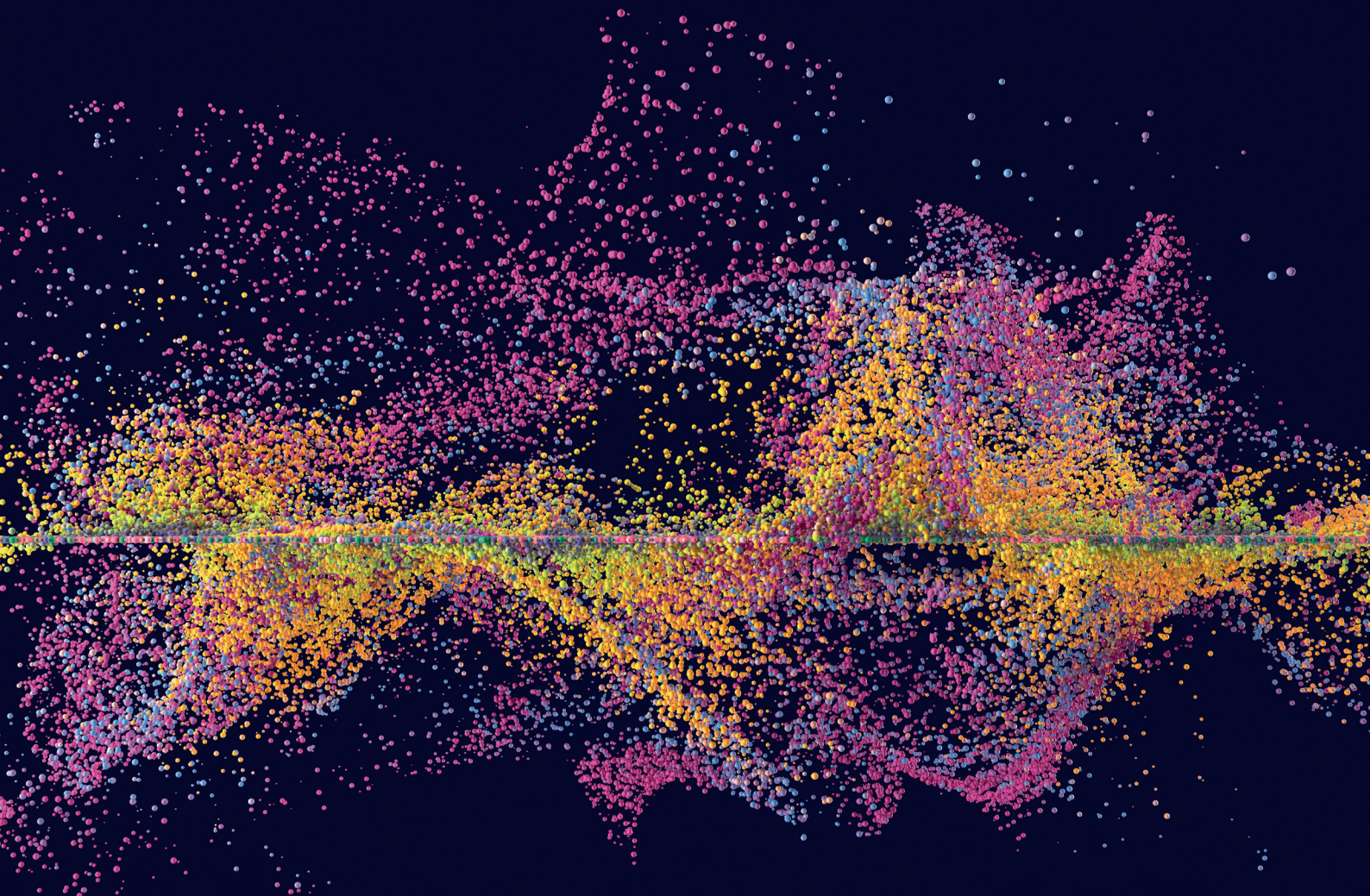


Jisc

A review of transitional agreements in the UK: Shortened



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Foreword

Our review of transitional agreements (TAs) highlights the remarkable strides we have taken as a community to deliver Open Access (OA) to research, for the benefit of all. It highlights the savings made through sector-wide negotiations, and shows that the UK has achieved exceptional levels of funder compliance and engagement in Open Access.

However, the report also shows us that TAs are yet to deliver on the promise of delivering full and immediate Open Access to research and moving from the paywall subscription system. Eight years on from the first TA, we see that TAs have little adoption beyond higher education limiting immediate OA publishing to the version of record to those authors at institutions that can either afford to subscribe to TAs or pay article processing charges.

Critically, the publishers with whom UK researchers publish the most are far from transitioning their portfolios to OA. This comes despite significant and sustained investment in transitional agreements from UK institutions and research funders. At the same time, we want to recognise those publishers, (many of which are smaller society publishers) who have not only transformed their processes and systems, but have also set out ambitious timescales and are well on their way to moving from paywalls entirely.

Implemented as a temporary model to enable a move to full OA UK and not an end point, it is right for us to objectively consider their effectiveness. The review gives an uncompromising evaluation of our progress towards an OA transition and of our investments

It brings with it opportunity, and with that ambition and optimism on the potential that sector-led negotiations can deliver in the future. This includes extending our international collaborations so all future arrangements enable everyone to participate in research.

I aspire for this review to act as a launchpad for the sector to set out its roadmap for future research dissemination. This work must run in parallel with and build upon our efforts to build an outstanding, dynamic, more inclusive innovation and research system.



Professor Steve Decent,
Principal and Vice-Chancellor,
Glasgow Caledonian University
and Chair of the UUK Jisc content
negotiations strategy group

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Glossary

The main data source for Open Access definitions in 'A Review of transitional agreements in the UK' is from Unpaywall and the majority of terms used to define Open Access were taken from this source.

Article Processing Charge (APC): an article processing charge is a fee applied by academic publishers to authors to make a research output freely and immediately available online.

Author Accepted Manuscript (AAM): “A researcher’s raw manuscript, after peer review but before publisher formatting. Also known as manuscript after peer review, author accepted manuscript, peer-reviewed version”¹.

Bronze articles: “Bronze articles are free to read on the publisher’s website, without a license that grants any other rights. There may be a delay between publication and availability to read, and often articles can be removed unilaterally by the publisher”².

Closed (only) articles: “Closed articles are a fifth OA status assigned by Unpaywall, where none of the [Bronze, Gold, Green nor Hybrid] OA categories apply”³.

Closed articles: Closed (only) and/or Bronze articles.

Diamond Open Access (OA) or Platinum Open Access (OA): “refers to a scholarly publication model in which journals and platforms do not charge fees to either authors or readers. Diamond Open Access journals are community-driven, academic-led, and academic-owned publishing initiatives. Serving a fine-grained variety of generally small-scale, multilingual, and multicultural scholarly communities, these journals and platforms embody the concept of bibliodiversity”⁴.

Double-dipping: “a publisher seeks an unwarrantable increase in revenues by levying article processing charges (APCs) for publication in a hybrid journal, while not providing a proportionate decrease in subscription costs”⁵.

Embargo: a period during which access to scholarly work is restricted to those who have paid for access. Once the embargo period ends, an article can be deposited in a repository (if permitted by the publisher).⁶

Fully Open Access (OA): A fully OA journal publishes “content [that] is freely available online and where user rights and the terms of copyright are defined”⁷.

Gold articles: articles that “have all the same characteristics as Hybrid articles, but are published in all-Open Access journals, which are in turn called “Gold journals”, or just “OA journals””⁸.

Gold & Green articles: Gold articles that also have a copy in a repository.

Green (only) articles: “Green articles are published in toll-access journals, but archived in an OA archive, or “repository”. These repositories may be discipline-specific (like ArXiv) or institutional repositories operated by universities or other institutions. Green articles may be published versions or preprints, and can have any license or no license”⁹.

Green articles: articles with a copy in a repository (i.e. including Gold and Hybrid articles).

Higher Education Institution (HEI): defined as “Universities, colleges or other organisations that primarily deliver programmes of higher Education”¹⁰.

Hybrid articles: “Hybrid articles are free to read at the time of publication, with an open license. These are usually published in exchange for an article processing charge, or APC”¹¹.

Hybrid & Green articles: Hybrid articles that also have a copy in a repository.

Open articles: Gold and/or Hybrid articles.

REF-eligible: articles that fulfilled the OA requirements for REF2021 (see Research Excellence Framework) and were therefore eligible for submission.¹²

Research Excellence Framework (REF): “The Research Excellence Framework [...] is the UK’s system for assessing the excellence of research in UK higher education providers (HEPs)”¹³.

Self-archiving: the same as Green (only) articles.

Transformative Agreement: Transformative Agreement was defined by the ESAC initiative as “an umbrella term describing those agreements negotiated between institutions (libraries, national and regional consortia) and publishers in which former subscription expenditures are repurposed to support open access publishing of the negotiating institutions’ authors, thus transforming the business model underlying scholarly journal publishing, gradually and definitively shifting from one based on toll access (subscription) to one in which publishers are remunerated a fair price for their open access publishing services”¹⁴.

Transformative Arrangement: Transformative Arrangement was defined by cOAlition S as “a number of strategies to encourage subscription publishers to transition to Open Access. We call these approaches ‘transformative arrangements’, for which there are currently three strategies: Transformative Agreements, Transformative Journals, and transformative model agreements”¹⁵.

Transitional Agreement: “Transitional agreements are examples of the ‘transformative arrangements’ referred to in the Plan S implementation guidance. [...] Transitional agreements are contracts which gradually shift the basis of payments from an institution to a publisher from subscription-based reading to open access publishing services in a controlled manner”¹⁶.

Total Cost of Ownership (TCO): encompasses all the costs incurred by an institution regarding the publication of research outputs in Open Access. It includes subscriptions and APC expenditure as well as “the cost of administering open access, such as time spent processing APC invoices or depositing items in a repository”¹⁷.

Version of Record (VoR): “The published version of research, after peer review and publisher formatting. Also known as VoR, formatted manuscript, publisher’s version”¹⁸.

Executive summary

Transitional agreements, adopted by Jisc and UK institutions alongside the global research community, were devised specially for hybrid journals operating both subscription and Open Access publishing models. Envisioned as a temporary mechanism to support publishers with transitioning titles to fully OA, they have the dual aim to “bring institutional investments in scholarly journal publishing under oversight and control, with an eye to cost reduction, and to drive a transition of scholarly journal publishing to Open Access”¹⁹.

As of January 2024 Jisc has negotiated and/or renewed 75 TAs with 47 publishers; we launched the first in 2016 with Springer. During that time, the **sector's requirements for TAs**, governed by the **UUK Jisc content negotiation strategy group**, have been refined to reflect changes in funder and institutional policies and learnings from our negotiations and institutional implementation. As a result, our negotiations have secured improvements to TAs including greater read access and OA publishing coverage, adherence to standards and workflow improvements. Our negotiations for TAs have also pushed for publishers to provide transparency on their costs, pricing and plans to flip their journal portfolios to OA in recognition that TAs were intended to be 'temporary and transitional.'

Ten years on from when negotiations commenced for the first TA with Springer, this review evaluates how effective TAs have been in delivering an OA transition, explores the impact of TAs globally and – critically – assesses the extent to which they have achieved the UK HE sector's requirements.

The review responds to the following questions:

- What proportion of scholarly literature is Open Access?
- What impact have transitional agreements had on open access to global and UK research publications?
- What effect have transitional agreements had on costs for UK institutions?
- How far have transitional agreements facilitated author compliance with funder requirements?
- Do transitional agreements deliver on their promise of being temporary and transitional?

It presents an evidence base for discussion. We hope that the review and its findings act as a catalyst for the research sector and partners to collectively discuss their aims for the future of open research dissemination and chart their roadmap to achieve this.

Scope

Our review is large but we have deliberately structured it, and its methodology and data, so that others including institutions, consortia, publishers and funders can use and build on our findings.

In **section 1** we review key UK and international OA initiatives, declarations and government, funder and publisher policy developments. We consider the developments that led to TAs, including the advent of offsetting models that sought to address the rising costs of OA and subscription access.

Section 2 contains our analysis of rates of the transition to OA (global and UK); an analysis of publishers' output and journal titles flipping to OA and the transition to OA by subject.

Section 3 assesses TAs against iterations of sector requirements, including cost constraint, funder compliance, licence type selection and transparency through data analysis, and publisher and institutional case studies.

Section 4 contains our conclusions, including a series of recommended actions that can be taken to improve the performance of TAs or to address the broader concerns expressed during this review and our negotiations.

This review does not examine publishers' commercial strategies or provide a comparative discussion on each publisher's approach to OA. Neither do we explore author behaviours and the extent to which the availability of TAs influences their publication choices. We also do not consider how openness or publication volumes are currently valued in the reward and incentive structures of research-performing organisations including review, promotion or tenure decisions or policies.

Our negotiations have secured improvements to TAs including greater read access and OA publishing coverage, adherence to standards and workflow improvements.

We acknowledge that publishers, institutions and consortia globally and UK HEIs are at different stages in the transition to OA and that the review, particularly the article analysis in [section 2](#), represents a snapshot in time. For example, our largest TA by article volume (Elsevier) started in 2022 and we saw higher levels of opt outs of OA publishing in the initial months of the agreement as authors grew accustomed to the OA workflow.

Lastly, we would like readers to note that TAs are only one type of OA agreement, and we have and will continue to support diversity through the negotiation of a range of OA models.

Findings

In this section we present some of the core findings. We strongly encourage you to read the full report as this contains valuable context, including the factors that are likely to have contributed to the results. The timeline of our review covers the COVID-19 pandemic, which upended research in many fields while accelerating OA to research in others but especially biomedical research.²⁰

What proportion of scholarly literature is Open Access?

The proportion and absolute numbers of global OA articles (Gold and Hybrid) have continued to grow over the last seven years, albeit slowing in 2022. Overall, the global proportion of Open articles published has increased over the last eight years, from 21% in 2014 to 46% in 2022.²¹

Despite this increase, the absolute number of Closed articles increased from 2.2 million to 2.6 million during the same period, likely due to the increase in overall research output. The growth in the proportion of Gold articles slowed to +0.9% between 2021 and 2022 after a steady growth of around 2.2% to 2.6% (2014 – 2019). Of concern is that after several years of a steady decline in the proportion of Closed articles, in 2022 it started to grow (+1%).

Gold articles make up the largest share of global OA output, averaging around four times the share of Hybrid. Between 2014 and 2022 Gold also grew considerably faster than Hybrid (by 19% compared to 5%), but this trend looks like it may now be switching, with proportions of Hybrid increasing faster and Gold growth slowing since 2020. The Green route to OA has also been declining across all the categories examined (Green-only, Gold and Green or Hybrid and Green), particularly in the more recent years.

In 2022, the proportion of UK Open articles was 4% higher when compared with the proportion of global Open articles.

UK transitioning to OA faster than the global rate

The UK's strong culture of publishing its research OA is reflected in our analysis. In 2022, the number of UK Open articles (all articles with any author affiliated with a UK organisation) was 4% higher when compared with the number of global Open articles (UK: 50%; global 46%). In addition, the UK has 15% fewer Closed articles (UK: 35%; global: 50%). In 2022 UK OA articles accounted for 65% of UK output (including Gold, Hybrid and Green), with a continual increase in absolute numbers and proportions of Open articles over the last eight years. Overall, the proportion of Open articles has increased by 30% and the proportion of Closed articles has decreased by 25% between 2014 and 2022.

However, the review also finds that in recent years (2021 and 2022) there has been a resurgence in (or at least, retention of) Closed articles. Closed UK articles grew by 4.5% between 2021 and 2022 after four years of decline. This growth must be monitored.

We observed important differences by subject: the UK publishes the most articles in medicine (slightly higher than the global average), but medicine is eighth lowest in its uptake of OA (compared with fourth highest globally).²² Overall, the median share of UK OA across subject areas is just under 40%, compared with 33% globally. For some fields such as engineering, environmental sciences and business and economics the proportion of Closed articles and Open articles has increased simultaneously due to a decline in Green-only content.

What impact have transitional agreements had on open access to global and UK research publications?

From 2018 to 2022 there was a more than 900% increase in the number of UK articles published under TAs with the same publishers, which is directly attributable to the increase in the number of TAs from one to 38 in the same period. TAs gave authors the ability to publish immediate OA at a time when most publisher embargo²³ periods did not permit the deposit and sharing of the author accepted manuscript (AAM) – of the TA publishers covered by our review 32% offered compliant Green OA options as of July 2023. Between 2017 and 2022 we saw considerable growth in OA uptake in disciplines with lower levels of research funding, including the arts, humanities and social sciences (AHSS)²⁴. TAs also facilitated immediate OA publishing for low-publishing HEIs.

Unintended consequences

While the UK appears to be transitioning to OA more effectively than the global average, there are some unintended consequences of TAs that are important to consider.

The UK's proportion of Hybrid articles is more than double the proportion in the rest of the world (UK: 21%; global: 10%). The UK's year-on-year increase in Hybrid publishing has recently surpassed the levels of growth in Gold publishing. This difference appears to be driven by TAs: the trend can be seen across all levels of our analysis, where the proportion of Hybrid articles in titles incorporated into TAs rose 19% between 2018 and 2022.

There has been a steady decline in the number of UK Green-only articles – around 4% over each of the last four years. This is a more exaggerated version of the global trend. While the UK had an initial emphasis on the Green route to OA (see section 1), we note that TAs appear to have converted articles to Gold/Hybrid OA that were likely to have previously been made OA via institutional or subject repositories. This may suggest that Gold and Hybrid routes are becoming more popular than – and even replacing – the repositories as a route to OA.

Closed content still dominates

Across global output in the TA titles of the 38 publishers we investigated, the shift toward Open was stronger than the (downward) shift in Closed – on average the proportion of Closed content declined by 2% and Open content increased by 7% for their TA titles. However, despite the downward shift, the average proportion of Closed content in the TA titles for the 38 publishers was 61% in 2022. This was not limited to just a few of the 38 publishers: 71% had proportions of Closed articles above 50% in their TA titles. The data was also reviewed at the UK corresponding author (CA) level, and albeit at a smaller scale, the review finds that for 13 of Jisc TA publishers the proportion of Closed UK CA content in their TA titles actually increased or was maintained between the year preceding the TA and 2022.

While you would expect the proportion of Closed articles in TA titles to reduce, around 40% of UK CA output has remained behind a paywall for the last five years. An in-depth examination of why 40% of UK CA output remains behind a paywall was out of our review's scope but factors include the limited reach and uptake of TAs beyond UK HE (see section 2b). Other factors may include the launch of more fully OA journals at the expense of the conversion or flipping of hybrid journals and the continued growth of articles in TA titles.

What effect have transitional agreements had on costs for UK institutions?

TAs reduced and constrained costs at a sector level

TAs have been a successful mechanism to constrain costs when reviewing at the sector level. The 2022 Jisc TAs (excluding Springer Nature) have delivered actual cost savings of £16.7m to subscribing institutions in the first year of the agreement when compared to expenditure in the preceding year²⁵.

Total 2022 expenditure via Jisc on TAs was £137m. Our analysis estimates that HEIs avoided costs of £6m in 2020 through TAs, (see section 3a) increasing to £42m in 2022 and a further £49.1m²⁶ when modelled into 2024 (see figure 27). Another successful outcome of TAs is that they have provided affordable routes to publication for low-output institutions – as a result of the Wiley TA six institutions published under the agreement that had not published OA with Wiley previously²⁷. TAs have also buffered high-output institutions from high publication fees when the APC route was the only funder compliant route for 68.4% of the TA publishers. However, we note

that real-terms savings and cost avoidance vary at the institutional level and it may be less easy to secure real terms savings in future, particularly if pricing is based on article volume and/or list price APCs.

Reliance on block grant funds

Even with estimated cost avoidance of nearly £42m in 2022, TA costs are still substantial. To aid institutions subscribing to TAs as a way of increasing OA and compliant publishing routes, UK Research and Innovation (UKRI) has permitted use of its OA block grants towards TA fees²⁸. We estimate that institutions used up to £9.4m of UKRI block grant funding towards the costs of TAs in 2022 – nearly a tenth of modelled costs for TAs that year. By 2024, this is predicted to increase to 25% of the modelled costs for 2024, faster than the predicted rate of increase of the modelled costs of TAs, meaning institutions stand to become increasingly reliant on the UKRI block grant to fund the costs of future TAs.

Longer term sustainability concerns

TAs repurpose previous subscription spend to cover the cost of read access and OA publishing. However, the APC persists as commercial publishers' preferred OA business model and the value of APCs is often used to calculate the cost of TAs.

As highlighted in [section 4](#) there are significant concerns with the longer term sustainability of article-based models. The zero VAT-rating for books, printed matter and e-publications in 2020 has had the effect of making the OA publishing charges that 'open up' access to research more costly than the equivalent fees to subscribe to the same content and read it. This, combined with the continued acceleration of published research articles ([see section 2](#)), means that OA models that are tied to

publication output are likely to prevent institutions from participating in the future, due to escalating costs.

How far have transitional agreements facilitated author compliance with funder requirements?

High levels of compliance achieved

TAs enabled the UK to achieve an exceptionally high level of compliance with funder OA policies – over 93% of UKRI-funded articles have a compliant route available to them²⁹ and, of these, 63% can be compliant through a Jisc-negotiated TA. Almost all TA publishers (35, or 92%) present a Creative Commons Attribution licence (CC BY) to authors as the default licence, with one publisher implementing systems to permit this from 2024.

Deposit in repositories

Almost all the Gold and Hybrid UK CA articles for the 38 TA publishers are also in a repository (and therefore REF-eligible³⁰) but only 13 (34%) of the TA publishers support automatic deposit of Gold and Hybrid articles to institutional repositories. We discuss embargo periods and the uptake of institutional rights retention policies in [section 1](#).

The majority of publishers support UK funder policies by depositing articles to PubMed Central (PMC) and Europe PMC (EPMC) but the review has highlighted differences in approaches. For example, two publishers only deposit to funder-mandated repositories if an APC has been paid, whereas two other publishers deposit AAMs irrespective of whether the author or institution is part of a TA.

Reducing administrative burden?

Our work to simplify and streamline OA processes was intended to ensure that scaling up OA was not unduly burdensome for authors and OA administrators. Although one of our case study institutions reported that the scale of OA achieved via TAs would not be possible without such a centrally managed system, overall efficiencies delivered were variable and the administrative burden of OA management persists. The institutions we interviewed acknowledge that TAs have improved workflows, but variations in offers, processes and systems between TAs mean that TA management continues to be resource-intensive for institutions, requiring specialised staff and financial management.

Total 2022 expenditure via Jisc on TAs was £137m. Our analysis estimates that HEIs avoided costs of £6m in 2020 through TAs, increasing to £42m in 2022 and a further £49.1m when modelled into 2024.

Do TAs deliver on their promise of being temporary and transitional?

The rate of transition is slow

As the UK represents a small proportion of global articles (approximately 4% in 2022³¹) we would not expect Jisc TAs alone to have a material impact on a publisher's OA coverage. The increase in global TAs does not appear to have made a material impact on levels of OA, either. We observed low rates of journals being 'flipped' to fully OA between 2018 and 2022. Fifteen publishers flipped some TA titles (although generally less than 10%), but we estimate that two-thirds flipped no journals at all. Of the publishers we modelled Karger flipped the highest proportion of its titles to TA – 15% (14 titles). Of the 'big five' publishers Wiley flipped the greatest proportion of Jisc TA titles to OA – 7% (104 titles).

TAs appear to be a more successful transition strategy within the UK for smaller, society publishers with a smaller portfolio of titles [see section 2]. The top four publishers by volume (Elsevier, Springer Nature, Wiley and Taylor & Francis [T&F]), account for 58% of UK closed articles (2017 – 2022) and during the period of the review these publishers increased or maintained proportions of UK Closed articles in their TA titles. If TAs do not transition the portfolios of the top publishers by output, the OA transition will not go far or fast enough.

The influence of TAs is also limited by their article coverage: for the publishers examined in this review an increase in the number of global TAs has not yet translated into higher proportions of articles made OA via these TAs.

Based on the journal flipping rates observed between 2018 – 2022 it would take at least 70 years for the big five publishers to flip their TA titles to OA. While our analysis and inspection of conversion rates or 'flipping' from hybrid to fully gold suggest that we will not transition the current scholarly publishing system away from paywalls in an acceptable timescale, we acknowledge that it is both the sum and coverage of a critical mass of OA arrangements that will induce a transition. For example arrangements that cover all researchers and all output that are adapted to reflect local finances are more likely to 'move the dial' than an approach that focuses on a specific funder or sector eg. higher education institutions (HEIs).

Transparency remains unclear

The transitional agreements oversight group (TAOG)³², one of Jisc's strategic sector groups met with four³³ TA publishers between March 2021 and July 2023 to scrutinise the performance of TAs and publisher OA strategies. However, transparency on how OA publishing charges are costed remains elusive; most TA publishers do not provide UK institutions or Jisc with detailed expenses and revenue breakdown. As of July 2023 only nine³⁴ of the 38 TA publishers had submitted data to cOAlition S's Journal Comparison Service (JCS)³⁵.

Similarly there is a lack of transparency on OA strategies for most (26) publishers. Seventeen of the TA publishers did not respond to our survey. Eight publishers that did complete our survey do not have (or could not disclose) an OA strategy or definitive targets/timescales to flip journals or portfolios to OA. Three publishers that were without a clear roadmap (or were unable to disclose one) were keen to stress that this does not reflect a lack of commitment to OA.

TAs enabled the UK to achieve an exceptionally high level of compliance with funder OA policies – over 93% of UKRI-funded articles have a compliant route available to them and, of these, 63% can be compliant through a Jisc-negotiated TA.

TAs are not capturing all UK research output

We found that the 'reach' of UK TAs was more limited than we hoped, both to articles from Jisc member institutions and articles published by researchers outside UK HE. There were 168 Jisc member research organisations with CAs that published in TA titles but not all members subscribe to all the relevant TAs. Therefore in 2022 21,894 'missed' articles could have been published via the relevant TAs.

In 2022, 81,838 articles were published with a UK CA: 74% of these were from authors at eligible Jisc member institutions, 65% were from authors at subscribing Jisc member institutions and yet only 47% were actually published via a UK TA.

Not only are there missed articles from authors at eligible organisations, there are groups of researchers (for example those in health and social care, commercial R&D settings or independent researchers) that are currently excluded from TAs (25% of UK CA papers in 2022 were by authors affiliated to non-Jisc members). TAs are yet to overcome the challenges associated with providing OA publishing to all researchers – though the potential to achieve this affordably and fairly is being tested by Jisc and the National Institute for Health and Care Research (NIHR).

The OA transition needs to accelerate

TAs use existing expenditure on subscriptions to fund OA publishing. For this reason it was hoped that as institutions took up more TAs this would stimulate a broader, global transition from the subscription/paywall system to full and immediate OA to all research.

Since the first TA was registered in the ESAC Registry in 2014 the number of TAs and the number of subscribing institutions and countries has grown, with 878 TAs registered as of December 2023. However, the growth in TAs being agreed and registered has slowed, which may indicate that the largest publishers have already made agreements with the countries/consortia most willing/able to enter into them.

Recognising that a large proportion of research originates from research-intensive countries, such as China and the US (26% of all global articles in 2022³⁶), we considered the impact if these countries had a similar pattern of transition to the UK. Our illustrative calculations suggest that even if these countries adopted TAs they would be unlikely to prompt a transition of publishers' portfolios to OA.

We also examined the article coverage of TAs entered into globally in 2022 ([section 2](#)). Nine publishers had a large number of global TAs (more than ten) but low levels of their global article output were covered by the TAs – less than, or equal to, 0.5% for each. Unless these TAs are extended to cover a broader range of the publishers' output these TAs are unlikely to convert these publishers' portfolios to fully OA.

Author behaviour appears to have remained the same

The availability of TAs across a broader range of publishers in this period does not appear to have changed author behaviours and UK authors continue to choose traditional publishers to disseminate their research.

The top ten publishers account for just over 90% of UK Hybrid output – a higher consolidation than for Closed (78% of output) and for fully Gold (66% of output). The top four publishers (Elsevier, Springer Nature, Wiley and T&F) together account for just under 50% of all articles published. The consolidation of output with the top four publishers is greater for the Hybrid route (66%) compared to the Gold (c. 25%) and Closed (58%). It is unclear whether TAs are contributing to this consolidation.

Conclusion

Our critical review of TAs provides a timely and comprehensive dataset to inform future discussions about models to support open research dissemination. It is clear that although TAs provide many benefits and have supported UK research to be disseminated in compliance with funder policy there are unintended consequences and negatives that must be considered and addressed.

It is also important to note that, while the review itself provides an objective data analysis it sits within the context of growing discontent with TAs from some institutions. In particular, we have witnessed an erosion in confidence that TAs will achieve a transition within an acceptable timescale. Stakeholders are concerned that without transparency and commitments from publishers TAs will simply become the norm. Given the level of public funds being invested in TAs, and the continual reliance on the UKRI block grant, it is appropriate to review the data and consider if what was considered a temporary investment is efficiently and effectively achieving a transition to OA.

We hope that the data presented in this review will stimulate discussion and debate across the research community about the future opportunities for research dissemination, what success looks like and the actions required to achieve this. We have purposely not suggested what success might look like, but instead we focus on some immediate recommendations:

- To maximise participation in research creation and dissemination without financial or other equality, diversity and inclusion (EDI) barriers we recommend that the sector prioritise agreeing additional indicators that demonstrate a commitment to equity. This will help to build support for alternatives to article or APC-based models
- Institutions and funders should use the review's findings alongside other indicators (including public commitments to an OA transition) in addition to the new equity indicators above when defining the research services the sector values and when agreeing where to invest. This includes reducing complexity and demonstrating a commitment to rapidly removing paywalls, while ensuring that models including TAs and successors to TAs do not place (or risk placing) other barriers – such as cost – to participation in research
- Financial divestment from underperforming TAs should be used to provide support for alternatives models. This may also include the redeployment of staff working on the financial or workflow administration of TAs

We hope that these recommendations will enable the sector and the broader research community to build on some of the successes of TAs while discussions take place regarding the future of research dissemination.

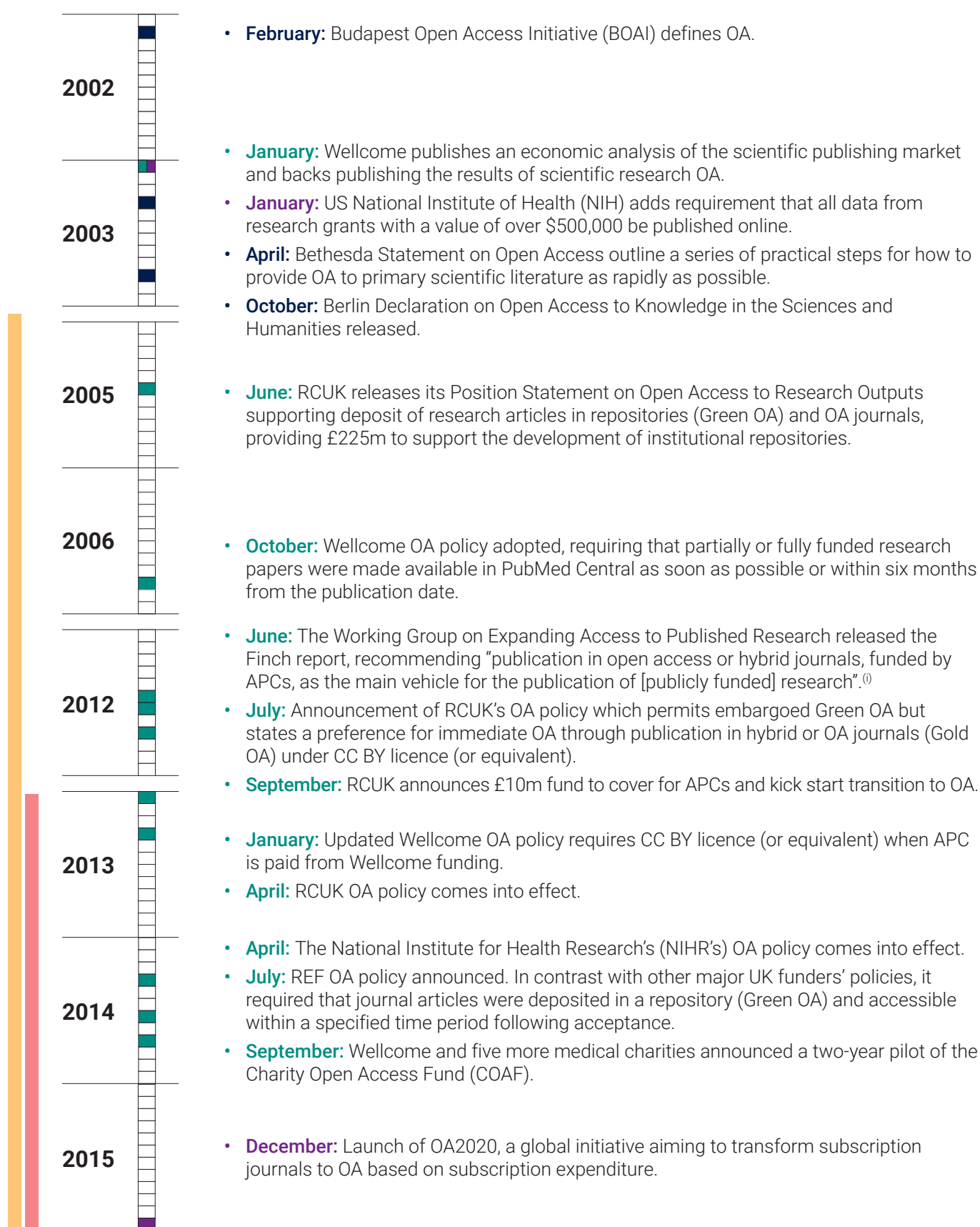
Section 1: background to OA in the UK

1a. Introduction

2023 marked over two decades of research, policy and concerted action on OA in the UK by funders, institutions, publishers, intermediaries, societies, researchers, mission groups and other organisations. This review aims to kickstart and inform a sector-wide discussion on what a thriving research system looks like and how research dissemination can best support this, while providing accountability for public investment in research.

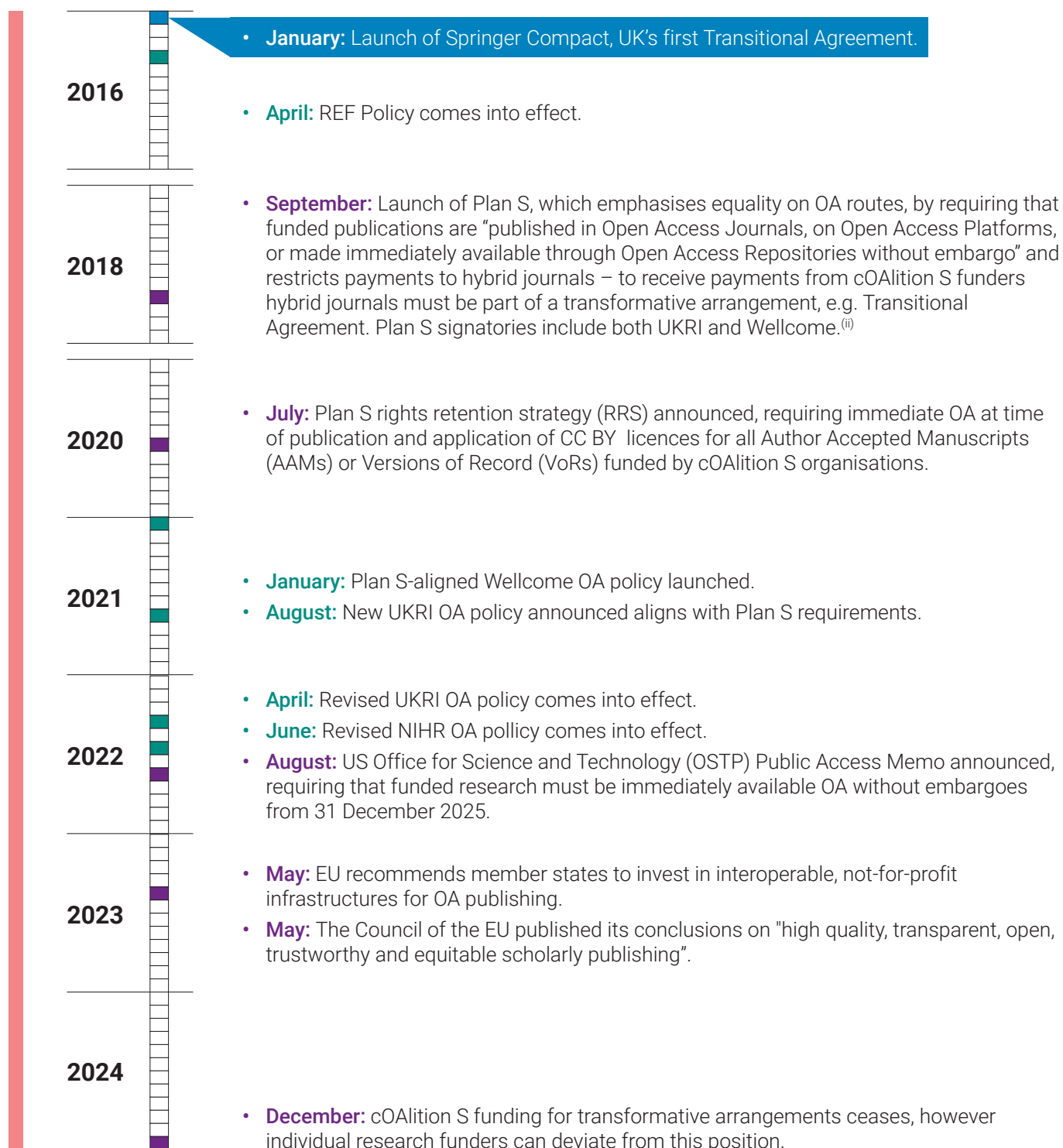
Open Access timeline: 2002 - 2015

Key: ■ Foundational OA principles ■ Global influences on OA development ■ OA policy development in the UK



2004 - 2015: Publishers increased embargo periods whilst also introducing APC-based hybrid OA options during this period.

Open Access timeline: 2016 - 2024



2013 - 2020: Average subscription charges for e-journal packages tracked higher than UK inflation during this period – reference for this point below

(i) Department for Business, Innovation & Skills (2012a)

(ii) cOAlition S (no date) What is cOAlition S?

1b. The path to Open Access

In February 2002, signatories to the Budapest Open Access Initiative (BOAI) defined OA and called for “free and unrestricted online availability” of peer-reviewed journal literature to “accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge”³⁷. BOAI proposed two paths to OA: a) self-archiving in open electronic archives and b) publication in “a new generation of journals committed to open access” or “existing journals that elect to make the transition to open access”.

The Bethesda Statement on Open Access Publishing³⁸, published the following year, included a series of practical steps set out by the biomedical research community for how to provide OA to primary scientific literature as rapidly as possible.

In the same year, the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities was released at a conference held by the Max Planck Society. Like the Budapest and Berlin declarations it upheld that all research outputs should be OA and grant all users free access to copy, use, distribute, transmit and display the work publicly, and that at least one copy of the work should be deposited in an online repository³⁹. The Berlin Declaration expanded on which research outputs should be made OA – “original scientific research results, raw data and metadata, source materials, digital representations of pictorial and graphical materials and scholarly multimedia material”⁴⁰ – and encouraged “the holders of cultural heritage to support open access”⁴¹.

The Budapest, Bethesda and Berlin declarations highlighted the importance of realising the internet’s full potential to open up access to research and defined key OA principles⁴². Momentum was bolstered by the uptake of Creative Commons licences, OA and services that supported authors to share and use OA⁴³ including registries of institutional, funder and publisher OA policies (Sherpa⁴⁴, ROARMAP⁴⁵), as well as OA journal directories (DOAJ⁴⁶).

OA policy development

Funder and institutional OA policies⁴⁷ have been a key driver for OA adoption and consequently of many of the changes in the academic publishing landscape over the last two decades, especially in Europe and North America⁴⁸. As of June 2023, there were 880 institutional

OA policies recorded in the Registry of Open Access Repositories Mandatory Archiving Policies (ROARMAP)⁴⁹ and 180 funder policies recorded in Sherpa Juliet⁵⁰ that advocate or mandate OA to research outputs through self-archiving⁵¹ or OA publishing⁵². Acknowledging potential bias towards policy data from Europe due to the geographical location of these services, data from Sherpa Juliet and ROARMAP suggests that OA policies are more prevalent in Europe (accounting for 69% of all institutional policies and 72% of all funders’ policies), followed by North America (11% and 17% respectively) when compared to Africa (4% and 2% respectively), Asia (8% and 6% respectively) and Central and South America (6% and 1% respectively).

In January 2003, the Wellcome Trust, the UK’s largest non-governmental funder, published an economic analysis of the scientific publishing market⁵³ that prompted its public support for publishing the results of scientific research OA. Wellcome’s public support for OA came alongside the US National Institutes of Health (NIH) requirement that all data from research grants with a value of over \$500,000 be published online⁵⁴.

In 2018 the European Commission (EC) called for a faster transition to OA and set the target of 2020 for “all publicly funded research in Europe [to be] freely available”⁵⁵. Later in 2018, the Plan S initiative was announced by cOAlition S, a group of research funders including UK Research and Innovation (UKRI) and the Wellcome Trust. Plan S – a set of ten principles – “aims [...] to accelerate the transition to a scholarly publishing system that is characterised by immediate, free online access to, and largely unrestricted use and re-use of scholarly publications”⁵⁶. Plan S stipulated three routes to OA – fully OA journals⁵⁷ or platforms, deposit of the version of record⁵⁸ (VoR) or AAM⁵⁹ in an open repository, or publishing in a subscription journal “under a transformative arrangement”. This was the first time that multiple funders set out their common OA requirements.

In May 2023 the Council of the EU published its conclusions on “high quality, transparent, open, trustworthy and equitable scholarly publishing”. Its recommendations included a requirement to “avoid the lock-in of services as well as proprietary systems”⁶⁰ and stressed the importance of supporting models not dependent on article processing charges (APCs) or similar per-unit charges by public research organisations⁶¹. Notably, it supported rights retention at institutional and author level and recommended

that the Commission examine the introduction of publication rights to remove barriers to access and reuse of publicly funded research results, publications and data at an EU level, while guaranteeing the author's consent⁶². Furthermore, it stated support for multi-format scholarly publishing models in Europe to promote OA to research output at no cost to authors and readers (Diamond OA⁶³). This aligns with the aims of the Horizon Europe-funded projects DIAMAS⁶⁴ and CRAFT-OA⁶⁵, which aim to advance collaboration in support of these models.

The adoption of OA policies resulted in growing numbers of research outputs becoming OA⁶⁶. However, it is notable that Brazil⁶⁷, China⁶⁸, Indonesia⁶⁹ and India have high numbers of OA publications but few or no funder or institutional OA policies⁷⁰ and few agreements recorded in the ESAC Transformative Agreement Registry⁷¹. Brazil and Indonesia published more research outputs OA annually than in Closed format, while China has published over 40% of outputs OA since 2020 and India since 2022⁷². Noorden (2019) posited that the high levels of OA publishing in these countries may be due to low-cost OA journals and websites⁷³. Indonesia, Brazil and India also rank among the top countries by OA journals in the Directory of Open Access Journals (DOAJ)⁷⁴.

The emergence of article processing charges (APCs)

The Bethesda Statement included a commitment from the Institutions and Funding Agencies Working Group to "agree to help fund the necessary expenses of publication under the open access model of individual papers in peer-reviewed journals (subject to reasonable limits based on market conditions and services provided)"⁷⁵. According to a survey by the Association of Learned and Professional Society Publishers (ALPSP), the "proportion of publishers offering optional open access to authors grew from 9% in 2005 to 30% in 2008"⁷⁶. In a follow-up survey in 2012 ALPSP reported that "most publishers surveyed now have a Hybrid model in place across all titles (ie author has option to pay for their article to be open access)"⁷⁷.

In their survey of authors who had published in OA journals about their APC funding sources and the factors influencing their journal selection, Solomon and Björk (2011) found it was easier for researchers to obtain APC funding "in the bio- and physical sciences than in the social sciences and humanities"⁷⁸. They also reported a strong correlation between "the level of the APC charged [...] with the objective or perceived quality of the journal"⁷⁹

– in other words, journals with higher impact factors applied higher APCs – and the discipline areas with higher levels of grant funding.

The rapid growth in OA and Hybrid⁸⁰ journals charging APCs over the past decade posed affordability concerns for research funders, academic institutions and their libraries. If the serials crisis⁸¹ had previously raised issues about subscription charges rising above inflation levels, it became apparent that APCs presented new charges in addition to rising expenditure on subscriptions. EBSCO's Serials Price Projections showed average subscription charges for e-journal packages tracked higher than UK inflation until 2020⁸² ([Figure 1](#)).

In 2012 global spend on APCs was estimated at over \$182m (£120m) (Björk and Solomon, 2014)⁸³ – this rose to an estimated \$2bn with 12 major academic publishers in 2020⁸⁴. Publishing consultancy Delta Think, which tracks commercial use of OA, estimated in an email on 11 July 2023 that total spend in 2022 on OA (via any payment mechanism – APCs, sponsored journals and other business models) was \$1.725bn.

In 2023, Klebel and Ross-Hellauer investigated the impact of APCs on the stratification of OA publishing by scientific disciplines, world regions and through time, termed the 'APC-barrier' "⁸⁵. They found a link between better resourced institutions and researchers publishing in OA journals with higher APCs. The study corroborated previous research that identified the increased likelihood for an author to publish an OA article involving payment of an APC based on several factors: male gender, employment at a prestigious institution, association with a STEM discipline, economies with higher GDP per capita, governmental research funding, and more advanced career stage (ie, higher professorial rank)⁸⁶. Nonetheless, research shows that white male authors' academic publishing, not specifically OA, dominates in subjects such as medical sciences⁸⁷ and that "non-white scientists experience various forms of inequality"⁸⁸.

Figure 1: CPI inflation and EBSCO Serials Price Projections between 2013 and 2023.

Data source: CPI and EBSCO

Year	CPI Inflation (UK)	EBSCO Serials Price Projections for e-journal packages
2023		2-3%
2022	10.5%	1-3%
2021	5.4%	1-3%
2020	0.6%	4-5%
2019	1.3%	5-6%
2018	2.1%	5-6%
2017	3.0%	5-6%
2016	1.6%	4-6%
2015	0.2%	5-7%
2014	0.5%	6-8%
2013	2.0%	5-7%

UK context

In 2004, following an inquiry into scientific publications, the House of Commons Science and Technology Committee released the 'Scientific Publications: Free for All?' report, which flagged "mounting concern that the financial benefits from the government's substantial investment in research are being diverted to an excessive degree into the pockets of publishers' shareholders" when "libraries are struggling to purchase journals". It recommended that the government takes a greater role in improving access to scientific publications to increase the impact of UK research and "acts as a proponent for change on the international stage".

In June 2005, Research Councils UK (RCUK), the largest funder of UK research, released its 'Position Statement on Open Access to Research Outputs'. It sought to ensure that the "[i]deas and knowledge derived from publicly funded research are made available and accessible for public use [...] as widely, rapidly and effectively as practicable"⁸⁹. It also advocated for publication and access models that "are both efficient and cost-effective in the use of public funds"⁹⁰, supported both e-print repositories and OA journals⁹¹ and announced that OA fees would be eligible costs in grant applications. Each council was able to determine its approach for OA and all had adopted policies by 2007⁹². Government funding of

£225m was provided to support the development of institutional repositories⁹³.

In 2011, the Minister for Universities and Science, David Willetts, held a research transparency roundtable with academic representatives, research funders, scholarly publishers and libraries⁹⁴. This resulted in the Working Group on Expanding Access to Published Research Findings (known as the Finch Report)⁹⁵ in June 2012. The UK Government's acceptance of the Finch recommendations fundamentally altered the direction of travel for OA in the UK. A key recommendation was that policies should support "publication in Open Access or Hybrid journals, funded by APCs, as the main vehicle for the publication of [publicly funded] research". This was considered the best approach to stimulate the wider economy and to provide publishers with the time and investment to support a transition and recommended that research councils and other research funders fund the costs of publishing in OA and hybrid journals⁹⁶.

In 2012 the Wellcome Trust also strengthened its OA policy. Having found that only 55% of research articles associated with its grants complied with policies in place since 2005, Wellcome stated that non-compliant publication would result in funding being withheld on active grants and new awards. Further change followed

in 2013, with the requirement that OA articles paid for from Wellcome funding be published under a licence permitting commercial re-use⁹⁷.

RCUK's new OA policy, based on the Finch recommendations, was announced in July 2012. The policy applied to peer-reviewed research papers acknowledging RCUK funding and it stipulated two routes to compliance: immediate and unrestricted access to the final published version of the paper on the journal website under a CC BY licence, or via "deposit of the final accepted manuscript in any repository, without restriction on non-commercial re-use and within a defined period"⁹⁸ according to research discipline. Notably, it stated a preference for immediate OA due to maximum opportunity for re-use.

During this period publishers increased the length of time before AAMs could be made OA (embargo periods) while adding the option to pay an APC to publish OA in subscription (Hybrid) journals. According to Gadd and Covey (2016) "restrictions around when a paper may be self-archived grew from eight incidences in 2004, /.../ to a total of 88 separate instructions in 2015 – a growth of 1,000%". The authors found "a clear link between the introduction of Gold Open Access and the increasing restrictions around Green Open Access"⁹⁹. As a result of these changes, for an increasing volume of journals the only route to compliance with the RCUK policy was via payment of an APC to the publisher.

In 2014, the four UK higher education funding councils¹⁰⁰ announced OA requirements for the 2021 Research Excellence Framework¹⁰¹ (REF) exercise. This policy stated that, to be eligible for submission, journal articles and papers published in conference proceedings with an International Standard Serial Number (ISSN) must have been deposited in a repository (institutional or subject) and accessible within a specified time period following acceptance. It allowed deposit of the final accepted manuscript or the published version of record and specified permitted embargo periods. The funding councils did not provide new funds for OA and stated that "institutions can achieve full compliance without incurring any additional publication costs through article processing charges".¹⁰² The REF submission requirements ensured that OA was on the agenda at the highest levels within UK higher education institutions (HEIs)¹⁰³.

In September 2014 Wellcome and five more medical charities announced a two-year pilot of the Charity Open Access Fund (COAF), underpinned by OA funding of £12m¹⁰⁴. In 2019 and 2020, Wellcome¹⁰⁵ and Cancer Research UK (CRUK)¹⁰⁶ pledged support to cOAlition S, updating their individual OA policies to align with Plan S, and COAF was disbanded in autumn 2020. UKRI, the funding agency that replaced RCUK, was also a signatory to Plan S and incorporated the principles into a new OA policy announced in 2021¹⁰⁷.

The National Institute for Health Research's (NIHR's) OA policy came into effect in April 2014. Following a consultation with stakeholders a revised policy applied from June 2022¹⁰⁸. As with Wellcome and UKRI, the policy requires that in scope articles be made OA by the official final publication date, without any embargo period, under a CC BY licence¹⁰⁹ (or Open Government Licence¹¹⁰ if appropriate).

Evidence underpinning various policy developments throughout this period often made reference to Value Added Tax (VAT) charged on digital content and the extent to which the cost of VAT charges hindered access to content, including scholarly research¹¹¹. Although printed scholarly content became exempt from VAT in 2016 it took until 2020 for the exemption to be extended to electronic journals. However, this exemption applied to fees related to reading, including subscriptions, but not to OA charges, including APCs, thus making the practice of opening up access to research more costly than the equivalent fees to subscribe to the same content via paywalls.

The VAT anomaly is particularly acute for transitional agreements (TAs) because, although they aim to use the same funding source (subscription funds) as their paywalled counterparts, as OA publishing increases it becomes more costly and administratively cumbersome to pay to publish, and to support government and funder policy. Over time, the current approach risks the entire cost of each TA being subject to VAT (20% as of January 2024), thereby making the OA route more expensive than less open routes¹¹².

The repository route

The number of institutional repositories in the UK grew significantly following the 2004 government recommendations¹¹³, from around 50 in 2005 to over 200 in 2011, decreasing slightly in 2012 and 2013 (Pinfield et al 2014, figure 2)¹¹⁴. By 2023, the global directory of OA repositories, OpenDOAR, included records for 248 UK institutional repositories¹¹⁵ (80% of all UK repositories)¹¹⁶.

Metrics were developed to demonstrate the value and use of repositories. In the UK, the IRUS service aggregated statistics that “enable[d] UK repositories to provide consistent, comparable and trustworthy usage data as well as supporting opportunities for benchmarking at a national level”¹¹⁷. Although 2019 saw a peak in the number of participating institutions providing article usage data to IRUS, the highest number of article downloads from institutional repositories was recorded in 2022: 32,085,234 (figure 2)¹¹⁸.

Gadd and Covey’s assessment (2016) of self-archiving policies in Sherpa Romeo found that, despite a 12% increase in publishers allowing some form of self-archiving between 2004 and 2015, the volume of restrictions around how, where and when self-archiving may take place increased by 119% (how), 190% (where) and 1,000% (when) respectively¹¹⁹.

By the mid-2010s UK HEIs reported good engagement with institutional repositories, often following local initiatives related to the REF OA policy. Holter (2020) observed that “self-archiving in the UK did receive a significant boost when (in 2016) the conditions for the next REF assessment were published”¹²⁰. For example, in 2015 approximately 100 articles were deposited each month to the University of Oxford’s institutional repository, but by 2017 this had increased by almost 1,000%¹²¹, and

in a 2017 blog post for OA Week the University of Edinburgh Library reported that 92% of the university’s research output was OA via the Green route following an institutional OA implementation programme¹²². In 2018, Research England reported that, based on survey responses, 80% of research outputs from 113 universities met the requirements for the REF OA policy or had a valid exception¹²³.

Although this policy rapidly and significantly increased UK author engagement with repositories, for many journals the only option available to authors to publish OA was through the payment of an APC. Notably Plan S and subsequent revisions to the UKRI and Wellcome OA policies granted equal emphasis to the Green and Gold routes to OA¹²⁴, by requiring that the CC BY licence be applied to all AAMs or VoRs for research articles resulting from their funding¹²⁵.

Rights retention strategies (RRSs)¹²⁶ sought to change the dominant practice¹²⁷ of publishers retaining author copyright on the AAM and to choose where to submit their research outputs and comply with funder policies. cOAlition S acknowledged that publishers could reject submissions that included rights retention language¹²⁸. Few publishers responded to cOAlition S’s 2022 request for information provided to authors at the submission stage¹²⁹ and Rumsey (2022) expressed concern that “mainstream [...] publishers impose terms and conditions that directly conflict with an author’s existing grant agreement, putting them in an unacceptable position”¹³⁰. Rights retention policies are relatively common in US universities¹³¹ as a result of the Harvard Faculty of Arts and Sciences OA policy, and a growing number of UK institutions have introduced new policies since 2021¹³². As of December 2023, 50 institutions have rights retention policies in place, or have publicly announced their intentions to adopt one.

Offsetting accelerated charges

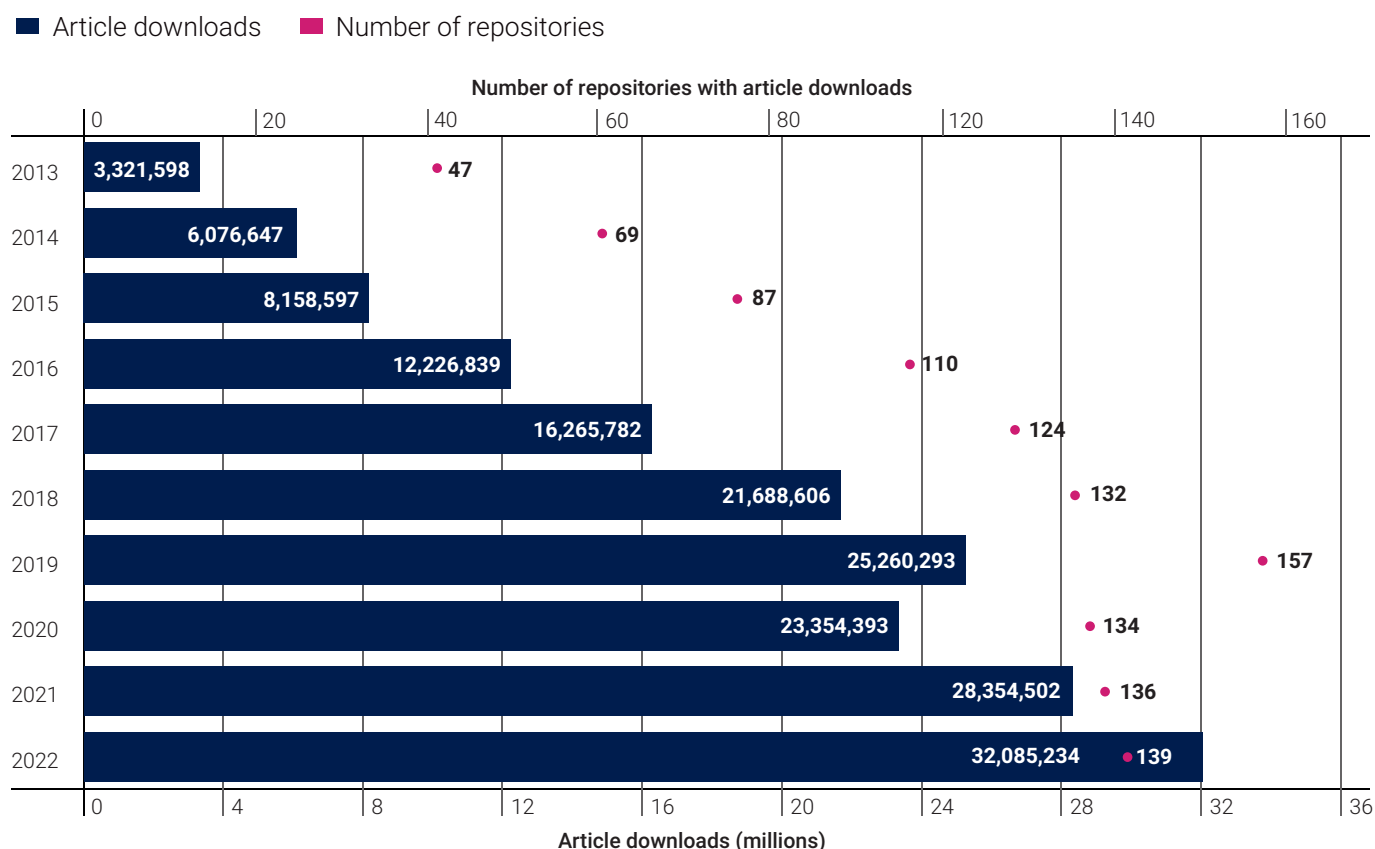
In 2014, following a review of the implementation of the Finch Report recommendations, the then Science Minister, David Willetts, called upon publishers to develop “innovative and sustainable solutions” to allow “a meaningful proportion of an institution’s total [APCs] with a publisher to be offset against total subscription payments”¹³⁵. In the letter he recommended that Jisc should work with publishers and institutions to “develop sustainable funding models that establish a relationship between the payment of APCs (and the costs of administering them) and subscription fees for an institution”. These became known as offsetting agreements.

Jisc mapped APC expenditure¹³⁶ and carried out work to establish the ‘total cost of ownership’¹³⁷ (TCO) to assess the total charges relating to subscriptions, APCs, administration and management of APCs. Research Consulting’s report ‘Counting the Costs of Open Access’¹³⁸ (2014) found that the time devoted to OA compliance in the 2013/14 academic year was equivalent to 110

full-time staff members across the UK. At this early stage of centralised OA payments “the Gold route [was] more than twice as time-consuming and costly for research organisations as Green” and the report noted “significant scope to realise efficiency savings in open access processes”.

Figure 2: number of institutional repositories¹³³ and articles usage data¹³⁴ based on the repositories that provided institutional repository usage statistics to IRUS.

Data source: IRUS



In 2014, following a review of the implementation of the Finch Report recommendations, the then Science Minister, David Willetts, called upon publishers to develop “innovative and sustainable solutions” to allow “a meaningful proportion of an institution’s total [APCs] with a publisher to be offset against total subscription payments”. In the letter he recommended that Jisc should work with publishers and institutions to “develop sustainable funding models that establish a relationship between the payment of APCs (and the costs of administering them) and subscription fees for an institution”. These became known as offsetting agreements.

In research commissioned by Jisc (Pinfield et al [2016]¹³⁹), 23 institutions reported paying 5,142 APCs between 2007 and 2014 with a total value of £8.6m; the 2013 value alone – £4.09m – represented an extra 11% in addition to average subscription costs. Their spend on APCs had increased from £977,848 in 2012 to £4,097,981 in 2013 and was projected to exceed £8m in 2014. This equated to £22,593 spent on APCs per day across the 23 institutions and “most APCs were paid to large, ‘traditional’ commercial publishers who also received considerable subscription income”. The research noted that APCs for hybrid journals were consistently higher than for fully OA journals.

Similarly, the APCs and subscriptions report (2016), which combined data from the Jisc TCO project and RCUK block grant returns for 2013-2015, showed the number of APCs paid by 70 institutions had doubled between 2013 and 2014 and that the average APC paid had increased by 6% in 2015 when compared to 2013. Total expenditure on APCs by institutions continued to rise, and between August 2014 and July 2015 was estimated to be at least £16.7m, representing 12% of institutions’ total expenditure on journals subscriptions¹⁴⁰. The majority of APCs had been paid to hybrid journals.

The UUK OA Coordination Group’s 2017 report, ‘Monitoring the Transition to Open Access’¹⁴¹, reported a 16% rise in average APCs from £1,699 in 2013 to £1,969 in 2016 and also noted that the average APC charge in hybrid titles was 28% higher than in fully OA journals. By 2016,

more than half of APC expenditure had been incurred with three major academic publishers – Elsevier, Springer Nature and Wiley. This latter point was central to the concerns of many small or medium publishers, including fully OA publishers, namely that if institutional budgets were spent on the major publishers their own financial sustainability would be at risk (Earney, 2017)¹⁴².

Varying ongoing policy developments during this period, coupled with differing publisher OA policies, resulted in what was referred to colloquially as a ‘policy stack’¹⁴³. The complexity increased the administrative burden and associated cost overheads for institutions. By 2017 the equivalent of 335 full-time staff were supporting OA across 113 UK institutions¹⁴⁴.

The offsetting agreements Jisc negotiated were intended to help institutions manage the combined charges for journal subscriptions and OA payments by offsetting the APC fees from subscriptions. Lawson’s (2019)¹⁴⁵ evaluation of the offsetting agreements put in place between 2015 and 2017 identified savings for each year (see figure 3). However, Lawson reiterated that the largest subscription publishers continued to be the main recipients of APC funds. The report highlighted additional charges (page and colour) and the “risks [of] entrenching the existing structure of the journals market and locking up even more money in big deals”¹⁴⁶. OA business models are a key driver of high growth in the revenues of large academic publishers¹⁴⁷.

Earney (2017) noted that “the concept of offsetting ha[d] itself become increasingly contentious” and said that “Hybrid APCs cost more than APCs in pure Gold journals, there is a higher cost of administration compared with pure Gold and Green OA, there are concerns over how [publishers] ensure that there has been no double-dipping¹⁴⁸ – and, more generally, there is a sense that Hybrid is not very progressive and poses the same market issues associated with the subscription journals market”¹⁴⁹. It is therefore more accurate to describe the savings as hypothetical or cost avoidance as it is not clear that institutions would have purchased the same volume of APCs if no deals were in place¹⁵⁰.

The UUK OA Coordination Group study showed that the overall increase in APC expenditure had continued despite offsetting agreements – more than fourfold from £758,000 to £3.4 million¹⁵¹ for a sample of ten universities between 2013 and 2016. Higher costs during a transition period were foreseen since subscription costs would continue to rise alongside the payment of APCs, but the increases were set against a backdrop of shrinking university budgets^{152, 153}. Bosch and Henderson (2018) found that journal pricing rose by approximately 5-6% each year between 2012 and 2017¹⁵⁴. Bosch et al (2023) found that in 2023 the average charges per title for STEM and SSH varied between \$338 and \$7,276, with titles prices increasing on average 5% when compared to 2022, and higher prices for STEM titles¹⁵⁵.

Delta Think data ([appendix 1](#)) shows that average fully OA and hybrid APCs have increased year-on-year. These data indicate increased costs and increasing pressure on institutional budgets¹⁵⁶. Shamash (2016) observed that APC expenditure increased by 136% between 2013 and

2014 and then a further 20% in 2015. Lawson (2019) noted that, although offsetting deals ‘save’ money and make more research OA, they have led to increased overall expenditure. Lawson drew a parallel with the logic behind subscription big deals – that big deals provide access to more content for a relatively small upfront increase in price and so make moderate administrative savings and deliver more ‘value’ but lead to higher absolute levels of expenditure¹⁵⁷. In 2022, spend by Jisc members on TA agreements with Wiley, Sage, Elsevier, T&F and Springer Nature¹⁵⁸ was £112.3m: almost a third of the total amount spent by HEIs on information provision according to the SCONUL 2021/22 expenditure data (£374,273,000)¹⁵⁹. Blanchard et al (2022) investigated the evolution of APC costs and electronic subscriptions in France. The authors found that the average APC for articles in fully OA journals was €1,395 in 2013 and €1,745 in 2020, and in 2020 their total cost was €30.1m. The total cost of subscriptions to journals packages for French institutions in the Couperin consortium was estimated to be €87.55m in 2020, with price increases varying between -1.95% and +7.22% between 2014 and 2021. The authors estimated that journal subscription costs would rise to €97.5m by 2030 and APC costs would reach between €50.6m and €68.7m by 2030. If the Green OA path were favoured, the estimated APC costs would decrease to €38.5m¹⁶⁰.

Figure 3: sector savings achieved by Jisc offsetting agreements 2015-2017.

Data source: Lawson (2019)

Year	Number of institutions	Total subscription amount	Total APC amount	Number of offsetting agreements	Total offset amount
2015	34	£17.3m	£2.3m	5	£1.2m
2016	38	£30.7m	£3.6m	6	£5.5m
2017	53	£38.4m	£3.4m	6	£7.09m

The advent of transitional agreements (TAs)

The principle of cost neutrality for a global OA transition was introduced in the Max Planck Digital Library white paper, **'disrupting the subscription journals' business model for the necessary large-scale transformation to open access**. Its primary finding was that "the money already invested in the research publishing system is sufficient to enable a transformation that will be sustainable for the future"¹⁶¹. The study ran "generic calculations [...] on the basis of available publication data and revenue values" to calculate incurred per article expenses. This model was reproduced at a global and national level, using Germany, the UK and France as examples. The report concluded that the €7.6bn spent annually¹⁶² in academic journals subscriptions to publish roughly 2 million papers was more than sufficient to fund OA business models. The OA2020 Initiative was established in 2015 with the aim of accelerating the transition to OA and transforming subscription business model by encouraging academic institutions to disinvest from subscriptions and invest in OA business models¹⁶³. In addition to its international coordination role via workshops and webinars, OA2020 hosts the Berlin Open Access Conference Series.

In November 2014, against the government target that 60% and 100% of all Dutch academic publications be OA in five (2019) and ten (2024) years respectively¹⁶⁴, universities in the Netherlands announced their OA agreement with Springer. This allowed corresponding authors (CAs) at subscribing Dutch universities to publish OA without author facing fees¹⁶⁵. In 2015 Jisc signed the Springer Compact agreement which also combined OA publishing and read access into one annual fee. The aim was to address the escalating costs of the hybrid business model and to 'accelerate the transition to OA on a large scale'¹⁶⁶.

At the 14th Berlin Open Access Conference (2018) delegates endorsed transformative agreements as a means of accelerating the progress of OA and defined the key characteristics of TAs: "temporary and transitional, [...] at least initially, be cost-neutral, with the expectation that economic adjustments will follow as the markets transform". The statement called upon publishers "to work with all members of the global research community to effect complete and immediate open access according to this statement". It should be noted that Jisc, under the direction of its strategic groups, uses the term transitional rather than transformative, as adopted elsewhere¹⁶⁷.

In September 2018 Jisc released its requirements for TAs, revised later to reference Plan S which had launched in the same month. A core principle of Plan S is the commitment that cOAlition S funders do not support the hybrid model of publishing but do allow funds to be used to support TAs. Plan S set a deadline of 31 December 2024 for cOAlition S members to withdraw financial support for funding transformative arrangements¹⁶⁸, acknowledging that TAs are temporary and transitional".

As negotiations progressed Jisc's TA requirements were further refined by Jisc's strategic groups, resulting in an increased emphasis on cost reduction versus cost constraint and uncapped OA publishing to the publisher's entire portfolio. This meant that former APC spend was removed completely from most TA proposals, which in some cases lowered baseline costs. While TAs meant that former subscription investments were more clearly and deliberately repurposed to facilitate OA communication they had significant implications for institutions, their libraries and publishers – workflows, processes, human resources, budgeting, financial streams, explored further in [section 3](#).

In 2021 a new phase in the transition to OA began. Wellcome's OA policy came into force in January and in August UKRI announced its own new policy, which came into effect in April 2022. Both of these policies require authors to make their research articles immediately OA and give equal preference to the Gold or Green routes, while prohibiting the use of their funding to cover publication charges in hybrid journals to titles covered by a TA. The University of Edinburgh's announcement in October of its Research Publications & Copyright Policy also marked the widespread adoption of institutional rights retention policies in the UK¹⁶⁹.

Reviewing the progress of transitional agreements

The remaining sections of the review examine the current OA landscape and evaluate the impact of Jisc-negotiated TAs.

Section 2 explores the scholarly publications landscape, the prevalence of OA by publisher, disciplines and countries, at different levels of granularity in the UK and globally. The questions driving this analysis and discussion include:

- To what extent has global and UK research output become OA?
- Is there a difference in the proportions of OA across UK research output across different levels of authorship (ie, any affiliated author or corresponding author)?
- How far have publisher portfolios transitioned to OA?
- To what extent have transitional arrangements facilitated these transitions?
- To what extent are publishers' journals 'flipping' to OA?
- Are there differences in the transition to OA by subject?
- What types of institutions participate in transitional agreements¹⁷⁰?

Section 3 assesses the effectiveness of TAs in the UK, under five TA requirements set by Jisc and UK academic institutions¹⁷¹:

1. Agreements must reduce costs
2. Agreements must be transitional and temporary
3. Agreements must permit compliance with funder mandates
4. Agreements must be transparent
5. Open Access content must be discoverable, and agreements must support improvements in service and workflow for authors and administrators

This section focuses on Jisc-negotiated TAs and seeks to respond to the following questions:

- What effect have TAs had on costs for subscribing institutions?
- To what extent are subscribing institutions dependent on block grants to fund TA costs?
- How do UKRI and Wellcome block grants affect participation in TAs?
- Are publishers globally and systematically offsetting subscription/read revenue against OA revenues?
- Are articles published under TAs meeting the requirements of funders?
- In which cases have publishers ensured and provided transparency over publishing costs?
- To what extent have publishers provided clear roadmaps showing their route to OA?

Appendix 2 outlines how we addressed these questions.

Section 2: the prevalence of OA in UK and global scholarly literature

2a. Global findings

To what extent has global publication in journals transitioned to Open Access?

Back in 2012, Lewis predicted that fully Gold would cover 50% of articles between 2017 and 2021 and 90% by 2025 at the latest¹⁷². Gold publication trends are still very far from Lewis's forecast.

A 2022 Delta Think report forecasted a 13% annual growth rate for OA research output between 2021 and 2024¹⁷³. It also noted output regressing to long-term underlying trends as a result of COVID-19. This was based on an estimation of the proportion of OA (excluding Green-only) in 2021 at around 45%¹⁷⁴, and Closed (including Bronze) at 55%. Hahnel (2022)¹⁷⁵, similarly claimed that between 2011 and 2021 publishing moved from 70% Closed to 54% OA.

In contrast the EC's Open Science Monitor, using data from Scopus and Unpaywall, showed that in 2018 18.5% of research outputs were Gold OA, 15.3% were Green, 6.3% were Hybrid and 4.9% were Bronze¹⁷⁶. In 2021, data from the STM Association¹⁷⁷ showed that for the top 30 countries/regions by publication volume, subscription-based content accounted for 49% of total articles, reviews and conference papers, 34% Gold OA and 9% Green OA. In the UK, subscription-only accounted for 21% of publications, Gold OA accounted for 48% and Green OA for 25%.

In 2018, Piwowar et al conducted a comprehensive assessment of the proportion of literature that was available OA. The study determined that the proportion of OA increased over time, with 45% of the total global articles published as OA in 2015, defined in the study as fully Gold, Hybrid, Green or Bronze.¹⁷⁸ However, if 'open' is limited to fully Gold and Hybrid articles, as it is in the rest of this report, only 21% of global scholarly literature would have been considered open at this point. The study attributed the growth in OA to the rapid increase in Gold and Hybrid since the year 2000.

Article proportions by Open Access status

The following visualisation ([figure 4](#)) shows the number and proportion of articles by their OA status between 2014 and 2022 according to the analysis undertaken for this report, outlined in 'appendix 2'. (Also see [appendix 3: number and proportion of global and UK articles by Open](#) for a table of the proportions.)

Note that the near plateauing in all articles in 2022, not specific to OA, may be linked to the end of the lockdown phase of the COVID-19 pandemic, during which article publication increased exponentially¹⁷⁹.

The proportion and absolute numbers of OA articles have continued to grow over the last seven years, albeit slowing in 2022. Overall, the proportion of global open articles published has increased over the last eight years, from 21% in 2014 to 46% in 2022. These findings are similar to those found in other studies such as Hahnel (2022), Pollock and Michael (2022), and STM (no date)¹⁸⁰. This has mirrored a decline in the proportion of Closed articles, from 70% in 2014 to 50% in 2022. With the increase in the proportion of Open (and decrease in the proportion of Closed) articles, Open and Closed articles in 2022 now account for similar proportions.

Between 2014 and 2022 Hybrid articles increased from 5% to 10% of global research output but, most notably, the proportion of Gold articles increased from 17% to 36% and Closed (only) articles decreased from 59% in 2014 to 41% in 2022. These figures diverge from the Open Science Monitor data, as Gold OA shows a markedly higher proportion in 2018 than that reported by the Open Science Monitor, whereas Green, Hybrid and Bronze OA show a lower market share. However, the increase in Gold and Hybrid shown by our analysis (as well as in Hahnel [2022]) is a continuation of the trend from the year 2000 noted by Piwowar et al (2018)¹⁸¹. Please note that we caution against a direct comparison with the 2018 work of Piwowar et al because of the difference in datasets and methods used¹⁸², as well as the contextual differences in publication trends during and after the COVID-19 pandemic¹⁸³.

Despite the decrease in the proportion of global Closed articles between 2014 and 2022, the number of Closed articles has increased from 2.2 million to 2.6 million during the same period. This is because the total volume of research output continues to grow: the larger Closed article volumes occupy a smaller share of an ever larger total research output.

When considering the primary OA status of an article, the number of Green articles slightly declined between 2014 and 2022, in both absolute and proportional terms. Specifically, Green-only articles make up 3.8% less of all global articles in 2022 than in 2014. However, when additional OA statuses of an article are taken into

consideration (ie, when an article is primarily categorised as a Gold or Hybrid article but is also Green by virtue of having a copy in a repository), then there is a more stable trend, where articles with a Green status make up an estimated 0.5% more in 2022 than 2014. These ‘shadowed Green articles’ (where the Green OA status is shadowed by a primary Gold or Hybrid status) may account for more Green articles than the Green-only articles: shadowed Green articles are estimated to make up 13.8% of global articles in 2022, compared to the 4.5% that are Green-only. The overlap between Gold and Green is estimated to be over three times as large as the overlap between Hybrid and Green, attributable to the larger number and share of Gold articles compared to Hybrid. This overlap

of Gold or Hybrid and Green OA statuses is partly unsurprising, given that strategies to transition to OA are not mutually exclusive. Indeed, negotiating for an alternative Green route is a standard approach when establishing TAs. This analysis is not able to discern, however, to what extent the overlap between Gold or Hybrid and Green articles is the result of Gold or Hybrid articles that are also made Green OA through a repository, or to what extent articles that were already Green OA through a repository were then also made Gold or Hybrid OA. This masking of Green articles is particularly important when we come to consider the costs associated with the transition to OA.

Figure 4: number (top) and proportion (bottom) of articles published globally by OA status, between 2014 and 2022.

Data source: Dimensions¹⁸⁴ and Unpaywall. Parameters: All articles. All titles for all publishers.

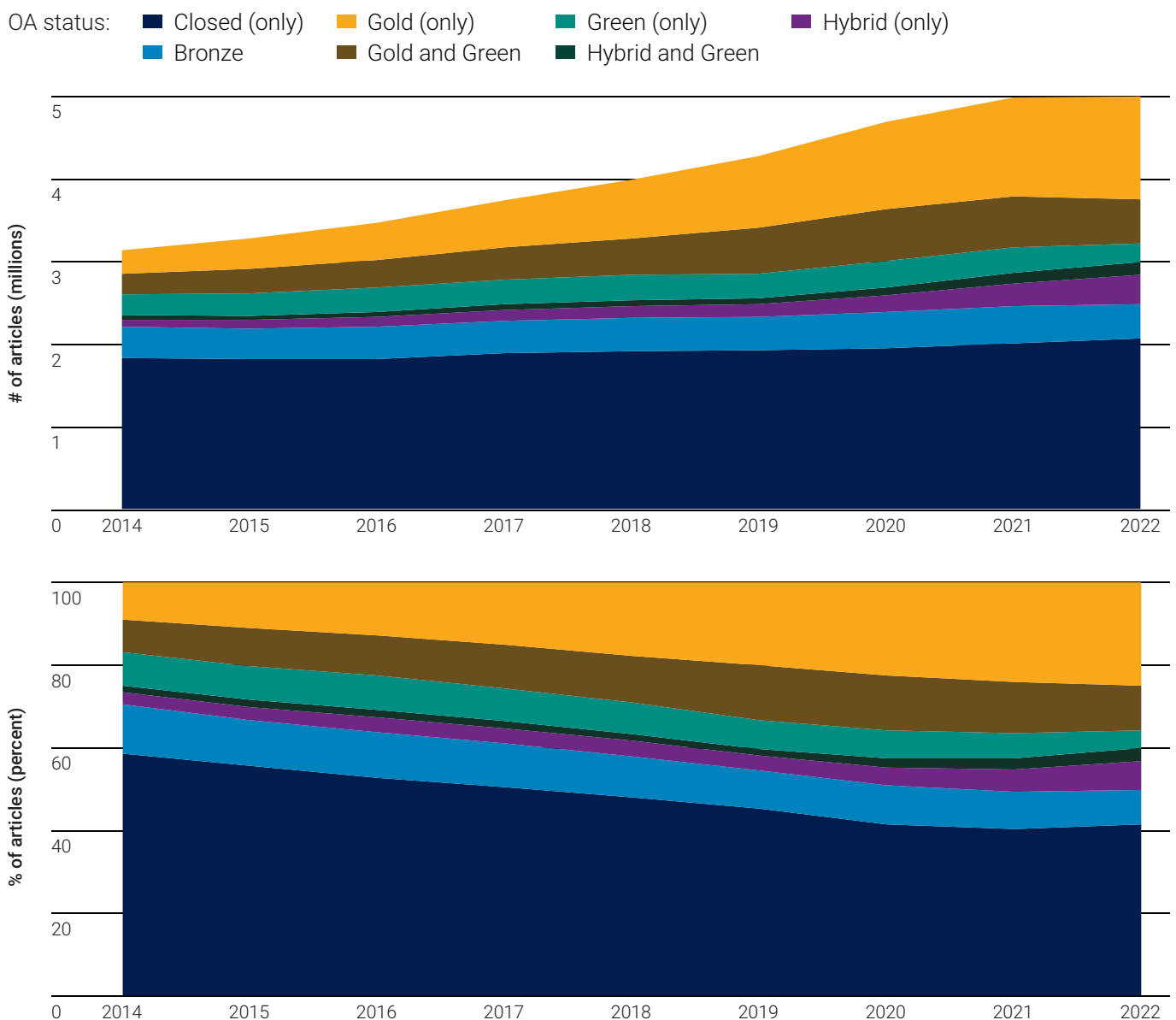
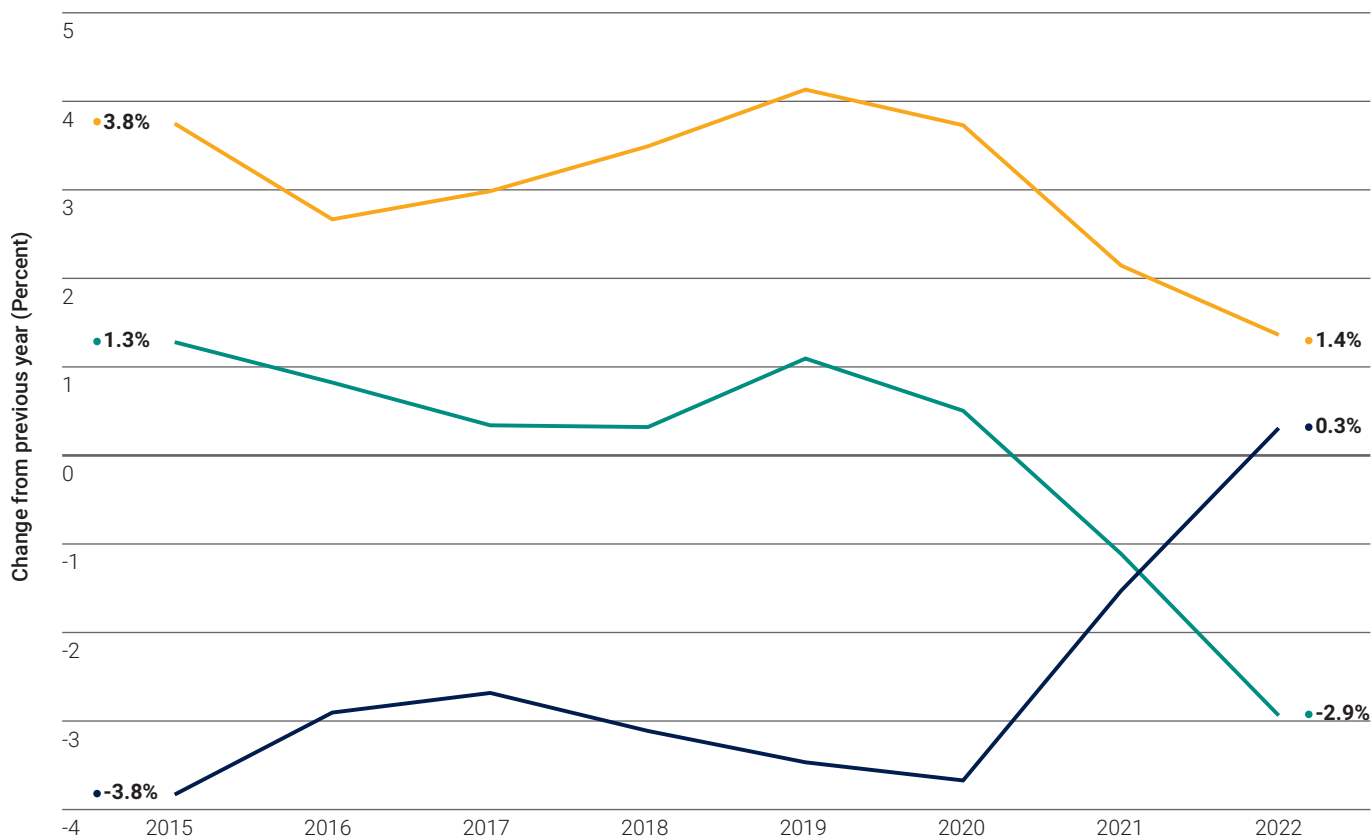


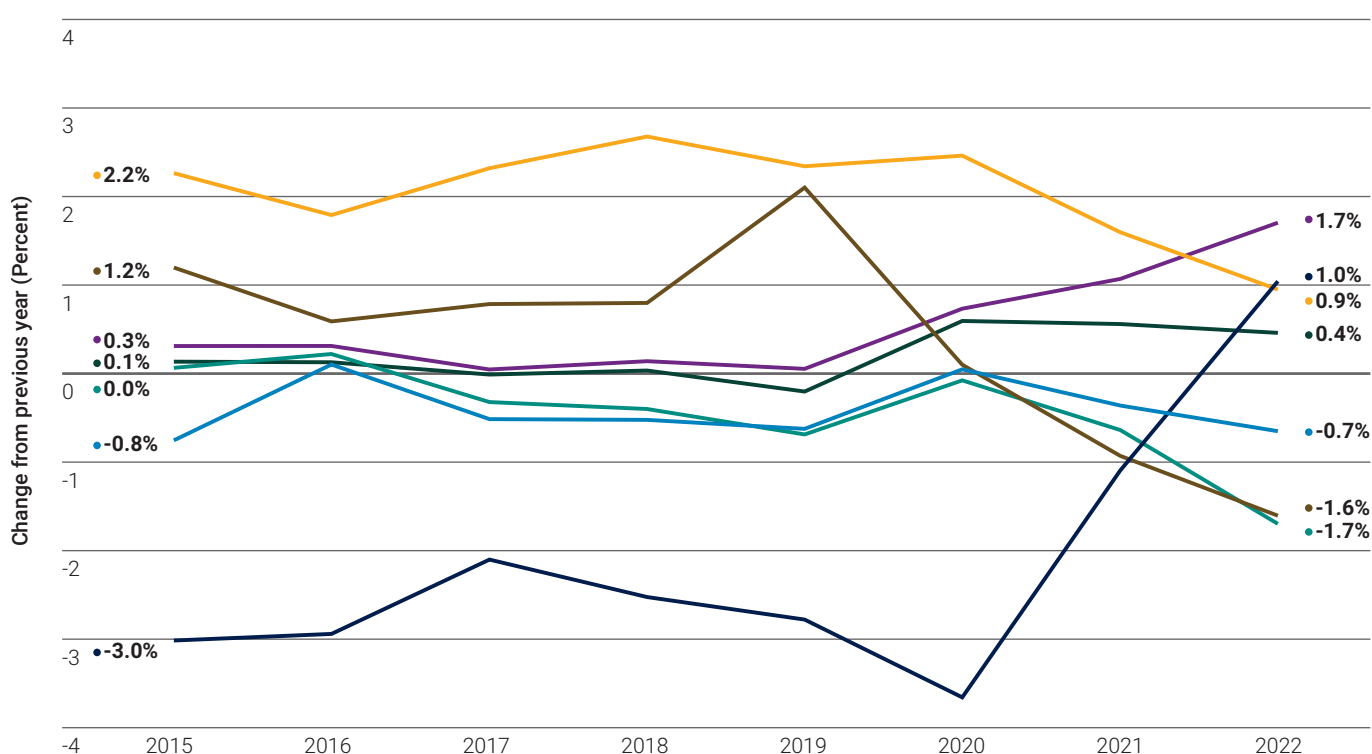
Figure 5: the year-on-year change in the proportion of all articles published globally from publishers with 2022 UK TAs by OA status (defined by Unpaywall), from 2014 to 2022.

Data source: Dimensions and Unpaywall. Parameters: All articles. All titles for all publishers.

OA status: ■ All Closed articles ■ All Open articles ■ All Green articles



OA status: ■ Closed (only) ■ Gold (only) ■ Green (only) ■ Hybrid (only)
 ■ Bronze ■ Gold and Green ■ Hybrid and Green



Rates of change in article proportions by Open Access status

Deeper analysis – as displayed in [figure 5](#) – shows that the rate of increase of Gold articles has stagnated between 2020 and 2022. Between 2014 and 2019 the proportion of Gold articles was growing at a rate of around 2.2% to 2.6%; but from 2020 onward the growth in the proportion of Gold articles started to slow, to as low as +0.9% between 2021 and 2022. This slowing of growth in Gold articles indicates a kind of ‘plateauing’, but it remains to be seen whether this is a longer term trend.

In contrast, the rate of change in the proportion of Hybrid articles started increasing from 2020 after maintaining a static proportion of 3-4% of global articles between 2014 and 2019. More concerningly, however, the rate of change in the proportion of Closed (only) articles has been increasing recently. After a steady decline of about -3% each year until 2020, the rate of change has since gone up, to +1.0% in 2022, meaning that the proportion of Closed (only) articles has actually increased. This is different to the 13% annual growth rate of OA forecasted by Delta Think¹⁸⁵, as proportions of Closed articles hold relatively steady and proportions of Open articles see only modest growth rates.

As noted for [figure 4](#), the proportion of Green-only articles has decreased over time and, as shown in [figure 5](#), this decrease is getting faster. After several static years,

Green-only articles were decreasing by 1.7% in 2022. The shadowed Green articles have had slightly different trends. For Hybrid articles that are also Green the proportions remained stable until 2019 (ie, around a 0% annual increase), but between 2020 and 2022 they have seen annual increases closer to 0.5%; for Gold articles that are also Green it is estimated that there was a surge between 2018 and 2019 with an increase of 2.1%, but since then this category has fallen dramatically, to a low of -1.6% by 2022. Overall, this suggests a decline across all Green categories, particularly in more recent years. This may, in part, be due to embargo periods still in place for younger articles (ie, since 2020). But we do not know to what extent this is the case, compared to a ‘real’ decline in the use of the Green OA route. Further research could help to show the effect of embargos and the causes for the apparent decline in Green OA.

What is the reach of transitional agreements globally?

The landscape of scholarly publication changed considerably between 2014 and 2022. One large component of the change in the context behind the conversion to OA is the increase in TAs¹⁸⁶ – the focus of this report. According to ESAC’s Transformative Agreement Registry, the first two global TAs were implemented in 2014 (in Austria by KEMOE/FWF with T&F and Institute of Physics [IOP]). Since then, global active TAs have increased to 426 in 2022 ([figure 6](#)).

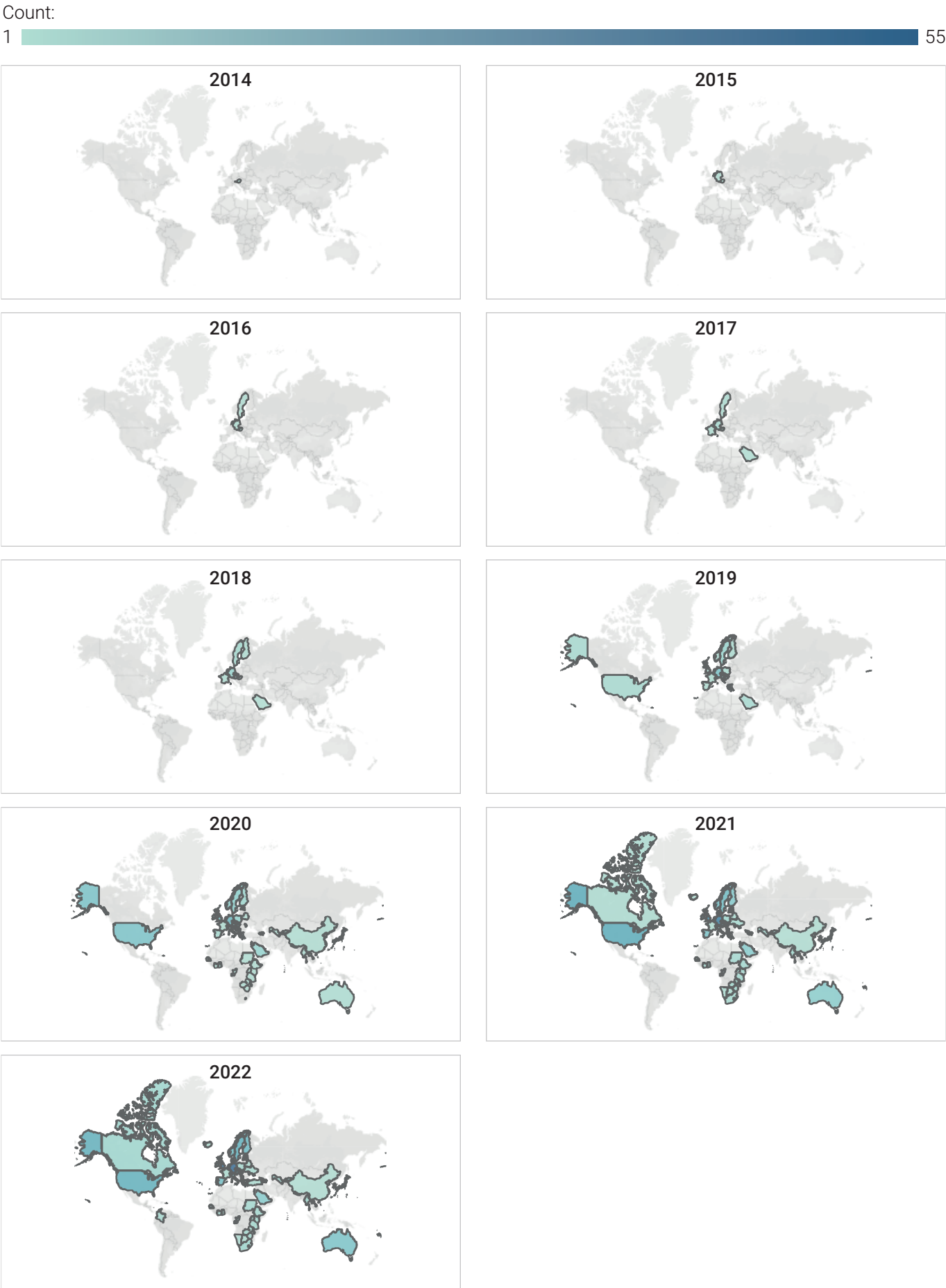
Figure 6: number of transformative agreements registered with ESAC by year.

Data source: ESAC Transformative Agreement Registry

Year	Number of TAs globally	Rate of change from previous year	Cumulative rate of change
2014	2		
2015	4	+100%	
2016	9	+125%	
2017	19	+111%	
2018	31	+63%	
2019	77	+148%	
2020	178	+131%	
2021	336	+88%	
2022	426	+27%	+21,200%

Figure 7: number and geographical location of TAs by year.

Data source: ESAC Transformative Agreement Registry



The rate of change in the number of global TAs, though, has been slowing in the last few years, from a high of +148% between 2018 and 2019 to a low of +27% between 2021 and 2022. This may be due to organisations not registering their TAs in the ESAC Registry, or it may indicate a slowing in the number of TAs globally as publishers have already made agreements with the countries/consortia most willing/able to enter into TAs.

Campbell et al (2022) highlighted the growing number of countries with TAs¹⁸⁹ – by May 2023 the ESAC Registry identified 74 countries with TAs. This includes a number of developing countries in Africa and Southeast Asia through the work of Electronic Information for Libraries (EIFL). While demand for TAs from consortia and research-performing institutions has increased¹⁹⁰, it is generally still the more affluent Western countries that hold the largest number of TAs¹⁹¹. Differences in regional participation may be attributed to a range of factors, including the location and OA policy requirements of research funders, as well as established cultural norms prioritising scholar-led publishing and low uptake of publishing with commercial publishers. Figure 7 shows the global spread of TAs in place in 2022.

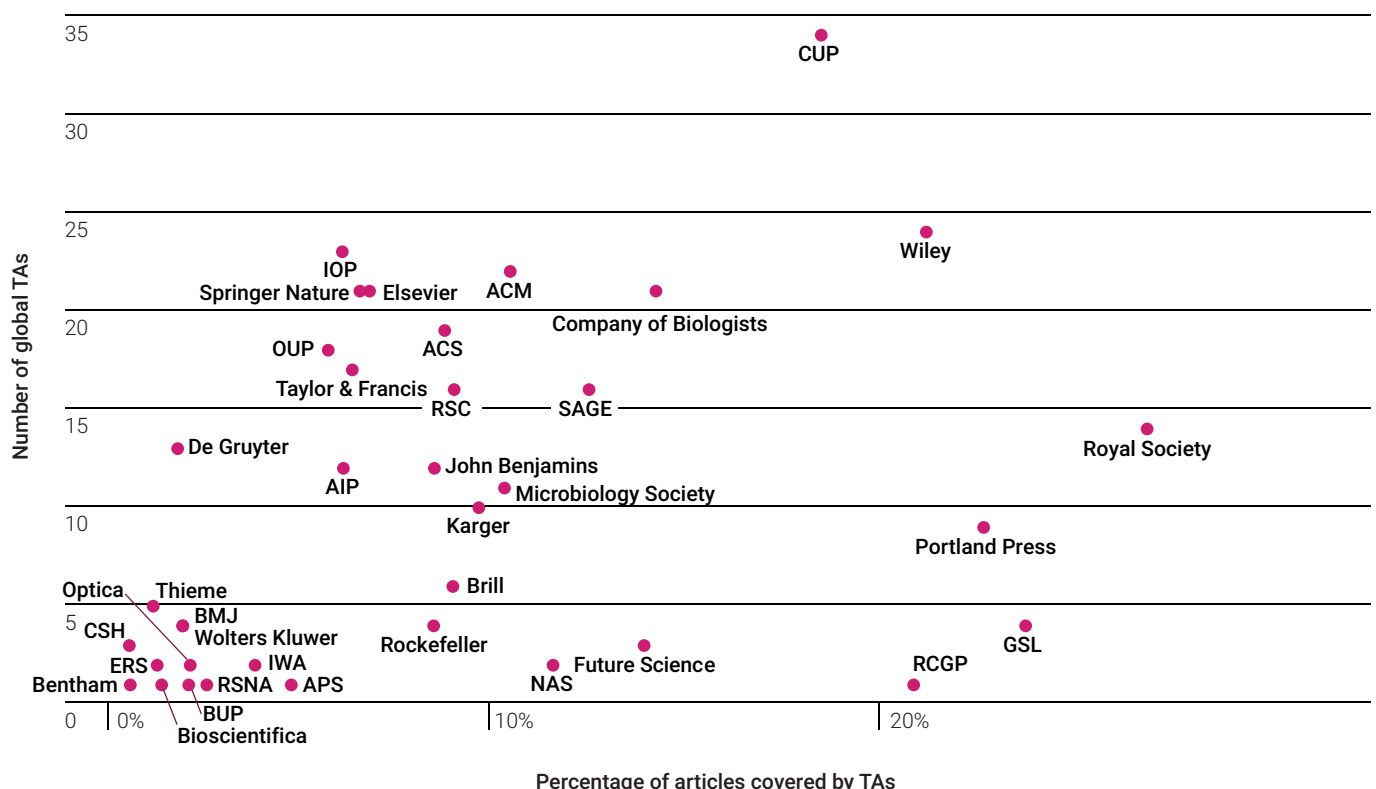
Figure 8 shows the number of TAs held with consortia or other groups/institutions worldwide (referred to as 'global TAs'), the rate of growth and the proportion of their global articles published under these global TAs by publisher (for publishers with 2022 Jisc TAs). Early adopter publishers, including IOP, T&F and Springer Nature, saw gradual take-up of their TAs initially with more significant increases in 2020. In 2019 Jisc, alongside other consortia, prioritised discussions with learned societies and academic presses and worked with the SPA-OPS project¹⁹² to support the OA transition for these publishers.

When there are more TAs, the coverage of articles under the TA generally also increases, as articles from more research organisations and/or journals can be included. However, this trend is not equal across all publishers, and it will also vary according to the differing sizes of the consortia or institutions that subscribe to the respective TA.

Figure 8: number of global TAs and the percentage of total research output covered.

Data source: Dimensions, ESAC Market Watch¹⁸⁷, and ESAC Transformative Agreement Registry¹⁸⁸

Parameters: Articles reported as published under a global TA.



Excluding the Royal Irish Academy (refer to [appendix 2, 'methodologies: prevalence of OA in global and UK literature: limitations'](#)), the publisher with the greatest estimated coverage in 2022 was the Royal Society, with 26% of global articles published under 14 TAs. We note the Microbiology Society and the Royal Society set out a series of 'transformative milestones' and openly available transparent pricing mechanisms "that ensures subscription income is not received for articles for which we have received an APC"¹⁹³. (Currently, more than 360 institutions¹⁹⁴ subscribe to a TA with the Royal Society, which has pledged to flip its four Hybrid research journals to fully OA when they reach the 75% OA threshold set for Transformative Journals (TJs) by cOAlition S¹⁹⁵; two [18%] of the society's journals are already fully OA.)

Publishers with a large number of global TAs (more than ten) but low levels of their global articles covered by the TAs – less than or equal to 0.5% for each, include: American Chemical Society (ACS), American Institute of Physics (AIP), Elsevier, IOP, Oxford University Press (OUP), Royal Society of Chemistry (RSC), Springer Nature, T&F and Walter de Gruyter (De Gruyter). Given the lessened influence of these publishers' global TAs, the conversion of these publishers' articles to OA via TAs is likely to be correspondingly limited.

Although several publishers maintained levels of Closed articles over 50% there was a substantial shift in the OA status of their research output across their global portfolio to Open between 2018 and 2022, suggesting a recent acceleration in the proportions of OA.

How has the global conversion to Open Access differed across publishers?

Across publishers' complete portfolios

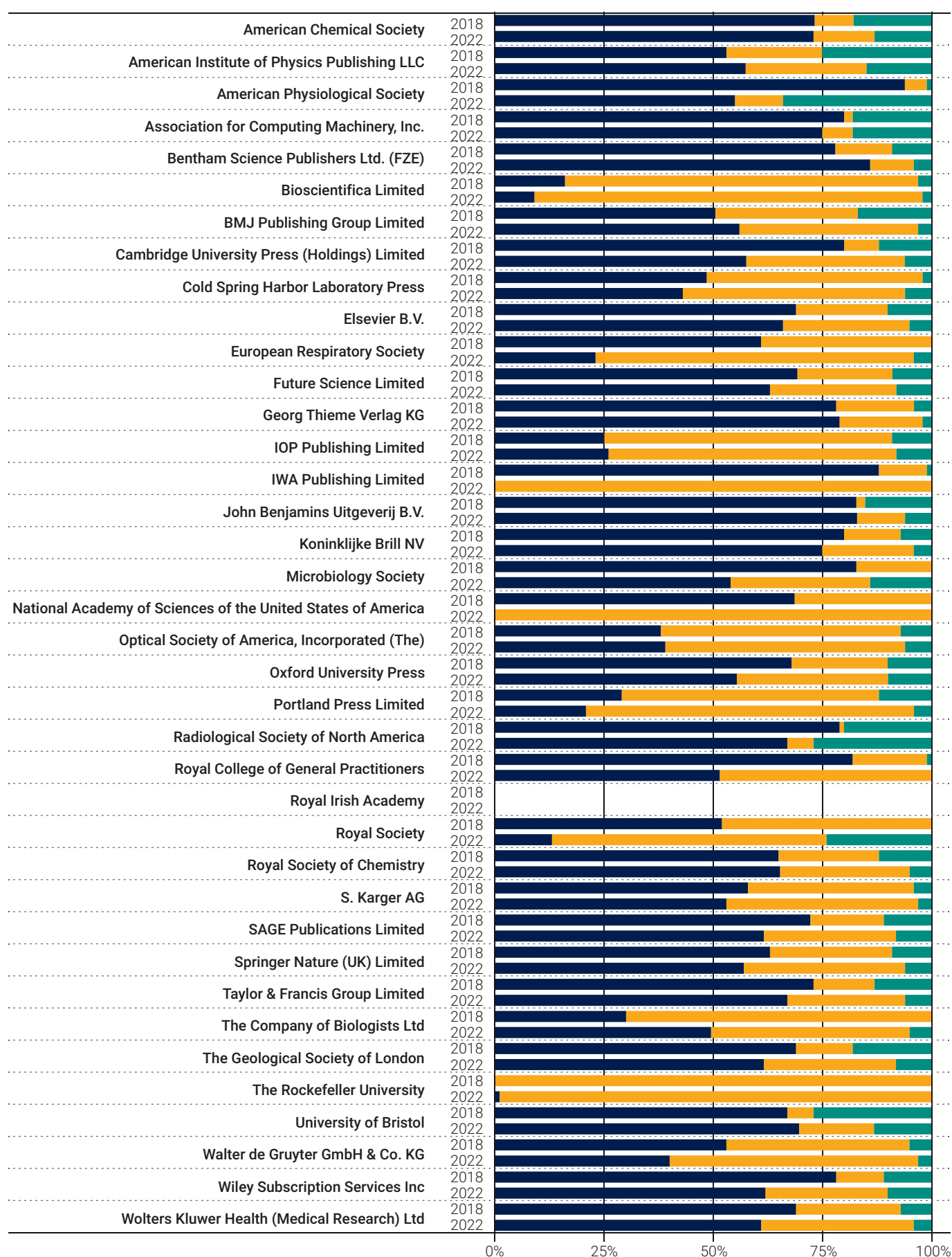
An examination of the content in publishers' portfolios, as shown in [figure 9](#), demonstrates that 26 of the listed publishers (68%) saw a decrease in the proportion of their global, Closed articles. Some of these were considerable. The smallest decrease in Closed was 1% for ACS, while the largest was 88% from IWA Publishing (IWAP)¹⁹⁶. Eleven publishers saw an increase in the proportion of their Closed articles, as high as 20% (for Company of Biologists [CoB]). On average across the 38 publishers, the proportion of Closed articles decreased by 12%.

Nonetheless, two publishers maintained a particularly high proportion of Closed global articles (John Benjamins: 83% and Bentham: 86%), and several more had proportions above 70%. So, even though marginal improvements have been made by some, the degree of improvement (in the decrease of the proportion of Closed articles) varies widely and many publishers still had a high proportion of Closed articles in 2022.

As we discussed earlier, one factor contributing to the trend for Closed content to account for a decreasing proportion of a publisher's portfolio over the last four years is the increase in OA research output in fully OA journals, including OA launches. IWAP saw an increase in research output in fully OA journals from 1.5% in 2018 to 100% in 2021¹⁹⁷. Although other publishers, such as Wiley, saw an increase in research output in their fully OA journals, (Wiley doubled the proportion of research output between 2018 and 2021), none were to the same extent as IWAP¹⁹⁸. It has also been noted that some publishers have acquired and launched OA journals or acquired OA publishers. For example, Springer Nature acquired BioMed Central (BMC) in 2008 and Atlantis Press in 2021, Informa bought Dove Medical Press in 2017, Elsevier launched 100 OA journals in 2019, ACS launched nine OA journals in 2020, while Wiley acquired Knowledge Unlatched in 2021 and Hindawi in 2022¹⁹⁹.

Figure 9: the proportion of articles by OA status, published globally by TA publishers in 2018 and 2022. Data source: Dimensions. Parameters: All titles in the publisher's portfolio.

OA status: ■ Closed (only) ■ Gold and Hybrid ■ Green (only)



This is not the only contributing factor. The increasing number of TAs negotiated between publishers and consortia around the world has also aided the shift to the open status of research outputs, either through increasing the number of TAs agreed with individual consortia/countries/institutions or by extending TAs to cover previously excluded titles. In cases where publishers partner with societies, the partner journals may be added to the TA title list after the initial launch – eg, IOP’s partner journals were added to the Jisc TA in year two of the agreement²⁰⁰.

Although several publishers maintained levels of Closed articles over 50% there was a substantial shift in the OA status of their research output across their global portfolio to Open between 2018 and 2022, suggesting a recent acceleration in the proportions of OA. On average across the 38 publishers, the proportion of Open articles increased by 13%, almost directly mirroring the decrease in Closed articles. Increases in Open articles ranged from -25% (CoB) to +89% for IWAP.

Titles flipping to fully OA

As Suber (2016) pointed out in a review of the approaches and experiences of converting scholarly journals to OA, flipping from a subscription or hybrid model to a fully OA one has been happening for as long as publishing OA in a subscription journal has been an option²⁰¹. However, with the announcement of Plan S and its time-limited endorsement for transformative arrangements to facilitate the transition of journals to fully OA, journal flipping has received more attention. The aim of transformative arrangements was to support the transition of traditional subscription titles and provide time for publishers to plan a future business model by continuing to allow funded researchers to publish compliantly in these outlets and allowing cOAlition S funders to contribute financially to OA for a time-limited period²⁰². Plan S recognised that publishers would need time to understand the process and consequences of transitioning a journal to fully OA, and to establish a business model that would continue to ensure a stable income stream to replace subscription fees, before introducing transformative arrangements as a Plan S-compliant route²⁰³. It was expected that, during this time, publishers would develop roadmaps for the full transition and slowly move journals to fully OA business models²⁰⁴.

Publishers have not given Jisc a definitive list of factors they used when deciding to flip a journal from hybrid to fully OA. Publishers that partner with societies to deliver publishing services such as hosting, peer review or licensing do not usually set policy or make decisions on when a title will flip to full OA, although they can be highly influential through the advice, guidance and support they give to societies. Some publishers advertise lists of journals that have flipped on their websites, but not the underpinning approach to flipping²⁰⁵. At the UKSG 2023 conference Dunn (2023) cited journal profile and author base as key criteria for Cambridge University Press (CUP) but stressed that “it’s a unique decision for each journal”²⁰⁶.

In 2020, cOAlition S established baseline data and key performance indicators (KPIs) for its new TJ programme, including a target of 75% OA for journals to flip to fully OA²⁰⁷. Fourteen publishers²⁰⁸ initially signed up. In 2021, an assessment of how the 15 participating publishers²⁰⁹ performed was released. The programme covered 2,304 journals, 74% of which were associated with Springer Nature²¹⁰. Of these, 13 (0.5%) reached the 75% OA article publication target and flipped to fully OA²¹¹. The review in 2022 showed that, of a total of 2,326 journals – representing 16 publishers²¹² – 26 (1%) flipped to fully OA²¹³, while another 695 (30%) met or exceeded their targets without flipping. A further 1,589 (68%) did not meet their targets and were removed from the programme²¹⁴. cOAlition S said the fact that so “many titles were unable to meet their OA growth targets suggests that for some publishers, the transition to full and immediate open access is unlikely to happen in a reasonable timeframe”²¹⁵. Further doubt about the commitment of commercial publishers to the TJ programme arose when Springer Nature removed six journals with OA levels of above 75%, rather than flip the journals to OA. Kiley observed “if a title is not prepared to flip at these levels of OA, the only logical conclusion is that they will never flip to full OA”²¹⁶. Subsequently, it was decided that the TJ programme would end in 2024.

Accurate data on flipped titles is difficult to attain, as there are no lists of journals and their access type available year by year, but estimations based on analysis by Delta Think (see [appendix 2, 'methodologies: prevalence of OA in global and UK literature'](#)) are laid out in what follows. Note that the results may be subject to errors, especially for smaller publishers because of their small sample sizes. Only journals that are 'likely' to have flipped (based on price list data available for both years) are displayed, which probably underestimates the proportion of journals that have flipped overall.

Despite indications earlier in this section that some TAs are converting Closed content for some publishers, very few journals appear to have flipped in recent years.

Figure 10 shows the low numbers of journals estimated as likely to have flipped to fully OA between 2018 and 2022. Only three publishers flipped more than 10% of the journals included in Jisc TA title lists. These publishers were smaller ones with a smaller portfolio of TA titles. A further 12 publishers flipped more than 1% and less than 10% of their Jisc TA titles, and the remaining 23 TA publishers are estimated to have flipped no journals at all

(and therefore aren't shown in [figure 10](#)). Of the publishers we modelled, Karger flipped the highest proportion of its titles to TA – 15% (14 titles). Of the 'big five' publishers Wiley flipped the greatest proportion of Jisc TA titles to OA – 7% (104 titles). Based on the journal flipping rates observed between 2018-2022 it would take at least 70 years for the big five publishers to flip their TA titles to OA. It is perhaps unsurprising that such a small number of titles have been flipped by publishers such as Elsevier, Springer Nature and T&F, given the minimal change in the proportion of OA content their portfolio has seen ([figure 9](#)). The proportion of society-owned titles within their portfolios may be a contributing factor but, as noted earlier, publishers can be highly influential in guiding societies.

What's more surprising is that publishers such as CUP, with higher increases in OA content (eg, 8% in 2018 to 36% in 2022) had only flipped 16 titles – 4% of titles included in their TA. However, Dunn highlighted the intended acceleration in the CUP's rate of flipping at the UKSG 2023 Conference, from two journals flipping in 2022 to six in 2023, to 39 confirmed for 2024, and

Figure 10: estimates of proportion and number of journals in TAs that are likely to have flipped to fully Gold and estimated year of flip.

Data source: Delta Think. Parameters: Titles in current or historic Jisc TAs.

	2018	2019	2020	2021	2022	Grand total
S. Karger AG		4% (4)	7% (7)	2% (2)	2% (2)	14% (15)
BMJ Publishing Group Limited	8% (5)		3% (2)		2% (1)	14% (8)
IWA Publishing Limited				13% (3)		13% (3)
Wiley Subscription Services Inc	0% (5)	1% (17)	2% (34)	1% (9)	2% (39)	7% (104)
Oxford University Press		2% (8)	1% (6)	0% (1)	2% (7)	5% (22)
Elsevier B.V.	1% (2)	1% (21)	2% (22)	1% (8)	0% (3)	5% (56)
Cambridge University Press (Holdings) Limited		1% (4)	1% (2)	1% (2)	2% (6)	4% (14)
SAGE Publications Limited	1% (14)	0% (4)	0% (3)	0% (4)	1% (9)	3% (34)
Future Science Limited	3% (1)					3% (1)
Georg Thieme Verlag KG				3% (1)		3% (1)
Royal Society of Chemistry	2% (1)					2% (1)
Taylor & Francis Group Limited			0% (1)	0% (4)	1% (28)	2% (33)
Springer Nature (UK) Limited	0% (2)	0% (6)	0% (8)	0% (1)	1% (15)	1% (32)
Association for Computing Machinery, Inc.					1% (1)	1% (1)
Koninklijke Brill NV			0% (1)			0% (1)

explained that in April 2023 CUP were “in the middle of assessing [their] Hybrid journals for 2025 flips”²¹⁷. This suggests a lag in publishers making changes to business models at the journal level and raises the question of how long is reasonable for journals to flip models.

Across publishers’ transitional agreement titles

Figure 11 shows the breakdown of publishers’ portfolio of global articles in their TA titles by OA status, in comparison to the breakdown of their whole portfolio shown in **figure 9**. Note that many publishers have only recently offered TAs with Jisc.

Of the 38 publishers with a Jisc TA in 2022, just over half (20 out of 38) have maintained or increased the proportion of their Closed content in the titles included in the TAs since the year before their Jisc agreement became active to 2022. Some publishers increased their proportion of Closed articles by over 20%: American Physiological Society (+22%); Radiological Society of North America (+21%); Company of Biologists Ltd (+23%), and The Rockefeller University (+20%). On average, though, across all 38 publishers the proportion of Closed content declined by 2%.

Most publishers’ (27 of 38, or 71%) proportions of Closed articles were still above 50% in 2022 in their TA titles. The average proportion of Closed content for the 38 publishers was 61%, but this ranged from 0.4% for IWAP (NB this publisher adopted the ‘subscribe to open’ ([S2O] model in 2021) to 92% for Wolters Kluwer²¹⁸. Wolters Kluwer also saw the greatest decrease in the number of Closed articles in the year before their Jisc TA and 2022, with over 25,000 fewer Closed articles in 2022 than in 2021. So, although their absolute number of Closed articles decreased, Closed became more dominant than Open or Green-only as the size of their portfolio in the TA titles decreased. Other publishers like Springer Nature saw the overall size of their TA title portfolio increase, so even though Springer Nature increased the number of Closed articles by nearly 30,000, the proportion of their Closed articles still went down while the proportion of OA articles increased.

More publishers maintained or increased the global Open content in their TA titles between the year preceding the Jisc TA and 2022: 29 of 38 publishers (76%) maintained or increased the proportion of Open articles, and 26 of 38 publishers (68%) maintained or increased the number of Open articles. These changes were more marked than the shifts in Closed content: on

average an additional 7%, or 2,498 articles, became Open. By 2022, nine publishers (24%) had a more than 50% Open articles in their TA titles, but on average across publishers Open accounted for 33% of the content in TA titles. There is still some way to go before Gold and Hybrid make up the majority of TA title content.

For most of the TA publishers, their Open articles were almost all also Green, by virtue of being in a repository. IWAP and Optica were the most notable exceptions, which had mostly Gold-only or Green-only articles. Several publishers had more even splits, where closer to half of their Gold articles were also Green. As noted above, it is not clear to what extent the overlap between Gold/Hybrid and Green articles is the result of Gold/Hybrid articles then also being made Green OA through a repository, or to what extent articles that were already Green OA were then also made Hybrid.

A closer look at a few of the larger publishers maintaining the share of their Closed content (**figure 11**) reveals an increase in the share of their Open content at the same time (with Green-only decreasing). For each of these publishers this also coincides with an increase in the number of global TAs offered but a minimal increase in the proportion of their total articles covered by those TAs (**refer back to figure 8**). For example, between 2020 and 2022 IOP’s global open research output in its TA titles increased from 16% to 20% (+4%). At the same time the estimated percentage of their global research output covered by a TA increased from 2% to 6% (+4%), despite the number of TAs available with IOP almost doubling from 12 to 23. There is a lag between the start of a new TA and publishing of OA articles under the TA, so it is possible that the shift to Open will accelerate going forward.

Similarly, Springer Nature has seen the proportion of global Open content in titles covered by TAs increase by only 4% between 2020 and 2022. At the same time, although the number of global TAs available between 2020 and 2022 increased from 13 to 21, the estimated proportion of their total research output covered by TAs has remained largely unchanged at between 5% and 6%. T&F have also seen little change in the proportion of Open articles in their global research output in TA titles in 2021 and 2022: 12% for both years. The estimated percentage of their global research output covered by a TA in these years remained around 5% or 6% despite increasing the number of TAs available by two.

Figure 11: proportion of publishers' global articles in their TA titles, by the articles' OA status by year (2018–2022). Data source: Dimensions and Unpaywall API. Parameters: All articles in titles in current or historic Jisc TAs

OA status: ■ Green only ■ Gold or Hybrid and Green ■ Gold and Hybrid ■ Bronze and Closed



As the UK represents a small proportion of global articles (approximately 4% in 2022²¹⁹) we would not expect Jisc TAs alone to have a material impact on a publisher's OA coverage. We would, however, expect the increase in global TAs (refer to [figure 8](#)) to have a far greater impact on OA levels. And indeed, the Gold and Hybrid content of these publishers has increased, but only slightly. More problematically, however, even though global TAs and coverage under those TAs has increased with these three publishers, their Closed content has not decreased. Instead, Gold and Hybrid articles are increasing, seemingly at the expense of Green articles, either concealing articles that were already OA through a Green route and/or reducing the number of Green articles as more authors select the Gold/Hybrid route due to the advent of TAs.

In contrast to these three, other publishers have increased the proportion and number of their fully Gold and Hybrid articles, at the same time as decreasing the proportion and number of their Closed ones. This has happened in tandem with growth in the number of TAs each publisher offered globally, and the proportion of their research output covered by those global TAs. For example, CUP has seen significant change in the proportion of Open articles in global content in TA titles between 2021 and 2022 (+20%; [see figure 11](#)), and at the same time has witnessed the estimated percentage of their global research output covered by a TA increase from 6% to 18% (refer back to [figure 8](#)). Similarly, Open articles in Karger's²²⁰ global research output in titles covered by a TA has also significantly increased – from 30% to 45% between 2020 and 2022 – at the same time as the estimated percentage of their global research output covered by a TA increased from 4% in 2021 to 9% in 2022. For these publishers the Open content appears to be converting Closed content, not additional to Closed articles, better facilitating the transition to Open.

The rates of conversion to Open shown for the titles included in the TAs ([in figure 11](#)), are slower than the rates across the publishers' global portfolio ([see figure 9](#)). For their TA titles, on average across all 38 publishers the proportion of Closed content declined by 2% and Open content increased by 7%; across their whole portfolio, on average across the 38 publishers, the proportion of Closed articles decreased by 12% while the proportion of Open articles increased by 13%. Probably, this can be explained by the inclusion of research output in fully OA journals in the publisher's whole portfolio (which is not the focus of TAs). However, it raises questions about the efficacy of TAs in transitioning content to Open at a global level.

How has the global conversion to Open Access differed across subject areas?

An examination of the uptake of OA by subject²²¹ shows considerable variation in OA between disciplines.

Figure 12 compares the proportions of OA within each field ('uptake', on the left) with their share of total output ('influence', in the centre). Uptake of OA within a field may not translate into large volumes of OA output overall. For example, articles in multidisciplinary journals are most likely to be OA and Gold (over 87% of them), reflecting the presence of large journals such as PLOS One and Scientific Reports. However, they account for around 2.5% of all articles published in the sample. Many fields with higher uptake of OA are also the larger fields, which serves to increase total OA uptake across the entire sample. For example, medicine, engineering and biological sciences together account for over 45% of articles in the dataset, so have the most influence on total OA proportions.

Each of the fields shown covers a variety of subjects. These are, for example, specialities within medicine or different engineering disciplines. Variations in Open (Gold or Hybrid) uptake for different subjects within each field are shown in the box and whisker plot on the right hand column. The median proportion of Open articles within a field is just under one-third, but there may be considerable variation within a field. For example, 39% of agricultural sciences output is Open, but this can vary from 13% to 88% depending on the subject covered. Plotting over 200 subjects covered by the data would prove too confusing, and so we have displayed the averages for the fields instead.

While articles in multidisciplinary journals are the most likely to be Open (over 87%), veterinary and allied health professions, and biological and environmental sciences, follow behind at 43 to 44%. Chemistry has 23%. On average, social sciences, arts and humanities use OA the least. History and archaeology has 23%, while law and the creative arts have the lowest share of Open articles at 22% of output.

Gold output in fully OA journals forms the major share of OA output, averaging just under four times more than Hybrid output.

Figure 13 shows the compound annual growth rates (CAGRs) in uptake of OA globally. The proportion of Bronze and Closed-only output has fallen, apart from in environmental sciences, which has shown a very slight increase, and noting that engineering and technology, and business and economics, show only modest decrease. The most significant growth has been in output from hybrid journals. This is greatest in nursing, veterinary, social sciences and arts and humanities, albeit from relatively low volumes of output. Gold output in fully OA journals has grown too, apart from in

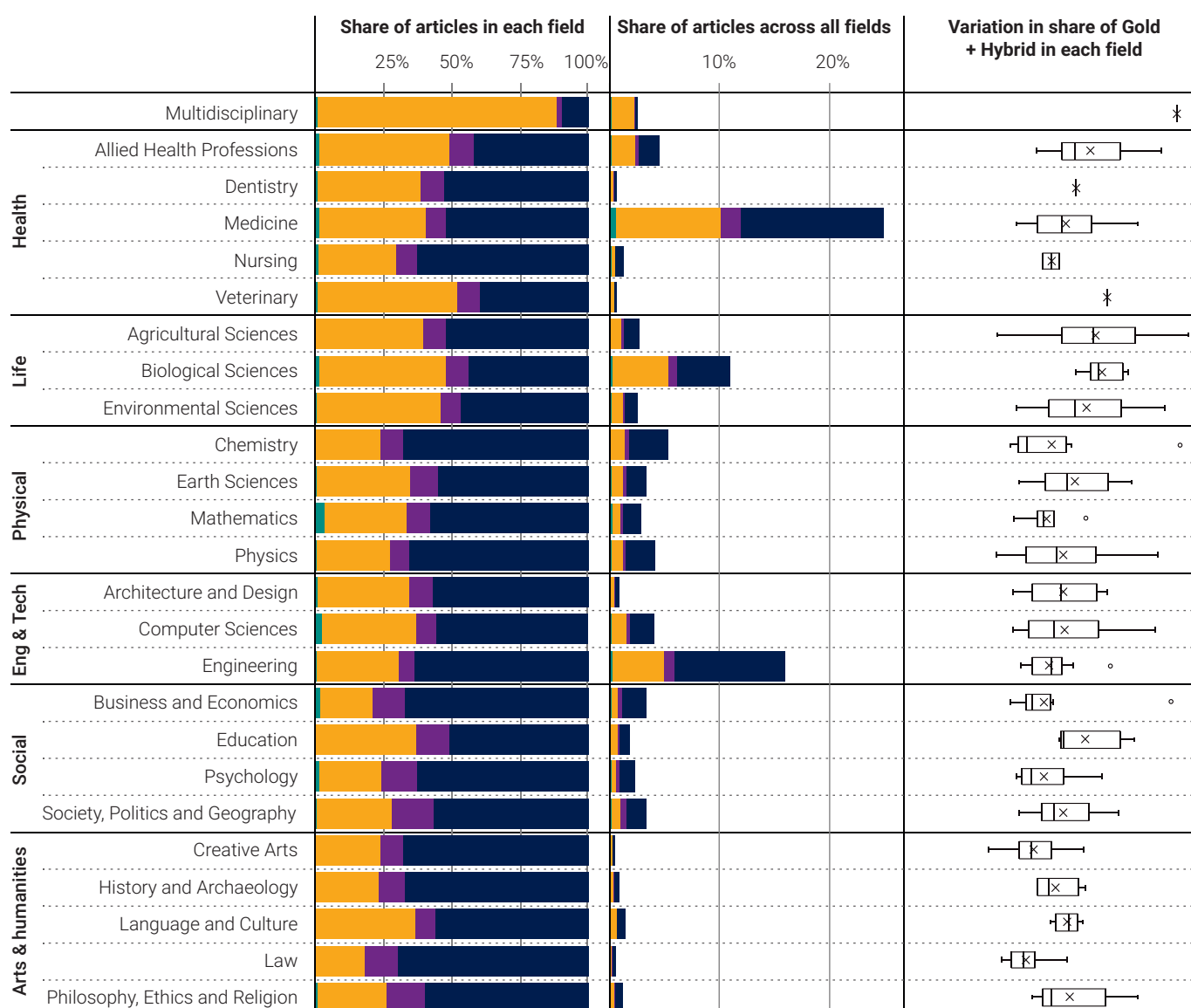
multidisciplinary journals. This may be the result of large 'mega-journals' losing to more specialist ones, however further research would be required.

As we noted above, the effect of each field on the total varies depending on the numbers of articles published. Larger fields will influence totals more than smaller ones. The fastest growing fields are typically the smaller ones, so growth in Open across all fields is relatively modest: 12.4% (five-year CAGR) for Gold and 15.2% for Hybrid.

Figure 12: uptake and influence of OA use for global research output by subject area and field.

Data source: Delta Think. Parameters: 2022 articles in certified academic journals.

OA status: ■ Green (only) ■ Gold ■ Hybrid ■ Bronze and Closed



How has the global conversion to Open Access differed across countries?

To provide a more relevant and detailed focus to the global findings, and a basis for comparison with the UK findings, Jisc approached consortia and related groups internationally about their countries' TAs (see [appendix 2, methodologies: international comparison](#)).

Discussions with Universiteitsbibliotheken en Nationale Bibliotheek (Netherlands) and Sikt (Norway) revealed a number of differences, including but not limited to:

- Both the Netherlands and Norway use additional fields to enhance and clean the OA status of articles as originally sourced from Unpaywall, using reports provided by publishers to the consortia, historical DOAJ statuses and checks against national repositories. The consortia estimate that this reduces the levels of Closed content reported on by 9% and 16% respectively. Additional cleaning of the OA statuses from Unpaywall was not undertaken on the UK data. (Given the different national contexts of journal articles, OA and data quality it should not be assumed that conducting similar checks in the UK would result in the same reduction in Closed content)

Figure 13: Average annual growth rate in uptake of OA (five-year compound annual growth rates, 2017-2022) for global research output by subject area and field.

Data source: Delta Think. Parameters: 2017 - 2022 articles in certified academic journals.



- Other consortia (or their institutions) identify eligible articles that have not been published OA and follow up with the publisher and institution to retrospectively publish in OA. If this had been undertaken in the UK in 2022, another 16k articles may have been made OA (not accounting for caps and opt-outs) (refer to [figure 17](#)) although scaling up to this level of intervention would require significant additional resource and may result in additional costs if caps etc were exceeded
- Consortia members represent a lower proportion of CAs in the UK (60% of articles) than in Norway (90%) or the Netherlands (68%), suggesting that the sphere of influence of Jisc TAs is smaller and has a smaller impact upon the conversion of all UK CA versions of record to OA²²²
- Netherlands and Norway CAs publish fewer articles than are published by UK CAs. Therefore, the Netherlands and Norway have a more limited influence on the global transition to OA despite their higher rates of Open articles

A more holistic comparison could be undertaken as a part of further research, but that is outside the scope of this report.

A global transition to OA will require more engagement from the largest research producers, such as China and the United States of America (US). Given their higher numbers of affiliated articles it is reasonable to assume that if China and/or the US stepped up their adoption of TAs the global shift to OA would be stronger and faster. In 2022 the US Office for Science and Technology Policy (OSTP) announced a requirement that funded research must be immediately available OA without embargoes, which has the potential to increase the research outputs that become openly available, to become effective 31 December 2025²²³. Although the memo does not state a preference for Gold OA and TAs, concerns have already been raised that the US will follow this route and be locked into APC-based OA indefinitely²²⁴. In China only a few funders (three) encourage or require some form of OA publishing²²⁵. In 2021 a law on scientific and technological progress was revised, “which requires promoting the development of open science”²²⁶ and China’s Association for Science and Technology (CAST) announced that it would set up an Open Science Promotion Consortium in 2022²²⁷, but the country still seems to be far from adopting TAs.

However, even if the US and China follow a similar trajectory to that of the UK the results probably wouldn’t be immediate or comprehensive. Since the UK’s first TA in 2016, the proportion of Open articles across all titles has increased by 21.9% and the proportion of Closed articles has decreased by 8.1% (discussed further under [‘2b. UK findings’](#)). Given that articles affiliated with the US accounted for 12.2% of all articles in 2022²²⁸, at those same rates of change in OA status, it would be expected that the global proportion of Open articles would increase by a further 2.7% and Closed articles would decrease by a further 1%, after six years. For China, with affiliated articles accounting for 13.9% of all articles in 2022²²⁹, at those same rates of change in OA status it would be expected that the global proportion of Open articles would increase by a further 3% and Closed articles would decrease by a further 1.1%, after six years. So, if both China and the US adopted TAs this year and observed the same rate of growth in OA that the UK has since its first TA six years ago, we estimate that the global rate of Open articles would increase by 5.7% by 2029. While other factors would in all likelihood contribute to more growth in global OA in that time, this illustrative calculation demonstrates that TAs in even the most research-intensive countries should not be expected to result in an immediate and comprehensive transition to OA, particularly when TAs have not resulted in considerable shifts to Open across all publishers.

If both China and the US adopted TAs this year and observed the same rate of growth in OA that the UK has since its first TA six years ago, we estimate that the global rate of Open articles would increase by 5.7% by 2029.

Summary

Since the first globally registered TA in 2014 the number of TAs and number of countries that subscribe to them has grown, but the growth has slowed in recent years. This may indicate that the largest publishers have already made agreements with the countries/consortia most willing/able to enter into TAs. While demand for TAs from consortia and research- performing institutions (RPOs) has increased, it is generally still more affluent Western countries that hold the largest number of TAs. TAs in even the most research-intensive countries cannot be expected to result in an immediate and comprehensive transition to OA: even if both China and the US adopted TAs this year. The influence of TAs is also limited by title coverage: for several publishers, a large number of global TAs did not translate into high levels of OA via these TAs.

The proportion of Open articles has roughly doubled between 2014 and 2022, yet half of global articles are still Closed. Furthermore, after several years of a steady decline in Closed articles, the proportion of Closed articles has recently started to creep up.

Of OA output, Gold articles make up the largest share, averaging around four times the share of Hybrid. Between 2014 and 2022 Gold also grew considerably faster than Hybrid (by 19% compared to 5%), but this trend looks like it may now be switching, with proportions of Hybrid increasing faster and Gold growth slowing since 2020. It remains to be seen whether this is a longer-term trend.

The Green route to OA has also been declining across all categories (Green-only, Gold and Green or Hybrid and Green), particularly in more recent years. These 'shadowed Green' articles may account for more Green articles than the Green-only articles, suggesting that Gold and Hybrid routes are becoming more popular than – and even replacing – repositories as a route to OA.

The trend of significant growth in Hybrid as an OA route and the more modest growth of Gold can also generally be seen across subjects. Many fields with a higher uptake of OA are also among the larger ones, such as veterinary and allied health professions, biological sciences and environmental sciences, which serves to increase total OA uptake across the entire sample. On average, social sciences, arts and humanities use OA the least.

Looking at global trends by publishers also gives a more nuanced view. For some publishers their Open articles are growing, largely at the expense of Green ones, either concealing articles that were already OA through a Green route and/or reducing the number of Green articles as more authors select the Gold route due to the advent of TAs. On the other hand, some publishers have increased the proportion and number of their Open articles, at the same time as decreasing the proportion and number of their Closed articles. This has occurred in tandem with growth in the number of TAs each publisher offered globally, and the proportion of their research output covered by those global TAs. Other (about one quarter of) publishers did not see their Open articles increase at all, and just over half maintained or increased the proportion of their Closed content.

On average across the TA titles of the 38 publishers investigated, the shift toward Open was stronger than the (downward) shift in Closed. However, the average proportion of Closed content in the TA titles for the 38 publishers was 61% in 2022, which is worse than the global average. This is to be expected, as the global portfolio will also include research output in fully Gold journals, but it also questions the efficacy of TAs in transitioning content to Open at a global level even while they have raised the profile of OA and sparked meaningful conversations about it.

It is perhaps not surprising, then, to see the low rates of journals being flipped to fully OA. Several publishers flipped some of their TA titles (although generally less than 10%), but about two-thirds are estimated to have flipped no journals at all. At the rate observed in the review, the 'big five' publishers would take more than 72 years to flip their TA titles.

2b. UK findings

To what extent has UK publication in journals transitioned to Open Access?

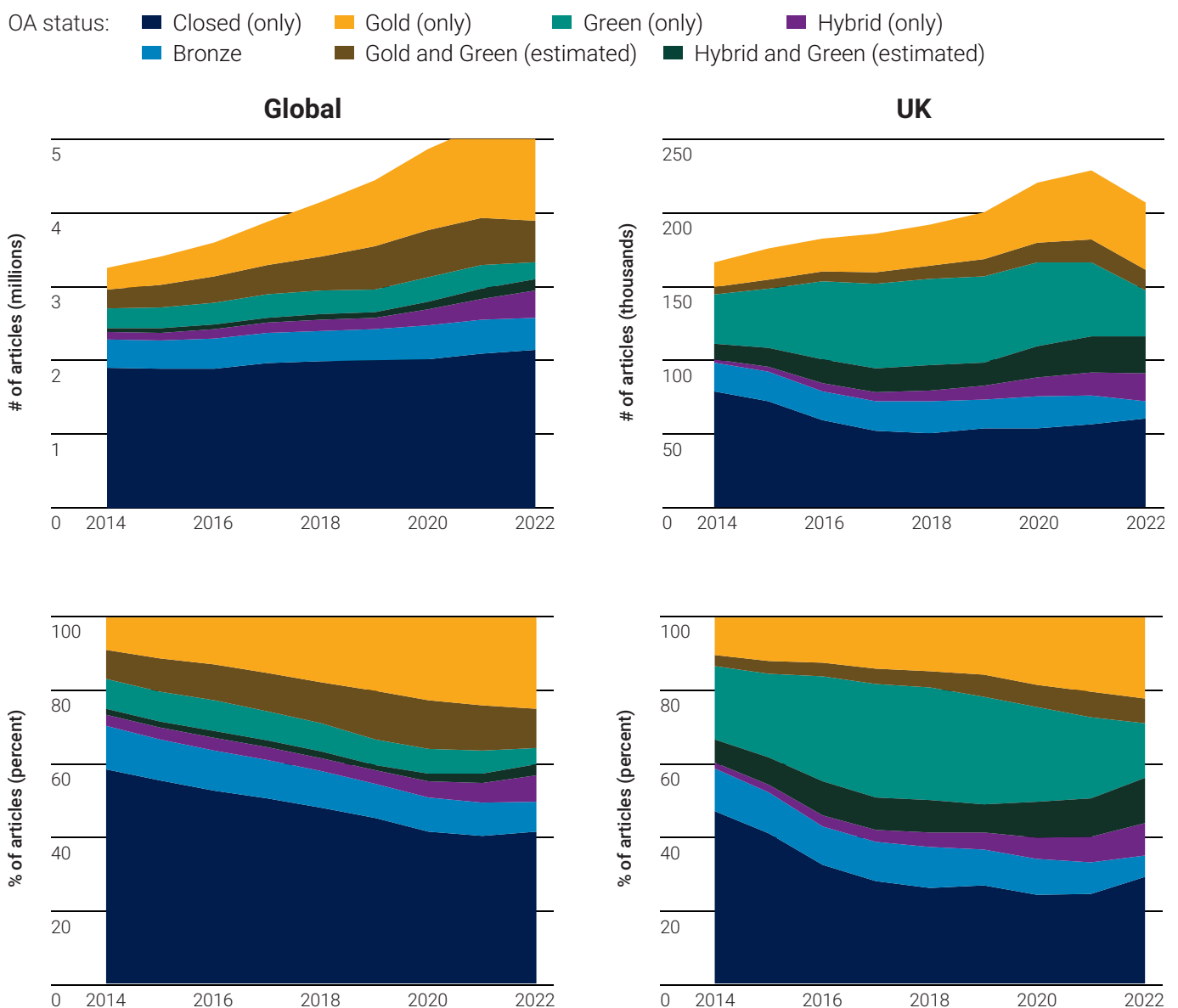
Article proportions by Open Access status

An examination of the OA landscape for UK articles (all articles with at least one UK author) reveals that it largely reflects the global picture, with a continual increase in absolute numbers and proportions of Open articles over the last eight years, although the UK saw a slight decline in absolute numbers of articles in 2022.

However, a closer look at UK articles reveals a different OA status composition to global articles ([see figure 14](#)). Although the levels of Open articles in 2022 are similar (UK: 50%; global: 46%), the UK has a considerably higher proportion of Hybrid articles (UK: 21%; global: 10%). This suggests that the transition to OA in the UK is more heavily influenced by TAs than the rest of the globe, and a more dominant tendency to Hybrid as an OA implementation route. The growth in UK publishing in hybrid journals has been previously noted as a key feature in the transition to OA following the introduction of major funder OA policies²³⁰.

Figure 14: number (top) and proportion (bottom) of global (left) and UK (right) articles published by OA status (defined by Unpaywall), between 2015 and 2022.

Data source: Dimensions. Parameters: All (global or UK) articles. All titles for all publishers.



If Green-only articles are included in calculating the OA levels of scholarly literature in 2022, we see that 65% of UK articles were OA, markedly higher than 50% globally. The proportion of Closed UK articles in 2022 was significantly smaller than the proportion at the global level (UK: 35%; global: 50%).

Overall, the proportion of Open articles in the UK has increased by 30% and the proportion of Closed articles has decreased by 25% between 2014 and 2022. This represents a faster transition to OA than globally, where Open articles increased by 25% and Closed articles decreased by 20% in the same period.

Rates of change in article proportions by Open Access status

Despite a large proportion of scholarly literature – both global and UK – being openly available in 2022 (UK: 65%; global: 50%), year-on-year change suggests that Closed (only) content is beginning to grow again. After four years of accounting for a declining proportion of UK articles, in 2021 and 2022 Closed (only) content grew across all publishers' portfolios (see [figure 15](#), 2021: +0.3%; 2022: +4.5%). This growth appears to have been largely at the expense of Green-only and Bronze articles, both of which have steadily declined in proportion over the last four years (average: Green-only: -3.9%; Bronze: -1.4%). This is a similar, but more exaggerated, trend to what we see at the global level: a steeper decline of Green-only articles and a greater increase in Closed (only) articles in recent years.

Shadowed Green articles have fluctuated over the eight-year period, with a high year-on-year change of +1.9% and a low of -1.1% for Hybrid and Green articles (in consecutive years). Overall, the trend is that they have been steadily increasing as a proportion of all UK articles over the last several years, mimicking the trend of the Gold- and Hybrid-only articles.

There are also similar trends at the UK and global levels for the growth in Hybrid and Gold articles: Gold articles have maintained a steady growth over the eight-year period (average: +1.5%), whereas Hybrid had slow growth in early years but has seen a slightly higher increase between 2021 and 2022 (+2.0%).

What is the reach of transitional agreements in the UK?

Jisc's first negotiated TA was with Springer Compact in 2016²³¹. Since then we have negotiated many more, with a variety of publishers²³²; by the end of 2022 we had 39 TAs in place²³³. This number increased in 2023, as we continued to work with smaller, independent publishers²³⁴. This growth in TAs follows a similar trend to the growth in TAs registered globally with ESAC, in that after a couple of years of rapid growth it has begun to decelerate.

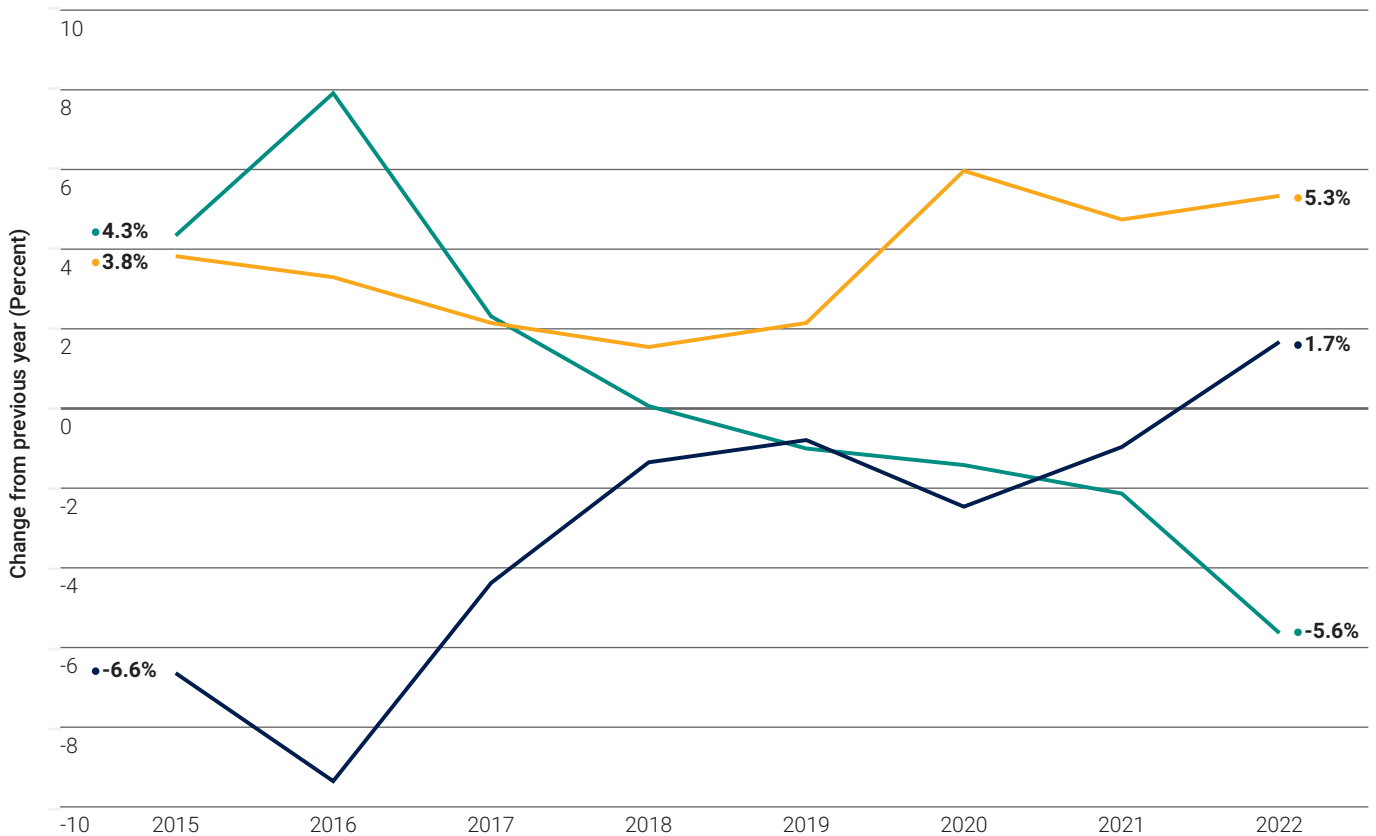
Jisc works with a variety of publishers and offers a range of OA agreements²³⁵, of which TAs (akin to 'read and publish' models) are only one type. As of May 2023, our 43 TAs made up 56% of our OA agreements. So while this model is by far the most common, TAs are by no means the only OA mechanism available to UK authors or supported by institutions.

TAs are focused on transitioning Closed content in hybrid journals to Open through the use of subscription fees. For instance, the proportion of Open articles with any UK author is 10% higher in all titles for all publishers (50% in 2022; refer to [figure 14](#)) than of Open articles with any UK author in TA titles (40% in 2022; refer to [figure 16](#)). This is mirrored by an opposite difference in Closed articles: the proportion of Closed articles with any UK author is 10% lower in all titles for all publishers (35% in 2022) than of Closed articles with any UK author in TA titles (45% in 2022). This difference can be attributed to the different nature of TA titles, in that TAs allow publication of Open articles in journals that are otherwise subscription-based, and therefore TA titles are predominantly Hybrid. It is thus unsurprising that the proportion of Hybrid articles is 8% greater for TA titles (29% in 2022; refer to [figure 16](#)) than for all titles (21% in 2022; refer to [figure 14](#)), while the proportion of Gold articles is 18% lower for TA titles²³⁶ (11% in 2022) than for all titles (29% in 2022), for a net 10% difference between all titles and TA titles.

Over the last five years, the TAs negotiated by Jisc have facilitated the publication of 87,225 immediate OA articles. From 2018 to 2022, there was more than a 900% increase in the number of articles published under TAs with the same publishers, which is directly attributable to the increase in the number of TAs from one to 38 in the same period.

Figure 15: the year-on-year change in the proportion of all articles published by authors affiliated to UK organisations, from publishers with 2022 UK TAs by OA status (defined by Unpaywall), from 2014 to 2022. Data Source: Dimensions and Unpaywall. Parameters: All UK articles. All titles for all publishers.

OA status: ■ All Closed articles ■ All Open articles ■ All Green articles



OA status: ■ Closed (only) ■ Gold (only) ■ Green (only) ■ Hybrid (only)
■ Bronze ■ Gold and Green ■ Hybrid and Green

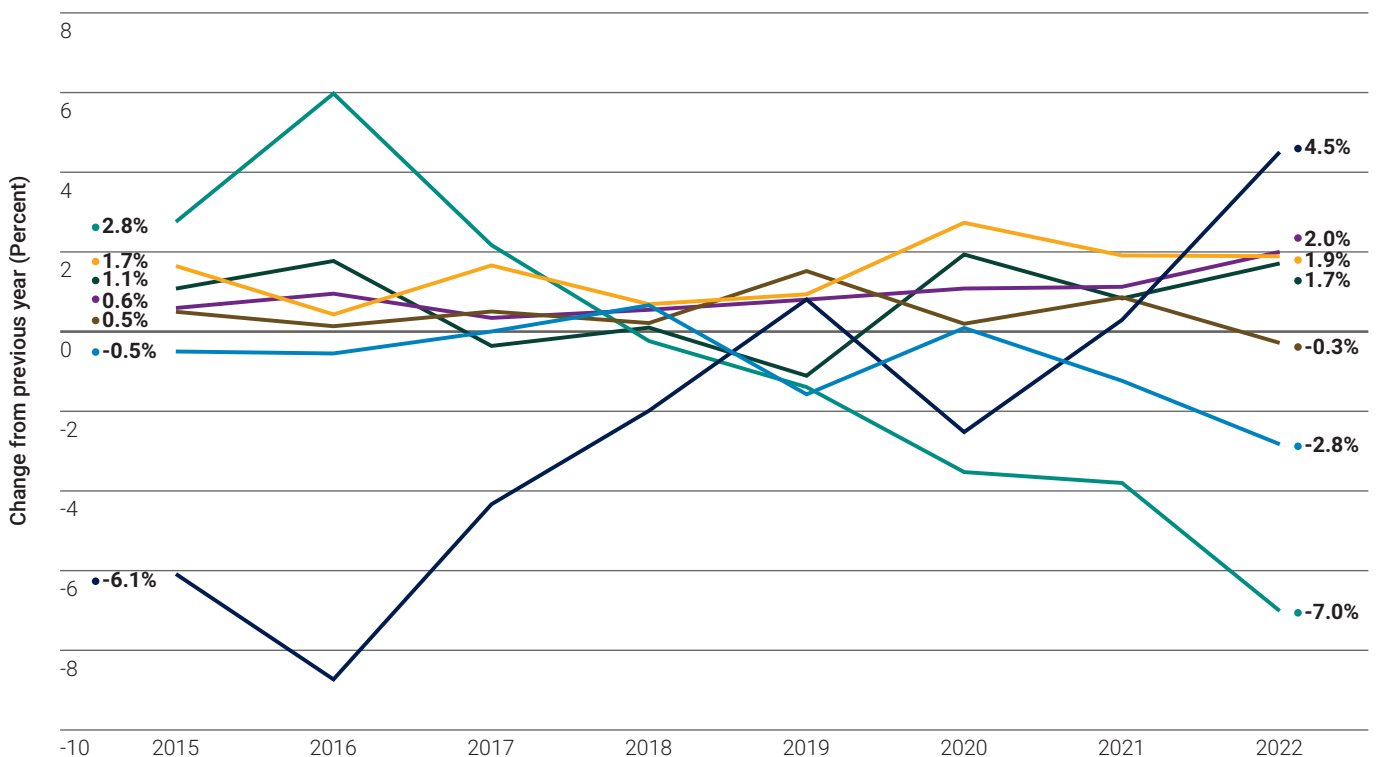
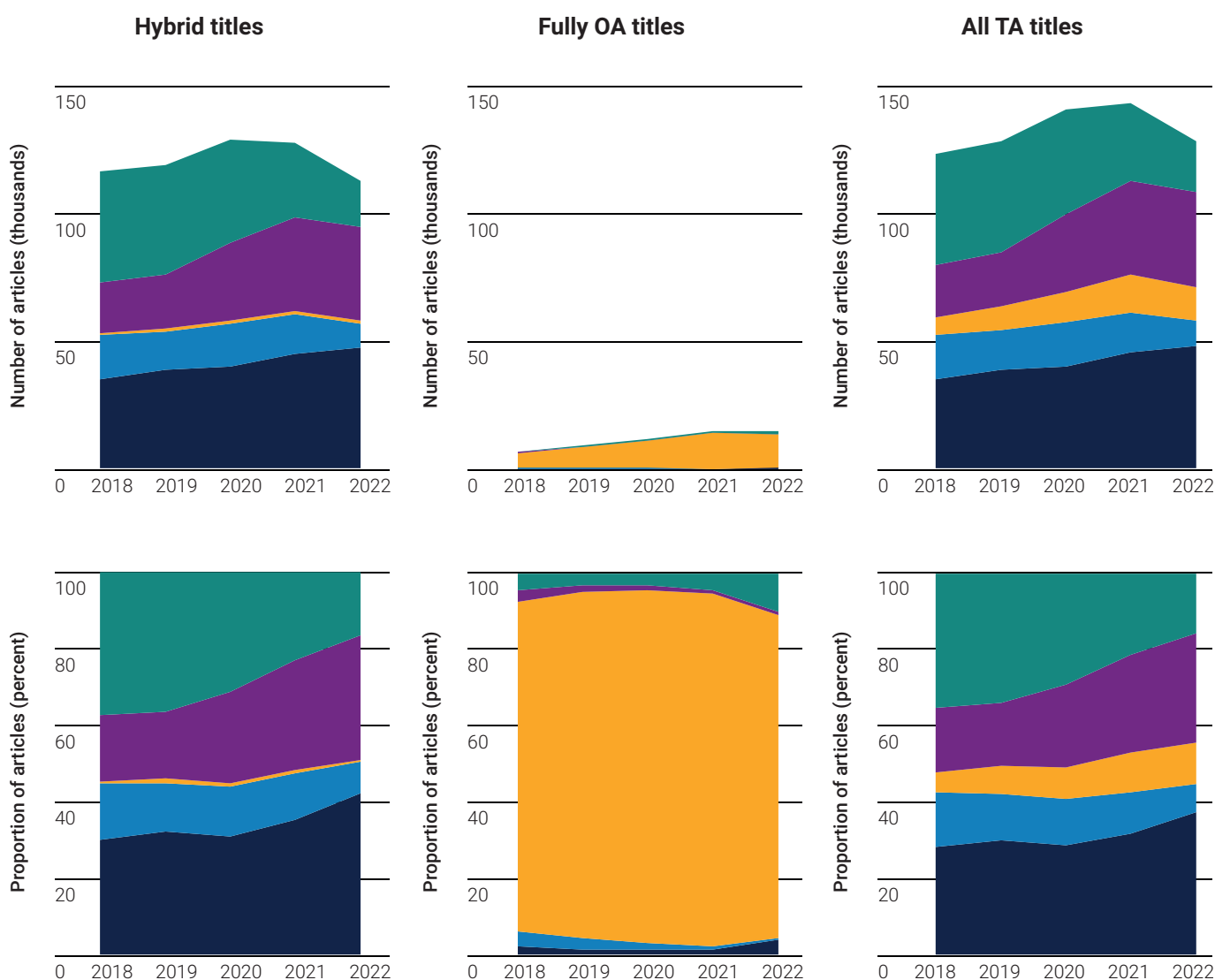


Figure 16: number and proportion of articles by OA status, differentiated between TA titles that are Hybrid and TA titles that are fully OA.

Data source: Dimensions, KB+, Journal Checker Tool API, and DOAJ list of added and removed journals. Parameters: All UK articles in titles in current or historic Jisc TAs (for 38 publishers).

OA status: ■ Closed ■ Bronze ■ Gold ■ Hybrid ■ Green



A subscription is required to allow the CA to be eligible to publish through a TA. The increase in the number of TAs available to Jisc members²³⁷ increased the number of UK CA papers covered by TAs. In 2018, 6% of UK CA articles in hybrid TA titles (see [figure 17](#); 85k articles) had an author affiliated to a Jisc member institution subscribing to the relevant TA (5k articles), as at this point the only TA available was the 2018 Springer Compact TA, covering 1,939²³⁸ titles. However, by 2022 the number of TAs negotiated by Jisc ensured that 65% of all UK CA research output was 'eligible' to go through a TA in 2022²³⁹. Of all UK CA articles (82k articles), 75% were by authors affiliated to a Jisc member institution (61k articles) and 65% were by authors affiliated to a subscribing Jisc member institution (53k articles).

If all the articles that were potentially eligible to go through the TA in 2022 had done so, the rates of Open articles in the UK would have been higher. As it was, in 2022 48% of all UK CA research output (39k of 82k articles) (or 64% of articles with a CA affiliated to a Jisc member organisation [39k of 61k articles]) did go through a TA and were made immediately OA.

Of all UK CA articles in 2022, 34% were not eligible to go through the TA: 25% (21k) because they were by authors not affiliated to a Jisc member and 9% (8k) because they were by authors affiliated to a Jisc member that did not subscribe to the TA. Therefore, ineligibility is usually due to author affiliations outside of Jisc membership, not to lack of subscription or other reasons.

Although the sector aims to convert all UK CA articles from TA titles to open, TAs are only currently available to Jisc members, so have a limited sphere of influence. If we look more specifically at the research output that TAs could convert to OA – ie, articles with a CA affiliated to a Jisc member institution – in 2022, only 12.5% (8k articles out of 61k) would not be able to go through a TA due to lack of subscription. The remaining 87.5% (53k) were eligible: the CA was affiliated with a Jisc member institution and the member had a subscription, and therefore had the potential to go through the TA²⁴⁰.

Of articles eligible to go through a TA, just over 14k were not published under the TA in 2022. This may be due to opt-outs or caps on agreements.

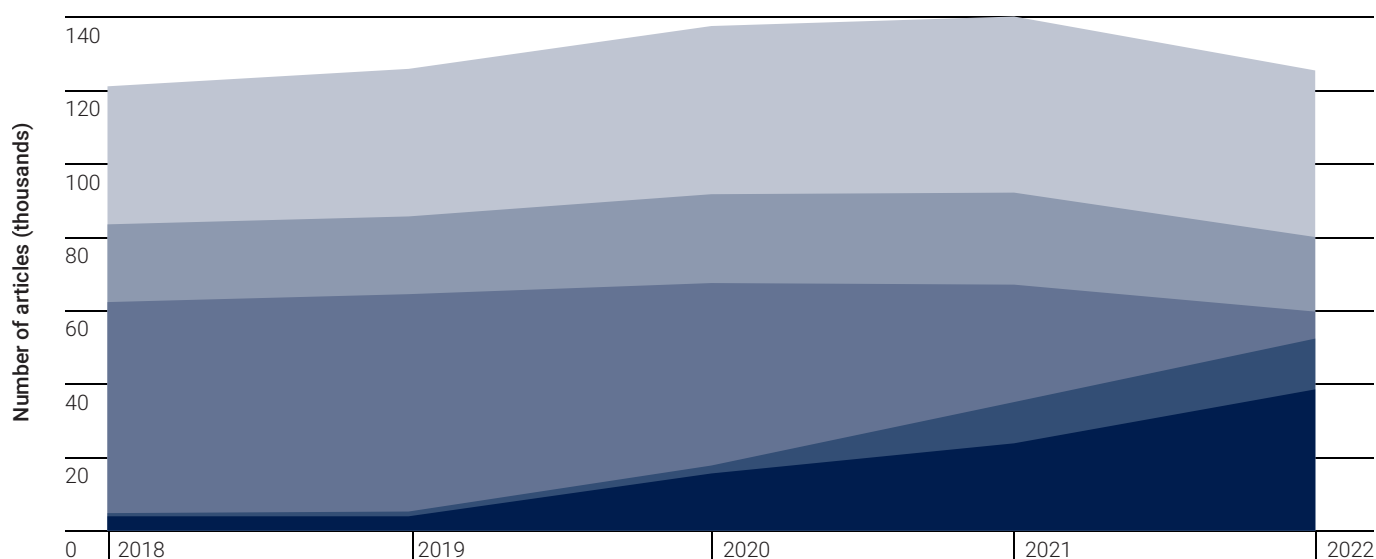
Springer Nature records that 3.5% of articles with a CA affiliated to a subscribing Jisc member did not go through a TA due to opt-outs; Wiley records 5.8%²⁴¹. While these opt-out rates are not necessarily representative of the other TA publishers, they indicate that opt-outs are unlikely to be the main reason for articles not being published under a TA.

More generally, the number of opt-outs has been decreasing for almost all publishers, with Karger being the only known exception²⁴². Opt-outs have decreased by 200% for Springer Nature between 2019 and 2022, and nearly 300% for Wiley between 2020 and 2022. The decreases may be attributable to authors' growing familiarity with the agreement, improved workflows, and/or advocacy and education.

Jisc-negotiated TAs cannot therefore be expected to (directly) result in a transition to full and immediate OA across all articles. However, one would expect that they would result in higher levels of OA articles published in active TA titles where the CA is affiliated to a Jisc member organisation. As shown in [figure 18](#), the levels of Open articles are slightly greater when considering only articles by CAs affiliated with a Jisc member organisation (right column) compared to articles by any author affiliated to any UK organisation (left column); specifically, 39% of articles with any UK-affiliated author were open and 45% were Closed in 2022, while 50% of articles with a Jisc member-affiliated CA were Open and 32% were Closed in 2022. Therefore, UK articles within the more

Figure 17: all articles by UK authors published in hybrid journals actively covered by a TA and all articles reported by publishers as published under a TA.

Data source: Dimensions and publisher-provided Article-Level Metadata (hereon 'ALM'). Parameters: All hybrid titles in current or historic Jisc TAs (for 38 publishers)



	2018	2019	2020	2021	2022
Articles with at least one author affiliated to a UK ROI	123,879	128,405	140,503	143,113	128,264
Articles with a UK corresponding author	85,299	84,574	93,369	93,883	81,838
Articles with a Jisc member corresponding author	63,908	65,934	68,949	68,449	61,057
Articles with a subscribing Jisc member corresponding author	4,904	5,358	18,014	35,943	53,458
Articles published under TA	3,777	4,056	15,870	24,283	39,163

direct sphere of influence of Jisc TAs are around 11% more Open (or 13% less Closed) than the broadest category of UK articles. So TAs may be bringing about a faster transition to OA for research that is within their direct sphere of influence (although this analysis does not necessarily demonstrate a cause-effect relationship).

Figure 18 shows growth in the proportion of Hybrid, which can be seen across all three levels of authorship. The growth is most pronounced at the more specific level of articles with a Jisc-member affiliated CA – where TAs would have the most direct impact – as the proportion of Hybrid rose from 21% in 2018 to 40% in 2022. This 19% increase is considerably greater than the 12% increase in

Hybrid proportions for all UK articles in TA titles in the same period. Most (70%) of the increase in Hybrid proportions at the broadest level of all UK articles can be attributed to the increase in Hybrid articles at the level of Jisc-affiliated CA, since 12k of the total 17k Hybrid UK articles grew from the articles with a Jisc-affiliated CA.

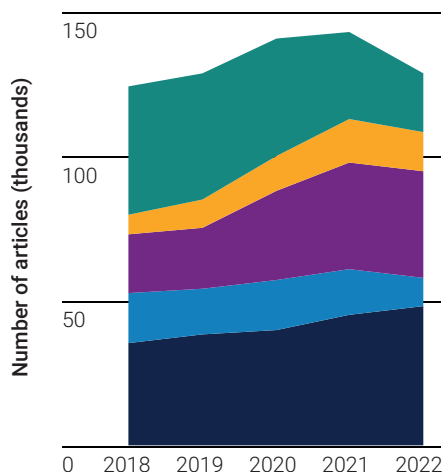
The proportions of Closed articles are lower for articles with a Jisc-affiliated CA (32% in 2022) than all UK articles (45% in 2022). Nonetheless, all three levels of authorship display a similar trend, with the proportion of Closed articles staying the same. Between 2018 and 2022 the proportion of Closed articles decreased by less than 3% at the level of any UK-affiliated article, by 2% at

Figure 18: number and proportion of articles by OA status, differentiated by levels of authorship affiliation with UK organisations.

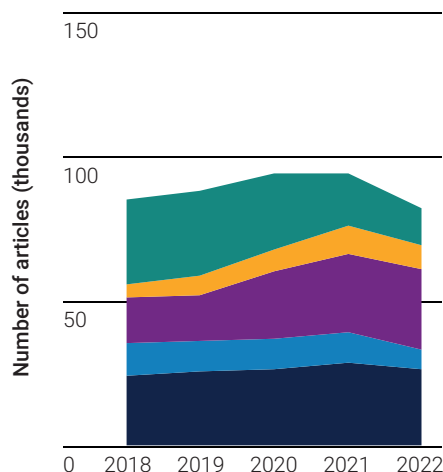
Data source: Dimensions, KB+. Parameters: All titles in current or historic Jisc TAs (for 38 publishers).

OA status: ■ Closed ■ Bronze ■ Hybrid ■ Gold ■ Green

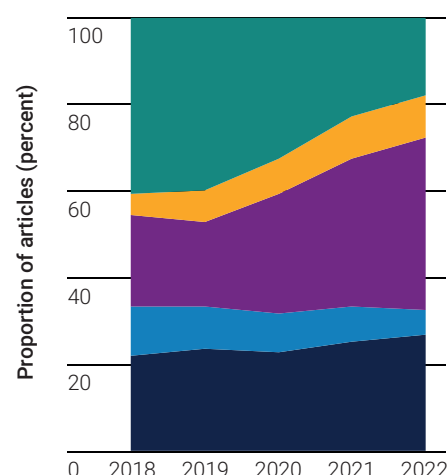
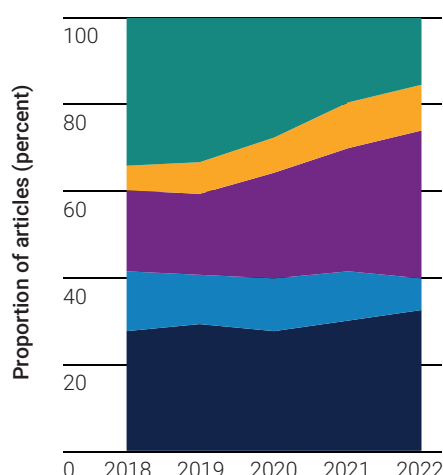
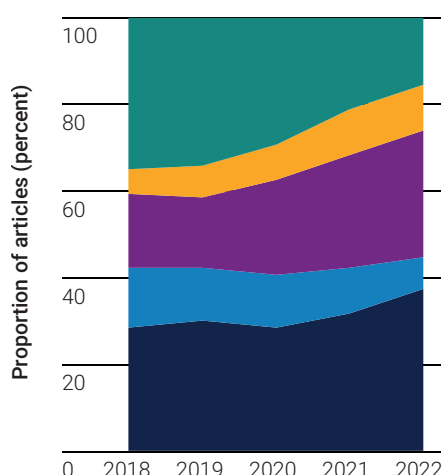
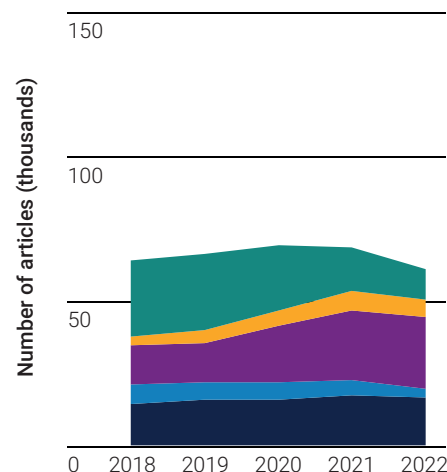
Articles with any author affiliated to UK organisation



Articles with corresponding author affiliated to UK organisation



Articles with CA affiliated to Jisc member organisation



the level of UK-affiliated CA articles and by 1% at the level of Jisc member-affiliated CA articles. The increases in the proportions of Hybrid articles, as noted above, are mostly the result of reducing or masking Green articles, as we've observed throughout this report.

In the **'2a Global findings'** section we looked at the reach of TAs and noted limited reach in terms of the countries with TAs and the coverage of those TAs over publishers' articles. In this section we drill further down to examine how, even in a country with some of the highest numbers of TAs, the reach of TAs is still limited by their focus on hybrid titles and to authors affiliated to member research organisations participating in TAs.

Who is subscribing to UK transitional agreements?

This section looks in more detail at organisations (Jisc members and non-Jisc members) that are publishing in TA titles but not subscribing to the relevant TA. Note that, due to the complexity of identifying the UK institutions affiliated to CAs, the figures for the number of unique organisations should be taken as estimates only (see [appendix 2, 'methodologies, prevalence of OA in global and UK literature'](#)). In particular, figures probably overestimate the number of research organisations.

By far the largest group of UK research organisations with CAs publishing in TA titles were non-Jisc members, estimated at over 24k organisations over the five years. When limited to years when TA titles were in an active TA, this estimate is reduced to over 11k non-Jisc member organisations publishing but unable to subscribe to the relevant TA. Of the other 168 (Jisc member) research organisations, no particular Jisc band, region or organisation type stands out as being over-represented in 'under-utilising' Jisc TAs.

Although non-Jisc member organisations are the largest group publishing in TA titles they account for only a quarter of UK CA articles (108k); there are almost three times as many (335k) published by UK CA affiliated with Jisc member research organisations. One of the major limitations of Jisc's TAs, therefore, is that they don't currently provide a route to OA for the many non-member research organisations publishing and are not offered to non-Jisc member organisations on a 1:1 basis or on behalf of a wider group of non-member organisations.

Even though there are many, varied non-Jisc member organisations with affiliated CAs publishing in TA titles, we estimate that most only published a few articles. The (CA-) affiliated non-Jisc member organisations that published the most in the TA titles across the five-year period were: Guy's and St Thomas' NHS Foundation Trust (1,281 articles), the NHS (1,218 articles), and King's College Hospital (1,113 articles). In some cases, non-Jisc member organisations may be connected to Jisc member organisations in a way that allows them to make use of TAs (in a way not represented here), but that would only apply to a small proportion of organisations.

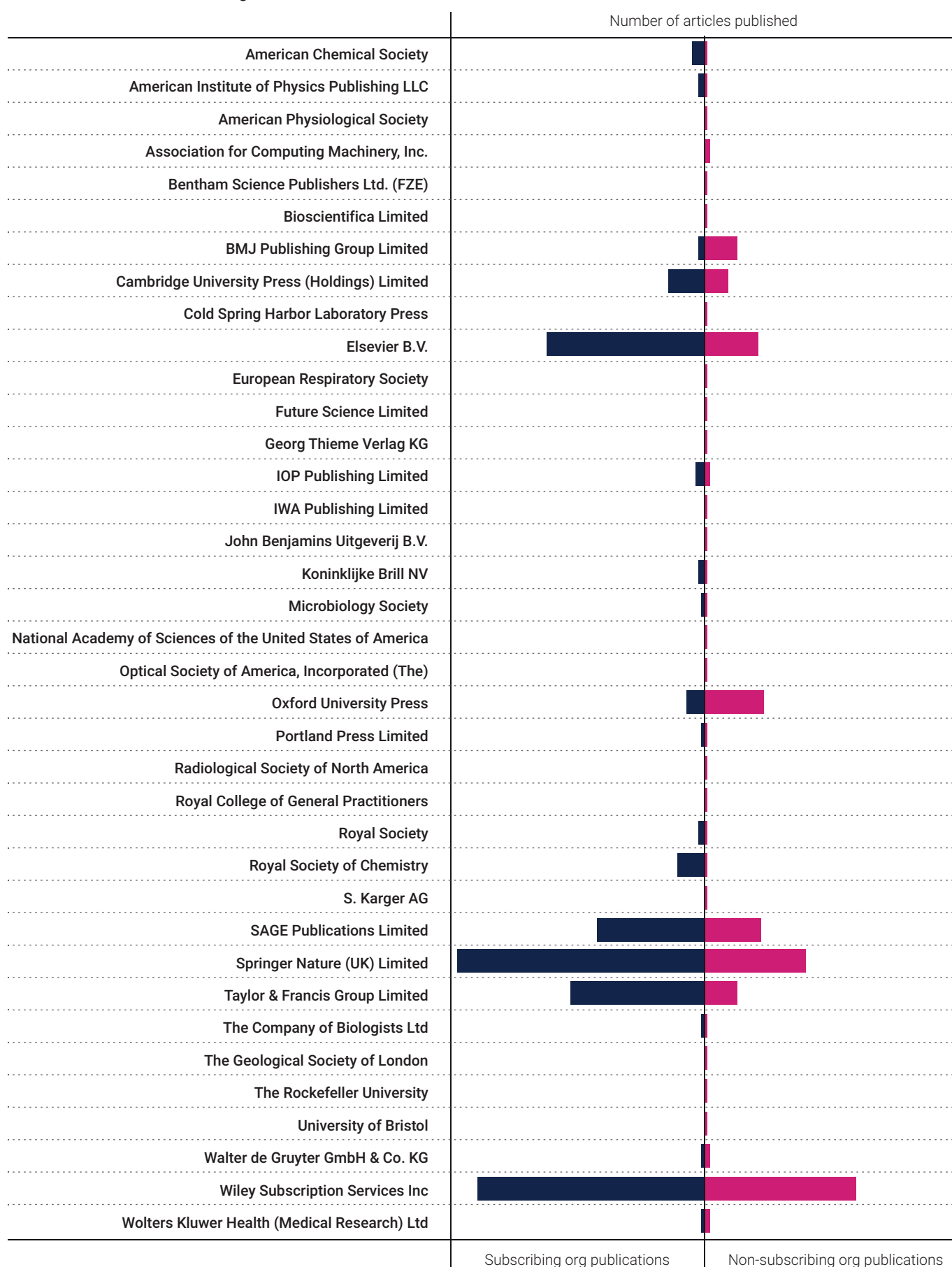
There are also some Jisc member organisations with CAs publishing in TA titles but not subscribing, despite the TA being available to them. Although these organisations generally subscribe to some Jisc TAs, not subscribing to even one TA may result in a high number of 'missed' eligible articles. As Jisc members evaluate TAs to inform participation, deciding not to subscribe may be a strategic decision due to insufficient publications with a given publisher to warrant subscription, budgetary limitations, policy decision or applicability of the content to the institution. Unlike access that can be supplied on a 'just-in-time' basis via mechanisms such as document delivery, it is not feasible even for a well-resourced institution to subscribe to all TAs their authors may publish under.

Figure 19 shows these trends broken down by specific publishers and their associated TAs, for years when the respective TAs were active.

Springer Nature has the highest number of articles published by organisations subscribing to the TA, which is over twice the number of articles published by UK organisations not subscribing to the TA (while the TA titles were active). In comparison, over five times as many articles were published in BMJ's TA titles by UK organisations not subscribing to the BMJ TA, than were published by UK organisations subscribing to the BMJ TA. The Springer Nature TA could therefore be expected to be more influential in converting content to OA, both in terms of the sheer number of articles and in the proportion of articles published by subscribing organisations. However, as we explain in the next section, even those publishers where one would expect a greater transition (such as Springer Nature) have not necessarily seen faster progress to OA.

Figure 19: UK CA articles between 2018 and 2022 by publisher broken down by institutions subscribing to the TA and those not subscribing to the TA.

Data source: Dimensions and Licence Subscriptions Manager (LSM). Parameters: 2018-2022 articles with a CA affiliated to a Jisc member organisation. All titles in current or historic Jisc TAs.



How has the share and type of Open Access articles differed across publishers?

While 38 publishers that had TAs with Jisc in 2022 are the focus of this report, there are other publishers transitioning UK articles to OA, and by different routes. An examination of the share of UK articles by OA types across publishers²⁴³ shows a highly consolidated market, but with significant differences between OA types.

Across all OA types the top four publishers by number of UK articles published are Elsevier, Springer Nature, Wiley and T&F, which together account for just under 50% of output.

UK Gold articles are highly consolidated, with the top ten publishers covering two-thirds of Gold articles in 2022. Over a third (35%) of Gold articles are published with the big, born-OA publishers: Multidisciplinary Digital Publishing Institute (MDPI) accounts for 22%, Frontiers 9% and Public Library of Science (PLOS) 3%. The four biggest commercial publishers²⁴⁴ together published just over a quarter of Gold articles. MDPI is now the single largest Gold publisher in the UK, producing just under twice as

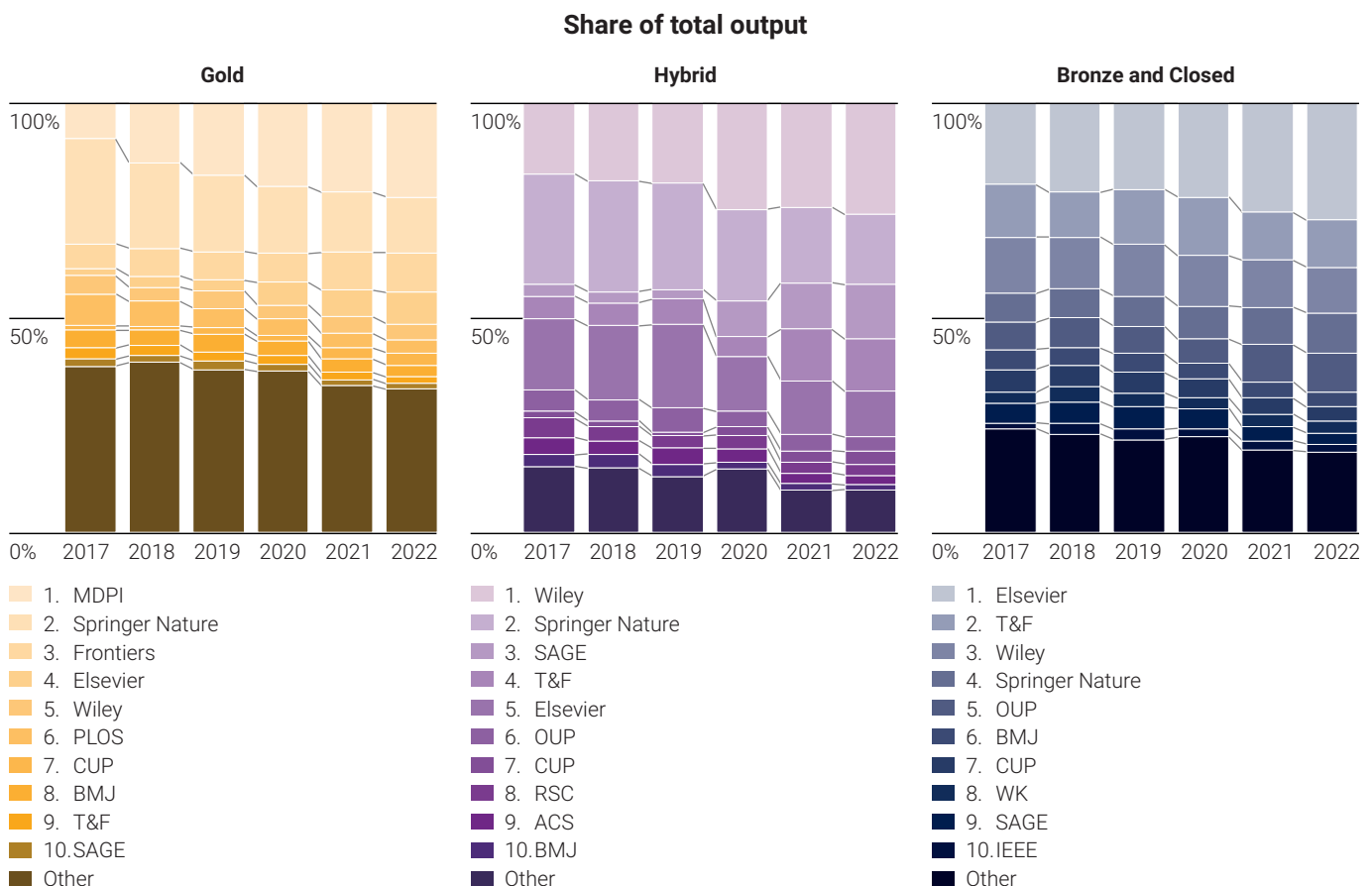
many articles as second-placed Springer Nature. Across all article types however, MDPI and Frontiers published just under 10% of output between them (with MDPI the fifth largest publisher and Frontiers the tenth largest in 2022).

Hybrid shows even higher consolidation: the top ten publishers account for just over 90% of UK Hybrid articles. However, in contrast to Gold, Hybrid is dominated by the four biggest commercial publishers, which together account for almost two-thirds of Hybrid OA articles. Wiley is the largest publisher of Hybrid articles as of 2022, producing about 1.5 times as much as second-placed Springer Nature. Springer Nature has lost share to the other commercial publishers as well as Sage.

Closed articles show slightly lower consolidation than for Hybrid: the top ten publishers account for just over 78% of UK Closed output. The four biggest commercial publishers occupy the top four places, covering 58% of Closed output between them. Elsevier is the largest Closed publisher overall, publishing about 1.4 times as many articles as Springer Nature.

Figure 20: share of total output of UK papers by the top ten publishers, comparing OA types.

Data source: Delta Think. Parameters: 2017-2022 UK articles in certified academic journals.



Across all access types there is a long tail of hundreds of publishers in the 'others' category, and their number has been growing over time. Biblio-diversity appears to be increasing alongside consolidation, albeit across a smaller proportion of output. Further research would reveal the causes of this trend.

Across publishers' transitional agreement titles

Figure 21 shows the breakdown of articles in publishers' TA hybrid titles, where the CA is affiliated to a UK organisation, by OA status. If a TA was successfully influencing the conversion to OA one would expect to see a fast and sustained conversion of the publisher's Closed content to Open soon after the TA became active – and this can be seen with Bioscientifica, European Respiratory Society (ERS), Karger and the Royal Society, suggesting that these TAs have been very successful in transitioning the UK CA articles to Open.

However, it is difficult to specify how quickly, how fast, or how much content should be expected to be converted to Open, and no targets have been defined by us or our members. Other TAs (such as AIP, IOP, Elsevier, CUP, T&F and Sage) appear to have converted Green articles to Gold or Hybrid. Although these TAs have not increased the proportion of open UK CA scholarship, in the absence of other routes to OA they have perhaps made access easier and quicker, through immediate OA publishing.

Thirteen (34% of 38) publishers maintained or even increased the proportion of their Closed articles in the years since their Jisc agreement became active. Eight of these publishers simultaneously increased the proportion of their Open articles, (with Green-only content therefore decreasing), demonstrating that an increase in Open does not necessarily correspond to a decrease in Closed, or vice versa. On average, the 38 publishers reduced the proportion of their Closed content by under 3%.

A closer look at a few of the larger publishers that are maintaining their Closed content (such as Sage, T&F and Wiley) (**figure 21**), reveals an increase in their Hybrid content at the same time, albeit with some decreases in 2022. In particular, these publishers saw a large jump in their Hybrid articles by UK CAs soon after the introduction

At both UK and global levels, on average, Gold and Hybrid content is increasing more than Closed content is decreasing. However, these directional shifts are greater at the UK CA level, where it seems likely that Jisc TAs are having more effect.

of their Jisc TA, which then stabilised or declined. In these cases, it would seem Jisc TAs were not a vehicle for continuous transition, but only precipitated an initial conversion to OA that was not sustained. Moreover, that initial conversion to OA did not come in the form of reducing Closed articles, but instead from masking Green articles.

This is not the case for all publishers with Jisc TAs, however. As shown in **figure 21**, several publishers (including AIP, Bioscientifica, ERS, Royal Society and Karger) have seen a large and sustained conversion of their UK CA articles to OA, alongside a decrease in the proportion of Closed articles. For these publishers TAs appear to be more successful, but it should be noted that many of these publishers have only had active TAs with Jisc for one or two years so it is unclear whether (or to what extent) these trends could be expected to continue.

More broadly, 25 (66% of 38) publishers maintained or increased the number and proportion of Open articles (of UK CA articles in the hybrid titles covered in their Jisc TA since the year before their Jisc TA was active). The average increase in the number of Open articles was 89%, with a minimum increase of 2% (Brill) and a maximum increase of 825% (IOP). Approximately one-third of publishers (13 out of 38) did not increase the absolute number of their Gold and Hybrid articles during the period their Jisc TA was active. Globally, this proportion is higher.

Figure 21: proportion of publishers' UK CA research output in their hybrid TA titles by OA status by year 2018 - 2022. Data source: Dimensions. Parameters: 2018-2022 articles with a CA affiliated to a UK organisation. All hybrid titles in current or historic Jisc TAs.

OA status: ■ Green only ■ Gold or Hybrid and Green ■ Gold and Hybrid ■ Bronze and Closed



At both UK and global levels, on average, Gold and Hybrid content is increasing more than Closed content is decreasing. However, these directional shifts are greater at the UK CA level, where it seems likely that Jisc TAs are having more effect.

By 2022, the average proportion of Closed content for the 38 publishers was 38% (for UK CA articles in hybrid TA titles), but this ranged from 0% for IWAP to 89% for Bentham. The average proportion of Open content for the 38 publishers was also 38% (for UK CA articles in hybrid TA titles), ranging from 0% for Cold Spring Harbor Laboratory Press (CSHLP) to 92% for the RSC.

In 2022, Open articles accounted for more than 50% of UK CA articles in hybrid TA titles, for 25 (66% of 38) publishers with Jisc TAs. On the other hand, 13 publishers (34% of 38) had proportions of UK CA Closed articles in their hybrid TA titles that were still above 50% in 2022. Of these, some were seeing their UK CA Closed content levels increase on pre-TA levels and some were seeing their UK CA Open content levels increase. Although TAs have been an effective mechanism for converting some of the UK CA articles in hybrid titles, they have not transitioned all content and success has been variable from publisher to publisher.

Almost all Gold and Hybrid UK CA articles for these publishers are also in a repository (and therefore Green OA). Microbiology Society, IWAP, Future Science and Brill are exceptional in having the largest proportions of Hybrid-only articles, but generally over half of their Hybrid articles also have a repository copy. Again, this analysis cannot deduce whether the increase in Hybrid content is simply masking articles that were already Open through the Green route, or whether the increase in Hybrid content is having the secondary benefit of making articles Open through the Green route as well.

How has the UK conversion to Open Access differed across subject areas?

An examination of the uptake of OA by subject²⁴⁵ reveals distinct patterns in articles from UK authors compared with global patterns.

Figure 22 compares uptake of OA within a field with the field's influence on (share of) all UK output.

Looking at the share of all output ('influence'), the UK shows slightly different patterns to the global averages. The UK publishes the most articles in medicine (just over

a quarter of articles published), but medicine is the eighth lowest in its uptake of OA (compared to fourth highest globally). The gap between second largest (engineering) and third largest field (biological) is much smaller than for global averages. In the UK, physical sciences account for lower shares of overall output compared with global averages, but social sciences, arts and humanities account for more. This means that, on average, the differences between the larger and smaller fields are less pronounced than for global averages.

The median share of OA within a field is just under 40%, compared with 33% globally. Again, there may be considerable variations across subjects within a field (such as between medical specialties). In total, the UK showed around a 13% higher uptake of OA compared with global averages. Exceptions include health sciences, history, linguistic and cultural studies, which make slightly less use of OA than global averages (and medicine, as noted above).

In the UK, 74% of articles in multidisciplinary journals are Gold, compared with over 87% globally. The difference is due to a higher uptake of non-OA options in multidisciplinary journals, but these are considered an outlier. The lower use of Gold is more pronounced in most other fields, in favour of Hybrid. Overall, Gold uptake averages 1.2 times that of Hybrid, compared with just under four times globally. This reflects UK-specific policies towards OA mandating the use of (and providing funding for) Hybrid (refer back to [section 1, 'background to OA in the UK'](#)). The second highest OA uptake is in environmental sciences (63%), then biological sciences and agricultural sciences (53 to 55%). Fields with the lowest OA uptake are dentistry (12%), nursing, and history and archaeology (15%) and creative arts (18%).

Figure 23 shows the average annual growth rates in uptake of OA for the UK. The pattern is broadly similar to global averages, but with a few exceptions. In areas of low OA uptake Bronze and Closed output have, on average, fallen faster than global averages, and vice versa for areas of higher OA uptake. Some fields – such as engineering, environmental sciences, and business and economics – showed an increase in share of both OA and non-OA output, due to a decline of Green-only. The most significant growth has been in OA uptake in hybrid journals, particularly in dentistry, veterinary, social sciences, arts and humanities, albeit from relatively low volumes of output. The pattern is similar to global averages but with slightly higher growth – which is

notable given the UK's higher than average use of Hybrid. Output in fully OA journals has grown too, apart from in multidisciplinary journals, where (similar to global trends) it is likely that large mega-journals are losing to more specialist journals.

Across all fields, the fastest growing fields for Gold are typically the smaller ones, so Gold growth overall is a modest 7.7% (five-year CAGR). Growth in Hybrid is

spread across some larger fields, resulting in total growth of 38%, several times more than that of Gold. These rates are different to those described in the section '[To what extent has UK publication in journals transitioned to Open Access?](#)', partly due to the different parameters and methodologies associated. However, both demonstrate a trend towards a growth in Hybrid over Gold articles.

Figure 22: uptake and influence of OA use for UK research output by subject area and field.

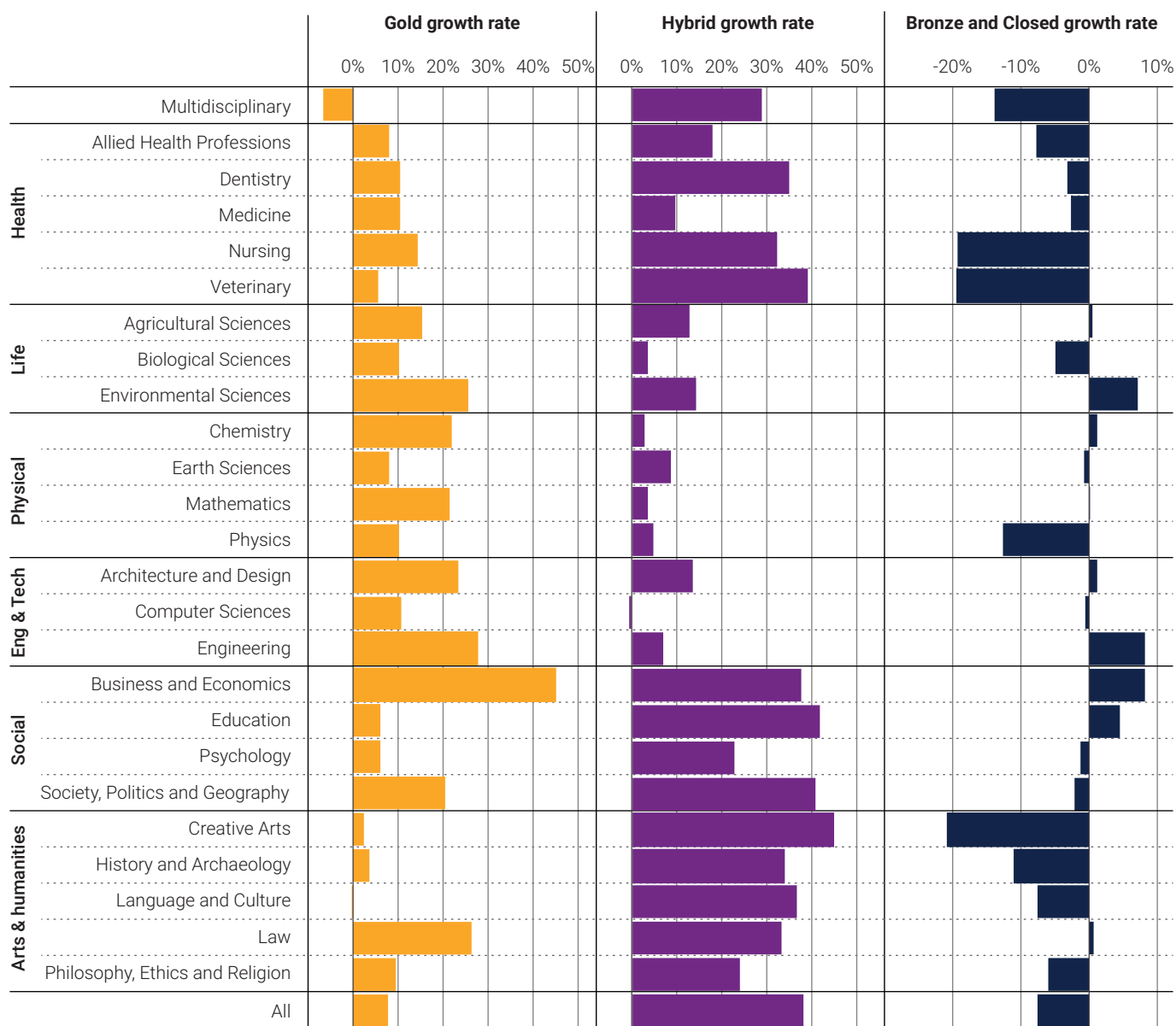
Data source: Delta Think. Parameters: 2022 UK articles in certified academic journals.

OA status: ■ Green (only) ■ Gold ■ Hybrid ■ Bronze and Closed



Figure 23: average annual growth rate in uptake of OA (five-year CAGR, 2017-2022) for UK research output by subject area and field.

Data source: Delta Think. Parameters: 2022 UK articles in certified academic journals.



Summary

Since the UK's first TA in 2016, the number of TAs negotiated by Jisc increased to 39²⁴⁶ in 2022, although the rate of increase has slowed in more recent years. By the end of 2022, more than 87k articles were published under the Jisc-negotiated TAs – immediately OA. In 2022, those accounted for 48% of all UK CA articles. Of the UK CA articles that were not published under a TA, reasons can be attributed to:

- Organisations affiliated with the CA not being a Jisc member (and therefore not being able to subscribe to the relevant TA) (25%)
- Jisc member organisations affiliated with the CA not subscribing to the relevant TA (12%)
- Other reasons not accounted for in the analysis such as opt-outs or caps (17%)

Opt-outs are unlikely to be the main reason for articles not being published under a TA.

TAs are only currently available to Jisc members and so have a limited sphere of influence. It is estimated that over 11k non-Jisc member organisations published in active TA titles but were unable to subscribe to the relevant TA. Non-Jisc member organisations are the largest group publishing in TA titles, accounting for a quarter of UK CA articles; these articles cannot be transitioned to OA through Jisc's TAs.

Furthermore, despite TAs being available to all Jisc members it is clear that all institutions do not subscribe to all relevant TAs in which their authors are publishing. This may be because of institutional policies and positions on TAs, availability of a publisher's permissive Green OA policy, or affordability making it unfeasible for institutions to subscribe to all TAs, particularly if only a handful of articles would be published under a particular TA.

It is perhaps unsurprising, then, that articles within the more direct sphere of influence of Jisc TAs (where the CA is affiliated to a Jisc member organisation) are around 11% more Open (or 13% less Closed) than the broadest category of UK articles. Similarly, the faster increase of Gold and Hybrid articles (than decrease in Closed articles) are greater at the UK CA level (than any UK articles), where it seems likely that Jisc TAs are having greater effect.

Overall, the proportion of Open articles has increased by 30% and the proportion of Closed articles has decreased by 25% between 2014 and 2022. This represents a faster transition to OA than globally in the same period. In 2022, 4% more of the UK's articles were Open, and 15% less were Closed, compared to globally.

In fact, there are higher levels of Open articles when looking at UK articles in all titles than in TA titles: this is attributable to the greater proportion of Hybrid articles and lower proportion of Gold articles in TA titles, which focus on conversion of Hybrid content. Much of the UK's movement towards Open can be attributed to the growth in Hybrid. The UK has a considerably higher proportion of Hybrid articles than the global average. After initially slow growth in Hybrid in the UK, the year-on-year increase in Hybrid is now surpassing the increase in Gold articles. This trend can be seen across all levels of analysis, but is most pronounced at TA title articles with a Jisc-member affiliated CA – where TAs would have the most direct impact – where the proportion of Hybrid rose 19% between 2018 and 2022.

While the analysis of OA by subject indicated that Gold uptake was slightly greater than that of Hybrid (most likely due to methodological differences), this analysis also found that the most significant growth was in OA uptake in hybrid journals – 38%, several times that of Gold – and that the UK's growth in Hybrid was higher than the Hybrid uptake globally. This report also observed important differences by subject: the UK publishes the most articles in medicine (slightly higher than the global average), but it is eighth lowest in its uptake of OA (compared with fourth highest globally). Overall, the median share of OA within a field is just under 40%, compared with 33% globally.

In 2022, 4% more of the UK's articles were Open, and 15% less were Closed, compared to globally.

While these trends suggest the UK is transitioning to OA more effectively than the global average, other findings indicate a resurgence in (or at least, retention of) Closed articles. In particular, after four years of accounting for a declining proportion of all UK articles, in 2021 and 2022 Closed-only content grew by 4.5%. The proportions of Closed articles are lower for articles with a Jisc-affiliated CA than all UK articles but, nonetheless, all levels of authorship display a similar trend, with the proportion of Closed articles staying the same and above 30%. This also holds true for 34% of TA publishers that maintained or increased the proportion of their Closed content in the years since their Jisc agreement became active and/or that had over 50% Closed content for the UK CA articles in their hybrid TA titles. The 38 TA publishers we looked at reduced the proportion of their Closed UK CA (hybrid TA title) content by 2.6% on average, but the average proportion of their content UK CA that was Closed was 38%.

While Closed, Hybrid and Gold articles have generally increased or remained in a steady state, Green articles have generally reduced. Green-only articles have steadily declined by around 4% over each of the last four years, which is a more exaggerated version of the global trend. This is probably at least partly the result of the UK's earlier emphasis on the Green route to OA (refer back to ['section 1: background to OA in the UK'](#)). Even from 2014, the UK had a higher proportion of Green articles than the global average, and this gap has only increased (the UK had 16% more Green articles than the global proportion of 18% in 2022).

For some fields (such as engineering, environmental sciences, and business and economics) the proportion of Closed articles and Open articles increased, with Green-only content therefore decreasing.

Some publishers are maintaining their Closed content while also increasing their Hybrid content. In these cases, it would seem Jisc TAs were not a vehicle for continuous transition, but rather only an initial conversion to OA from shadowed Green articles. Indeed, almost all of the Gold and Hybrid UK CA articles for the 38 TA publishers are also in a repository (and therefore REF-eligible). Other publishers have seen a large and sustained conversion of their UK CA articles to OA, alongside a decrease in the proportion of Closed articles. For these publishers – generally smaller, society publishers – TAs would appear to be more successful.

These smaller publishers making a better transition to OA has a smaller impact on broader national OA trends, while the larger publishers who maintain or increase their Closed content have a larger impact. The top four publishers of articles are Elsevier, Springer Nature, Wiley and T&F, which together account for just under 50% of output. All these publishers have been increasing or maintaining their Closed content and were the top four publishers of Closed content, together accounting for 58% of Closed articles. If TAs cannot serve to transition the portfolios of these top publishers, one would not expect the needle for levels of OA in the UK to move far or fast.

The top ten publishers account for just over 90% of Hybrid output – a higher consolidation than for Closed (78% of output) and for Gold (66% of output). This raises the concern of maintaining biblio-diversity in publishing; if TAs are focused on large, commercial publishers, will that continue to entrench their dominance? Although biblio-diversity appears to be increasing, as there is a long and growing tail of hundreds of publishers, this is alongside an increase in consolidation, as top publishers account for a greater share of articles published. This consolidation is highest for the Hybrid route – the focus of TAs.

Although TAs have been an effective mechanism for converting some of the UK CA content in hybrid titles, they have not transitioned all content and the success has been at varying degrees across publishers, subjects and organisations.

Section 3: evaluation of transitional agreements

Jisc's requirements, and our approach to negotiating TAs, are led by UK academic institutions and sector agencies through Jisc's strategic groups²⁴⁷. We first introduced the requirements for TAs in September 2018. They reference and align with other international initiatives and standards, including the LIBER principles for publisher negotiations²⁴⁸, the Plan S Principles²⁴⁹, the OA2020 goals²⁵⁰ and the ESAC recommendations on publisher workflows²⁵¹. We review them on an annual basis and refine them to take account of developments in workflows, funder policies and institutional requirements.

The requirements cover peer-reviewed research articles, including reviews and conference papers, and their objective is to transition subscription titles to OA, eliminating paywalls for all readers. We register our TAs and publish contracts in the ESAC Registry²⁵² in line with the OA2020 transparency requirements.

3a. Agreements must reduce costs

The sector’s first requirement for TAs is to reduce and constrain costs. This requirement is in the interest of promoting financial sustainability and recognises the non-monetary contributions that researchers employed by research institutions provide to publishers through high-quality research, peer-review and editorial services. Since 2021 the sector required TAs to offer a total fee for both reading and publishing that resulted in a reduction in existing subscription expenditure. It also sought a commitment to constrain costs across all elements of the agreement, including: annual price increases, removing ‘in the wild’ APC payments from the total fee and removing all additional fees for publishing services, such as page charges or colour charges. The requirement specifies that charges for paywalled content and collections should reflect the volume of content made OA. This is discussed also in [subsection 3c](#).

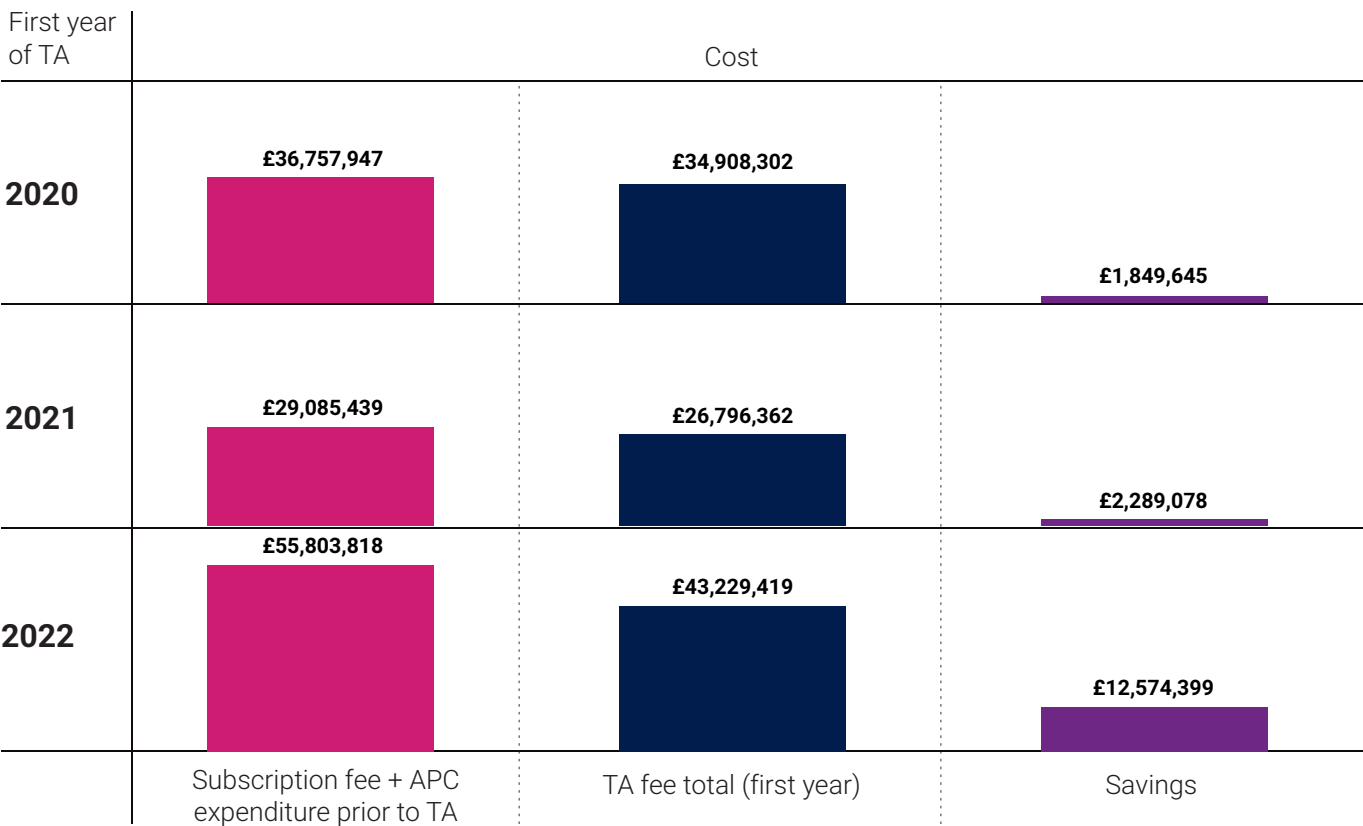
Costs and actual cost savings for pre-TA and the first year of TA expenditure

To evaluate whether agreements offer a fee for both reading and publishing that resulted in an overall reduction in comparison to expenditure on reading and publishing under the subscription model, we have compared the fee for the TAs in their first years with expenditure on the subscription agreement plus expenditure on APCs by the same subscribing institutions in the year immediately prior to the TAs. (See ‘[appendix 2, methodologies, cost analysis](#)’ for more detail; note that all figures presented in [section ‘3a. Agreements must reduce costs’](#) exclude VAT.)

In 2020, the 13 TAs that commenced that year delivered a 5% actual cost saving to the sector: the pre-TA known expenditure on subscription fees and APCs in 2019 was £36.8m, while the first-year fee (for reading and publishing) of the TA was £34.9m, delivering at least £1.8m in savings (see [figure 24](#)). The 17 TAs starting in 2021 delivered a further £2.3m in savings to the sector: a 9% actual cost saving on the known pre-TA spend (2020) with the publishers whose TA started in 2021. Finally, the six TAs

Figure 24: the pre-TA sector known expenditure on subscription fees and APCs, the total sector expenditure for the first year of the relevant TAs and the sector savings.

Data source: LSM and publisher-provided pre-TA APC expenditure



with new publishers starting in 2022 delivered a further £12.6m in savings to the sector: a 29% actual cost saving on the known pre-TA spend (in 2021). Of the six agreements that commenced in 2022 and delivered a combined £12.6m saving to the sector, the Elsevier agreement delivered 94% of the saving through the negotiated £11.9m saving.

In total, 20 of the 37²⁵³ Jisc-negotiated TAs delivered a cost saving of £17.9m to the subscribing institutions in the first year of the agreement compared to the institution's known expenditure (subscription and APC fees) in the year preceding the TA. The savings varied from as little as £180 to as much as £11.9m per publisher, with a median average of £145.7k (see '[appendix 4, detailed analysis of cost savings by publisher](#)')²⁵⁴. Seventeen TAs did not deliver savings and led to an actual £1.2m increase in spend for the subscribing institutions. On average, subscribing institutions increased spend by £68.6k with these publishers. However, the extent of this increase in spend is much smaller than the savings delivered by the other TAs.

A closer understanding of the context in which Jisc TAs were negotiated explains some of these increases. Nine agreements, in which the fee for the first year was increased compared to the sector's known expenditure (subscription and APC fees) from the year preceding the TA, were with smaller publishers: American Physiological Society, Bentham, ERS, Radiological Society of North America (RSNA), Royal College of General Practitioners (RCGP), Royal Irish Academy (RIA), the Royal Society, CoB, and the Geological Society of London (GSL). For these nine publishers the actual increase in spend for the sector amounted to £149.5k. These agreements saw increases to the sector varying from £502 for the RIA TA, which had two subscribers in the first year (and for the pre-TA agreement), to £85.8k for the Royal Society TA, which had 30 subscribers (in the first year of the TA and the preceding pre-TA year).

The TAs with smaller publishers, which often had a minimum spend, increased the content available to subscribers and generally offered unlimited publishing. TAs with smaller publishers seem to address some of the issues raised by Paltani-Sargologos (2020) and Frontiers (2022)²⁵⁵, that TAs limit opportunities for small and fully OA publishers, hindering biblio-diversity in the market²⁵⁶. Similarly, Farley et al (2021) argued that TAs fail to create "an equitable scholarly publishing ecosystem" because they prevail in research-intensive institutions

and "maintain the power imbalance that the oligopoly legacy commercial publishers currently enjoy"²⁵⁷. TAs have addressed some of the issues raised in the literature – for instance, agreements are more accessible to less research-intensive institutions. But there are still concerns, with these maintaining the subscription model while transitioning and institutions without the funds to subscribe may be impacted as a result.

Many institutions have purposely elected to support society publishers in their transition to Open. For example, the Royal Society TA provided access to the full journal package (eight hybrid titles) and uncapped OA publishing (eight hybrid titles and two fully OA journals) at the cost of a discounted 2021 full journals subscription package plus the institution's mean 2018/19 spend on OA publishing. The structure of this agreement saw all institutions pay an increased amount for access to paywalled content, but at the same time increased their access to content. One institution increased their spend with the publisher by £8k for access to an additional ten titles and unlimited OA publishing. To some extent, the initial savings made from TAs with major academic publishers may have enabled UK institutions to support TAs and other OA arrangements with society and smaller publishers.

Association for Computing Machinery's (ACM's) TA also saw an increase in sector spend of 113%. However, a closer look at the business model can explain the increase, as ACM had applied their global business model, ACM Open²⁵⁸, in which the cost was based entirely on OA publishing, rather than subscription expenditure. Consequently, low expenditure across the consortium on subscription fees and a high number of UK CA articles resulted in increased expenditure for the ACM TA. In spite of ACM publishing a breakdown of their publication costs (see '[section 3c. Agreements must be transparent](#)'), several institutions elected to remain on the read-only subscription model.

The Sage TA, which started in 2020, saw a £162k (1.9%) increase in spend by the sector with the publisher. However, when the agreement was negotiated in 2019 the cost did not include the previous year's APC spend. Furthermore, in addition to uncapped OA publishing the agreement gave access for all subscribers to three collections (Premier, IMechE and RSM) which had previously required separate subscriptions, providing increased content to nearly two-thirds of the subscribers and better value for money.

Figure 25: savings, calculated as the difference between the subscription fees and APC expenditure in the year prior to the TA, with the total TA fee in its first year, by publisher and TA start year. Totals broken down into positive and negative savings values.

■ Postive savings ■ Negative savings

	2020	2021	2022
American Chemical Society			-£599,393
American Institute of Physics Publishing LLC		£165,697	
American Physiological Society		-£6,614	
Association for Computing Machinery, Inc.	-£14,085		
Bentham Science Publishers Ltd. (FZE)			-£6,483
Bioscientifica Limited	£23,490		
BMJ Publishing Group Limited		£878,264	
Cambridge University Press (Holdings) Limited		£465,795	
Cold Spring Harbor Laboratory Press		£2,699	
Elsevier B.V.			£11,859,168
European Respiratory Society	-£9,325		
Future Science Limited		£180	
Georg Thieme Verlag KG	-£3,875		
IOP Publishing Limited	-£57,233		
IWA Publishing Limited	£4,397		
John Benjamins Uitgeverij B.V.			£9,614
Koninklijke Brill NV		£29,297	
Microbiology Society	£40,480		
National Academy of Sciences of the United States of America		£27,720	
Optical Society of America, Incorporated (The)			£486,299
Oxford University Press		£422,799	
Portland Press Limited	£187,870		
Radiological Society of North America		-£739	
Royal College of General Practitioners		-£1,676	
Royal Irish Academy		-£502	
Royal Society		-£85,824	
Royal Society of Chemistry	-£119,728		
S. Karger AG		£899	
SAGE Publications Limited	-£161,993		
Taylor & Francis Group Limited		£429,954	
The Company of Biologists Ltd	-£22,719		
The Geological Society of London		-£22,140	
The Rockefeller University	£105,260		
University of Bristol			-£36,779
Walter de Gruyter GmbH & Co. KG		-£16,732	
Wiley Subscription Services Inc	£1,877,106		
Wolters Kluwer Health (Medical Research) Ltd			£861,973
Grand total	-£388,958 £2,238,603	-£134,227 £2,423,304	-£642,655 £13,217,054

With the exception of ACM, the TAs discussed in this report are based on the 'read and publish' model, which gradually transitions the value of previous subscription expenditure to cover the cost of OA publishing. As VAT in the UK applies to publishing services but not to fees associated with reading digital content, institutions participating in these TAs must be provided with separate 'read' and 'publish' fees so the applicable VAT can be audited. There is currently no sector standard for calculating read and publish fee splits and publishers are guided by their tax advisors.

For the period 31 July 2022 to 14 June 2023 we estimate that institutions paid over £8m in VAT for the TA products of the publishers in this analysis²⁵⁹.

To date, in most cases publish fees have been calculated in advance, providing institutions with certainty about VAT liability during the term of a TA. However, T&F did not take this approach and have calculated VAT at various points during the term of their TA. This lack of cost predictability has been very unpopular with UK institutions and resulted in one high-value previous T&F subscriber not signing up to the TA.

Modelling future TA costs and costs avoided

This section considers whether TAs can be expected to continue to reduce costs, by comparing the modelled cost of TAs with the modelled hypothetical charge of read-only subscriptions plus hypothetical charges for APCs. This approach estimates cost avoidance from TAs while accounting for other routes to immediate OA that institutions would have used in the absence of TAs. Specifically, TA modelled costs are compared to read-only subscriptions plus the hypothetical charge of publishing half of unfunded articles OA through direct payment of APCs (assuming that funded articles were covered by block grants or institutional research grants and that the other half of unfunded articles could have been published as OA without cost through the Green route). Refer to '[appendix 2, methodologies: cost analysis](#)' for more detail on the modelled costs.

Figure 26 shows this approach to calculating cost avoidance broken down, from top to bottom:

1. The modelled hypothetical charge of read-only agreements in 2022 is shown on the top (£110m). With that subscription alone, no articles would have been published OA.
2. Then, the hypothetical charge of publishing unfunded articles as immediate OA has been modelled as a hypothetical charge to the institution. We anticipated that during the relevant time period funded articles would be covered by the UKRI block grant or individual research grants. Based on the unfunded articles published under a TA in 2022 and the list price APC value, it is estimated that the immediate OA publishing of unfunded articles would be an additional £66m in hypothetical charges, for a running total hypothetical charge of £176m.
3. However, unfunded articles published through TAs in 2022 could have been made OA without attracting an APC payment, as some could have been published OA via the Green route. The third (middle) bar shows a reduction in the hypothetical charge to publish, whereby only 50% of unfunded articles are assumed to have been published immediately OA through direct payment of APCs. (The other 50% of funded articles are assumed to have been made OA without cost via the Green route). The 50% cost reduction of £33m leaves the total hypothetical charge in 2022 of a scenario without TAs at £143m.
4. In comparison, the sector expenditure on TAs in 2022 is modelled as £101m (blue bar).
5. Taking this cost of TAs against the hypothetical charges associated with a scenario without TAs leaves an estimated cost avoidance in 2022 of £42m (purple bar).

This calculation of cost avoidance is repeated and extrapolated for the years 2020-24, shown in **figure 27**. As before, **figure 27** compares the modelled cost of TAs with the costs if TAs had not been negotiated and read-only agreements had continued instead, alongside the cost for direct payment of APCs for unfunded articles published immediately OA outside of the Green route. The model in **figure 27** shows that TAs are estimated to have enabled HEIs to avoid costs of £6m in 2020, and that cost avoidance would increase into 2024 up to a modelled £49.1m²⁶⁰.

This assumes that we do not negotiate any new TAs. We would expect new or renewed TAs to increase cost avoidance. Actual savings on contracted spend may be higher than modelled. However, future cost avoidance may be less easy to secure, particularly if future pricing is based on article volume and/or list price APCs (see 'section 1, background to OA in the UK').

Looking at costs avoided by publisher, on average the modelled costs avoided were £2.2m per publisher in 2022, although this varied, as shown in figure 28. Elsevier had the greatest modelled cost avoidance of £22m in 2022, while Karger had the smallest, modelled as -£51,800, or -20% of total spend. Seven publishers were modelled to have negative costs avoided, suggesting that TAs have not been a cheaper route to reading and publishing immediate OA for all publishers.

Figure 26: the modelled costs of TAs compared to the modelled hypothetical charges of read-only subscriptions, including 50% of unfunded APCs (assumed to not be published through the Green route), with the difference shown as modelled costs avoided.

Data source: LSM



Dependence on block grants

Even with estimated cost avoidance of nearly £42m in 2022, TA costs are still substantial. In 2022, for institutions that had subscribed to the TA as well as to the pre-TA subscription agreement, TAs were modelled by Jisc to cost over £100m. These costs come out of institutional budgets, which are under increasing financial pressure²⁶¹.

To aid institutions subscribing to TAs as a way of increasing their OA and compliant routes to publishing, UKRI has allowed its block grants (OABGs) to be used towards the 'publish' element of TAs²⁶². Specifically, UKRI has allowed that "[t]he cost of a TA charged to OABGs must be based on an organisation's UKRI-funded output or previous UKRI spend with that publisher using the publisher's methodology to calculate the 'publish' element of the agreement"²⁶³. This has been useful to ease budgetary pressures and increase the immediate publication of OA articles, but if this source of funding was no longer available to support TA subscription costs, what would the financial impact be to research organisations? Without the ability to use the OABG, TAs

may no longer be affordable and sustainable for research organisations. This is addressed in the following paragraphs²⁶⁴.

Based on UKRI block grant returns in 2022 Jisc estimates that, in 2022, institutions used up to £9.4m of UKRI block grant funding towards the costs of TAs (according to the methodology outlined in '[appendix 2: methodologies, financial dependence on block grants](#)'). This means that, at most, nearly a tenth of modelled costs for TAs in 2022 ([see figure 29](#)) were covered by UKRI block grant funding.

As the 2022 modelled costs for TAs are limited to those institutions that also subscribed to the pre-TA subscription agreement it is possible that the calculated dependence on the UKRI OABG for 9% of TA modelled costs is an over-estimate. However, this model assumes that the UKRI OABG is not used to support all TAs, specifically, where the TA fee is based on subscription spend only, which includes AIP, T&F, Elsevier and Springer Nature. We recognise that some institutions may have used the OABG

Figure 27: the modelled costs of TAs compared to the modelled hypothetical charges of read-only subscriptions plus APCs for 50% of unfunded articles, with the difference shown as modelled costs avoided.

Data source: LSM

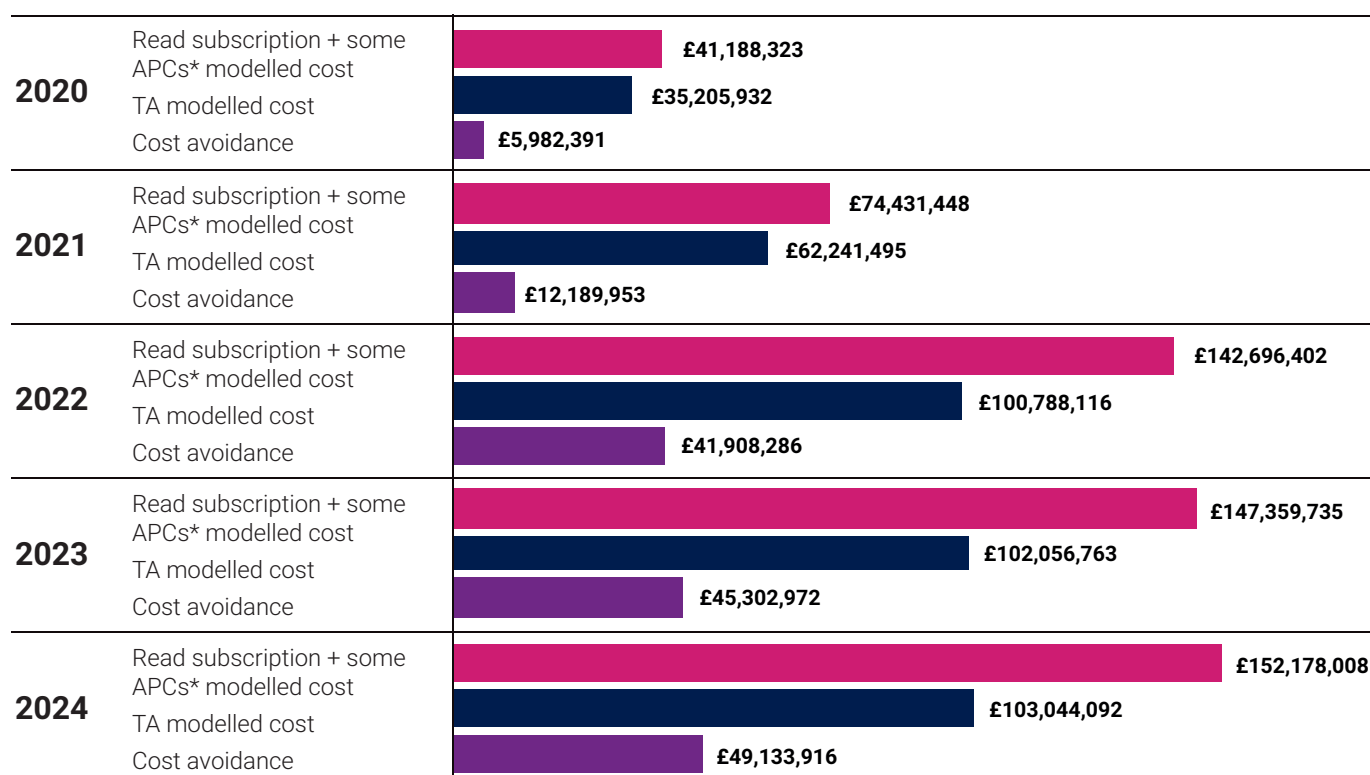


Figure 28: the modelled costs of TAs compared to the modelled costs of read-only subscriptions, including 50% of unfunded APCs (assumed to not be published through the Green route), with the difference shown as modelled cost avoidance, per publisher. Data source: LSM

	Read only modelled cost + some AP	TA modelled cost	Cost avoidance
American Chemical Society	£3,906,729	£3,749,491	£157,238
American Institute of Physics Publishing LLC	£973,430	£696,939	£276,491
American Physiological Society	£302,723	£257,844	£44,879
Association for Computing Machinery, Inc.	£25,018	£26,495	-£1,477
Bentham Science Publishers Ltd. (FZE)	£2,330	£7,276	-£4,946
Bioscientifica Limited	£165,451	£76,099	£89,352
BMJ Publishing Group Limited	£661,702	£844,121	-£182,419
Cambridge University Press (Holdings) Limited	£3,818,549	£2,599,308	£1,219,241
Cold Spring Harbor Laboratory Press	£115,707	£130,918	-£15,211
Elsevier B.V.	£55,184,956	£32,863,256	£22,321,699
European Respiratory Society	£23,325	£27,201	-£3,876
Future Science Limited	£88,853	£61,199	£27,654
Georg Thieme Verlag KG	£67,874	£57,377	£10,497
IOP Publishing Limited	£2,160,469	£1,748,608	£411,861
IWA Publishing Limited	£117,542	£94,185	£23,357
John Benjamins Uitgeverij B.V.	£34,454	£23,835	£10,619
Koninklijke Brill NV	£653,457	£328,674	£324,784
Microbiology Society	£241,356	£179,760	£61,595
National Academy of Sciences of the United States of America	£76,446	£53,663	£22,783
Optical Society of America, Incorporated (The)	£351,625	£159,297	£192,328
Oxford University Press	£6,415,439	£4,860,221	£1,555,219
Portland Press Limited	£279,763	£222,063	£57,700
Radiological Society of North America	£3,653	£2,873	£781
Royal College of General Practitioners	£46,475	£13,998	£32,477
Royal Irish Academy	£30,175	£1,358	£28,817
Royal Society	£459,682	£610,201	-£150,519
Royal Society of Chemistry	£1,738,703	£1,950,008	-£211,304
S. Karger AG	£213,867	£265,702	-£51,835
SAGE Publications Limited	£12,737,461	£9,519,029	£3,218,432
Taylor & Francis Group Limited	£24,204,732	£16,293,144	£7,911,588
The Company of Biologists Ltd	£374,658	£482,951	-£108,293
The Geological Society of London	£156,979	£170,079	-£13,100
The Rockefeller University	£231,394	£199,325	£32,070
University of Bristol	£23,856	£66,145	-£42,288
Walter de Gruyter GmbH & Co. KG	£343,587	£197,264	£146,322
Wiley Subscription Services Inc	£25,106,907	£21,224,400	£3,882,507
Wolters Kluwer Health (Medical Research) Ltd	£1,357,075	£723,812	£633,263
Grand total	£142,696,402	£100,788,119	£41,908,286

Figure 29: estimated (maximum) use of UKRI block grant towards transitional agreement costs in 2022 by publisher.

Data source: UKRI block grant returns 2021-2022 (and 2020-2021); LSM; internal reports on price lists and agreements

Wiley Subscription Services Inc	£3,325,201
Oxford University Press	£1,534,858
Cambridge University Press (Holdings) Limited	£1,036,390
Royal Society of Chemistry	£690,140
American Chemical Society	£610,550
BMJ Publishing Group Limited	£526,668
Royal Society	£265,061
SAGE Publications Limited	£232,607
IOP Publishing Limited	£201,285
The Company of Biologists Ltd	£162,047
Optical Society of America, Incorporated (The)	£152,736
National Academy of Sciences of the United States of America	£101,035
S. Karger AG	£84,386
Portland Press Limited	£74,155
Association for Computing Machinery, Inc.	£44,346
The Rockefeller University	£43,960
Microbiology Society	£41,265
American Physiological Society	£37,049
European Respiratory Society	£27,540
Royal College of General Practitioners	£26,000
University of Bristol	£22,500
The Geological Society of London	£21,777
Cold Spring Harbor Laboratory Press	£21,438
John Benjamins Uitgeverij B.V.	£19,220
Georg Thieme Verlag KG	£16,631
Bioscientifica Limited	£14,775
Future Science Limited	£12,817
Koninklijke Brill NV	£8,253
IWA Publishing Limited	£6,726
Walter de Gruyter GmbH & Co. KG	£6,706
Bentham Science Publishers Ltd. (FZE)	£2,619
Wolters Kluwer Health (Medical Research) Ltd	£40
Springer Nature Customer Service Center GmbH	£0
Radiological Society of North America	£0
Elsevier B.V.	£0
American Institute of Physics Publishing LLC	£0

Grand total: £9,370,781

to support the funding of VAT across all agreements, therefore it is more likely that this calculated proportion of dependence on the UKRI OABG of 9% is an underestimate.

The publisher for which the UKRI block grant was estimated to fund the most was Wiley: over £3.3m (see figure 29).

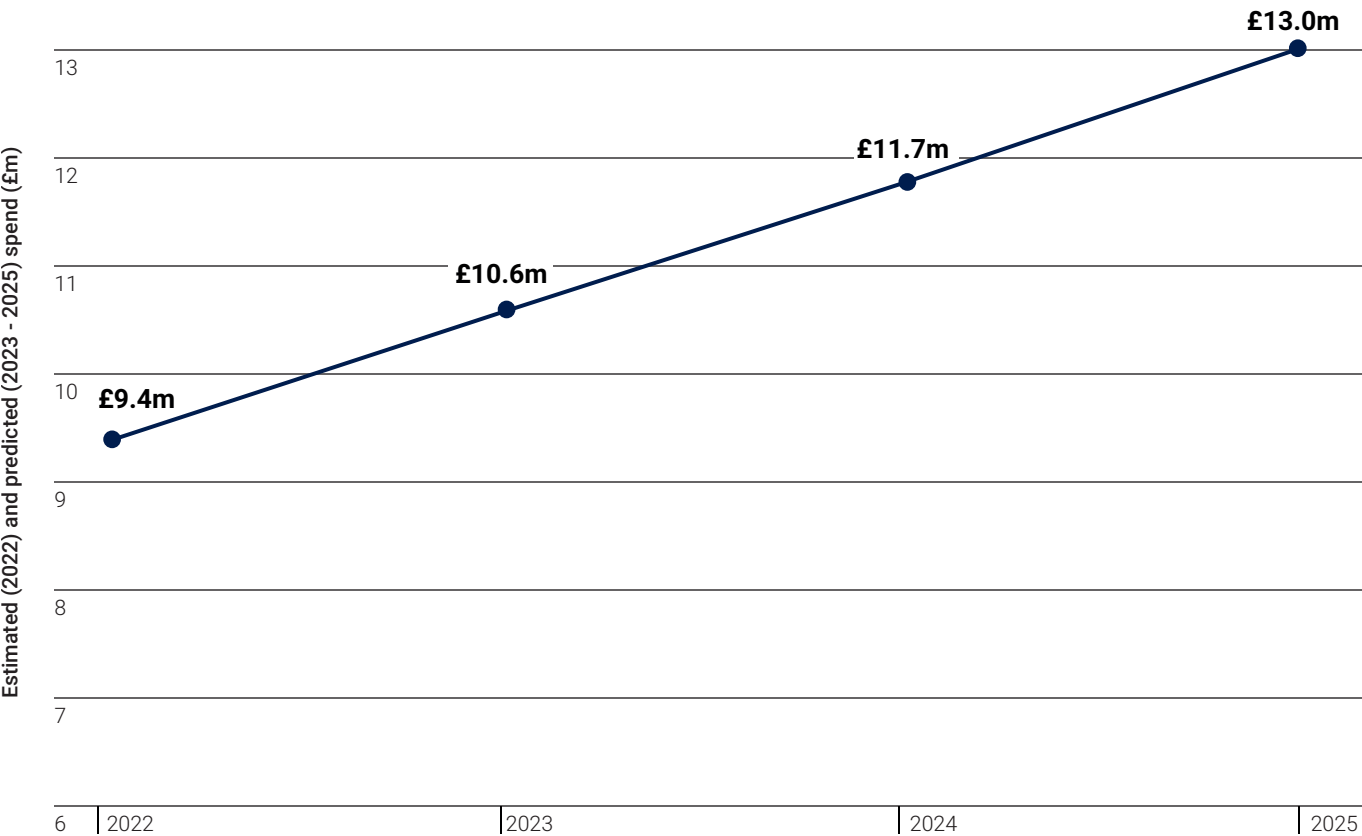
Financial dependence on UKRI block grants for TA costs is expected to increase over time, as the costs of TAs increase, the publish element of TAs increases and the number of UKRI-funded publications is predicted to grow. Based on a forecasted model of the change in UKRI-funded articles published under each publisher’s TA, as well as price increases and adjustments to the publish portion of the TA fee, a model of future use of UKRI block grants for TA costs is presented in figure 30. See ‘appendix 2: methodologies, financial dependence on block grants’ for more detail. Note that this forecast

does not account for any caps on articles published under TAs.

Based on our methodology, dependence on UKRI block grants is expected to increase to £12m by 2024, equivalent to a 25% increase from 2022. The predicted rate of increase of dependence on UKRI block grants is faster than the predicted rate of increase of the modelled costs of TAs (2% between 2022 and 2024, based on figure 27), suggesting that institutions will become increasingly reliant on the UKRI block grant in funding the costs of TAs, both absolutely and proportionally.

Figure 30: estimated and predicted (maximum) use of UKRI block grant towards transitional agreement costs from 2022 to 2025.

Data source: UKRI block grant returns 2021-2022 (and 2020-2021); LSM; internal reports on price lists and agreements



Offsetting and transitioning to a pay to publish model

The third and final way we evaluated the financial benefit of TAs was by considering the extent to which the costs of TAs are offset by the 'value' of articles published²⁶⁵. As more content is made OA over time, the costs of TAs should be paying more for publishing than for reading. If the proportion of costs offset (by the value of articles published) increases over time, then this would suggest that the TAs are being effective in transitioning from a 'read and publish' OA model to a 'pay to publish' OA model (where the reading element is free). Cost offsetting is determined through examination of the number of articles published, evaluation of their overall value, consideration of the APC cost avoidance by the sector and then evaluation of the extent to which the cost of the TA has been offset by the value of the publishing.²⁶⁶

Figure 31 shows that both the modelled costs of TAs and the value of publishing through the TAs has increased over time, as more agreements have been negotiated.

Most importantly, though, the proportion of TAs offset by their publishing value is estimated to have increased over time, with 88% of the total cost of TAs offset in 2022 by the value of articles published.

On average, the cost of TAs was offset 243% per publisher. This was skewed by a few publishers (primarily Royal Irish Academy) with a large estimated offset. The median of the offset across publishers was 95%. Karger had the lowest offset, with 21% of TA costs offset by the value of articles published under the TA (see figure 32).

Seventeen of the agreements published articles with a value above the total cost of the TA in 2022. This tended to be with small and medium publishers, such as OUP (158%), RSC (122%) and CUP (103%), but it also included T&F from the 'big five' (118%). Of the other agreements, eight had offset the total cost of the TA by over 75%.

Figure 31: the modelled costs of TAs compared to the total APC expenditure on articles published through the TAs, with the percent offset calculated as the proportion of APC expenditure over the TA cost.

Data source: LSM and publisher provided APC expenditure

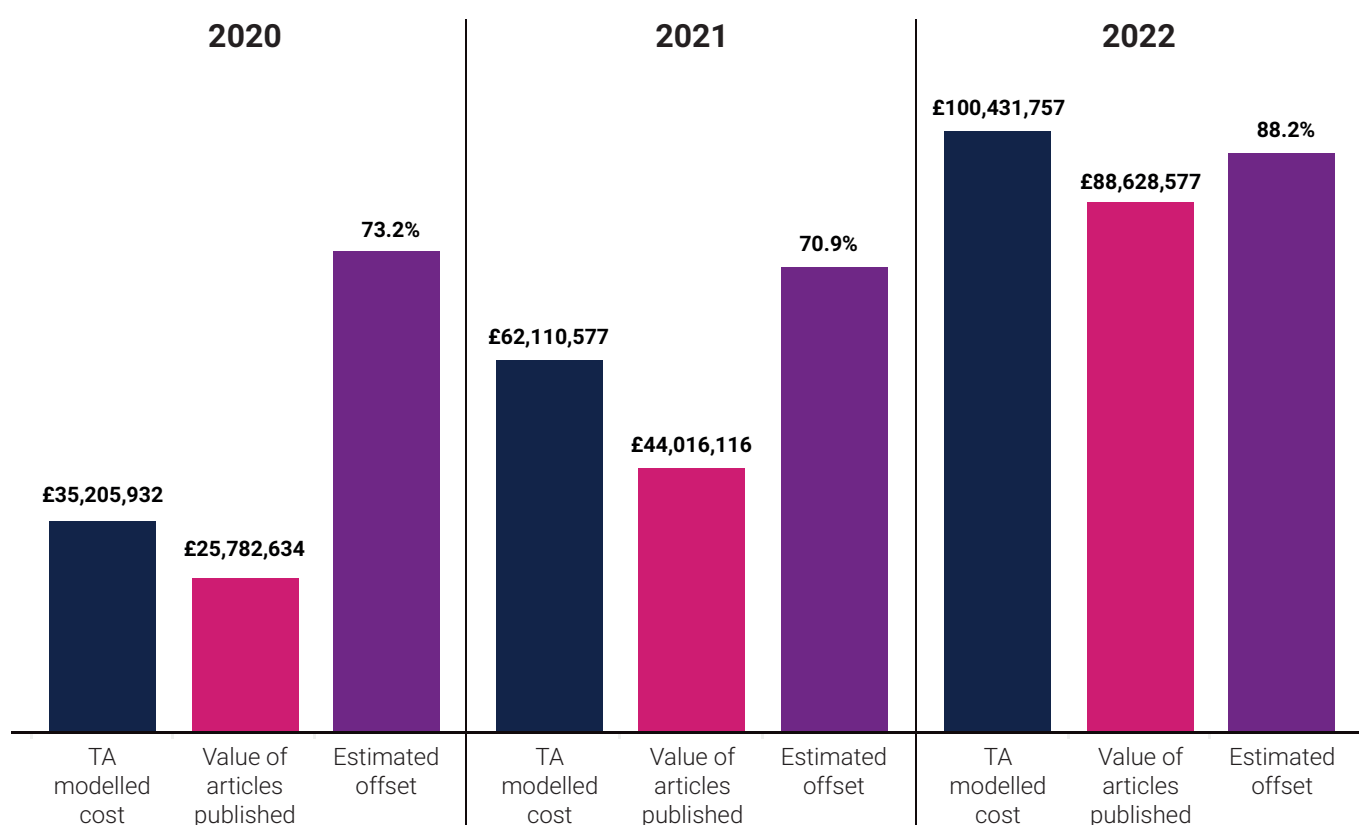


Figure 32: the 2022 modelled cost of TAs compared to the total 2022 APC expenditure on articles published through the TAs, with the percent offset calculated as the proportion of APC expenditure over the TA cost, per publisher.

Data source: LSM and publisher-provided APC expenditure

	TA modelled cost	Value of articles published under the transitional agreement	Estimated offset
American Chemical Society	£3,749,491	£4,592,086	122%
American Institute of Physics Publishing LLC	£696,939	£610,193	88%
American Physiological Society	£257,844	£193,675	75%
Association for Computing Machinery, Inc.	£26,495	£33,265	126%
Bentham Science Publishers Ltd. (FZE)	£7,276	£3,010	41%
Bioscientifica Limited	£76,099	£137,266	180%
BMJ Publishing Group Limited	£844,121	£721,700	86%
Cambridge University Press (Holdings) Limited	£2,599,308	£2,683,462	103%
Elsevier B.V.	£32,863,256	£25,292,106	77%
European Respiratory Society	£27,201	£37,197	137%
Future Science Limited	£61,199	£63,256	103%
Georg Thieme Verlag KG	£57,377	£28,562	50%
IOP Publishing Limited	£1,748,608	£1,384,121	79%
IWA Publishing Limited	£94,185	£52,188	55%
John Benjamins Uitgeverij B.V.	£23,835	£27,886	117%
Koninklijke Brill NV	£328,674	£587,684	179%
Microbiology Society	£179,760	£265,479	148%
National Academy of Sciences of the United States of America	£53,663	£223,687	417%
Oxford University Press	£4,860,221	£7,694,318	158%
Portland Press Limited	£222,063	£201,340	91%
Radiological Society of North America	£2,873	£2,878	100%
Royal College of General Practitioners	£13,998	£88,000	629%
Royal Irish Academy	£1,358	£58,525	4310%
Royal Society	£610,201	£521,200	85%
Royal Society of Chemistry	£1,950,008	£2,378,679	122%
S. Karger AG	£265,702	£55,024	21%
SAGE Publications Limited	£9,519,029	£7,540,162	79%
Taylor & Francis Group Limited	£16,293,144	£19,148,867	118%
The Company of Biologists Ltd	£482,951	£244,928	51%
The Geological Society of London	£170,079	£61,600	36%
The Rockefeller University	£199,325	£52,302	26%
Walter de Gruyter GmbH & Co. KG	£197,264	£318,984	162%
Wiley Subscription Services Inc	£21,224,400	£13,005,644	61%
Wolters Kluwer Health (Medical Research) Ltd	£723,812	£319,303	44%

Summary

Overall, TAs have delivered savings to the sector in three areas:

1. Actual cost savings, when comparing the fee for the TA in their first year with expenditure on the subscription agreement plus expenditure on APCs by the same subscribing institutions in the year immediately prior to the TA
2. Cost avoidance, calculated as the difference between the modelled hypothetical charges of read-only agreements and OA publishing for (50% of) unfunded articles with the modelled cost of the TA
3. Offsetting TA costs with the value of articles published

(Note that this excludes the Springer TA; refer to [appendix 2: 'methodologies, cost analysis'](#)). These three approaches in combination show that TAs have been successful at immediately reducing actual costs and indicate that the agreements have probably facilitated cost avoidance and a transition of costs towards a pay to publish model.

In terms of immediate, actual cost savings, 37 Jisc-negotiated TA publishers delivered a total cost saving of £16.7m to subscribing institutions in the first year of the agreement, compared to the institutions' known expenditure in the year preceding the TA. As for continuing to avoid costs, TAs are modelled to have avoided £42m in costs associated with a scenario without TAs in 2022, up from cost avoidance of £6m in 2020. And finally, in terms of financial transition to a pay to publish model, the proportion of TAs offset by their publishing value is estimated to have increased over time, with 88% of the total cost of TAs offset in 2022.

This is a positive financial picture for TAs as a whole. However, important differences across publishers are masked by summary figures. While 20 of the 37 publishers investigated delivered an actual cost saving in the first year of the agreement, savings varied from as little as £180 to as much as £11.9m per publisher, and 17 did not deliver savings, leading to an increase in spend with the publisher for subscribing institutions, albeit of only £1.1m²⁶⁷. Of these, nine were agreements with smaller publishers. Similarly, Elsevier had the greatest modelled cost avoidance of £22m, while seven publishers were modelled to have negative costs avoided. In terms of

offsetting, 17 of the agreements published articles with a value over and above the total cost of the TA in 2022, but the proportion of costs offset in 2022 varied from as high as 4,310% (Royal Irish Academy) to as low as 21% (Karger). These findings suggest that TAs have not been a cheaper route to reading and publishing OA and/or a faster route to a pay to publish model for all publishers.

Although analysis indicates TAs resulted in actual cost savings and costs avoided, TAs may still not be an affordable solution for education institutions. Findings from the report estimate that institutions used up to £9.4m of UKRI block grant funding towards the costs of TAs in 2022 – nearly a tenth of modelled costs for TAs that year. By 2024, this is predicted to increase by 28% from 2022, faster than the predicted rate of increase of the modelled costs of TAs, meaning institutions stand to become more reliant on the UKRI block grant to fund the costs of TAs.

In addition to the direct financial cost of TAs, there is also the administrative cost of TAs to consider. The extent to which TAs have delivered workflow improvements is explored further in [section 3d](#).

3b. Agreements must permit compliance with funder mandates

The specifications of this requirement are based on the OA policies of UKRI, Wellcome and other funders that were previously part of the COAF and that continue to provide OA funding to institutions centrally. The specifications also align with the OA requirements of REF 2021²⁶⁸ and Plan S²⁶⁹. The requirements have necessarily evolved as new funder policies have been announced.

Eligibility for RPOs to allocate funds from the block grants provided by UKRI and Wellcome is determined by a publisher's willingness to meet this requirement. Therefore, it is in the publisher's interest to fulfil these criteria. By doing so publishers support their authors in navigating though the complex policy landscape by, for example, updating and automating their workflow systems.

Methodology

The evaluation of this requirement is based on TA information from Jisc's LSM and licensing managers (LMs) responsible for the TAs, supplemented by responses to a publisher survey (see [appendix 5](#)). All 38 TA publishers were invited to complete the survey and

21 did so (55% response rate), representing a range of publisher types.

Of the 38 TAs in place in 2022, all apply CC BY licences and therefore the VoR of articles published under the TA can be deposited in repositories specified by funders as a minimum. We monitor article-level compliance with UKRI's OA policy: 93% of UKRI-funded articles complied with the UKRI OA policy in December 2023 and of these, 63% achieved compliance through inclusion in Jisc-negotiated TAs.²⁷⁰

Only 32% (12) of the TA publishers also have a Green OA policy that fulfils the second criterion and funder requirements for some or all journals²⁷¹. Of these the ERS and the RSNA permit this for UKRI-funded authors only ('Green by exception') and Springer Nature only for CAs affiliated with an institution participating in their TA. However, all capped TAs must allow Plan S-compliant Green OA should the article cap be exceeded.

All TA publishers of relevant research (33) deposit eligible articles to PMC and EPMC. Of the 33% (11) depositing only funded articles²⁷², as required by Wellcome and two UKRI research councils²⁷³, six publish predominantly humanities and social sciences content and two (RSC and De Gruyter) stated that they deposit to PMC only if an APC has been paid. The publisher survey invited publishers to explain their approach to PMC deposits. While responses mostly re-stated information sourced from LMs, two publishers (Karger and CoB) stated that they also deposit AAMs for funded authors outside of a TA. Wolters Kluwer also deposit AAMs for funded authors, but this only applies to the US research funder, the National Institute of Health (NIH).

The TAs have, therefore, provided mechanisms for UK CAs to make a version of their article immediately available in a repository under the licence required by their funder or institutional OA policy. However, the emphasis is weighted heavily towards the VoR. Based on discussions with publishers during negotiations and their survey responses it is clear that the majority of publishers with TAs in 2022 are reluctant to offer funder-compliant Green OA as an alternative route to OA in hybrid journals and do not understand why authors would want a choice of routes to OA. While this may be due to misinterpretation of the publisher survey question related to this point²⁷⁴, only six respondents²⁷⁵ stated provision of choice for authors relating to Green OA via the AAM.

"authors can select to opt out of the transitional agreement should they want to choose an alternative compliant route."

BMJ Publishing

"...there hasn't been a request so far for an alternative route. If the institution is part of a transitional agreement with GSL then we could consider this..."

Geological Society of London

"If authors are under a transformative agreement, the preferred route to OA is via this agreement including hybrid and genuine gold OA journals. However, all other routes are supported by IOP Publishing."

IOP Publishing

"We work with authors on a case-by-case basis to achieve their open access needs."

Optica

Thirty-five TAs (92%) include workflows through which CC BY is presented to the CA as the default licence for publishing in some or all hybrid and fully OA journals within the TA (with this criterion applying to 'some titles' for four TAs). T&F have implemented systems that present CC BY as the default licence from January 2024. Although Future Science offered CC BY as the default in their first TA, authors must now request this as part of the submission workflow.

Eligibility for submission to REF 2021 required that articles had been deposited in an institutional or subject repository within a specified time period. Three publishers with TAs in place prior to 2021²⁷⁶ supplied article metadata and full text to Jisc's Publications Router service for automated deposit into institutional repositories during the REF 2021 cycle. As of January 2024, 15 of the TA publishers have joined the service.²⁷⁷ Thirteen of the participating publishers provide articles published as OA in hybrid or fully OA journals included in the TA; of these, Portland Press provides VoRs from hybrid journals only for institutions that participate in the TA. Only two publishers (BMJ and Future Science) also provide AAMs of Closed articles, with only BMJ permitting

deposit with no embargo. OUP joined the service in November 2023 and currently provide content from fully OA journals only. The remaining publisher, Elsevier, provides article metadata feeds but not full text. Six²⁷⁸ TA publishers are currently in discussions with Jisc about joining Publications Router. As technical development may be required to establish the feeds from publisher to Jisc there may be a time lag between TAs being launched and publishers joining Publications Router – eg, Wolters Kluwer, which is currently unable to meet the Router's technical specifications.

3c. Agreements must be transparent

In common with other consortia²⁷⁹, and reinforced in the Berlin16 statement²⁸⁰, Jisc seeks transparency on publisher pricing and OA strategy with TA publishers so that the sector can determine the value derived from the agreements they join. During the term of the TA publishers are contracted to submit publication data to Jisc and TA subscribers and to engage in open discussions with sector representatives. This requirement outlines the process and the long-term goal: fair, transparent, affordable and sustainable pricing for publishing services. In this review we have considered the following questions:

- In which cases have publishers ensured and provided transparency over publishing costs?
- To what extent have publishers provided clear roadmaps for their route to OA?
- Are publishers globally and systematically offsetting subscription/read revenue against OA revenues?

The TAOG²⁸¹, one of Jisc's strategic sector groups, was established in 2021. It is co-chaired by two library directors and is made up of senior library leaders and OA practitioners with significant experience of collections and/or OA. The membership represents UK institutions of different sizes, research intensity and geographical spread. Between March 2021 and July 2023 the group met with four²⁸² TA publishers and one fully OA publisher and it has reflected on the optimum data requirements to monitor transparency in TAs and the transition to OA. During this period cOAlition S announced its price and service transparency frameworks, which evolved into the Journal Comparison Service (JCS)²⁸³, and Jisc and the TAOG encouraged participation by the TA publishers. Of the publishers that have met with the TAOG, only Wiley and PLOS have so far submitted data to the JCS. Jisc has met with several other TA publishers who requested

to discuss their OA strategy on behalf of the TAOG, including ACM, BMJ, CUP, Microbiology Society and Portland Press. We have also worked in partnership with sector bodies, including ALPSP, the Society Publishers' Coalition and OA2020 to provide guidance and resources for publishers.

Methodology

As TAOG meetings with publishers are confidential the evaluation of this requirement is based on responses to the publisher survey (see [appendix 6](#)), supplemented by information in LSM and LM intelligence, and case studies completed with two publishers and three institutions. Thirty-eight TA publishers were invited to complete the publisher survey and 21 responses were received (55% response rate), representing a range of publisher types. Publisher case studies included a semi-structured interview and website analysis. Institutional case studies based on a questionnaire and a follow-up interview were completed with library representatives from Edge Hill University, The University of Lancaster and University College London (UCL) (see [appendix 8](#)).

Cost transparency

The price transparency frameworks approved by cOAlition S and which evolved into the JCS became the standard for price data during the period covered by the review. The JCS is therefore a valuable source to monitor publisher transparency relating to publishing costs²⁸⁴. As of July 2023, only nine²⁸⁵ of the 38 TA publishers had submitted data to the JCS.

The JCS aims to help institutions "better understand if the fees they pay are commensurate with the publication services delivered"²⁸⁶. The review has assessed the extent to which institutions are making use of price transparency in their evaluation of OA agreements. The institutional case study participants were asked how useful libraries had found (or would find) pricing data from the JCS, from slides presented to UK subscribers by ACM about the new ACM Open model²⁸⁷ and from a blog post by PLOS on price transparency²⁸⁸.

None of the case study institutions had registered with the JCS. UCL and the University of Lancaster said they rely on Jisc assessments of costings and publisher business models. UCL commented that they found the slide deck and blog post formats more accessible and useful:

“It is difficult for us to assess the information provided even by publishers like PLOS and ACM, because we are not accountants or experts on publishing business models./.../ PLOS’s blog post and ACM’s slides give us some confidence that their models have been properly costed, that these publishers are serious (in the case of ACM) about transitioning to a gold open access model and that their objective is not to make an unreasonable profit at the expense of authors and institutions. PLOS’s transparency about its Community Action model enabled us to participate in this agreement despite its relatively high investment per article.”

Catherine Sharp, head of OA services, UCL

Edge Hill University highlighted their concern at the lack of progress towards cost transparency during the period covered by the review:

“Not providing, or obscuring, cost transparency information, /.../ enables publishers to act in ways that primarily serve their commercial interests which is at odds with the sector’s long-term goal to move to an open research landscape that is fairer and more equitable.”

Anna França, head of collections and archives, Edge Hill University

Both Edge Hill and Lancaster commented that cost transparency is “crucial” and likely to increase in importance as a determinant in their decision making in the post-TA landscape.

Case study institutions were also asked what else would give them confidence that publishers aren’t double-charging for the same services. Lancaster wanted publishers to provide:

“A breakdown of the cost in full detail and /.../ full data behind accessing content and publication history, and costs apportioned to each.”

Similarly, Edge Hill said:

“Publishers committing to providing data on individual journal titles that show how their revenue is calculated and demonstrate a reduction in subscription costs as publishing increases. Data that shows how revenue is reinvested into open access publishing and services.”

While UCL require:

“Evidence that the publisher is flipping hybrid journals to fully OA, as opposed to launching new fully OA and/or hybrid journals. Some publishers have launched large numbers of new titles in recent years. We presume that funds from the APCs that institutions have paid on top of subscription fees have contributed to the costs of these launches.”

Although the review has assessed publisher websites to gauge the extent to which publishers are globally and systematically offsetting subscription/TA ‘read’ revenue against OA revenue it has not determined clear examples for all the TA publishers. However, there are pockets of good practice, and to highlight these we completed two case studies and one close analysis. Other examples not included in the review are the Royal Society²⁸⁹, the GSL²⁹⁰ and CSHLP²⁹¹. It is notable that all examples of transparency are from not-for-profit publishers and societies:

Publisher case study 1: The Company of Biologists (CoB)

CoB's transparent pricing/'double-dipping' policy²⁹² outlines how the publisher offsets OA revenue against subscription income, thereby avoiding double-dipping. The resulting price changes are applied for all markets globally, with no exceptions:

1. Agree an annual price increase, taking into account the prevailing rate of inflation
2. Apply a reduction to the price increase according to the percentage change in the number of OA articles published in each journal over the previous three years, using a rolling average to smooth out annual variations

NB CoB may reduce the subscription price based on revenue rather than content where the proportion of OA revenue is lower than the proportion of OA content.

For example, for 2023, CoB's board of directors approved an annual price increase of 4.9%. The percentage change in the number of OA articles was deducted from the price increase of 4.9% to give the net decrease/increase in price, shown in [figure 33](#).

Figure 33: example of CoB's transparent pricing policy for 2023.

Data source: publisher website²⁹³

Journal	Number of OA articles 2018-2020	Number of OA articles 2019-2021	Change in OA as % of total articles	2023 price adjustment
Development	255	290	3.82%	4.9% - 3.82% = +1.08%
Journal of Cell Science	191	233	3.32%	4.9% - 3.32% = +1.58%
Journal of Experimental Biology	44	122	5.55%	4.9% - 5.55% = -0.65%

Publisher case study 2: Cambridge University Press (CUP)

CUP developed a double-dipping policy in 2018 as part of a commitment to fair and transparent pricing. This was intended to ensure that subscribers would not be charged for access to content made OA via payment of an APC – “where non-open access content in a journal has been reduced over a four-year rolling window as a result of the publication of open access articles, the open access portion of the journal’s content is acknowledged through a reduction in subscription prices over the following three years”²⁹⁴. This was revised in 2022 to form CUP’s transparent pricing policy, which includes up to three elements:

- An inflationary increase that is applied to all journals (different increases may be applied to print and online formats)
- An occasionally applied further price increase or decrease to an individual journal for exceptional reasons – eg, a dramatic change in the type of content that a journal publishes
- For online-only subscriptions, a price correction to prevent double-dipping and to reflect changes in the subscription (non-OA) content in the journal. Starting with 2022 prices, CUP adjusts prices so that a change in the amount of subscription content of up to 15% per year is fully reflected in journal prices over a period of three years. The price change is limited to $\pm 5\%$ per year

The following examples (figures 34 and 35) show how this policy was applied for 2023 pricing for two CUP journals. The inflationary increase applied in 2023 was 3%.

Figure 34: example of offsetting transparency.

Data source: publisher case study interviews

Journal of Plasma Physics	2018-2020 volumes	2019-2021 volumes	2023 volume
Mean number of articles per year supported by subscriptions*	114.3	106.7	
Fractional change in articles/year*		-6.6%	
Capped price change due to subscription content change* (capped to +/- 5%) for 2023			-5%
Inflationary price rise for 2023			3%
Overall price change for 2023			97.9%
Online-only price 2022 volume			£1,782
Online-only price 2023 volume			£1,744
Cumulative price change in effect due to all double-dipping policies applied in all previous years (excluding inflation)			6.04%

* Please note that by ‘articles supported by subscriptions’, CUP means both non-OA articles and OA articles that received no OA funding (through APCs or TAs)

Figure 35: Example of offsetting transparency.

Source: publisher case study interview

Tempo	2018-2020 volumes	2019-2021 volumes	2023 volume
Mean number of articles per year supported by subscriptions*	106.0	100.7	
Fractional change in articles/year*		-5.0%	
Capped price change due to subscription content change* (capped to +/- 5%) for 2023			-5%
Inflationary price rise for 2023			3%
Overall price change for 2023			97.9%
Online-only price 2022 volume			£144
Online-only price 2023 volume			£141
Cumulative price change in effect due to all double-dipping policies applied in all previous years (excluding inflation)			5.00%

* Please note that by 'articles supported by subscriptions', CUP means both non-OA articles and OA articles that received no OA funding (through APCs or TAs)

Publisher case study 3: Association of Computing Machinery (ACM)

This case study is a close analysis of ACM Open²⁹⁵. This new model is designed to transition ACM's publishing portfolio to OA over a five-year period. The new transparent pricing structure rebalances pricing so that it is more closely aligned with ACM's expenses. It is based on a ten-tier system, with the average number of CA research articles published over the past three years determining which tier the institution is placed in. While the model is intended to provide budget predictability for all stakeholders, with tiered pricing fixed for the term of the agreement, under the UK 2023-2025 agreement fees ramp up each year for tiers one to nine (tier ten institutions have low publishing output and the tier's set fee will decrease as OA content increases). This approach has been taken in recognition of the cost reallocation and significant price increase for one-third of UK subscribers (high research output institutions assigned to tiers one to nine) under the new model.

A notable factor in the communication about ACM Open is the publisher's transparency on the financial information underpinning the new model²⁹⁶ (income, expenses and detailed revenue breakdown for 2021) and the structure of the new pricing approach (see figure 36).

Figure 36: ACM publications' financial information for 2021.

Source: ACM Publications Finances²⁹⁷ (reproduced with the publisher's permission)

2021 vs. 2020, 2019 High-Level ACM Publications Financials			
Income	2021	2020	2019
Subscriptions & Advertising	23,646,899	23,569,075	23,992,725
Digital Library: Open Access Licenses	1,287,471	516,000	N/A
Total Income	24,934,370	24,085,075	23,992,725
Expenses			
Journals	4,402,061	3,896,143	4,091,846
Magazines	5,444,898	5,313,187	5,519,977
Proceedings	5,820,381	5,468,671	5,631,759
Digital Library	5,764,836	5,888,960	5,098,667
Agents/Sales	2,907,170	2,848,053	2,747,357
Publications Board	11,079	60,025	211,615
Total Expense	24,350,425	23,475,039	23,301,221
Publishing Program, net	583,945	610,036	691,505

2021 Revenue Breakdown	
Income	
Digital Library: Consortia, Corporates, & Govt Licenses	19,816,140
Digital Library: ACM Open Licenses	1,287,471
Digital Library: Articles Pay Per View	80,020
Institutional Membership Dues	367,366
Subscription Revenue (including SIGS); a la Carte Subscriptions	808,008
SIG Hardcopy Magazine Subscriptions (<i>Interactions/Inroads</i>)	130,770
Digital SIG Master Package	155,312
Advertising, including SIGS	1,076,250
ICPS Proceedings: Non-ACM Conference Publication Fees	464,864
Open Access Revenue (APCs)	347,200
All Other Publications Revenue: ACM Books, etc.	400,969
Total Income	24,934,370

Two case study institutions provided positive feedback on ACM's cost transparency. As noted previously, it gave UCL confidence in the pricing of the new model, although signing up was still "quite a difficult decision given the level of additional cost". Edge Hill commented:

"...the transparency of the approach and ACM's willingness to share their plan is commendable."

**Anna França, head of collections and archives,
Edge Hill University**

Global equity in publishing has become increasingly important to the sector during the period covered by the review. As well as understanding the extent to which TA fees are offsetting global pricing, the sector is keen to know what steps TA publishers are taking to ensure that TAs do not exclude regions on economic grounds. The publisher survey asked if publishers use differential pricing for OA, eg, based on purchasing power parity (PPP)²⁹⁸, and what provision they make for those who cannot afford to pay anything.

Only one publisher (ERS) specifically mentioned using PPP but several publishers²⁹⁹ stated that regional differences influenced pricing. Only one survey respondent (John Benjamins) does not currently apply differential pricing or make provision for those who cannot afford to pay. All other publishers that completed the survey provide fee waivers (or are planning to) for authors on the basis of ability to pay, with 62% (13)³⁰⁰ participating in the Research4Life and Hinari Access to Research for Health programmes. Two publishers stated that work is ongoing in this area: Wiley is "exploring additional solutions to reduce barriers to publication for authors from LMICs" and ACM is "developing an additional waiver system to provide deep discounts to countries listed as low income and lower middle income countries using World Bank data".

OA strategy

Survey responses highlight the lack of transparency on publisher OA strategies across the TA publishers (see [appendix 6](#)). While IWAP completed the transition to OA in 2021 with the adoption of the S2O model³⁰¹, only 57% (12) of other survey respondents confirmed that they have a roadmap with a clear plan to an OA transition³⁰². Of these, five publishers provided links to information in the public domain³⁰³ and seven were able to provide a target date for their transition to OA³⁰⁴ – the majority of these are society publishers.

Five publishers³⁰⁵ cited limited interest in OA and TAs at a global level as a key factor in the lack of a clear roadmap for their transition, with T&F noting that only 9% of their global output was covered by TAs in 2022. Wiley commented that "not all regions or subject areas are fully ready for the transition to OA" and highlighted the complexity of "the global OA policy landscape". Optica stated that they do not currently plan to transition their portfolio:

"Because our mission as a global scientific society is to serve our entire community, we want to make sure everyone has the opportunity to publish, whether they can afford to pay for it or not. As a result, we do not currently plan to transition our program to full open access, rather we plan to continue offering a mix of both subscription and open access options."

Several publishers that were without a clear roadmap (or were unable to disclose one) were keen to stress that this does not reflect a lack of commitment to OA. John Benjamins alluded to the subject discipline they serve as a key factor – "given the field we focus on, the field of linguistics, we envision a transition to take quite some years". Karger described "a task force focused on driving forward OA and open science sustainably" and pilots for transformative journals and the S2O model in 2023 as well as Diamond OA partner publications. Portland Press noted that although plans for a non-APC Gold OA future may rely on current TA language "the continuance of TA vocabulary should not be mistaken for holding fast to what should be a temporary status".

RCGP said that they do not have a roadmap for an OA transition. However, in 2021 the college adopted an OA policy for the research content in its flagship journal, *British Journal of General Practice*³⁰⁶. This approach, also adopted by BMJ Publishing for *The BMJ*, is considered a valid approach to transitioning titles to OA by several research funders, including Wellcome, UKRI and The Bill & Melinda Gates Foundation³⁰⁷.

Although the survey stressed that respondents should not divulge information that would risk breaching commercial confidentiality the results clearly indicate that TAs have not achieved the required level of transparency in regard to publisher OA strategies. Consequently, they do not provide reassurance to subscribing institutions of an end point, reinforcing concerns about TAs as the 'new big deal' or becoming the status quo.

3d. Open access content must be discoverable, and agreements must support improvements in service and workflow for authors and administrators

Since the introduction of TAs in the UK Jisc has worked to address the indirect costs associated with administrative processes. Simplifying and streamlining OA processes was intended to ensure that scaling up OA was not unduly burdensome for authors and OA administrators. Examples include addition of an 'at a glance' summary of TA requirement criteria to the offer document, provision of guidance on TA evaluation and sharing good practice examples from Jisc members on budget management and evaluation workflows in webinars and online³⁰⁸.

This requirement specifies publishing standards and processes that can deliver efficiencies, eg, adoption of author, institution and funding identifiers. During negotiations this requirement's criteria are supplemented by a checklist and guidance for TA publishers developed by Jisc and the sector³⁰⁹, through the RLUK OA publisher processes group (OAPP)³¹⁰. The OAPP has met with five TA publishers during the period covered by the review to provide feedback on OA dashboards in development and communication templates for authors.

Methodology

The evaluation of this requirement is based on information from LMs (see [appendix 7](#)) and from three institutions (see [appendix 8](#)). Institutional case studies are based on a questionnaire and a follow-up interview completed with library representatives from Edge Hill University, The University of Lancaster and UCL.

Of the 38 TAs, 34% (13)³¹¹ use Copyright Clearance Center's well-established RightsLink dashboard, 24% (nine)³¹² use dashboards developed by the publisher and one (Karger) uses ChronosHub. The remaining 16 TAs do not use dashboards for OA administrators, most likely due to their size, but for these publishers there is no intervention required by administrators to approve OA. In most cases authors are identified via their institutional email in the submission system, although for the University of Bristol Press (BUP) authors are required to request OA by email after acceptance. As of January 2024, six publishers³¹³ that do not use dashboards to manage TAs are participating in the OA Switchboard Initiative³¹⁴.

In their responses to the publisher survey both T&F and the Royal Society commented on the investment in systems and processes that publishers make to support

TAs, with this representing increased costs for the Royal Society. T&F stated that they are exploring 'auto-approval' functionality to increase efficiencies for OA administrators and noted the additional benefits resulting from investment in OA workflows:

"In particular they have propelled the development of persistent identifiers for authors, institutions and funders, which in turn has helped all stakeholders to understand more clearly the impact of a given piece of research. These same identifiers also play a critical role in helping to navigate the increasing research integrity issues that publishers are mitigating."

By removing the need for individual APC transactions and invoice payments, TAs have the potential to increase efficiencies for institutions and for publishers. To assess the impact of TA dashboards in practice, case study institutions were asked to what extent TAs have delivered efficiencies when compared to managing OA payments outside a TA.

For Edge Hill, the smallest of the case study institutions, TAs have removed a step in their workflow:

"Our research office administers payments for APCs on a case-by-case basis. The process is for the researcher to supply an application form with the key information/.../. Since the advent of TAs, applications will first go to the head of research support services in the library, to ensure the researcher is aware of the options presented through our TAs. TAs have delivered efficiencies quite simply by reducing the number of cases we receive. This is less admin for us, and for the researchers too, who need not make a request in many cases."

Anna França, head of collections and archives, Edge Hill University

Lancaster commented that efficiencies are variable:

"[TAs] offer simple approval processes for library staff in the OA team/.../[but] it does depend on the criteria and each publisher's workflow and dashboards as to the savings in administration."

**Louise Zambianchi, open access manager,
University of Lancaster**

UCL, the most research intensive of the case study institutions, provided data on the impact of TAs on OA payment methods (figure 37) and stated that the number of papers made OA via TAs could not be achieved without such a centrally managed mechanism.

However, UCL also noted:

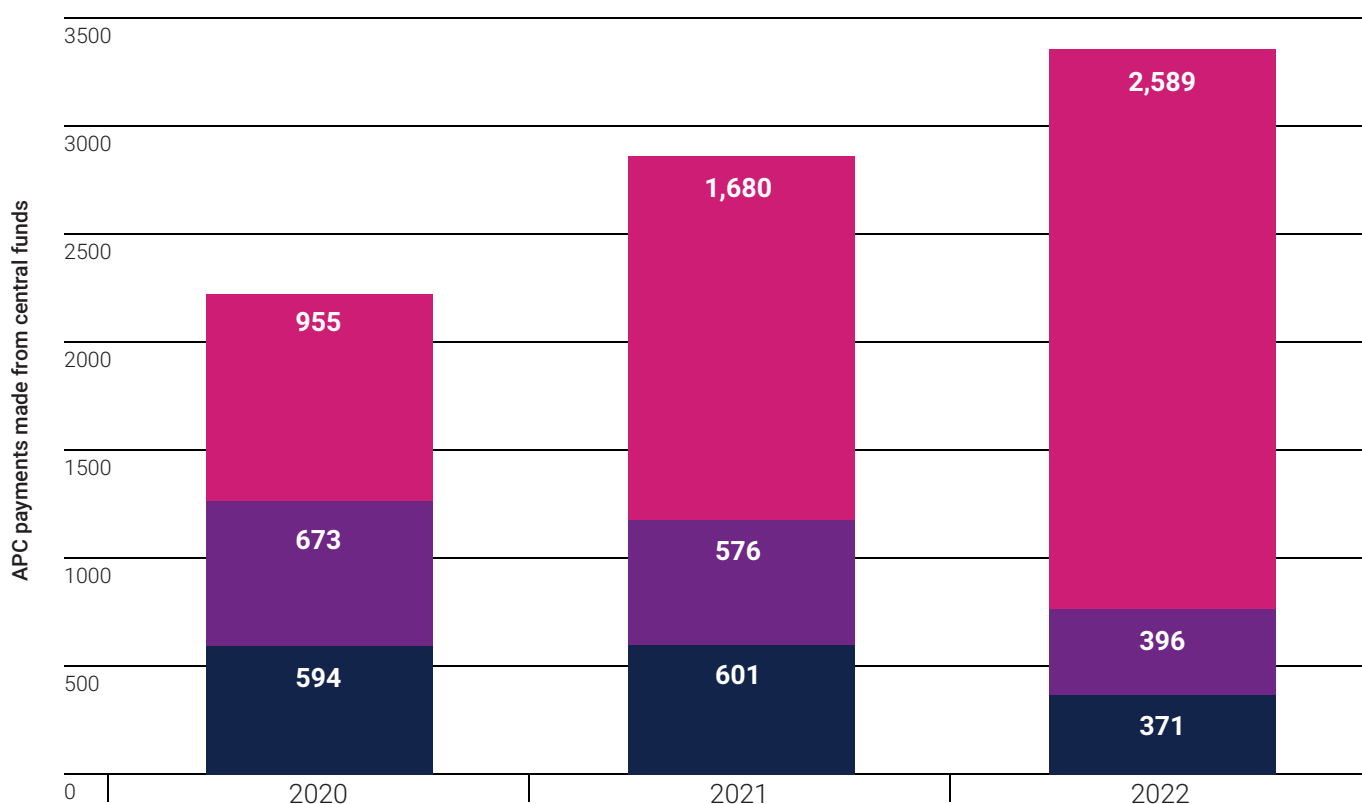
"Workflows for transformative agreements are not without problems and administrative burdens. Carrying out approvals and/or liaising with publishers for UCL's 39 agreements (in 2023) is a relatively quick process, but requires a more advanced skillset than previous APC payment workflows./.../ The multiplicity of article types, publisher dashboards, funder policies and author statuses means that staff need to be adept at making judgements, and that it is difficult to achieve consistency even within a single institution."

Catherine Sharp, head of OA services, UCL

Figure 37: UCL central APC payments by method of payment, 2020-22.

Data source: institutional case study

■ Invoice ■ Pre-pay ■ TA



To manage TAs UCL has changed the OA team staffing structure. Higher grade staff are working on OA approvals than pre-TAs and a new manager is responsible for implementing new workflows and troubleshooting. The team also maintains a large number of templates for advising authors about their eligibility for TAs and workflows for using them.

The experiences of institutions indicate that, due to the variety of dashboards and workflows, there are complexities to managing TAs. Edge Hill noted a specific issue with the T&F workflow where “an author had to provide an APC quote amount and quote number for the article, even though no APC was to be paid”, and UCL highlighted several areas where further improvements and standardisation would increase efficiencies:

“Some publishers’ dashboards provide insufficient metadata, requiring us to liaise with authors to obtain accepted manuscripts or ask further questions before we can approve a paper. Some publishers’ rejection reasons are misleading for authors, since they do not fit into the categories we use. Article types can be confusing; this, again, may necessitate our liaising directly with the corresponding author. Different publisher approaches to co-corresponding authorship and dual affiliations can make it difficult for us to advise authors.”

Catherine Sharp, head of OA services, UCL

While all institutions favoured frictionless workflows for authors they recognised potential disadvantages and unintended consequences. Specific concerns were that:

- The emphasis on sophisticated automated workflows should not exclude smaller publishers from TAs
- TAs should not hide the cost of OA publishing from authors
- TAs can perpetuate existing models of publishing and may drive submissions to large commercial publishers

Summary

Our finding is that TAs have only partially met requirements two to five, with variation between publishers.

The majority of publishers support UK funder policies by depositing articles to PMC and EPMC but the review has highlighted differences in approaches. For example, two publishers (RSC and De Gruyter) only deposit to funder-mandated repositories if an APC has been paid, whereas two other publishers (CoB and Karger) will deposit AAMs outside of a TA. Wolters Kluwer also deposit AAMs for funded authors, but this only applies to the US research funder, the National Institute of Health (NIH).

More than half of the TA publishers support only one route to funder compliance. Although UK funder requirements were tightened up in response to Plan S only 12 (32%) of the TA publishers currently have a clearly stated Green OA policy that fulfils Plan S requirements, and for three of these there are eligibility restrictions, ie, UKRI-funded authors only for the ERS and the RSNA, and CAs affiliated with an institution participating in their TA only for Springer Nature.

Almost all TA publishers (35 or 92%) present CC BY to authors as the default licence, with one publisher (T&F) implementing systems to permit this from January 2024. Fewer TA publishers (13 or 34%) currently support auto-deposit of TA articles to institutional repositories, and one publisher – Elsevier – only deposits article metadata.

Our review has highlighted low levels of transparency in the majority of TAs relating to costs and OA transition strategies. Where examples of transparency have been identified this relates to non-profit and society publishers. Although all institutional case studies indicated the importance of transparency in future OA agreements, they would prefer simpler presentation of cost breakdowns than the JCS affords.

While institutions acknowledge that TAs have been critical to scaling up OA rapidly and the value of TA workflow improvements to date it is clear that, because of variations in processes and systems between TAs, TA management continues to be resource-intensive for institutions.

Section 4: conclusions

The UK has played a principal role in initiating an OA transition, driven by funder policy and institutional demand for a publishing ecosystem that is affordable, fair and transparent. TAs emerged as a mechanism to refocus subscription spend to cover both read access and OA publishing. Although TAs in their current form have not proved to be the catalyst for a full global transition from the paywalled system to OA, the fact that Jisc and other consortia were able to negotiate them at all, and for the cost of subscription spend alone in the case of three of the highest value journal agreements, is a significant achievement against a backdrop of lengthened embargoes and escalating costs³¹⁵ (on top of increased administration³¹⁶).

The TAs examined in this review were the result of concerted action between institutions, funders, global consortia and (often) researchers. They delivered expanded access to subscription content, immediate OA publishing across a publisher's full portfolio of titles and adoption of technical standards. They also eased friction in achieving OA compliance for authors and reduced the number of transactional OA payments for institutions. In all these ways they represented an improvement on the Big Deal journal subscription model.

Through this review we have found that TAs delivered significant growth in the volume of UK research made immediately OA on publication and achieved high levels of compliance with funder OA policies. They have also provided cost savings at the sector level.

However, the sector's requirements for TAs have only been partially met and the paywalled model persists. The data provides a strong indication that TAs in their current form are not the optimal mechanism to bring about a global transition from paywalls to OA within a time period acceptable to the sector, and that TAs with commercial publishers will not result in the transparency on costs and OA strategies the sector wants. As TAs focused on institutional output rather than UK research in its entirety, an unintended consequence appears to be that TAs were subscribed to and used by institutions who would have made the manuscript OA via the Green route – as a result TAs appear to be converting articles that would have been published Green OA to Gold.

Increase in immediate OA to UK research

Between 2018 and 2022 the number of articles published immediately OA via UK TAs increased by over 900%, with 87.2k articles published during this time. In the same period only 32% of publishers (12) provided a Plan S-compliant Green OA option and TAs enabled the UK to achieve an exceptionally high level of compliance with funder OA policies – 93% of UKRI-funded articles are compliant³¹⁷ and of these, 63% achieved compliance through inclusion in Jisc-negotiated TAs. Additionally, 92% of TAs (35) include workflows through which CC BY is presented to the CA as the default licence for some or all TA titles.

TAs have increased immediate OA options for unfunded disciplines. There has been considerable growth in OA uptake in hybrid journals within AHSS between 2017 and 2022, as measured by the five-year CAGR.³¹⁸ They have also facilitated immediate OA publishing for low-publishing HEIs: as a result of the Wiley TA six Jisc bands (5b-10)³¹⁹ saw institutions publish OA under the agreement that had not previously published with Wiley.³²⁰

TAs have constrained costs

TAs constrained costs at a sector level, provided affordable routes to publication for low-output institutions and buffered high-output institutions from high-publication fees.

The 2022 Jisc TAs (excluding Springer Nature) have delivered actual cost savings of at least £16.7m for HEIs, when comparing expenditure on the TA in the first year against subscription expenditure plus expenditure on APCs in the year immediately prior to the TA by subscribing

The TAs examined in this review were the result of concerted action between institutions, funders, global consortia and (often) researchers. They delivered expanded access to subscription content, immediate OA publishing across a publisher's full portfolio of titles and adoption of technical standards. They also eased friction in achieving OA compliance for authors and reduced the number of transactional OA payments for institutions. In all these ways they represented an improvement on the Big Deal journal subscription model.

institutions. Modelling of TA costs and hypothetical charges for the continuation of read agreements and the payment of APCs³²¹ also suggests that TAs enabled the sector to 'avoid' costs of £42m³²², which represents a 600% increase on the estimated cost avoidance in 2020 (£6m).

Despite savings and some workflow efficiencies, TAs have incurred additional costs for some institutions due to the reported need for higher grade staff to administer OA approvals, implement different TA workflows, support authors in understanding their eligibility and in navigating OA options and workflows for different agreements.

Furthermore, the sector's reliance on funder contributions towards TA charges is significant. In 2022 UK institutions used an estimated £9.4m in UKRI OABG funding towards TA participation costs. Concerns about the affordability and sustainability of TAs for institutions are compounded by VAT issues and an ongoing acceleration of research output.

Paywalled content has stayed steady

Despite the ambitions of HEIs and funders to transition UK research to OA, this study has demonstrated that TAs have not significantly moved the dial of the proportion of OA over the past two years, at both the global and UK level (see [figure 14](#)). In the UK, levels of OA have held steady – approximately 40% of UK CA output in TA titles has remained behind a paywall for the last five years (refer back to [figure 18](#)). However, in 2021 and 2022, after four years of decline, Closed-only UK articles grew by 4.5%. This growth needs to be monitored.

For many of the TA publishers examined, including those that have seen a decrease in closed content, few journals have transitioned, or flipped, to fully OA. This low rate of flipping hybrid journals among all TA publishers, alongside the lack of transparency and clarity on publisher OA strategies (only 12 publishers confirmed having an OA roadmap and only seven had a defined end date), suggests that the transition to a completely OA environment is still a long way off.

However, it is important to note that for some publishers, particularly smaller and society publishers, TAs appear to be driving down the level of paywalled content and transitioning their portfolios to OA. Specifically, 18 publishers (47%) decreased the proportion of global Closed articles in their TA titles in the year preceding their TA and 2022; by 2022, 11 publishers had less than 50%

of their global articles Closed in their TA titles. Despite this, only two of the 11 publishers had flipped any of their TA titles and only four out of 11 confirmed a transition end date. On average, across 38 TA publishers the reduction in the proportion of Closed of their global articles in TA titles was only -2.2% between 2018 and 2022.

TAs and Green OA

The UK's proportion of articles available openly as Green is notably higher than it is globally (15% in the UK compared to 4% globally, of Green-only articles in 2022, and 34% and 18% for all Green articles respectively). This is probably due to the efforts of funders and institutions, including the equal emphasis given to the Green route to OA in the UKRI OA policy. However, Green-only UK articles have steadily declined in proportion over the last four years (average: -3.9%). We believe this is partly due to the increase in OA achieved via TAs which, at least for many of the larger commercial publishers, appears to be at the expense of Green articles, ie, TAs are publishing articles as Gold or Hybrid that prior to the TA would have been Green OA and/or reducing the number of Green articles. Therefore, rather than reducing the proportion of Closed articles, TAs appear to have instead converted Green to immediate Gold/Hybrid OA.

Transitioning to where?

Despite TAs being in place in the UK since 2016, 33 of 38 TA publishers examined in this study have not achieved the sector goal of moving away from pricing based on historical subscription spend. This requirement has not been met due to serious concerns within the sector about the cost of article-based models for OA agreements and the lack of alternatives to APC-based models.

The APC persists as commercial publishers' preferred OA business model. The use of APCs in combination with subscriptions has long been a source of contention, even beyond accusations of double-dipping (see [section 1b: the path to Open Access](#)), as it is unclear how the list price of APCs relates to the actual cost of providing publishing services; 29 TA publishers have not submitted price transparency data to the JCS. Although APCs are often used to calculate the cost of TAs, even if not evident in the contract, a move from TAs to pricing based on APCs alone is not desirable due to the lack of price justification and exposure to runaway costs (see [appendix 1](#) for the annual average increase in fully OA and hybrid APCs) as the number of global research articles continues to grow exponentially.

Not only has there been a lack of significant movement towards full OA in output and business models by most commercial publishers, but the availability of TAs across a broader range of publishers in this period does not appear to have notably changed author preference of publication venue. Ninety per cent of hybrid UK articles were published with the top ten publishers by article output. Similarly, Wiley, Springer Nature, Sage, Elsevier and T&F accounted for 78% of UK hybrid OA output in 2022.

Spend on TA agreements with Wiley, Sage, Elsevier, T&F and Springer Nature³²³ in 2022 was £112.3m. This was almost a third of the total amount spent by HEIs on information provision according to the SCONUL 2021/22 expenditure data (£374,273,000)³²⁴. With the continued dominance of large commercial publishers there is likely to be limited budget available to participate in alternative OA models.

Looking ahead

TAs have not been as successful in shifting UK research to OA as expected or hoped by the sector. However, this review has extended existing literature and created an evidence base that the sector and our partners overseas can use to drive decision making. We have recommended that the sector prioritises agreement of additional indicators to demonstrate a commitment to equity so that researchers in the UK and beyond can participate in research creation and dissemination without financial or other EDI barriers. Divestment from agreements that do not meet the sector's requirements should provide additional financial support for alternative or more equitable publishing models.

The report provides an opportunity for the sector to design new ways of working together to agree its requirements for future scholarly publishing models that are sustainable and deliver the open research services the sector values. In the interim period there is scope for the sector to work with publishers on improving data flows and reporting about the performance of agreements to reduce administration. This should include using persistent digital identifiers to improve the interconnectedness, reusability and accuracy of agreement data alongside other research-related data. Stronger coordination across the sector will identify and tackle TA workflow, compliance and reporting issues. Publishers can reduce administration by improving workflows and reporting in addition to providing simpler proposals that are transparently costed.

There is much here for the research sector to consider. It will require collective effort to set out the sector's course post-TAs and to bring about the required changes. This review has come at a key point, which offers a once-in-a-generation opportunity to improve research assessment, culture and integrity, all of which cut to the heart of the issues within the current scholarly publishing system. TAs have had an important role to play in the UK's OA journey and have highlighted the enormous potential that open research has to drive research and innovation in the UK.

Endnotes

- 1 OAO (no date) [Author accepted manuscript \(AAM\)](#). [accessed 10 October 2023]
- 2 Unpaywall (2021) [What do the types of oa_status \(green, gold, hybrid, and bronze\) mean?](#) [accessed 9 November 2023]
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- 4 Plan S (no date) [Diamond Open Access](#). [accessed 10 October 2023]
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- 13 UKRI (2022) [How Research England supports research excellence](#). [accessed 10 October 2023]
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- 16 Jisc (2023) [Working with transitional agreements](#). [accessed 10 July 2023]
- 17 Lawson, S. (2015) 'Total cost of ownership' of scholarly communication: managing subscription and APC payments together', Learned Publishing, 28 (1), pp. 9-13. [accessed 26 June 2023]
- 18 OAO (no date) [Version of record](#). [accessed 10 October 2023]
- 19 ESAC (no date b)
- 20 Aviv-Reuven and Rosenfeld (2021)
- 21 For a definition of an Open article and other article types, please refer to the [Glossary](#)
- 22 Journals are also classified according to the ANZSRC taxonomy but expanded based on Delta Think's own work on classifying health sciences journals. For more information please see [appendix 2: methodologies](#).
- 23 For a definition of Embargo, please refer to the [Glossary](#)
- 24 See [section 2b 'UK findings: how has the UK conversion to Open Access differed across subject areas?'](#)
- 25 To ensure a fair comparison, only institutions that subscribed to the pre-TA agreement and the current agreement have been included, and only publishers with a subscription agreement (ie, not a TA) later than 2018 but before their TA were included (thereby excluding Springer Nature).

- 26 We acknowledge that cost avoidance as a measure becomes less relevant as alternative means of OA publication grow that would not rely on the payment of an APC.
- 27 Vernon et al. (2021)
- 28 UKRI (2020)
- 29 Based on articles published between 2017 and 2021, which were funded by one of the UKRI funding bodies. Data sourced from [Dimensions](#) in April 2022, an inter-linked research information system provided by Digital Science.
- 30 For a definition of REF-eligible, please refer to the [Glossary](#)
- 31 Data Source: Dimensions
- 32 Jisc (no date d)
- 33 Wiley, Sage, T&F and Elsevier
- 34 European Respiratory Society, IWA Publishing, Royal College of General Practitioners, Royal Society of Chemistry, The Company of Biologists (CoB), The Rockefeller University Press (Rockefeller), Royal Society, Wiley
- 35 See [Journal Checker Tool](#).
- 36 Based on the number of articles published in 2022 with a research organisation in China or the US, but excluding articles with a research organisation in the UK, sourced from [Dimensions](#) on 22 August 2023.
- 37 BOAI (2002)
- 38 Brown et al. (2003)
- 39 Max-Planck-Gesellschaft (2003)
- 40 Max-Planck-Gesellschaft (2003)
- 41 Max-Planck-Gesellschaft (2003)
- 42 This statement was used in the three declarations
- 43 Creative Commons (no date)
- 44 Jisc (no date c)
- 45 ROARMAP (no date g)
- 46 DOAJ (no date a)
- 47 Huang et al. (2020)
- 48 Young (2009)
- 49 ROARMAP (2022a)
- 50 Jisc (2023 d)
- 51 For a definition of self-archiving, please refer to the [Glossary](#)
- 52 For a definition of Hybrid or Gold articles, please refer to the [Glossary](#)
- 53 The Wellcome Trust (2003)
- 54 NIH (2003)
- 55 European Commission (2018)

- 56 Plan S (2023c)
- 57 For a definition of fully Open Access, please refer to the [Glossary](#)
- 58 For a definition of version of record, please refer to the [Glossary](#)
- 59 For a definition of author accepted manuscript, please refer to the [Glossary](#)
- 60 Council of the European Union (2023)
- 61 For a definition of article processing charge, please refer to the [Glossary](#)
- 62 Council of the European Union (2023)
- 63 For a definition of Diamond Open Access or Platinum Open Access, please refer to the [Glossary](#)
- 64 [DIAMAS](#) Project
- 65 [CRAFT-OA](#) project
- 66 Huang et al. (2020)
- 67 Alencar and Barbosa (2021)
- 68 Wang and Campbell (2023)
- 69 Noorden (2019)
- 70 Jisc (2023c),
ROARMAP (2022b)
- 71 ESAC (2023a)
- 72 Data collected from [Dimensions for publication types \(articles only\), country of research organisation, by Open Access status \(Gold, Green, Hybrid\) and divided by all articles \(Gold, Green, Hybrid, Closed and Bronze\) for each calendar year. Dimensions](#) (2023) Definition of Open Access filters. [accessed 18 July 2023]
- 73 Noorden (2019)
- 74 "DOAJ is a unique and extensive index of diverse Open Access journals from around the world, driven by a growing community, committed to ensuring quality content is freely available online for everyone". [DOAJ](#) (2023) DOAJ. [accessed 18 June 2023]
- 75 Brown et al. (2003)
Quint (2002)
- 76 Association of Learned and Professional Society Publishers (2008)
- 77 Research Information (2012)
- 78 Solomon and Björk (2011)
- 79 Solomon and Björk (2011)
- 80 For a definition of Hybrid articles or Gold articles, please refer to the [Glossary](#)
- 81 McGuigan and Russell (2008)
Jurchen (2020)
- 82 Price projections decreased after 2020 due to the global economy contraction resultant from the COVID-19 pandemic.
EBSCO (2021)

- 83 Björk and Solomon. (2014)
- 84 The 12 major publishers with 70% of articles publications comprises: Springer Nature, Elsevier, Wiley, Taylor & Francis, MDPI, Sage, IEEE, American Chemical Society, Frontiers, Oxford University Press (OUP), Public Library of Science (PLOS), and Hindawi.
Sivertsen and Zhang (2022)
- 85 Klebel and Ross-Hellauer (2023)
- 86 Olejniczak and Wilson (2020), Siler et al. (2018)
- 87 Tanne (2022)
- 88 Liu, Rahwan and AlShebli (2023)
- 89 Research Councils UK (2005)
- 90 Research Councils UK (2005)
- 91 Research Councils UK (2005)
- 92 ROARMAP (no date a), ROARMAP (no date b), ROARMAP (no date c), ROARMAP (no date d), ROARMAP (no date e), ROARMAP (no date f).
- 93 Department for Business, Innovation & Skills (2012c)
- 94 Department for Business, Innovation & Skills (2011)
- 95 Department for Business, Innovation & Skills (2012a)
- 96 Department for Business, Innovation & Skills (2012a), Thorley (2012)
- 97 The Wellcome Trust (2012)
- 98 Research Councils UK (2012)
- 99 Gadd and Covey (2017)
- 100 Department for the Economy Northern Ireland, Higher Education Funding Council for England (HEFCE), Higher Education Funding Council for Wales (HEFCW), Scottish Funding Council (SFC)
- 101 For a definition of the Research Excellence Framework, please refer to the [Glossary](#)
- 102 Higher Education Funding Council for England (2016)
- 103 Swan (2014)
- 104 Kiley (2014)
- 105 The Wellcome Trust (2019)
- 106 Cancer Research UK (2020)
- 107 cOAlition S (2021a)
- 108 NIHR (2019),
NIHR (2022)
- 109 Creative Commons (2023)
- 110 Open Government Licence (no date)
- 111 House of Commons (2004), Department for Business, Innovation & Skills (2012a)

- 112 SCONUL (2021)
- 113 House of Commons (2004).
- 114 Pinfield et al. (2014)
- 115 OpenDOAR (2023)
- 116 Please note that the repositories recorded in OpenDOAR may not have been reviewed since they were created.
- 117 Needham and Stone (2012)
- 118 2013-2019 figures are based on statistics from repositories participating in the IRUS R4 service
2020-2022 figures are based on statistics from repositories participating in the IRUS R5 service
Please note that in 2020 changes were made to how usage is measured, which resulted in a transition from COUNTER 4 to COUNTER 5. This impacted on the number of repositories providing usage data and on how downloads were counted from 2020 onwards. For more information see - [Jisc support guides - comparing r4 and r5](#)
- 119 Gadd and Covey (2017)
- 120 Holter (2020)
- 121 Rumsey (2017)
- 122 Andrew (2017)
- 123 Fraser et al. (2018)
- 124 Eglen and Gatti (2021)
- 125 cOAlition S (no date)
- 126 RRS aims to give researchers “the freedom to submit manuscripts for publication to their journal of choice, including subscription journals”. Plan S (no date b)
- 127 Rumsey (2021b), Rumsey (2021a), Rumsey (2023)
- 128 Karatzia (2021)
- 129 Kiley (2022)
- 130 Rumsey (2022)
- 131 Open Access Directory (no date)
- 132 Examples of early adopters include:
Andrew (2021), cOAlition S (2022a), cOAlition S (2022b), University of Aberdeen (2022), Proven (2022), Grove (2023)
- 133 The number of repositories refers to the repositories participating in IRUS that had article downloads in each year, not the actual number of institutional repositories that existed at the time.
- 134 The lower number of article downloads in 2020 was due to delays for some repositories in implementing R5 tracker.
- 135 Jump (2014)
- 136 Earney (2017)
- 137 For a definition of total cost of ownership, please refer to the [Glossary](#)
- 138 Research Consulting (2014)

- 139 Pinfield, Salter and Bath (2016)
- 140 Shamash (2016)
- 141 Jubb et al. (2017)
- 142 Earney (2017)
- 143 Banks (2016)
- 144 Fraser et al. (2018)
- 145 Lawson (2019)
- 146 Lawson (2019)
- 147 Schimmer, Geschuhn and Vogler (2015), Puehringer, Rath and Griesebner (2021), Butler et al. (2022)
- 148 For a definition of double-dipping, please refer to the [Glossary](#)
- 149 Earney (2017)
- 150 Earney (2017)
- 151 Jubb et al. (2017)
- 152 Universities UK (2023), House of Commons Committee of Public Accounts (2022)
- 153 Pinfield, Cox and Rutter (2017)
- 154 Bosch and Henderson (2018)
- 155 Bosch et al. (2023)
- 156 Tillack (2014)
- 157 Shamash (2016), Lawson (2019)
- 158 NB Springer Nature TA spend has not been included in the cost analysis in [section 3a](#)
- 159 SCONUL Annual Return 2021/2022. Statement of use: the statistics are copyright of SCONUL, which grants permission to its members to use the statistics within their institution. SCONUL holds the copyright in the text accompanying these statistics.
- 160 Blanchard, Thierry and van der Graaf (2022)
- 161 Schimmer, Geschuhn and Vogler (2015)
- 162 The authors acknowledge that there is a margin of error to account for the fluctuation in exchange rates.
- 163 Open Access 2020 (2023a)
- 164 OCW (2013)
- 165 TU/e Eindhoven University of Technology (2014)
- 166 Butler (2016)
- 167 For a definition of Transformative Agreement, please refer to the [Glossary](#)
- 168 For a definition of Transformative Arrangements, please refer to the [Glossary](#)
- 169 Andrew (2021)
- 170 For a definition of Transitional Agreements, please refer to the [Glossary](#)

- 171 Jisc (2023b)
- 172 Lewis (2012)
- 173 Pollock and Michael (2022)
- 174 Pollock and Michael (2022)
- 175 Hahnel (2022)
- 176 European Commission (2019)
- 177 STM (no date)
- 178 Piwowar et al. (2018)
- 179 Nane et al. (2023), Kiley (2020), Miller and Tsai (2020),
Pollock. and Michael (2022)
- 180 STM (no date)
- 181 Piwowar et al. (2018)
- 182 Piwowar et al. (2018) study determined the proportion of literature OA based on a sample of DOI-assigned journal articles from Crossref
- 183 The number of articles published continued to rise during the COVID-19 pandemic, and the proportion of OA articles increased dramatically, driven by the need for faster publishing speeds and growth of pre-prints. (Liao (2022))
- 184 Data sourced from Dimensions in August 2022 and January 2023, an inter-linked research information system provided by [Digital Science](#). Due to licensing restrictions, these images should not be used or reproduced for other purposes without permission. Hereafter Dimensions
- 185 Pollock and Michael (2022)
- 186 Transitional agreements were discussed at the 14th Berlin Open Access Conference by the international community and defined as “temporary and transitional, with a shift to full open access within a very few years. These agreements should, at least initially, be cost-neutral, with the expectation that economic adjustments will follow as the markets transform”
Open Access 2020 (2018)
- 187 ESAC (2023b)
- 188 ESAC (2023a)
- 189 Campbell et al. (2022)
- 190 “...global research communities are committed to complete and immediate open access, to retaining author copyrights and to negotiating transformative agreements that are temporary, transitional, and cost-neutral” as stated in the 14th Berlin Open Access Conference
Max-Planck-Gesellschaft (2018)
- 191 Harris et al. (2021), Winter (2023)
- 192 Wise and Estelle (2020)
- 193 Anderson, Heyman and Simmons (2022)
- 194 Royal Society (2023b)
- 195 Royal Society (2023a)

- 196 The large proportion of OA in the IWAP portfolio may be a result of the Diamond model they have offered other consortia; their agreement with Jisc follows a read and publish model similar to the other TAs investigated in this report
- 197 Bosshart, Cookson and Hess (2022)
- 198 ESAC (2023b)
- 199 Springer Nature Group (2021), Murphy (2009), Informa (no date), Elsevier (no date), Stanchat (2020), Knowledge Unlatched (2021), Milliot (2021)
- 200 ESAC (2023a)
- 201 Solomon, Laakso and Björk (2016)
- 202 Plan S (2023a)
- 203 Plan S (2023b)
- 204 If Green is included OA rises to c. 65% of UK scholarly literature and c. 50% of global in 2022. This was estimated c. 33% globally in 2015 (+17%).
Plan S (2023d)
- 205 Cambridge University Press (no date), Royal Society (2023a), Wiley (no date)
- 206 Dunn (2023)
- 207 Plan S (2021b)
- 208 American Society of Tropical Medicine & Hygiene (ASTMH), Association for Computing Machinery (ACM), BMJ, CUP, CoB, Elsevier, Inter-Research Science Publisher, Karger, OUP, Rockefeller, Royal Society, Springer Nature, Wageningen Academic Publishers, World Scientific
- 209 ACS joined the programme.
- 210 Plan S (2022)
- 211 Ten journals from Springer Nature, two from OUP, and one from the Association for Computing Machinery.
- 212 The Geological Society of London joined the programme.
- 213 Eleven journals from Springer Nature, six from Elsevier, five from CUP, three from OUP, and one from the Association for Computing Machinery.
- 214 74% of journals from Springer Nature, of which 57% did not meet their targets.
- 215 Plan S (2023f)
- 216 Plan S (2023f)
- 217 Dunn (2023)
- 218 IWAP have flipped all of their journals to OA using Subscribe to Open (S2O). IWA Publishing (2023)
- 219 Data Source: Dimensions
- 220 Furthermore, Karger is aiming to flip 15 journals in the next four years and alongside 'publish and access' agreements piloted the S2O model for two journals in 2023
- 221 Analysis is based on data from Delta Think. This covers a different sample to other analysis – please refer to [the methodology, appendix 2](#).
- 222 Please note these calculations refer specifically to articles by organisations that are members of the consortia

- 223 Petrou (2022)
- 224 Pooley (2022)
- 225 Jisc (2023c)
- 226 China Association for Science and Technology, and International Association of Scientific, Technical, and Medical Publishers (STM) (2022)
- 227 Chongfang and Campbell (2023)
- 228 Based on the number of articles published in 2022 with a research organisation in the US, but excluding articles with a research organisation in the UK (approximately 632k), sourced from [Dimensions](#) on 22 August 2023, over the number of articles published in 2022 ([see figure 4](#))
- 229 Based on the number of articles published in 2022 with a research organisation in China, but excluding articles with a research organisation in the UK or US (approximately 720k), sourced from [Dimensions](#) on 22 August 2023, over the number of articles published in 2022 ([see figure 4](#))
- 230 Jubb et al. (2017)
- 231 Marques and Stone (2020)
- 232 Jisc (2023b)
- 233 The American Psychological Association TA is not included in the analysis for this review. See [appendix 2, methodologies, 'prevalence of OA in global and UK literature'](#)
- 234 Plan S (2021a)
- 235 Jisc (2023b)
- 236 TAs may include some fully OA titles, but generally very few.
- 237 Jisc (2023a)
- 238 Marques and Stone (2020)
- 239 Not accounting for more specific article types (eg, front matter), caps or other stipulations that would have limited the eligibility of articles to be published through a TA.
- 240 Within any caps specified in transitional agreements, and any other limitations (such as funded articles only).
- 241 Based on internal reports provided by the publishers for 2022.
- 242 ACS, AIP, Brill, OUP, Karger, Sage, T&F, Rockefeller, De Gruyter and Wiley
- 243 Analysis is based on data from Delta Think. This covers a different sample to other analysis – please refer to [the methodology, appendix 2](#).
- 244 Springer Nature, Elsevier, Wiley and T&F
- 245 Analysis is based on data from Delta Think. This covers a different sample to other analysis – please refer to [the methodology, appendix 2](#).
- 246 Note that APA is excluded from analysis (refer to [appendix 2: methodologies](#)), so 38 publishers are considered in this report.
- 247 Jisc (no date b)
- 248 LIBER (2017)
- 249 cOAlition S (2021b)

- 250 Open Access 2020 (2023b)
- 251 ESAC (2021)
- 252 ESAC (2023a)
- 253 The Springer Nature TA was not included in this analysis. See [‘appendix 2: methodologies, cost analysis’](#).
- 254 Due to the nature of the T&F TA, the VAT for OA publishing was charged separately to the agreement fee. Please see [p24 for a discussion on VAT](#).
- 255 Fenter (2022)
- 256 Paltani-Sargologos (2020)
- 257 Farley et al. (2021)
- 258 Association for Computing Machinery (no date)
- 259 This includes Optical Society of America and Springer Nature. Note that the TA products associated with these publishers during the period specified are not always the same as the TA products analysed elsewhere in this section, as the VAT estimates are for more recent products. These are estimates only, as the VAT may not have always been charged by the supplier in the way calculated here.
- 260 It is recognised that cost avoidance over the next couple of years may be reduced as more institutions implement RRSs and authors use this route to publish their manuscripts openly.
- 261 Parr and McQuillan (2023)
- 262 UKRI (2020)
- 263 UKRI (2020)
- 264 See also institutional case studies ([appendix 8](#)), which highlight rights retention policies as an alternative route to OA in the absence of funder block grants.
- 265 Value here is defined by the APC that would have been paid to publish the article OA. However due to the lack of cost transparency (please see [‘section 3c. Agreements must be transparent’](#) for a more detailed discussion), it is recognised that this may not be the most appropriate way to measuring the ‘value’ of the publishing process and that an APC may not be commensurate with the value of the publishing process.
- 266 For more background on offsetting as a measure of financial transition to OA, refer to: Marques and Stone (2020).
- 267 It should be noted that not all TAs are taken by all institutions, with savings and strategy being important factors in decision making, so it is conceivable that institutional decision making is a biasing factor in the costs avoided and savings made.
- 268 REF (no date)
- 269 UKRI and Wellcome are members of cOAlition S
- 270 Jisc (no date a)
- 271 ACM, Bioscientifica, CUP, ERS, John Benjamins, Brill, Microbiology Society, RSNA, Karger, Springer Nature, Royal Society, BUP. NB All RCGP research content is now published as Gold OA.
- 272 CUP, ERS, Brill, Optica, OUP, RSNA, RIA, RSC, Sage, T&F, Wolters Kluwer
- 273 Medical Research Council and Biotechnology and Biological Sciences Research Council

- 274 For example, ACM state on their website “the cornerstone of the Hybrid Open Access option for ACM authors is the right to choose whether to make one’s work Open Access in the ACM Digital Library in a particular ACM Publication. This choice is made by the author(s) alone, is made on an ‘article by article’ basis, and may be based on a variety of factors, including Funder Open Access Mandates, personal views on the need to support the Open Access Movement, or any number of other reasons.” Association for Computing Machinery (2023b).
- 275 BMJ, GSL, IOP, John Benjamins, Karger, Optica
- 276 IOP, Sage, Springer Nature
- 277 ACS, BMJ, Elsevier, Future Science, IOP, National Academy of Sciences of the USA (NAS), OUP, Portland Press, RSC, Sage, Springer Nature, CoB, Royal Society, De Gruyter, Wiley. See [appendix 5](#)
- 278 AIP, CUP, Thieme, Brill, Karger, T&F
- 279 ESAC (no date a)
- 280 Open Access 2020 (2023c)
- 281 Jisc (no date d)
- 282 Wiley, Sage, T&, PLOS and Elsevier
- 283 Plan S (no date a)
- 284 The list of publishers that provide price data to the Journal Comparison Service is available via the [Journal Checker Tool](#)
- 285 ERS, IWAP, RCGP, RSC, CoB, Rockefeller, Royal Society, Wiley
- 286 Plan S (2023e)
- 287 This information is available in Hall, Srivastava and Delman (2023)
- 288 PLOS (2023)
- 289 Royal Society (2023c)
- 290 The Geological Society of London (2023)
- 291 Cold Spring Harbor Laboratory Press (no date)
- 292 The Company of Biologists (2023)
- 293 The Company of Biologists (2023)
- 294 Cambridge University Press (2023)
- 295 Association for Computing Machinery (2023a)
- 296 Hall, Srivastava and Delman (2023)
- 297 Hall, Srivastava and Delman (2023)
- 298 OECD (no date)
- 299 ACM, BMJ, CSHLP, Portland Press, RSC, Karger, Royal Society, Wiley, Wolters Kluwer
- 300 ACM, BMJ, CSHLP, ERS, GSL, IWAP, Microbiology Society, Optica, RSC, Karger, Royal Society, Wiley, Wolters Kluwer
- 301 IWA Publishing (no date)
- 302 ACM, CSHLP, CUP, GSL, IOP, John Benjamins, Portland Press, RSC, T&F, CoB, Royal Society, De Gruyter
- 303 ACM, CSHLP, CUP, RSC, CoB

- 304 ACM, CSHLP, CUP, Portland Press, RSC, CoB, De Gruyter
- 305 Optica, T&F, GSL, Royal Society, Wiley
- 306 Royal College of General Practitioners (no date)
- 307 Journal Checker Tool (no date a), Bill & Melinda Gates Foundation (no date)
- 308 Jisc (no date e),
Dobson (2020)
- 309 The checklist is available via the [Jisc repository](#)
- 310 RLUK (no date)
- 311 BMJ, CUP, Future Science, Thieme, Brill, NAS, Optica, Portland Press, RSC, Royal Society, De Gruyter, Wolters Kluwer
- 312 ACS, AIP, ACM, Elsevier, OUP, Sage, Springer Nature, T&F, Wiley
- 313 APS, CSHLP, John Benjamins, CoB, Rockefeller, BUP
- 314 OA Switchboard (no date)
- 315 See [figure 1](#) for subscription increases and [appendix 1](#) for APC increases.
- 316 Fraser et al. (2018)
- 317 Based on articles published between 2017 and 2021, which were funded by one of the UKRI funding bodies. Data sourced from [Dimensions](#) in April 2022, an inter-linked research information system provided by Digital Science .
- 318 See [section 2b 'UK findings: how has the UK conversion to open access differed across subject areas?'](#)
- 319 Jisc (2023a)
- 320 Vernon et al. (2021)
- 321 Assuming that 50% of unfunded articles would ever be published under the Gold route (and the other 50% would become open via the Green route).
- 322 Cost avoidance figures should be treated with caution as they do not reflect administrative costs or savings and assume that institutions or individual researcher would have had the funds to pay these figures, which they did not.
- 323 NB Springer Nature TA spend has not been included in the cost analysis in [section 3a](#).
- 324 SCONUL Annual Return 2021/2022. Statement of use: the statistics are copyright of SCONUL, which grants permission to its members to use the statistics within their institution. SCONUL holds the copyright in the text accompanying these statistics.

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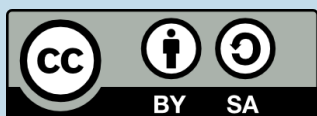
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Find your Jisc account manager

jisc.ac.uk/contact/your-account-manager –

we are ready to discuss any, or all aspects
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