# EVIDENCE TO INFORM A RESPONSE TO THE UKRI REVIEW OF OPEN ACCESS POLICIES

A REPORT FOR THE PUBLISHERS ASSOCIATION

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## EXECUTIVE SUMMARY:

The UK continues to show leadership in relation to Open Access. UK Research and Innovation (UKRI) is currently undertaking a review into its Open Access policies, with the OA policies for the Research Councils UK (RCUK) and Research Excellence Framework 2021 policy (REF) both in scope. The intention is to maximize access to, and re-use of, research published across formal scholarly research articles, peer reviewed conference proceedings and monographs, building on the progress made following the Finch Review in 2012.

This report emphasizes that publishers – small and large, commercial and non-commercial – share in the desire to make the transition to OA a reality as comprehensively and rapidly as possible. There are some concerns as to how to best navigate the transition period, but publishers are ultimately committed to finding the necessary mechanisms to accelerate transformations.

For the purposes of this report, publishers, librarians and researchers have all contributed to conversations around three central themes:

- Green OA and embargo periods;
- Licensing requirements; and
- Hybrid journals.

These dialogues elucidated a strong case for appropriate embargo periods if the Green OA model is to remain viable. Whilst some circumstances do justify zero embargos, publishers were able to explain why this model cannot successfully operate if zero embargoes are the norm. Interviewees similarly outlined the important role non-derivative and non-commercial licenses can play in some instances, protecting authors from misrepresentation and protecting publishers against the misappropriation of their investments.

Most positively, this report has considered the role that transformative agreements will play in realising the UK's OA ambitions. Coupled with the work done by hybrid journals, "read and publish" agreements have become increasingly popular over the last 2 to 3 years, leading to unprecedented take-up of OA. Publishers therefore believe their adoption will be the most effective route to widespread implementation of OA within a reasonable timescale. Contributors to this report have outlined some constructive suggestions as to how to productively leverage transformative arrangements, emphasizing that future policies should be mindful of the logistical complexities of executing hundreds of agreements between publishers and universities.

All stakeholders now await the proposals to be set out in UKRI's consultation paper, due to be published in January 2020. Publishers look forward to developing the findings of this report to agree practical solutions for the next stage of the UK's OA policy journey.

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## SECTION A: INTRODUCTION

1. This report outlines evidence gathered during a short study commissioned by the Publishers Association (PA), as part of its input to the current UKRI Open Access Review. There are two policies within the scope of that Review - the Research Council UK (RCUK) Policy on Open Access and the Research Excellence Framework (REF) open access (OA) policy. The REF policy is governed and jointly owned by the four UK Funding Bodies, not just UKRI, and they are working jointly together on that part of the Review[1]. A consultation paper on the first (RCUK) part of the Review will be published in January 2020; it will be followed by a further consultation paper on policy related to the REF in the same quarter.The aim is to align policies across UKRI's Research Councils, along with the UK Funding Bodies' policies on future Research Excellence Framework (REF) exercises, and to consider how Innovate UK should be included.

2. This report is structured around three issues identified by the PA as core concerns in possible future developments in policy relating to OA:

   2.1. Green OA and embargo periods;

   2.2. Licensing requirements; and

   2.3. Hybrid journals.

3. The evidence presented here reviews the current state of knowledge on each of these issues, based on a detailed literature review (covering published papers and reports), and interviews with representatives of a range of publishers and librarians, and with two researchers. Some publishers were able to provide detailed evidence from their own resources; but no primary research was undertaken in the limited time available for this study. Evidence-gathering has focused on the UK, but the report also takes account of relevant information from overseas. The report also focuses on matters relating to scholarly journals and conference proceedings[2], and does not cover the significantly different issues associated with monographs and other books.

4. The three main sections of the report take a common format. Each starts with a brief statement highlighting concerns that have been raised by publishers and others either in writing or in our interviews. There is then an account of current policies from both funders and publishers, followed by an analysis of evidence on key issues raised in the literature or in interviews. Each section then ends with a more detailed account of the concerns raised by publishers, in the light of the evidence presented in the main body of each section.

5. The study was undertaken while the UKRI Review was still under way, and so the nature of the proposals to be set out in the Consultation Paper due to be published in January 2020 was unknown. We were aware, however, of the Plan S principles[3] and implementation guidance[4] published by cOAlition S in autumn 2018, of the revisions to the implementation plan[5] published in May 2019, and of the workplan and priorities published in June. We are also aware that UKRI is a member of cOAlition S; that it has stated that "Plan S principles broadly align with current [UKRI] Open Access policies and will be considered as part of the UKRI Open Access Review"; but that final decisions on UKRI policies will be made via the Review[6]. Plan S is therefore at the least an important input to the

[1] "The OA policy for the REF after next will build upon the evidence from UKRI OA consultation, with a view to carry out a separate, REF-specific consultation in the first quarter of 2020. The OA policy for the REF after next will be communicated following an analysis of the responses to the consultation. It is the intention to align as closely as possible to the UKRI OA policy, whilst taking into account the differences for a policy associated with grant funded research and research that is submitted to a UK-wide research assessment exercise. UKRI Open Access Review" https://www.ukri.org/funding/information-for-award-holders/open-access/open-access-review/

[2] The terms 'papers' and 'articles' are used in this report to cover publications in both journals and conference proceedings.

[3] https://www.scienceeurope.org/wp-content/uploads/2018/09/Plan_S.pdf

[4] https://www.coalition-s.org/implementation-guidance-on-plan-s-now-open-for-public-feedback/

[5] https://www.coalition-s.org/principles-and-implementation/. The revised version was accompanied by a rationale explaining the reasons for changes to the original implementation guidance: https://www.coalition-s.org/rationale-for-the-revisions/

[6] https://www.ukri.org/funding/information-for-award-holders/open-access/open-access-review/. It is important to note that the timetable for implementation of any decisions arising from the UKRI review has not yet been determined. Similarly, the timetable for Plan S remains uncertain: there is conflicting information on the Plan S website as to whether its requirements will apply to all articles published from 1 January 2021 on the one hand, or to all articles funded by new grant calls from that date on the other.

Review, and hence we have taken into consideration the wide range of responses to the principles and the implementation guidance.

6. We should stress finally that the evidence we have gathered, and especially the interviews with publishers, indicates a noticeable change in the tone of their discussions about the future: publishers want make the transition to OA a reality as comprehensively and rapidly as possible. Hence they are keen to continue and accelerate discussions with all the key stakeholders about the transition. But they are clear that such a transition cannot be achieved as quickly as Plan S suggest; and that some aspects of the Plan S requirements, particularly those relating to Green OA with zero embargoes and a CCBY licence, are completely unacceptable. More positively, they see hybrid journals combined with 'read and publish' agreements as a feasible mechanism for achieving the transition – at the very least for the articles published by authors funded by UKRI and other Plan S funders – in a reasonable timescale.

# SECTION B:
# GREEN OA AND EMBARGOES

## B1. KEY CONCERNS

The key concern raised by publishers and many other commentators is that Green OA, especially without an appropriate embargo period, is simply not sustainable as a mechanism for transition to a fully-OA world: for it depends on – but also put at risk – the viability of the journals in which articles are published. Embargoes, and other restrictions surrounding the posting of articles, are designed to mitigate that risk. But journal half-lives are significantly longer than the embargoes currently allowed by funders; and publishers all stress the importance of retaining control of their posting policies: versions used, posting location, licensing, as well as embargoes.

These concerns are heightened by

- the continuing growth of access via scholarly collaboration networks, especially ResearchGate, and the growth of the illegal site SciHub;
- the development of much-improved interoperability between repositories and the increasing adoption of services which are transforming the ease with which journal articles can be found and accessed via a wide range of sources;
- the risk that Plan S, coupled with the growing effects of these changes in the environment, and with constraints on library budgets, would make it impossible for them to sustain their current level of subscriptions. Publishers acknowledge that any relationship between the free availability of articles via Green OA on the one hand, and library subscriptions on the other, is controversial and a source of contention between them and many librarians. But most publishers fear that these changes make such a relationship inevitable.

The Plan S requirement that subscription-based articles should be made freely accessible with no embargo and with a CCBY licence is therefore unacceptable. It amounts to a requirement that publishers should make freely available some version of an article in which they had made a considerable investment - crucially via peer review and other services which validate articles as worthy of entering the scholarly record. Requiring publishers to forgo the fruits of that investment would threaten the viability of most journals.

## B2. CURRENT POLICIES

The policies of both funders and publishers relating to the deposit of articles differ significantly on key matters including the versions deposited, where they are deposited, embargo periods, and licensing (the latter is considered in Section D). There are also significant differences between subject areas.

### B2.1 RCUK policy

RCUK's current policy preference is for Gold OA[7], with Green OA as a fall-back. Its Green OA policy is that accepted manuscripts should be made accessible in "any repository". The choice of repository is normally at the discretion of authors and their institutions. But the Medical Research Council (MRC) requires deposit in the Europe PubMedCentral (PMC) repository, and researchers funded by the Biotechnology and Biological Sciences Research Council (BBSRC) "are encouraged" to submit papers to that repository[8]. The Natural Environment Research Council (NERC) has established its own NORA[9] repository for publications from its own research centres. RCUK policy stipulates that repositories should include open access and funder metadata in a format that allows consistent aggregation and searching.

[7] RCUK Policy on Open Access and Supporting Guidance, https://www.ukri.org/files/legacy/documents/rcukopenaccesspolicy-pdf/ . See also RCUK Policy on Open Access: Frequently Asked Questions (last updated 1 May 2019) https://www.ukri.org/files/funding/oa/oa-faqs-pdf/

[8] BBSRC, Safeguarding Good Scientific Practice, September 2016 http://www.bbsrc.ac.uk/documents/safeguarding-good-scientific-practice/

[9] http://nora.nerc.ac.uk/

RCUK allows for an embargo period of no more than six months in STEM disciplines, and no more than 12 months in arts, humanities and social science (AHSS) disciplines (funded mainly by the AHRC and ESRC). Where funding is unavailable to pay APCs for Gold OA, the allowable embargo period is currently extended to 12 months in STEM disciplines and 24 months in AHSS. In biomedicine, however, the MRC allows a maximum embargo of six months in all circumstances.

RCUK accepts that researchers can derive value from sharing pre-prints; but considers only versions 'as accepted for publication' when assessing compliance with its policy.

### B2.2 Policies for REF 2021

Policies relating to REF 2021 place more emphasis than RCUK on Green OA, not least because the Funding Bodies responsible for the REF do not provide any dedicated funding for APCs (or indeed for any of the costs associated with OA). Policies have evolved over the past three years and are now set out in the *Guidance on Submissions* published in January 2019[10]. As noted in the Introduction, a consultation on policy for the REF due to take place after 2021 will be issued early in 2020. The current policy is significantly more complex than RCUK's.

Either the accepted manuscript or the version of record (VoR) of articles to be submitted to REF 2021 must have been deposited in an institutional or subject repository which must meet certain requirements relating to discovery and access. Deposit must take place "as soon as possible" after the publisher notifies the author that the article has been accepted for publication, and no later than three months after that date.[11]

It is expected that the accepted manuscript should be the version deposited; but where publishers allow, the VoR may be deposited instead. Versions that have been provisionally accepted, subject to revision, are not acceptable. But accepted manuscripts and 'near final' versions available on pre-print services are acceptable.

The articles deposited must be accompanied by openly-available metadata or bibliographic records that make the articles discoverable by search engines. Embargoes on access to the full text of up to 12 months for STEM disciplines (covered by REF Panels A and B) and 24 months for AHSS (covered by Panels C and D) are allowed, so long as they are specified by the publisher, and so long as the discovery requirements are met. A month's grace is allowed beyond the specified embargo period.

There is a complex set of allowable exceptions to these requirements. The most important from publishers' perspective are that closed-access deposit is allowed when

- the article incudes third-party material for which OA rights could not be granted; or
- the journal requires an embargo period beyond the maxima, but is the most appropriate journal for publication; or
- the journal disallows OA deposit in a repository, but is the most appropriate journal for publication.

There is no limit on the on the volume of articles submitted to the REF which make use of these exceptions.

### B2.3 Plan S

The key Plan S principle was originally framed to state that publications "must be published in compliant Open Access Journals *or on compliant Open Access Platforms*" (emphasis added)[12]. There was no reference to deposit or embargoes. The guidance[13] issued by cOAlition S in November 2018 stated that it would "under specified conditions, accept scholarly articles in Open Access repositories"; and that VoRs or accepted manuscripts made available immediately, with no embargo, in a compliant repository would conform with Plan S. It went further and recommended that all publications should be deposited in open repositories; and requested publishers to facilitate deposit, "to ensure long-

[10] REF 2019/01 *https://www.ref.ac.uk/publications/guidance-on-submissions-201901/*

[11] Since the policy was finalised after the 'publication period' for which articles are eligible for submission to the REF, there is provision that articles accepted for publication before 31 March 2018 may be deposited up to three months after *publication*, rather than acceptance.

[12] http://scieur.org/plan-s

[13] cOAlition S Making full and immediate Open Access a reality https://www.coalition-s.org/wp-content/uploads/271118_cOAlitionS_Guidance.pdf

term archiving, research management, and to support maximum re-use". The technical requirements set for compliant repositories, however, were widely regarded as excessive and impractical[14].

In the months following publication of the guidance on implementing Plan S, Robert Jan Smits and his colleagues sought to make clear that Green OA on the terms set out in the guidance was an acceptable route to compliance. The cOAlition also reacted to the to the consultation launched in November 2018 by issuing a revised set of principles and guidance in May 2019[15], in which the key principle was revised by adding an explicit reference to making publications "immediately available through Open Access Repositories without embargo". The Rationale[16] which accompanied the revised principles stated that it offered" a clear route for those who wish to work within a subscription model, by utilising deposit of the AAM or VoR in a repository". The Rationale also repeated the encouragement for researchers to deposit their publications in repositories; and it withdrew some of the technical requirements for repositories that had received a negative reaction. The cOAlition did not retreat, however, on its insistence on zero embargoes[17].

### B2.4 Publishers' policies

UUK's report on the transition to OA published in December 2017[18] found that publishers' posting policies for Green OA were becoming more complex. In general terms the policies were more permissive for accepted manuscripts than for VoRs (where very few publishers allow postings of any kind); with a similar gradation in moving from postings on personal websites through institutional and subject repositories to other sites, particularly those such as ResearchGate that are seen as commercial operations. Some publishers allow postings to institutional and, *a fortiori*, to subject repositories only when that is mandated by funders; and some apply different embargo periods depending on whether or not authors are subject to a mandate from their funders. Following the publication in 2015 of the STM Association's *Voluntary principles or article sharing in scholarly collaboration networks[19]*, several publishers amended their policies to allow such sharing where sites have adopted those principles, or where they have bilateral agreements. Many policies restrict "systematic distribution", or require licences that restrict specific kinds of re-use. But few publishers make systematic efforts to check against breaches of their policies, relying (with the exception of postings on ResearchGate - see below) on ad hoc reporting.

The UUK report found that three-quarters of hybrid and subscription journals allowed accepted manuscripts to be made immediately accessible on *personal websites*; but only a sixth allowed immediate access via *institutional repositories*. Just under half allow access via institutional repositories after twelve months, but nearly a third have longer embargoes. Where postings in *subject repositories* are allowed, embargoes of less than twelve months are rare; and between 5% and 8% of journals do not allow postings to subject repositories even when funders mandate Green OA. It should also be noted that some publishers with relatively liberal policies on posting to personal websites and institutional repositories require the use of a restrictive licence, such as CCBY–NC-ND, which protects against commercial use and the creation of derivatives [20].

The RoMEO database [21]of publishers' policies unfortunately does not capture data on posting locations, on whether the VoR can be posted at all, on embargo lengths, or any licence or other restrictions. Nevertheless, a study of the original 107 publishers covered by the database[22] confirms both the growth in restrictions on where, when and how articles may be posted, and an increase in the length of embargoes. It also pointed to an increase in other restrictions or requirements,

[14] See, for example, the responses from COAR (https://www.coar-repositories.org/files/COAR-response-to-implementation-of-Plan-S-1.pdf); Sconul (https://www.sconul.ac.uk/sites/default/files/documents/SCONUL%20submission%20on%20Plan%20S%20guidance%20consultation_0.pdf; and Harvard and MIT libraries (https://libraries.mit.edu/news/harvard-library/29052/)

[15] https://www.coalition-s.org/wp-content/uploads/PlanS_Principles_and_Implementation_310519.pdf

[16] https://www.coalition-s.org/rationale-for-the-revisions/

[17] The ROARMap registry (http://roarmap.eprints.org/ ) currently records five funders which require deposit with no embargo, including the Agence National de Recherche.in France, the Bill and Melinda Gates Foundation, and the Nordic Council of Ministers. The great majority of funders prescribe maximum embargoes of 12 months (or more).

[18] https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2017/monitoring-transition-open-access-2017.pdf

[19] http://www.stm-assoc.org/2015_06_08_Voluntary_principles_for_article_sharing_on_scholarly_collaboration_networks.pdf

[20] It should also be noted that the embargo periods for journals owned by learned societies are typically set by publishers, rather than the societies concerned. See M Finn, *Plan S and the Hybrid History Journal Landscape : RHS Interim Working Paper* July 2019

[21] http://sherpa.ac.uk/romeo/index.php

[22] E Gadd and D Covey "What does 'green' open access mean? Tracking twelve years of changes to journal publisher self-archiving policies" *Journal of Librarianship and Information Science* 2016

such as posting only where there is a funder mandate, use of specific licences, a specified form of acknowledgment to the publisher, and/or a requirement to provide a link to the published version (required in 44% of cases in 2014-15). In a few cases (for example the American Historical Review), authors are allowed to include a toll-free link to articles on their personal website and in their institutional repository.

**Summary: Current policies**

Current UKRI policies allow for embargoes of up to 12 months (STEM) and 24 months (AHSS); and for the forthcoming REF there is liberal set of exceptions for journals that exceed those maxima. But Plan S allows for no embargoes at all.

Publishers are much more concerned than funders about the version that is posted, and where it is posted. They tend to allow shorter (even zero) embargoes when articles are posted on personal websites as distinct from institutional repositories; and are more restrictive still about subject repositories or commercially-run services. The great majority of publishers forbid the posting of VoRs on any site. Policies suggest that publishers' key concern is to sustain traffic to their journals and articles via their own platforms.

## B3. AUTHOR BEHAVIOUR AND ATTITUDES

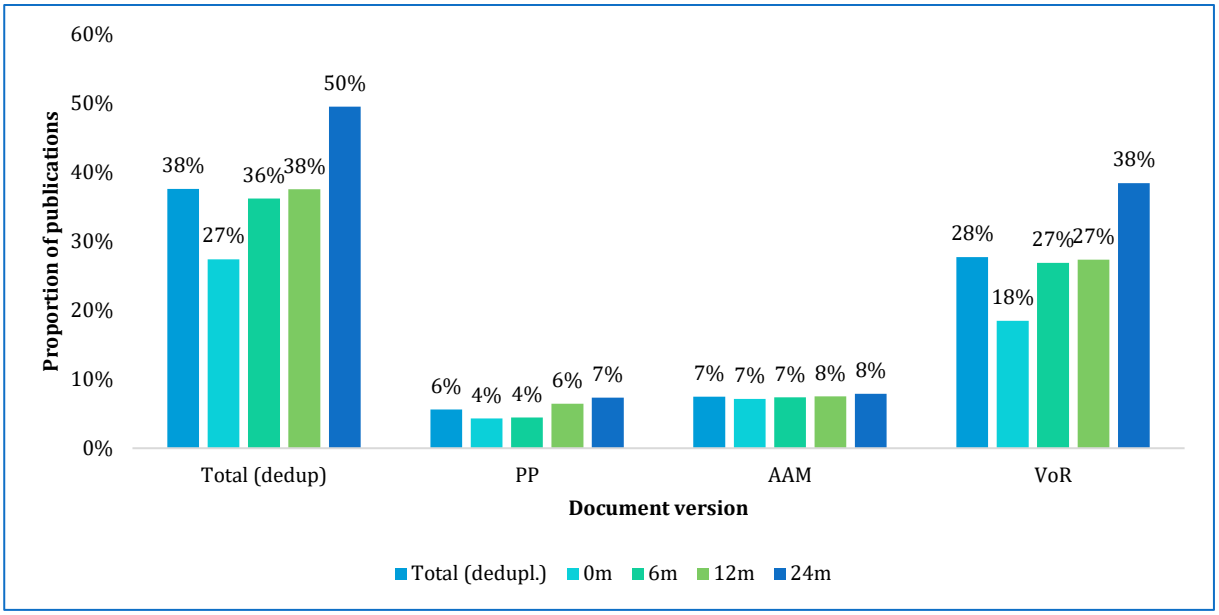
Measurement of Green OA and the rates of deposit of articles in different kinds of repositories and other services is fraught with methodological difficulties relating to versions, sampling, timing, duplicate postings, and the 'backfilling' of repositories with articles published some years previously. It is therefore not surprising that studies come up with different answers.

The UUK monitoring report[23] found that in 2016, 38% of subscription-based articles published globally over a two-year period, and 48% of those published by UK authors, had been made accessible online within 24 months of publication. Some three-quarters of the documents posted were VoRs, the majority of which were found in ResearchGate, almost invariably in contravention of journal policies. Deposits of accepted manuscripts in institutional repositories are, however, far more common for UK-authored articles than the global average. Institutional repositories account for 26%, of all UK deposits of accepted manuscripts, as distinct from the global average of 5%.

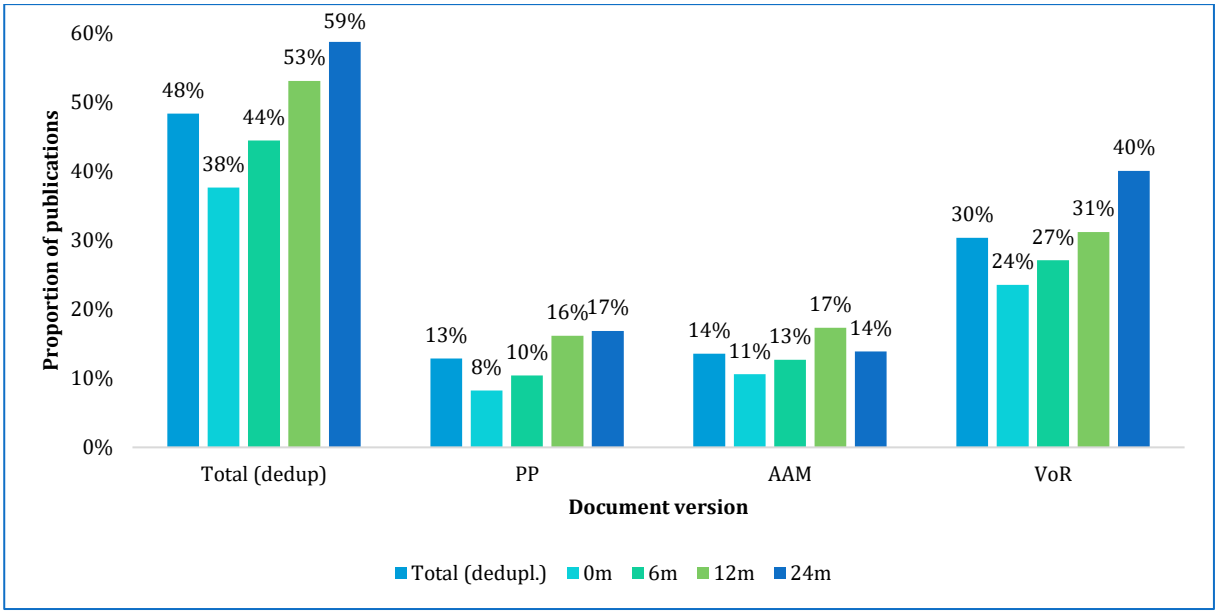
[23] https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2017/monitoring-transition-open-access-2017.pdf

*Figures 1a and 1b. Proportions of subscription-based articles posted online, global and UK, by version and time post-publication.*

*1a Global*

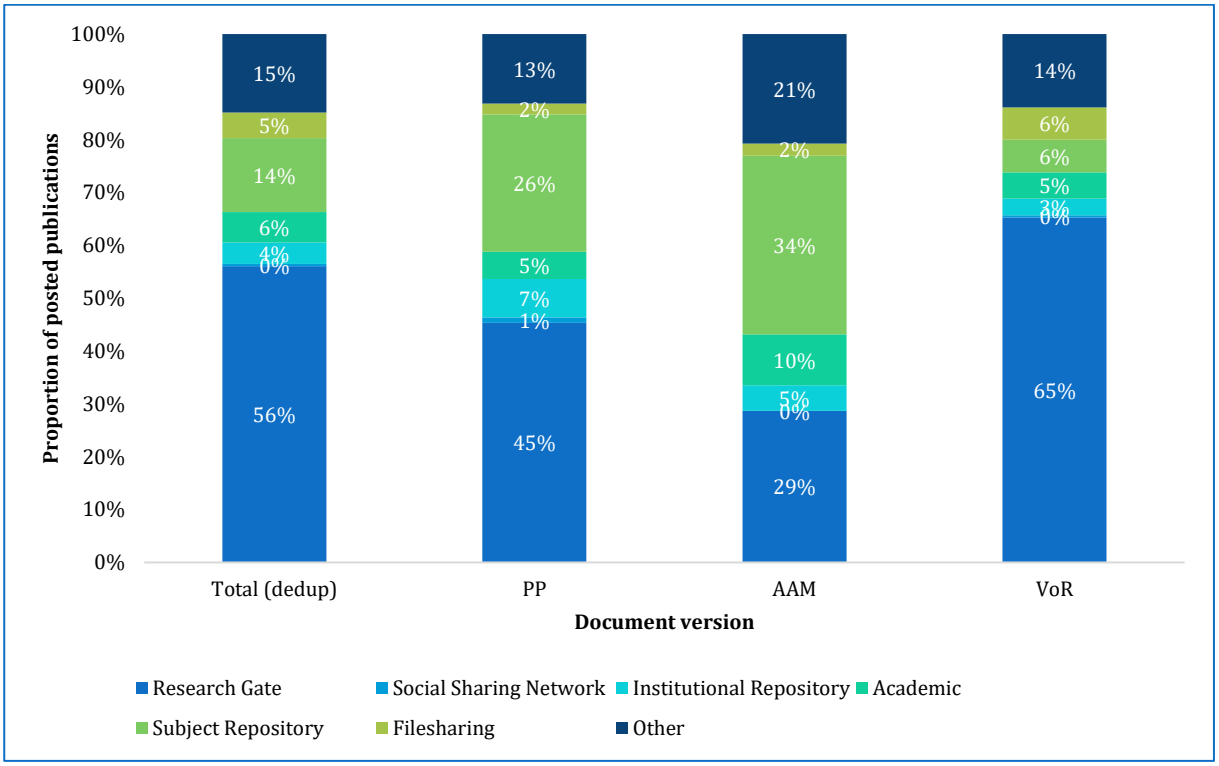



*1b UK*

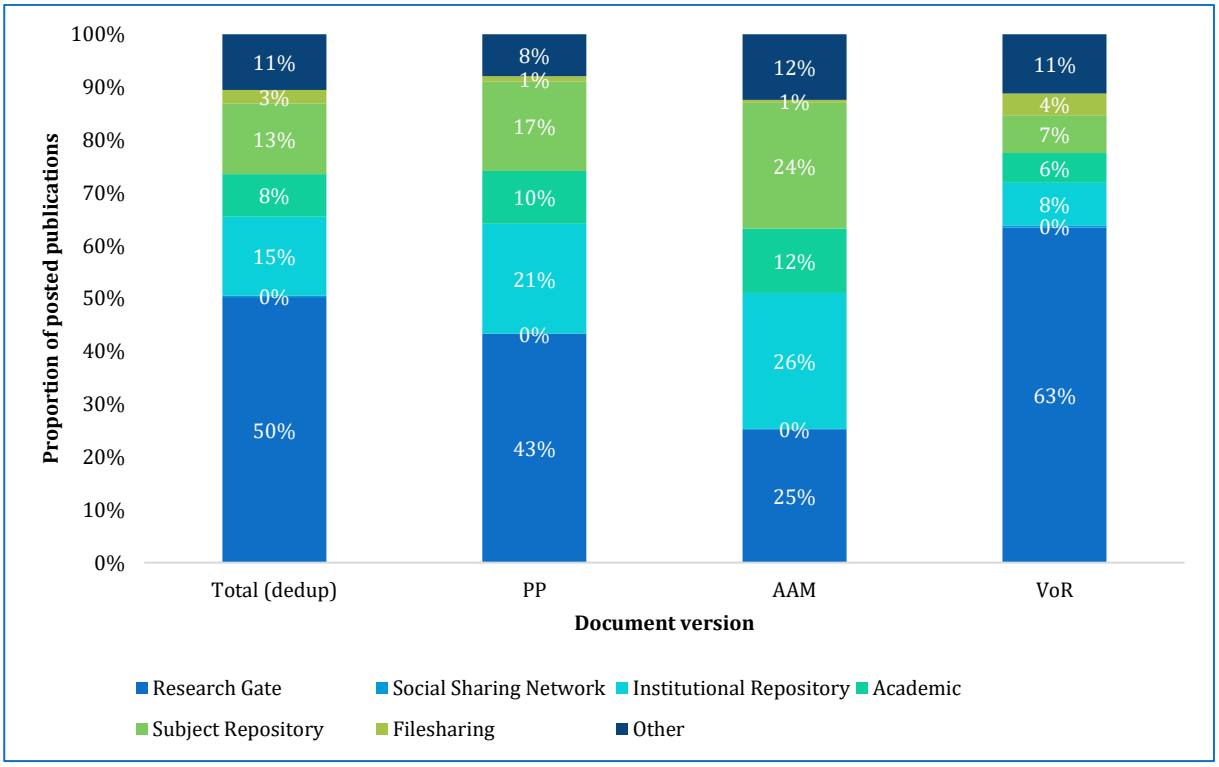


*Figures 2a and 2b. Versions and locations of subscription-based articles posted online, global and UK.*

*2a Global*




*2b UK*



Other studies show rather different figures. Science-Metrix[24], using data derived from its own database, plus SCOPUS and Web of Science, found in 2018 that versions of 31% of the global total of articles published in 2014 were accessible via websites and repositories, with significant variations by subject, from 37% in the natural sciences to 9% in the arts and humanities. For the UK, the overall total was 36%, ahead of the world average but lower than for countries such as France (46%), the Netherlands (42%) and the USA (38%). These figures all include articles available from ResearchGate.

Heather Piwowar and colleagues[25], using the oaDOI service and samples from CrossRef, Web of Science and Unpaywall, found much lower proportions of Green OA in 2017, from 11.5% of a sample of articles in Web of Science published between 2009 and 2015, to 9.1% of a sample accessed by users of the Unpaywall browser extension, to only 4.8% of a sample of articles across all publication years with a CrossRef DOI. Bosman and Kramer [26] analysed data from Unpaywall that has been integrated into Web of Science and found similarly low levels of Green OA on the part of Dutch authors. Martin-Martin and his colleagues[27], however, searched in Google Scholar for samples of articles published in 2009 and 2014 and found 11.3% for 2009 and 10.5% for 2014 freely accessible via institutional or subject repositories (and not from the publisher's platform), plus a further 20 -21.8% freely accessible from other sources (mainly ResearchGate but also including personal websites). Again, there were significant differences by subject area (with the highest rates of Green OA in the natural and social sciences, and the lowest in engineering and humanities), and by country. England was above the world average for 2014 articles, at 15.9%, but again lower than France (17.4%), the USA (18.2%) and also Scotland (18.3%). Van Leeuwen and his colleagues[28] found that Green OA played a much more significant role in OA generally than shown in other studies – 75% in the UK as distinct from 25% for Gold OA. But this is within a much lower estimate for the overall level of OA – 27% in 2014 – than shown in other studies.

The most up-to-date study from the EU's Open Science Monitor[29] analyses SCOPUS and Unpaywall data to show a global level of Green OA of 24% in 2017 (down from 26.4% in 2016, presumably as a result of delays in posting and as a result of embargoes). It shows the UK as having the second highest rate of Green OA after Switzerland, at 41.9% for the years 2009-2017, as compared to 30.3% for France and 36.3% for the USA. Finally, Lariviere and Sugimoto[30] found significant variations in the adoption of Green OA by authors funded by different bodies: in the UK, for example, from 25% for EPSRC to 10% for MRC.

Since the various studies use significantly different methodologies and definitions, it is difficult to provide a consensus picture, particularly with regard to articles published in the last two-three years. It seems clear that outside a few areas such as the use of PubMedCentral (PMC) for accepted manuscripts in biomedicine[31] and ArXiv for preprints in physics, deposit of articles in repositories remains relatively low. An unpublished study of articles from five major publishers in 2018 showed that accepted manuscripts for between 1.7% and 3.1% of the articles were freely accessible 36 months after publication. For some high-impact journals, however, a combination of effective publisher deposition services and self-deposition by authors can result in 30-40% of accepted manuscripts being made publicly-available on services other than publishers' platforms [32].

Nevertheless, ResearchGate is by far the most popular location for deposit taken across all subject areas, with the VoR the most common version deposited (thus usually infringing copyright). The UUK monitoring study[33] showed a global

[24] Science-Metrix, Analytical Support for Bibliometrics Indicators Open access availability of scientific publications http://www.science-metrix.com/sites/default/files/science-metrix/publications/science-metrix_open_access_availability_scientific_publications_report.pdf

[25] H Piwowar et al "The state of OA: a large-scale analysis of the prevalence and impact of OpenAccess articles" PeerJ 2018 DOI 10.7717/peerj.4375

[26] J Bosman and B Kramer, "Open access levels: A quantitative exploration using web of science and oaDOI data".http://dx.doi.org/10.7287/peerj.preprints.3520v1

[27] A Martin-Martin et al "Evidence of open access of scientific publications in Google Scholar: A large-scale analysis, *Journal of Informetrics*, 12, 2018,pp819-841

[28] TN van Leeuwen et al "Developing indicators on Open Access by combining evidence from diverse data sources" , *Proceedings of the 2017 STI Conference*, 6-8 September, Paris, France (https://sti2017.paris/)

[29] https://ec.europa.eu/info/research-and-innovation/strategy/goals-research-and-innovation-policy/open-science/open-science-monitor/trends-open-access-publications_en#additional-indicators

[30] V Lariviere and CR Sugimoto, "Do authors comply with mandates for open access" *Nature* 562, pp 483-6, https://www.nature.com/articles/d41586-018-07101-w

[31] Most of the larger publishers organise for themselves deposit in PMC for articles funded by agencies that mandate deposit. For some high status journals the result is that accepted manuscripts for a fifth or more of their articles are deposited in PMC.

[32] Information from interviews with publishers

[33] https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2017/monitoring-transition-open-access-2017.pdf;

average of 'licit' online deposit of 6% immediately or shortly after publication, rising to 11% after 24 months. These figures suggest that neither the presence nor absence of an embargo, nor its length, has a major impact on authors' propensity to deposit their articles and make them accessible (and evidence from publishers indicates that embargo length similarly has little if any effect on authors' propensity to publish OA in hybrid journals). The UK tends to be above the global averages for deposits, and the monitoring report noted that data from CORE[34] suggested that the numbers of full-text articles in UK repositories increased by over 60% between 2014 and 2016. It may be that the requirements of REF 2021 will bring a further marked increase in deposit in institutional repositories.

Many OA advocates urge Green OA as a "workable and inexpensive path to OA in all academic fields and regions of the world"[35]. It may be that the enforcement of funders' policies such as the REF requirement to deposit articles in institutional or other repositories – along with the development and adoption of more user-friendly mechanisms for deposit and uploading - will serve to increase the utility of repositories for both authors and readers. But there is a very long way to go before the majority of articles across all subject areas are deposited in institutional or subject repositories. Laakso noted in 2013[36] that only a relatively small minority of authors were making use of the freedom to deposit their articles allowed to them by publishers. From a different perspective, Khoo and Lay[37] note that where publishers' policies are more restrictive, and not in line with the requirements of funders, neuroscientists nevertheless continue to publish in the non-compliant journals. But as Rumsey notes[38] authors are presented with conflicting messages from publishers about the importance of active dissemination and sharing on the one hand, but warnings about embargoes, versions, licences and posting policies on the other. As Bjork and others have noted[39], it is hardly surprising that many authors accept the attractive and easy-to-use invitation from ResearchGate to make their VoR publicly-accessible via their RG profile. In so doing they almost invariably infringe copyright or their publishing agreement, not necessarily because they are not allowed to deposit their article, but because they deposit the wrong version[40]. Until deposit in repositories is made easier, and its benefits made more obvious to authors with tangible evidence of increases in visibility, usage and impact (thus with fewer restrictions such as embargoes), ResearchGate – along with the large and well-established subject repositories such as PMC - may well continue to be the more attractive option. But full implementation of Plan S could bring about the necessary changes.

**Summary: Author behaviour**

The UUK monitoring report and other studies use varying methodologies, but they suggest that at most between 10% and 20% of published articles are deposited and made freely accessible in accordance with publishers' and funders' policies. Much higher proportions (up to 40%) are made freely accessible illegitimately via ResearchGate. Green OA deposits are higher in the natural and social sciences than in engineering and humanities; but there is no evidence to suggest that rates of deposit are influenced by either funders' or publishers' policies on embargoes. Until deposit in repositories becomes easier and its benefits more obvious in terms of visibility, usage and impact, deposit rates across all subject areas are unlikely to rise to the levels OA advocates would like to see. But Plan S may stimulate the necessary changes.

[34] https://core.ac.uk

[35] *Harvard Library and MIT Libraries provide recommendations for Plan S implementation 16 January 2019* https://libraries.mit.edu/news/harvard-library/29052/

[36] M Laakso "Green open access policies of scholarly journal publishers: a study of what, when, and where self-archiving is allowed", Scientometrics, 2013. DOI 10.1007/s11192-013-1205-3

[37] S Y-S Khoo and B P P Lay "A Very Long Embargo: Journal Choice Reveals Active Non-Compliance with Funder Open Access Policies by Australian and Canadian Neuroscientists" *Liber Quarterly*, 28 (2018) DOI: 10.18352/lq.10252

[38] S Rumsey Discussion Paper: Help! I'm an author – get me out of here. University of Oxford, 24th July 2018. https://ora.ox.ac.uk/objects/pubs:890971

[39] B-C Bjork. "Gold, green, and black open access", Learned Publishing (2017) doi: 10.1002/leap.10

[40] H R Jamali "Copyright compliance and infringement in ResearchGate full-text journal articles" Scientometrics (2017) DOI 10.1007/s11192-017-2291-4

## B4. REPOSITORIES AND WORKFLOWS

The OpenDOAR registry[41] shows that there are now over 4,200 repositories worldwide, and that the UK has the second largest number (283), after the USA. They were originally set up to meet the needs of individual institutions and subject communities; but they now operate in an increasingly federated environment. But as a UUK working group[42] noted in 2018, discoverability, long term sustainability and preservation, along with rates of deposit, continue to be big challenges. The group made recommendations including

- the provision by both publishers and repositories of machine-readable metadata that includes NISO/Crossmark article version tags, licensing tags and embargo periods consistent with RIOXX;
- full integration into institutions', funders' and publishers 'systems of the JISC Publications Router, and the Funder Registry (CrossRef);
- active engagement with the Organisation ID Registry initiative, and the work being done by CASRAI to establish standardised contributor role taxonomies;
- improvements in the user experience and user interfaces; and
- a study to explore the need for national repository solutions or 'hubs' for one or all of the big challenges – discoverability, sustainability and preservation.

Progress is being made on these and other issues, and many publishers have worked with Jisc on the Publications Router and similar initiatives. But it is notable that in response to strong negative feedback, cOAlition S has retreated from its early insistence on a series of technical requirements for repositories, including automated ingest, XML in JATS standard, open API for access, and a help desk. Much remains to be done in developing integrated workflows for authors, publishers, institutions, funders and other stakeholders, and in particular to improve the quality of metadata for articles in repositories: IRUS-UK[43] (which aggregates usage data for more than 100 institutional repositories in the UK) reported for the UUK monitoring report that for only around a half of all articles could the journals in which they were published be identified. It is thus far from clear how many repositories will meet even cOAlition S's revised requirements; or exactly how those requirements will meet its intention that they should "underpin a route towards a new generation of repository platforms".

**Summary: Repositories and workflows**

Despite recent progress, much remains to be done to improve integration and interoperability between repositories, with improvements to metadata, and integrated workflows for all parties being high priorities. COAlition S's revised requirements may stimulate further developments to make repositories more user-friendly for all users.

## B5. USAGE

Literature on the usage of Green OA content is much more sparse than analyses of its availability. Data provided by the CORE service[44] for the UUK monitoring report showed that article downloads from UK institutional repositories rose from six to twelve million between 2014 and 2016. The pattern as between individual repositories and over time showed wide variations, but unfortunately the data does not enable us to draw conclusions about any relationship between usage and the length of embargoes, or about the age of articles that are being read. It should also be stressed that the figures are skewed by the marked popularity of a very small number of articles. With the exception of those

[41] http://v2.sherpa.ac.uk/opendoar/

[42] Open Access Repositories: Report and Recommendations, UUK 2018 https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2018/open-access-repositories-report-and-recommendations.pdf

[43] https://irus.jisc.ac.uk/

[44] https://core.ac.uk/

articles, it is difficult to believe that – at least in 2016 - downloads from UK institutional repositories were having an effect on usage via the journal's own platform.

The UUK monitoring report also showed that the annual volume of downloads from PMC and its satellites is also increasing, by 157% between 2012 and 2016, to over 900 million; and that downloads per article increased by 64% in the same period. The numbers are significant: only the largest publishers have as many as 900 million downloads a year; and the average number of downloads per article in 2016 was, at 209, higher than that for many notable journals on their publishers' platforms. One implication is highlighted in a series of articles by Davis and his colleagues, who have shown that availability and access to articles via PMC and other sources after the embargo period serve to depress usage on publishers' platforms by up to 20% or more; and that the effect is growing over time[45]. Few publishers, however, are active in monitoring usage on PMC or other repositories, and any possible effects on downloads from their own platforms. Views and downloads of articles are highest in the months following publication, and fall significantly after that, with sometimes a small increase after embargoes are lifted. Nevertheless, it seems likely that as the volumes and proportions of articles available in institutional and subject repositories increase, along with better metadata and discoverability, via Web of Science[46] and newer discovery services such as Unpaywall and Kopernio, then the use of Green OA content and the concomitant effect on usage on publishers' platforms, will increase also.

**Summary: Usage**

Downloads of articles from UK institutional repositories are increasing, but no data is available in the literature on the age of articles downloaded, or to provide evidence on any relationship between usage and the length of embargoes. With a very few exceptions, numbers of downloads from UK institutional repositories up to 2016 seem unlikely to have had any impact on use of the journal platform. Downloads from PMC reached over 900 million in 2016. Evidence suggests that access via PMC has a significant effect on usage of journal platforms. As interoperability and discoverability across different repositories and other services increase, this effect may well be seen more generally.

## B6. PRE-PRINTS

Since the ArXiv repository for pre-prints was founded in 1991, it has become the primary vehicle for the circulation of research findings in many – but not all - areas of physics and mathematics, mainly in the form of 'pre-prints' made accessible before they are submitted to a journal. ArXiv now contains over 1.5 million articles, and there were 1.4 million downloads in June 2019[47]. Other services for the circulation of reprints are reasonably well-established – Repec in economics, SSRN in the social sciences – but have not to date become as embedded in researchers' workflows as ArXiv.

The last five years, however, have seen prolific growth in the numbers of preprints across a wide range of subject areas. This has been stimulated by the development of new pre-print services such as BioRxiv, but also of publishing operations based on the open availability of pre-prints that are then subject to open peer review, such as F1000Research and PeerJ. CrossRef reports that the volume of pre-prints is rising at 30% a year[48]. BioRxiv now (July 2019) contains over 55,000 papers, and the number of downloads is increasing rapidly too: it showed an 82% increase in downloads between October 2017 and 2018, with median downloads per article of 279[49]. PeerJ published nearly 1300 pre-prints in

[45] See, for example, P M Davis "Public accessibility of biomedical articles from PubMed Central reduces journal readership—retrospective cohort analysis" FASEB J. 2013 Jul; 27(7): 2536–2541, doi: 10.1096/fj.13-229922; P M Davis "The effect of public deposit of scientific articles on readership". Physiologist 55, 161–165

[46] Web of Science now shows the availability of articles in repositories

[47] https://arxiv.org/stats/monthly_downloads

[48] Lin, J. (2018) Preprints growth rate ten times higher than journal articles. *CrossRef Blog*. 31st May 2018 https://www.crossref.org/blog/preprints-growth-rate-ten-times-higher-than-journal-articles/

[49] https://rxivist.org/; R J Abdill and R Blekhman "Tracking the popularity and outcomes of all bioRxiv preprints" *eLife* 2019;8:e45133. DOI: https://doi.org/10.7554/eLife.45133

2018[50]. Twenty-five different preprint services are now hosted on the Open Science Foundation's open source infrastructure[51].

Several commentators argue that pre-print services represent a positive and transformative development in scholarly communications, turning publishing into a cost-effective two-stage process which resolves the financial 'serials crisis' and also drives out predatory journals[52]. Several funders including the NIH and the Wellcome Trust are now also taking a positive view, supporting the use of pre-prints in grant applications; and the Funding Councils in the UK will allow their submission in the forthcoming REF exercise.

Most publishers have come to take a relaxed attitude towards pre-prints: few make any attempt to restrict their availability, nor is it clear that they could do so legally, though some American learned societies point to a risk of prior publication. Many publishers require authors to provide a citation and a link once an article has been submitted for publication, though it is not clear how widely this requirement is complied with or enforced. The recent development of new pre-print services has led a number of publishers to revisit the issues surrounding pre-prints[53]; and several pointed to the value of pre-prints in their responses to the Plan S consultation[54].

Some commentators are more sceptical, however, questioning the value of pre-prints and the risks posed – especially but not solely in the medical sciences - by the circulation of articles that have not been peer reviewed[55]. For publishers there is also the risk that, as with postings of accepted manuscripts in repositories, the increasing availability of pre-prints will reduce downloads from their own platforms[56] The benefits in terms of early circulation of new findings and new knowledge thus have to be weighed against the lack of quality assurance and the risk that there will be an increase in access to and use of poor-quality research[57]. And in the current context, it is important to stress that making pre-prints available does not meet the requirements of Plan S.

**Summary: Pre-prints**

Pre-prints services and the open availability of pre-prints have grown rapidly in the past three-four years. Most publishers take a positive attitude towards pre-prints, stressing their value in the rapid dissemination of research results. The benefits of early dissemination, however, have to be weighed against the lack of quality assurance and the risks of an increase in access and use of poor-quality.

## B7. PUBLISHERS' CONCERNS

Providing access via repositories and scholarly collaboration networks to accepted manuscripts and VoRs published in scholarly journals depends essentially on the continuance and sustainability of those journals. For subscription-based and hybrid journals that depend on the fees they charge for access to articles on the journal platform, repositories and

[50] https://peerj.com/archives-preprints/?year=2018&journal=cs

[51] https://osf.io/preprints/

[52] See in particular Toby Green, "Is open access affordable? Why current models do not work and why we need internet-era transformation of scholarly communications". *Learn Publ.* 2019; 32(1): 13–25. See also Carà PD, Ciriminna R, Pagliaro M: "Has the time come for preprints in chemistry**?"** *ACS Omega.* 2017; **2**(11): 7923–7928; Desjardins-Proulx P, White EP, Adamson JJ, et al.: "The case for open preprints in biology". *PLoS Biol.* 2013; 11(5): e1001563; R Sever, M Eisen, J Inglis, "Plan U: Universal access to scientific and medical research via funder preprint mandates*", PLoS Biol* 17(6): e3000273.https://doi.org/10.1371/journal. pbio.3000273 ; Tennant J, Bauin S, James S, et al.: "The evolving preprint landscape: Introductory report for the Knowledge Exchange working group on preprints." *BITSS.* 2018; 5; . Vale RD: "Accelerating scientific publication in biology". *Proc Natl Acad Sci U S A.* 2015; 112(44): 13439–13446.

[53] See, for example Lauer MS, Krumholz HM, Topol EJ: "Time for a prepublication culture in clinical research?" *Lancet.* 2015; 386(10012): 2447–2449

[54] See, for example, the responses from Sage (https://uk.sagepub.com/sites/default/files/sage_publishing_plan_s_implementation_guidance_feedback_0.pdf), SpringerNature (https://media.springernature.com/full/springer-cms/rest/v1/content/16462700/data/v1) and the Optical Society of America(https://www.osapublishing.org/submit/review/pdf/OSA_Statement_on_Plan_S.pdf )

[55] Sheldon T: "Preprints could promote confusion and distortion". *Nature*. 2018;559(7715): 445.

[56] Davis PM, Fromerth MJ: "Does the arXiv lead to higher citations and reduced publisher downloads for mathematics articles?" *Scientometrics*. 2007; 71(2); Davis, P. (2018) Journals Lose Citations to Preprint Servers. *Scholarly Kitchen Blog* 21st May 2018 https://scholarlykitchen.sspnet.org/2018/05/21/journals-lose-citations-preprint-servers-repositories/

[57] For a comprehensive and judicious review of the issues, see the pre-print A Chiarelli et al "Preprints and Scholarly Communication: Adoption, Practices, Drivers and Barriers" *F1000Research* 2019, 8:971

collaboration networks represent rival channels. Since the emergence of Green OA, publishers have therefore, as the Finch Report noted, imposed restrictions on access via those rival channels – in the form of embargoes, limited rights of use and re-use, versions that can be deposited and so on – in order to guard against potential falls in their licence revenues and risks to the viability of their journals.

### B7.1 Embargoes and journal half-lives

Recent studies have shown that the half-lives of journals in terms of usage of the articles they contain are significantly longer than the embargo lengths allowed for by funders, and indeed those imposed by publishers themselves. A British Academy survey in 2014 showed an average of 48 months for journals in the humanities, and 46 months in the social sciences. A parallel study by Davis of STM disciplines found half-lives of 49-60 months in physics and mathematics, with only health sciences showing significantly shorter half-lives at 24-36 months[58]. Publishers have used studies such as these to suggest that the embargoes they impose are reasonable, and that reducing them would entail risks to their revenues and the viability of their journals. Some of the publishers we interviewed spoke of the especially severe threat that short embargoes pose for important niche journals, including many that publish relatively infrequently – quarterly or with even longer intervals between issues, rather than weekly or monthly. The Publishers Association has expressed concern about these risks, pointing among other things to five journals – the *Journal of Dental Research*, the *Journal of Clinical Investigation*, *Annals of Mathematics*, the *American Journal of Pathology* and *Genetics* – which had to change their policies to deal with falls in revenues arising from short embargoes[59]. Abolishing embargoes altogether, as Plan S proposes, would increase the risks exponentially, and is therefore unacceptable to the great majority of publishers of subscription-based and hybrid journals.

OA advocates often point to subscription-based and hybrid journals and publishers which have liberal policies, with zero embargoes. It is important to stress, however, that such policies typically relate to the posting of accepted manuscripts (not VoRs) on personal websites and in institutional repositories. Providing open access via subject-based repositories or collaboration networks is not allowed. And the publishers to whom we have spoken all stress the importance of being able to retain control of all aspects of their posting policies: the versions used, the posting location, the uses allowed, and especially embargoes. Their concerns are heightened by developments in the wider environment we outline below.

**Summary: Embargoes and half-lives**

Journal half-lives are significantly longer than the embargoes allowed by funders. Where publishers have liberal policies with zero embargoes, postings are restricted to accepted manuscripts on personal websites and institutional repositories. Publishers all stress the importance of retaining control of their posting policies: versions used, posting location, licensing, and embargoes.

### B7.2 The wider environment

We have already noted the recent increases in the availability of pre-prints. It is not as yet clear whether this will have an impact on usage via journal platforms; but there is some evidence that it might[60]. More pressing concerns for publishers relate to three issues: scholarly collaboration networks, especially ResearchGate; the pirate site SciHub; and

[58] R Darley, D Reynolds and C Wickham, Open Access journals in humanities and social science, British Academy, 2014. For the study by Philip Davis for the Professional and Scholarly Publishing division of the Association of American Publishers, see http://www.publishers.org/usagestudy/. The British Academy study showed even longer half-lives for journals submitted to the RAE in 2008, and very much longer for those in JSTOR.

[59] The Publishers Association, *Short Embargos and Negative Impact on Publishers – a review*

[60] P M Davis and M J Fromerth, "Does the arXiv lead to higher citations and reduced

publisher downloads for mathematics articles?" *Scientometrics, Vol. 71, No. 2 (2007) 203–215*; P M Davis, Journals lose citations to preprints servers Scholarly Kitchen Blog 21st May 2018 https://scholarlykitchen.sspnet.org/2018/05/21/journals-lose-citations-preprint-servers-repositories/

technological and infrastructure developments which are affecting accepted manuscripts and their nature, the ease of deposit, and discoverability for Green OA content.

### *B7.2.1 ResearchGate*

The UUK monitoring report[61] found that three-quarters of the articles it found in locations other than authorised journal platforms took the form of VoRs, and that two-thirds of those VoRs were found in ResearchGate. The other studies of the take-up of OA cited in paragraphs 2.2.2- 2.2.6 above show similarly high-levels of open availability via ResearchGate. Publishers have refined their policies in relation to postings on ResearchGate and other collaboration networks following publication in 2015 of the STM Association's *Voluntary principles or article sharing in scholarly collaboration networks*[62]. Many publishers that do allow such postings restrict them to sites that have adopted those principles, or with which they have bilateral agreements. In most cases, policies also restrict postings to providing access only to authors' private networks, and forbid "systematic distribution", or require licences that restrict specific kinds of re-use.

Members of the publishers' Coalition for Responsible Sharing [63] have since October 2017 issued more than 400,000 takedown notices for content uploaded to ResearchGate. But they note that more than a million articles that infringe copyright have been added to the site since then, at a rate of around 58,000 a month. The Coalition reports that ResearchGate refuses to implement proposed solutions that would automatically indicate to authors whether an article can be shared openly or only privately. Hence two of its members, the American Chemical Society and Elsevier, have instituted legal proceedings in the USA and Germany, seeking a remedy against ResearchGate's continuing "to provide access to millions of copyrighted articles in contravention of agreements between publishers and authors"[64]. Some of the other publishers we spoke to have taken a different approach, preferring to reach individual agreements with ResearchGate giving them access to its database to facilitate the issuing of take-down notices (which have been implemented). It is not clear how frequently the four million illicitly-posted articles currently estimated to be freely accessible from ResearchGate are viewed and downloaded; but publishers fear that its use, along with those of smaller services such as Academia.edu will continue to increase. On the other hand, one publisher, Springer Nature, has initiated a pilot under which a selection of articles are made available so they could be made automatically available on authors' profiles for all ResearchGate users to access, read and share on or off campus. The aim is to make articles accessible to users on their preferred platform at any one time; to test users' preferences; and to provide more accurate information to subscribing institutions on patterns of usage[65].

### *B7.2.2 SciHub*

A second issue of concern is SciHub, the single largest source in the world for free, but illegal, access to journal articles, launched by Alexandra Elbakyan in 2011. SciHub obtains the articles using leaked credentials, though their source is unclear. By 2017, its database contained nearly 70% of the scholarly articles registered with CrossRef, and over 80% of the articles published in subscription-based journals.[66] It thus provides access to more articles than the libraries of most research-intensive universities; and its coverage no doubt continues to grow. Legal action by publishers has been unable to stem its growth; and usage figures are impressive (though a cause of much concern to publishers). In five months between September 2015 and February 2016 – when its coverage of journal content was significantly less than now – it provided access in response to 164,000 requests a day, using a very simple search interface[67].

### *B7.2.3 Wider technological and infrastructure developments*

Technological and infrastructure developments are having profound effects. First, within the publishing industry, they are leading to a diminishing distinction between accepted manuscripts and VoRs. As authoring tools become more sophisticated and more widely adopted, with XML the standard throughout the authoring and publishing process, an

[61] https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2017/monitoring-transition-open-access-2017.pdf

[62] http://www.stmassoc.org/2015_06_08_Voluntary_principles_for_article_sharing_on_scholarly_collaboration_networks.pdf

[63] The Coalition currently includes a mix of 17 commercial and university presses, and learned society publishers. http://www.responsiblesharing.org/

[64] Coalition for Responsible Sharing, Status Report 13 June 2019. http://www.responsiblesharing.org/status-report-on-researchgate-june-2019/ . See also H R Jamali "Copyright compliance and infringement in ResearchGate full-text journal articles" *Scientometrics*, 112(1), 241-254. https://doi.org/10.1007/s11192-017-2291-4

[65] Note that users without institutional subscription have access to articles in a non-downloadable format. https://group.springernature.com/de/group/media/press-releases/springer-nature-and-researchgate-extend-content-sharing-pilot/16916562

[66] D S Himmelstein et al Research: Sci-Hub provides access to nearly all scholarly literature. *eLife*. 2018;7:e32822 https://doi.org/10.7554/eLife.32822.001

[67] Bohannon J. 2016b. Who's downloading pirated papers? Everyone. *Science* 352:508–512. DOI: https://doi.org/10.1126/science.352.6285.508

'accepted manuscript' is simply one in a series of stages through which a published article evolves; and giving it a special status for the purposes of deposit and access becomes more problematic. Related to this is the material that PMC and other services increasingly put alongside individual articles, which add value to them and further erode the distinction between accepted manuscripts and VoRs; as a result, the PMC version often appears first in a Google search.

Second, developments in the scholarly communications infrastructure outside publishers' control are affecting both the ease of deposit for authors, and discoverability for users. As the Finch Report noted, the impact of the posting of articles in institutional repositories and personal websites was until recently limited by their lack of visibility for many users, especially via a simple Google search. This remains the case for many users. One respondent to the Plan S consultation reported that she often gets requests for articles that are freely available via a repository and her own website; and she noted that the free versions did not turn up in response to a regular Google search, though they did via Google Scholar[68]. The need to identify and search a series of individual repositories and other sites has formed a significant barrier for many users. But that barrier is becoming less important as subject repositories increase in size and coverage and become more well-known; and also as repositories in general place more emphasis on high-quality metadata and interoperability[69]. Discovery of freely-accessible versions of articles is also becoming easier as services such as Unpaywall OA Button and Kopernio, capable of finding such versions wherever they are located, become more widely available and used. Moreover, these services are beginning to develop mechanisms to simplify for authors the process of deposit.

**Summary: The wider environment**

Publishers' concerns about short or zero embargoes are exacerbated by three issues:

- the continuing growth of access via scholarly collaboration networks, especially Reseasrch Gate, which is estimated to contain four million articles that are freely available in contravention of copyright agreements;
- the growth also of SciHub, now the world's largest source of free access to journal articles; and
- the development of much-improved interoperability between repositories and the increasing adoption of services such as Unpaywall, OA Button and Kopernio, which together are transforming the ease with which journal articles can be found and accessed via a wide range of sources and services, and the ease of deposit for authors.

### B7.3 Green OA and library subscriptions

Taken together, the three developments noted above – ResearchGate, SciHub, and easier deposit and discovery – along with the continued growth of both institutional and subject repositories, are intensifying publishers concerns about Green OA in general and short or zero embargoes in particular.

Publishers' fear is that libraries will reduce or cancel their subscriptions to journals. Publishers are very much aware of the pressures on library budgets, even while the volumes of journals and articles being published continue to increase at 2-3% annually. They thus fear that as the proportions of journals' content accessible from sources other than publishers' platforms increase, particularly with short or zero embargoes, libraries will be tempted to cancel journal subscriptions. Publishers are also aware that libraries are paying ever-closer attention to data on usage levels when it comes to re-negotiating big deals and other subscriptions.

[68] R L Millstein The Implications of Plan S: What Is the Best Type of Open Access for Philosophy and Other Humanities Disciplines? http://dailynous.com/2018/09/20/best-type-open-access-philosophy-humanities-disciplines-guest-post-roberta-millstein/

[69] See, for example, the report of the UUK repositories working group https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2018/open-access-repositories-report-and-recommendations.pdf; and the focus on interoperability of the Confederation of Open Access Repositories. https://www.coar-repositories.org/activities/repository-interoperability

The British Academy noted in 2014 that the relationships between librarians and publishers were characterised by mutual mistrust, suspicion and even anger; and there is little sign that this has improved in more recent years. Linda Bennett 's report commissioned by ALPSP and the Publishers Association in 2012[70], which suggested that a significant proportion of libraries would cancel subscribe to journals whose contents were freely available after six months, was much criticised. The British Academy's study two years later[71] suggested that financial constraints were much more important than embargo periods in influencing libraries' decisions to cancel; and it noted the finding of the PEER project [72]that academics across all disciplines overwhelmingly wanted access – at least at the final stages of their research - to the VoR. It also stressed the difficulty any library would face in implementing a cancellation strategy based on postings and embargoes, particularly when posting was inconsistent and low in percentage terms, and so long as embargoes did not go as low as six months across the board. Nearly all the publishers we spoke to questioned whether such conditions still apply, when even the distinction between accepted manuscripts and VoRs is becoming less clear-cut, as a result of the increasing availability, sophistication and use of automated authoring tools[73]. For what is certain, as the British Academy report points out, is that unless library budgets increase in line with the secular increases in journal contents and prices, libraries will perforce have to cancel journal subscriptions, and adopt some criterion or other for deciding on which ones will in fact be cancelled.

Most librarians insist that there is no link between articles becoming accessible via repositories and other services, and libraries' willingness to continue their subscriptions. One library commentator has claimed bluntly that "There is no evidence that permitting researchers to make a copy of their work available in a repository results in journal subscriptions being cancelled. None"[74].There are of course significant methodological difficulties in gathering any such evidence, whether or not it exists; and many publishers fear that wider changes in the environment, coupled with constraints on library budgets, make such a relationship inevitable . As with any subscription business, publishers are used to an annual rate of attrition and thus the need to find new customers. Like other subscription businesses, publishers often struggle to identify the reasons for such attrition, and they are reluctant to publicise cancellations, reductions in the scope of their agreements, or falls in revenues. Nevertheless, all the publishers we interviewed spoke of usage data as a key issue in any negotiations on the pricing of renewal agreements.

Moreover, in the past two-three years individual universities and consortia – particularly the larger ones - have been more forthright in publicising cancellations and failures to reach agreement. High profile cases include the failure of a hundred German universities to reach a Project DEAL agreement with Elsevier[75], and a similar failure in negotiations between Elsevier and the University of California system[76]. SPARC has started recording major cancellations[77], with most in the USA, but including other countries such as Canada, Finland, Norway, Sweden, France, and the Netherlands; and while Elsevier features as the most prominent publisher in the list, others include Sage, Springer Nature, Taylor and Francis, Wiley, the Royal Society of Chemistry, the American Chemical Society, and both Oxford and Cambridge University Presses. The numbers so far are not massive, at 75, but it is notable that the trend is significant enough to be monitored in this way, and SPARC believes that the trend is accelerating[78]. On the other hand, big deals themselves act as a check against cancellation of individual journals: cost per journal would be dramatically higher for individual journal subscriptions, and cancellations mean that some faculty do not get all the titles they want. Some librarians, however, have stated publicly that they use databases as UnPaywall to determine the percentage of a journal's content that is freely available, and that it has an impact on their decisions as to whether or not to continue to subscribe[79]. An

[70] https://www.alpsp.org/write/MediaUploads/Reports/2012_Potential_Effects_of_6_month_embargo.pdf

[71] R Darley, D Reynolds and C Wickham, *Open Access journals in humanities and social science*, British Academy, 2014

[72] http://www.peerproject.eu/fileadmin/media/reports/20120618_PEER_Final_public_ report_D9-13.pdf

[73] One publisher referred to accepted manuscripts as an increasingly artificial construct in the publishing process

[74] D Kingsley, Half-life is half the story, Unlocking Research blog 16 October 2015, https://unlockingresearch-blog.lib.cam.ac.uk/?tag=embargo

[75] N Fowler and G Meijer,What's the big DEAL and why is it so difficult to reach? Elephant in the Lab 27 August 2018 | doi:10.5281/zenodo.1404031

[76] R Anderson, The University of California and Elsevier: An Interview with Jeff MacKie-Mason, Scholarly Kitchen 6 May 2019

[77]https://docs.google.com/spreadsheets/d/1brXHnANwLBCHYo5b79hF6vGF63fdOCSOSiPxCScf0hc/edit?usp=sharing

[78] L McKenzie, "Big Deal' Cancellations Gain Momentum" *Inside Higher Ed*, 8 May 2018

[79] Rick Anderson, LIBLICENSE listserv 25 June 2019

unpublished survey in 2017 found that 38% of librarians would cancel subscriptions if the majority of the content would be freely available six months after publication.

The publishers we spoke to are all concerned about cancellation trends, particularly in the light of the changes in the wider environment to which we have referred above, and which have an inevitable influence on negotiations between publishers and libraries. There are added concerns about the pressures on university finances, and thus on the budgets for libraries. Several of the publishers we interviewed spoke of their awareness of statements from least some librarians that the ready availability of articles from other sources makes cancellations less of a problem for staff and students that they would otherwise be. As Rick Anderson pointed out in a recent Scholarly Kitchen blog which attracted lively comment[80],while libraries may not assess the availability of content elsewhere when deciding on subscriptions and cancellations, cost per download - which certainly *is* a factor in those decisions - is likely to rise as a result of users accessing articles from sources other than the publisher's platform. Financially-pressed university managers are also likely increasingly to question the need to pay for access to journals whose contents are freely available – legally or not - from other sources; and some in the USA have stated explicitly that accessing articles made available in breach of licences and copyright is not problematic. Cancellations such as those in Germany and California are made easier for libraries since they know that staff and students can gain access to articles by other means. In the current climate, both libraries and publishers are aware of this, and it is the context in which negotiations take place.

In such a context, making the accepted manuscript of all articles funded by Plan S funders accessible, and readily-discoverable, immediately on publication and with a CCBY licence would make it very difficult for all scholarly publishers to sustain their current levels of subscriptions. There would thus be a threat to the sustainability of significant numbers of journals. Those worst affected would be those small niche journals where most of the content comes from authors in countries where Plan S funders are dominant. Even where funders act in accordance with the PlanS principle that they should meet the cost of publication fees, there are circumstance in which – for example if significant proportions of the content of those journals reports on work that is *not* funded by a Plan S signatory - it is difficult to see how some journals could survive even in OA form.

**Summary: Green OA and library subscriptions**

The potential relationship between the free availability of articles via repositories and other services on the one hand, and library subscriptions on the other, is controversial and a source of contention between libraries and publishers. Many library commentators insist there is no relationship. But most publishers fear that wider changes in the environment, coupled with constraints on library budgets, make such a relationship inevitable for the future. The bulk of the investment publishers make in individual articles arises in getting to the stage when the article has been validated – through the journal management processes of submission, peer review and so on – as worthy of entering the scholarly record.

Requiring publishers to forgo the fruits of that investment by making a peer-reviewed version freely accessible immediately on publication would be – for all the publishers we interviewed – unacceptable. For it would tend to privilege the use of interim versions of articles rather than the VoR; and put at severe risk the viability of their journals and of the investments they have made in the scholarly communications system as a whole.

[80] R Anderson, They Know We Know They Know: Does Sci-Hub Affect Library Subscriptions? Scholarly Kitchen 3 July 2019

# SECTION C:
# LICENSING

## C.1 KEY CONCERNS

Publishers require authors to transfer or assign copyright, or to grant a licence to publish (almost always exclusive) in order to

- protect their investment in publishing journals and articles;
- enable them to sustain the integrity of the scholarly record and to take action to protect authors and their rights.

Though there are some concerns about commercial re-use of articles, many publishers accept that if funders pay an APC for Gold OA articles and journals, they are entitled to set the licensing conditions.

Their major concern is that any requirement, such as Plan S envisages, for authors to make accepted manuscripts (*a fortiori* VoRs) of subscription-based articles freely available in repositories with no embargoes and without any restriction against commercial use would threaten the very existence of their business.

Authors' anxieties about derivatives are a secondary concern for publishers; and they are keen to ensure that those anxieties are properly addressed.

## C.2 CURRENT POLICIES

As with Green OA and embargoes, policies on licensing vary significantly between different funders and publishers. A requirement, or an option, to use Creative Commons licences, particularly CCBY, is becoming more common; but it is by no means a universal requirement; and CCBY remains especially controversial in some areas.

### C.2.1 RCUK requirements

RCUK's policy is based on its view that OA requires that users should be able, free of any access charge, to "re-use the content of published papers both manually and using automated tools (such as those for text and data mining) provided that any such re-use is subject to full and proper attribution and does not infringe any copyrights to third-party material included in the paper"[81]. Where Research Council funds are used to pay an APC for Gold OA, RCUK therefore requires publishers to make the paper freely accessible under a CCBY licence. If the publisher does not allow use of the CCBY licence, authors are directed not to pay an APC, since the journal does not comply with RCUK policy.

For articles deposited in a repository, RCUK's current FAQs[82] state that its preference is for CCBY, but the formal requirement is that there should be no restriction on non-commercial reuse, including text- and data-mining, and that the licence should allow adaptations of the article to be shared. The CCBY-NC licence, or equivalent, is acceptable; but the CCBY-NC-ND licence is not. Government employees, and authors in universities collaborating with them, should use the Open Government Licence.

### C.2.2 Policies for REF 2021

The REF *Guidance on Submissions*[83] states that articles published under a CCBY-NC-ND licence will meet its requirements for access. It also recommends that institutions should consider the extent to which authors retain or transfer copyright in the articles they publish "as part of creating a healthy research environment". No rules or requirements follow from that recommendation, but it may presage further requirements for future REF exercises.

[81] https://www.ukri.org/files/legacy/documents/rcukopenaccesspolicy-pdf/

[82] https://www.ukri.org/files/funding/oa/oa-faqs-pdf/

[83] REF 2019/01 https://www.ref.ac.uk/publications/guidance-on-submissions-201901/

### C.2.3 Plan S

The first of the ten Plan S principles published in September 2018[84] stated that "Authors [should] retain copyright of their publication with no restrictions. All publications must be published under an open license, preferably the Creative Commons Attribution Licence CC BY. In all cases, the licence applied should fulfil the requirements defined by the Berlin Declaration". The reasoning was set out in the implementation guidance published in November 2018[85]: that authors (or their institutions) must retain copyright so that they are in a position to post their articles on a compliant platform or journal of their choice. The guidance therefore required that journals must offer authors or their institutions the option of "full copyright retention without any restrictions, i.e. no copyright transfer or licence to publish that strips the author of essential rights".

The guidance went on to require that

- the public should be granted a licence to copy and redistribute content, and to adapt it for any purpose, so long as proper attribution is given to the author;
- articles should be published, and/or posted in repositories, under a CCBY, CCBY-SA or CC0 licence; and
- use of the CCBY-NC licence was unacceptable, since it was incompatible with the Berlin Declaration.

It also argued that use of the CCBY-ND licence was not necessary to protect authors' rights, since they were protected by Rules of Good Research Practice, and by the Berne Convention.

The guidance accepted that more restrictive licences might be needed to protect third party content where rights-holders demanded it: and that therefore such content was unaffected by the Plan S requirements.

In responding to the feedback on its original proposals, cOAlition S re-stated (in its revised guidance and the rationale for the revisions issued in May 2019[86]) its view that copyright should remain with the author. But it went on to indicate that it would develop mechanisms similar to the Harvard and the UKSCL licences[87] to ensure that no author need negotiate individually with a publisher. These would take the form of funding contracts by cOAlition S members requiring authors or institutions to retain copyright and the rights necessary to make the VoR or the accepted manuscript immediately accessible under an open licence. Journals would thus have to accept authors' retention of copyright, at no extra cost. The cOAlition also suggested that further action was required at institutional and national levels to promote wider adoption of rights retention approaches.

COAltion S also reiterated its opposition to CCBY- NC and CCBY-ND, and argued that ND was not required, since the CCBY licence demands that any changes made when re-using licensed material must be clearly marked. But as an interim measure, it recommended that funders should be willing to consider the use of CCBY-ND on a case-by-case basis.

### C.2.4 Publisher policies

The DOAJ indicates that 5,513 (41%) of its 13,547 journals require authors to publish under a CCBY licence[88]. The next most popular licence is CCBY-NC-ND (22%), followed by CCBY-NC (19%), CCBY-NC-SA (8%) and CCBY-SA (6%). Nevertheless, CCBY is used for the flagship fully-OA journals that publish the largest numbers of articles, such as Nature Communications and PLoS One, and 57% of articles listed in DOAJ have used the CCBY licence. There are, however, significant differences by subject area: whereas 71% of articles in medicine are published CCBY, in social science that proportion falls to 40%.

The UUK report on the transition to OA published in 2017 found a very different picture for hybrid journals: while CCBY may be allowed as an *option* in most cases (sometimes depending on the payment of an additional fee) it is very

[84] http://scieur.org/plan-s

[85] cOAlition S Making full and immediate Open Access a reality https://www.coalition-s.org/wp-content/uploads/271118_cOAlitionS_Guidance.pdf

[86] https://www.coalition-s.org/wp-content/uploads/PlanS_Principles_and_Implementation_310519.pdf ; and https://www.coalition-s.org/rationale-for-the-revisions/

[87] https://osc.hul.harvard.edu/policies/ioal/ and https://ukscl.ac.uk/

[88] https://doaj.org/search?source=%7B%22query%22%3A%7B%22match_all%22%3A%7B%7D%7D%2C%22from%22%3A0%2C%22size%22%3A10%7D. Searches conducted 18 July 2019.

rarely made *mandatory* by the publisher as a condition of publication. Some publishers allow CCBY only when it is made mandatory by authors' funders. Nevertheless, data collected from members of the Open Access Scholarly Publishers Association (OASPA) indicates a sharp rise in the use of the CCBY licence in hybrid journals.[89] But it is not clear how widely the model licences developed by the International Association of STM Publishers have been taken up in practice[90].

### C.2.5 Licensing for Green OA

The current position on licences for articles deposited in repositories or elsewhere is complex and uncertain. There is no central source of information: SHERPA-RoMEO does not cover the issue. The licences to publish used by most publishers (see below) which typically allow authors to deposit on their websites or certain repositories sometimes refer to restrictions against commercial use (Wiley) or re-use (SAGE); but many publishers make no reference to rights or restrictions at all, while by contrast Elsevier and some other publishers prescribe a CCBY-NC-ND licence. Repository managers can therefore face difficulties in determining the terms under which they make articles accessible. Most repositories include alongside their articles a copyright statement; and some institutional repositories state that they provide rights equivalent to the CC BY licence for all items in the repository, unless otherwise specified[91]. But most publishers see lack of an NC restriction for accepted manuscripts as unacceptable, particularly in a context where the distinction between an accepted manuscript and a VoR is diminishing (see Section B above). More fundamentally, as we discuss below, absence of an NC restriction would allow large tech companies to collect large aggregations of articles and market them in a variety of ways.

### C.2.6 Tensions between policies

From the brief account above it will be clear that there are differences and tensions between the policies of individual funders and publishers, and sometimes individual universities too. These cause difficulties for all stakeholders, and especially for authors. In order to address those difficulties, working groups established by UUK made good practice recommendations in 2018 to ensure that funders and publishers provide clear and readily-available information in their guidance documents, in metadata, and on the face of full text articles. They also recommended that where publishers do not wish to compel authors to adopt the CCBY licence required by their funders, they should make clear to authors that choosing any other licence would put them in breach of their funder's requirements[92]. It is not clear how widely these recommendations have been taken up.

**Summary: Current policies**

Funders' policies build on the Berlin Declaration and its requirements for rights not only to access, but to copy, use, and distribute articles, and to make and distribute derivatives. Hence the requirement for CCBY: the NC and ND restrictions are unacceptable for Gold OA articles, though current policies allow one or both of them for Green OA. Plan S would require CCBY in all circumstances, coupled with retention of copyright by authors or their institutions.

Many publishers have accepted CCBY for Gold articles; but especially for hybrid journals CCBY is an option rather than a requirement, sometimes with an additional fee. For Green OA, the position is more complex and even opaque. Many publishers set restrictions on access and use in their licences to publish, while others specify a specific CC licence, often CCBY-NC-ND.

[89] https://oaspa.org/wp-content/uploads/2019/07/OASPA-Members-CC-BY-Growth_Data-to-2018_CC0.xlsx

[90] See https://www.stm-assoc.org/intellectual-property/licensing/open-access-licensing/

[91] See for example the statement of the University of Exeter's ORE repository at https://www.exeter.ac.uk/research/openresearch/oa/copyright/

[92] The recommendations can be found in Professor Adam Tickell's Independent Advice on Open Access to Research Publications 2018. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/774956/Open-access-to-research-publications-2018.pdf

## C.3 COPYRIGHT AND LICENCES TO PUBLISH

Copyright and licensing agreements are the life-blood for publishers, and in scholarly publishing generally the long-established model has been for publishers to acquire rights "wide and long" in order to protect their investment[93]. In recent years some publishers have moved away from a requirement that authors transfer or assign copyright, to a requirement to sign a – usually exclusive - licence to publish[94]. In practice, as the Publishing Research Consortium stated in 2015, an exclusive licence has an effect similar to a copyright transfer[95]. Under both kinds of agreements, authors can retain important rights to use and share their work, although only under a licence to publish is it possible for authors to retain the right to require the publisher to seek permission if it receives requests from others who wish to use the work, in full or in part, in another publication. There have been attempts by Knowledge Exchange in the UK and other European countries, SPARC in the USA, and via the Scholars Copyright Addendum Engine developed by Creative Commons, to encourage authors to restrict the rights they transfer to publishers; but they have so far not achieved widespread adoption. Plan S would require authors to retain copyright, but currently more than half of DOAJ journals do not meet that requirement[96].

**Summary: Copyright and licences to publish**

Some publishers have shifted from a requirement for authors to transfer or assign copyright, to a licence to publish; but the differences between them are minor. The addenda created by SPARC and others to restrict the rights authors transfer to publishers have not achieved high take-up.

## C.4 UK SCHOLARLY COMMUNICATIONS LICENCE (UK-SCL)

The development of a UK-SCL[97] was initiated at Imperial College London in 2015, with the aim of supporting the transition to OA by simplifying copyright processes; and giving authors and institutions more control over their research publications. The main driver for its development was an attempt to cut through the complexity created by a variety of policies from funders, publishers and institutions with regard to licensing and posting in repositories; and to provide a one-step process for compliance with funders' OA policies[98]. It is not intended or designed to facilitate Gold OA. The UK-SCL focuses on the retention of re-use rights, and is based on a model developed at Harvard University, adapted for UK legal and other circumstances. Under the UK-SCL authors would grant universities a non-exclusive licence to make their accepted manuscript freely-available from the point of publication via the university's open access repository with a CC BY-NC licence. The UK-SCL itself would be held by the university, and would be binding on publishers.

[93] This is in contrast to trade publishing, where authors typically retain rights that may become significant sources of income. See F Dodds, "The changing copyright landscape in academic publishing*" Learned Publishing* 2018

[94] There are some notable exceptions. Elsevier, for example, requires transfer of copyright as part of its publishing agreement, and Wiley requires transfer for its wholly-owned journals. Some publishers of fully-Gold OA journals have now adopted a non-exclusive licence to publish for those journals.

It should also be noted that in most jurisdictions, including the UK, authors' moral rights - the right of attribution, the right to have a work published anonymously or pseudonymously, and the right to the integrity of the work – cannot be assigned or transferred.

[95] C S Lavizzari and R Viljoen, Open Access Licensing, Publishing Research Consortium, February 2015

[96] J E Frantsvag and T E Stromme "Few Open Access Journals Are Compliant with Plan S" *Publications* 7, 26 2019

[97] See the draft at https://ukscl.ac.uk/wp-content/uploads/2017/11/UK-Scholarly-Communications-Licence-and-Model-Policy-v-1_20171109.pdf ; and J Baldwin and S Pinfield "The UK Scholarly Communication Licence: Attempting to Cut through the Gordian Knot of the Complexities of Funder Mandates, Publisher Embargoes and Researcher Caution in Achieving Open Access" *Publications* 2018, *6*(3)

[98] A study by Research Consulting in 2014 found that it took institutional repositories 20 minutes to 'triage' papers for deposit. "Counting the costs of open access", available at: www.ariessys.com/wpcontent/

uploads/Research-Consulting-Counting-the-Costs-of-OA-Final.pdf

The UK-SCL has stimulated considerable debate. In July 2017, the Chair of UUK's Open Access Co-ordination Group, Professor Adam Tickell, called it the biggest challenge to the post-Finch consensus on open access, and urged Vice Chancellors to exercise caution before adopting it[99]. Concerns have focused on a number of issues.

First, the long-established custom and practice is that UK universities waive any right to involvement in copyright in research publications, and allow authors to dispose of copyright at they think fit. Many academics have come to assume that copyright in their scholarly works is their own; but in the UK there is evidence that increasing numbers of universities are asserting a generic claim to all the intellectual property produced by their staff[100]. The UK-SCL would involve authors automatically granting a licence to their universities immediately an accepted manuscript came into existence; and thus would mark a fundamental change in the relationships authors, publishers and universities, with potential to upset the often-close relationships between authors and their preferred journals. Some commentators have suggested a risk to academic freedom. But others have suggested that many researchers are confused about copyright, and that this contributes to their reluctance to post articles in repositories.[101]

A second area of concern relates to waivers. These are granted automatically under the Harvard model; but the draft UK-SCL provides only that universities "will give every consideration" to requests for a waiver, for delays of up to six months (STEM) and twelve months (AHSS) in access to the accepted manuscript[102]. The Steering Group assumed, at least initially, that such requests would be small in number; but many publishers made clear that they would seek waivers for many or all of their journals. In a letter to Vice Chancellors, the Publishers Association estimated that universities would need to process waivers for 100,000 articles a year, creating a massive administrative burden for authors, their institutions and libraries, with no clear benefit. The response from the Steering Group has been to suggest that during a two-year implementation phase universities would issue blanket waivers for all publishers that request them. And in its response to Plan S[103] the Group has suggested that while the default embargo remains zero, universities could grant waivers up to the maxima allowed by funders.

A third concern relates to the CCBY-NC licence, with academics in AHSS disciplines arguing strongly for a CCBY-NC-ND licence. In its response to Plan S, the UK-SCL community indicates that it now accepts CCBY-NC as the default licence "in line with the minimum requirements for the current RCUK policy". It also indicates that more restrictive licences might be acceptable, particularly in an early implementation phase, and that authors could then have the ability to re-release their articles on a less-restrictive licence if they so wished at a future date. In this sense, restrictions in the licence could "decay" over time.

The future of the UK-SCL remains uncertain. Its launch has been delayed several times, and a number of significant amendments have been made to the original model. The UKRI Review, together with Plan S, have obviously transformed the environment in which the initiative was originally framed; and the attention of many of the publishers we interviewed and who were concerned about the UK-SCL has shifted to those two larger concerns. The SCL community has indicated its intention to align the licence with cOAlition S funder policies once those are clarified. The UK-SCL website still states that a number of universities are taking the model policy and licence through their own committee procedures; but the UK-SCL community clearly does not wish to move until the results of the UKRI Review are finalised and implemented.

[99] https://www.universitiesuk.ac.uk/policy-and-analysis/research-policy/open-science/UUK%20Open%20Access%20Coordination%20Group/Paper%201%20-%20UUK%20OACG%20meeting%20note%2007.07.2017_v2.pdf

[100] E Gadd, "UK university policy approaches towards the copyright ownership of scholarly works and the future of open access", *Aslib Journal of Information Management*, 69 1, 2017

[101] But note that ignorance of copyright is also cited as a reason why researchers do post VoRs in ResearchGate.

[102] Note that these embargo lengths are below the maxima allowed for in the current requirements for the REF, which are 12 months (STEM) and 24 months (AHSS).

[103] https://ukscl.ac.uk/ukscl-community-response-to-plan-s/

**Summary: The UK-SCL**

The UK-SCL aims to cut through the complexity created by a variety of policies from funders, publishers and institutions with regard to licensing and posting in repositories. But it has proved controversial. First, it would require authors automatically to grant a licence to their universities immediately an accepted manuscript came into existence. Second, publishers have indicated that they would seek waivers on a massive scale. Third, there are concerns about the terms of the proposed licence.

## C.5 CREATIVE COMMONS AND CCBY

Since its foundation in 2001, the Creative Commons organisation has been closely linked with the OA movement. Its attribution licence – CCBY - meets the requirements of the Budapest and Berlin Declarations, and through its Scholars' Copyright Project it has worked closely with OA advocates such as SPARC. Use of the CCBY licence has become the default requirement for policy-makers and funders seeking to promote OA, and it has been adopted by many OA publishers. But in many areas it remains controversial.

### C.5.1 Author attitudes

An international study of authors in 2003 found that their key concerns with regard to copyright were the rights of attribution and integrity: they wanted to limit aggregation, modification and annotation in order to ensure that all post-publication copies of their work are precise replicas. Most were not looking for an economic return on their work, though they did not want to see others to securing financial returns if they themselves did not[104]. Such attitudes are reflected in more recent studies, though with some signs of change. A Taylor and Francis survey of authors in 2014[105] showed that CCBY was the least preferred option for 35% of authors (though this was down from 52% in 2013), and the most preferred for only 7%. By contrast the most restrictive Creative Commons licence - CCBY-NC-ND - was the most popular preferred option, at 33%. Similarly, when Nature Publishing Group offered authors a choice of licences for *Scientific Reports*, the majority chose a more restrictive licence than CCBY. But when it shifted in 2015 to make CCBY the default licence, 96% of authors accepted it[106]. Those publishers to whom we have spoken and who now offer a choice of licences for at least some of their journals report very different proportions of authors choosing a CCBY licence: from less than a third up to 100%. There is some evidence of disciplinary differences, with authors in the AHSS disciplines favouring the most restrictive licences, and some indications of a preference for CCBY-NC in the life sciences. Much depends of course on how the choice is presented: an opt-in choice results in much lower take-up of CCBY than a default CCBY option with an opt-out. Nevertheless, controversy remains: some commentators claim that being compelled to publish under a CCBY licence takes important rights away from authors, and represents an assault on academic freedom[107]. And even among those publishers who suggest that authors' concerns may be overblown, many suggested to us that it was important for all those concerned in the transition to OA to win over those scholars – especially in AHSS disciplines – who were still expressing those doubts.

**Summary: Author attitudes**

Surveys of authors and the choices they make when offered licence options indicate that they prefer restrictive licences; though there are signs that attitudes may be changing.

[104] E Gadd et al "RoMEO studies 1: the impact of copyright ownership on academic author self-archiving", *Journal of Documentation*, 59. 3, 2003; and "RoMEO studies 2: how academics want to protect their open-access research papers", *Journal of Information Science*, 29. 5 2003

[105] Taylor and Francis Open Access Survey 2014. http://www.tandf.co.uk/journals/explore/open-access-survey-june2014.pdf

[106] https://www.nature.com/press_releases/open-access-week.html

[107] See, for example, Rick Anderson, Open Access and Academic Freedom, Inside Higher Education, 15 December 2015

### C.5.2 Derivatives and plagiarism

A key concern, especially in AHSS disciplines, relates to derivatives and the risk of misrepresentation, but also of plagiarism[108].

*Amendments and misrepresentation*

The basic concern for many authors is their wish to ensure that the text of their articles is not altered or corrupted in any way. Even minor changes to wording can change the meaning of an article, and this could, in the view of many researchers, have a serious negative impact on their reputation: for flawed and altered versions could still be attributed to the original author. As the British Academy put it in 2018, where "the content of an argument or analysis depends exclusively or mainly on the words used and the way the sentences are constructed, authors should have protection from misuse, misquotation or mistranslation"[109]. Many AHSS authors are particularly concerned to retain control in order to guard against the risk of poor translations[110] Examples of misrepresentation, however, are hard to find. None of the publishers, librarians or researchers we spoke to could point to any specific instances.

CCBY advocates suggest that authors are protected against misrepresentation by their moral right to the integrity of their work; and that the CCBY 4.0 licence demands that licensees must indicate if changes are made when they re-use licensed material. But the licence demands only that licensees indicate the fact that changes have been made, not the precise nature of those changes. Even if that omission were to be rectified, it is not clear exactly which author rights would be protected.

*Moral rights*

The CCBY 4.0 license also states that "to the extent possible, the Licensor waives and/or agrees not to assert any [moral] rights"; authors must thus waive, among other things, their moral right "to object to any distortion, modification of, or other derogatory action in relation to the said work, which would be prejudicial to the author's honor or reputation". That waiver could prove significant in cases where malicious users have distorted a work on a matter of, for example, historical controversy[111].

*Research ethics*

In social science in particular, articles often report on research where there is an implicit or explicit contract between researchers and human participants. In such circumstances, researchers work under ethical conditions which require them to protect the rights of those participants, which may amount to a covenant requiring them to keep control over the subsequent use of their work[112].

*Plagiarism*

The primary guard against plagiarism are the norms and rules of scholarly behaviour[113]; and the attribution requirement of CCBY licence means that any work integrating licensed content must refer clearly to the original and its authors. But there is no requirement for re-used passages to be clearly marked, and subsequent users could clearly be misled. CCBY advocates claim that CCBY does not encourage plagiarism[114]; but some commentators believe that "the latitude allowed by the CC-BY licence would constitute plagiarism in many AHSS disciplines"[115].

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[108] For a useful overview of the issues, see M Couture, Open access, adaptation rights and the Creative Commons licences No Derivative (ND) restriction 18 January 2019, https://jaamcouture.home.blog/2019/01/18/open-access-adaptation-rights-and-the-creative-commons-licences-noderivative-nd-restriction/

[109] British Academy *Open access and monographs: Where are we now?* May 2018 https://www.thebritishacademy.ac.uk/sites/default/files/British_Academy_paper_on_Open_access_and_monographs-May_2018.pdf.

[110] See, for example, K Graf and S Thatcher, "Point & Counterpoint Is CC BY the Best Open Access License?" *Journal of Librarianship and Scholarly Communication*, 1(1), 2012 and J B Holbrook, Feedback on guidance on implementation of Plan S 8 February 2019, https://jbrittholbrook.com/2019/02/08/feedback-on-guidance-on-implementation-of-plan-s/

[111] See M P Eve, Response to cOAlitionS Implementation Guidelines, 21 January 2019, https://eve.gd/images/Eve%20-%20Plan%20S%20Response.pdf

[112] See, for example, the OPERAS response to Plan S, https://zenodo.org/record/3249906/files/443_Plan%20S.pdf?download=1; and a hypothetical example by Heather Morrison at https://poeticeconomics.blogspot.com/2012/10/why-cc-by-will-sometimes-be-violation.html

[113] The Berlin Declaration refers to these as 'community standards'.

[114] See, for example, D Kingsley, Is CC-BY really a problem or are we boxing shadows? Unlocking Research blog 3 March 2016, https://unlockingresearch-blog.lib.cam.ac.uk/?p=555

[115] Plan S Consultation response from the Arts and Humanities Alliance http://artsandhums.org/wp-content/uploads/2019/01/PlanS-Consultation-AHA-final.pdf; Statement on position in relation to open access from editors of 21 UK history journals https://www.history.ac.uk/news/2012-12-10/statement-position-relation-open-access

*Text and data mining*

COAlition S, like many funders, has been resistant to any licensing restriction on the uses to which articles and their content can be put. They argue that any such restriction diminishes the value of OA, and would cause problems for those who wish to combine, remix or sample articles and their content. Much of the emphasis has been on text and data mining, but many of the publishers we interviewed confirmed that their legal advisers had indicated that any concern about TDM was now moot. For since the UK's adoption of a TDM exception to the Copyright, Designs and Patents Act 1988, and the EU's proposed Directive on Copyright in the Digital Single Market, those who have authorised access to read also have a legal right to copy and manipulate for text and data mining purposes for non-commercial purposes[116].

*Summary: Derivatives and plagiarism*

Authors – mainly but by no means solely in AHSS disciplines - have raised a series of concerns about derivatives and the risks of misrepresentation and plagiarism. They feel strongly that the requirement in the CCBY licence for licensees to indicate when changes are made does not offer sufficient protection. There are also concerns that the licence requires authors to waive moral rights; that allowing unrestricted re-use may be incompatible with the ethical requirement to protect the interests and rights of research participants; and that the licence may encourage plagiarism. The UK's copyright exception for text and data mining means that the ND restriction does not preclude TDM. . Like other funders, cOAlition S has now acknowledged the issues raised by researchers about derivatives, but suggested only that exemptions from a CCBY requirement can be dealt with on a case-by-case basis[117]. Even if practicable, that is unlikely to satisfy the strong concerns of the AHSS community, who are likely to continue to press for the use of an ND restriction to any Creative Commons licence[118].

### C.5.3 Third party material

COAlitionS acknowledged the problems associated with the inclusion in articles of third party material where rights-holders will not agree to a CCBY licence; and allowed for more restrictive licences in its original guidance. Its more recent version states simply that "Third-party content included in a publication (for example images or graphics) is not affected by [its licensing] requirements"[119].Publishers confirmed to us that the problems are both widespread and often complex in AHSS disciplines. Rights-holders including museums, galleries, libraries and archives as well as commercial organisations have very different positions with regard to permissions and the prices they charge for them; and publication rights are often time-limited, involving burdensome procedures for renewal. Articles may bear different licences applied to different parts of the content and for different periods. If a CCBY licence is used for a PDF file containing third party material to which that licence cannot apply, then the whole file cannot be shared openly. Unless such issues are made crystal clear in the metadata, there is the risk of copyright violation, or rendering the CCBY licence meaningless[120].

**Summary: Third party material**

The problems associated with the inclusion of third party material – mainly but again not solely in AHSS disciplines – are widespread and complex. It is of critical importance that these issues are fully addressed in any modifications to UKRI's policies.

[116] See Section 29a of the CDPA 1988. The EU's Directive would restrict TDM activity to research institutions and for the purposes of scientific research. See also R Mallalieu "

The elusive gold mine? The finer details of Creative Commons licences – and why they really matter" *Insights* 32, 2019. There remains some doubt as to whether the UK exception allows authorised readers to *store* the results of their TDM analyses. It would clearly be useful if definitive legal advice could be obtained on this point.

[117] COAlition S Rationale for the Revisions Made to the Plan S Principles and Implementation Guidance https://www.coalition-s.org/rationale-for-the-revisions/

[118] In its response to the Plan S guidance, the Royal Musical Association refers to the concern about derivatives as 'one of the most significant issues' for AHSS researchers, and urges at the least a delay in the requirement for CCBY. https://www.rma.ac.uk/rmawp/wp-content/uploads/2019/02/RMA_Plan_S_and_UKRI_response.pdf

[119] https://www.coalition-s.org/principles-and-implementation/. Plan S makes no reference to meeting the costs of licensing for third party material.

[120] OPERAS Declaration on Plan S Implmentation Guidance https://operas.hypotheses.org/2575; M P Eve, Response to cOAlitionS Implementation Guidelines, 21 January 2019, https://eve.gd/images/Eve%20-%20Plan%20S%20Response.pdf

### C.5.4 Commercial uses

As we noted earlier, most researchers do not seek financial reward for their work, but many of them do want some control over how their work is used. The response to Plan S initiated by Lynn Kamerlin and signed by hundreds of researchers urged the use of the CCBY-NC licence, in order - for ethical reasons - to restrict for-profit commercial exploitation of their work[121]. Some researchers have reported alarming misappropriation of their work[122], but the reported cases seem to be rare. Many researchers tend to assume that 'commercial' and 'for-profit' are synonymous terms; but the former term is not directly linked to the making of profits, and the definitions of commercial and non-commercial uses are by no means clear-cut. The NC restriction provides protection for rights-holders, but limits the potential for re-use and sharing[123]. Since many funders wish to support and enhance the use of research findings and their potential for promoting innovation in the economy and society at large, they are reluctant to accept a non-commercial restriction. Many publishers accept this, especially when funders are meeting the cost of publication through the payment of APCs. For subscription-based articles and journals, however, CCBY without an NC restriction is seen as a substantial – even existential – threat. And where journals publish significant numbers of articles from researchers in industry, some publishers may be reluctant to flip to fully-Gold OA with a CCBY licence since they anticipate resistance from authors to the absence of any restriction against commercial use.

### C.5.6 Patents

A related issue, raised in many responses to Plan S as well as by one or two of our interviewees, relates to patents. There has long been a tension in funders' policies between the aims of securing rapid and widespread dissemination of research results on the one hand, and protecting and exploiting innovations resulting from research on the other. The European Federation of Academies of Sciences and Humanities (ALLEA) and other bodies have raised this issue many times in recent years, and ALLEA points in its response to Plan S[124] to the lack in European patent law of a "grace period" such as is allowed in American law. And the Guild of European Research-Intensive Universities urged in its response[125] that "intellectual property rights and patent protections should also be given proper consideration when defining permitted licences, to maintain a balance between Open Access and the valorisation of discoveries through patents".

**Summary: Commercial uses and patents**

Many authors are keen to restrict commercial uses of their work, though the definitions of such use are difficult to determine. The tension in funders' policies between a requirement for rapid and widespread dissemination of research results on the one hand, and the need to protect and exploit those results on the other, need careful attention in any modifications to OA policies.

## C.6 PUBLISHERS' CONCERNS

Many publishers accept that if funders pay an APC for Gold OA articles, they are entitled to set the licensing conditions. But for other publishers, there remains a concern about the absence of any restriction on commercial use when a CCBY licence is used; and some charge an extra amount in APCs if authors require that licence. Even for Gold

[121] https://forbetterscience.com/2018/09/11/response-to-plan-s-from-academic-researchers-unethical-too-risky/

[122] See, for example, C W Schadt, A Rant on Strawberries, Open Access Licenses, and the Reuse of Published Papers, 2 July 2013, https://schadtlab.wordpress.com/2013/07/02/a-rant-on-strawberries-open-access-licenses-and-the-reuse-of-published-papers/

[123] G Hadedorn et al "Creative Commons licenses and the non-commercial condition: Implications for the re-use of biodiversity information" ZooKeys 150: 127–149, 2011; P Kimpel Consequences, risks and side-effects of the license module "non-commercial use only – NC". https://openglam.org/files/2013/01/iRights_CC-NC_Guide_English.pdf

[124] https://www.allea.org/wp-content/uploads/2018/12/ALLEA_Response_PlanS.pdf

[125] https://www.the-guild.eu/news/2019/12_open-science.pdf

OA articles and journals publishers risk some loss of revenue from sales of reprints, especially to pharmaceutical companies. For most publishers, this is a relatively small but nevertheless significant source of revenue; one publisher reported that levels of rights income were a consideration when it came to deciding on whether or not to 'flip' specific journals to fully-Gold OA. Others reported that rights income is declining for all journals[126], while many said that they can retain at least a proportion of the revenues even when articles are published CCBY[127]. For subscription-based articles, the position is rather different.

Shifting from a broad revenue base of journal subscriptions to a Gold OA model would bring its own risks for publishers. But the major concern for all the publishers we interviewed is that any requirement, such as Plan S envisages, for authors to make accepted manuscripts (*a fortiori* VoRs) of subscription-based articles freely available in repositories with no embargoes and without an NC restriction would threaten the very existence of their business. Google, Amazon and other large companies would be able to take over journal contents at scale and without restriction, to create large aggregations, and to exploit the content in any way they wished. This would amount, as one publisher put it, to the licensed misappropriation of the investment that publishers had made in the management of their journals and the processes of submission, peer review and so on that gets an article to the stage where it is deemed worthy of entering the scholarly record..

Even if deposit were restricted to the accepted manuscript rather than the VoR under the Plan S terms, the loss and the risk would be huge. The costs of peer review and other services involved in getting a submitted article to the stage of accepted manuscript represent up to half or more of many publishers' costs. Moreover, as we have noted, the distinction between accepted manuscripts and VoRs is becoming ever smaller with the increasing sophistication and adoption of tools for authors that make use of XML and other technologies. Hence accepted manuscripts are becoming more acceptable to readers as a substitute for using the journal platform. But attaching a CCBY licence to multiple versions of the same article adds to the risks of confusion in the scholarly record.

Derivatives are a secondary concern for most publishers. Those with strong portfolios in AHSS disciplines are keen to retain the support of the many researchers who have deep-seated disquiet about the implications of the CCBY licence; and some point out that funders and OA advocates need the full support of the whole AHSS community. Few publishers take active measures to check that their content is not being misused; but they do provide a service to authors by following up when misuse is reported to them.

Publishers accept that text and data mining is allowed under the UK's exception to the Copyright, Designs and Patents Act 1988, even if a CCBY-ND licence is applied. Many remain anxious about the potential impact on their platforms of large-scale use of TDM; but they report little use of TDM technologies to date.

**Summary: Publishers' concerns**

Publishers' major concerns with regard to the CCBY licence relate to its use for articles in subscription-based and hybrid journals. Using the licence for such articles would allow anyone, and any organisation, to gather up those articles at scale for whatever use they wished, and effectively misappropriate the investment that publishers have made. The viability of publishers' businesses would be put at risk. Authors' anxieties about derivatives are a secondary concern for publishers; but they are keen to ensure that those anxieties are properly addressed.

[126] One of our respondents reported reprint sales as representing up to 7-8% of revenues; but for most it was significantly lower than that. publishers On the other hand, it is reported that some 40% of the profit at *The Lancet* is generated by industry reprints ISMPP White Paper. *A multistakeholder discussion on open access and medical publishing* https://www.ismpp.org/assets/docs/Inititives/White_Papers/ISMPP_OA_White_Paper.pdf

[127] The American Society for Clinical Investigation reports that while the revenues are not large, they help to keep down the fees paid by authors: https://www.jci.org/articles/view/126932

# SECTION D:
# HYBRID JOURNALS

## D.1 KEY CONCERNS

Most publishers are keen to see a transition to OA, and they believe that hybrid journals, combined with 'read and publish' and similar agreements, provide an effective way to achieve a widespread transition to OA in a reasonable timescale. There is rapidly-increasing interest in negotiating and implementing such agreements, in the UK and many other countries. They are complex and time-consuming to put in place. But concerns about Plan S focus on

- the timescales for reaching such deals, but also for achieving a transition to full OA, which are both seen as unrealistic;
- the need for funding to meet the additional costs associated with a transition to full OA, in a context where the pace of change varies widely across different countries and institutions; and where changes to the current dual support regime for research will be required to ensure a successful transition in the UK;
- shifts in the incidence of costs between different countries and institutions, and the potential difficulties in achieving an appropriate balance between the interests of winners and losers;
- lack of clarity as to the precise requirements relating to transparency in costs and pricing, and their relationship to levels of service;
- the potential financial impact on learned societies, and their limited ability – along with smaller publishers – to engage in the complexities of transformative deals. Librarians too are worried that it will be simply impossible to put in place agreements with the hundreds of small publishers with which their authors publish articles;
- the need to take full account of the needs of the AHSS disciplines where high proportions of research are undertaken with no dedicated funding;
- the complexities and the costs associated with APC waivers for authors in the global south and elsewhere – including the UK- who lack access to research funding; and
- the need to take account of the needs of journals – including review journals – which include significant amounts of content in the form of commissioned commentaries, reviews and the like.

## D.2 CURRENT POLICIES

Neither RCUK nor the REF requirements make any reference to hybrid journals, although some concern about meeting the costs of APCs for the rising number of articles published in such journals by UK researchers has been expressed in the independent advice provided to Ministers on OA[128].

### D.2.1 Plan S

The Plan S principles published in September 2018 stated that the hybrid model was not compatible with the other principles, though it was not made clear why. The guidance on implementation published in November stated that publication in hybrid journals would be acceptable so long as they were covered by a "transformative agreement that has a clear and time-specified commitment to a full Open Access transition".[129] Such agreements should

- make their costs publicly available on a website to ensure transparency;
- be concluded by the end of 2021 and last for no more than three years; and

[128] Adam Tickell Open access to research publications - 2018 Independent advice https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/774956/Open-access-to-research-publications-2018.pdf

[129] http://scieur.org/plan-s; cOAlition S Making full and immediate Open Access a reality https://www.coalition-s.org/wp-content/uploads/271118_cOAlitionS_Guidance.pdf

- describe how the journal will move to full OA once the contract expires.

The guidance also made clear that mirror journals were not acceptable.

In responding in May 2019 to feedback, the cOAlition argued that it had seen no evidence to refute its view that "outside transformative agreements, hybrid journals have not delivered timely full and immediate Open Access"[130]. Nevertheless, it undertook to work with stakeholders to develop new models and mechanisms, especially for learned societies and smaller publishers. It also undertook to consider, where no "overarching" transformative agreement is in place, developing a framework for "transformative journals" which increase the share of OA content, offset payments for publishing against subscription costs, and commit to a transition to full OA in an agreed time-frame. It again emphasised that all such arrangements were temporary, and that funding to support publication fees in such journals would cease at the end of 2024.

**Summary: Current policies**

RCUK and REF policies currently set no requirements for hybrid journals. But Plan S would seem to require all journals to become, via some kind of transformative agreement, fully-OA by 31 December 2024.

## D.3 HYBRID JOURNALS AND THE TAKE-UP OF OA

### D.3.1 Volumes of hybrid journals

An analysis of SCOPUS data presented in the UUK report[131] showed a rise in the proportion of titles operating on a hybrid model, from 36.2% in 2012 to 45.0% in 2016 (Figure 3a). Of the titles in which UK authors publish, the rise was from 47.7% to 56.9% (Figure 3b). Examination of the titles most popular with UK authors in four subject areas showed that hybrids were the most popular category, especially in AHSS subjects (Figure 4). A later study by Bjork showed a similarly rapid rise in the number of hybrid journals from a sample of 20 major publishers, and calculated that as early as 2014, 73% of the journals of the big five publishers were hybrid[132].

[130] https://www.coalition-s.org/wp-content/uploads/PlanS_Principles_and_Implementation_310519.pdf; and https://www.coalition-s.org/rationale-for-the-revisions/

[131] https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2017/monitoring-transition-open-access-2017.pdf

[132] B-C Bjork, "Growth of hybrid open access, 2009-2016" *PeerJ* 2017.DOI 10.7717/peerj.3878

*Figure 3a Proportion of journals by publishing model, 2012 and 2016, global*

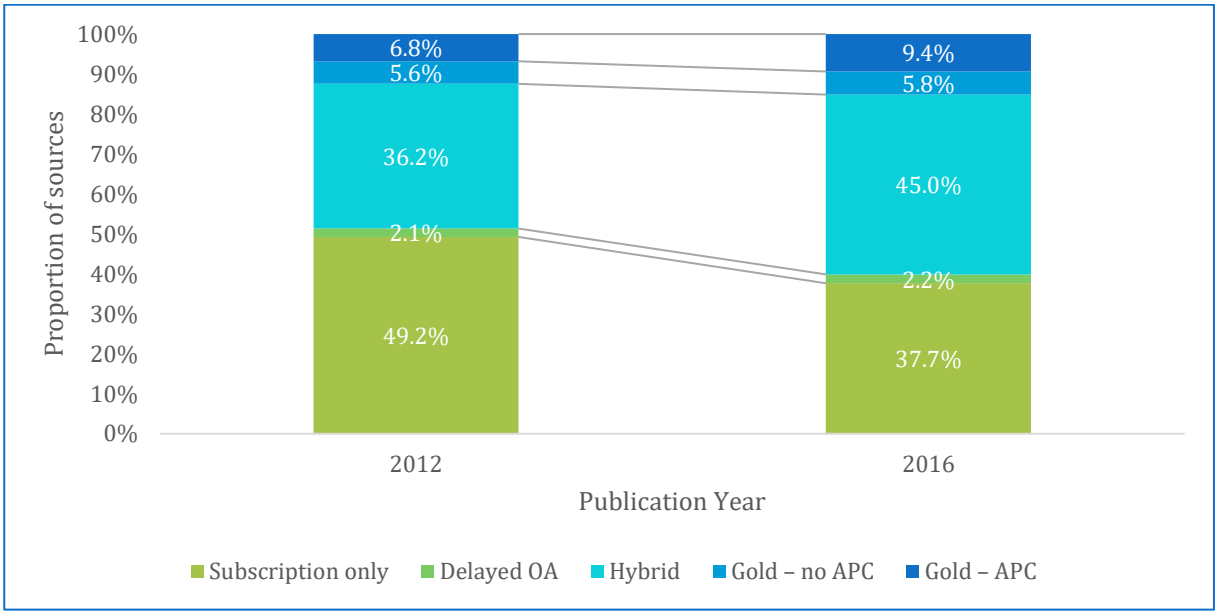



*Figure 3b Proportion of journals by publishing model, 2012 and 2016, UK*

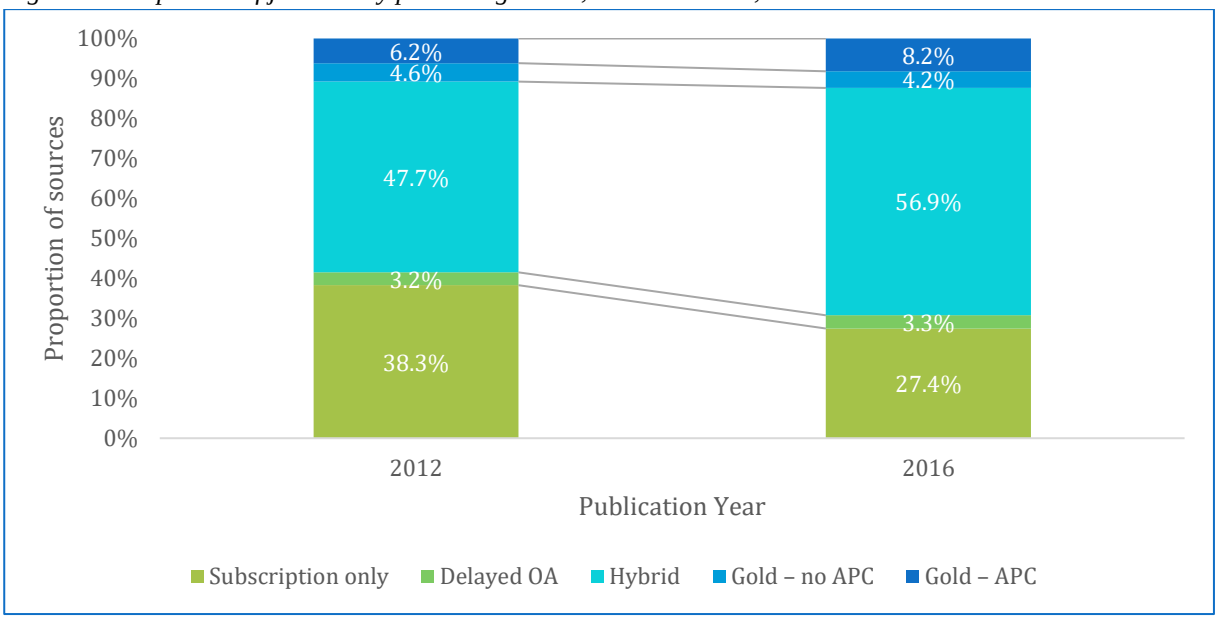
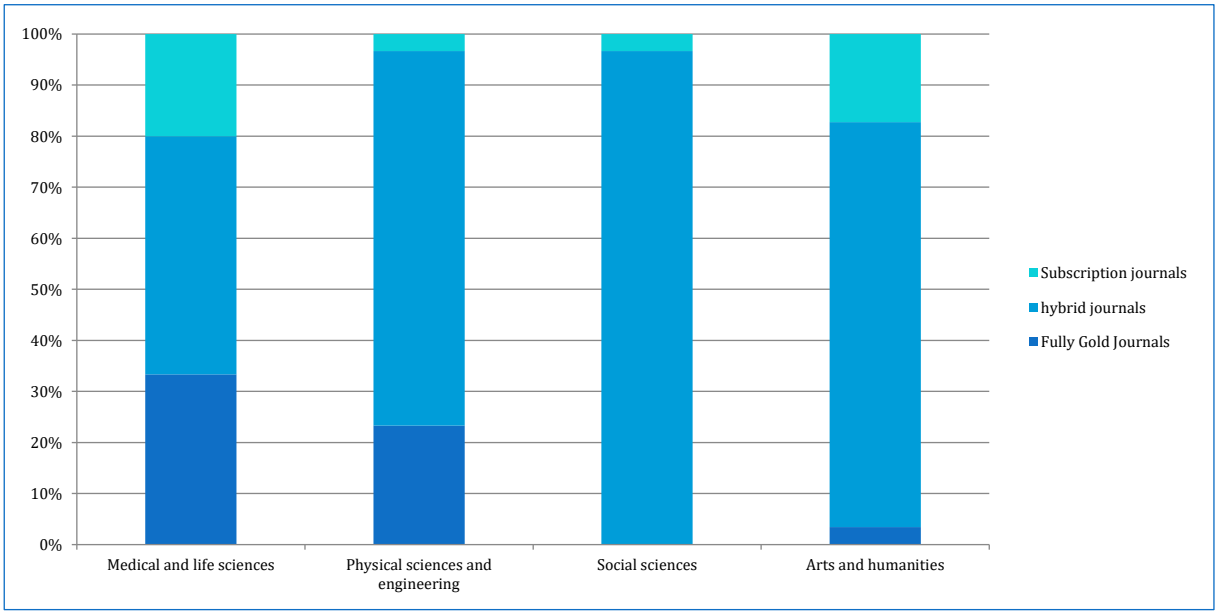


*Figure 4. Categories of journals popular with UK authors in four subject areas, 2013-15*




By contrast with hybrids, the availability of fully-Gold OA journals across many disciplines is much sparser, and the selection of suitable journals available to authors much more limited. An analysis of the journals indexed in Journal Citation Reports showed that across 227 disciplines and four JIF ranking quartiles, there was no Plan S-compliant fully-OA journal in 50% of the discipline/quartile segments; and that in 78% fewer than 10% were compliant[133].

### D.3.2 Volumes of OA articles in hybrid journals

Again using the SCOPUS database, the UUK monitoring report indicated that, between 2012 and 2016, articles published OA in hybrid journals rose from 0.8% to 3.8% of the global total of all published articles. But the introduction of funding from RCUK in 2013 led to a much sharper increase in the UK, from 2.7% to 15.4% (Figures 5a and 5b). It should also be noted that UK authors tend to choose more-highly-cited journals than the global average, which explains in part their preference for hybrid[134].

[133] Plan S Implementation Guidance: Submission from Springer Nature https://media.springernature.com/full/springer-cms/rest/v1/content/16462700/data/v1

[134] For an analysis, see the first UUK monitoring report, published in August 2015: https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Pages/monitoring-transition-open-access-2015.aspx

*Figure 5a. Proportion of articles published under different publishing models, 2012-16: global*

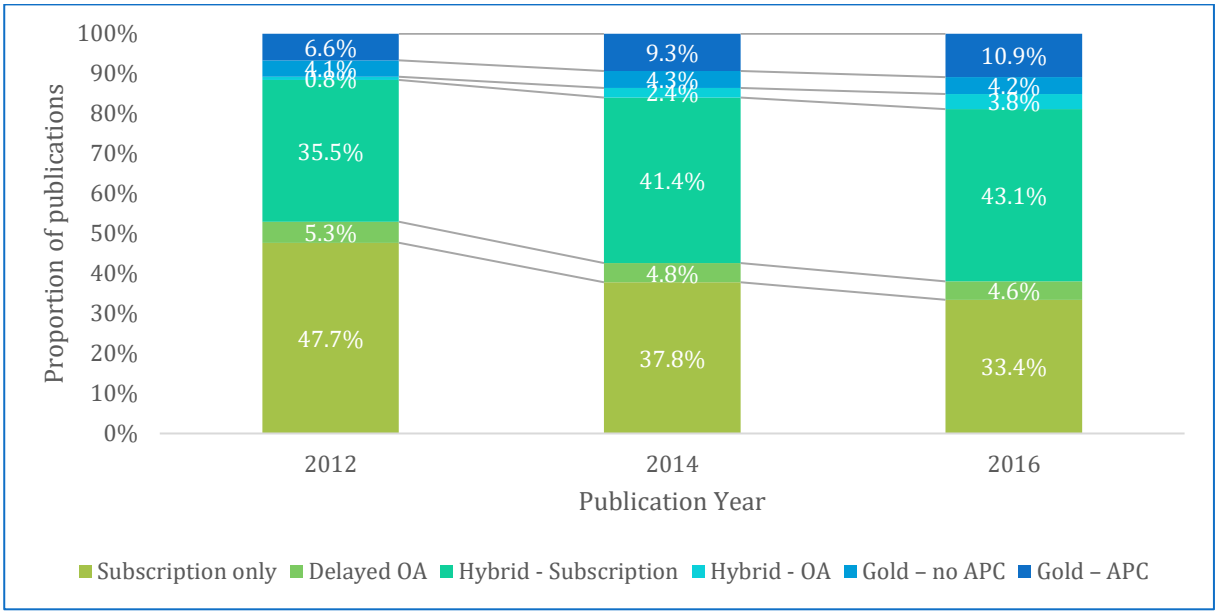
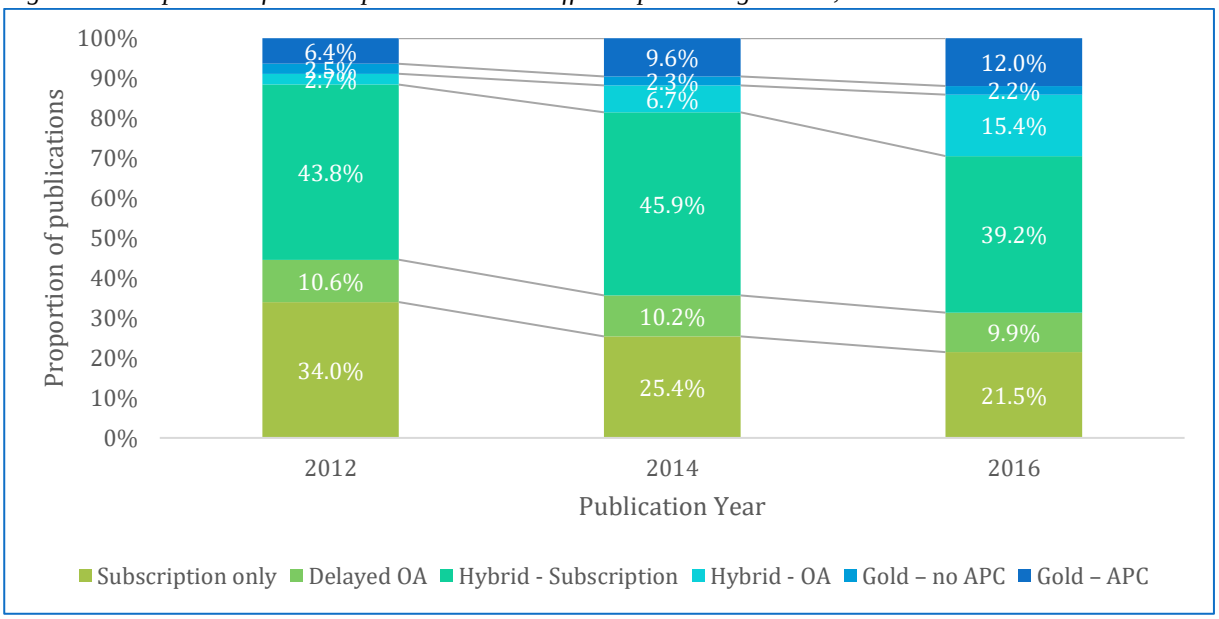



*Figure 5b. Proportion of articles published under different publishing models, 2012-16: UK*




A more recent study of articles published by authors who record funding by one of the UK Research Councils shows even higher rates of OA take-up, with 23% of all articles published OA in hybrid journals in 2018[135]. But many publishers have told us that the increase in take-up seen in the years following the introduction of the RCUK block grants has now flattened out.

Global estimates of the volumes of OA articles in hybrid journals in other recent studies are complicated by the introduction into the analysis of a new categorisation, Bronze OA, defined as articles free-to-read on the publisher's platform but with no clearly-identifiable licence. It is likely that this category includes some articles in hybrid as well as 'delayed OA' journals as shown in Figures 5a and b above.

[135] Unpublished publisher survey

Piwowar and her colleagues found hybrid OA represented 4.3% of a sample of articles in Web of Science published between 2009 and 2015, 8.3% of a sample accessed by users of the Unpaywall browser extension, and 3.6% of a sample across all publication years with a CrossRef DOI. Hybrid was much more prevalent in mathematics, (9.4%) biomedicine (8.1%) and clinical medicine (6.3%), with much smaller proportions in physics and chemistry as well as in social sciences. Across all three samples and disciplines, however, the study found much higher proportions of articles as Bronze OA. Martin-Martin and colleagues, using Google Scholar, found significantly lower proportions: only 0.5% for articles published in 2009, rising to 1.5% in 2014. Again, the proportion for Bronze OA is much higher - 12.6% for 2014; and the proportions are highest in the life sciences, and much lower in AHSS disciplines, with physics and chemistry intermediate between the two. Bosman and Kramer found a steep rise in hybrid OA articles from authors in Dutch universities in 2015-16: to around 15-17% in some universities[136]. Again, the evidence suggests that the proportions are highest in life sciences and medicine, and much lower in AHSS disciplines.

The increases seen in the Netherlands may be associated with the introduction of 'publish and read' and similar agreements: Springer Nature reports that OA articles in its hybrid journals rose by 20% in 2018, faster than in its fully-OA journals[137]. Evidence from individual publishers indicates that where 'read and publish' agreements are put in place, with effective administrative arrangements for the payment of APCs, rates of OA publishing in hybrid journals across the institutions and consortia rise fast, and across all disciplines, including AHSS, mathematics and other disciplines where Gold OA take up has up to now been low.

Evidence specific to the UK reinforces these conclusions. One medium-sized publisher reports that OA take-up under an offsetting agreement has reached 23%, as compared with 100% in a country where APCs are paid automatically under a centralised administration. Another reports that while nine in ten of Research-Council-funded papers were published in its hybrid journals, only just over a third were published OA. By contrast, following Springer Nature's Compact deal in the UK, the numbers and proportions of articles published in its hybrid journals with a UK corresponding author that were made OA rose sharply. In 2013, there were 694 Gold hybrid articles (12%); by 2107, this had risen to 3,908 (66%). The increase was across all disciplines, and in humanities, OA in hybrid journals rose from 10% to 80%[138]. Even with earlier offsetting agreements, the evidence from the publishers we spoke to is that the key driver of change is ensuring that Gold OA is a simple option for authors, with funding in place and no administrative barriers. Comparisons between agreements in different countries makes it clear to publishers that where arrangements are complex –as they have tended to be in the UK - OA take-up is held back[139].

### D.3.3 Author choice and the role of hybrid journals in Gold OA

Figure 5b shows that by 2016, hybrid journals accounted for the majority of Gold OA articles published by UK authors: 15.4% of all articles published, as against 14.2% for articles published in fully-Gold journals. This is in sharp contrast to the global picture, which shows 3.8% of all articles published Gold OA in hybrid journals, as distinct from 15.1% in fully-Gold journals. The global figures are strongly influenced by the USA and China, where take-up of Gold OA overall, and Gold OA in hybrids in particular, is significantly below global averages.

The six-fold increase in the take-up of Gold OA in hybrid journals in the UK between 2012 and 2016 – from 2.7% of all articles to 15.4% - is clearly the result of the availability of funding from RCUK, the Wellcome Trust and the other members of the Charities OA Fund (COAF), coupled more recently with the arrival of 'read and publish' agreements with publishers. As we noted earlier, UK authors show a higher-than average preference for publishing in journals with a high citation impact; and such journals are strongly represented among hybrids. Surveys repeatedly show that the key factor in authors' choice of the journal in which to publish is the match between their paper and the scope and quality of the journal. They also suggest that Gold OA publishing is driven by the ready availability of funding. The post-Finch

[136] H Piwowar et al "The state of OA: a large-scale analysis of the prevalence and impact of OpenAccess articles" *PeerJ* 2018 DOI 10.7717/peerj.4375; J Bosman and B Kramer, "Open access levels: A quantitative exploration using web of science and oaDOI data" http://dx.doi.org/10.7287/*peerj.preprints*.3520v1; A Martin-Martin et al "Evidence of open access of scientific publications in Google Scholar: A large-scale analysis, *Journal of Informetrics*, 12, 2018, 819-841

[137] Springer Nature, *Plan S Implementation Guidance: Submission from Springer Nature*, 2019.

[138] Springer Nature, *Gold Open Access in the UK: Springer Nature's Transition,* 2018. https://media.springernature.com/full/springer-cms/rest/v1/content/15717732/data/v7. More recently, Springer Nature reports that where its transformative agreements are mature, well over 70% of authors are now publishing OA. Steven Inchcoombe, A faster path to an open future, https://www.springernature.com/gp/advancing-discovery/blog/blogposts/a-faster-path-to-an-open-future/16705466; *Plan S implementation Guidance: Submission from Springer Nature,*

[139] Information from individual publishers and from interviews.

funding regime enabled UK authors to publish in high-quality hybrid journals and to make their articles OA; and increasing numbers of them have taken that choice. Nevertheless, the publishers who have been able to provide data for us report that OA take-up among authors who indicate that they have received funding from UKRI has not reached 50%. It appears that take-up has been impeded by the often-complex administrative arrangements surrounding access to the funds to pay APCs, and by some universities' reluctance to pay APCs for publishing in hybrid journals[140]. Offsetting and 'read and publish' agreements, on the other hand, both raise awareness of OA and increase authors' appetite for it[141].

Where articles *have* been published OA in hybrid journals, evidence suggests that they gain strong benefits. The UUK monitoring report found that OA articles, and especially those in hybrid journals, were downloaded more frequently than non-OA articles. Piwowar and colleagues found the average number of citations for hybrid Gold articles 31% higher than the average for all articles; and notably higher than for articles in fully-Gold journals, which were 17% below the average. Analysis of articles indexed in SCOPUS shows a similar pattern, with Gold OA articles in hybrid journals showing on average the highest citation impact, and those in fully-Gold OA journals the lowest[142]

A Springer Nature study of samples of articles published in its hybrid journals showed that OA articles across all subject fields are downloaded four times more often than non-OA articles, and that the advantage remained even after controlling for impact factor, institutional ranking and other factors. It also found that OA articles attracted on average 60% more citations, with the advantage again shown across all subject areas. Similar advantages were shown also in terms of mentions in news and policy documents, and in Altmetric scores[143]. There are too many confounding factors to make similar comparisons between OA articles in hybrid and fully-Gold journals. The evidence does suggest that hybrid journals have a critical role to play in the transition to OA; but since not all authors, when given the choice, opt for OA, there is clearly more to be done to promote the benefits of OA.

**Summary: Hybrid journals and the take-up of OA**

Hybrid journals have become the dominant publishing model in recent years, and they are among the most popular journals with authors, especially in the UK. Take-up of the OA option has increased faster in the UK than in most other countries, though it has been held back by complex administrative arrangements, and by lack of funding in some cases. Where 'read and publish' agreements have been put in place, take-up has increased rapidly. And OA articles in hybrid journals enjoy especially high rates of downloads and impact.

## D.4 COSTS AND FUNDING

For publishers, hybrid journals involve a change from a single main revenue source to two: subscription fees and APCs. For universities and other research institutions they involve a parallel shift from one category of cost to two. That carries implications for funders as well as universities. In the UK, universities typically pay for subscriptions from their core revenues, typically derived in the main from tuition fees along with block grants from HEFCE in England and the parallel bodies in Northern Ireland, Scotland and Wales. APCs – for fully-Gold as well as hybrid journals - represent a new additional cost. Following the Finch Report, the Research Councils became involved in funding scholarly communications for the first time, by providing block grants to universities to meet the costs of their new policies: mainly but not solely the costs of APCs.

The Finch Report accepted that costs would rise during a transition to OA, especially since UK authors produce a high proportion of the global total of articles (6.3% in 2014, though the proportion is falling as China and other nations increase their output faster than the UK). The UUK monitoring report found in 2017 that for a group of ten universities,

[140] D Kingsley and P Boyes "Who is paying for hybrid?" *Unlocking Research Blog*. October 24th 2016. https://unlockingresearch-blog.lib.cam.ac.uk/?p=1002

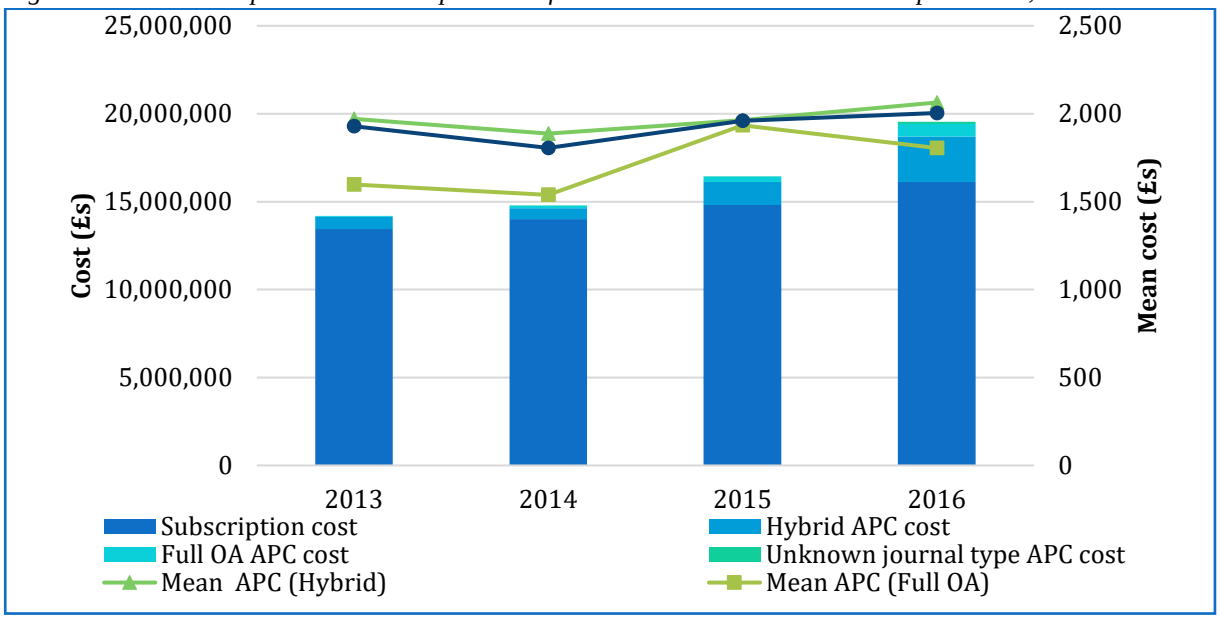
[141] Research Consulting, *The Role of Hybrid Open Access in Extending Author Choice*, January 2018

[142] Information from publisher interview

[143] Springer Nature White Paper, *Assessing the Open Access Effect for Hybrid Journals.* See also the National Library of Sweden's Evaluation of offset agreements – report 4: Springer Compact

subscription expenditure with seven publishers rose by 20% between 2013 and 2016, from £13.4m to £16.1m, while their expenditure on APCs rose more than fourfold, from £758k to £3.3m, with most of those sums attributable to hybrid journals; and total expenditure on APCs and subscriptions together rose by 32%, from £14.1m. to £18.7m (Figure 6). Expenditure on APCs represented 5% of overall expenditure on journals in 2013, but rose to 18% in 2016. The report notes that these figures actually under-estimate the amounts and proportions of expenditure represented by APCs, for three reasons: first, they do not include APCs paid to Gold OA-only publishers; second they exclude APC payments made from other than centrally-managed funds (often termed 'APCs in the wild'); and third, they do not take full account of APC payments made under several offsetting and 'read and publish' agreements *(see D5 below).*

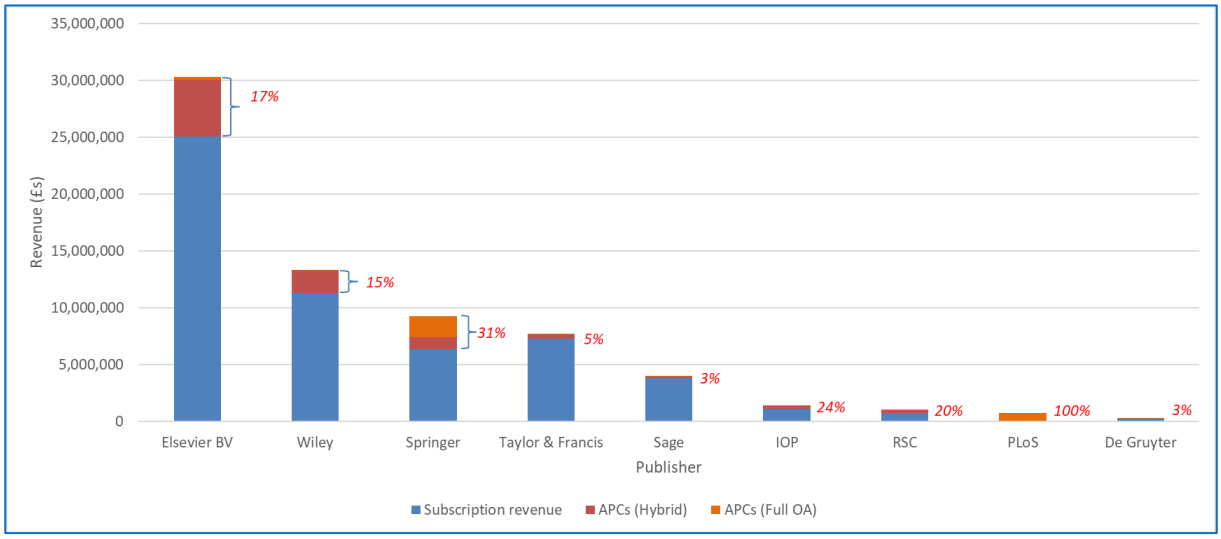
*Figure 6. Total subscription and APC expenditure for ten UK universities with seven publishers, 2013-16*




As is well-known, APCs tend to be higher for articles in hybrid journals than for fully-Gold journals. The average amount paid by UK universities for hybrid journals in 2016 was £2,099, as compared with £1,621 for fully-OA journals. But the gap between them has narrowed, as APC prices for fully- Gold journals rose between 2013 and 2016 in real terms by 8% a year, while for hybrids they rose by 2.6%. The reasons for this are not clear; it may reflect in part constraints on APC prices arising from offsetting and related agreements. Many of the publishers we spoke to referred to the need to amend and simplify their pricing structures.

The pattern of payments from UK universities to different publishers reflects the structure of the publishing industry, with more than half of all APC payments going to the three largest publishers. Elsevier, Springer Nature, and Wiley. The total of APC and subscription payments from 36 UK universities to selected publishers is shown in Figure 7.

*Figure 7. Subscription and APC payments by 36 UK universities to selected publishers, 2016*




### D.4.1 Trends in costs for the future

The increases in expenditure seen in recent years cause much concern to universities and to funders. They result from the sustained increases in numbers of journals and articles; increases in real terms in the prices of subscriptions and of APCs; the high rate of publication of articles by UK authors; and increases in the take-up of Gold OA at a rate significantly higher in the UK than in many other countries. Professor Tickell's advice to Ministers compiled in late 2017[144] included a number of projections of the cost implications for universities and funders of the transition to OA to 2028. The projections were based on four sets of scenarios, starting from Jisc estimates of £180m spent by UK universities on subscriptions and £65m on APCs in 2016 (ie a total spend of £245m):

- a continuation of then-current trends in the costs of subscriptions and APCs, where the estimated expenditure would reach £427m in 2028, and £818m if the UK were to achieve 100% take-up of Gold OA (figures in 2016 prices) ;
- an assumed fall in subscription expenditure (either through cancellations or by downward pressure on prices) as the take-up of OA increases, where estimates ranged from £659m to £753m in 2028;
- an assumed reduction in then-current rates of increase in APC prices, in response to concerted pressure from funders and universities (for example by imposing caps on the levels of APCs they would fund), where estimates ranged from £490m to £652m in 2028; and
- significant increases in the adoption of offsetting or 'read and publish' agreements, where estimates ranged from £336m to £367m in 2028.

Modelling of this kind is clearly imprecise, and different assumptions would have produced different results. But the report concluded that adoption of 'read and publish' agreements would lead to much lower rates of increase than those shown in the other three sets of scenarios.

### D.4.2 "Double dipping" and transparency

The issue of "double dipping" has played a prominent part in discussions relating to the costs associated with hybrid journals, starting from the Progress Review of the Finch Report in 2013 and David Willetts' response to it, which called for "sustainable funding models that establish a relationship between the payment of APCs and ….subscription fees"[145] Many librarians and funders see the payment of APCs for publication in journals to which they have already paid a subscription as *ipso facto* representing double dipping, particularly when they see no evidence of a fall in subscription prices. At a time when institutional – and especially library – budgets are under pressure, this has fed into the mistrust

[144] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/774956/Open-access-to-research-publications-2018.pdf

[145] Letter from David Willetts, Minister for Universities and Science to Dame Janet Finch, 23 January 2014

between libraries and publishers to which the British Academy has drawn attention[146]. As a result, many funders and libraries have excluded payment for Gold OA in hybrid journals from their OA policies[147].

All the publishers we interviewed state unequivocally that they do not double dip: that they *do* take account of the proportions of OA articles when they set subscription prices for hybrid journals. The problem is that where – as in most hybrid journals – the proportions of OA articles remain relatively low, any effect on subscription prices is often hard to detect: any reduction may be overtaken by overall increases in the volumes of articles published, and/or hidden for individual journals by big deals. In some cases, subscription prices have fallen, but it is essential that publishers should strengthen their efforts to make their pricing policies – and their effects on individual journals and packages from year to year – as transparent as possible[148].

### D.4.3 Flipping

The flipping of subscription-based and, more particularly, hybrid journals to fully OA is relatively under-studied. The Open Access Directory lists some 280 journals that have flipped, roughly half of them from a range of publishers, others from learned societies and agencies such as the Spanish Research Council CSIC. On the other hand, a recent study identified 152 journals that have made a reverse flip from OA to a subscription model[149]. But beyond a few case studies, there is little information in the public domain about the motivations and the mechanics of flipping, though some of our interviewees told us of increasingly-sophisticated analytical tools to help them in identifying candidates for flipping, covering issues such as trends in submissions and publication numbers, subscription and APC income and waivers, other sources of revenue, and possible changes in costs [150]. The publishers we interviewed acknowledged that the numbers remain small, though it may well be that the rate of flipping will rise as a result of 'read and publish' agreements now being put in place.

**Summary: Costs and funding**

The move towards OA in the UK has been accompanied by a sharp rise in costs for universities. The rise in expenditure on APCs for articles in hybrid journals has been especially rapid, but there have been few flips of hybrid journals to full-OA. Librarians and other commentators have become increasingly concerned about double dipping, especially in the payments they make to the four major publishers. Projections of current trends in expenditure over the next decade show further sharp increases; but they also suggest that read and publish agreements would provide the most effective constraint on further rises in costs.

## D.5 OFFSETTING AND RELATED AGREEEMENTS

Following David Willetts' open letter to Dame Janet Finch in 2014 referred to above, Jisc Collections negotiated offsetting agreements with a number of publishers in UK; and related agreements have been implemented in other countries including Austria, Germany, the Netherlands, Norway and Sweden. The Jisc agreements reflected concerns from institutions about rising costs, and they vary in nature and scope, from vouchers for the payment of (discounted) APCs based on total spend in any one year, to the offsetting of expenditure on APCs in one year against subscription expenditure the next year, to the Springer Compact agreement under which all articles published in its hybrid journals can be made OA. Analyses of the effect of seven of the Jisc agreements – with De Gruyter, Institute of Physics, Royal Society of Chemistry, SAGE, Springer, Taylor and Francis, and Wiley – show considerable variation in the numbers of

[146] R Darley, D Reynolds and C Wickham, *Open Access journals in humanities and social science*, British Academy, 2014

[147] Kingsley, D. and Boyes, P. (2016) Who is paying for hybrid? *Unlocking Research Blog*. October 24th 2016. https://unlockingresearch-blog.lib.cam.ac.uk/?p=1002

[148]Plan S Implementation Guidance: Submission from Springer Nature

https://media.springernature.com/full/springer-cms/rest/v1/content/16462700/data/v1; An HSS Perspective on Plan S, https://plansinhss.home.blog/

[149] L Matthias et al "The Two-Way Street of Open Access Journal Publishing: Flip It and Reverse It" *Publications*, 2019, 7,23

[150] For a study of some of the motivations and mechanics, see D J Solomon et al, *Converting Scholarly Journals to Open Access: A Review of Approaches and Experiences*, 2016 http://nrs.harvard.edu/urn-3:HUL.InstRepos:27803834

Gold OA articles covered, the amounts 'offset', and the overall cost savings. The Springer Compact agreement implemented in 2015 was the first "read and publish" agreement in the UK, and has had the most impact[151], with dramatic increases in the numbers of articles published Gold OA in hybrid journals already noted, and consequent high levels of 'savings' in terms of amounts that would otherwise have been charged in APCs[152].

Both publishers and librarians report that offsetting agreements are complex to administer, and our interviewees acknowledge that this has limited the impact of offsetting in increasing the take-up of OA in the UK: once authors have decided to publish in a hybrid journal, they have to go through a number of hoops before they can secure the funds to enable them to publish their article Gold OA. 'Read and publish' agreements like the Springer Compact are in part a response to these problems, since they involve many fewer hoops for all parties. The exclusion of fully-OA journals[153], however, acts as a further limit on agreements' effectiveness as mechanisms for transition to an all-Gold-OA future.

From a university perspective, offsetting agreements have not been wildly popular. Although publishers can point to cost savings for universities compared to what they would have paid in APCs if the agreements had not been in place, universities in fact saw increases in overall expenditure, coupled with some complex administration[154]. Moreover, the agreements in some senses served to bring together librarians' concerns about hybrid journals and about big deals. The fear is that the agreements may exacerbate the risk of 'lock-in' associated with big deals, in a context where the largest publishers are also the largest recipients of APC payments, and up to 80% of APCs in the UK are paid to hybrid journals[155]. Some librarians also complain about lack of transparency in at least some cases as to the financial mechanics in the agreements, and there was – and remains – a degree of confusion as to how they operate in practice. There were also concerns about cost allocation between universities, since the agreements were based for the most part on historical print spend going back to the 1990s, with large variations between similar universities as to the amounts paid for the same e-journal collection. Such variations are even harder to justify during a transition towards OA. All these concerns have led to Jisc drafting a set of Principles for Offsetting Agreements, and also to the broader Joint Understanding on Offsetting issued by the European members of the Efficiency and Standards for Article Charges (ESAC) initiative[156]. More recently, Jisc Collections has adopted objectives seeking transformative agreements that enhance the benefits of its earlier pilot agreements, with an emphasis on costs, improved administrative arrangements, and support for funder requirements[157].

But there are challenges from publishers' perspectives too. Offsetting and related agreements have so far been reached in the main by larger publishers, and smaller publishers worry that they may lead to more market concentration. Moreover, such agreements may not even be feasible for smaller and learned society publishers, where small movements in revenue have a much more significant impact than for their larger competitors. But many of the publishers we interviewed expressed concerns that funders' policies and universities' expectations on OA are not being fully funded; and more than one found it difficult to reconcile the demand for discounts on subscriptions world-wide to take account of the take-up of OA in subscription journals (thus avoiding accusations of double-dipping), coupled with discounts on APCs for individual universities and consortia to enable them to increase the number of OA articles they publish[158].

[151] It is important to stress that the agreement does not cover Nature or BioMed Central titles.

[152] S Lawson, *Report on offsetting agreements: evaluating current Jisc Collections deals*, Year1 – evaluating 2015 deals; Year 2 – evaluating 2016 deals; and Year 3 – evaluating 2017 deals. The Royal Society of Chemistry agreement ended in 2016, and the De Gruyter agreement started in 2016. Agreements with OUP and CUP were implemented in 2018.

[153] The Wiley agreement with Jisc Collections does include fully-OA journals

[154] See the Jisc Open Access Good practice project at https://www.jisc.ac.uk/rd/projects/open-access-good-practice

[155] K Shamash, *Article processing charges (APCs) and subscriptions*. Jisc,, 2016 https://www.jisc.ac.uk/reports/apcs-and-subscriptions

[156] Jisc Collections, *Principles for Offset Agreements*,2014,: https://www.jisc-collections.ac.uk/Global/News files and docs/Principles-for-offset-agreements.pdf; ESAC, *Joint Understanding of Offsetting*, 2016: http://esac-initiative.org/joint-understanding-of-offsetting/

[157] L Earney, "Offsetting and its discontents: challenges and opportunities of open access offsetting agreements", Insights, 30 (1) 2017; L Earney, "National licence negotiations advancing the open access transition: a view from the UK", Insights, 31, 2018

[158] Negotiations between Elsevier and the consortium of German institutions known as DEAL foundered at least in part on this latter point. See N Fowler and G Meijer "What's the big DEAL and why is it so difficult to reach? . *Elephant in the Lab* . DOI: https://doi.org/10.5281/zenodo.1404031

The issues that have arisen to date in offsetting and related agreements are being addressed in the new 'read and publish' agreements now being negotiated and implemented in increasing numbers not only in the UK but across Europe and in North America too[159].

**Summary: Offsetting and related agreements**

A number of offsetting agreements have been implemented in the UK since 2013, and they have helped to advance OA and to limit cost increases. But their impact has been limited by complex administrative arrangements. They have also given rise to concerns that they may exacerbate the 'lock-in' associated with big deals, and that they may not be feasible for small publishers. They also bring to the fore issues relating to fairness in the allocation of costs between institutions.

## D.6 TRANSFORMATIVE AGREEMENTS AND PLAN S

It will be clear from the discussion of offsetting agreements above that 'transformative agreements' predate Plan S. Many publishers see them as the most effective way to achieve a widespread and rapid transition to OA, especially if they automatically identify the articles relevant to the agreement and ensure that publishing costs are met centrally, without authors having to do any additional work beyond the normal submission process.

The European Universities Association recently reported that two-thirds of consortia would like to have APCs and subscriptions covered by a single agreement, and pointed to several benefits in accelerating the transition to OA, helping to control costs, and improving administrative efficiency. But like others it also drew attention to some drawbacks in "sustaining the status quo, dominated by large publishers" and "reinforcing publishers' profits"[160] LIBER, the Association of European Research Libraries, issued a series of five principles for use in negotiating such agreements in 2017, and a related set of priorities was identified by the California Digital Library in 2018. [161] At European level, the ESAC initiative based at the Max Planck Digital Library has issued a series of Guidelines for transformative agreements[162], and currently (August 2019) records 49 such agreements in place, with 17 publishers. The agreements cover a number of European countries, plus three in the USA (with Iowa State University and the California Digital Library), but only one in the UK, the Springer Compact agreement with Jisc Collections.

Jisc is in active discussions with a number of publishers in the UK, and it is using as the basis for those negotiations the *Requirements for transformative Open Access agreements* issued in August 2018[163] . These set out much more detailed requirements than the more generic LIBER principles or ESAC Guidelines. They specify that agreements must enable the UK to publish all articles OA; provide a commitment to move away from the subscription/hybrid model within an agreed timescale; and abandon pricing models based on historic print spend. They also seek agreements at a cost "similar" to that being paid previously under the subscription model, with price increases linked to indicators such as the CPI. Further requirements relate to transparency, improvements in service and workflows, and compliance with funders' mandates.

Jisc's requirements, particularly on costs, are seen as exacting for many publishers, and in many respects they anticipate Plan S. All the publishers we spoke to are seeking to negotiate and implement transformative agreements; and some of them stress that they are working towards becoming fully-OA publishers. But negotiations in the UK in particular are now affected by uncertainties surrounding not only Plan S but also the UKRI Review. Many publishers report that these uncertainties are themselves serving to delay the negotiations. Of their very nature, agreements of this kind are complex and take considerable time to negotiate. Publishers have to take into account comparisons with existing agreements (both subscription-based ones and other new transformative agreements); the impact both on their overall portfolio of

[159] The agreement between Springer Nature and Projekt DEAL was announced as this report was being written.

[160] R Morals et al *2019 Big Deals Survey Report: An Updated Mapping of Major Scholarly Publishing Contracts in Europe*, EUA 2019

[161] https://libereurope.eu/blog/2017/09/07/open-access-five-principles-for-negotiations-with-publishers/; https://libraries.universityofcalifornia.edu/groups/files/slasiac/docs/NegotiatingJournalAgreementsAtUC_ACallToAction_final.pdf

[162] https://esac-initiative.org/about/transformative-agreements/guidelines-for-transformative-agreements/

[163] https://www.jisc-collections.ac.uk/Transformative-OA-Reqs/

journals and on specific groups of journals; and the potential impact on their publishing partners - especially learned societies – which can be especially complex.

## D.7 PUBLISHERS' CONCERNS

### D.7.1 Timescale

One of the key requirements of Plan S is that agreements must be implemented by 1 January 2021and that funding for publication fees covered by them will cease on 31 December 2024. The expectation, though not explicitly stated, seems to be that all journals covered by such arrangements should have become fully-OA by that date. Otherwise the only compliant publication route for authors supported by Plan S funders would be Green OA with no embargo and a CCBY licence, which is unacceptable to publishers. But none of those to whom we have spoken believes that it is feasible to flip all their subscription-based and hybrid journals to full OA within five years. Articles from authors supported by Plan S funders represent between four and eight per cent of all publications globally[164] (estimates vary): even if all of them were to adopt OA publication, many journals would not reach near the point where flipping to full OA would be feasible.

As many publishers have pointed out, the pace of transition to full OA is not under their control: it is because only a minority of funding bodies across the world have implemented policies to support Gold OA that only a small number of journals have so far been able to flip to OA. Most publishers say that they cannot commit to flipping their journals on the basis of agreements with consortia in just a few countries, representing only a small proportion of the journals' authors[165].

Librarians and others have made similar points. The 'read and publish' agreements they are negotiating with publishers now do seek to ensure that over time, all the articles produced by authors at their institutions can be published OA in journals covered by the agreement. But that will not mean that all those journals will be flipped to fully-OA, since some of them will attract few if any articles from cOAlition S funders. Transformative agreements can reasonably expect within the agreed timetable to reach fully-OA publishing for the institutions they cover; but unless cOAlition S brings on board all the other significant funders of research across the world, they cannot reasonably expect to convert all journals to full-OA[166].

### D.7.2 Costs and funding regimes

In 2015, Ralf Schimmer and his colleagues at the Max Planck Digital Library issued a White Paper arguing that there is enough money in the subscription-based system to meet the costs of a system based on full OA[167]. Their estimates of subscription income may be questioned, but even if they are correct, their analysis ignores a number of key issues, including the highly-varying implications of a fully-Gold world for different countries, consortia and institutions, depending on whether they are net producers or consumers of journal contents. Crucially also, they ignore the costs of transition: for as long as there are journals and articles published on a subscription basis, the costs of transformative agreements will tend to be higher than those for subscription-only agreements. Agreements can provide, on top of a subscription fee, for APCs at often highly discounted levels; but only in very exceptional circumstances could publishers contemplate a 100% discount on all the articles to be produced by an institution over the term of an agreement. Moreover, if journals are to flip or to be replaced by new fully-OA journals, there would be a gap in revenues as subscription income terminated one year, and APC income built up the following year; or as new journals

[164] ISI estimates that Plan S funders supported 6.4% of 2017 papers indexed in Web of Science, but other estimates vary. N Quaderi et al *The Plan S footprint: Implications for the scholarly publishing landscape* ISI 2019

[165] See, for example, Plan S Implementation Guidance,: Submission from Springer Nature. https://media.springernature.com/full/springer-cms/rest/v1/content/16462700/data/v1*;*

How to make Plan S more likely to succeed: IOP Publishing – input to consultation on implementation guidelines https://zenodo.org/record/3249906/files/285_Plan%20S.pdf?download=1*;*

Plan S Consultation Response from the Society Publishers' Coalition https://zenodo.org/record/3249906/files/456_Plan%20S.pdf?download=1

[166] Response to Guidance on the Implementation of Plan S from Imperial College London, https://zenodo.org/record/3249906/files/358_Plan%20S.pdf?download=1

[167] R Schimmer et al *Disrupting the subscription journals' business model for the necessary large-scale transformation to open access. A Max Planck Digital Library Open Access Policy White Paper*. https://dx.doi.org/10.17617/1.3

were created with substantial up-front costs and no established market[168].The amount by which the costs of transformative agreements exceed the costs of current subscription agreements – after allowing for inflation, the rising volumes of articles and other factors – is of course at the heart of negotiations between publishers, consortia and institutions[169].

The fourth principle of Plan S provides that "Open Access publication fees are covered by Funders or research institutions", and that is welcome to publishers. But there are complex funding issues to address in the UK. As we noted earlier, the dual support system provides two main sources of public funding to support research in UK universities: QR block grants for universities, which are un-hypothecated; and grants for specific projects provided by the Research Councils. Since 2014, RCUK has also provided block grants to universities to meet the costs of its OA policies; and more recently s the members of COAF have also provided dedicated funding for the same purpose. But university budgets – and more especially library budgets - are under pressure, and librarians at research-intensive universities in particular say that they have insufficient funds to meet the costs of OA for all the articles their staff produce. The current funding mix - QR, Research Council block grants and other sources of funding - fits at best uncomfortably with any rapid implementation of transformative agreements. If fully-Gold OA publishing were to become the norm for UK universities, then presumably QR would become the main source of funding; but universities would require increases in QR to meet the additional transitional costs to which we have referred, and levels of QR would need to be adjusted between institutions (see below). Questions that have already been raised about how and to whom universities allocated those funds would become more pressing[170]. But until the increases and adjustments could be made, the current unhappy and inefficient mix of QR and Research Council funding would have to be maintained.

### D.7.3 Winners and losers

Many publishers have pointed out that a shift from reader-payment models to author-payment necessarily involves a shift in the overall burden of costs: some countries, consortia and institutions will pay more, while others will pay less. And the pattern of winners and losers will be complex. Research-intensive countries like the UK, along with the USA, China, Germany and others, will tend overall to pay more than they do at present (and many publishers point out that the additional costs in China will be especially significant). Countries with lower research intensity will tend to pay less.

At consortium level, much will depend on the comparative success of individual consortia in negotiating reader-payment agreements in the past. Consortia with relatively low-cost agreements at present may well find that transformative agreements come with significant increases; and the shifts are likely to be amplified by the requirement for transparency.

The experience of individual universities within countries and consortia will also vary considerably. As the number of transformative agreements increases, and more content is published OA, it is far from clear that the less-research-intensive universities will be willing to contribute towards the costs of publishing by the research-led institutions. The moneys currently spent on subscriptions by the less-research-intensive universities – as well as by companies and other organisations – will tend to disappear from the system. That will increase the cost pressures on the research-intensive universities[171].

In the UK, Russell Group universities, and others with high volumes of research outputs, will pay more as the balance in transformative agreements between read and publish costs shifts in favour of the latter. And it is not clear that funds formerly paid in subscriptions to read will transfer to them from other institutions. The shift away from historic spend

[168] T Green, "Is open access affordable? Why current models do not work and why we need internet-era transformation of scholarly communications". *Learn Publ*. 2019; 32(1): 13–25; Steven Inchcoombe, 'The Best Laid Plan S…', *The Bookseller* (blog), 10 October 2018, https://www.thebookseller.com/blogs/best-laid-plan-s-87201; M McNutt *"Plan S" falls short for society publishers—and for the researchers they serve*

PNAS February 12, 2019 116 (7) 2400-2403 https://doi.org/10.1073/pnas.1900359116

[169] The Springer Compact agreement in Sweden is estimated to have cost between 42% and 51% more compared with what would have been paid under earlier agreements with Springer. National Library of Sweden *Evaluation of offset agreements – report 4: Springer Compact*

[170] See, for example, Academy of Social Sciences response to Plan S, and UKRI implementation https://zenodo.org/record/3249906/files/512_Plan%20S.pdf?download=1

[171] T Green, Are we being wilfully blind about the transformation that's needed in scholarly publishing? 24 May 2019, https://medium.com/swlh/are-we-being-wilfully-blind-about-the-transformation-thats-needed-in-scholarly-publishing-d0bfb61d1f05

on print journals to a more rationale cost allocation model between institutions will further complicate the picture of winners and losers[172].

### D.7.4 Transparency and price caps

The Plan S Principles call for transparent costing and pricing, with information on publishing costs and how they affect publication fees being openly available on journal websites. The revised guidance issued in May 2019 also retains the possibility that funders may cap the amounts they pay for publishing services. Some commentators have questioned the legality of requiring transparency on costs[173]. Most of the publishers we have spoken to, however, point to increased transparency over recent years on matters such as article volumes, list prices, and adjustments to those prices when subscription article volumes decline. There are also moves to greater transparency as to the newer read and publish agreements.

The precise nature of the Plan S requirements to be met by 1 January 2020 is not yet clear, but most publishers are content to enhance transparency by providing more generic information about how their costs and prices relate to the different kinds of services they offer. But some publishers and other commentators point to potential difficulties and problems. Many of the costs of publishing are indirect and substantially influenced by unit volume. Hence cost-per-article is often a highly-misleading way of characterising publishers' and journals' operations. Different publishers and journals have very different cost structures. There is also the risk of providing perverse incentives for publishers to publish more articles, to drive down costs, and to reduce standards of peer review and quality control. Price caps would intensify those risks. High-quality journals would find it impossible to sustain the full range and depth of services they provide at present, and the result would be a homogenisation of the journal publishing landscape[174].

### D.7.5 Learned societies and small publishers

Learned society publishers play an important role in the UK scholarly publishing landscape. Most of them have a small number of prestigious journals that publish high-quality articles that have gone through rigorous editorial and production processes. Volumes are low and costs tend to be high. Societies are close to their communities and take pride in publishing what are among the most reputable journals in their respective fields.

The two UUK monitoring reports in 2015 and 2017 identified 280 UK learned societies that publish scholarly journals, and showed that net publishing income constituted a significant proportion of their overall revenues[175]. The analysis of 25 societies in the 2017 report showed that societies vary widely in size, publishing revenues and margins, with the largest societies in STEM disciplines, while the smaller ones in AHSS disciplines tended to be more dependent on publishing revenues. It also showed that while publishing expenditure was tending to rise, margins were falling; and that some societies were showing signs of financial strain. Many societies were seeking to diversify their income streams in response to perceived risks; and while most of them remained in reasonable health, they were aware that a period of sustained revenue growth (in the main from publishing) was coming to an end.

Societies' key concern arising from Plan S and the UKRI Review is whether there will be sufficient funding for all authors wishing to publish in their journals to pay APCs at levels that will sustain their high-quality publishing as well as the other activities to support their research communities[176]. Given the importance of societies to the UK research and scholarly communications ecology, there have been some suggestions that UKRI might consider funding them

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[172] L Earney, "Offsetting and its discontents: challenges and opportunities of open access offsetting agreements", *Insights*, 30 (1) 2017

[173] M P Eve Response to CoAlition S Implementation Guidelines https://eve.gd/images/Eve%20-%20Plan%20S%20Response.pdf

[174] M McNutt "Plan S falls short for society publishers—and for the researchers they serve"

*PNAS* February 12, 2019 116 (7) 2400-2403 https://doi.org/10.1073/pnas.1900359116;

Geological Society response to Plan S, https://zenodo.org/record/3249906/files/241_Plan%20S.pdf?download=1

[175] https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Pages/monitoring-transition-open-access-2015.aspx; https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2017/monitoring-transition-open-access-2017.pdf

[176] The Academy of Social Sciences reports that for a sample of societies representing the core disciplines of the social sciences, publishing represents 40-50% of their revenues. Academy of Social Sciences response to Plan S, and UKRI implementation https://zenodo.org/record/3249906/files/512_Plan%20S.pdf?download=1. See also the Association of American Publishers Feedback to cOAlition S, which reports that for some of learned societies, publishing accounts for upwards of 90% of their revenues, and that "it would be incredibly difficult to shift from their current broad revenue base of journal subscribers to a far narrower revenue base of authors, and this is particularly so in fields where authors do not traditionally have access to funds to cover publication costs" https://zenodo.org/record/3249906/files/298_Plan%20S.pdf?download=1

directly; but direct funding by Government would carry risks for societies' autonomy[177] Hence the Wellcome Trust and UKRI, in partnership with the Association of Learned and Professional Society Publishers (ALPSP), have commissioned research to explore how learned societies might adapt to a Plan S world. A consultation document[178] issued in June 2019 concluded that in order to transition successfully to such a world, societies would need to transform their existing revenue streams to support OA publishing; and it identified a range of different models in seven categories ranging from 'co-operative infrastructure and funding' to 'strategies for change and cost reduction'. A final report and toolkit for societies is due to be launched at the ALPSP conference in September.

One of the key challenges for learned societies – as for the even wider range of small publishers – is that they lack the administrative resources available to large publishers, and that they find it hard to get a seat at the table when policies and agreements are being negotiated. This makes for especial difficulties when they are being asked to consider experimental and yet-to-be-defined agreements, with attendant risks to their revenues, and to a highly-constrained timetable[179].

There are parallel difficulties for libraries. Many UK universities spend half or more of their budgets on agreements with publishers outside the Jisc model agreements; and they simply do not have the resources to change all such agreements to meet Plan S requirements in anything like the prescribed timetable. But there are still more difficulties for the research-intensive universities: analysis at one Russell Group university showed that in the years 2102 -2018, its staff published articles in over five thousand journals published by more than 760 different publishers. It is simply impossible for any university to put in place arrangements to ensure that for the future all the articles published by its staff, across all the publishers and journals in which they wish to publish, will meet Plan S requirements.

The Wellcome/UKRI/ALPSP study for learned societies has pointed to the need for new alliances between funders, publishers, learned societies, libraries and universities; and cOAlition S has stated that it "will work together with all stakeholders to develop new models for agreements", "transformative agreement model contracts", and a framework for individual "transformative journals". But there is little sign as yet of any deep understanding of the scale of the problems involved. There remains the risk that the effect of transformative agreements under the Plan S model could be to entrench the advantages enjoyed by large commercial publishers.

### D.7.6 Disciplinary differences

As we have already noted, there are relatively fewer fully-OA journals in the AHSS disciplines and that those that do exist have little profile[180]; most journals are hybrid, but take-up of OA has been low. The relatively lower levels of research funding as compared to STEM disciplines means that a high proportion of research – in some humanities disciplines *most* research – receives no dedicated funding, with costs met from QR block grant and other sources. As bodies including the Royal Economic Society and the English Association have pointed out,[181] the implication is that some significant reconfiguration of current funding arrangements will be required in order to make anything like Plan S operate in an effective and equitable way.

Current subscription prices for journals tend to be low, particularly in the humanities, where prices for highly-prestigious journals typically range between £200 and £400. But given the high proportions of articles published by authors with no dedicated funding, APCs could have to rise very significantly in order to enable journals to move to a full-OA model. The risk then is that unaffiliated scholars and early career researchers without access to research funds would be unable to publish in high-status journals. Waivers for them and for scholars from the global south would serve only to add to the rise in APCs for everyone else. For all these reasons, the British Academy and learned societies in AHSS disciplines have been particularly vociferous in arguing that hybrid journals are not an impediment to OA, but

[177] Academy of Social Sciences response to Plan S, and UKRI implementation https://zenodo.org/record/3249906/files/512_Plan%20S.pdf?download=1

[178] http://www.informationpower.co.uk/consultation/

[179] Plan S Consultation Response from the Society Publishers' Coalition, https://zenodo.org/record/3249906/files/456_Plan%20S.pdf?download=1; "We are just too small to negotiate deals with individual libraries."Malavika Legge, acting director of publishing for Portland Press and the Biochemical Society, speaking at Frankfurt Book Fair panel discussion https://publishingperspectives.com/2018/10/what-is-plan-s-and-why-are-many-publishers-worried/;

[180] British Academy, Science Europe's Plan S: making it work for all researchers

[181] Royal Economic Society, Response to Plan S consultation, https://zenodo.org/record/3249906/files/257_Plan%20S.pdf?download=1; English Association and University English, joint response to Plan S, https://zenodo.org/record/3249906/files/283_Plan%20S.pdf?download=1

rather a necessary pre-condition for it; and that they have played a key role in facilitating its development in their disciplines.

### D.7.7 The global south and waivers

All the publishers we spoke to are members of Research4Life and other schemes that provide access to their journals for institutions in countries in the global south either for free or at highly-discounted subscription prices. The cost to publishers is minimal: essentially it represents a lost opportunity for potential sales. For fully-OA journals – but not for hybrid journals - publishers provide fee waivers for authors in the global south, and these do represent a significant cost, resulting in APCs higher than they would otherwise be. Plan S would in effect require fee waivers to be extended to all journals; and in order to avoid a new kind of exclusion, many publishers would want to extend them to the wider range of unaffiliated scholars and early career researchers (the precariat) without any access to research funds. For some journals the costs, and the impact on APC levels, would be significant.

### D.7.8 Journals with non-research content

Many journals include substantial amounts of content in the form of reviews, commentaries and other commissioned material that could not be covered by APCs. The authors are providing a service to readers of the journal with timely coverage of topics of interest, reviews and analyses of recent literature and so on. The costs involved are met by subscription fees. In a few cases, journals have adopted a model under which such material is accessible only via a subscription from individuals or institutions, while research articles are published OA. This model provides a mix of revenue streams while also delivering a diverse range of content to a broad readership[182].Some of our interviewees suggested that implementation of Plan S would lead them to adopt such a model for a significant number of their journals, though it is not clear that it would meet the Plan S requirements. For review journals, the issue is more stark: it is not clear how they can comply with Plan S.

[182] See, for example, the *Journal of Clinical Investigation*.

**Summary: Transformative agreements and Plan S**

Transformative deals pre-date Plan S, and are seen by many as an effective way to achieve a widespread transition to OA in a reasonable timescale. Following its experience in negotiating and implement the first read and publish agreement with Springer Nature in 2015. Jisc Collections established in 2018 a series of requirements for further transformative agreements. There is rapidly-increasing interest in negotiating and implementing such agreements, in the UK and many other countries. But they are complex and time-consuming to put in place.

Concerns about Plan S focus on:

- the timescales for reaching such deals, but also for achieving a transition to full OA, which are both seen as unrealistic. A transition for all journals is not possible within five years given the small proportion of articles that are supported by Plan S funders;
- the additional costs associated with a transition to full OA, in a context where the pace of change varies widely across different countries and institutions; and where changes to the current dual support regime for research will be required to ensure a successful transition in the UK;
- shifts in the incidence of costs between different countries and institutions, and the potential difficulties in achieving an appropriate balance between the interests of winners and losers;
- lack of clarity as to the precise requirements relating to transparency in costs and pricing, and their relationship to levels of service;
- the potential financial impact on learned societies, and their limited ability – along with smaller publishers – to engage in the complexities of transformative deals. Librarians too are worried that it will be simply impossible to put in place agreements with the hundreds of small publishers with which their authors publish articles;
- the need to take full account of the needs of the AHSS disciplines where high proportions of research are undertaken with no dedicated funding;
- the complexities and the costs associated with APC waivers for authors in the global south and elsewhere – including the UK- who lack access to research funding;
- the need to take account of the needs of journals – including review journals – which include significant amounts of content in the form of commissioned commentaries, reviews and the like.

# SECTION E:
# CONCLUSIONS

There has been a noticeable change in the tone of publishers' discussions about the future of scholarly publishing. Publishers want to make the transition to OA a reality as comprehensively and rapidly as possible; and they see the transformation of hybrid journals through the kinds of agreements now being put in place as the key viable route to a full transition - at the very least for the articles published by authors funded by UKRI and other Plan S funders – in a reasonable timescale.. Hence they are keen to continue and accelerate discussions with all the key stakeholders about the transition. But they are clear that such a transition cannot be achieved as quickly as Plan S suggest; and that some key aspects of the Plan S requirements, particularly those relating to Green OA with zero embargoes and a CCBY licence, are simply unacceptable.

## Green OA and embargoes

Publishers – small and large, commercial and non-commercial - are united in a strong belief that Green OA, especially without an appropriate embargo period, is simply not sustainable as a mechanism for transition to a fully-OA world: for it depends on the continuance of journals while simultaneously (and increasingly) threatening their viability. Embargoes and other restrictions seek to mitigate that threat. Even those publishers who allow zero embargoes in strictly-limited circumstances stress the importance of retaining control over their policies relating to the posting of articles: the versions posted; posting locations; uses permitted; as well as embargoes.

Publishers' concerns about Green OA, and any move towards short or zero embargoes, are exacerbated by

- the evidence that where large aggregations of articles are created and made easily discoverable and usable – as, for example, with PMC – usage on such sites tends to reduce usage on journal platforms;
- the likelihood that this effect will grow as a result of the rising use of sharing sites such as ResearchGate and the increasing adoption of infrastructural services such as Unpaywall, OA Button and Kopernio
- the increasing risk that the higher availability and use of content from a variety of sites, coupled with constraints on university and library budgets, will lead to higher rates of attrition and cancellation of subscriptions, and significant reductions in revenue

For all these reasons, publishers are united in their opposition to any move to require authors to post subscription-based articles on repository and other platforms with no embargo and a CCBY licence. They will not comply with any such policy.

## Licensing

Many publishers have accepted the use of the CCBY licence for Gold OA articles, especially when that is required by a mandate, and the funder pays for an APC. For Green OA, however, publishers typically set restrictions on both access and usage, in order to protect their investment in bringing articles to the stage where they are validated as worthy of entering the scholarly record.

Many authors, especially in AHSS disciplines, are concerned that use of a CCBY licence brings risks of misrepresentation and plagiarism. The concerns are real, even if evidence to support them is sparse; and they are unlikely to be assuaged by allowing use of the ND restriction on a case-by-case basis. Some authors and others have wider concerns about commercial use of their articles.

Publishers' major concerns with regard to the CCBY licence relate to its use for articles in subscription-based and hybrid journals. Using the licence for such articles would allow anyone, and any organisation, to gather up those articles at scale for whatever use they wished, and effectively misappropriate the investment that publishers have made. The viability of publishers' businesses would be put at risk. Authors' anxieties about derivatives are a secondary concern for publishers; but they are keen to ensure that those anxieties are properly addressed.

**Hybrid journals**

Hybrid journals have become the dominant publishing model in recent years. Authors' take-up of the OA option has increased rapidly in the UK, though not as fast as some had hoped; and there are increasing concerns among librarians and others about the costs involved.

Offsetting and, more recently, transformative agreements have become increasingly popular, especially in the last 2-3 years. Publishers see their adoption as an effective route to widespread implementation of OA within a reasonable timescale. Where transformative agreements are in place, take-up of OA has increased to unprecedented levels. But there are concerns among both publishers and librarians about

- the unrealistic timescales envisaged by Plan S;
- the increasing costs involved, especially during the course of transition, and the marked changes in the incidence of those costs between different countries and institutions;
- the impact on small publishers and learned societies, and the sheer logistical difficulties in establishing agreements between hundreds of publishers and universities;
- the marked differences between the interests, attitudes and take-up of OA in different disciplines; and
- the needs of niche journals, review journals, and those journals that include significant amounts of non-research content.

All these factors must be taken into full account in planning for an effective transition to OA. But publishers are keen to establish many more transformative agreements, in the UK and the rest of the world, in order to achieve the transition that all stakeholders want.