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Why and How the G20 Should Supercharge Research Publishing Reform

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Abstract

The importance of our global system to disseminate research in the current digital era is hard to overstate, yet its undue profitability and systemic failures are frequently ignored.

While technological advancements could theoretically enable unfettered access to research knowledge, structural impediments often constrain this. The sector is dominated by an oligopoly and impeded by market failures. In 2022, the five biggest publishers made only 31 percent of their articles Open Access (without paywall) and charges for Open Access publishing could be as high as \$11,690. This means publicly-funded research is too often locked behind paywalls, and researchers without the funds to publish are frequently prevented from doing so. These issues are not a niche concern for the academically-minded. Research and innovation underpins almost every imaginable form of social and economic advancement, from effective primary healthcare to macroeconomic development to climate adaptation. Failing global digital systems for sharing new knowledge are an underrecognised drag on progress and resilience.

The movement towards Open Access research is part of a broader vision for Open Science, championed by multi-lateral initiatives, notably UNESCO, and various previous G20 convenings. While this movement has achieved some progress for research users by reducing paywalls, gains have been modest and slow and, more importantly, have largely been achieved by erecting new but equally inequitable pay-to-publish barriers that prevent many researchers from effectively sharing their work.

A more transformative and inclusive vision for change is still possible, but the challenges are principally political, rather than technical or economic. A targeted science diplomacy effort could kick-start fresh action to reform our global systems for publishing research and sharing knowledge through leveraging digital innovations and better digital platforms. In the full policy brief we will build on our paper from last year ([see CGD website](#)), to establish a vision for reform, detail a theory of change for how science diplomacy can realise such reform and offer specific recommendations for the G20 in 2024.

Keywords: digital governance, science diplomacy, open access, research publishing reform, global public goods.

Diagnosis of the issue

Research plays a vital role in human and planetary advancement, progressing knowledge across all sectors. However, the current system of publishing and disseminating research is broken. This is, at core, an issue of digital governance. In 2020, global public funding for research reached an estimated US\$1 trillion (Burke, Okrent, and Hale 2022), generating knowledge products with the potential to benefit society. However, once published in peer-reviewed journals, research often transitions from being a public good to a private commodity, inaccessible behind paywalls. Almost 70% of publicly-funded research was restricted in this manner in 2018 (Piwowar et al. 2018). Further, the research publishing industry, valued at \$26.5 billion in 2020, is dominated by five major companies: Elsevier, Springer Nature, Wiley Blackwell, Taylor and Francis, and Sage Publications. These publishers control over 50% of journals, profit significantly from subscription fees, and operate profit margins that rival those of tech giants like Apple (Macrotrends LLC 2024). The business model of commercial publishers is also underpinned by unpaid academic labour for peer-review and editing. Despite this, researchers face high subscription and publishing fees once their research is published with a median publication charge of \$2,860, reaching as high as \$11,690. The over-emphasis on publication as a measure of career success within academia, further perpetuates what is a governance failure of these key digital platforms.

The current system is failing in five critical ways:

1. **Ineffective distribution of public goods:** Publicly-funded research, including ideas, evidence, and data, should benefit everyone, but paywalls limit access which hinders potential for societal and economic growth; particularly in lower-income countries who must rely on temporary or charitable solutions (Research4Life 2024).
2. **Constraints on generating new research:** Limited access to existing research impedes the production of high-quality studies, resulting in redundant or methodologically weak research. The shift towards open access publishing excludes many due to affordability,

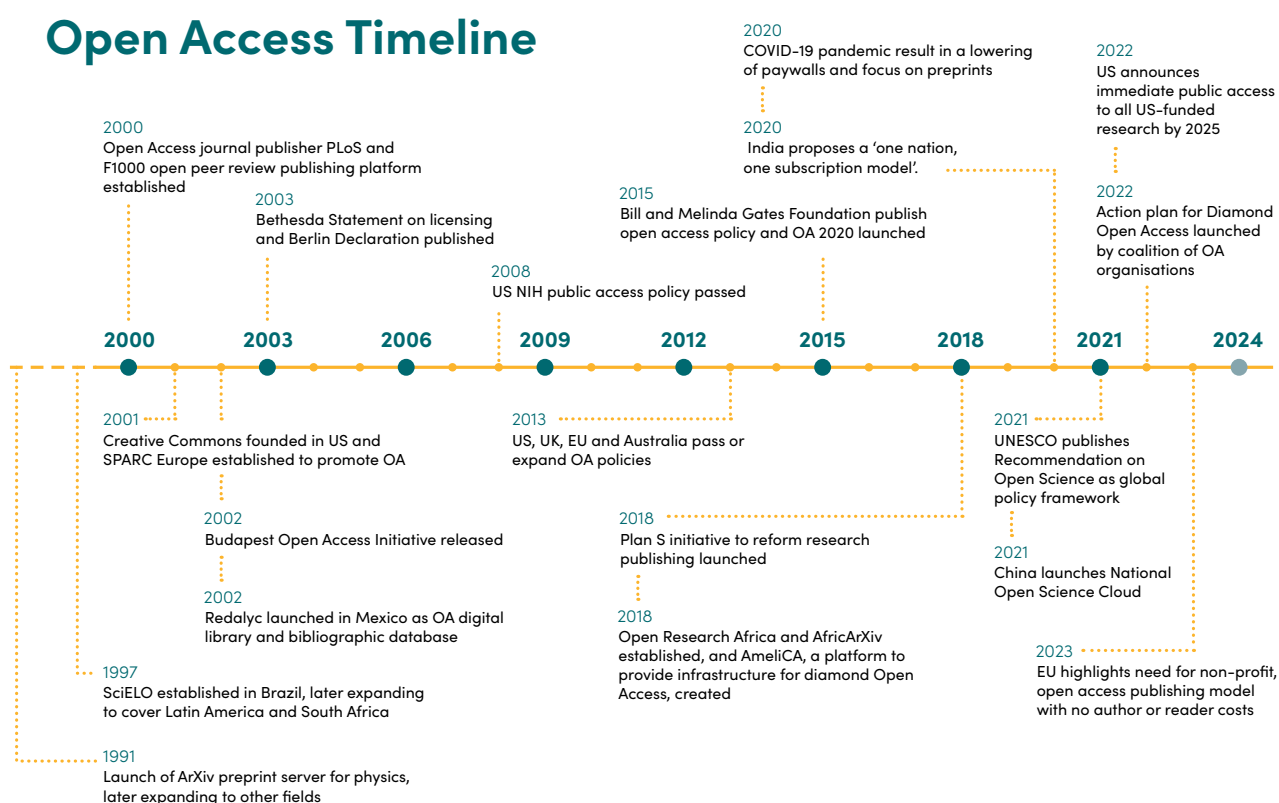
exacerbating inequalities and restricting diverse perspectives.

3. **Inefficiency and poor value from public spending:** Funders pay exorbitant fees to access research findings, controlled by commercial publishers with high profit margins, offering poor value for public investment.
4. **Inequitable global research participation:** Prestigious institutions have privileged access to global science, perpetuating power and wealth disparities. This inequity hampers progress by excluding talent from under-represented regions and demographics.
5. **Erosion of public trust in science:** A closed research enterprise undermines public trust and support for scientific investments. In an era of growing reliance on scientific evidence and digital connectivity, especially emphasised during COVID-19, fostering public trust is crucial for addressing global challenges like pandemics and climate crises.

Frustration and exclusion in response to this issue have sparked a global movement for change in research publishing over the past two decades. Notable initiatives include the International Science Council's 2021 review (International Science Council 2021) and UNESCO's 2021 Recommendation on Open Science (UNESCO 2021), endorsed by 193 countries. The G20 Chief Science Advisers' Roundtable (CSAR) has previously acknowledged UNESCO's guidelines and the need to enable immediate and universal access to appropriate publicly funded scholarly scientific knowledge to communities within and beyond G20 members (G20 India 2023).

Specific efforts to establish Open Access (see Figure 1) include OA2020, advocating to switch investments from subscription-based models to Open Access solutions (OA2020 2024), and cOAlition S, aiming for immediate Open Access to published research (e.g., 'Plan S') (European Science Foundation 2024). Emerging economies, particularly Latin America (Bosman et al. 2021), have also pioneered alternative, non-profit publishing models, challenging the dominance of commercial publishers.

FIGURE 1 Timeline of selected Open Access initiatives



However, despite efforts to transition journals towards Open Access and create alternative platforms, progress has been slow, digital publishing innovations have not been realised, and the dominance of the research publishing oligopoly persists. Importantly, there is still a lack of global-scale initiatives addressing critical reforms. This should be a concern beyond the scientific community and one that requires high-level attention.

Science diplomacy for research publishing reform: A governance gap for digital publishing platforms

The need to reform research publishing and its digital platforms presents a promising ground for the practice of science diplomacy, where science policy intersects with international policy and diplomatic relations. In the context of Open Access reform, science diplomacy primarily focuses on leveraging diplomacy to facilitate international cooperation dedicated to open research practices, but it also entails using research outputs to inform foreign

policy objectives and enhance international relations. The primary actors involved in science diplomacy for research reform are envisaged to be nation-states, supported by international organisations and a robust ecosystem of civil society organisations. While there are synergies between science diplomacy and research reform, the integration of these concepts has been minimal, with science diplomacy scarcely referenced in research reform circles.

The G20 is well-placed to fill the systemic governance gap and complement the existing efforts for reform at an international policy level. The G20 nations, responsible for ~90% of global research spending, are witnessing a shifting landscape in research production, with emerging economies like China, India, Brazil, and Indonesia making significant strides. The question arises whether these new research producers will continue relying on expensive Western-based journals or embrace alternative publishing models and innovative platforms. The outcome could lead to either further fragmentation and hindered

collaboration or comprehensive reforms fostering global research culture. Without decisive political leadership, the former scenario is more likely, perpetuating an ineffective, inefficient, and inequitable research ecosystem. However, the G20, with its significant political and economic influence and inclusive membership, has the potential to drive transformative change in research publishing and its digital platforms. With collective research expenditure in the hundreds of billions, the G20 possesses both the leverage and legitimacy to champion reforms that benefit the global research community and advance progress against pressing global challenges.

Recommendations

Despite initiatives like UNESCO's roadmap on Open Science and ad hoc discussions at forums including the 2023 G20, the full potential of science diplomacy to drive international momentum toward research reform remains largely untapped. To address this gap, integrating science diplomacy into research publishing reform initiatives and digital publishing innovations is crucial. Building on UNESCO's guidelines, the principles of science diplomacy, and previous G20 calls to synergise global efforts to expand access to scientific knowledge, we offer the following three recommendations for G20 leaders:

1. Lead in elevating the discourse and articulate a vision for change.

The G20 has legitimacy to champion change and it holds significant potential in reshaping perceptions of the research publishing issue and leading regulation of innovations in digital publishing platforms. Often seen as a niche concern, research publishing is, in fact, a global systemic challenge that profoundly impacts social and economic progress – a reality that the G20 can confer importance and credibility to. The G20 holds the dual leverage of political and economic strength, allowing it to centrally spur change on a scale beyond what cOAlition S and its predecessors could achieve. Importantly, it would be able to enhance diverse dialogue, build consensus,

and emphasise better measures of importance, such as societal impact alongside scientific value, for this global challenge.

As part of this, while avoiding overly detailed discussions, the G20 could endorse two clear principles:

- ▶ *Rejecting pay-to-publish models:* Flipping from pay-to-read to pay-to-publish is not a viable solution. While initially appealing, especially to stakeholders in well-funded research systems, this approach effectively excludes many countries from full participation in the global research system. It perpetuates inequalities and undermines the democratisation of knowledge dissemination.
- ▶ *Separating research publication from assessment of importance and quality:* Moving on from outdated norms in research publishing of physical and highly curated journals, in the digital era, there are minimal constraints on the volume of research that can be published online. Curation of high-quality research can still be valuable but should be separated from the act of publication. This ensures that research dissemination and the relevant digital platforms remain accessible, inclusive, and are centred around responsible governance.

To affect a significant shift in perceptions, sustained political focus and commitment are key. The G20, if interested in changing perceptions, should consider developing a clear communications strategy. This strategy should articulate goals, key messages, and stakeholders, tailoring messaging to different stakeholders' interests. Buy-in may not always be straightforward, necessitating a comprehensive program of activities including public events, publications, private meetings, and individual outreach efforts. It is essential to frame the issue in terms of its systemic effects, rather than just its immediate barriers. To maintain momentum, countries could nominate dedicated Open Access government leads and establish working groups to steer the development of the communications strategy further.

More broadly, signalling the importance of reforms to research publishing and relevant digital platforms can trigger a domino effect, sparking political will for public investment, cross-border initiatives, policy alignment with public interests, innovation, and prompting publishers to reform their practices.

2. Champion equitable funding mechanisms.

The transition to Open Access in the digital era carries financial implications, requiring reallocation of existing investments in new infrastructure; all within the reach of existing public spending if states work together. To ensure equitable access to publishing for all researchers, innovative funding mechanisms are needed. G20 nations, with their substantial research funding capacities, are well-positioned to initiate the establishment of these mechanisms. Building on the UNESCO guidelines, this could include allocating funding to support initiatives aimed at advancing Open Science, such as investing in digital infrastructure development, capacity-building programs, and educational initiatives focused on digital literacy and Open Access publishing. Specifically, the G20 Research and Innovation Working Group (RIWG) could explore commissioning analysis to investigate the feasibility of a coordinated multilateral initiative supporting non-profit digital publishing platforms, contingent on adherence to interoperability standards to prevent fragmentation.

3. Pursue policy harmonisation.

Policy harmonisation in Open Access involves aligning rules, regulations, and standards governing research dissemination and its digital publishing platforms. The current landscape is fragmented, with diverse national and institutional policies hindering knowledge flow. While the G20 may not be ideal for negotiating comprehensive policies, endorsement of specific Open Access positions by G20 nations could guide national and multilateral efforts. This requires a balanced approach, considering economic, political, and cultural diversity. Harmonisation does not mean a uniform solution but a flexible framework

respecting Open Access principles and accommodating national contexts. Importantly, pursuing policy harmonisation builds on G20 CSAR recommendations to establish interoperability standards following 'Findability, Accessibility, Interoperability, and Reuse' (FAIR) principles that would allow interlinking among various national and international repositories to expand access to publicly funded research outputs.

These recommendations align with Brazil's G20 Presidency priority to enhance multilateralism and reform global governance institutions, all while placing the problem of inequality central to its efforts. Specifically, they support the T05 task force by advocating for improved regulation of digital platforms in research publishing systems, promoting fairness, transparency, and accountability.

A window for science diplomacy leadership

Notably, the issue of digital research publishing reform has been championed by both Brazil and South Africa – nations holding current and future G20 Presidencies. Initiatives like SciELO (Scientific Electronic Library Online 2023), have made significant strides in reforming research publishing systems towards Open Access. Brazil's early investments in Open Access alternatives positioned it as a global leader, with SciELO and other open publishing platforms exemplifying low-cost research dissemination since 1998. Similarly, South Africa's engagement, reflected in SciELO South Africa, and the African Open Science Platform, demonstrates a commitment to open research. South Africa's endorsement of initiatives like OA2020 and cOAlition S emphasizes collaboration to drive the shift towards Open Access. Furthermore, its involvement in projects such as African Journals Online and the Science Granting Councils Initiative showcases its dedication to fostering an inclusive research landscape across the continent (African Journals Online 2024; Science Granting Councils Initiative 2024). With this, the G20 has an opportunity to build on the strides made by country-led initiatives and take a lead on addressing this global challenge.

Scenario of outcomes

Looking ahead, we can imagine two broad futures for global research publishing:

1. **Further fragmentation and siloing.** Countries or regions develop and prioritise their own systems but connections and interoperability between these networks are weak. International and trans-disciplinary collaboration is hindered. Public investment is wasted and inequities persist. Progress against global challenges, in particular, is impaired.
2. **Comprehensive research publishing reforms** yield a global research system where the publication of research facilitates maximum value as a freely available global public good via well-governed digital platforms. International collaboration is facilitated by an openly available research record, fuelling progress.

Embracing comprehensive research publishing reforms would not only benefit research-specific settings but also offer instrumental advantages for the G20 and facilitate science diplomacy internationally. Realising the recommendations and scenario two, promises enhanced collaboration within the research community, enabling researchers from diverse backgrounds to collaborate effectively and accelerate scientific discovery. With improved access to research outputs and an enabling digital environment for generating new research, the quality and diversity of research would increase, leading to more innovative solutions to global challenges. Moreover, an efficient and value-driven research publishing system would ensure optimal resource utilisation, directing investments towards initiatives that maximise societal benefit and address pressing global issues such as climate change and public health. Finally, the current context of polarisation and distrust that is weakening the institutions that were designed to uphold international peace and security, would benefit from strengthened public trust in science with reforming research publishing systems and relevant digital platforms.

For the G20, embracing research publishing reforms and promoting Open Science practices through leveraging digital innovations offers an opportunity to demonstrate leadership in advancing scientific collaboration and knowledge sharing globally. By endorsing specific Open Access policy positions and fostering diplomatic cooperation, the G20 can enhance its influence and reputation as a driver of positive change in the international research community. Through science diplomacy, the G20 can leverage its collective power to promote greater alignment and coordination among member states, contributing to economic competitiveness, technological innovation, and social progress on a global scale. Ultimately, by prioritising research publishing reform, leveraging digital platform innovations, and embracing Open Science principles, the G20 can promote transparency, collaboration, and innovation, leading to a more stable, prosperous, and equitable global community.

However, actioning on the recommendations and transitioning to scenario two also poses several challenges and risks. Sustainable funding models must be established to support Open Access publishing and digital infrastructure, ensuring the long-term viability of these initiatives. Intellectual property concerns may arise regarding data ownership and rights, requiring careful consideration and negotiation to balance the interests of various stakeholders. Addressing the institutionalised culture within academia, which often prioritises traditional publishing models and metrics of success, may require cultural shifts and incentives to encourage Open Science practices. Additionally, the influence of lobbying efforts and private interests in shaping research policies and practices may present obstacles to meaningful reform, necessitating robust governance mechanisms and stakeholder engagement to mitigate potential conflicts of interest.

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