

Global Thinking

ON-MERRIT recommendations
for maximising equity in open
and responsible research



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Title: **Global Thinking:**

ON-MERRIT recommendations for maximising equity in open and responsible research

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This report was created by the ON-MERRIT project.

ON-MERRIT is an EC-funded project (Oct 2019-Mar 2022) to investigate how and if open and responsible research practices might worsen existing inequalities. Our multidisciplinary team uses qualitative and computational methods in order to examine advantages and disadvantages in Open Science and Responsible Research & Innovation (RRI).

Find out more: <https://on-merrit.eu/>



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Executive summary

Open and responsible research has the potential to profoundly alter the who, what, why, when and how of knowledge-creation. Yet it is not a destiny. The ways we implement change today will have long-lasting consequences for the kind of open and responsible research ecosystem we inhabit tomorrow. For that future to be one more equitable than today's world, critical consideration must be given to the ways in which agendas of openness are shaped by those in positions of power and privilege, and might hence reflect or even reinforce global dynamics of inequity.

ON-MERRIT is an EC-funded project to investigate dynamics of cumulative advantage and threats to equity in the transition to Open Research and Responsible Research & Innovation (RRI) across a range of stakeholder categories (in particular for those at the periphery) and multiple dimensions of Open Research, as well as its interfaces with industry and policy. Our results found many areas of concern, from which we identified four key areas of risk:

- **Resource-intensity of Open Research:** Putting open and responsible research into practice requires considerable resources (including infrastructures, services, and training). The structural inequalities that exist within institutions, regions and nations, and on a global scale, create structural advantages for well-resourced actors and structural disadvantages for less-resourced actors, in terms of capacity and ability to engage in these practices.
- **Article processing charges and the stratification of Open Access publishing:** The article processing charge (APC) model within Open Access publishing seems to discriminate against those with limited resources (especially those from less-resourced regions and institutions). These facts seem to be having effects of stratification in terms of who publishes where.
- **Societal inclusion in research and policy-making:** Open and responsible research processes take place within broader social systems where inequalities continue to structure access and privilege certain actors while others are disadvantaged. Despite laudable aims of equity, inclusion and diversity in open and responsible research, the most marginalised, vulnerable, and poor remain mostly excluded.
- **Reform of reward and recognition:** Institutional processes for reward and recognition not only do not sufficiently support the uptake of open and responsible research, but often get in the way of them. This disadvantages those who wish to take up these practices (putting early-career researchers especially at risk).

In response, we worked with a co-creation community of stakeholders to develop recommendations for funders, research institutions and researchers to take action to mitigate these threats. Those recommendations, presented here, spotlight dynamics of equity, especially as they relate to the need for truly open and shared infrastructures, services, and training, as well as the centrality of aligning rewards and recognitions to foster open and responsible practices. They also underline the need for global thinking in two senses of that term: greater shared understanding and dialogue amongst stakeholders from across the world and joined-up approaches which target reform of the research ecosystem as a whole. In highlighting these issues, we do not aim to imply that Open Research is anything other than the right direction of travel. However, given its commonly held aim of increasing equity, any potential for Open Research to actually drive inequalities must be taken seriously by the academic community in order to realise the aim of making science truly open and collaborative, and ensuring success in research is based, in the end, on merit.

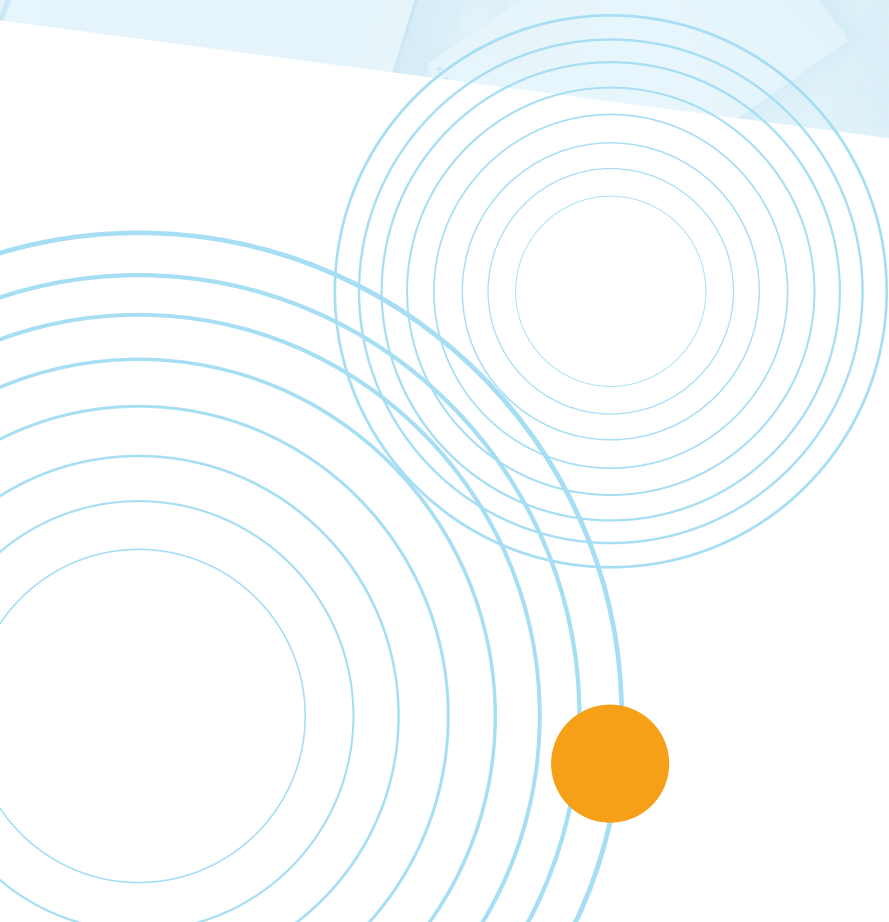


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Introduction





Introduction

Open Research¹ holds the promise to make scholarship more inclusive, participatory, understandable, accessible and re-usable for large audiences. Increasing equity has been a commonly-stated aim (amongst many others) of Open Research since its inception. The stirring language of the foundational 2002 Budapest Open Access Initiative, for example, claimed Open Access could share learning between rich and poor and “lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge” (“Declaration of the Budapest Open Access Initiative” 2002). Nielsen’s seminal *Reinventing Discovery* devotes a chapter to the ways in which networked Open Research is ‘democratizing’ research. (Nielsen 2013). More recently, “increased equity” was listed as a “key success factor” for Open Research by a stakeholder-driven study (Ali-Khan et al. 2018), while another study stated that “Open science principles of openness and transparency provide opportunities to advance diversity, justice and sustainability by promoting diverse, just and sustainable outcomes” (Grahe et al. 2020).

However, making processes open will not per se drive wide equity in terms of reuse or participation unless also accompanied by the capacity (in terms of knowledge, skills, financial resources, technological readiness and motivation) to do so. These capacities vary considerably across regions, institutions and demographics. Those in possession of such capacities are advantaged, with the effect that the potential for Open Research to foster inclusivity is put at risk by conditions of “cumulative advantage” (the so-called “Matthew effect”) (Ross-Hellauer et al. 2022).

ON-MERRIT (Observing and Negating Matthew Effects in Responsible Research & Innovation Transition), funded by the European Commission from October 2019 to March 2022, has investigated these dynamics using qualitative and computational methods. We have examined advantages and disadvantages in Open Research and Responsible Research & Innovation (RRI) across a range of stakeholder categories (in particular for those at the periphery) and multiple dimensions of Open Research, as well as its interfaces with industry and policy. Our results have indeed found many areas of concern.² From this, we have distilled four key areas where we argue that Open Research is particularly at risk: the resource-intensity of Open Research; article processing charges (APCs) and the stratification of Open Access (OA) publishing; societal inclusion in research and policy-making; and the reform of reward and recognition practices to foster the expansion of Open Research.

¹ We use the term ‘Open Research’ rather than ‘Open Science’ to be inclusive of research that is not strictly “scientific” in nature (as that word is sometimes understood in English), i.e., to include knowledge-production work conducted within the arts, humanities and social sciences.

² ON-MERRIT results are available via our website: <https://on-merrit.eu/results/> and archived at: <https://zenodo.org/communities/on-merrit>.

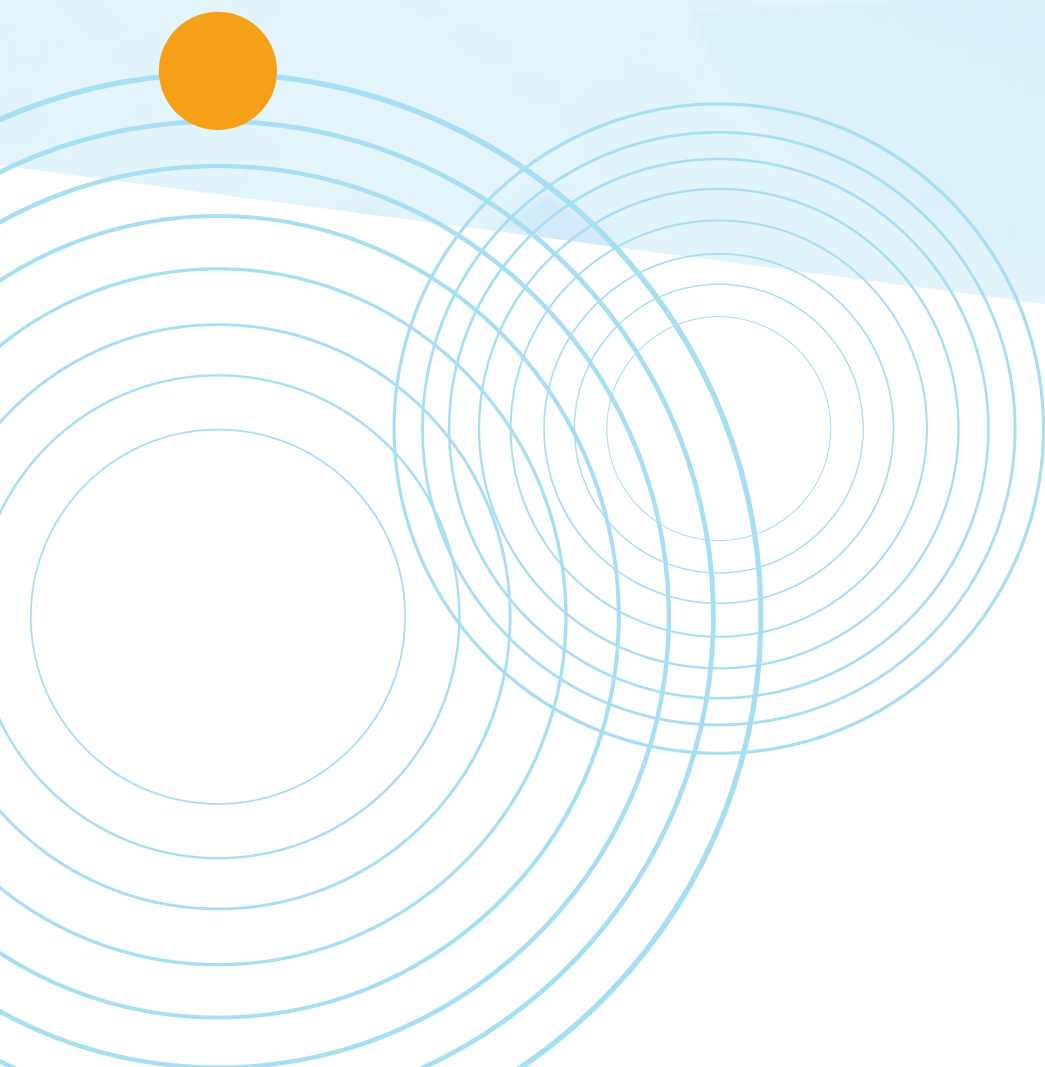
In this briefing, we present an overview of each issue alongside recommendations to mitigate their effects. We developed these recommendations through a co-creative process designed to produce recommendations that are valid and viable to members of the stakeholder groups to which they are addressed (funders, research institutions and researchers). This engagement with our co-creation community used a modified Delphi method (Linstone and Turoff 1975) to gather first recommendations, centred on the four topic areas, using an online survey tool that was distributed to targeted respondents from each stakeholder group. Then, we hosted a series of workshops (one per stakeholder group) to discuss and debate the recommendations submitted by the participants, as well as those offered by us. These recommendations then went through several more rounds of debate and revisions, including via voting for inclusion or revision using another online survey, a final workshop, as well as internal rounds of revision.

These recommendations are targeted at funders, research institutions and researchers as the three groups most closely affected by these issues and best positioned to take action in response to them. However, change requires action from a variety of actors, including governments, civil society actors, industry and publishers. We recognize this and also recognize that some of the recommendations that follow implicate action among these other actors. In particular, governments have a crucial role in ensuring this agenda is supported through their policies which should seek to maximise academic and scientific understanding amongst their populations, while publishers of scholarly work should also act in responsible ways oriented to equity and not merely profits.

Through the process of co-creating these recommendations, themes emerged which we identify as the need for “global thinking” in two senses of that term. Firstly, the issues we address desperately need greater shared understanding and dialogue amongst stakeholders from across the world. As an overarching recommendation, we therefore encourage all stakeholders to (further) participate in global initiatives to create shared visions for Open Research and RRI. Such dialogue will aid in setting mutual expectations and responsibilities. Secondly, thinking should be “global” in the sense of joined-up approaches which target reform of the research ecosystem as a whole and not mere atomistic policy actions targeting specific aspects of open and responsible research. Although we present each issue separately, all issues were discussed in our meetings together and their implications for each considered within our revisions.

Finally, we acknowledge that ON-MERRIT, as an EC-funded project, has a European standpoint. While our recommendations have been written via a co-creative process with global actors, and with global implications in mind, we nonetheless concede our standpoint may influence our positions. The recommendations are, however, written in a way that allows for broad applicability, leaving it up to the relevant actors to determine how to implement them.

The resource-intensity of Open Research





The resource-intensity of Open Research

Putting Open Research into practice requires considerable resources, be they economic, institutional, or social/cultural in nature. The inequalities that exist between institutions, nations, and world regions create structural advantages for well-resourced actors in terms of their ability to engage in Open Research practices.

Background

Empowering researchers to take up Open Research requires considerable investment to train and support researchers, as well as to provide them necessary infrastructures for, to name a few, effective research planning, data-hosting and sharing, and publication of results. Even in well-resourced regions such as Europe (Tenopir et al. 2017; Peter et al. 2018) and the USA (Tenopir et al. 2014), readiness-levels of training and support infrastructure among nations and institutions are highly diverse. These disparities are, of course, even greater in what Siriwardhana (2015) terms 'resource-poor' settings. Given that Open Research practices depend on underlying digital competences (Steinhardt 2020), the continuing realities of the digital divide (Maiti, Castellacci, and Melchior 2019) have real effects on participation in an Open Research world (Chin, Ribeiro, and Rairden 2019).

For example, data inequalities can persist, even in an open environment, when less-resourced researchers (and other actors) lack access to the skills, money, and computing power (Johnson 2018) required to benefit from Open Data. Edelenbos et al. (2018) argue that Open Data "are particularly accessible to research institutes with more budget." Those working in environments where resources are in short supply are hence at a disadvantage (Rappert and Bezuidenhout 2016; Bezuidenhout et al. 2017; Bezuidenhout et al. 2017). Hence, increasing evidence suggests that instead of levelling the playing field, Open Data could in some ways further empower those already advantaged (Cinnamon 2020; Carroll, Rodriguez-Lonebear, and Martinez 2019; Kitchin 2013).

That transparency in research is increasingly becoming a benchmark for quality (Leonelli 2018) may also create cumulative disadvantage for those who lack the resources to participate in open methods practices, by sharing analysis code, lab notebooks or pre-registering analyses.

Training as a means to make the transition from policy and engage researchers in open and responsible research practices has been acknowledged as a core element of programmes that promote Open Research and RRI since their inception (Directorate-General for Research and Innovation 2016; Ignat and Ayrís 2020) and is

one of the eight ambitions of the European Commission’s Open Science Policy.³

Yet, recent research has found that researchers are largely unaware of international Open Research initiatives and that their awareness-levels of Open Research remain somewhat low (Berg et al. 2017). The same study also found that researchers lack training courses, support from their institutions, institutional/funding guidelines and support for practising Open Research. Institutional support is therefore key to Open Research adoption and expansion (Ignat and Ayris 2020).

ON-MERRIT’s contribution

We studied current institutional structures for open and responsible research training and their relationship to current levels of adoption of these practices with a two-pronged approach. We conducted an international survey of practices and opinions amongst active researchers, as well as the institutional support they had for these practices; and, we conducted in-depth interviews with representatives responsible for training provision in 11 institutions across three continents to identify the support, drivers and barriers to open and responsible research from an institutional point of view.

We found that there is awareness about the importance of Open Research and RRI as ways to increase transparency, collaboration and openness in research, yet a disconnect between awareness and actual uptake. We also found that training for researchers, especially regarding Open Access, Open Data, Open Research, Licensing, and Open-Source Software is low, and that there is little integration of Open Research topics into formal curricula of master’s or doctoral courses. Institutions report that the availability of qualified research support staff is an important constraint in addressing the challenges of Open Research training delivery (Correia et al. 2021).

To mitigate these issues, with our co-creation community, ON-MERRIT has developed the following recommendations.



Funders



Institutions



Researchers

The icons on the left indicates to whom each recommendations applies.

³ https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/open-science_en#the-eus-open-science-policy

Recommendations

Recommendations



1. Funders, institutions and researchers should encourage and support the use of sustainable, shared Open Research tools, training materials, and infrastructure, to foster inclusivity, reduce costs and promote open standards.

Good services require human and financial resources. More equitable distribution of access to such services would be helped through greater emphasis on sharing of infrastructure and materials.



2. Funders, institutions and researchers should strategically prioritise collaboration and partnership with less-resourced regions/institutions, to build knowledge of and capacity for Open Research via direct exchange of knowledge and resources amongst actors and communities of practice.

Collaboration is an important way to bridge the resource divide and support the continued development of Open Research amongst all stakeholders. Through mechanisms including multi-site projects, twinning of institutions, cross-national alliances and researcher exchange, closer collaboration between institutions with differing levels of resources across the globe could be encouraged. Existing platforms should be leveraged to enable this wherever possible. Such collaborations should be constructed in such a way that partners in less-resourced institutions are equal actors. Existing guidelines regarding equitable collaboration, including the “Global Ethics Code to promote equitable research partnerships”⁴ and the “Consensus statement on measures to promote equitable authorship in the publication of research from international partnerships”⁵, should be followed.

⁴ <https://www.globalcodeofconduct.org/>

⁵ <https://doi.org/10.1111/anae.15597>



3. Funders and institutions should require Open Research and RRI practices wherever appropriate and support the associated costs.

The transition to Open Research is far from complete. Policies have been, and will continue to be, an important lever for change. However, while transparency and openness are generally desirable across disciplines, specific open practices may not be equally appropriate everywhere. Policies must continue to reflect this. In addition, institutions and funders that require Open Research should make clear how they will support these activities.



4. Funders and institutions should provide basic and advanced training courses on Open Research and RRI tailored to specific contexts (including disciplines, career-stage and specific research areas), investing in more trainers to directly support researchers and making training materials open to anyone who may wish to use them.

Training and awareness-raising continue to be key to the uptake of Open Research. Resources should be made available for this, and wherever possible, implementation plans and materials should be shared to foster more equitable access to training. Researchers should commit to attending such training wherever available. Funders and institutions should continually evaluate the effectiveness of training, share evaluation findings with others, and revise training based on those findings.



5. Funders and institutions should encourage and support maximal transparency regarding the costs associated with Open Research practices. Additionally, they should support research to understand the costs associated with not doing Open Research to create a baseline for understanding the economic impacts of Open Research.

There is a lack of information about the costs of implementing Open Research practices and of how these compare to the costs of mainstream research practices. More transparency on costs associated with open and non-open practices is needed to be able to assess the economic implications of Open Research.



6. Funders and institutions should commit resources to (meta-)research to investigate and monitor equitable uptake of Open Research and RRI globally, and expand or develop (open) infrastructures to sustainably enable this meta-research.

Differences in levels of investment in and uptake of Open Research practices will shape outcomes. The research community should take a research-led approach to this issue and commit to further investment in meta-research to study potential negative effects, especially on traditionally disadvantaged actors. In addition, open infrastructure (e.g., bibliographic databases) essential for this work should be sustainably funded to enable the reproducibility, transparency and equity of such meta-research.

Article processing charges and the stratification of Open Access publishing





Article processing charges and the stratification of Open Access publishing

The article processing charge (APC) model within Open Access publishing seems to discriminate against those with limited resources (especially those from less-resourced regions and institutions). These facts seem to be having effects of stratification in terms of who publishes where.

Background

Open Access to research publications (OA) is often hailed as a democratiser of access to knowledge (Fitzpatrick 2011). It is also framed as boosting return on investment (Mayer 2013) and as a solution to unequal access to information across regions (Nwagwu and Ahmed 2009; Bawa 2020; Koutras 2020; Arunachalam 2017; Raju, Claassen, and Moll 2016; Koutras 2015) and disciplines. And, the model benefits authors by giving them citation advantages (Tennant et al. 2016; Ottaviani 2016). Since its introduction, two main routes to OA have emerged: publishing in OA journals (“Gold OA”) and author self-archiving of non-OA publications in OA repositories (“Green OA”).

Gold OA is supported by a variety of business models, including consortial funding (also called “Diamond OA”, see Fuchs and Sandoval (2013)) or volunteer labour (Moore 2019), but many OA journals and publications are funded by article processing charges (APCs). The APC-model is controversial since the benefit of OA (free readership) is offset by a new barrier to authorship for those who cannot afford the high fees. In this regard, the extent to which OA policy has been driven by richer nations risks reshaping scholarly communications to enable access but still foster exclusion. Since the costs of APCs are usually paid by institutions or research funders (via project funding), those with fewer resources are disadvantaged (Siriwardhana 2015; Raju et al. 2020).

APC-based OA hence risks stratifications of publishing as well-resourced researchers can cover even the highest APCs while less-resourced researchers cannot (Pourret et al. 2020; Boudry et al. 2019; Siler et al. 2018; Batterbury 2017; Sotudeh and Horri 2008; Gray 2020; Christian 2008; Davison et al. 2005; Eilers, Crowther, and Harvey 2017; Tennant and Lomax 2019; Monge-Nájera and Monge-Nájera 2018). Even in well-resourced areas like the UK, the rising cost (Copiello 2020) of APCs is recognised as an issue which will mitigate OA’s net benefits (Jubb et al. 2017).

In particular, costly APCs are a risk to early career researchers, researchers from less-resourced regions, and those with limited English competence—the latter groups being most likely to fall prey to costly but low-quality predatory publishers that have invaded the OA market (James 2017; Nnaji 2018; Soler and Cooper 2019; Allman 2019; Noga-Styron, Olivero, and Britto 2017; Kurt 2018). High APCs may even discriminate against women, who seem more likely to take cost into account when selecting publication outlets (Niles et al. 2020).

APCs also serve to exclude researchers in the Social Sciences and Humanities, who receive less research funding relative to the ‘hard’ sciences (Eve 2014). It is particularly troubling that publishers typically charge more for high impact journals (Gray 2020; Tennant and Lomax 2019), given the persistent (though problematic) association between journal prestige and perceived publication quality (Ferrer-Sapena et al. 2016). Such stratifications in publishing, favouring traditionally-advantaged actors, will only exacerbate historical inequalities (Garuba 2013) and undermine the wider aims of Open Research. We therefore agree with Czerniewicz (2015), who argues that such consequences are the result of too narrow a focus on achieving OA per se, by whichever means, without acknowledging “the inequitable global power dynamics of global knowledge production and exchange”. Given such issues, many have begun to advocate for increased investigation of sustainable APC-free models of OA publishing (Bosman et al. 2021).

ON-MERRIT’s contribution

The ON-MERRIT team used scientometric methods to identify, measure and assess effects of cumulative advantage in Open Research and RRI. A key part of this was to study how the uptake of OA publishing affects existing hierarchies within academic publishing across research related to three UN Sustainable Development Goals (Zero Hunger, Good Health and Well-Being, and Climate Action). We found that well-resourced actors in these research areas publish OA more frequently, and in journals with higher APCs (on average) than those from less-resourced regions and institutions. We therefore concluded that the higher ranked, more prosperous and more prestigious institutions appear best able to adopt, adapt to, and benefit from the evolving landscape of Open Access publishing. This means that persistent structural inequalities in contemporary academic publishing are not necessarily remedied by the Open Access movement, with specific trends such as APC-based OA publishing potentially exacerbating dynamics of cumulative advantage. If research on key global issues is only driven by well-resourced actors, it risks being oblivious to challenges faced by societies and communities less embedded into the global production of knowledge (Pride et al. 2021).

To mitigate these issues, with our co-creation community, ON-MERRIT has developed the following recommendations.

Recommendations



1. Funders, institutions and researchers should collectively demand greater transparency from publishers on publication costs, regarding prices and services, and (where possible) support open infrastructures to collect this information.

To counter concerns about the rising costs of article processing charges, and to foster greater awareness of the true costs of publishing, more transparency regarding costs should be demanded from providers of publishing services and platforms. Such demands will work best collectively, and should be supported by infrastructures to synthesise this information.



2. Funders, institutions and researchers should support alternative publishing models where those show potential to be more inclusive, including consortial funding models for open publishing infrastructures which support Open Access publishing with no author-facing charges.

Alternative models to support Open Access journals which include no author-facing charges, including consortial-funding models or “Diamond Open Access”, should be strongly supported to spread costs amongst institutions and funders.



3. Funders, institutions and researchers should encourage and support the use and maintenance of sustainable, shared and open source publishing infrastructure, to reduce costs and promote open standards.

Community-led open source infrastructure initiatives are key elements of creating an equitable and affordable system for Open Access publishing. Stakeholders should support such initiatives commensurate to the value they demonstrate in lowering costs and enabling more equitable publishing. Such services should empower a flexible, interoperable publishing ecosystem which harnesses the potential for distributed and shared services including publishing platforms, repositories, preprint servers and review services.



4. Institutions and researchers should ensure the accepted version (or later) of peer-reviewed works are deposited in an open repository.

Author self-archiving through deposit of publications in repositories remains a crucial route to Open Access, especially for those for whom access to funds for APCs is limited. Institutions can assist authors in self-archiving and should ensure repositories adhere to accepted standards (e.g., use of persistent identifiers and agreed metadata standards) to ensure the discoverability of content. In addition, the rich potential for repositories and preprint servers to act as the base content-layer for a myriad of research outputs, upon which added-value services for review, curation and dissemination can be built, should be further explored.



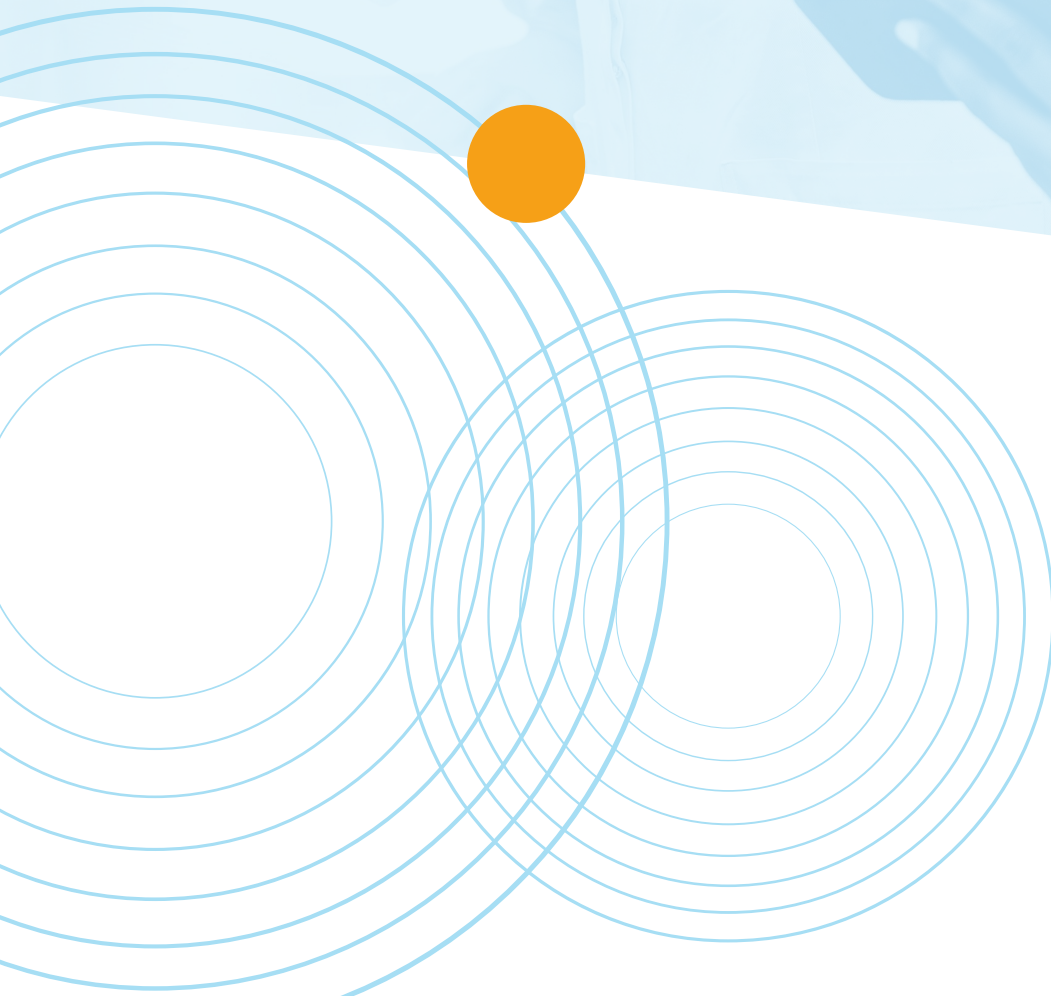
5. Funders and institutions should consider supporting authors' right to self-archive publications by implementing rights retention strategies.

Authors can be supported to assert their rights to self-archive through rights retention strategies such as the “Rights Retention Strategy”⁶ and “ZeroEmbargo on Publicly-Funded Scientific Publications”⁷. In supporting such actions, care should be given to support, especially, early career researchers to understand the issues and in negotiations with publishers.

⁶ <https://www.coalition-s.org/rights-retention-strategy/>

⁷ <https://libereurope.eu/press-release-model-law-zero-embargo/>

Societal inclusion in research and policy-making





Societal inclusion in research and policy-making

Open Research and RRI both promise greater uptake of research by policy-makers and greater equality of access to processes of scientific knowledge production and policy-making. Yet, these processes take place within broader social systems where inequalities continue to structure access and privilege certain actors while others are disadvantaged. Physical access to research helps little where outputs remain cognitively inaccessible due to the relative impenetrability of scientific publications for lay publics. Contributing to this problem, we have found that institutional norms within research-funding and research-performing organisations often work against those who wish to broaden inclusion within knowledge production and at the science-policy interface. Despite the inclusive agendas of Open Research and RRI, the most marginalised, vulnerable, and poor remain mostly excluded.

Background

Literature that examines the relationship between scientific research and policy-making typically describes researchers and policy-makers as living in different and frequently incompatible worlds (Gollust et al. 2017). Policy-makers seek information that is timely, relevant, credible, and readily available (Head 2015). They struggle with knowledge management and appraisal of research outputs, in addition to a lack of resources, knowledge, and skills to utilise research. Research awareness is low, and few academics participate directly in the policy process. Rather than turning to scientific outputs, policy-makers prefer receiving information through personal networks (Reichmann, Wieser, and Ross-Hellauer 2020).

Open Research is meant to make “science more responsive to societal and economic expectations” (Directorate-General for Research and Innovation 2016) by bringing scientific research into closer contact with policy-makers and broader publics (Tennant et al. 2016; Olesk, Kaal, and Toom 2019; Willinsky 2003). Yet, research has found that achieving impact is a resourceful activity that requires far more time and effort than simply making research outputs OA, given that policy-makers, on the whole, do not read these materials. Further, given the stratification trends that we describe in the section on APCs, it stands to reason that more high-profile OA output from established actors may lead to further over-representation of knowledge produced by dominant groups (Hillyer et al. 2017; ElSabry 2017; Okune et al. 2016) and foster the continued exclusion of marginalised research voices in policy-making processes.

Shelley-Egan, Gjefsen, and Nydal (2020) argue that in contrast to RRI, which is rooted in participatory research traditions, Open Research’s ambitions are more pragmatically focussed in terms of engagement with the public.

Whereas “RRI’s approach to opening up extends an invitation to publics to co-define the aims and means of technical processes in order to increase their alignment with public values,” “Open Science restricts ambitions for opening up to adjustments and improvements to processes based on quality criteria ultimately rooted in the existing research system.” Open Research is thus seen as insufficiently critical of the value and direction of science. It is also seen as failing to fully appreciate “societal voices and citizens as legitimate conversation partners and beneficiaries of technology and knowledge.”

Overall, the evidence reviewed here suggests that Open Research is not living up to its promises of fostering inclusion of broader publics in scientific research, nor of facilitating greater use of scientific outputs in policy-making processes.

ON-MERRIT’S contribution

The ON-MERRIT team took a closer, empirical look at the relationship between research (open and closed) and policy-making, and the extent to which Open Research and RRI are able to include broader publics in processes of research and policy-making. We examined these by surveying policy-makers across the EU and by interviewing policy-active researchers about their experiences working with policy-makers.

Confirming existing research, we found that policy briefs and oral communication are policy-makers’ preferred ways of receiving information (Rodrigues et al. 2021). Therefore, Open Access to research is of little consequence to them and does not impact their uptake of it, however the understandability of research outputs matters greatly (Cole et al. 2021). We identified several other key factors that influence research uptake by policy-makers, including congruence between research aims and policy goals; research alignment with supranational policy positions (taken by the UN, OECD, EU, etc.); relationships between policy-makers and researchers that are based on trust and credibility; and upstream engagement of policy-makers in the research process (Cole et al. 2021). In terms of inclusion, we found that only a small group of researchers participate in policy-making processes and that this pool is shaped by notions of prestige and existing levers of inequality. Additionally, we found that while multi-stakeholder and participatory approaches to research have an inclusive effect, the world’s poorest and most vulnerable populations remain mostly excluded. Influencing this outcome, we found that institutional and scientific norms (e.g., reward and recognition practices) pose barriers to expanding inclusion in processes of research and policy-making (Cole et al. 2021).

To mitigate these issues, with our co-creation community, ON-MERRIT has developed the following recommendations.

Recommendations



- 1. Funders, institutions and researchers should support mutual understanding between all stakeholders (including funders, institutions, researchers and wider societal actors) regarding good practices and key challenges and opportunities in socially-inclusive research.**

Socially-inclusive research is currently not well supported by funders and research institutions, despite existing investments in Open Research and RRI. Those who conduct it (or wish to) often face hurdles and biases when applying for and using funding, and at the institutional and departmental level, where participatory research is considered 'soft' science and/or 'care work' by some. It is therefore critical that funders, institutions and researchers build upon existing frameworks and principles to develop a shared understanding of what socially-inclusive research is, why it is important, and how it can be supported and fostered.



- 2. Funders should fund research and engagement activities that broaden inclusion and diversity among researchers and among non-academic research collaborators.**

Only a limited number of researchers are able to participate at the science-policy interface and historic levers of exclusion like racism, sexism and classism (among others) work to privilege some while disadvantaging others. Within this context, researchers who collaborate with non-academic actors sometimes face bias and exclusion in policy-making settings due to the diversity of their teams. These factors significantly limit the range of researchers and other actors who are able to participate at the science-policy interface. Greater support for diversity within research teams is needed.



3. Funders, institutions and researchers should, where appropriate and possible, support and cultivate interdisciplinary research teams and networks that are demographically inclusive.

Research funders, institutions and individual researchers have the power to broaden diversity and foster inclusion in their research programmes. Interdisciplinary collaboration is an important and effective way of doing this, and focusing on ensuring demographic inclusivity will broaden the range of actors who are able to participate in research and at the science-policy interface.



4. Researchers should, where appropriate and possible, use open, accessible and inclusive research practices and produce open and understandable outputs, including in local languages where appropriate.

More can be done to make research accessible and understandable to everyone. Inclusivity in research and policy-making should happen across the lifespan of a project and outputs must be both physically and cognitively accessible (i.e., understandable) to be valuable to broader publics and especially relevant/impacted communities.



5. Institutions and researchers should, where appropriate, partner with civil society and community outreach organisations to foster public engagement and dialogue to inform their research agendas, with care to include under-represented demographics.

Inclusion of broader publics in research and policy-making requires time, money, and specific skills that may not be present in the existing research environment. Researchers are already overburdened and can only do so much within the remit of their jobs. Therefore, partnering, by researchers and by institutions, with already skilled, resourced and engaged organisations holds great potential.



6. Funders and institutions should support (open and sustainable) infrastructure that enables the findability and understandability of research for non-academic audiences.

Broader publics (e.g., the general public, policy-makers, industry) who are not trained in scholarly research, but stand to benefit from scholarly results, need ways to access this material (both physically and cognitively) and the knowledge of where to find it. The development of open and sustainable infrastructure to facilitate this is required.



7. Institutions and researchers should, where appropriate, partner with wider societal actors (civil society organisations, industry, etc.) in the translation and dissemination of understandable research findings and the mutual exchange of knowledge.

Cognitive accessibility of results is critical to Open Research. Yet, the communications norms of academic research generally make outputs inaccessible to non-experts. This is an area where partnership with non-academic organisations is fruitful, and allows for the production and dissemination of accessible outputs without overburdening researchers.



8. Funders, institutions and researchers should engage policy-makers to foster mutual learning and facilitate the use of research in policy-making processes, including the use of open resources.

Research shows that the uptake of science by policy-makers is more likely to happen when researchers engage with them to learn about their processes, goals and challenges. Communication with policy-makers should not be viewed as a one-way process, wherein researchers educate policy-makers, but should be a mutual learning experience that respects the autonomy of each.



9. Funders and institutions should support fora (including staff and resources) to facilitate knowledge exchange between researchers, policy-makers and publics, and training and preparation for working with policy-makers.

Truly Open Research requires greater engagement and exchange of ideas between researchers and other societal actors. However, researchers are, for the most part, not trained in how to work with policy-makers, nor do they necessarily have resources available to them to support public-facing work. Researchers require support and training to do this work, and the opportunity and spaces to do so.

Reform of reward and recognition





Reform of reward and recognition

Structures of reward and recognition within research-performing organisations and funders often do not support the uptake of open and responsible research practices. This could either disincentivise the uptake of these practices, or damage the career-prospects of those who commit to them.

Background

Despite recent initiatives to reform research assessment towards more holistic methods (including responsible use of research metrics), including The Declaration on Research Assessment (DORA)⁸ and the Leiden Manifesto for Research Metrics (Hicks et al. 2015), growing research demonstrates that institutional norms and practices at research-performing institutions and funders, do not sufficiently support the uptake of open and responsible practices, or even discourage them. In particular, it is claimed that current practices focus too much on quantitative measures over qualitative measures (Malsch 2014; Colavizza et al. 2020), with the misuse of quantitative research metrics, including the journal impact factor (JIF), among the most pressing issues (Adler, Ewing, and Taylor 2009; McKiernan et al. 2016; Rice et al. 2020; Walker et al. 2010; Vinyard and Colvin 2018; Niles et al. 2020; Blankstein and Wolff-Eisenberg 2019).

Researchers who wish to take up open and responsible research practices are hence potentially exposed to risk to their career prospects. Although research has demonstrated that Open Research can help researchers succeed (McKiernan et al. 2016), nonetheless perceptions are that such practices are not valued by promotion, review and tenure committees (Wilsdon et al. 2015) and lack institutional support (Peter et al. 2018). Niles et al. (2020) found that even though respondents publish in Open Access journals, they believe that their peers see more value in journal prestige (e.g., as measured by JIF) and bibliometrics. This disconnect between what individuals value and their perceptions of what is valued by others has been posited as one reason for the so-called “attitude-behaviour gap” between the words and actions of researchers when it comes to actually implementing Open Research (Köster et al. 2021).

ON-MERRIT'S contribution

The ON-MERRIT team assessed the extent to which open and responsible research activities are currently rewarded via promotion, review and tenure processes at research-performing institutions. By examining institutional policies from institutions across seven countries, we found that criteria related to open and responsible research remain rare and measures associated with quantification largely dominate.

⁸ <https://sfedora.org/>

Our international survey of active researchers confirmed that measures of quantification remain very important, with publishing in highly-regarded journals or conferences (as measured by metrics like JIF) reported by the overwhelming majority as being important in institutional policies. The survey showed that researchers value qualitative factors like collaboration, collegiality, mentoring and quality in the research process much more than was reflected in institutional policies (Pontika et al. 2021). Our findings hence show that researchers are ready for change. Yet as we look ahead to what those changes might be, we must be careful not merely to propagate the “tyranny of metrics” responsible for many of the ills within the current system. Simply introducing further indicators accounting for open and responsible research practices may do more harm than good. Norms, and not just indicators, must be changed for openness and responsibility to flourish.

To mitigate these issues, with our co-creation community, ON-MERRIT has developed the following recommendations.

Recommendations



1. Funders and institutions should support a change in assessment culture, moving beyond narrow quantitative indicators (e.g., of publication and funding acquisition) to value quality, openness (where appropriate), collaboration and responsibility in research, and recognise the full range of academic tasks.

Reform of research assessment to value open practices must come as part of a broader conversation about cultures of assessment, including a shift of focus from research outputs (i.e., publications) to broader research behaviours. The aim should not be to perform open practices per se, but to institutionalise these as part of standard research practice where appropriate. In addition, research as a collaborative activity could be better recognised if rewards were focused less on the performance of individuals and more on research teams.



2. Funders and institutions should make reward and recognition processes flexible to respect diversity in its many forms, including disciplinary differences, national assessment frameworks, institutional values and missions, and differing experiences and career trajectories related to gender, race/ethnicity, age, etc.

Multiple framework conditions (including differing levels of institutional autonomy, Open Research readiness-levels, disciplinary differences, research career stage, regional factors and demographic considerations such as gender) influence the potential for reform in academic reward structures in general, and towards better recognising Open Research practices in particular. Reform cannot aim at one-size-fits-all solutions.



3. Funders, institutions and researchers should collaborate with all stakeholder groups at local, national and global levels to define and implement reformed reward and recognition practices.

Achieving equitable change in rewards and recognition will require collaboration from actors across the spectrum. Given differences in disciplinary cultures, types of institutions, and local, national and regional regulatory frameworks, fora for collaboration should be encouraged at all levels in this regard. DORA, as well as the recently announced Paris Call on Research Assessment⁹ are examples of this.



4. Funders and institutions should encourage and support coordination activities to foster knowledge-sharing and awareness of best practices regarding reform of research assessment practices, especially between experienced and less-experienced actors.

Conversations regarding the need for reform are at different stages of advancement across regions, disciplines and institutions. Hence, those actors at the forefront of change should be encouraged to share their motivations for change and lessons learned through mutual exchange with others.



5. Institutions should designate institutional leaders or teams responsible for research culture and research improvement to guide reforms.

Leadership is important in setting the tone for, and motivating, change. Hence, to demonstrate the support of top leadership and sync change with broader institutional strategy, institutions should appoint leaders and teams to drive change.

⁹ <https://osec2022.eu/paris-call/>



6. Funders and institutions should implement inclusive processes towards reaching consensus on aims and means for reforming reward and recognition processes.

Although consensus is relative and total agreement likely unrealistic, the nuances of the debate on the need for change in reward and recognition processes mean that open debate, with the inclusion of all voices, should be encouraged wherever possible.



7. Funders, institutions and researchers should ensure that all relevant stakeholders, especially persons involved in hiring and assessment, are part of efforts to reform reward and recognition processes.



Continuing the previous point, once broad consensus on the aims of reform has been reached, it is essential that all stakeholders are part of achieving this change. The participation of those involved in making hiring and assessment decisions is especially pertinent.



8. Funders and institutions should ensure that all those involved in assessment processes are suitably trained in best practices, as collaboratively defined by all stakeholders.

Real reform will be achieved at the level of practice rather than policy. In order to ensure that equitable reward and recognition processes are implemented, adequate training for assessors is required.



9. Researchers should, where possible, lead by example with regard to Open Research and RRI and as part of a diverse and representative coalition, push for reform within their institutions.

Systematic change to reward and recognition of research is required, but individual researchers can push for change by putting reform on the agenda at their institutions or joining/setting-up networks across institutions (recognising, however, that those at different career stages have different possibilities for action and also that researchers face time constraints).



10. Institutions should ensure sustainable career pathways are available for research support staff facilitating Open Research.

Incentivising openness requires reform beyond just the careers of researchers. Open practices rely on a range of individuals working in supporting roles, including data stewards, trainers, and infrastructure developers. These new roles, often currently supported by short-term or project funds, require longer-term horizons to recognise their importance.



Conclusion

Open and responsible research has the potential to profoundly alter the who, what, why, when and how of knowledge-creation. Yet it is not a destiny. The ways we implement change today will have long-lasting consequences for the kind of open and responsible research ecosystem we inhabit tomorrow. For that future to be one more equitable than today's world, critical consideration must be given to the ways in which agendas of openness are shaped by those in positions of power and privilege, and might hence reflect or even reinforce global dynamics of inequity.

Here we have spotlighted four crucial areas for action. The recommendations compiled should be taken as a whole. As said in the introduction, open and responsible research needs “global thinking”, with international dialogue and joined-up policy approaches. The recently-adopted “UNESCO Recommendation on Open Science”¹⁰ is a very encouraging example of this, especially in emphasising common understanding as a basis for all other steps. Our recommendations complement this vision by spotlighting dynamics of equity, especially as they relate to the need for truly open and shared infrastructures, services, and training, as well as the centrality of aligning rewards and recognitions to foster open and responsible practices.

In highlighting these issues, we do not aim to imply that Open Research is anything other than the right direction of travel. We hope that the wider Open Research community will take these recommendations in the constructive spirit in which they are meant, as a springboard to help recognize and further address such issues. None of this is meant to diminish the aims of Open Research per se, or negate the good that it has the potential to bring. However, given its commonly held aim of increasing equity, any potential for Open Research to actually drive inequalities must be taken seriously by the academic community in order to realise the aim of making research truly open and collaborative, and ensuring success in research is based, in the end, on merit.

¹⁰ <https://en.unesco.org/science-sustainable-future/open-science/recommendation>



Co-creation community

These recommendations were drafted via a co-creation process with members of the stakeholder groups to which they are addressed (funders, research institutions and researchers). We gratefully acknowledge the contributions of all these community members, including those listed below, as well as those who advised they did not wish their name to be shared.

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