

Open access to research publications

Independent advice

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1. Executive Summary

- 1.1 Open Access to research is a public benefit which enhances transparency, scientific integrity and rigour, stimulates innovation, promotes public engagement, and improves efficiency in research. The UK is widely recognised as being the leading nation in the Open Access and Open Data movements. This is both underpinned by, and underpins, the UK's position as second only to the USA as a leading research power.
- 1.2 Since the Finch Report was published in 2012, the UK has made substantial progress towards the objective of ensuring that publicly funded research is made available through an Open Access route. By April 2017, almost all journal articles published by UK university academics will be available under Open Access routes. Of these, approaching 20% will be available on the date of publication and without any further restriction. These figures are higher than anywhere else in the world.
- 1.3 Such progress has been stimulated by:
 - Clear mandates and, in some cases, financial support from RCUK, the Funding Councils, and major charitable funders
 - The development of a dense network of institutional repositories at universities, complemented by subject repositories
 - The development of new routes to Open Access by publishers and Learned Societies
 - The development of an underpinning infrastructure
- 1.4 There are competing financial interests between the parties involved in the funding and publication of scientific and scholarly work. In this context, it is particularly notable that the transition to Open Access in the UK is being achieved with relatively little public discord.
- 1.5 UK universities currently spend an estimated £33m on Open Access charges and, without mitigation, this is estimated to rise to between £40m and £83m by 2020. The total cost of publication to universities is estimated at £168m (or over 11% of the value of QR awarded across the United Kingdom). Non-academic institutions spend a further £127m.
- 1.6 A significant proportion of the cost of Open Access has been incurred in 'hybrid journals', where individual articles are made immediately available in journals that are otherwise behind a subscription paywall.
- 1.7 In order to continue to make progress in the transition to Open Access, and to maintain the UK's leadership, no major changes to the UK's approach are recommended. However, some minor changes will be helpful. These are summarised in section 2.

- 1.8 Open Access to research data has developed more slowly than for research publications. The Concordat on Open Research Data will be finalised in early 2016, and while there are major scientific and public good advantages in pursuing open research data, the cost implications are not yet fully understood. In pursuing open research data, the interests of commercial firms who co-fund research in UK universities and the need for the UK to exploit intellectual property funded by the taxpayer needs to be appreciated.

2. Summary of recommendations

1. Encourage universities to sign-up to the *San Francisco Declaration on Research*
2. RCUK to continue supporting Gold Open Access Charges.
3. UK Open Access Coordination Group to support the development of agreed service standards around Gold Open Access
4. UK Open Access policy should offer greater choice to research producers
5. UUK OA Coordination Group to continue annual work to **monitor the transition** towards Open Access
6. UUK OA Coordination Group to convene an **Efficiency Forum** sub-group
7. UUK OA Coordination Group to convene a **Repositories** sub-group
8. UUK OA Coordination Group to convene an **Open Access Monographs** sub-group
9. The UK Open Data Forum to coordinate work associated with a 'roadmap' for sector infrastructure

3. Introduction

- 3.1 This document presents the background, evidence base and details of advice from Professor Adam Tickell, Provost and Vice-Principal, University of Birmingham and Chair of the Universities UK Open Access Coordination Group, to the Minister for Universities and Science, Jo Johnson MP, following his letter of request dated 22 July 2015.
- 3.2 The Minister invited me to provide advice which sets out:
- *‘Challenging but achievable UK goals and priorities for open access to publications, and related data, in the next five years.*
 - *Any adjustments, for example to infrastructure or governance, which would support delivery of these goals and priorities.’*
- 3.3 This advice is given in a personal capacity. It is informed by primary evidence from the sector, research commissioned on my behalf by UUK, written submissions from, and discussions with, various individuals and stakeholder groups from across the UK.
- 3.4 This paper does not cover Open Access monographs, other than to note that the UUK OA Coordination Group will convene a working group to make progress and further recommendations.

4. Scholarly communication: background and the transition to OA

- 4.1 The UK research base is unrivalled for its broad-based excellence, evidenced not only by the results of the Research Excellence Framework 2014, but also through systematic international comparative research.¹ It is also one of the most efficient, effective and productive science and research ecosystems in the world. Despite representing just 0.9% of the world's population and 4.1% of researchers, the UK accounts for 9.5% of downloads, 11.6% of citations and 15.9% of the world's most highly-cited articles.²
- 4.2 Scholarly communication plays a key role in the dissemination and impact of UK science. The journal market has grown into a significant global industry, and constitutes a notable export market for the UK.³ Universities currently spend approximately £168m a year on the total costs of publication, of which £33m is estimated to be spent on Open Access charges. These costs are primarily charges against research, both university managed QR and through funds top-sliced from research budgets by Research Councils and charities.
- 4.3 However, while there may have been innovations in presentation and delivery of scientific knowledge, business models surrounding journals have proven less dynamic. It is in this context that the OA agenda has emerged.

What is Open Access?

- 4.4 At its heart is the principle that research outputs should be available freely, without restrictions on access or reuse, such as cost barriers or onerous copyright constraints.⁴
- 4.5 Open access publishing, by improving access to information and knowledge, promotes:⁵
- the public benefit arising from publicly funded research;
 - enhanced transparency, openness and accountability, and public engagement with research;

¹ See UK field-weighted citation index in BIS (2013) International Comparative Performance of the UK Research Base London: BIS, p. 2, 8, 32

² Ibid esp. pp.31–56

³ Overall book and academic journal sales remain steady at £4.3billion with digital revenues growing to 35% of the overall total. Export sales now account for 44% of revenue. Accessed: www.publishers.org.uk/policy-and-news/news-releases/2015/latest-pa-figures-show-digital-innovation-driving-publisher-rev/

⁴ Finch, Janet et al (2012), [Accessibility, sustainability, excellence: executive summary](#), RIN. p.10

⁵ Finch, Janet et al (2012) [Accessibility, sustainability, excellence: how to expand access to research publications](#). Report of the Working Group on Expanding Access to Published Research Findings, RIN.

- closer linkages between research and innovation, with benefits for public policy and services, and for economic growth;
- improved efficiency in the research process itself, through increases in the amount of information that is readily accessible, reductions in the time spent in finding it, and greater use of the latest tools and services to organise, manipulate and analyse it;
- increased returns on the investments made in research, especially the investments from public funds; and
- the creation of a new model of scholarly communications.

4.6 The UK began the transition to OA early, when Parliament recommended a shift to OA publishing in 2004⁶. The Wellcome Trust (the second largest charitable funder of scientific research in the world) began mandating that all its funded research should be made OA from April 2005.⁷

4.7 In practice, initial progress in implementing OA was slow, as a wide range of stakeholders were defensive about their material and perceived interests. Crudely, there are three different sets of interests:

- Universities and other research institutions. These both produce the content for, and purchase, research. Broadly, university leaderships, and university academics, see reputational and scientific benefit from Open Access; but seek to minimise the costs associated with publication.
- Funders, such as the Research Councils, the Funding Councils and the Wellcome Trust. Funders in the UK see widespread dissemination and the costs of publication as being integral to the research process; and
- Commercial publishers and Learned Societies. The UK is home to a significant constellation of publishers and Learned Societies. Both are a fundamental part of the research ecosystem and contribute to invisible exports. These organisations seek to maximise income from their intermediation activities. Some have fundamental concerns about implications of OA to the long-term sustainability and viability of academic publishing.

⁶ Select Committee on Science and Technology Tenth Report (2004). Available: www.publications.parliament.uk/pa/cm200304/cmselect/cmsctech/399/39903.htm

⁷ Wellcome Trust Open Access policy www.wellcome.ac.uk/About-us/Policy/Policy-and-position-statements/WTD002766.htm

Establishing the policy framework in the UK

- 4.8 OA policy development in the UK gained transformative impetus with the 2012 report by Professor Dame Janet Finch.⁸ This recognised that the traditional research communications system was becoming “increasingly unsustainable as a result of the economic, technological and social changes.”⁹
- 4.9 The Finch Report sought to balance the different interests of the three principle stakeholder groups, and in doing so, the report recommended a mixed economy of ‘Gold’ and ‘Green’ routes to OA by which:
- **‘Green’ Open Access** refers to publications which are placed in institutional or subject repositories, often after a publisher imposed embargo period. Publishers often impose copyright and re-use restrictions on such publications
 - **‘Gold’ Open Access** refers to publications where ‘Article Processing Charges’ (APCs) are paid to the publisher, in return for immediate and unrestricted access to the full text to anyone in the world.
- 4.10 Finch concluded that pursuing Gold over Green should ultimately be the preferred practice in delivering the full benefits associated with OA, of improved ‘transparency and accountability, engagement with research and its findings, closer linkages between research and innovation, and improved efficiency in the research process itself’.¹⁰
- 4.11 There is the potential for a significant ‘free rider’ problem with Open Access. Open Access publications are, by definition, freely available. As long as the standard model of subscription publishing prevails, the costs of Open Access disproportionately fall both on countries in the vanguard (in this case, the UK) and research intensive universities. Although Finch recognised that the UK may end up with higher costs, the expectation was that UK leadership would help to lead to a transformation that other countries would emulate.
- 4.12 In his response to the Finch Report, David Willetts endorsed the recommendation for a mixed economy, as a transitory arrangement towards Gold OA as standard.¹¹

⁸ Finch, Janet et al (2012) [Accessibility, sustainability, excellence: how to expand access to research publications](#). *Report of the Working Group on Expanding Access to Published Research Findings* RIN.

⁹ Finch, Janet et al (2012), [Accessibility, sustainability, excellence: executive summary](#), RIN. p.10

¹⁰ Finch, Janet et al (2012) [Accessibility, sustainability, excellence: how to expand access to research publications](#). *Report of the Working Group on Expanding Access to Published Research Findings* RIN. p12

¹¹ Letter to Professor Dame Janet Finch from David Willetts MP (January 2014). Available: www.researchinfonet.org/wp-content/uploads/2013/02/BIS-Transparency-Letter-to-Janet-Finch-One-Year-On-Response-January-2014.pdf

Initial responses

- 4.13 However, although Finch was carefully balanced, it did not meet with universal approval. Some leading universities believed that Gold Open Access represented an unfunded commitment at a time of significant budgetary pressures, whilst some Learned Societies believed that 12 month embargo periods for Green Open Access papers would undermine journals in the humanities and social sciences, where dissemination models are markedly different from the physical and life sciences.
- 4.14 To mitigate these concerns, considerable work was undertaken to ensure that the principal policy objective – that of widening access to publicly funded research – could be met with minimal difficulties. This approach included:
- **Stimulus funding for Gold OA:** The Research Councils top-sliced their budgets to provide particular support for research intensive institutions, in recognition of the fact that the financial burden fell most heavily on them. These funds – circa £22 million a year – could be used both to purchase Gold Open Access and to build institutional repositories
 - **Variable embargo periods for Green OA:** Embargo periods for Green Open Access publications were allowed to vary depending on the broad disciplinary area of a journal; and
 - **Broad endorsement of the mixed economy and parameters for Gold and Green:** The Publishers Association published a ‘Decision Tree’, endorsed by all parties, stating that Green Open Access was acceptable if no funds were available for Gold (Annexe 1). The Minister gave his approval to the adoption of the Decision Tree in 2013.
- 4.15 Both the Research and Funding Councils implemented Open Access mandates which have led to major changes in behaviour:
- **Research Councils UK** introduced a revised and central OA policy, replacing pre-existing policies of individual research councils, to take effect from April 2013.¹²
 - In March 2014, **HEFCE** (in collaboration with the devolved funding councils) announced that, to be eligible for submission to the next REF, almost all publications must be made open-access.¹³
- 4.16 These mandates mean that almost all publicly funded research will be Open Access. The Funding Councils are agnostic as to whether this should be in Gold or Green form, whilst RCUK have a preference for Gold.
- 4.17 In order to ensure that progress continued to be made, Universities UK agreed to a request from David Willetts to convene the UUK Open Access Coordination Group, with Professor Adam Tickell as Chair. This group has representation from all the

¹² RCUK Open Access Policy: www.rcuk.ac.uk/research/openaccess/policy/

¹³ HEFCE Open Access Policy: www.hefce.ac.uk/rsrch/oa/Policy/

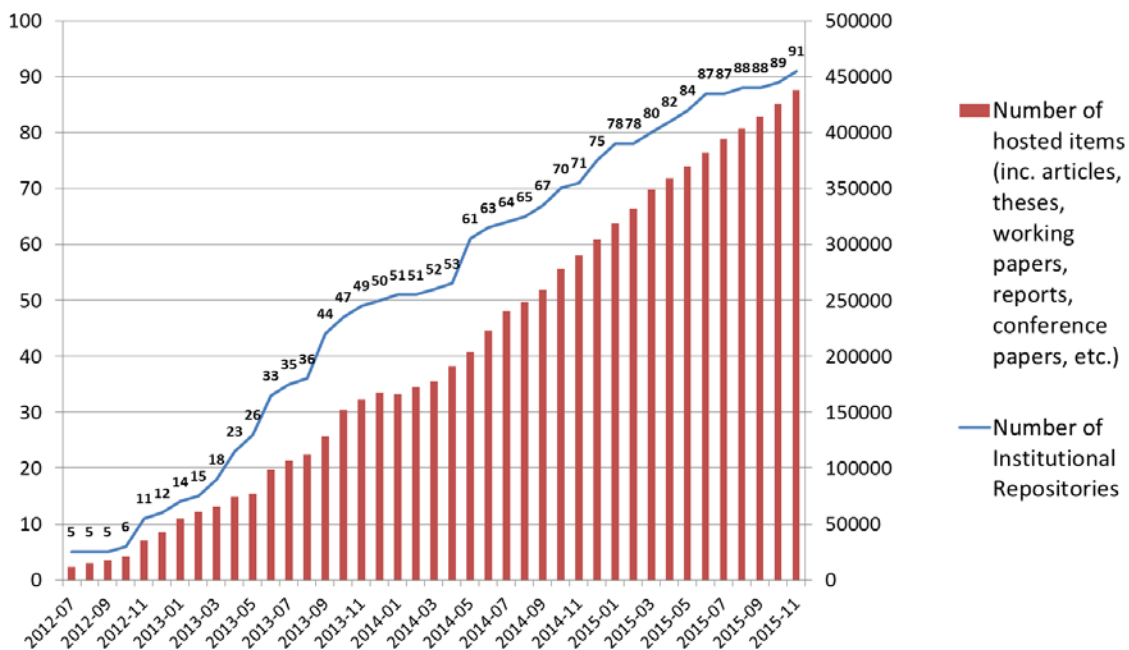
principle stake holding communities, and was established in May 2014. The remit of the UUK Open Access Coordination Group is to:

- Develop and interpret the data and evidence base on the implementation of open access in priority areas
- Coordinate related research and activity being undertaken by stakeholders
- Commission research to fill gaps in the evidence
- Provide advice on policy and the direction of implementation of open access
- Provide advice on the coordination and development of open access infrastructure

5. Progress towards Open Access in the UK

- 5.1 There has been considerable progress in the transition towards OA in the UK since the Finch Report and the UK is making more progress towards accessible science than any comparable nation. With support from funders (notably the Wellcome Trust, the Research Councils and the EU's FP7 pilot 'OpenAire'), as well as individual institutional initiatives, an estimated 19% of UK authored publications are now published in Gold Open Access form.¹⁴
- 5.2 All UK universities with significant QR income have developed institutional repositories to curate and maintain Green Open Access publications and almost all publicly funded research will be available in at least this form by 2017. Since the publication of the Finch Report, there has been a rapid growth in both repositories and deposited articles. In 2014, 6 million articles were downloaded from UK university repositories.¹⁵

Figure 1: growth in UK institutional repositories, hosted items and articles, 2012-2015¹⁶



¹⁴ See Annexe 3 for more information.

¹⁵ IRUS-UK, growth over time. Available: www.irus.mimas.ac.uk

¹⁶ Ibid.

5.3 Other initiatives that have supported the dissemination of research knowledge through OA include:

- **The 'Access to Research UK'¹⁷ public library initiative:** publishers have provided free access to journals to people in 206 local authorities. This enables the public to walk into participating public libraries and access over 10 million articles. Systematic evaluation of the initiative has not yet been conducted, but participating publishers report strong uptake where the scheme is promoted by librarians
- **Establishment of new, OA-only journals:** These have been set up by disruptive innovators, long-standing commercial publishers, Learned Societies, and research funders. Launched in late 2012, *eLife*¹⁸ is an example of the new breed of online, peer-reviewed, Open Access-only, scientific journals, focusing on biomedical and life sciences.
- **Investment in and development of OA infrastructure:** work on necessary infrastructure to support both Gold and Green Open Access has been carried out by a range of organisations and coordinated in the UK by Jisc (overview available in Annexe 2).¹⁹
- **Off-setting the costs of Gold OA against subscriptions:** There has been some limited progress in developing 'offset deals', where publishers reduce the costs of subscriptions to universities who pay for Gold Open Access. For example, IOP Publishing (the commercial arm of the Institute of Physics) has a 3 year pilot programme which allows the participating 21 universities to offset the majority of their APCs against their subscription and licence fees. Offsetting is considered further in paragraphs 6.22-5.23.

5.4 However, significant challenges do remain, particularly in relation to overall costs are particularly high in research intensive universities (see also paragraphs 6.18-6.25).

¹⁷ Access to Research project. Available: <http://accesstoresearch.pls.org.uk/>
<http://accesstoresearch.pls.org.uk/>

¹⁸ The journal was established through collaboration between the Max Plank Society, Wellcome Trust and Howard Hughes Medical Institute. Its articles are immediately and freely available to all, and the journal does not charge authors to publish. It has grown into a successful, non-profit journal. www.elifesciences.org

¹⁹ Based on a paper prepared for the UUK OA Coordination group (Sept 2015). Further information available here: www.jisc.ac.uk/open-access

6. Issues and challenges

6.1 There remain some challenges in making the transition to Open Access. These might be summarised under five broad headings:

- i. Market considerations
- ii. Supporting Gold OA
- iii. Supporting Green OA
- iv. Supporting Monographs
- v. Coordination and stakeholder management

i. Market considerations

6.2 The journey towards Open Access remains in development. While there is not unanimity, a number of stakeholders have indicated that they believe the current journal market is failing to operate optimally – particularly in relation to journal access and the cost of Gold OA. Such concerns are held within the UK and elsewhere in Europe, evidenced by the strong stance taken by the League of European Research Universities.²⁰

6.3 Broadly speaking, the features present in a mature and optimal market are characterised by:

- *low levels of market concentration*
- *low entry barriers*
- *dispersed buyer power*
- *strong customer response*²¹

6.4 Where one or more of these is not present, there could be negative consequences for efficiency, productivity and quality. These will be briefly considered in turn.

- *low levels of market concentration*

6.5 There are many journals and publishers operating in the journal market, offering a wide range of options to authors and research funders as to where and how research is disseminated.

6.6 However, the market is dominated by a small number of large publishers. The available evidence suggests that the vast majority of both subscription fees and

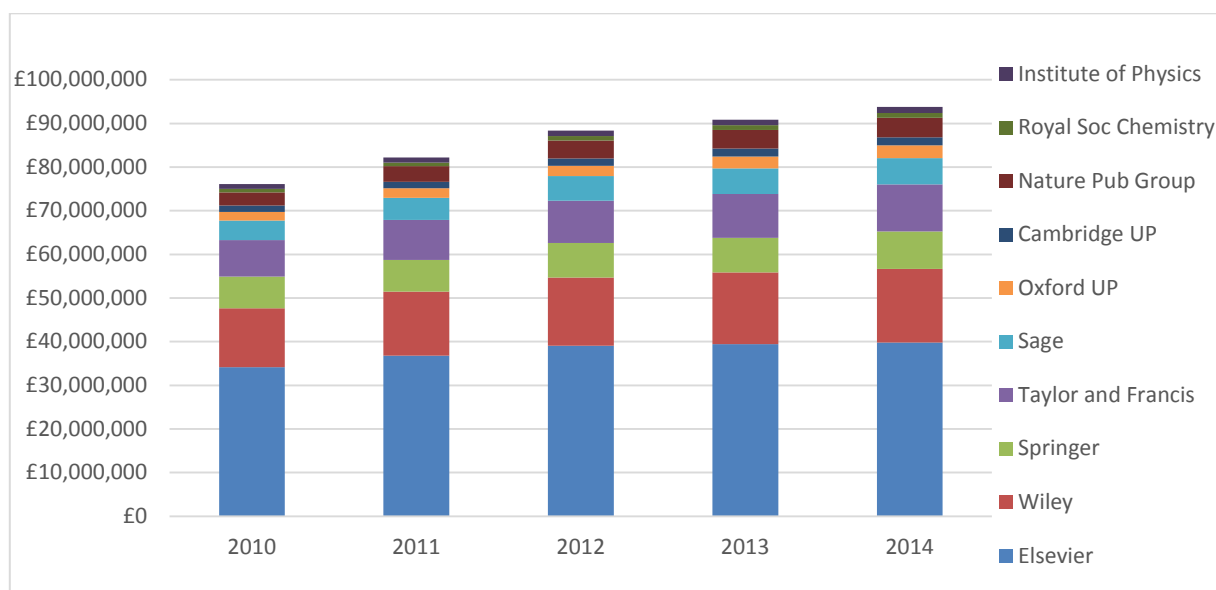
²⁰ LERU Statement for the 2016 Dutch EU Presidency (2015) *Moving Forwards on Open Access*. www.sconul.ac.uk/sites/default/files/documents/LERU%20Statement%20Moving%20Forwards%20on%20Open%20Access.pdf

²¹ Competition Commission (2013) Guidelines for market investigations: Their role, procedures, assessment and remedies. Available from: www.gov.uk/government/uploads/system/uploads/attachment_data/file/284390/cc3_revised.pdf

APCs are paid to a small number of publishers, and that the market appears to be somewhat resistant to lowering levels of market concentration.

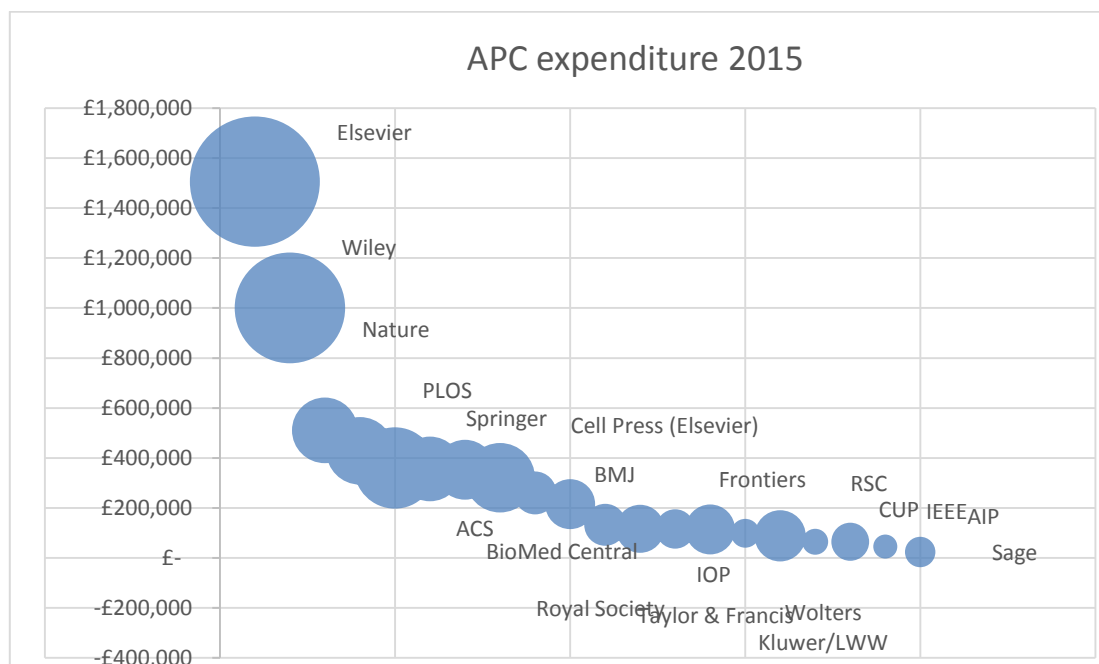
- 6.7 Figure 2 shows the best estimate of the cost of journal subscriptions that UK universities pay to the largest ten publishers which, in 2014, totalled £94m. The data were gathered using FOI Act requests and, as not all universities responded in all years, they are likely to under-estimate the total cost. The four largest publishers account for a majority of subscription income.
- 6.8 The best estimates of the spending by UK universities on APCs show a similar pattern (Figure 3, over). In the chart, it is worth noting that PLOS (the Public Library of Science) is an Open Access only publisher. These data are drawn from a sample survey conducted by Jisc and under-estimate total spending. Separately, research commissioned for this work estimates current total spending on APCs in 2015 as being in the region of £33m²².

Figure 2: Subscription costs to 10 largest publishers from 155 institutions, 2010-2014²³



²² Research Information Network (2015) *Bespoke OA modelling commissioned by UUK*. Unpublished.

²³ Retr0.me (2015) *UK universities' spending on journal subscriptions*. Available: <http://retr0.me/2015/07/07/UK-HEI-journal-subscriptions.html>

Figure 3: Gold OA charges paid to publishers from a sample of institutions, 2015²⁴

6.9 It would be unfair simply to ‘blame’ publishers for such concentration. Academics not only prefer to publish in high status journals, but citation practices, promotion processes and peer review in both the REF and research granting bodies may favour such publications. Consequently, ‘prestige’ diminishes the salience of cost signals, hindering effective market operation. To assist an effective market, this relationship between perceptions of quality and particular journal titles should be weakened.

Recommendation: universities should be encouraged to sign-up to the *San Francisco Declaration on Research Assessment*.²⁵ This requires that metrics are used appropriately in the evaluation of individual researchers in order to remove distortion in the market by privileging certain publication routes. Providers of research metrics²⁶ have clearly stated the need to use them appropriately and that they should not be employed at a granular level.

- *low entry barriers*

6.10 A well-functioning publication market also requires surmountable barriers to entry for new providers (publishers). Likewise, providers need to be able to fail.

²⁴ Based on Data provided by the Jisc Total Cost of Ownership (TCO): www.jisc-collections.ac.uk/Jisc-Monitor/APC-data-collection/

²⁵ American Society for Cell Biology (2013). *The San Francisco Declaration on Research Assessment* www.ascb.org/dora/

²⁶ For example, www.elsevier.com/connect/san-francisco-declaration-on-research-assessment-dora-elseviers-view and http://researchanalytics.thomsonreuters.com/statement_re_sfdra/

- 6.11 Although historically marked by stability and long-standing publishers, there has been a high level of market entry – but typically in the OA-only, digital-only publishers. The subscription publishers have not seen comprehensive challenge. As cost is not a significant driver for a researcher’s choice of journal, brand reputation makes it difficult for new market entrants to become established.
- 6.12 It is, however, important not to lose sight of the contribution and potential of exclusively Open Access publishers, such as PLoS²⁷ and Hindawi²⁸, and journals, such as *e-Life* and *Nature Communications*. These have been disruptive and are contributing to a transformation in science communication. They are more likely to embrace innovative new technologies, approaches and business models. This has meant that new entrants to the market have been able to operate competitively, at scale, in a relatively short period of time, offering a real alternative to incumbent providers. It is essential that research funders and universities continue to support such developments, and more research into drivers and barriers would be beneficial.
- *dispersed buyer power*
- 6.13 The academic journals market is international and, while there are forums within which library consortia discuss matters of common interest, there are no examples of significant international collaboration by buyers in negotiating with journal publishers. The UK could usefully learn from the Dutch, and cooperate where appropriate opportunities arise.
- *strong customer response*
- 6.14 At present, researchers are empowered as consumers, and can spend their funding where they decide (within the remit of funders policies). RCUK provide block-grant funding for OA, which is top-sliced from the overall research funding pot. This is an appropriate, low-burden approach that helps underpin the additional costs of delivering Gold OA, and is broadly supported by the research community. It signals that the costs of publication must be valued as an integral part of the total cost of research.
- Recommendation:** the Research Councils should continue to support Gold Open Access charges²⁹. However, this needs to be alongside other measures noted in this paper.
- 6.15 There has been some concern raised by research funders about the quality of service received from publishers in return for Gold OA charges. The Wellcome Trust in particular has said that: “we expect every publisher who levies an open access fee to provide a first class service to our researchers and their institutions [which] still seems to be some way off. These problems are particularly prevalent amongst

²⁷ PLOS (Public Library of Science): www.plos.org

²⁸ Hindawi Publishing Corporation: www.hindawi.com

²⁹ Nurse, P. (2015) *Nurse review of research councils: recommendations*. Available: www.gov.uk/government/publications/nurse-review-of-research-councils-recommendations

publishers offering a hybrid OA option, which is also the more expensive way to comply with our OA policy.”³⁰

- 6.16 In order to assist the quality of service provision and aid transparency and clarity of information necessary for decision making, relevant stakeholder groups should continue to work together to understand each party’s needs and expectations.

Recommendation: Publishers and purchasers need to agree clear service standards around Gold Open Access. The UK Open Access Coordination Group can assist in producing a framework. Ministerial support for this would provide a welcome stimulus to action.

- 6.17 Alongside the individual recommendations above, the UUK OA Coordination Group should continue to commission research to monitor the transition towards open access, and specifically include a review of the developing market conditions. By doing so, we can be assured that the transition to OA continues to proceed.

Recommendation: The impact of the various mechanisms being introduced to help shape a more effective market (such as off-setting arrangements) and the implementation of the voluntary good practice guide and code of conduct should be **reviewed** in three years and the outcomes should be reported to the Minister. Regular progress updates Years 1 and 2 could be included in the **annual report to the Minister**.

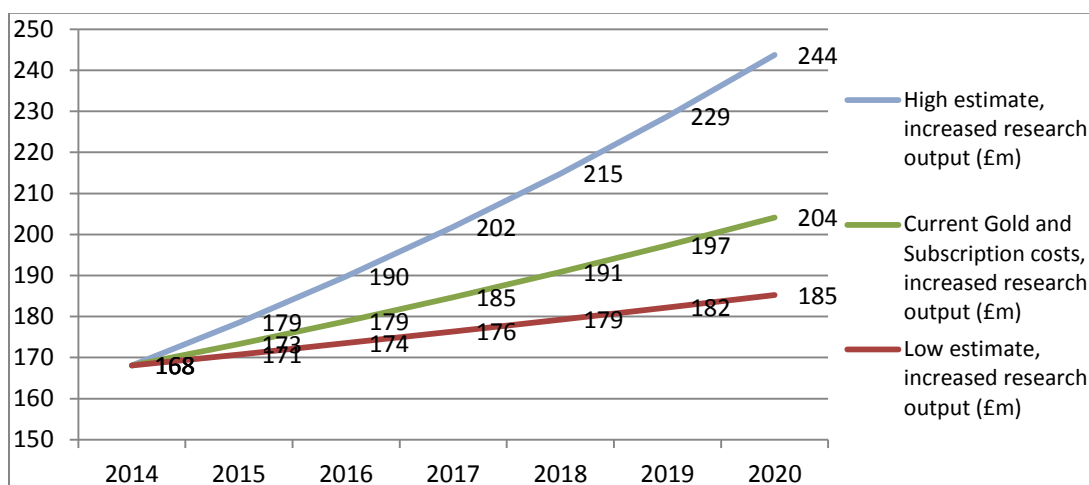
ii. Support for Gold OA

- 6.18 Although there is a broad consensus about the benefits of Open Access in the UK, financial challenges remain. This is particularly acute in relation to Gold OA. Research for this report shows a consistent and steep increase in the average cost of purchasing Gold OA, without a commensurate fall in subscription costs. Consequently, the overall costs of publication are increasing beyond those projected in the Finch Report. This has largely resulted from the growth of, so-called, ‘hybrid’ journals which remain based on subscriptions but, for an additional fee, will publish papers on the Gold model.
- 6.19 Publishers and Learned Societies are concerned (i) that hybrid journals will publish so many individual Gold papers that international customers will cancel subscriptions, but that income from these Gold papers will be insufficient to replace the lost income and (ii) that new Open Access journals will replace existing subscription and hybrid journals. In extremis some journals may close and ensuring that digital content remains accessible will be important. Further research is required to understand the true implications of the OA agenda on sustainability with regards to individual publishers and Learned Societies.

³⁰ Kiley, R. (2015) The Reckoning: An Analysis of Wellcome Trust Open Access Spend 2013-14. Available: <http://blog.wellcome.ac.uk/2015/03/03/the-reckoning-an-analysis-of-wellcome-trust-open-access-spend-2013-14/>

- 6.20 Universities are concerned that the preference for Gold Open Access is placing a strain on national and institutional research budgets. As detailed in Annexe 6, modelling commissioned for this report suggests that the costs of driving a strong preference for Gold OA could rise from £33 million in 2014 to between £40 million and £83 million by 2020, of which approximately 76%³¹ is accounted for by payments to the publishers of hybrid journals.
- 6.21 The interaction between the two different charges, and the complexity that local deals add to the picture, makes it extremely difficult to arrive at a robust estimate of potential costs associated with the move to OA over time. However, if we consider the overall amount paid to publishers (combining subscriptions and APCs), we estimate a **potential** rise in total costs to universities alone from £168m in 2014 to between £185m-£244m by 2020 (see Figure 4 on next page)
- 6.22 One solution to this is that APCs are offset against subscription costs in hybrid journals. Offsetting deals in the UK are still in development, and dialogue between funders and publishers should be encouraged to this end. The in-principle agreement announced in December 2015 between Elsevier and Dutch universities, which appears to be a country level offset scheme, may provide a model for the UK to emulate.³²
- 6.23 An alternative approach would be to consider whether funding Gold Open Access in Hybrid Journals where there are no equivalent offsets in subscription costs is a good use of public funds. During the course of working on this report, I met with the Publishers Association and Elsevier and I do not believe that the major publishers would find this slight change of course challenging.

Figure 4: Estimated projection of total funding to publishers (via Gold and subscription charges) to the research system³³



³¹ Estimate provide by Jisc based on [Total Cost of Ownership](#) project. Wellcome Trust's figure of 72% for their [2012-2013 reporting period](#), and 76% from RIN in [Monitoring the transition to Open Access](#)

³² Vereniging van universiteiten (2015) Open Access Newsletter, number 13 (10/12/2015)

³³ Research Information Network (2015) *Bespoke OA modelling commissioned by UUK*. Unpublished. NB: Projected funding to publishers is subject to great many variables that are impossible to accurately forecast, so the above projections are a based on a number of assumptions, detailed in annexe 6.

6.24 A case could be made that the UK's "strong policy preference for Gold" is limiting the decision making agency of researchers and therefore limiting price differentiation within the Gold publishing marketplace. Observers have posited that the wide variety in APC prices and their general convergence suggests that APC prices might not be grounded in the actual cost of producing an article but are perhaps reflections of what the market can bear.³⁴

Recommendation: Flexibility in the UK's favoured route to Open Access would allow greater freedom of choice for researchers on where and how to publish and, mindful both of the clear need to maintain the UK's strong leadership in Open Access and of the strong contribution that institutional repositories are making to widening public access, the current UK 'strong policy preference' for 'Gold' could usefully be inflected as a '**preference for Gold**'.

6.25 Such a shift would be assisted by greater harmonisation of funder policies for Open Access, and so it is recommended that RCUK and HEFCE consider such a proposition, as part of a wider effort to further empower universities and researchers to make the most effective and efficient choices when making publicly-funded research 'open'.

Recommendation: Convene an **Efficiency Forum** sub-group, to be technical and detailed in nature, with a focus on identifying efficiencies and areas for collaboration in, for example, financial management, policy compliance, and reporting requirements between stakeholders. It will report into the main Coordination group. Membership: Jisc (lead and secretariat); nominated Publishers; nominated institutions; research funders, key infrastructure providers and international representation from Max Planck Digital Library (Germany) and Association of Research Libraries (US and Canada).

iii. Support for Green OA

6.26 The widespread growth of institutional (and subject) repositories is a major, and *relatively* cheap mechanism for meeting the primary policy objective of widening access to publicly funded research. It is a mechanism that, with varying degrees of enthusiasm, the universities, the research funders, and the publishers, have reached an accord over.

6.27 However, whilst supporting Green OA is pragmatically essential, even with an impressive growth in repositories there remain issues that must be addressed.

- There needs to be a guarantee that a deposit in a repository is permanent and accessible. Curating digital material is difficult and potentially costly and as repositories gain momentum, it is possible that outputs could get lost.
- As Green Open Access publications are sometimes subject to embargoes and rights restrictions, purists do not accept that it they are Open Access. There may

³⁴ Lawson, S. (2014) *APC Pricing*, Figshare. Available: https://figshare.com/articles/APC_pricing/1056280

be merit in developing a model that permits full re-use after a specified, and lengthier, period of time.

- There needs to be continued development of the infrastructure of repositories and enhance their interoperability so that they provide effective routes to access for research publications including reports, working papers and other grey literature, as well as theses and dissertations; a mechanism for enhancing the links between publications and associated research data; and an effective preservation service.

6.28 It is therefore recommended that the British Library, Research Libraries UK and the Society of College, National and University Libraries (SCONUL) convene, with appropriate support, to advise as to the best mechanisms to ensure that there is at least one permanent copy of an open access publication and that due regard is given to long term curation of digital assets. As the Universities UK Group already has many of the stakeholders represented, it would be happy to assist with this.

Recommendation: Convene a **Repositories** sub-group, to advise as to the best mechanisms to ensure due regard is given to long term curation of digital assets, and to ensure that there is at least one permanent copy of an open access publication. Membership: British Library, Research Libraries UK and SCONUL convene, with appropriate support.

iv. Support for Monographs

6.29 Open access monographs remain a challenging objective, but imperative to the overall objective of open science. As recommended in the RCUK review of OA policy implantation, work should continue to support developments in this area.

Recommendation: Convene an **Open Access Monographs** sub-group to perform an intelligence sharing / monitoring role in the first instance, and to later advise and help drive the progress of any pilots of OA monographs. Membership: an appropriate chair, Jisc, Wellcome Trust, HEFCE, ARMA, British Library and be convened by UUK.

v. Coordination and stakeholder management

6.30 I noted in paragraph 4.7 that the different stakeholders have significant financial and policy differences. In the period since the publication of the Finch Report, these differences have remained largely muted at a time when the UK has seen considerable progress in the implementation of the open access mandate. The Learned Society publishers, researchers in universities and independent research organisations and funders have a symbiotic relationship in a thriving research ecosystem. Furthermore, the UK is home to many of the world's leading publishers and journals to the benefit of both employment and the balance of payments. Consequently, subject to ensuring value for public funds, there is merit in maintaining a strong dialogue so that contentious issues can be managed in a collegial fashion.

- 6.31 The UUK OA Coordination Group is an effective vehicle for this, and building on earlier points, it is appropriate that it is utilised to oversee dedicated and focused areas of work. It is proposed that the UUK OA Coordination Group convenes the Task-and-Finish Groups recommended in this document, alongside annual work to monitor the transition to OA, and would be happy to **report to BIS Ministers annually** with a progress report on OA.

7. Open Research Data³⁵

Background

- 7.1 Open access to research data is a logical evolution of the open science agenda, and both flows from and underpins OA. As the Royal Society argued in 2012,³⁶ large scale data collection and analysis requires effective communication through a more intelligent openness. The UK has already made a number of international commitments on open data in general, e.g. the G8 set out principles that open data should be discoverable, accessible, assessable, intelligible, useable and, where possible, interoperable.
- 7.2 For data to meet these requirements, they must be supported by explanatory metadata (data about data). As a first step, data that underpin a journal article should be made concurrently available in an accessible database. We are now on the brink of an achievable aim: for all science literature to be online, for all of the data to be online and for the two to be interoperable.
- 7.3 Successful exploitation of these powerful new approaches will come from: (1) a shift away from a research culture where data is viewed as a private preserve; (2) expanding the criteria used to evaluate research to give credit for useful data communication and novel ways of collaborating; (3) the development of common standards for communicating data; (4) mandating intelligent openness for data relevant to published scientific papers; (5) strengthening the cohort of data scientists needed to manage and support the use of digital data; and (6) the development and use of new software tools that simplify the creation and exploitation of datasets.
- 7.4 Making data open to specialists is one challenge; making all data open and available to the general public represents a greater challenge. For example, what is considered intelligible, accessible and useable to the scientific community will be qualitatively different from what is appropriate for a general user.

Open research data and the UK

- 7.5 Within the UK, open research data are being coordinated by the UK Open Data Forum, a cross-stakeholder group that includes all the major participant organisations with an independent Chair.
- 7.6 The UK is a leading nation in terms of open research data. In particular, the policy framework and approach set out by EPSRC, with its emphasis on institutional responsibility, is being widely adopted by other funders. Other nations, particularly the Dutch, are increasingly active in this field, and there is strong interest from the US in collaborating through the UK Open Data Forum.

³⁵ I am grateful to Professor Nick Wright, PVC Research at the University of Newcastle and co-author of draft Concordat on Open Research Data, for advice on Open Data.

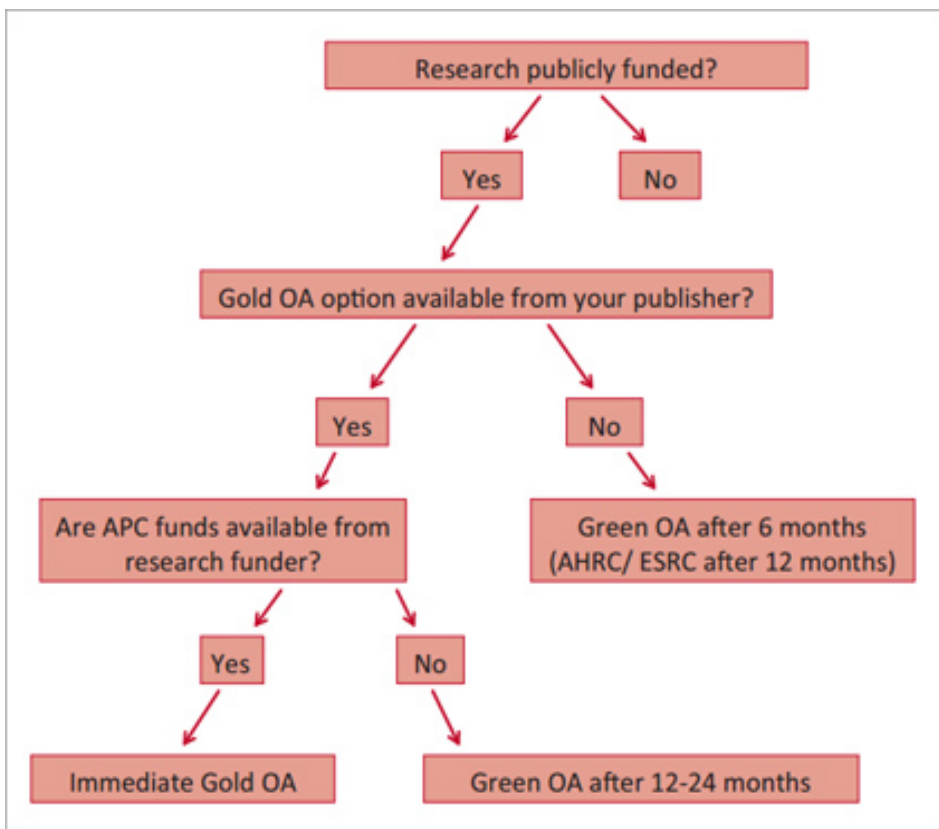
³⁶ The Royal Society (2012) *Science as an Open Enterprise*. Available: <https://royalsociety.org/topics-policy/projects/science-public-enterprise/report/>

- 7.7 There are a wide range of approaches in making data open and accessible that are currently used and/or under development, such as discipline specific and institutional repositories, shared services, and both public and commercial cloud-based offers. Such diversity is a strength and the UK should work towards establishing and strengthening a “data ecology” approach rather than an over-centralised model.
- 7.8 The Open Data movement has made rapid early progress. It would be premature to use regulatory compliance mechanisms to enforce adherence. The data landscape is fast-moving and relatively immature (for example, the major sharing platform has only been widely available since 2012). Any attempt to plan for the future infrastructure needs of the sector cannot make assumptions about what might be considered ‘best practice’ while new approaches are emerging and evolving. Annexe 7 sets out some of the pros and cons of open data infrastructure, as articulated by the ERAC Task Force on open research data.
- 7.9 The key focus at present is the development of a *Concordat on Open Research Data* that is currently being finalised. The Concordat recognises that different organisations and academic communities are at different levels of maturity in terms of open research data.
- 7.10 The UK Open Data Forum will establish a national infrastructure roadmap to support open research data and coordinate work to support this. It will produce an action plan for the UK by Summer 2016.
- 7.11 Key challenges include:
- **Digital/data curatorship and selectivity**
a decision-tree approach will be developed to guide institutions and researchers over what data should be kept and made open; based on quality, usefulness and importance.
 - **Cost**
Open access to research data should be viewed as part of the total cost of research, and funded accordingly; it provides public benefit, from public funding and hence research funders should be willing/able to support reasonable costs of making data open
 - **Recognition and citation/attribution for re-use of datasets**
Parity of esteem with research publications should be encouraged, where appropriate
 - **Intellectual property**
The UK taxpayer and industrial co-funders need to be able to exploit the intellectual property from their investment, so delays to the publication of data may be necessary.
- 7.12 The UK Open Data Forum is well placed to take a more formal/public leadership role, and the publication of the Concordat is a good opportunity to stimulate this via a clear mandate. The Forum could then develop into an action focussed group that drives forward progress to agreed outcomes.

Annexe 1: Simplified RCUK OA decision making tree

The decision tree below illustrates a simplified version of the decision-making process available to authors in receipt of RCUK funding. It has been developed by the Publishing Association and endorsed by BIS. However, it is not comprehensive and is not intended to be understood in isolation.

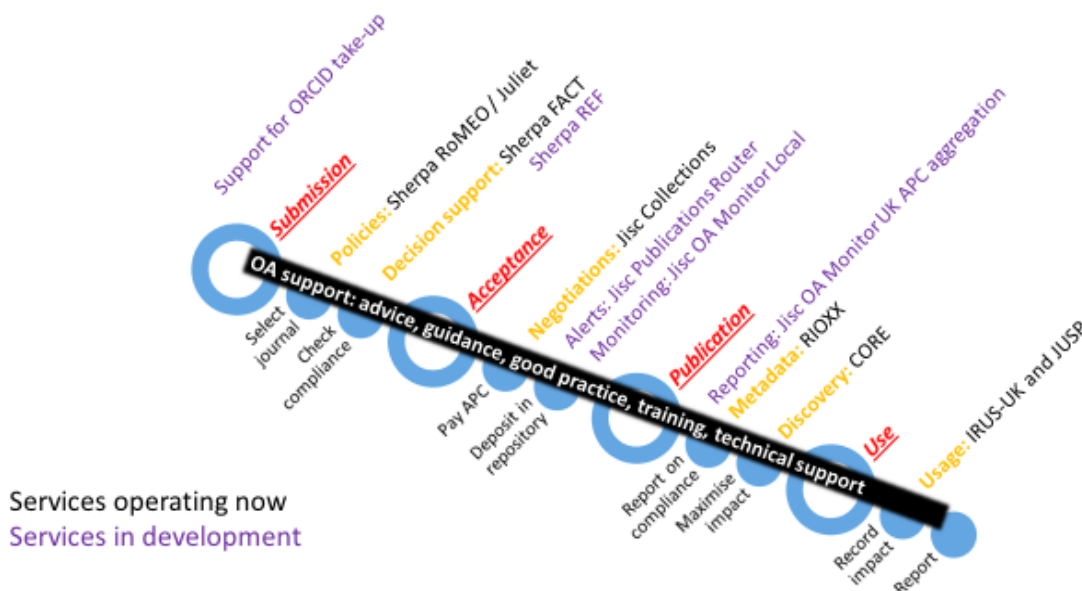
Figure 5: Research Councils UK Open Access Policy decision making tree



Annexe 2: Overview of selected Open Access Infrastructure in the UK

- 1.1 OA infrastructure refers to the variety of services available to the Higher Education and research community, largely provided by Jisc (the shared service which champions ICT services for the sector) and which support institutions to understand, implement and engage with policies as efficiently and effectively as possible.
- 1.2 The current infrastructure services offered cover the whole life-cycle of open access publishing, from submission, through publication and attempt to measure later usage and impact of OA publications. In addition to the services currently in operation, the sector is also developing new services to meet the evolving needs of UK universities. Selected services are presented graphically below according to a typical article lifecycle.

Figure 6: UK Open Access services in operation and in development³⁷



³⁷ Jisc (2015) OA infrastructure: Jisc services and sector developments, a paper to the UUK OA coordination group. www.universitiesuk.ac.uk/openaccess

- 1.3 **Article submission services:** From the moment an academic is ready to publish in a journal, there are services which assist in locating, understanding and complying with the range of policies offered by different OA journals, whether 'hybrid' or 'pure gold'. This area of activity is multifaceted and sector services assist institutions in:
- understanding relevant funder policies³⁸
 - understanding via an index of journal policies whether, and on what terms, versions of articles can be deposited.³⁹
 - understanding, for a particular combination of funder(s) and journal title, whether and how compliance with the funder policies can be achieved.⁴⁰
- 1.4 **Article acceptance services:** [Jisc Collections](#) negotiates with publishers on behalf of UK higher and further education institutions. The overall aim is to limit and constrain the negative financial impact on institutions of subscribing to journals content and paying for APCs with those same publishers.
- 1.5 Further services are in development, which include an alerting service intended to pass notifications from publishers and repositories to institutions and authors.⁴¹ In particular, it is envisaged that the service will alert authors that that an article has been accepted for publication.
- 1.6 In order to assist institutions in managing and reporting to funders to show compliance to OA policies, a service is in development which will enable universities to collect the range of information about their OA publications.⁴²
- 1.7 **Article publication services:** Following the acceptance of an article by a journal, there are a number of support services in place and in development to assist institutions. Jisc, the Research Councils and HEFCE have cooperated to develop a repository metadata profile that allows institutions to collect and expose information to demonstrate their compliance with relevant OA policies⁴³, and associated technical support is available to institutions⁴⁴.
- 1.8 A range of services are also provided via the aggregation of OA content from UK and worldwide repositories and many OA journals. This enables a one-stop-shop to support institutions with discovery, analytics, and text-and-data mining access. This service is offered in partnership between Jisc and the Open University, and has a key role with respect to the REF OA policy.⁴⁵

³⁸ [Sherpa Juliet](#)

³⁹ [Sherpa RoMEO](#)

⁴⁰ Sherpa REF: To be launched December 2015.

⁴¹ [Jisc Publications Router](#). Discussions with publishers are on-going, as is technical development. It is intended that a beta service will be available from early 2016.

⁴² [Jisc OA Monitor Local](#). A beta service will be available in the first half of 2016.

⁴³ [RIOXX](#)

⁴⁴ [Jisc repository technical support service](#)

⁴⁵ [CORE](#): a beta service will be available in the first half of 2016

- 1.9 **Article usage services:** The sector has developed a number of services that collect and assist interpretation of usage data for OA articles via download data from the major journal publishers⁴⁶ and a selection of repositories⁴⁷. A related service is in development which aims to support institutional decision making by quickly identifying whether compliance with the REF OA policy can be achieved (and how to do so) when following a particular journal policy, or not. Additionally, there are activities underway to encourage greater levels of commonality between journal policies, so that language is consistent and options are transparent.⁴⁸

⁴⁶ [JUSP](#)

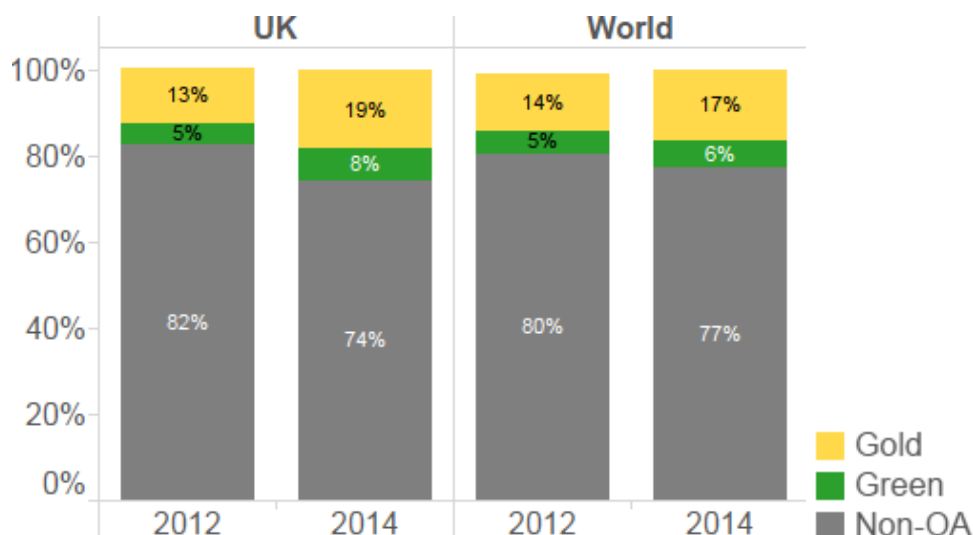
⁴⁷ [IRUS-UK](#)

⁴⁸ [Sherpa RoMEO](#)

Annexe 3: Growth of OA publishing in the UK

- 1.1 The UUK OA Coordination Group commissioned an investigation to monitor the transition towards OA in the UK. Its findings place the UK at the forefront of international OA implementation.
- 1.2 Key findings include:
- UK publishing via Gold OA was below the global average in 2012, at 13% and 14% respectively.
 - However, UK Gold publishing had increased by 24% per year between 2012 and 2014, faster than the average global increase of 14% per year over the same period.
 - Articles published via Gold accounted for around 19% of UK articles in 2014, higher than the global average of just under 17%.
- 1.3 There is therefore a stronger prevalence of authors choosing to publish via both Gold and Green publishing options in the UK, and both are increasing at a faster rate than world averages (figure 7).

Figure 7: Prevalence of journal article publishing via Gold, Green, and traditional (non-OA, subscription only) routes, after 24 months

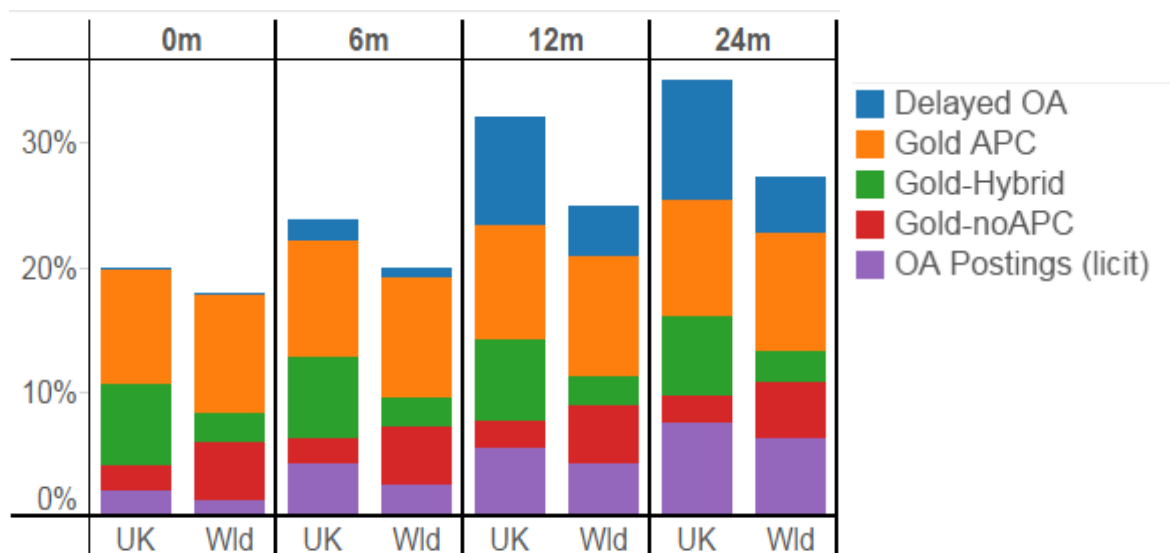


Source: based on Research Information Network (2015) *Monitoring the Transition to Open Access*⁴⁹

⁴⁹ Research Information Network (2015) 'Monitoring the Transition to Open Access', p9.
www.researchinfonet.org/OAmonitoring

- 1.4 The same report estimated that, when gold OA and delayed OA⁵⁰ into account, 35% of all UK articles posted between 2012 and 2014 were available via OA within 24 months of publication. This compares with an estimated 27% of all articles posted globally in the same two-year period (Figure 8).

Figure 8: Percentage of articles available via OA by months after publication, UK and world, 2014



- 1.5 Although the take-up of immediate OA models grew even faster in the UK than the global average, publication in subscription-based journals was essentially static (-0.4%).
- 1.6 The UK's profile of OA take-up is significantly different from the global averages: its use of OA in hybrid journals and of delayed OA journals is more than twice the world average in both cases, while its take-up of fully-OA journals (that do not charge APCs), is less than half the world average and falling.
- 1.7 It is also noticeable that UK authors show a preference for publishing in journals with higher citation rates in their field as measured by the field-weighted citation impact, reflecting the excellence of the UK research base.

⁵⁰ Delayed OA: where a journal decides to make an article free to access after a time period, but often still subject to restrictive copyright restrictions, rather than 'true' OA.

Annexe 4: the international OA policy context

- 1.1 The journal market has a global reach, and authors are funded to submit articles by national funding agencies from across the world. For this reason, UUK OA policy developments must be considered in light of international approaches and preferences.
- 1.2 Evidence suggests that there is an increasing number of research funding bodies and universities around the world which mandate that publically-funded research outputs are made Open Access.⁵¹ Few funding bodies have an explicit preference for Gold OA, and the vast majority support Green, with flexibility for authors to publish via Gold.⁵²
- 1.3 International stakeholders are becoming more vocal in drawing attention to recent findings that suggest publishers are profiting excessively through OA publishing. Reflecting a view that current OA publishing business models require further development, the Netherlands has made OA a priority for its upcoming EU Presidency (January–June 2016), and has the support of VSNU, the Dutch counterpart to UUK.
- 1.4 It is worth noting that both Dutch universities and the Dutch government have a stated preference for OA publishing via the Gold route over Green, due to a belief that the Gold route is likely to be more sustainable in the long term, but note that the experience of the UK in this area has shown development to be complex.⁵³
- 1.5 To this end, the Dutch Government have committed to making Open Access a priority of their Presidency of the Council of the European Union – January to June 2016 – having previously endorsed the ‘Golden Road for Open Access’. In December 2014, the Dutch reaffirmed the ambition to make sixty per cent of all publicly funded scientific articles available in OA by 2016, and all articles OA by 2024.⁵⁴
- 1.6 The EU Commission has announced policies both for open access to publications and for access to data arising from research funded under Horizon 2020, the successor to Framework Programme 7 which came into effect in 2014⁵⁵

⁵¹ For more information see: <http://roarmap.eprints.org/>

⁵² Based on preliminary UUK research using ROARMAP database.

⁵³ For more information see: www.government.nl/documents/reports/2014/12/08/2025-vision-for-science-choices-for-the-future

⁵⁴ VSNU statement on open access. Available at: www.vsnu.nl/en_GB/openaccess-eng.html

⁵⁵ For more information see: http://ec.europa.eu/research/science-society/document_library/pdf_06/era-communication-towards-better-access-to-scientific-information_en.pdf

- 1.7 Additionally, the European University Association is currently consulting on a 'Roadmap to Open Access', which aims to help European universities to reach greater levels of open access and is to be completed in Spring 2016.⁵⁶

⁵⁶ For more information see: www.eua.be/activities-services/news/newsitem/2015/11/19/eua-to-develop-roadmap-supporting-the-transition-towards-open-access

Annexe 5: Universities UK Open Access Coordination Group: subgroups

1.1 The UUK OA Coordination Group is an established forum for bringing key stakeholder groups together and to navigate the transition towards open access. It is proposed that the groups work would be strengthened by the establishment of three sub-groups, so that focused work can continue and feed into the group, so as to maintain a single route and 'voice' for managing contentious issues. The proposed membership and terms of reference of each group is set out below:

1.2 **Open Access Monographs sub-group:**

Role: The group is to perform an intelligence sharing/monitoring role in the first instance, and to later advise and potentially help drive the progress of any pilots of OA monographs.

Composition: Envisioned to be a smaller group, with similar composition in terms of interests to the main OA group. Membership will have an overlap with, but not be exclusively, members of the main OA group. A chair has not yet been confirmed, but the group should include representation from Jisc, Wellcome Trust, HEFCE, ARMA, British Library and be convened by UUK.

Meetings: The group will meet with a similar frequency to the UUK OA Group, but out-of-cycle to allow reporting of activity.

1.3 **Efficiency Forum sub-group:**

Role: There are changes needed to workflows and systems within and between research funders, institutions, publishers and service providers. These relate to, for example, financial management, policy compliance, and reporting requirements between stakeholders. The forum will be a mechanism for efficiencies to be identified and pursued by all stakeholders in a coordinated way.

Composition: Jisc (lead and secretariat); nominated Publishers; nominated institutions; research funders, key infrastructure providers and international representation from Max Planck Digital Library and Association of Research Libraries.

Meetings: The group will meet with a similar frequency to the UUK OA Group, but out-of-cycle to allow reporting of activity.

1.4 **Repositories sub-group:**

Role: To advise as to the best mechanisms to ensure that there is at least one permanent copy of an open access publication, and that due regard is given to long term curation of digital assets.

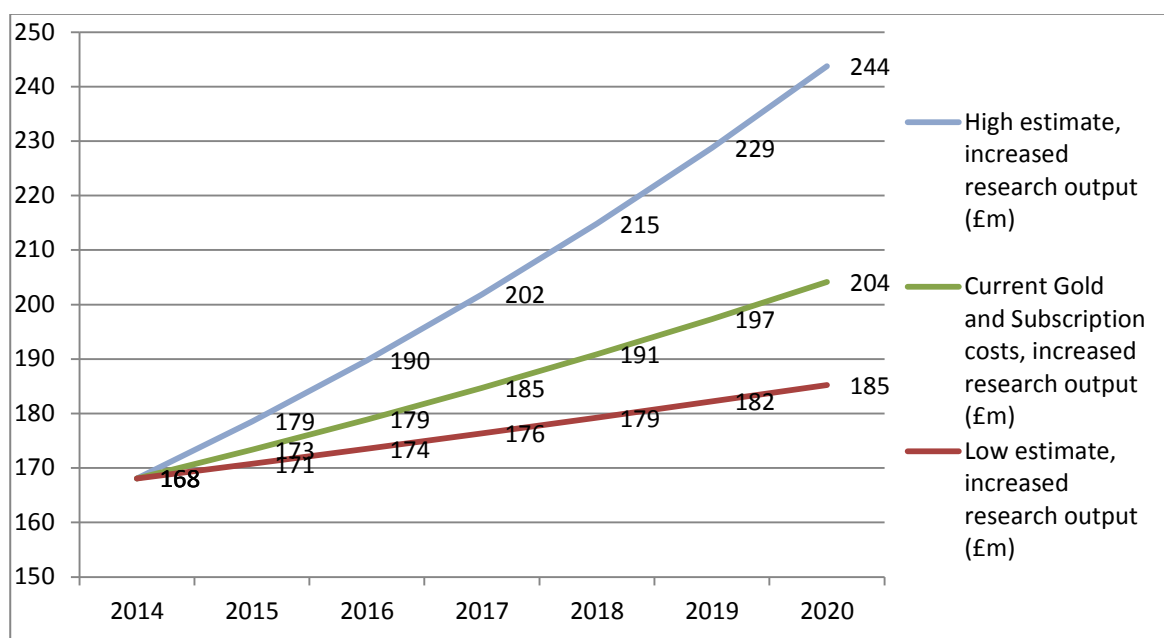
Composition: British Library, Research Libraries UK and SCONUL convene, with appropriate support.

Meetings: The group will meet with a similar frequency to the UUK OA Group, but out-of-cycle to allow reporting of activity.

Annexe 6: Modelling scenarios for Gold OA and subscription costs to 2020

The following data is built from estimates commissioned from Research Information Network. It represents 'best-guess' modelling of potential payments to publishers via Gold OA charges (APCs) and subscription fees, based on 2014 data presented in Research Information Network (2015) '[Monitoring the Transition to Open Access](#)'. This research should not be used as the basis for further assessments or decision-making.

Figure 9: Projected potential payments to publishers (for Gold OA and subscriptions) to 2020



High estimate:

- Increased article output from UK by 3% a year
- Increased APC charges from £1550 per article by 3% per year
- Increased proportion of articles requiring APC payment (signalling Gold preference)
- Increased subscription costs by 3% per year

Current ratios, increased output:

- Increased article output from UK by 3% a year
- Static APC charges at £1550 per article
- Increased proportion of articles requiring APC payment (signalling Gold preference)
- Static subscription costs

Low estimate:

- Increased article output from UK by 3% a year
- Static APC charges at £1550 per article
- Static proportion of articles requiring APC payment (current proportion)
- Decrease in subscription costs by 2% a year (i.e. offsetting)

Annexe 7: Options for the Open Data Infrastructure considered by the ERAC Task Force

Type of infrastructure	Pros	Cons
Open Access journals with Open Data mandates (“for underlying data”)	<ul style="list-style-type: none"> ● Excellent discoverability and accessibility; ● Excellent usability of the data: validation, replication, reanalysis, new analysis, reinterpretation, or inclusion into meta-analyses; ● Data dissemination is directly linked to the publication activity, which is traditionally valorised in the recruitment and the promotion of researchers; ● Allows peer reviewers of the papers to check the scientific quality of the underlying data. 	<ul style="list-style-type: none"> ● The notion of “underlying” data remains vague. In some cases all related data are needed to replicate a research; ● Reluctance to put data in Open Access may discourage researchers from publishing in journals with Open Data mandates; ● Effective implementation of the mandate is not assured; ● Supposes the existence of relevant Open Data infrastructures ; ● The questionable prestige rankings of scholarly journals could reflect upon the perceived quality of related data.
Open Access data journals	<ul style="list-style-type: none"> ● As a proper publication, a data paper provides academic accreditation to researchers (including citations); ● Dedicated peer review of the quality of the data (scientific and technical aspects); ● Maximisation of the opportunities for data-reuse because of the excellent description of the published datasets and the high discoverability and accessibility of the data papers; ● Possible usage of traditional bibliometrics (such as Impact Factors), as well as development of new data related metrics: “As data papers are becoming distinct publishing products, a number of data journals are also supporting alternative metrics (altmetrics), thereby enhancing further data publication.” (RECODE, 2014). 	<ul style="list-style-type: none"> ● Not all data journals mandate that the data discussed in the paper are archived in certified Open Access repositories; ● Different standards with regard to the accessibility and the identification of data (although most of data journals require at least a DOI or URI for the shared datasets); ● Remain within the traditional paradigm of journal publication.

Type of infrastructure	Pros	Cons
Web 2.0 collaborative tools for scientists	<ul style="list-style-type: none"> • Help scientists to include Open Access sharing of data into their daily routine and workflow; • Not linked to an institution: follows mobile researchers. 	<ul style="list-style-type: none"> • Participate to the potentially inefficient multiplication of the places of repository; • Uncertainty about the sustainability of the tools.
Web 2.0 social networking and bibliographic management tools	<ul style="list-style-type: none"> • Well known tools; • Not linked to an institution: follows mobile researchers. 	<ul style="list-style-type: none"> • Participate to the potentially inefficient multiplication of the places of repository; • Uncertainty about the sustainability of the tools; • “Dark Open Access” : access is only possible for the registered members (not real Open Access); • Not optimal discoverability; • Basic usage is free of charge but additional services and extra storage cost.
Research data repositories	<ul style="list-style-type: none"> • Dedicated tools for data archiving and data sharing; • Allow possible embargo periods; • Not linked to an institution: follows mobile researchers. 	<ul style="list-style-type: none"> • Participate to the potentially inefficient multiplication of the places of repository; • Uncertainty about the sustainability of the tools.
Institutional repositories	<ul style="list-style-type: none"> • Existing mandates (IDOA mandates) at institutional and European level for Open Access could easily be extended to Open Data; • Inclusion of the data in the usage of institutional repositories to assess researchers and to steer universities; • Participate to the institutional visibility of universities; • Excellent discoverability; • Strong Open Access mandates; • Centralised metrics and altmetrics; • Extended possibilities of data mining (COAR, 2015). 	<ul style="list-style-type: none"> • Even if it is technically possible to archive data in institutional repositories, current institutional repositories are mainly used to share papers than other types of research outputs (Archambault et al., 2014); • Librarians are not always the best trained specialists to curate data repositories.
Personal websites		<ul style="list-style-type: none"> • Lack of standardisation; • No quality assurance.
Cloud storage	<ul style="list-style-type: none"> • Usual way for teams of researchers to share project related data. 	<ul style="list-style-type: none"> • Not open for not-members of the team (not real Open Access).

Source: European Research Area Committee Open Data Task Force



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