the analysis included in this report.

1 *https://peerj.com/preprints/3100/*
2 *http://www.sciencemag.org/news/2016/04/whos-downloading-pirated-papers-everyone*
3 *http://blogs.lse.ac.uk/impactofsocialsciences/2017/06/12/a-closer-look-at-the-sci-hub-corpus-what-is-being-downloaded-and-from-where/*

***Figure 1.9** – Embargo periods for accepted author manuscripts, 2015 and 2017*

***Figure 1.9.1** – Embargo periods for personal websites*

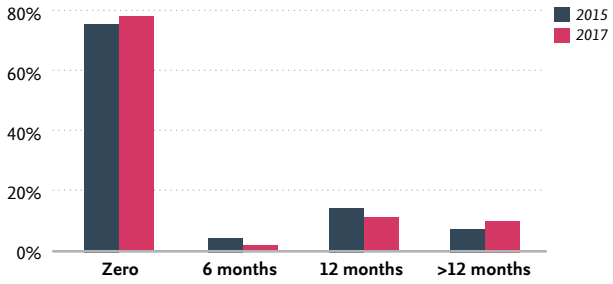


***Figure 1.9.2** – Embargo periods for institutional repositories*

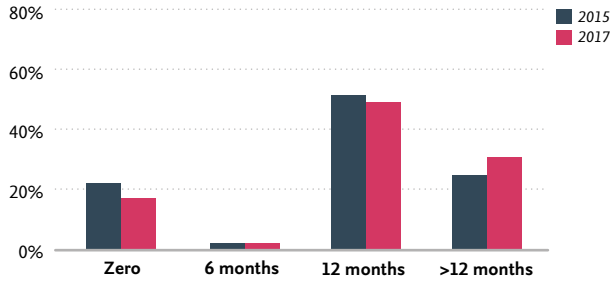
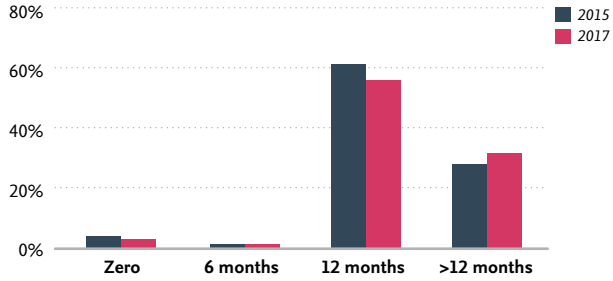


***Figure 1.9.3** – Embargo periods for subject repositories*



Only a relatively small minority of publishers allow the posting of the published version of record of a subscription-based article on any site, and there has been little change since 2015. As we note in *Chapter 2*, however, many of the articles made accessible from repositories and other sites take the form of the version of record, indicating that authors deposit them in contravention of their publishers' policies.

Figure 1.10 *– Embargo Periods in Four Subject Areas, 2015 and 2017*

Figure 1.10.1 – Embargo periods for accepted MSs on personal websites

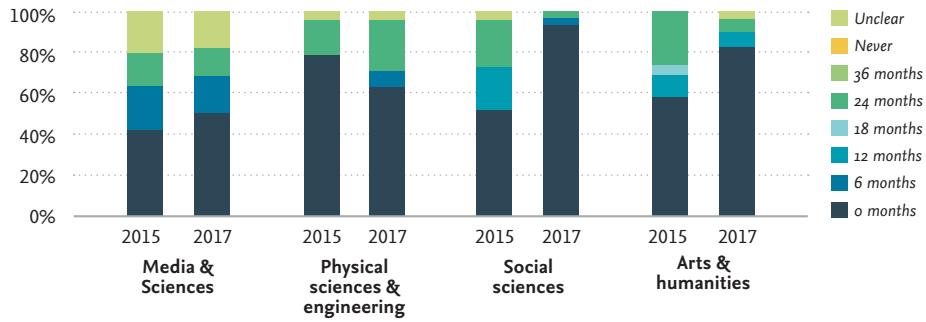


Figure 1.10.2 – Embargo periods for accepted MSs in instiutional repositories

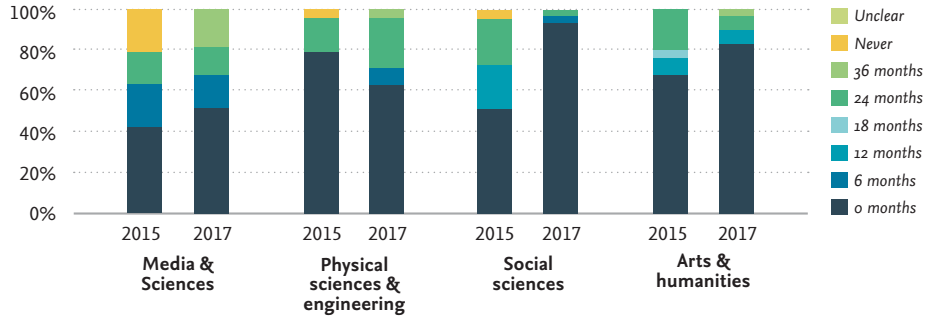
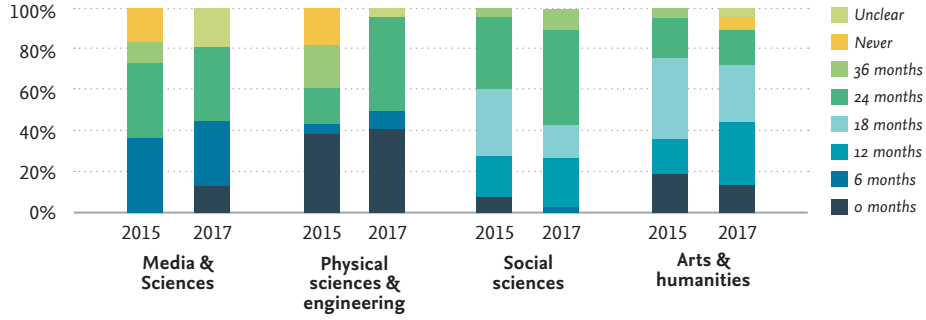
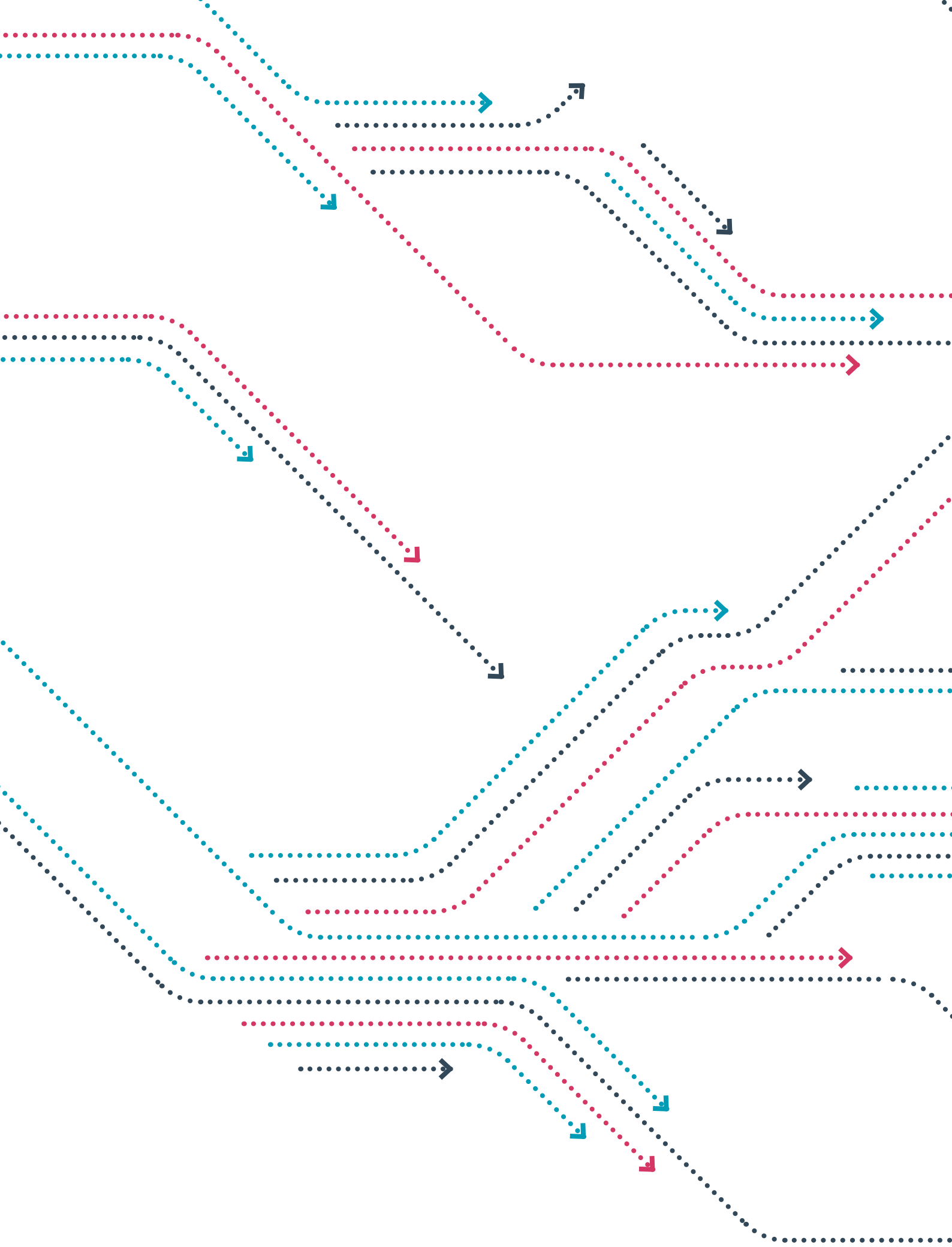
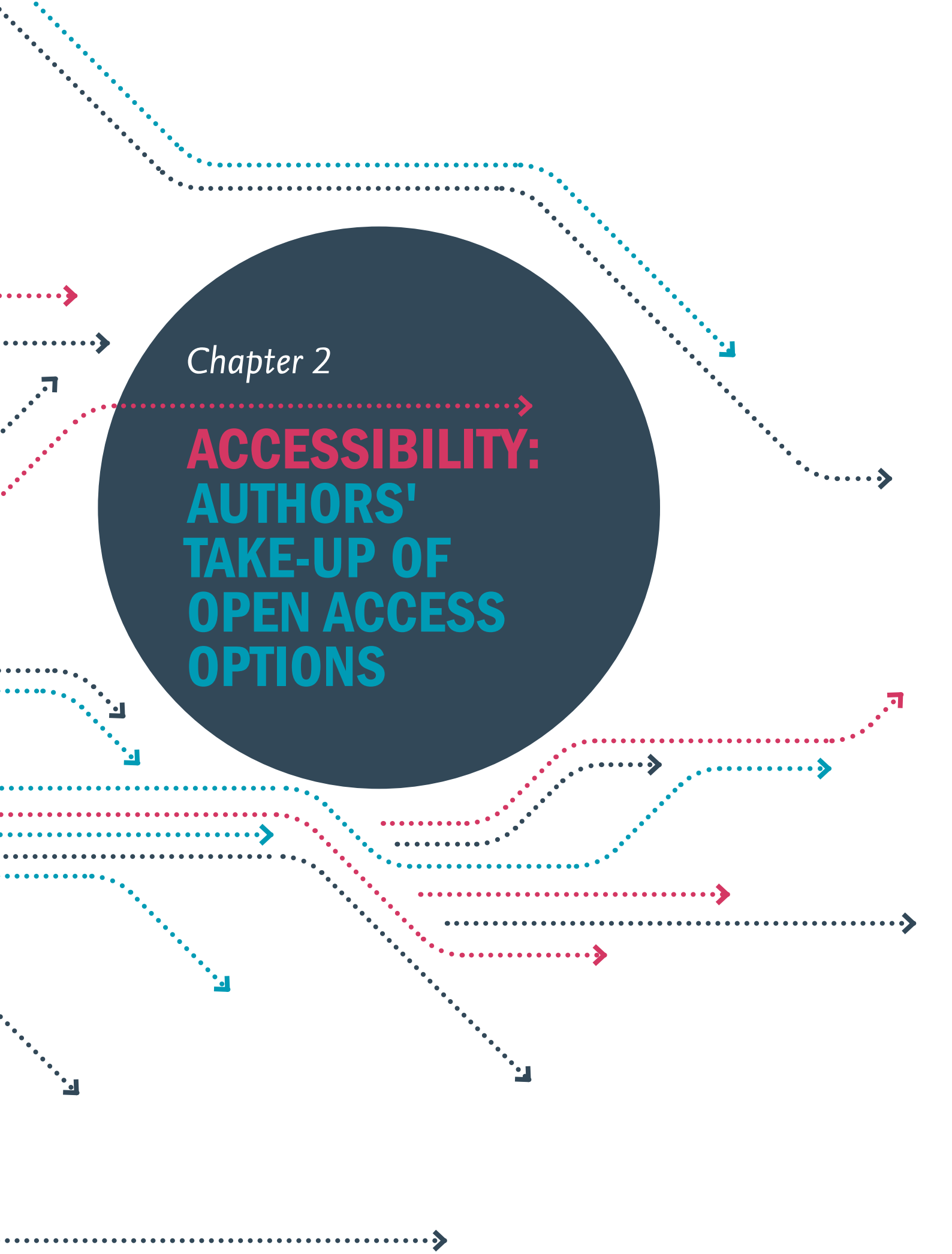


Figure 1.10.3 – Embargo periods for accepted MSs in subject repositories







Chapter 2

ACCESSIBILITY: AUTHORS' TAKE-UP OF OPEN ACCESS OPTIONS

2.1 Introduction

Since the aim of policy in the UK is to achieve a shift towards OA , we seek in this part of the study to determine for the UK and the global baseline the proportion of articles published under different publishing models and – for a sample of those published under a subscription-based model – whether or not a version is readily accessible online.[1] We have used two parallel approaches and applied them to all publications globally, as well as those where at least one author listed a UK affiliation. We also assessed posted versions for compliance with publisher policies on what version can be posted at what location and under what (if any) embargo. A full account of our methodology is at *Annexe 1*[2] and comparisons between the UK and some regions of the world at *Annexe 3*.[3]

1 The figures presented here represent accessibility in the developed world, and do not include the large corpus of literature accessible to users in developing countries free or at low cost via Research4Life, INASP, EIFL and similar programmes.

2 *www.universitiesuk.ac.uk/policy-and-analysis/Documents/2017/monitoring-transition-open-access-annexe-1-methodology.pdf*

3 *www.universitiesuk.ac.uk/policy-and-analysis/Documents/2017/monitoring-transition-open-access-annexe-3-regions.pdf*

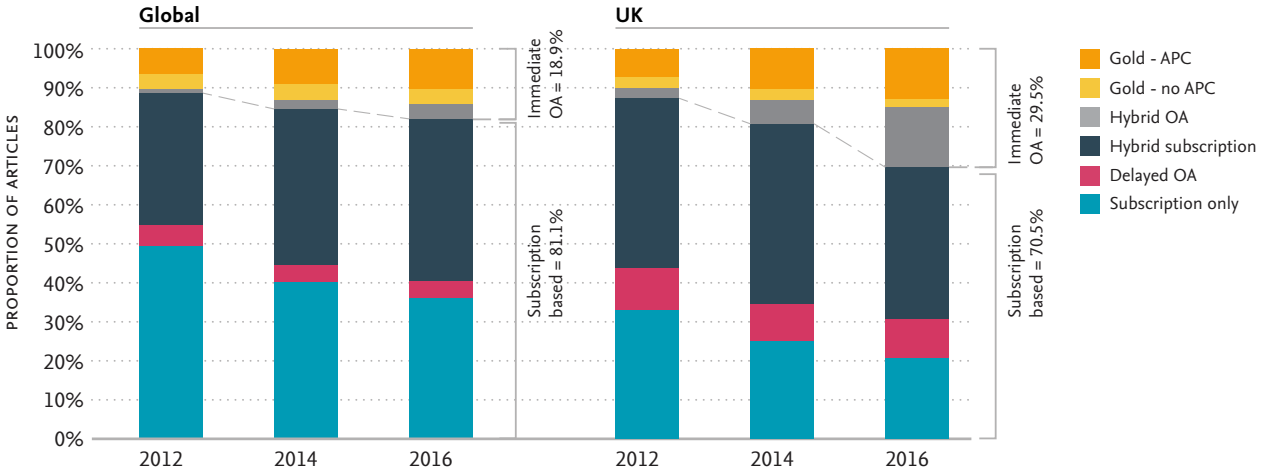
2.2 The numbers and proportions of articles published under immediate Gold OA terms are rising

The numbers of articles published globally under both immediate OA and subscription-based publishing models *(see page 9 for definitions)* grew in absolute terms between 2012 and 2016. But *Figure 2.1* shows that articles published under Gold OA publishing models grew faster than subscription-based ones, and hence Gold OA rose from 12% to 19% of all articles. More than half of Gold OA articles were published under the Gold – APC model, and hybrid Gold articles grew fastest, albeit from a low base.

For UK-authored articles, the growth in immediate Gold OA was greater still. Between 2012 and 2016 they grew from 12% to 30% of all articles. This rapid rate of increase seems to demonstrate the effects of the policies of RCUK and major research charities led by the Wellcome Trust, and of the funding they have provided to support Gold OA. The especially strong growth in Hybrid OA, from 2.7% to 15.4% of all articles, probably also reflects UK authors' propensity to select journals with above-average Field Weighted Citation Impact *(FWCI, see Annexe 1 for definition[2])*. The proportion of UK-authored articles in hybrid journals that are published as Gold OA rose from 6% in 2012 to 28% in 2016.

Between 2012 and 2016, the proportion of all UK-authored articles published on immediate Gold OA terms rose from 12% to 30%.

Figure 2.1 *– Proportion of articles published under different publishing models, global and UK*



2.3 More subscription-based articles are being made accessible on Green OA terms via posting on websites, repositories and other services

In 2016, 48% of UK-authored subscription-based articles were made accessible online within 24 months of publication.

In order to provide a complete view of accessibility, we have also examined the extent to which versions of subscription-based articles are easily findable and accessible on Green OA terms via posting in repositories and elsewhere.

Our earlier study found that in 2014 at least one version of 19% of all articles published globally under a subscription-based model were accessible online within 24 months after publication. Our current study indicates that in 2016 that proportion had risen to 38% (*Figure 2.2*). Many articles are available in multiple versions, and their availability increases over time, from 27% at or near the time of publication to 50% at 24 months post-publication. Some three-quarters of the postings are represented by a copy of the version of record (VoR), the majority of which (nearly two-thirds) were found at ResearchGate *(Figure 2.3*). Preprints and accepted author manuscripts (AAMs) were also likely to be found at other sites such as academic websites, institutional repositories or subject repositories. All of the postings of VoRs in our sample, and around a third of AAM postings, were not consistent with journal policies.

For subscription-based articles with UK authors, we find significantly higher rates of posting. Our earlier study found that in 2014 at least one version of 23% of such articles were accessible online within 24 months after publication. In 2016, that proportion had reached 48% *(Figure 2.2)*. As with the global sample, VoRs are the most prevalent among posted versions, but AAMs and preprints are more prevalent than in the global sample. The UK also shows a much sharper increase in postings of AAMs at six months and twelve months post-publication. This reflects the policies of major research funders in the UK and the European Union, and also the typical embargo periods of many journals and publishers. But as in the global sample, the majority (nearly two-thirds) of postings are represented by VoRs, and most of these (again nearly two-thirds) were found at ResearchGate. On the other hand, UK-authored publications are far more likely than the global average to be found as AAMs in institutional repositories. This may reflect the more intensive development of such sites in the UK. Again, all of the postings of VoRs in our sample, and about a third of AAM postings, were not consistent with journal policies.

Figure 2.2 *– Proportion of articles published under subscription-based publishing models posted online, global and UK, by document version and time post publication*

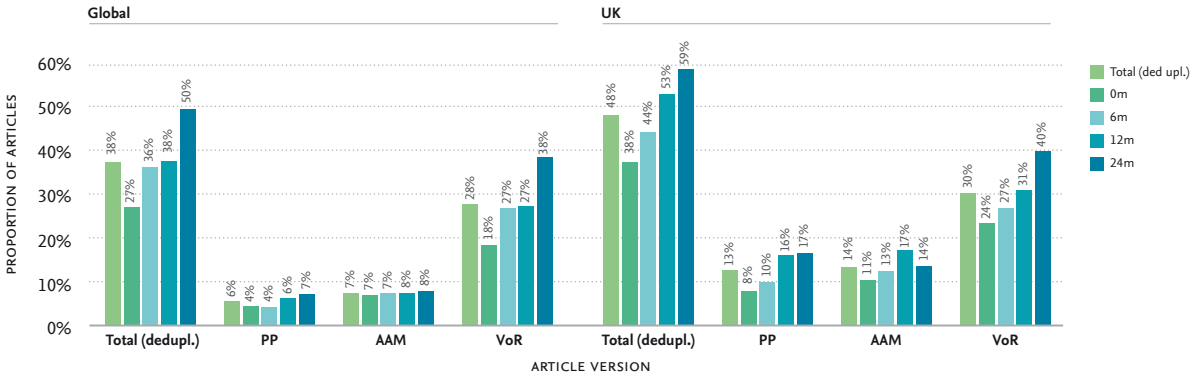
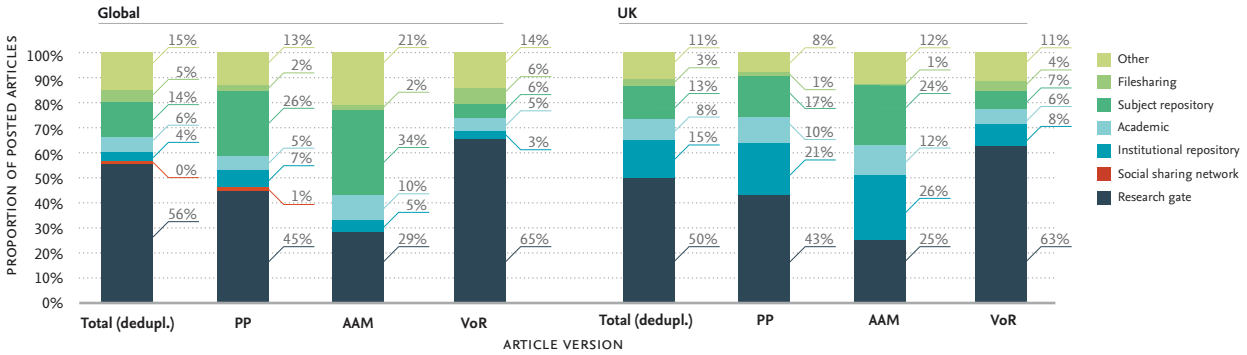


Figure 2.3 *– Proportion of articles published under subscription-based publishing models posted online, global and UK, by document version and location**



** Since postings may occur in different versions and at different locations, these figures are given as proportions of the duplicated totals and so add to 100%*

2.4 More than half of UK articles are made openly accessible within 12 months

In order to estimate the overall proportions of OA articles, we need to consider those that are published as immediate Gold OA, those published in 'delayed OA' journals (where all the articles are made accessible on the publisher's platform at a defined time after publication) and those made accessible by posting in a repository or other site (Green OA). We have also taken into account the age of articles at the time at which posted versions were found online.

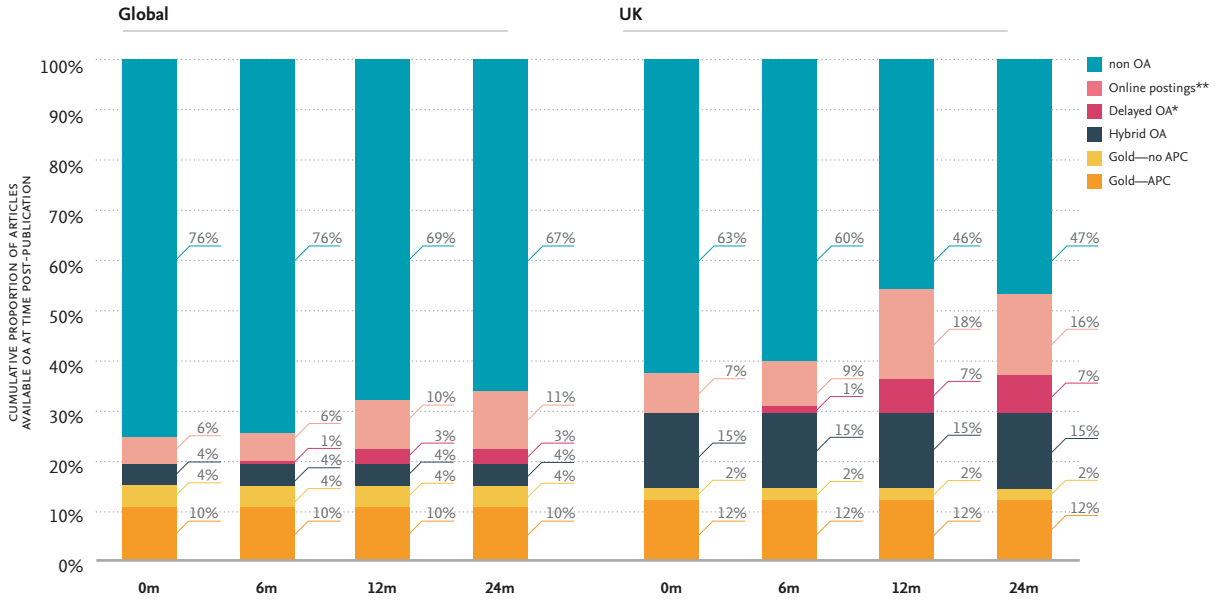
In our previous study, we found that in 2014, 18% of articles published globally over the previous two years were accessible immediately on publication in line with funders' and journal policies, rising to 25% within 12 months, and 27% within 24 months. Our current study *(Figure 2.4)* indicates that in 2016 25% were accessible immediately on publication, rising to 32% within 12 months, and 33% within 24 months. Again, it is important to stress that these figures do not take account of the articles harvested and made accessible by the illegal SciHub site.

For UK-authored articles, the proportions in our previous study were significantly higher: 20% were accessible immediately on publication, rising to 32% within 12 months, and 35% within 24 months. Our current study shows that from that higher base, the proportions have continued to increase, so that in 2016 37% of UK-authored articles were accessible immediately on publication, rising to 54% within 12 months, and 53% within 24 months. The slight fall in postings recorded between 12 and 24 months of publication may simply reflect differences in the samples of articles checked, or perhaps a change in behaviour as more authors respond to REF and other policy requirements by posting their most recent articles.

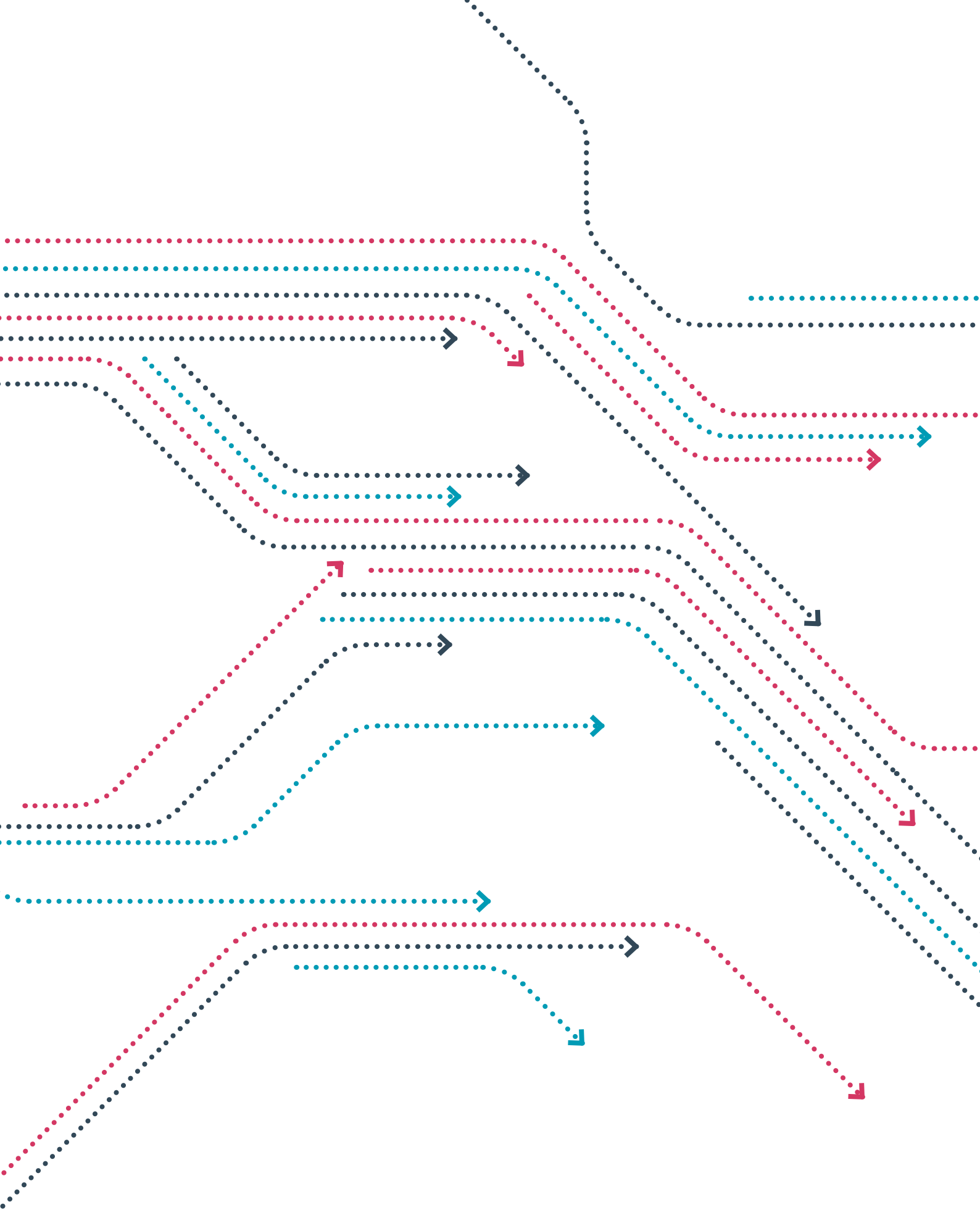
In broad terms, therefore, more than a third of UK-authored articles in 2016 were accessible immediately, as compared to a fifth in 2014; and more than a half were accessible within 12 months, as compared to one-third in 2014. The rising trend indicates that the various policies to promote and support OA in the UK are having a positive effect. The great majority of those that are not currently accessible could in principle be made so on Green OA terms if authors were to post them on websites, repositories or elsewhere in line with journals' policies.

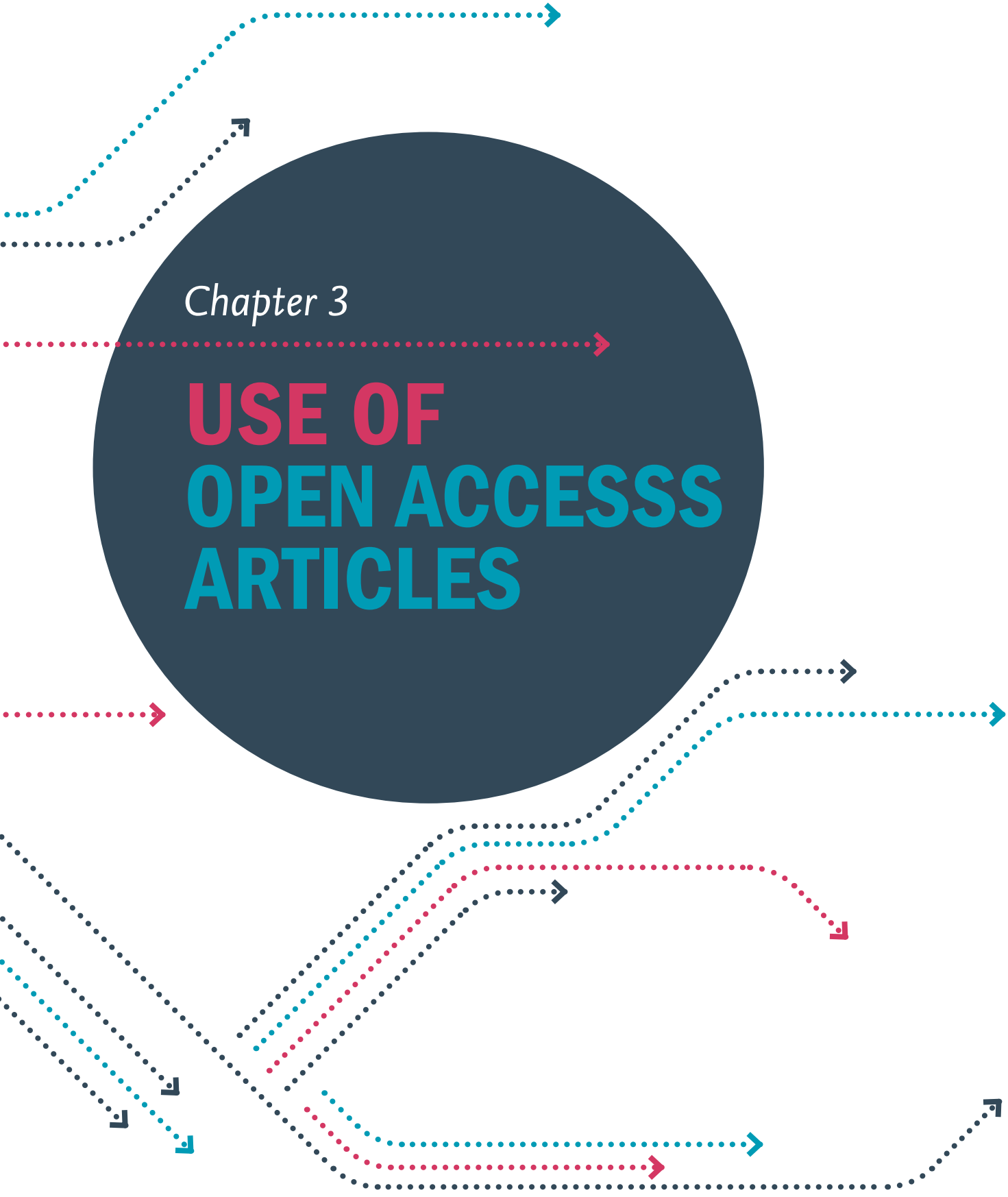
Either via immediate Gold OA, delayed OA, or on Green OA terms via posting on websites and other services, more than a third of UK-authored articles were in 2016 accessible immediately, as compared to a fifth in 2014; and more than a half were accessible within 12 months.

Figure 2.4 *– Proportion of articles in 2016 published under immediate Gold OA or accessible within 24 months through Green OA online postings in line with journal policies, global and UK*



** Delayed OA periods greater than 24 months post-publication adds another 1.1% for Global and 2.7% for UK-authored publications*
*** Online postings excludes those of publications published under Delayed OA and illicit postings of AAMs*





Chapter 3

USE OF OPEN ACCESSS ARTICLES

3.1 Introduction

A key aim of OA policies is that scholarly articles should not only be more accessible, but also more widely read and used. The best available proxy in assessing this is to examine numbers of downloads, though we cannot know whether articles downloaded are actually read or used in any way. Nor does the data allow us to examine any demographic patterns among those downloading articles. What we *can* examine is patterns in downloading of OA and non-OA articles.

Articles may be downloaded from a variety of sites: personal and departmental websites, subject and institutional repositories, sharing sites, and publishers' as well as aggregators' platforms. Hence we have used a range of datasources in order to investigate downloads on different platforms. Although we are aware, however, of the increasing popularity of sharing sites (scholarly communications networks and the like) we have not been able to gather any data relating to downloads from them.

3.2 Gold OA articles are downloaded from publishers' platforms more frequently than subscription-based articles

Aggregated data for universities in the UK, along with data from individual publishers, indicates that Gold OA articles are on average downloaded more frequently than non-OA articles. There is also some evidence to suggest that OA downloads are increasing as a proportion of all downloads. But the patterns vary across different publishers, and still more across different journals. There is no evidence to suggest that publishing an article on Gold OA terms inevitably leads to more downloads.

3.2.1 UK university downloads

The Journal Usage Statistics Portal (JUSP) aggregates data on downloads via publishers' and intermediaries' sites from 180 higher education libraries in the UK, though it does not cover fully-OA publishers such as Frontiers, Hindawi or PLOS (which thus depresses the overall picture of OA downloads).

OA articles are downloaded from publishers' platforms on average between twice and four times as much as non-OA articles.

The number of journals covered by JUSP rose by 30% between 2013 and 2016, from 19,900 to 25,900; and the recorded total of all downloads rose at roughly the same rate from 164 million to 215 million. OA downloads increased by 61% between 2014 (the first year for which reliable figures are available) and 2016, with a sharp increase in the latter year. Since downloads of all articles rose at less than half that rate, downloads of OA articles (from both hybrid and fully-OA journals) rose from 4% to 5.3% of all downloads *(Figure 3.1)*.

Some publishers and intermediaries show no downloads at all, or very small numbers. But most of those with substantial numbers of OA downloads saw significant increases between 2014 and 2016. And it seems likely that those increases may be related to a rise in the numbers of Gold OA articles from most publishers over this period.

Figure 3.1 *– Downloads of articles via UK University Libraries, 2014 to 2016*

Figure 3.1.1 *– Downloads of OA articles for all JUSP publishers, 2014 to 2016*

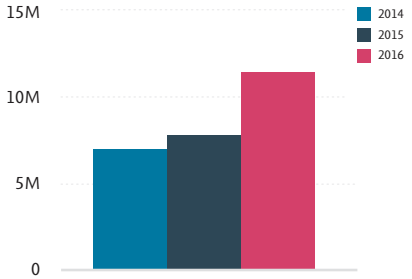
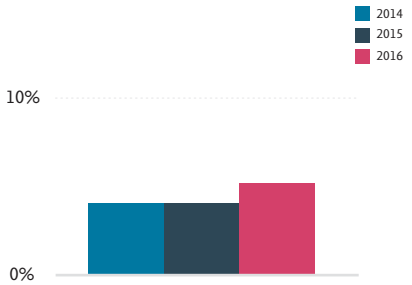


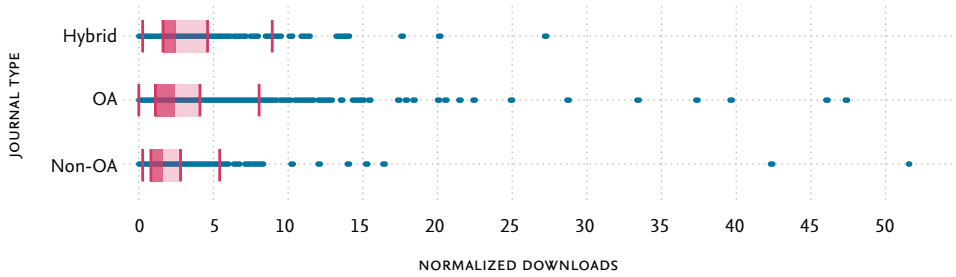
Figure 3.1.2 *– OA downloads as percentage of all downloads for all JUSP publishers, 2014 to 2016*



3.2.2 Downloads from individual publishers' platforms

An analysis of articles published in April 2016 by a large publisher (*Figure 3.2*) shows that in the succeeding year, downloads of OA articles in hybrid journals were on average more than three times higher, and of articles in fully-OA journals more than twice as high, compared with non-OA articles.

Figure 3.2 *– Downloads of articles from a large publisher, May 2016 to April 2017*



A medium-sized publisher with some 80 journals, shows a slightly different pattern, with 2.5 million downloads in 2016 of OA articles published that year, as against 4.3 million downloads of non-OA articles. *Figure 3.3* shows that downloads of OA articles in both fully-OA and hybrid journals are on average significantly higher than for non-OA articles, particularly for users at non-subscribing institutions.

Figure 3.3 *– Downloads of articles from a medium-sized publisher, 2015 and 2016*

Figure 3.3.1 *– Downloads of OA and non-OA articles from a medium-sized publisher, known users*

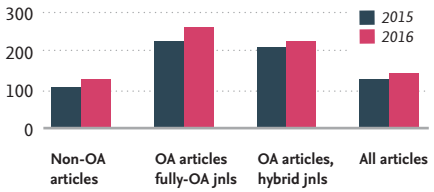
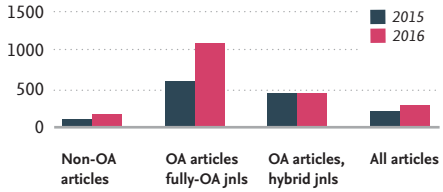


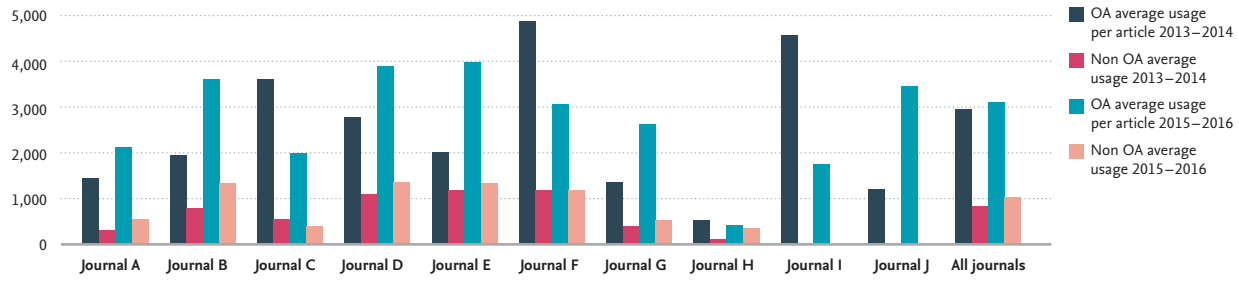
Figure 3.3.2 *– Downloads of OA and non-OA articles from a medium-sized publisher, unknown users*



For a second medium-sized publisher, the ratio between downloads of OA and non-OA articles in hybrid journals varies on average from just over one to four or five (with one title reaching over six in 2016); and for a third, analysis of three hybrid journals again shows downloads for OA articles on average between three and four times those for non-OA articles.

Finally a small publisher of high status journals, eight of them hybrid and two fully-OA, saw in 2016 over 6.0 million downloads of OA articles published in that year, as against 3.6 million for non-OA articles. Downloads for OA articles were on average more than three times higher than for non-OA articles. For individual titles, the ratio was between 2.5 and 6, with the exception of one small journal in the humanities, where the ratio is currently around 1.2. But when we examine the changes in downloads for articles published and downloaded between 2013 and 2014, and between 2015 and 2016, as shown in *Figure 3.4*, it is clear that individual titles show very different patterns of change for both OA and non-OA articles: there were rises and falls for both OA and non-OA articles.

Figure 3.4 *– Downloads of articles from a small publisher, 2013–2014 and 2015–2016*



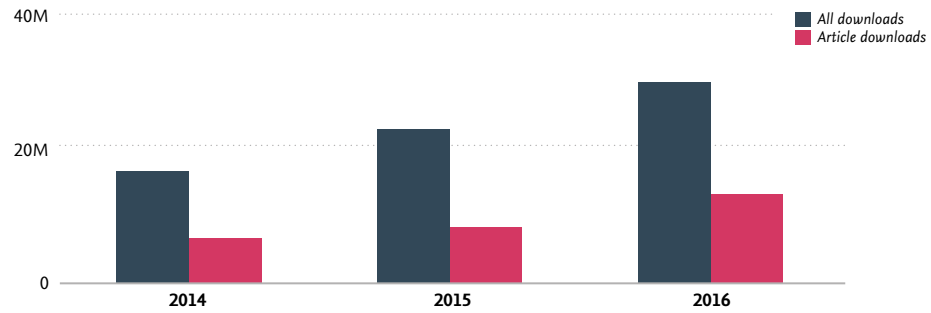
In sum, while there are complex patterns – as is to be expected – when it comes to individual journals, evidence from a range of publishers indicates that downloads from their platforms of OA articles are on average between two and four times the rate for non-OA articles. But there is no obvious pattern as between hybrid and fully-OA journals. Examples of very high and relatively lower download rates can be found in both types of journal.

3.3 More articles are being downloaded from UK institutional repositories

IRUS-UK aggregates usage data for over 110 institutional repositories (IRs) in the UK (up from 70 in 2014). The contents of IRs vary hugely, with many including high proportions of working papers, dissertations, presentations and so on as well as versions of published scholarly articles. Metadata quality varies too, and so for only around half of all articles can the journals in which they were published be identified. With all those caveats, *Figure 3.6* shows that downloads of scholarly articles constituted just over 40% of all downloads in 2016, and that they had increased at a slightly faster rate since 2014 than for other kinds of content. Data from CORE suggests that the numbers of full-text articles in UK repositories increased by more than 60% between January 2014 and December 2016, while the number of article downloads more than doubled from 6 to 12 million. This suggests that downloads per article are increasing.

The number of full-text articles in UK institutional repositories (IRs) increased by more than 60% between 2014 and 2016, while the number of downloads more than doubled from 6 to 12 million.

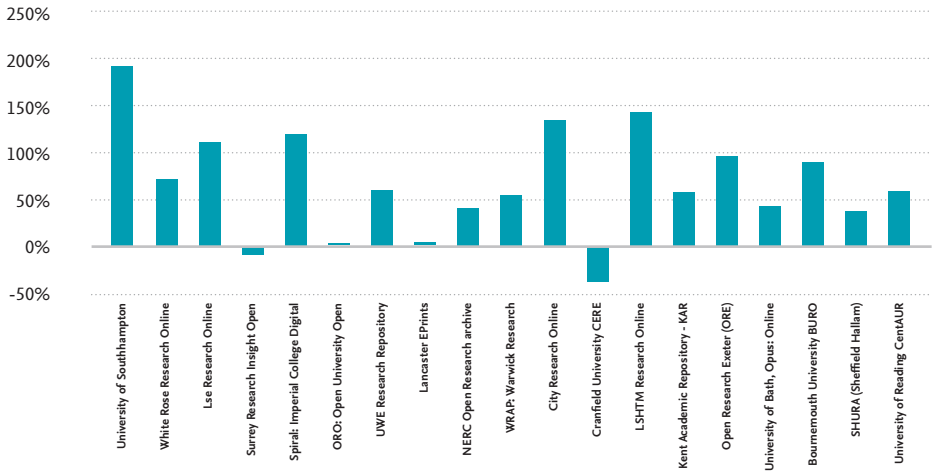
Figure 3.6 *– Downloads from UK repositories, 2014 to 2016*



3.3.1 Downloads from individual repositories

A wide range of institutions feature among those with the highest numbers of article downloads, and 22 had more than 200,000 such downloads. But the rank order of IRs by article downloads changes significantly from year to year. For those IRs for which we can trace downloads over three years, most showed significant increases between 2014 and 2016. But as shown in *Figure 3.7*, for the top twenty such institutions in 2016, the increases vary in scale; and two IRs, Surrey and Cranfield, actually show a fall in article downloads.

Figure 3.7 – *Downloads from UK repositories, 2014 to 2016*



3.3.2 Articles from specific journals

Where the metadata allowed, IRUS recorded downloads of articles from over 12,000 journals in 2016, a rise of 60% since 2014. But as in 2014, the top ten titles alone accounted for a significant proportion (8%) of all downloads. Three of the four titles with the most downloads (and also with the largest numbers of articles downloaded) are fully-OA journals, where of course versions of record are freely-accessible on the publisher's platform *(Table 3.1)*. But as we noted in 2015, the download figures are also skewed by the popularity of a few articles: a single methodological article in *Qualitative Research in Psychology* still accounts for more than 1% of all downloads from UK IRs.

Table 3.1 *– Top 20 Journals for article downloads from UK institutional repositories, 2016*

	Accounted for by a single article			
Title	**Downloads**	**No.**	**Percent**	**No. of articles downloaded**
Qualitative Research in Psychology	**150,536**	136,775	90.9%	34
PLOS ONE	**84,464**	1,726	2.0%	6,687
IDS Bulletin	**49,501**	621	1.3%	2,417
BMJ	**43,504**	2,276	5.2%	1,003
New England Journal of Medicine	**29,299**	11,618	39.7%	240
Coaching: An International Journal of Theory, Research and Practice	**21,104**	17,524	83.0%	12
Journal of Business Ethics	**20,020**	5,163	25.8%	135
International Journal of Human Resource Management	**19,999**	3,396	17.0%	110
Social Science and Medicine	**19,955**	3,027	15.2%	234
New Media and Society	**19,437**	5,730	29.5%	45

OA titles highlighted

3.4 Both the numbers of articles in PubMed Central and the numbers of downloads are rising

The largest single subject repository is PubMed Central (along with its satellites). The number of articles available rose by 56% from 2.8 million in 2012 to 4.4 million in 2016. But the number of downloads rose even faster by 157%, as shown in *Figure 3.8*. As a result, the average number of downloads per article rose from 127 to 209.

Figure 3.8 *– Downloads from PubMed Central, 2012 to 2016*

Figure 3.8.1 *– Article downloads from PubMed Central*

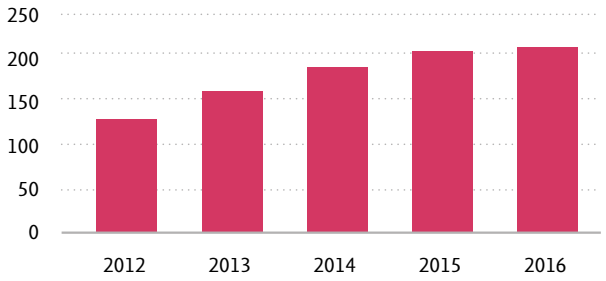
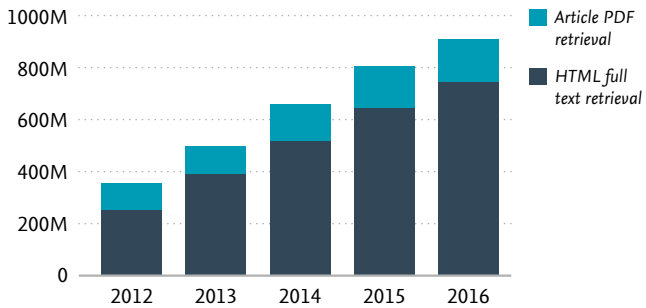
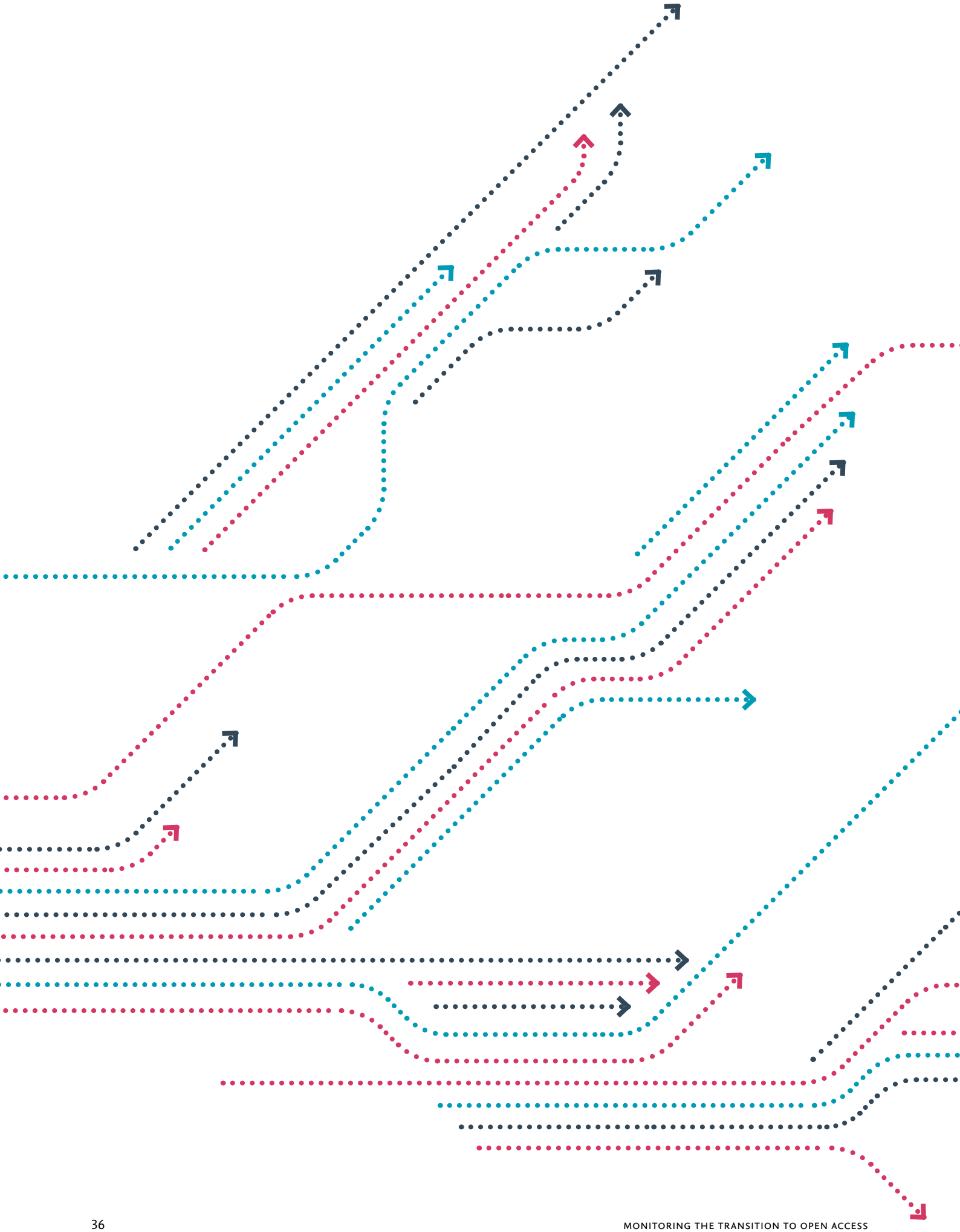


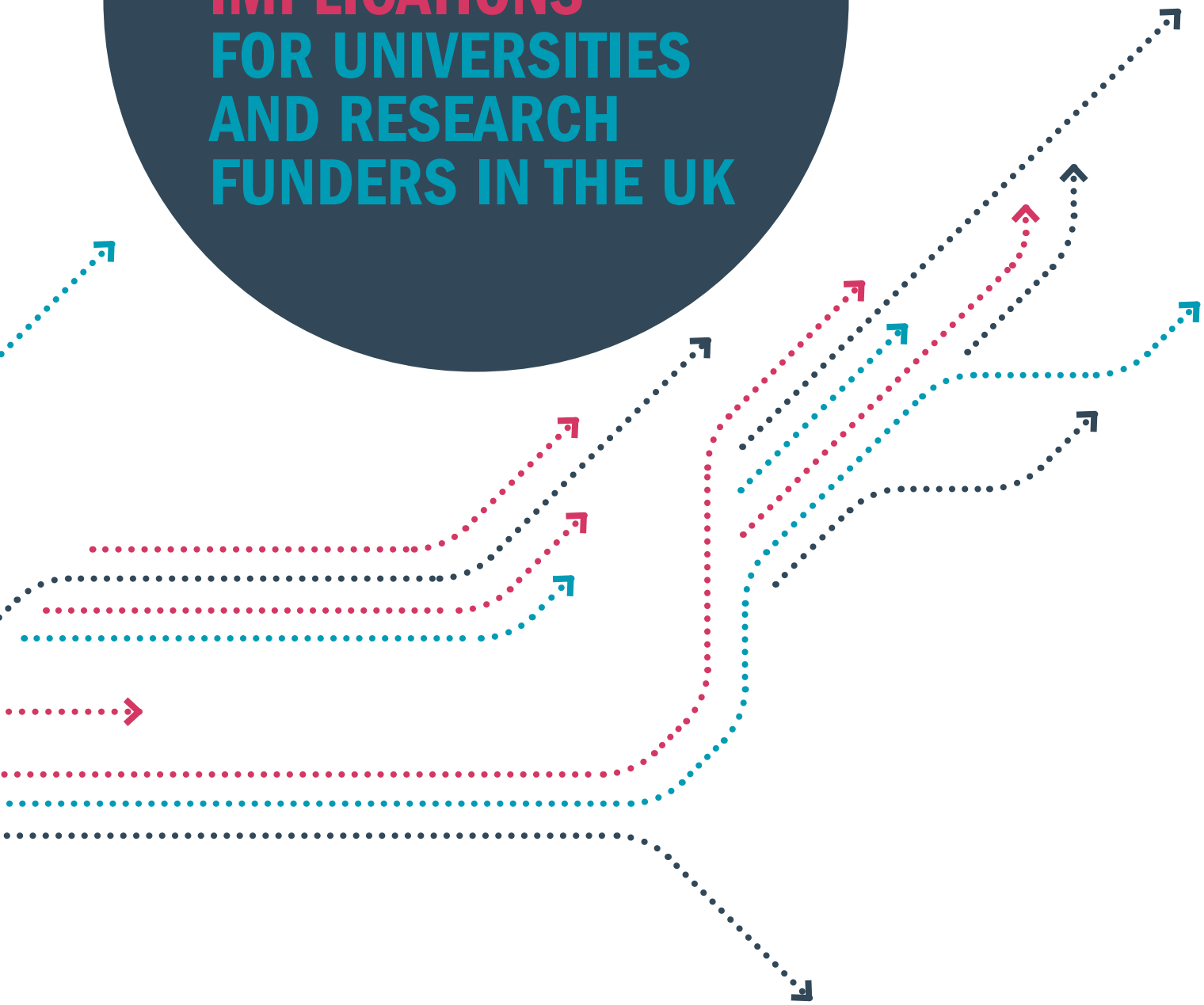
Figure 3.8.2 *– Average number of downloads per article from Pub Med Central*





Chapter 4

FINANCIAL IMPLICATIONS FOR UNIVERSITIES AND RESEARCH FUNDERS IN THE UK



4.1 Introduction

One of the major issues in the move towards OA is how the transitional costs can be, and are being, met. Hence we have examined, as in 2015, data from a sample of universities and from major funders on the payments that they are making for article publishing charges (APCs) and for subscriptions to journals. Our aim has been to assess patterns of change as the take-up of OA in the UK has risen over the past four to five years.

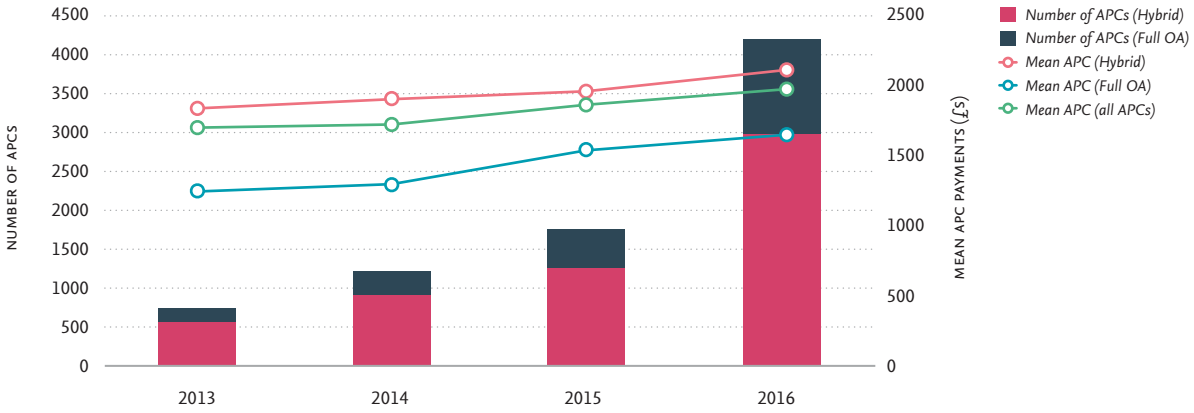
4.2 Expenditure by UK universities on APCs is rising

4.2.1 Trends 2013 to 2016

Data from a sample of UK universities, collated by Jisc, shows a clear trend of rising centrally-managed expenditure on APCs. In a group of ten universities for which data is available covering the years 2013 to 2016, the number of APCs paid rose more than fivefold from 766 to 4,200 (*Figure 4.1*). Over that period, the balance of APC payments has been strongly in favour of hybrid rather than fully-OA journals, though the ratio has shifted each year, from 76% hybrid: 24% fully-OA in 2013 to 70:30 in 2016. These ratios are broadly consistent with data reported by RCUK and by the Charity Open Access Fund (COAF).

Between 2013 and 2016, the number of APCs paid rose fivefold.

Figure 4.1 – *Number of APCs and mean APC cost by journal type, 2013 to 2016, 10 institutions**



* *Cranfield University, King's College London, Queen Mary University of London, Royal Holloway – University of London, Swansea University, University of Birmingham, University of Cambridge, University of Glasgow, University of Liverpool, University of Sussex*

The mean average APC payment rose from £1,699 in 2013 to £1,969 in 2016, a rise of 16% (as compared with a rise of 5% in the CPI). The 2016 figure was somewhat higher than *RCUK's reported mean for APCs* paid from its block grant allocations of £1,811 in 2015–16, but lower than the *Wellcome mean* of £2,044 over the same period. It was also slightly higher than the mean of £1,847 paid by German institutions (calculated at the average exchange for the year of EUR to GBP of 0.81864), although data from the *OpenAPC website* shows UK and German averages following similar trends over the last four years. Such international comparisons, however, are subject to instability in exchange rates.

The UK average for hybrid journals in 2016 was £2,095, as compared with £1,640 for fully-OA journals. But the gap between them narrowed, from 49% in 2013 to 28% in 2016. This was because while the average for full-OA journals rose by 33%, for hybrids it rose by only 14%. The reasons for this are not entirely clear but it is possible that the slower rise for hybrids may partly reflect constraints on APC prices arising from offsetting deals.

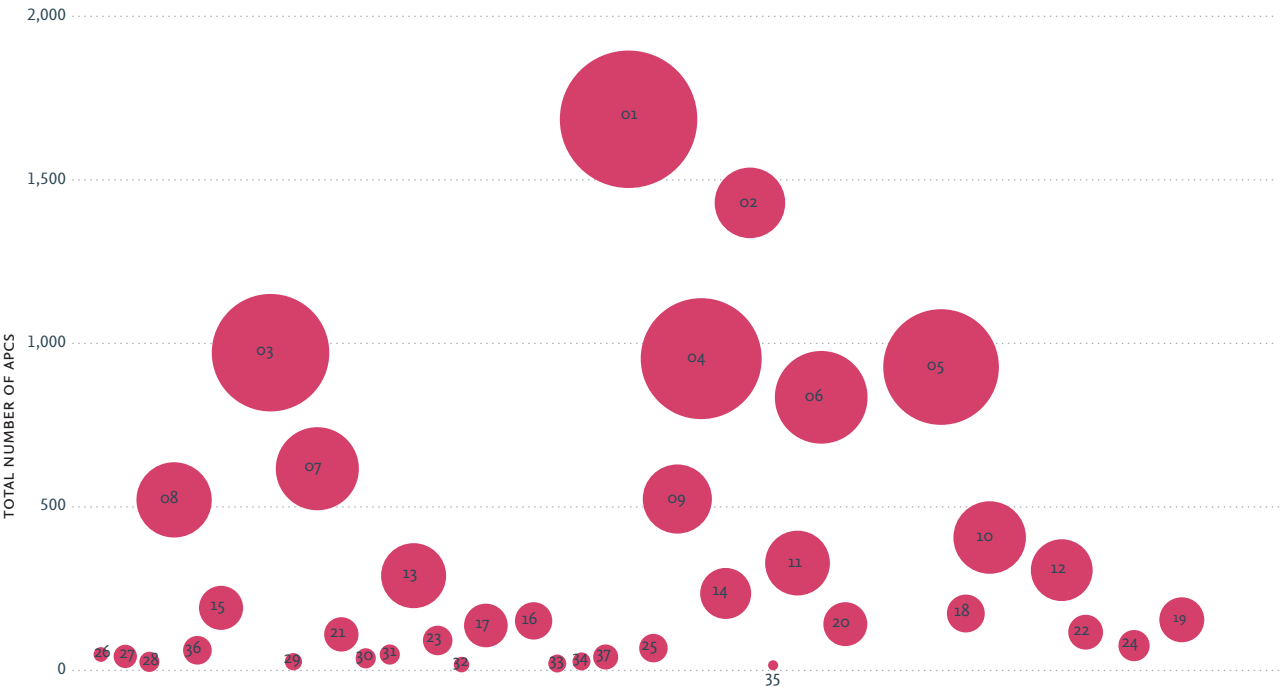
£2,095
Average for hybrid journals in 2016

£1,640
Average for fully OA journals in 2016

4.2.2 Patterns across universities in 2016

Figure 4.2 illustrates the wide variation in APC expenditure across a much larger sample of 37 universities, which made a total of 11,914 APC payments in 2016, amounting to £18.5 million. The smallest number of payments was 17 (amounting to £13,000) at the University of Hull, and the largest number, 1,689 (amounting to £2.7 million) at University College London.

Figure 4.2 *– Total number vs. cost of APC payment (37 institutions, 2016, bubble size indicates total APC cost in £s)*



INSTITUTION

01	University College London	£2,666,787	11	University of Liverpool	—	21	Lancaster University	—	31	Manchester Metropolitan University	—
02	University of Glasgow	£682,872	12	University of Southampton	—	22	University of St Andrews	—	32	Plymouth University	—
03	Imperial College London	£1,907,919	13	Newcastle University	—	23	Northumbria University	—	33	Royal Holloway, University of London	—
04	University of Cambridge	£2,048,622	14	University of Exeter	—	24	University of Sussex	—	34	St. George's, University of London	—
05	University of Oxford	£1,876,189	15	Durham University	—	25	University of Bath	—	35	University of Hull	—
06	University of Manchester	£1,239,482	16	Queen's University Belfast	—	26	Aberystwyth University	—	36	Cranfield University	—
07	King's College London	£951,702	17	Queen Mary, University of London	—	27	Aston University	—	37	Swansea University	—
08	Cardiff University	£789,550	18	University of Reading	—	28	Bangor University	—			
09	University of Birmingham	£691,415	19	University of York	—	29	Keele University	—			
10	University of Sheffield	£743,238	20	University of Nottingham	—	30	London School of Economics and Political Science	—			

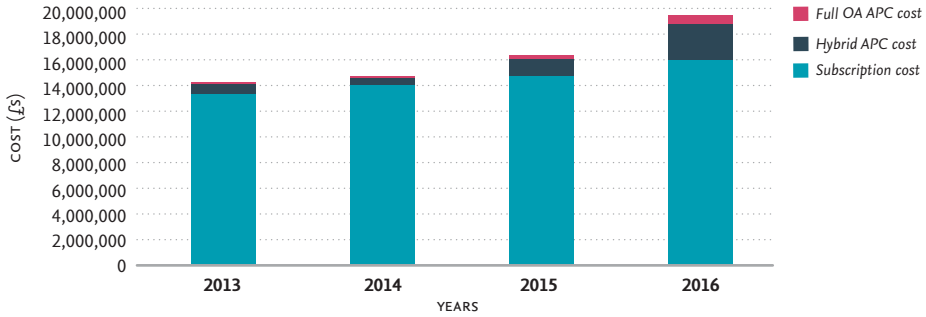
4.3 Expenditure on APCs is rising faster than expenditure on subscriptions

A key issue in the transition to OA is the relationship between expenditure on APCs and on journal subscriptions.

We can track expenditure for our smaller group of ten universities with a sample of seven publishers on both subscriptions (based on publicly-available datasets derived from freedom of information enquiries) and APCs over the years 2013 to 2016 (*Figure 4.3*). During that period, subscription expenditure rose by 20%, from £13.4 million to £16.1 million. But expenditure on APCs rose more than fourfold, from £758,000 to £3.4 million. If we focus solely on hybrid titles, expenditure on APCs again rose fourfold, from £689,000 to £2.7 million; and total expenditure on APCs and subscriptions for hybrid journals rose by nearly a third, from £14.1 million to £18.8 million. Whereas in 2013 the ratio between subscription and hybrid APC expenditure was roughly 19:1, by 2016, it had fallen to 6:1.

In 2013 the ratio between subscription and hybrid APC expenditure was roughly 19:1, but by 2016, it had fallen to 6:1.

Figure 4.3 – *Total subscription and APC expenditure, 2016**

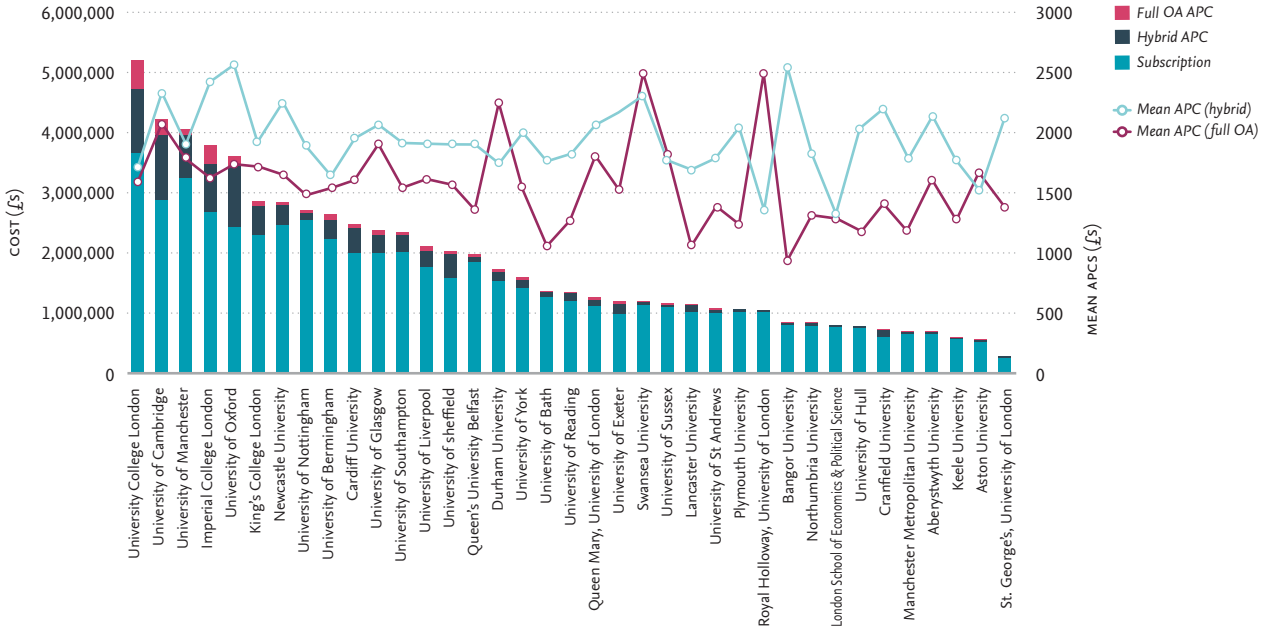


** in £s, 10 institutions: Cranfield University, King's College London, Queen Mary University of London, Royal Holloway – University of London, Swansea University, University of Birmingham, University of Cambridge, University of Glasgow, University of Liverpool, University of Sussex; and 7 publishers: Elsevier, Wiley, Springer, Taylor & Francis, Sage, Institute of Physics, Royal Society of Chemistry*

Figure 4.4 shows expenditure in 2016 on both APCs and subscriptions for our larger sample of 37 universities and for the largest eight publishers. Like *Figure 4.1*, it also shows the mean level of APCs for hybrid and fully-OA journals. Expenditure patterns of subscriptions and APCs varied widely across the sector. Across all 37 universities, expenditure on subscriptions totaled £56.1 million, and on APCs £11.3 million, a ratio of roughly 5:1. If we focus solely on hybrid titles, the £56.1 million expenditure on subscriptions was accompanied by £8.9m on APCs, a ratio of roughly 6:1.

The figures quoted above are under-estimates of the amounts and proportions accounted for by APCs for two main reasons. First, they do not include APCs paid to publishers who publish only OA journals. Second, evidence suggests that only about 80% of overall university expenditure on APCs is met from centrally-managed funds (Pinfield, Salter, & Bath, 2017). If we were to include other APC payments in the analysis, a reasonable estimate of the balance between expenditure on APCs and subscriptions would be a ratio of 5:1. But there is a third factor that complicates the analysis even further. For an increase between 2013 and 2016 of 20% in expenditure on subscriptions by our sample universities to our seven publishers has been accompanied by the development of offsetting deals and similar arrangements which provide for reduced or zero payments of APCs. Some of the costs associated with Gold OA are thus often shifted onto subscriptions. Lawson (2017) has demonstrated that while overall costs might be lower than they probably would have been without such deals in place, the total amount being paid by institutions is still rising. But making an accurate estimate of the impact of offsetting deals at an aggregate level is difficult, since it is not entirely clear how institutions are accounting for offsetting – by reducing recorded APC costs, reducing subscriptions or some other way – in the way they report the data.

Figure 4.4 – *Total subscription and APC expenditure, and mean APC according to journal type, 2016**



** in £s, 37 institutions and 8 publishers: Elsevier, Wiley, Springer, Taylor & Francis, Sage, Institute of Physics, Royal Society Chemistry, and De Gruyter*

4.4 RCUK is the biggest source of funds to meet the costs of APCs

Data on the sources from which universities met their expenditure on APCs is very patchy. In many cases, the source of funds is not recorded. Trends in expenditure by funding source from 2013 to 2016 for 11 universities for which we have data from those years are shown in *Table 4.1*.

The largest single source of funds for these universities in all years was RCUK, which itself reported payment 9,509 APCs in 2015–16. For our larger sample of 38 universities for 2016, RCUK accounted for 80% of the known funding, a total of £2.9 million, while COAF was the source for 15%, amounting to £0.5 million. Other sources recorded by institutions (such as the European Union and the National Institutes of Health) accounted for around 1% each.

Table 4.1 – *Number of APCs according to funder, 2013 to 2016, 11 institutions.**

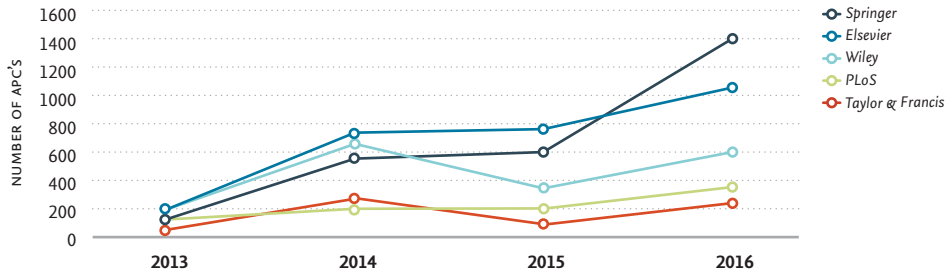
Funder	2013	2014	2015	2016
RCUK	12	1082	1461	2275
COAF	4	227	759	956
EU	0	10	21	76
NIH	1	72	51	61
Others	1	82	56	151
None	0	2	27	77
Unknown	1185	2648	1647	3311
Total	**1203**	**4123**	**4022**	**6907**

**Cranfield University, King's College London, Queen Mary University of London, Royal Holloway – University of London, Swansea University, University College London, University of Birmingham, University of Cambridge, University of Glasgow, University of Liverpool, University of Sussex*

4.5 More than half of APC payments go to the three largest publishers

The pattern of payments of APCs to publishers reflects the current structure of the academic publishing industry, with a small number of large publishers dominating the market. *Figure 4.5* shows numbers of APCs paid by our sample of 11 higher education institutions from 2013 to 2016. As might be expected, Elsevier and Springer Nature have the largest share of the market, with the latter overtaking the former in terms of numbers of APCs in 2016. This reflects its development and acquisition of OA titles, including those of BioMedCentral and Nature Publishing Group. But Elsevier remains the market leader in terms of revenue: as shown in *Figure 4.6*, including data from 38 institutions, in 2016, Elsevier had 28.5% of the market share for the larger sample of 38 institutions compared with 15.8% for Springer and 11.2% for Wiley. Between them, these three publishers thus accounted for over half of the total expenditure on APCs for the sample universities.

Figure 4.5 – *Number of APCs by top 5 publishers, 2013 to 2016, 11 institutions**



**Cranfield University, King's College London, Queen Mary University of London, Royal Holloway – University of London, Swansea University, University of Birmingham, University of Cambridge, University of Glasgow, University of Liverpool, University of Sussex, University College London*

The picture is equally clear when we analyse the sum of the revenues provided to publishers (including PLOS, the leading fully-OA publisher) in the form of both APCs and subscriptions paid by universities (*Figure 4.7*). Elsevier is by far the largest recipient of both subscription and APC revenues, with its APC revenues deriving primarily from hybrid titles. For Springer Nature, by contrast, APC revenues derive mainly from fully OA titles. The comparatively low proportion of APC revenues for Taylor & Francis and Sage, as compared to other publishers, probably relates to their focus on humanities and social sciences.

Figure 4.6 – *Market share of publishers, 2016, 38 institutions*

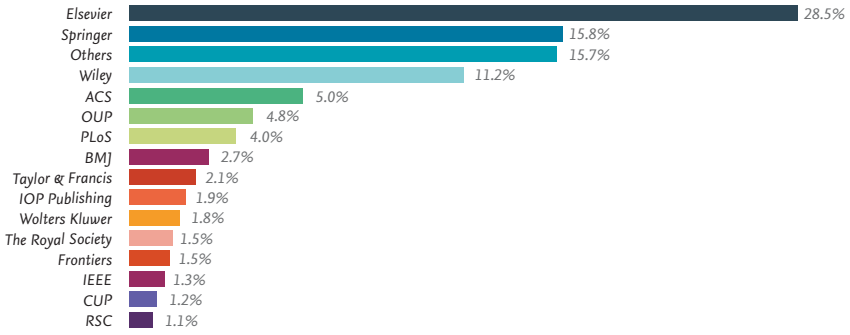
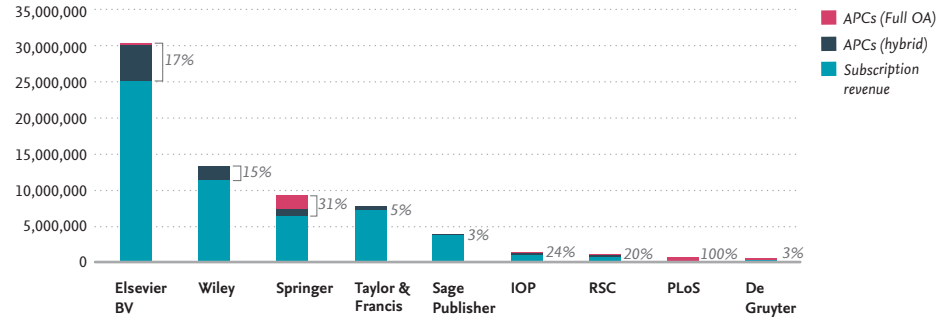
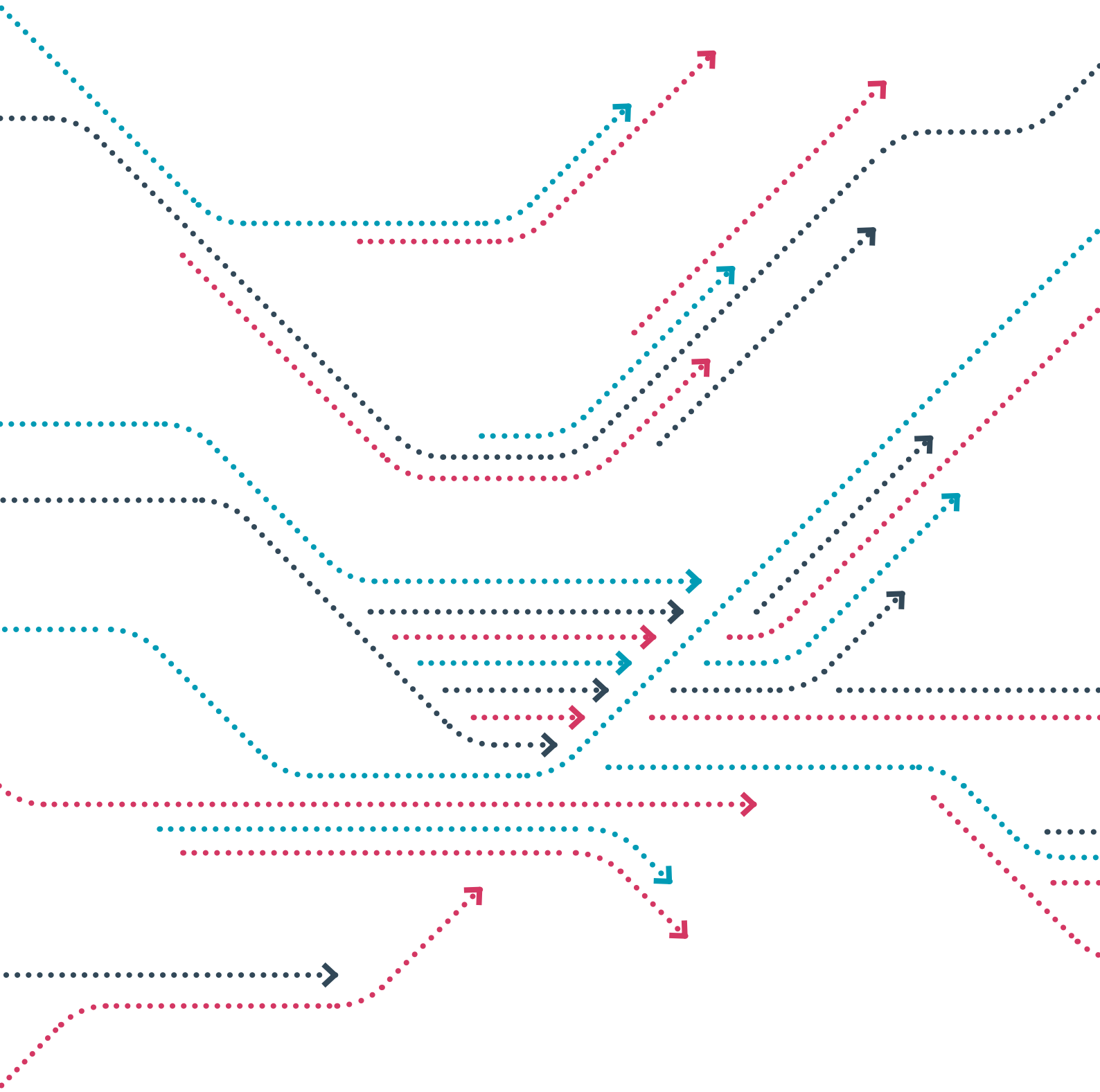


Figure 4.7 – *Total APC and subscription revenue for sampled publishers, 36 institutions, 2016 (in £s. Percentages indicate APC/total revenue ratio)*





Chapter 5

IMPLICATIONS FOR LEARNED SOCIETIES

5.1 Introduction

Many learned societies expressed concerns at the time of the Finch report and subsequently about potential adverse effects on their revenues – and thus on the scope of their work to support their disciplines – of a transition to OA. We identified in our previous report some 280 UK societies that publish scholarly journals, and we showed that net publishing income constituted a significant proportion of their overall revenues. In this report we have continued to track the financial health of a sample of 30 learned societies over the five-year period from 2011 to 2015 (the last year for which we found published accounts consistently available). The sample comprises 25 societies across our four broad subject areas designed to reflect the characteristics of the whole population, together with a further judgemental sample of five large societies with high levels of publishing activity.

280

UK learned societies publish academic journals and conference proceedings

Our work has involved

A. analysis of the societies' published financial statements for periods ending in the 2014 and 2015 calendar year, supplementing data previously gathered for 2011-2013

B. preparation of aggregate indicators of societies' levels of publishing income and expenditure, and overall financial health

C. qualitative interviews with representatives of 15 of the sampled societies to discuss and contextualise the financial results[3]

D. validation of our findings through an event, attended by approximately 40 representatives of the learned society community

3 Robert Dingwall of Dingwall Enterprises Ltd provided valuable assistance for this work.

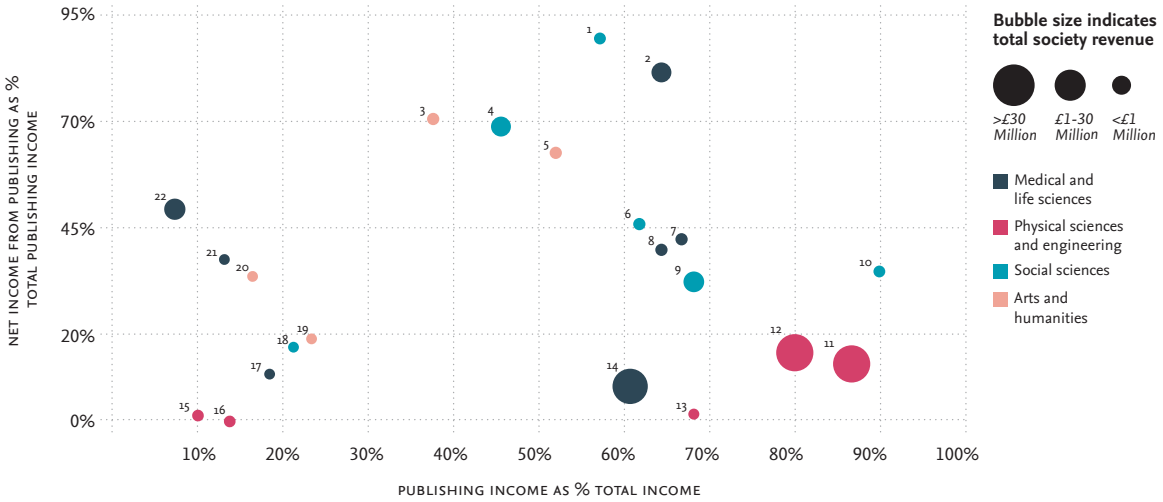
5.2 Societies vary widely in size, and in their publishing revenues and margins

Figure 5.1 provides an overview of the sampled societies, illustrating wide variations in size, revenues and surplus/deficit from publishing. Some variations arise from differences in societies' publishing model, and in the way publishing activity is disclosed within statutory financial statements. Nevertheless, some broad patterns are immediately apparent:

- The largest societies are in STEM subjects, which account for just under 50% of all actively-publishing societies by number, but almost 90% by revenue.
- Large societies in the physical sciences and engineering tend to generate a high proportion of their revenue from publishing, but generate lower margins than those in other disciplines.
- Societies in the social sciences are typically most reliant on the surpluses generated from publishing, but societies generating significant net income from this source can be found across all four subject areas.

The significance of publishing revenues to the UK learned society community is clear, though it varies across societies. As we showed in our previous study, most publish only a single peer-reviewed journal, which is usually outsourced to a commercial partner or university press. However, a small number have significant portfolios of journals, published in-house or through a wholly-owned subsidiary. Some of the journals published by UK societies are among the leading journals in their field internationally.

Figure 5.1 – *Publishing revenue, publishing margin, and society size (22 societies, missing data and outliers are excluded, 2015)*



01 UACES
02 British Society for Immunology
03 Royal African Society
04 British Sociological Association
05 Royal Musical Association
06 Royal Anthropological Institute
07 British Lichen Society
08 International Bee Research Association
09 Royal Economic Society
10 Society for Medieval Archeology
11 Institute of Physics
12 Royal Society of Chemistry
13 International Glaciological Society
14 British Medical Association
15 Edinburgh Geological Society
16 Royal Institute of Navigation
17 British Orthodontic
18 British Cartographic Society
19 Association for Scottish Literary Studies
20 Society for Libyan Studies
21 British Ornithologists Union
22 Royal College of Psychiatrists

5.3 Publishing expenditure is rising, but margins are tending to fall

Figure 5.2 illustrates the aggregate income generated from publishing for the sampled societies, analysed between reported expenditure and net income/margin. Although publishing revenues have risen steadily over the period, by 18% in total, publishing expenditure has risen by 27%, resulting in falling margins. This broad trend is apparent within all four subject areas, with the exception of arts and humanities, where publishing is often a loss-making activity. Income from publishing accounted for a significantly smaller proportion of societies' aggregate charitable expenditure in 2015 than in 2011, as shown in *Figure 5.3*.

Societies' publishing revenues grew by 18% in the 5 years to 2015 but publishing expenditure by 27%.

Figure 5.2 *– Publishing net income and expenditure (aggregate for 30 societies, 2011 to 2015)*

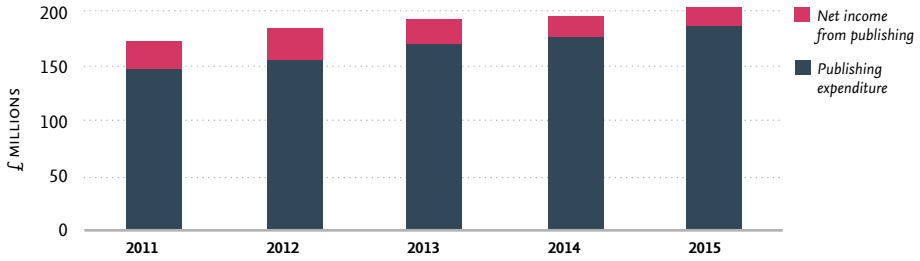
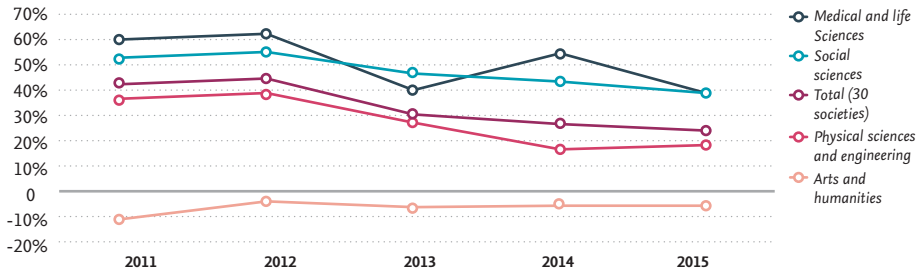


Figure 5.3 *– Net income from publishing as % of charitable expenditure (excluding publishing costs, 2011 to 2015)*

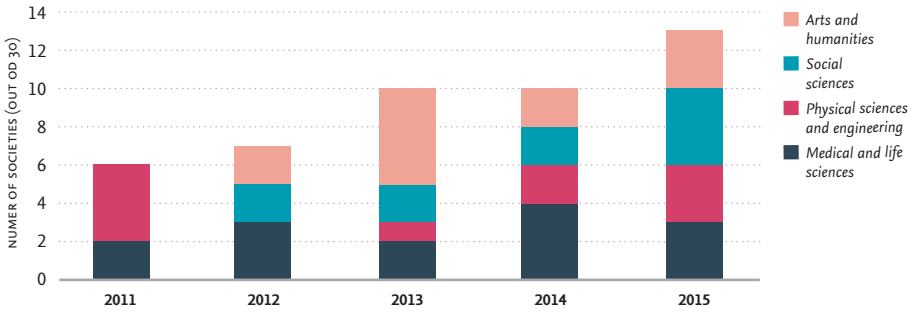


5.4 Some societies are showing signs of financial strain

43% of the sampled societies reported an operating loss in 2015.

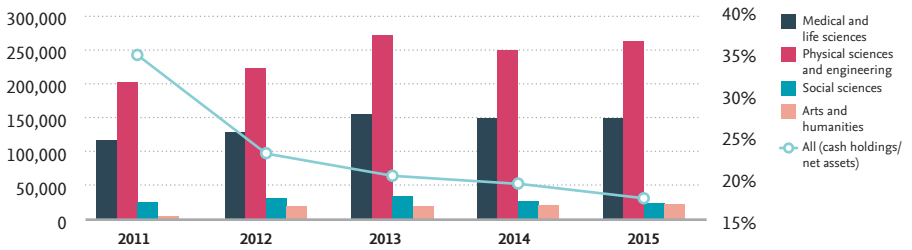
Our work reveals a mixed picture of societies' overall financial health. As *Figure 5.4* illustrates, there has been a sharp rise in the number of societies reporting a loss on their operating activities, from six (20%) of our sample in 2011 to 13 (43%) in 2015. Some of these losses in 2015 arose from strategic decisions or exceptional items. Examples disclosed in societies' annual reports included distribution of reserves (Royal Society of Chemistry), restructuring costs (British Medical Association), and settlement of a pension deficit (University Association for Contemporary European Studies); and only four societies in our sample reported sustained losses over a period of three years or more. Nevertheless, our interviews with society representatives confirmed that many are facing growing inflationary pressures, but see only limited scope to raise revenues from memberships or other sources. To date, most societies have chosen to absorb cost increases rather than reduce the scope of their activities, which largely accounts for the rise in reported losses.

***Figure 5.4** – Number of societies reporting a loss (out of 30, 2011 to 2015)*



Despite these trends most societies have seen a steady rise in their net assets (*Figure 5.5*). Among the largest societies there has been a progressive shift away from holding significant cash balances in favour of more proactive investment or distribution strategies, reflecting in part the low interest rates which have prevailed in the recent past.

Figure 5.5 – *Net assets by panel and aggregate cash holdings (30 societies, 2011 to 15)*



5.5 Societies are seeking to diversify their income streams in the face of perceived risks

Societies are diversifying their income streams to mitigate financial risk.

Our discussions with society representatives indicate that they see the main risks to their financial health arising from the broader economic climate (which has seen cost pressures grow while revenues stagnate); political developments, including Brexit; and potential decisions on university and research funding. Most societies see OA as a possible risk to subscription revenues in the medium-to-long term, although, in the short term, some have benefited from new APC-based revenue streams, as well as from the recent fall in the value of sterling (which has brought increases in income from overseas). Where societies have a publishing partner they are to some extent buffered by multi-year contracts. In other cases, the complex strategic and organizational challenges presented by OA appear to have prompted a move away from self-publishing.

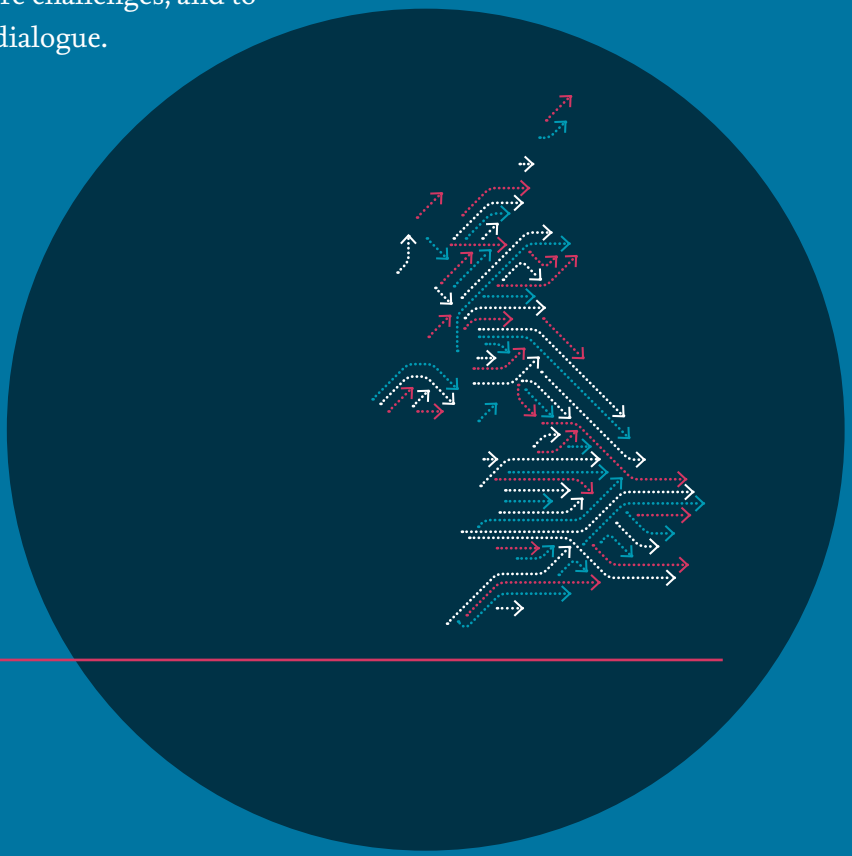
Most societies are aware of the need to diversify their sources of income in order to mitigate the financial risks that they face, including OA, over the next few years. Many societies from across all disciplines are considering how they can reposition their offering to enlarge their memberships, both from within the higher education sector and from wider groups of researchers and practitioners. By extending their reach in this way, societies can strengthen their role as intermediaries between researchers and practitioners, though there may be some risk of loosening their engagement with the policy and planning systems for higher education and research.

5.6 While societies remain in good health, they are aware that a period of sustained revenue growth is coming to an end

UK learned societies have benefited from a long period of sustained revenue growth, often driven by their publishing activities, which has allowed many of them both to expand their activities and to develop healthy reserves. They are aware that publishing margins are under increasing pressure, that revenues are unlikely to grow at the same rate in the future, and that revenues may indeed fall. Societies in the social sciences are perhaps the most exposed to such developments. All societies are also conscious of heightened economic and political uncertainties that are likely to have an impact on them. Nevertheless, we have identified no evidence of systemic risk to UK learned societies or their broader financial sustainability, whether from OA or other factors.

This publication was commissioned by Universities UK (UUK), the representative organisation for the UK's universities, on behalf of the UUK Open Access Coordination Group. Founded in 1918, UUK's mission is to be the voice of universities in the UK, providing high-quality leadership and support to its members to promote a successful and diverse higher education sector. With 136 members and offices in London, Cardiff (Universities Wales) and Edinburgh (Universities Scotland), it promotes the strength and success of UK universities nationally and internationally.

The UUK Open Access Coordination Group is Chaired by Professor Adam Tickell, Vice-Chancellor of the University of Sussex, and is convened by Universities UK on behalf of the national and research funding councils. The group works to ensure that the activities to support the transition towards open access in the UK can be effectively coordinated, have an ongoing focus and that progress can be monitored. The group has no formal powers, but brings funders, institutions, publishers and other stakeholders together to recognise and explore challenges, and to build and maintain a close and constructive dialogue.



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