Rethinking where and how we publish in health sciences

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ABSTRACT

Over the past few decades, scientific publishing has undergone significant transformations evolving from a print-based system to a digitised and globally accessible ecosystem. While this shift has facilitated faster dissemination and broader access to knowledge, it has also exposed systemic weaknesses, including the profiteering by major commercial publishers and persistent inequities in the publishing landscape. This opinion article aims to educate researchers in rehabilitation sciences and the broader health sciences who are unfamiliar with scholarly publishing models and practices, with the goal of fostering more accessible, equitable, and sustainable knowledge production and dissemination. We critically examine the limitations of traditional subscription models, as well as pay-to-publish open access (gold with article processing fees) and hybrid models, highlighting their financial and systemic barriers. In contrast, we advocate for more equitable alternatives: the free-to-readers and free-to-authors model (diamond open access), which typically involves publishing costs covered by academic institutions or public funders, and self-archiving (green open access). We also discuss the increasing importance of preprints and peer-reviewed preprints (peer-print articles) in decoupling knowledge dissemination from conventional journal publication. We argue for greater recognition of these latter models in academic evaluation and for institutional support of open infrastructures. We recommend broader reforms, including replacing authorship with contributorship, shifting the focus from novelty to reproducibility and transparency, and eliminating the journal impact factor as a criterion for evaluation. Collectively, these recommendations aim to reinforce a scholarly publishing ecosystem that prioritises equity, rigour, and the collective advancement of science.

KEYWORDS: Scientific publishing, Open science, Open access, Research assessment, Scholarly communication, Research dissemination

In recent decades, scientific publishing has undergone major transformations. What was once a system relying on print journals resulting in temporally and spatially restricted circulation of scientific knowledge has evolved into a digitized ecosystem characterized by faster dissemination processes and broader accessibility.

With the advent of the internet in the 1990s, scholarly journals began transitioning to digital formats. This shift accelerated in the 2000's due to the emergence of new forms of technical infrastructure, such as disciplinary repositories like PubMed Central [1], institutional repositories [2], and open access publishers, such as PLoS, BioMed Central, and mega publisher Frontiers. Today, all scientific journals are accessible online, with only a few maintaining print versions alongside digital ones. Theoretically, anyone with an internet connection, anywhere in the world, should now have immediate access to any scientific article. The reality, though, is that much of scholarly publications remain behind a paywall. Data from OpenAlex, an open and comprehensive catalog of global scholarly outputs, show that only 38.2% of works classified as "article" or "review" published between 2014 and 2024 have an open access status. In the OpenAlex field of "Health Professions", 39.9% of works have an open access status, and of these, only 5.5% were classified as diamond open access, i.e., free of charge to both the readers and the authors (Supplementary Material 1) [3].

During the same period, traditional subscription-based publishing models, which require readers or institutions to pay for access, began to be challenged by the emergence and growth of open access, which offers readers free access to published research and ensures authors retain the rights to their research. In parallel, researchers started to make their scientific manuscripts publicly available prior to peer review through the publication of preprints. This practice emerged in the 90's with the launch of arXiv [4], which supported the already well-established prac-

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tice of sharing early versions of manuscripts in physics and mathematics. Posting preprints, which enables immediate knowledge dissemination, gained momentum in the 2010s, especially in the health sciences, with the creation of public archives such as SportRxiv [5] in 2017 and medRxiv [6] in 2019.

The development of open access and preprints has been instrumental in addressing the growing demand for research transparency, reproducibility, and adherence to open science, defined as "an inclusive construct that combines various movements and practices aiming to make multilingual scientific knowledge openly available, accessible, and reusable for everyone" [7]. This demand extends to other research material such as data and code [7], and is justified by the inability to replicate important studies in multiple fields, including medicine [8, 9, 10, 11], kinesiology [12], psychology [13, 14, 15], philosophy [16], and economics [17]. This so-called reproducibility crisis has exposed weaknesses in the scientific publishing system, not only in terms of methodological rigor, but also in the way science is organised and in how it generates and validates knowledge.

This article aims to inform researchers, particularly those in rehabilitation and health sciences, about the evolving landscape of scholarly publishing. We highlight key elements that should, in our view, guide the assessment of scientific publications, not only in terms of advancement of knowledge, but also in supporting the broader ecosystem that enables equitable participation in, and access to, scientific research. To help readers navigate our article, we provide a conceptual illustration summarising scholarly publishing models and practices (Figure 1), as well as an overview of their advantages and common barriers, along with actions to reduce these barriers (Table 1).

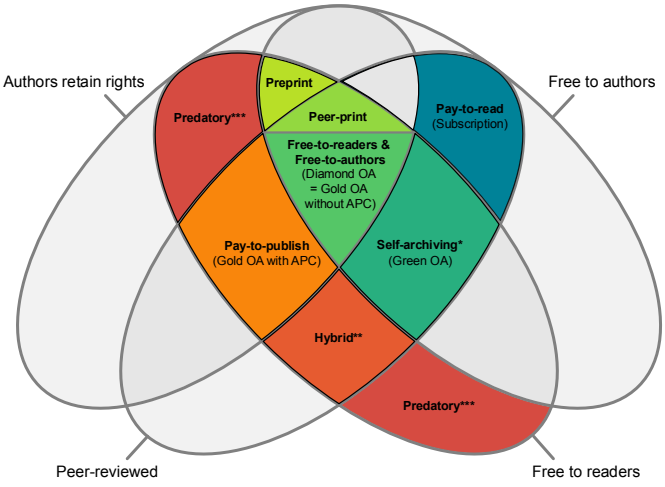

Figure 1 Publishing models and practices

Notes: Adapted from Farquharson JI, Wadsworth FB. Introducing Volcanica: the first diamond open-access journal for volcanology. Volcanica. 2018; 1(1): i-ix. DOI:10.30909/vol.01.01.i-ix. *Here, self-archiving refers to the Accepted Manuscript (also referred to as the author approved manuscript) and the Version of Record; **The overlap is hard to convey as authors may sometimes retain rights with hybrid and sometimes not; ***Predatory publishing is not a scholarly model or practice, but authors should be aware of this exploitative business model characterized by the requirement for authors to pay a fee often without the return for the promised service (e.g., the absence of genuine peer review, long-term preservation, etc.). In these venues, copyright is also unclear, as authors may not always retain the rights to their work; OA = Open access; APC = Article processing charges.

Scholarly publishing models

In this section, we provide an overview of the traditional and dominant scholarly publishing models. While there is a substantial body of literature on the various open access pathways, our goal is not to offer a comprehensive review. Instead, we aim to present a summary of the main models, and their key critiques, particularly in relation to the equitable advancement of scholarly publishing.

Pay-to-read model (subscription)

The subscription model has long been the dominant system in scientific publishing, where access to scholarly articles is restricted to individuals or institutions that pay for subscriptions[1]. Under this "pay-to-read" model, authors typically do not pay to publish. Instead, institutions pay substantial fees to publishers – often through "Big Deals", which are bundled multi-year subscription packages – for access to a wide range of journal content. While these bundles offer extensive coverage, they incur high and rapidly rising costs and can include journals of limited relevance to the subscribing institution. As a result, libraries have faced what is known as the Serials Crisis[2], in which libraries could no longer sustain inflated costs or contend with publisher pricing strategies [18, 19]. Due to its paywall and the high costs of negotiated Big Deals, the model has drawn criticism for limiting access to publicly funded research, especially in low-resource settings. In response, other options that either replace or overlay this model have been created to provide open access to readers.

Pay-to-publish model (gold open access with article processing charges)

Open access publishing models have been instrumental in democratising access to knowledge for readers. Under fully open access models for readers, there are two approaches: gold with article processing charges (APCs) and gold without APCs (diamond open access). The gold model with APCs is increasingly criticized for limiting access to knowledge production for authors by requiring them to pay a fee, known as an APC, to publish a single article. These fees can be substantial, averaging approximately $2,500 USD [20], but can be much higher, as we see with *Cell Genomics* fee of $8,900 (without discount) [21]. Therefore, a more accurate term for the gold APC model would be the "pay-to-publish" model. We argue that although this model enables free access to readers, it restricts access to knowledge production, effectively reserving publication for scientists who can afford to pay thousands of dollars to publish each of their articles.

Hybrid model

The hybrid model overlays the pay-to-publish model onto the subscription-based publishing system. In this model, authors can choose to pay for their individual article to be openly accessible, while the journal itself remains behind a paywall for other content. The revenue model for hybrid journals is problematic. First, the academic community pays twice for access to the same article: once through subscriptions and again through APCs paid by authors. This double payment – also known as double dipping – raises ethical concerns and undermines the democratization of access to knowledge for readers (who may still face paywalls) and to knowledge production for authors (who may pay to publish). Secondly, the hybrid model charges higher average APCs than the gold model, at approximately $3,000 USD per article [20, 22, 23]. However, APCs in hybrid journals can range much higher. For example, Springer Nature's most prestigious journal *Nature* charges $12,690 USD [24]. In the field of rehabilitation, we see that *Archives of Physical Medicine and Rehabilitation*, published by Elsevier, charges $4,000 USD [25] and *Physical Therapy and*

[1] Some publishers also offer pay-per-view access to individual articles, but this section focuses on institutional subscription models, which remain the primary structure of access under the traditional model.

[2] "Serials" is a library term for journals, magazines, and other regularly published materials.

Table 1 Brief overview of publishing models and practices

Model or Practice	Advantages	Disadvantages	Actions for Improvement
Pay-to-read model (Subscription)	• No cost to authors.	• Institutions or readers pay fees to access articles. • Limits access to publicly funded research. • Subscriptions are very costly for institutions and often include journal bundles (called "Big Deals" by publishers), which have proven unsustainable for library budgets.	• OA models, with a focus on supporting and rewarding models that are free for readers and free for authors (diamond OA) • Investments in open infrastructure. • Peer-print articles.
Pay-to-publish model* (Gold OA with APCs) Publishing in a fully OA journal after paying APCs.	• No cost to readers. • Immediate OA. • Author workflows can be straightforward. • Authors typically retain copyright and control of their work.	• APCs will continue to increase. • APC pricing is often tied to the prestige of journal, with fees increasing the higher the Journal Impact Factor (JIF). • Authors often cannot afford the APCs for all the articles they publish.	• Frameworks and tools that support the evaluation of scholarly communication models, like APCs, in line with community values (e.g., How Equitable is it?).
Hybrid model* Publishing OA in an otherwise closed-access journal (subscription model) after paying an APC.	• Immediate OA.	• APCs are often unreasonably high and will continue to increase. • APC pricing is often tied to the prestige of journal, with fees increasing the higher the Journal Impact Factor (JIF). • Authors often cannot afford the APCs for all the articles they publish. • Publishers often "double-dip". Libraries pay for the journal subscription, and authors at their institution pay again in the form of an APC. This is unnecessarily costly for the institution.	• Frameworks and tools that support the evaluation of scholarly communication models, like APCs, in line with community values (e.g., How Equitable is it?).
Self-archiving model (Green OA) Self-archiving published manuscripts in an OA repository.	• No cost to authors or readers. • Allows authors to choose a journal they wish, including closed-access journals, while adhering to funder mandates.	• Many journals require an embargo period, usually 12 months but can be up to 24 months, before a version of the manuscript can be made publicly available in a repository. • Additional work for authors to deposit a version of the article in a repository. • There are questions about the findability of the deposited version of the article.	• Rights retention policies: authors retain some non-exclusionary rights, such as the right to immediately deposit a copy of their article in a repository (no embargo). • Secondary Publication Rights (SPR) – strategies enacted into national law that enable authors and institutions to reuse works. SPRs remove the burden of negotiating from authors. • Articles deposited in many institutional repositories are discoverable through search engines (e.g., Google Scholar), open catalogs (e.g., OpenAlex), some databases (e.g., Web of Science, Scopus) and using browser extensions (e.g., Unpaywall).
Free-to-readers & Free-to-authors model (Diamond OA or Gold OA without APCs) Publishing in a fully OA journal funded by libraries, academic institutions, societies, volunteers and/or funders	• No cost to authors or readers. • Article is immediately available (immediate OA). • Straightforward workflow for authors. • Authors typically retain copyright and control of their work.	• Less common in some geographic areas and in certain disciplines.	• Libraries provide infrastructure (e.g., Open journal systems [OJS] hosting) and financial support to encourage innovative OA models and greater diversity of options for authors. • There is an increase in global initiatives, like DIAMAS, that promote diamond OA as it aims to address the imbalance of power in scholarly publishing, which is largely held by five publishers, rather than just the symptoms of that monopoly (e.g., expensive APCs).

Table 1 Brief overview of publishing models and practices (*Continued*)

Model or Practice	Advantages	Disadvantages	Actions for Improvement
Preprints Archiving a version of a non-peer-reviewed publication not yet accepted by a journal.	• No cost to authors or readers. • Author can share their research immediately. • Authors can receive early feedback. • Accelerates the pace of scientific discovery. • Public record of the author's original manuscript, making modifications introduced during the peer-review process visible.	• Adoption varies across scientific disciplines. • Not often rewarded in evaluation criteria for tenure, promotion, and funder mandates.	• Use structured metadata fields to link between related research outputs and provide interoperability across platforms. • Systematically reference related outputs within each material (e.g., cite the preprint in the final article).
Peer-print articles Peer-reviewed preprints, also known as the publish-review-curate model.	• No cost to authors or readers. • Article is immediately available (immediate OA). • Authors retain copyright and control of their related works. • Reduces duplication of peer review for a single study. • Promotes transparency, accelerates knowledge transfer, enables community control of knowledge.	• Emerging practice. • Not often rewarded in evaluation criteria for tenure, promotion, and funder mandates.	• Initiatives, like COAR Notify, are emerging to facilitate the linking of research outputs hosted in repositories with open peer review services and overlay journals. • Declarations like the Barcelona Declaration on Open Research Information advocate and support open research and open infrastructure, enabling the governance of research by the academic community.
Transformative Agreements (TAs)* Agreements negotiated between institutions (libraries, consortia) and publishers that bundle together subscriptions (read) and OA fees (publish).	• No cost to readers. • Reduces cost for authors. • Immediate OA.	• TAs are proving financially unsustainable for the library community. • Navigating submission systems (e.g., affiliations, discounts, licenses) can be complicated or difficult to understand for authors. • Publishers can exclude the most prestigious journals from these deals. • Most TAs are negotiated between large commercial publishers and well-resourced institutions.	• Establishing methods to analyze the value of these agreements, supporting evidence-based decision-making on their use. Quality data that is openly accessible will also empower institutions and consortia in negotiations with publishers.
Predatory publishing Business model characterized by misleading indexing claims and journal metrics, no preservation practices, no DOIs, and/or no (or sham) peer review.		• Negative impact on career advancement (Tenure & Promotion). • Contribute to "bad science". • Research waste: funding and time spent to perform the research disseminated in a venue that lacks quality, preservation, etc. • Withdrawals can be costly and hard.	• Authors can develop publishing literacy to better navigate the landscape through initiatives such as Think. Check. Submit.

Notes: Adapted from Boden C, Dawson D. Brief overview of open access (OA) models. University Library, University of Saskatchewan. https://libguides.usask.ca/open_access/OA-models. Published September 2023. Accessed August 15, 2025; *Any APC-based model inherently incentivizes quantity over quality for profit-driven publishers (i.e., the more articles you accept the more profit you make) which can introduce conflict of interest concerns for editors and the scholarly community; OA = open access; APC = article processing charges; DOI = Digital Object Identifiers.

Rehabilitation Journal (PTJ), published by Oxford University Press, charges $4,237 USD [26]. Although the hybrid model was initially proposed as a transition to open access – with the understanding that subscription prices would decline as APC revenue grew owing to the increase in open access content – we now see this model becoming further entrenched [27, 28]. The continued growth of hybrid can be attributed, in part, to the emergence of Transformative Agreements [29], which are agreements negotiated between institutions (libraries, consortia) and publishers that bundle together subscriptions (read) and open access fees (publishing) [30]. The larger the initial Transformative Agreement contract, the more likely it is to be renewed, creating a cycle of dependency and trapping libraries in hybrid models indefinitely, endowing legacy publishers with substantial market power and raising entry barriers for fully open-access alternatives [31].

Self-archiving (green open access)

The green open access model refers to the practice of authors self-archiving a version of their manuscript in a publicly accessible repository. These repositories can be either institutional, such as university or national repositories (e.g., HAL in France [32]), or subject-specific (e.g., PubMed Central [1], arXiv [4]). This model is free for both the authors and the readers, and provides an author-controlled route to access, when copyright has not been transferred to publishers. As such, green open access is considered a more sustainable and author-empowering model than gold with APCs and hybrid models. However, due to many restrictive journal policies, authors are often limited to depositing the accepted manuscript after peer review but before publisher formatting. This practice is also frequently subject to embargo periods imposed by publishers, during which the deposited version remains inaccessible to the public.

Free-to-readers and free-to-authors model (diamond open access or gold without APCs)

The diamond open access model could be referred to as the "free-to-readers and free-to-authors" model, although publishing costs remain and are typically covered by third parties. This model aligns best with the ideal of democratizing science worldwide – essentially removing the financial burden from authors and enabling more community control over publishing. Although free to authors and readers, diamond open access journals still require funding to operate and are typically funded by academic institutions, research consortia, scholarly associations, or public funds [33]. This model seeks to eliminate financial barriers on both ends of the publishing process, thereby promoting a more equitable and inclusive system. Diamond open access journals are often non-profit, mission-driven, and managed by academic communities themselves (e.g., European Rehabilitation Journal, Communications in Kinesiology). While they may not always have the same visibility or indexing as journals published by large commercial publishers, they embody the values and ideals of open access set out by the Budapest Open Access Initiative (BOAI) [34] or more recently by the United Nations Educational, Scientific and Cultural Organization (UNESCO) [7], by ensuring that neither the ability to pay nor institutional affiliation determines access to the production or consumption of knowledge. Diamond open access represents the most ethically robust and socially responsible form of open access publishing. However, we must learn from past challenges, such as the Serials Crisis and the rise of unsustainable APCs [18, 19], by ensuring the control of this model remains firmly in the hands of our community.

Alternative publishing practices: Preprints and peer-print articles

The following – preprints and peer-print articles – are not publishing models in themselves but rather practices that occur during certain stages of the research dissemination process. These practices signal a shift toward more open, transparent, equitable, and sustainable scholarly publishing. By allowing researchers to share their work early and open the review process, they not only enable a more rapid publishing process, but offer the community more ownership over knowledge creation.

Non-peer-reviewed publications: Preprints

A preprint, also referred to as the Author's Original Manuscript (AOM), is a version of a manuscript that is shared publicly before it has been peer-reviewed, and can be considered self-archiving. In the 2010s, preprinting rapidly expanded into new disciplines (e.g., SportRxiv [5], medRxiv [6], bioRxiv [35], PsyArXiv [36]). Today, preprints are recognized by multiple funding agencies [37], and are encouraged by over 145 journals, including BMJ, Stroke, PLoS Medicine, and PTJ, that allow authors to submit their work directly from medRxiv [38].

Some researchers consider preprinting to be a publishing model in and of itself. This standpoint has triggered ongoing debates because the scientific publishing process has traditionally been considered incomplete without peer review. However, preprints facilitate the opportunity for researchers, who are experts in their field, to review a preprint themselves and decide if it is worth referencing in their own work.

Preprints can significantly accelerate the pace of scientific discovery. Stephen Quake has modeled the effects of publishing preprints on overall research productivity [39]. Using conservative assumptions, Quake suggests that the widespread use of preprints could accelerate scientific discoveries by up to seven times over a ten-year period. Therefore, we recommend adopting preprinting to accelerate the dissemination and cumulative advancement of scientific knowledge.

One of the criticisms of preprints is the publication of multiple versions of the same study in the literature. This criticism is related to the difficulty of linking different types of research outputs associated with the same study, such as datasets, methodological materials, analysis scripts, and preregistrations. In principle, this linkage can be established using structured metadata fields in identifiers like the Digital Object Identifier (DOI) that capture the relationships between versions or related outputs. However, while such linkage is technically feasible and partially implemented, particularly within well-integrated infrastructures like Crossref [40] and Europe PMC [41], the widespread adoption of standardized metadata practices and seamless interoperability across platforms remains a work in progress. Systematically referencing related outputs within each material, such as citing the preprint in the final article, would significantly improve traceability and integration.

Peer-reviewed preprints: Peer-print articles

In the past decade, preprint-first initiatives have emerged (e.g., Peer Community In [42], Review Commons [43], PREreview [44], MetaROR [45]). These initiatives have organized the free and public peer review of preprints, independently of a journal submission. As such, these initiatives make preprints the central object of scholarly evaluation. When a preprint has been peer-reviewed, the core scientific evaluation process *per se* is completed, making journal publication secondary or optional. Therefore, we recommend that peer-reviewed preprints, sometimes referred to as peer-print articles, be recognized as finalized scientific outputs by scientific communities, academic institutions, and funding agencies, on the same level as traditional peer-reviewed articles.

This publishing model decouples the act of sharing findings from formal publication. Researchers first post a preprint, then receive peer review through independent platforms, and finally, the work may be curated or recommended by scholarly communities or journals. Notable examples contributing to this Publish-Review-Curate [46] model include Peer Community In (PCI) [42] and MetaROR [45], where expert communities provide publicly accessible reviews and recommendations for preprints, and Review Commons [43], which offers journal-independent peer review in the life sciences and facilitates direct transfer to partner journals.

Another benefit of this model is that it reduces the duplication of peer review for a single study, which occurs when a manuscript is rejected and then resubmitted to another journal – a sequence that may be repeated multiple times before eventual acceptance. By centralizing peer review around the preprint and making it public, this approach reduces the overall reviewing burden on researchers and contributes to addressing the ongoing peer-review crisis.

This model promotes transparency, accelerates knowledge transfer, empowers our communities of researchers, and reduces pressure on the peer-review system. Therefore, the academic system should promote the initiatives supporting this system and encourage researchers to use them.

Publishing considerations to support equitable and effective open access

Publishing is endorsement: Reinforcing venues that align with scholarly values

When choosing where to publish their work, whether in a journal, a preprint server, or a data repository, authors should consider how their submissions support the long-term sustainability and recognition of that venue. Journals rely on a steady flow of quality submissions to remain viable. Without these submissions, journals and platforms may struggle to operate or cease to exist altogether. In contrast, venues that receive a high volume of submissions can increase their visibility and strengthen their reputation. Each published article not only contributes to the advancement of knowledge but also, implicitly endorses the journal itself, along with its specific publishing model and the publishing group that owns it.

When deciding where to submit a manuscript, the journal's business model and, more broadly, its publication ethics should be considered important criteria [47]. To support and strengthen a publishing system that not only disseminates knowledge but also contributes to reinforcing the academic ecosystem, we recommend that researchers prioritise publishing their work in venues owned and governed by the scientific communities such as journals published by scholarly, clinical, or patient-led not-for-profit societies. Some of these venues adopt a diamond access publishing model (e.g., Advances in Rehabilitation, European Rehabilitation Journal) or require only minimal APCs to cover essential operational costs, such as editorial tools and hosting platforms (e.g., Open Journal Systems by PKP) [48]. In other cases, national organizations cover the APCs on behalf of authors, paying them directly to for-profit publishers (e.g., Chiropractic & Manual Therapies; Journal of Physiotherapy). When publishing in such venues is not feasible, we recommend publishing with not-for-profit entities (e.g., PLoS). Finally, publishing in journals owned by for-profit publishers that operate independently of the academic system should be considered a last resort. While such journals may still serve the function of disseminating knowledge, they do so at the cost of diverting financial resources away from the scholarly community and towards commercial interests. This commitment to research ethics could extend to citation practices: when multiple references are equally relevant, citing articles from non-profit journals would help enhance their visibility [49].

Reproducibility and transparency over novelty

While novelty is important, scientific knowledge is only reliable if results are reproducible, which should therefore be more strongly emphasized and valued. Reproducibility depends on transparency, which relies on practices such as preregistration, registered reports, preprints, and the public sharing of material, data, and analysis scripts. Notably, statements claiming data are "available upon request" have proven ineffective – more than 9 out of 10 requests go unanswered or are denied [50]. Reproducibility also requires clear and formal references to the material, software, and packages used in a study, which not only enhances reproducibility and transparency but also ensures proper credit for the researchers who invested time and effort in developing these resources. As open science practices enhance research quality, they should be supported and rewarded.

Moreover, negative or null results are just as meaningful to scientific knowledge as positive findings. They help reduce publication bias and ensure a more accurate and complete scientific record. Accordingly, the publication of null results and replication studies should be encouraged to foster a more trustworthy and robust body of scientific knowledge.

Contributorship rather than authorship

The criteria set by the International Committee of Medical Journal Editors (ICMJE) for authorship in scientific articles [51] often do not fully recognize all individuals whose contribution make a study possible. We believe that the Contributor Roles Taxonomy (CRediT) [52] and the Method Reporting with Initials for Transparency (MeRIT) [53] approaches are suitable for the multidisciplinary and specialized nature of contemporary research, and recommend their adoption. By explicitly detailing each contributor's role in a dedicated section, these approaches enable a more inclusive model of authorship that acknowledges all contributors in the author line. This approach better recognizes meaningful contributions, including those of students and research staff responsible for tasks such as data collection or technical support, which are essential to the success of a study.

Journal Impact Factor should be eliminated

We consider the journal impact factor (JIF) to be an inappropriate criterion for determining where researchers should publish their work. This metric enables for-profit publishers to uphold their market power in scholarly communication and justify APCs that are often disproportionate to the operational costs of running a journal [54]. Continued reliance on this metric for evaluating research outputs has financial implications for institutions, particularly those in countries with limited research funding, and ultimately reinforces global inequalities in both the production of and access to knowledge.

The JIF has several well-documented flaws. Citation distributions within journals are highly skewed, meaning a small number of highly cited articles can disproportionately inflate a JIF, while most articles receive far fewer citations [55, 56, 57]. The JIF is also vulnerable to manipulation through editorial policies, such as encouraging citation of the journal's or publisher own articles [58] and increasing the number of ineligible article types that contribute citations but are excluded from the denominator in JIF calculations [59]. Moreover, the data used to calculate the JIF are neither transparent nor openly available to the public [60, 61, 62].

For these reasons, we recommend eliminating the use of the JIF in decisions related to funding, hiring, and promotion. This recommendation aligns with the Declaration on Research Assessment (DORA) [63], which has been signed by over 26,850 individuals as well as multiple funding agencies, universities, and other organizations.

Avoid predatory and controversial journals

Predatory journals are characterized by the requirement for authors to pay an APC often without the promised return of services, such as the absence of preservation practices (i.e., practices ensuring that articles remain available, accessible, and citable in the long term), the lack of Digital Object Identifiers (DOIs), misleading claims about indexing and impact factor, and no or sham peer review. Such outlets cannot be considered part of legitimate scholarly publishing; rather, they represent an exploitative business model that drain resources from the academic system.

There also exist controversial journals that do include preservation practices, DOIs, indexing and impact factor, and recognizable peer-review workflows (e.g., they have an editorial board, invite reviewers, and provide editorial decision). However, they are characterized by dubious practices

that raise concerns, such as excessively rapid peer reviews and an excessive number of special issues [64]. These journals thrive in the pay-to-publish model (gold OA with APCs), where profitability increases with volume, often at the expense of research quality, with peer review becoming a mere formality [65, 66]. One tactic involves inviting researchers to serve as guest editors for special issues [67], effectively turning them into unpaid sales agents. These guest editors may feel pressured to solicit submissions – often with high fees – to avoid underfilled issues. We recommend that researchers think carefully before accepting such invitations. We also recommend avoiding both predatory journals, which lack the foundations of scholarly publishing, and controversial journals, whose practices raise significant concerns about rigor and quality.

Informing students and researchers about predatory and controversial journals is essential to help them develop awareness, prevent inadvertent support of their exploitative practices, and safeguard the integrity and quality of scholarly research.

Conclusion

Scientific publishing is at a critical crossroads. While digitization has accelerated and broadened the dissemination of knowledge, it has also amplified structural inequities in access to and participation in research. Pay-to-publish models impose financial and temporal constraints on readers and authors, undermining the principles of open science.

To democratize both access to, and production of, knowledge, we recommend greater recognition in applications for academic positions, promotions, and research funding for open scholarship practices that use equitable pathways, such as diamond open access journals and self-archiving. Research sharing practices continue to evolve in response to changing funder mandates, global epidemics like COVID-19, and developments in the scholarly publishing landscape, such as open infrastructure and initiatives like DORA [63], DIAMAS [68], and COARA [69]. For example, preprints and peer-reviewed preprints (also known as peer-print articles) have been on the rise [70, 71], influencing new publishing models, like Publish-Review-Curate [46]. These practices offer compelling alternatives that should be actively supported, recognized, and rewarded by scientific communities, academic institutions, and funding agencies.

We urge scientists to remain vigilant and critically engaged with the evolving landscape of scientific publishing. Increasingly common open access agreements, such as Transformative Agreements [30], create the illusion that publishing in pay-to-publish journals is free for authors. However, the absence of direct payment by authors does not eliminate these costs; instead, they are absorbed by institutions and rendered invisible to researchers. This dynamic further reinforces unsustainable publishing models and drives up institutional costs, exacerbating disparities between well-funded and under-resourced institutions in their ability to contribute to knowledge production. Many libraries enter into these agreements not out of preference, but because there are few viable alternatives supported or incentivized within the current academic publishing system. The university community is often attached to models of publishing that are driven by prestige. Until there is a broader willingness to adopt and reward practices such as sharing work via preprints, peer-print articles, or publishing in diamond open access venues, the trend towards hybrid and transformative agreements is sadly likely to persist.

To navigate this complexity, we recommend researchers build publishing literacy by learning about the various publishing models and adopting values-based dissemination strategies within their teams. Discussing publishing goals early in the research process can help guide decisions and guard against deceptive practices, such as those used by predatory or controversial journals. There are many resources to guide researchers in navigating publishing. For example, the Principles of Transparency and Best Practice in Scholarly Publishing [72] and think.check.submit [73] provide concrete advice in navigating ethical practices that adhere to research integrity.

To foster a more transparent and inclusive research ecosystem, evaluation practices must shift away from journal-based metrics and toward the diversity, reproducibility, and openness of scientific contributions. This includes adopting contributorship models, valuing negative and replication findings, and eliminating reliance on the JIF in hiring, funding, and promotion decisions.

Publishing is not just a means for disseminating research, it is an endorsement of the systems and values that underpin scientific knowledge production. Supporting publishing models that prioritise equity, rigour, and the collective advancement of science is essential to building a more just and effective scholarly ecosystem.

Statement and declaration

Authors' contribution

Leigh-Ann Butler: Writing (Original Draft), Visualization, Writing (Review and Editing); Matthieu P. Boisgontier: Conceptualization, Writing (Original Draft), Visualization, Writing (Review and Editing).

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Competing Interests

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