Combatting Predatory Academic Journals and Conferences

SUMMARY REPORT

iap SCIENCE HEALTH POLICY
the interacademy partnership

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Foreword

This is the summary of a full report prepared by the InterAcademy Partnership (IAP). IAP is a global network of over 140 science, engineering and medical academies that work together to support the role of science in seeking solutions to the world's most challenging problems. In 2020, IAP launched a two-year study on Combatting Predatory Academic Journals and Conferences, generously funded by The Gordon and Betty Moore Foundation (GBMF), and governed by an international working group supported by a professional secretariat.

The primary objective of the study was to identify practicable and effective interventions that can curb and help combat the concerning rise in predatory journals and conferences, and provide recommendations to key stakeholder communities to this effect. The Working Group has drawn evidence from a unique survey of academicians and researchers from all over the world; gained insights and perspectives from dialogues with global, regional and national practitioners from key stakeholder communities; and conducted an extensive literature review. An important outcome of these activities has been a better understanding of what is meant by predatory journals and conferences; the extent to which they have pervaded the global research community; and what can be done to combat them. The recommendations in this report are the views of the Working Group and not necessarily of IAP.

Rigorous peer review is a hallmark of IAP studies. We would like to thank the following reviewers for their constructive comments:

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1. Introducing predatory journals and conferences

Publishing and evaluation with peer review at its core are essential components of the scientific endeavour. Yet traditional academic publishing models, research evaluation and peer-review systems have never been entirely immune from exploitation and malpractice, with the risk of compromising the integrity of research and making the scholarly communication system vulnerable to overt commercial predation. While the digitisation of scholarly communication and ongoing development of open access models have undoubtedly revolutionised many aspects of scientific endeavour – creating exciting new avenues for the access, dissemination and production of knowledge - they have also, in some ways, exacerbated this predation. Shifting paradigms of research communication, evaluation, peer review, institutional rankings, metrics and business models, have created more space for predatory academic practices to take root and thrive.

This report focuses on predatory publishing (journals) and predatory conferences. Both are motivated by profit rather than scholarship, soliciting articles and abstracts from researchers through actions that exploit the pressure on researchers to publish and present their work to their peers. Features of these practices include, but are not limited to, rapid pay-to-publish or pay-to-present models without rigorous (or even any) peer review, fake editorial boards falsely listing respected scientists, fraudulent impact factors or metrics, journal and conference titles that are deceptively similar to those of legitimate ones, paid review articles that promote fake science, and aggressive spam invitations to solicit articles and abstracts, including outside of a researcher's own expertise.

Recent evidence puts the number of predatory journals at over 15,500 (Cabells Predatory Reports, 2022), with studies of, and opinions on, predatory publishing variable and expanding (Xia, 2021). In contrast, there is relatively little literature on predatory conferences, with much of it anecdotal (Nisha *et al*, 2020; Pecorari, 2021), but it has been suggested that predatory conferences may outnumber real ones (Grove *et al*, 2017; McCrostie, 2018). Originally affecting largely African and Asian academia (Bjork *et al*, 2020), predatory practices are now prevalent globally, growing fast in oil-rich countries in particular (Machacek & Srholec 2021)[1] and including the United States and Europe, with reputable institutions and senior academics also inadvertently scammed or knowingly complicit in their operations (Moher *et al*, 2017; Cobey, 2017). Arguably, the threat of predatory journals and conferences has been underestimated by many stakeholders because they are seen as a problem of young, inexperienced scientists or those in less developed countries (Xia *et al*, 2014), while dismissive attitudes amongst more established research and publishing communities may well have unintentionally assisted their growth.

The impact of predatory journals and conferences is contentious. The degree to which they service poor or misleading research (Brown & Lewis, 2021) or robust and trustworthy research (Shamseer, 2021), together with the extent to which this is then cited and used (e.g. Björk *et al*, 2020; Akca & Akbulut, 2021; Frandsen, 2017), will have significant bearing on the scientific, policy, societal and economic impact of predatory practices. In all cases, the efficiency, diversity and trustworthiness of the research enterprise are compromised.

The impact of the coronavirus (COVID-19) pandemic may be further cause for concern, as poor-quality research and unscrupulous actors capitalise on the confusion and urgency caused by the pandemic, as new norms of research management, communication and use play out. While the world is still focused on COVID-19, the authors of this report argue that the issue of predatory academic practices is not given sufficient attention by key stakeholders, and the risks to the scholarly community, academic publishing and ultimately public policy are profound, if left unchallenged.

1 This paper was controversially retracted in September 2021 but the authors continue to contest it (RetractionWatch 2021).

"Combatting predatory academic journals and conferences" is a two-year study led by the InterAcademy Partnership (IAP)[2], a key constituency of the global research community. The study has sought to improve the understanding of predatory journals and conferences, their prevalence and impact, the drivers fuelling them, and effective ways to combat them. The study complements other work on this important issue by taking a truly global perspective, exploring drivers or root causes, and being process rather than product oriented, following a systemic approach with integrative recommendations for all key stakeholders. It has deployed a range of methodologies, including a unique survey of researchers around the world and in-depth stakeholder focus groups with key sectors and regional webinars. This wide and diverse engagement has helped raise awareness of predatory journals and conferences amongst key stakeholder communities, whilst drawing on their input on practicable ways of combatting them.

2. The spectrum approach: a revised definition and new tool

There is a great deal of confusion and misunderstanding about what constitutes predatory journals and conferences across all key stakeholder communities. The distinction between predatory and reputable outlets is growing less apparent (largely as the former make inroads into the latter) and presents a huge challenge for efforts to curb them. Binary "safelists" and "watchlists" that endeavour to delineate good practices from bad ones fail to address this complexity and risk disadvantaging less-established journals and conferences and overlooking questionable practices creeping into established ones.

A revised definition

Predatory journals and conferences are described here as a spectrum or typology of journal and conference practices; a broad set of dynamic predatory behaviours that range from genuinely fraudulent and deceitful practices - as described by the international consensus definition in Nature (Grudniewicz et al, 2019) - to questionable and unethical ones, with varying degrees of unacceptable to well-intentioned low-quality practices in the middle. At their core, and in agreement with the international consensus definition, these practices serve to prioritise self-interest at the expense of scholarship. They can be committed by new and established, fraudulent and reputable, traditional and Open Access publishers, anywhere in the world. Typical markers are provided for each part of the spectrum to help users navigate their way around this complexity.

With predatory practices on the rise, diversifying and becoming more sophisticated, it is increasingly difficult to identify, track and monitor predatory journals and conferences, and distinguish them with confidence from fraudulent, poorly resourced or low-quality ones. In reality, there is a spectrum of behaviours for both academic journals and conferences (Figures 1 and 2) that are dynamic rather than static, and intensified by their rapid evolution and increasing complexity. At one end of the spectrum, traits common to both include deceitful practice; little, poor or no peer review and/or editorial control; and the fraudulent use of the names of established journals, institutions or researchers. At the other end, there are questionable and unethical practices by some established reputable outlets, such as establishing a second tier of journals that publish rejected papers on payment, which can be harder to both identify and challenge. This is exacerbated by the fact that most journals and conferences conduct themselves behind closed doors (whether legitimate or predatory) making transparency and good practice hard to audit.

2 IAP is the global network of merit-based science, engineering and medical academies, working together to help address shared global challenges using the best available scientific evidence. Together with its four regional networks in Africa (NASAC), the Americas (IANAS), Asia (AASSA) and Europe (EASAC), IAP has provided numerous in-depth science policy reports and statements.

Figure 1: A spectrum of predatory behaviours for journals

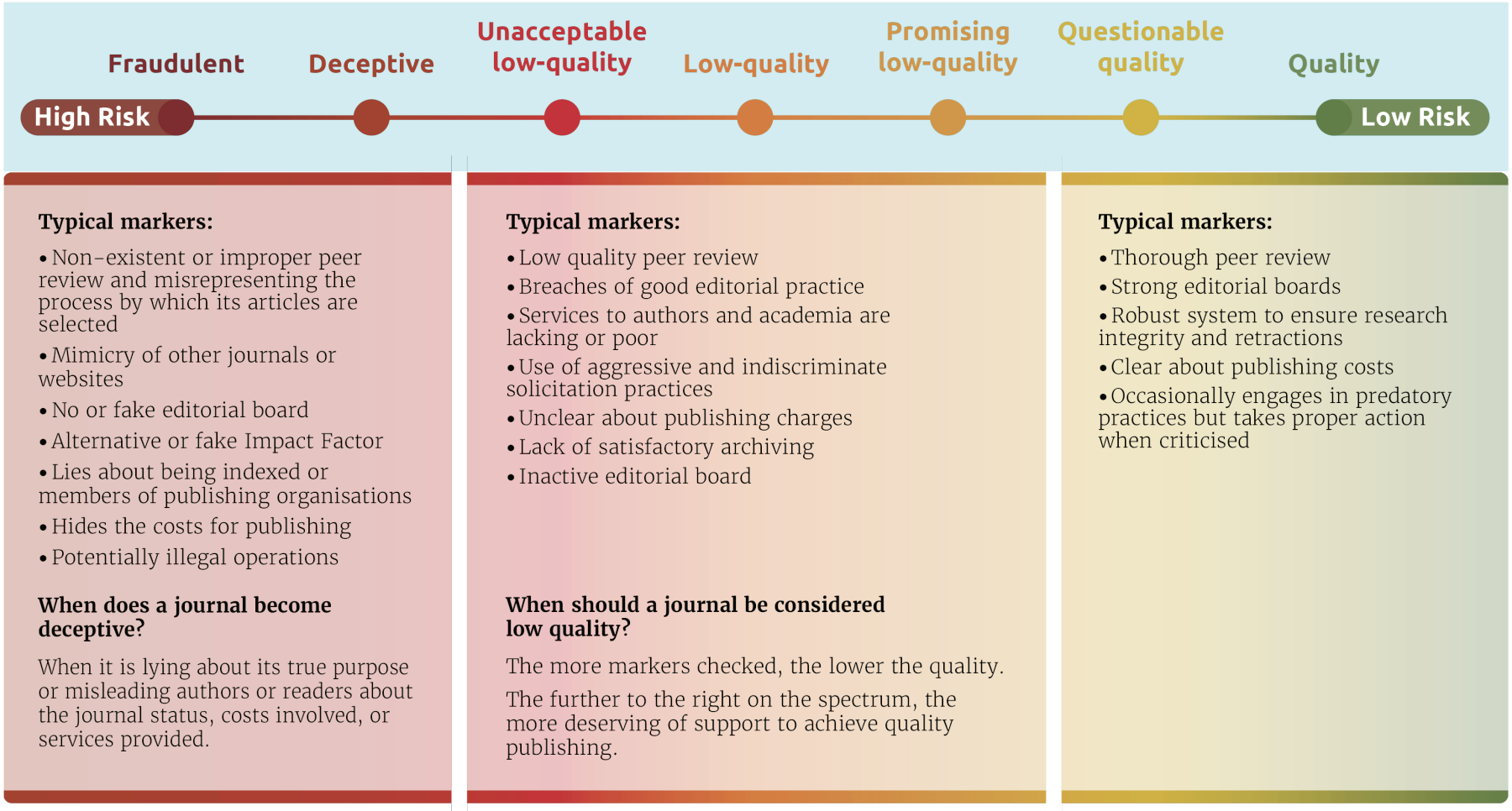
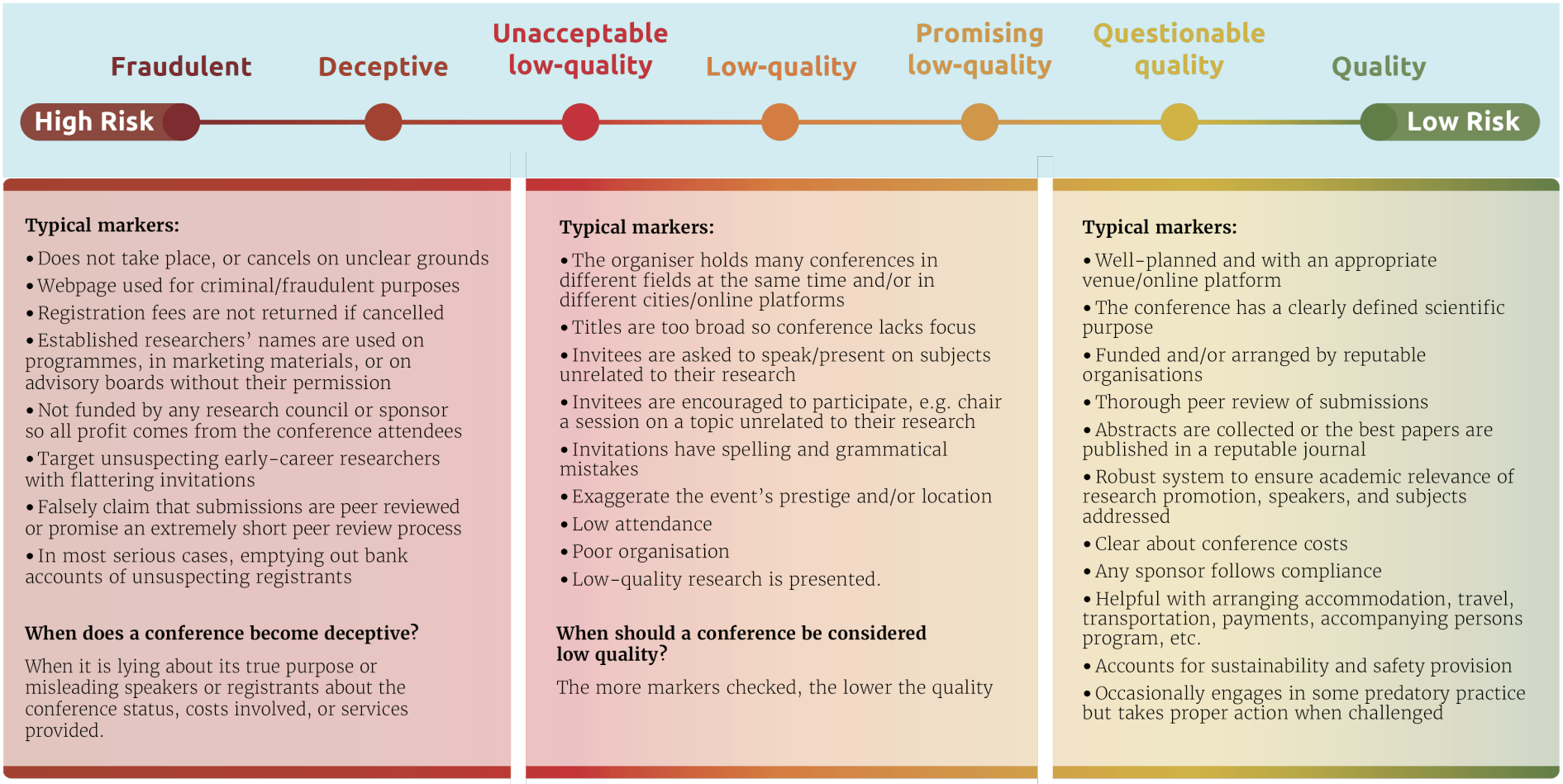


Figure 2: A spectrum of predatory behaviours for conferences



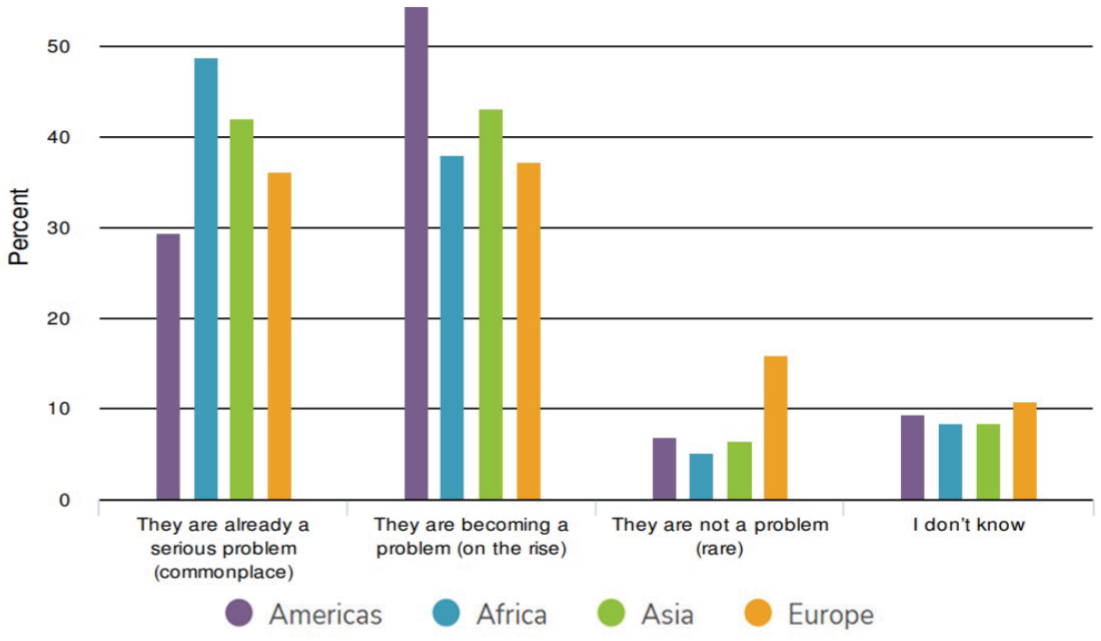
A spectrum approach is presented as a new tool for researchers and other interested stakeholders to help them minimise their risk of falling "prey", and as an alternative to the existing binary definitions. This makes it possible to identify poor practices/behaviours regardless of whether or not they are practiced in a journal or conference considered "predatory".

This spectrum approach is a stimulus for starting a new, more nuanced conversation that avoids the oversimplified classification of good and bad, safe and watch, in and out journals. It is not perfect but is fundamentally about transparency rather than making value judgements, as the value of certain traits may be different in different geographic contexts.

3. Prevalence and impact: a global survey of researchers

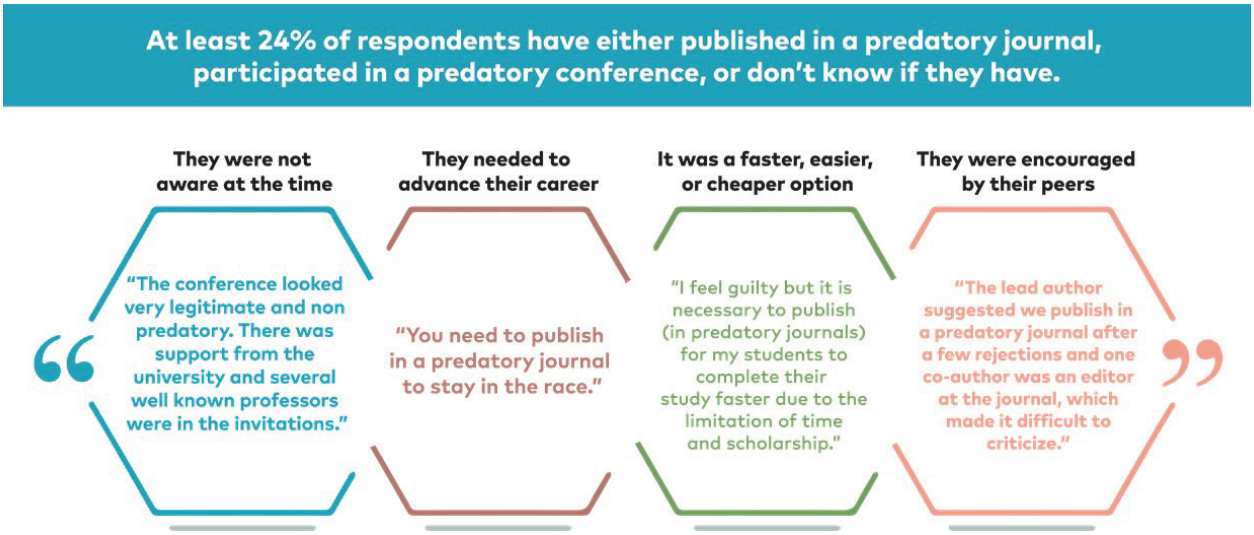
The perspectives of scholars and researchers on predatory journals and conferences are rarely documented, and their experiences and stories largely untold. A unique, open and inclusive survey of the global research community - designed to gauge awareness, understanding and experience of predatory journals and conferences- has demonstrated that these practices have pervaded all parts of the world, across multiple disciplines and career stages. Over 80% of the 1,800+ respondents from 112 countries, who voluntarily participated, indicated that predatory journals and conferences are already a serious problem or on the rise in their country, with the highest level of concern expressed by those in low- and middle-income countries: researchers in South Asia, Latin America & the Caribbean and Sub-Saharan Africa significantly more so than those in the EU, for example (Figure 3). However, respondents worldwide are concerned that, if left unchallenged, predatory academic practices risk infiltrating and undermining the credibility of the research enterprise; fuelling misinformation with potentially damaging public policy consequences; and widening the research gap between low-income and high-income countries, in an already biased system heavily weighted towards the latter. Respondents cited lack of awareness as the main reason for falling prey to predatory practices, highlighting an urgent need for awareness-raising campaigns, training and mentorship resources to protect researchers at all stages of their career.

Figure 3: Regional breakdown of perceptions of predatory practices in country of work



There was also evidence of individual and institutional collusion, manifesting itself in researchers knowingly publishing in predatory journals and participating in predatory conferences; apparent institutional complacency or acceptance of predatory behaviours; and some leading institutions hosting predatory conferences to generate income while conferring predatory outlets with a veneer of credibility. 14% of survey respondents admitted to publishing in predatory journals or participating in predatory conferences, largely because they were not aware at the time or to advance their careers (Figure 4). Some did not know if they had (10% of respondents), demonstrating how difficult it can be to distinguish predatory practices. Others may have been unwilling to self-report this practice for fear of reprisal, in spite of the survey's anonymity.

Figure 4: Reasons for using predatory services, knowingly or unknowingly



Respondents in low- and middle-income countries were more likely to report they had used predatory practices, or did not know if they had, than those in higher-income countries; and while academic career stage had no significant bearing, respondents in some disciplines appeared to be more vulnerable than others.

As a crude proxy, 14% of the world's researchers equates to over 1.2 million researchers and billions of dollars of wasted research budget. Some commentators argue that the economic waste of predatory publishing is a drop in the ocean compared to research waste through poor design or procurement, but this misses a vital concern: that of the inevitable and understandable lack of public trust in research and research integrity should predatory practices and poor and misleading research be allowed to flourish. Recognising this concern, over 90% of survey respondents indicated that predatory practices must be combatted, and encouraged IAP to help mobilise international efforts and build a global compact/consensus.

4. Tools and interventions to combat predatory practices

Existing tools and interventions designed to expose, stigmatise, avoid and prevent predatory practices are numerous and diverse. Many of these resources are free and managed by (networks of) institutions, researchers and volunteer watchdog communities (e.g. Think.Check.Submit, Think.Check.Attend, AuthorAid, Predatory-publishing.com, Dissernet, OHRI's one-stop-shop of resources), while others are pay-for subscription services (e.g. Cabell's Predatory Reports). Interventions include "watchlists", "safelists",

checklists, guides, training and mentoring programmes, institutional and national policies and regulations, and standard-setting services for good practice. Libraries, abstracting and indexing services, together with journal editor associations, help users distinguish legitimate journals and publishers from non-legitimate ones, and set principles of transparency and editorial best practice: they include Committee on Publication Ethics, (COPE); Directory of Open Access Journals (DOAJ), Open Access Scholarly Publishers Association (OASPA), and Latindex.

Their collective impact may only be limited, however, as they struggle to keep up with the adaptability and increasing range of tactics predatory outlets use, such as rebranding journals and reissuing papers (Siler et al, 2021). All of these tools and interventions play their part, especially those that raise awareness to mitigate personal risk, but missing are robust global interventions and those that address systemic issues driving predatory practices and behaviours.

5. The systemic drivers of predatory practices

Little attention has been paid to the drivers, or root causes, of predatory practices. Known predatory publishers undoubtedly exploit the digitisation of academic publishing, commercial (or gold) open access (OA) and author-pays models to their advantage (Siler, 2020; Lakhotia, 2017) and research evaluation/assessment criteria, based on quantity not quality, are likely to continue to fuel predatory practices. The authors identify three main drivers of predatory journals and conferences which, if addressed, would have long-term, sustained impact:

(1) the increasing monetisation and commercialisation of the scholarly enterprise, including an academic publishing system whose proprietary and commercial interests may compromise research integrity, with the author-pays (pay-to-publish, pay-to-present) model being especially prone to abuse by predatory actors;

(2) the predominance of quantity-over-quality research evaluation systems, together with the institutional drivers and incentives that shape the behaviour of individual academics; and

(3) serious challenges and weaknesses in the peer-review system, notably the lack of transparency (whether fully open, anonymised or hybrid) in the peer-review process and the lack of training, capacity, and recognition of peer reviewers.

There is very little consideration of these drivers, and their unintended consequences, in efforts to combat predatory journals and conferences, requiring urgent attention: these are manifested in the report's conclusions and recommendations.

6. Conclusions and recommendations

The authors conclude and recommend (in italics) that:

1. **Current definitions of so-called predatory academic journals and conferences are inadequate**: they conflate different behaviours – ranging from fraudulent and deliberately deceitful to questionable and unethical. This range is described in *spectra of predatory journal and conference practices to provide more nuanced definitions, and as navigation tools for user communities.*

2. **Awareness and understanding of predatory practices and behaviours are generally poor**, including how to avoid them and the consequences of not doing so; indeed, the economic, policy, research, professional and personal impacts are underplayed in current literature. Further, it is not just low-quality research that finds its way into predatory outlets; quality research can also be lost to them. *There is an urgent need to deliver robust training at all levels of scholarship – from graduate students to senior researchers, supervisors, mentors and librarians – to raise awareness and minimise their risk, vulnerability and the temptation to use or promote these practices.*

3. **Predatory actors and outlets are becoming more sophisticated**, making it increasingly difficult for scholars to differentiate bad journals and conferences from good ones. The inclusion of some fraudulent journals in leading indexes and databases further adds to the confusion. *Publishers, libraries, indexing and conferencing services should continue to work together to agree common principles, develop tools and mechanisms to improve coherence, set minimum standards of quality and practice, and promote compliance with them.*

4. **Predatory journals and conferences are on the rise and risk undermining public trust in research and research integrity and creating significant wastage of research resources.** *Leading multilateral organisations (such as UNESCO) and international science networks (such as IAP and the International Science Council, ISC) should lead a renewed and concerted, cross-sectoral effort to address this issue, including debating whether a global, non-profit body or consortium of existing actors is required for academic publishing and conferencing accreditation.*

5. **Predatory journals and conferences risk becoming engrained in research culture.** Some researchers *knowingly* use predatory outlets to advance their careers, satisfy timelines or peer pressure, and there are indications that predatory practices are becoming institutionalised as a means to advance institutional ranking. *Institutional good practice, due diligence and disincentives for repeat offenders should be embedded in all Higher Education Institutions (HEIs), with the support of government organisations and science funders, and championed by learned societies and national academies.*

6. **The monetisation and commercialisation of academic research output help drive predatory practices and behaviours.** Predatory journals and conferences, whether fraudulent, poor quality or unethical, together with their intended and unintended consequences, are signs of a much wider, profit-driven enterprise that can exploit researchers, policymakers and the public. Within this enterprise, **the author-pays model is particularly prone to abuse by predatory actors.** *All key stakeholders have a responsibility to promote an open, inclusive and global discussion on how to transition to more sustainable, less profit-motivated economic models of OA publishing, including devising alternatives to author-pays or pay-to-publish / pay-to-present models to cover the costs associated with academic publishing.*

7. **Contemporary research evaluation systems are a major driver of predatory practices.** The publish-or-perish (quantity over quality) nature of research evaluation systems all over the world places both researchers and institutions under pressure; a fact exploited by predatory outlets and creating perverse incentives for researchers who knowingly use them. *Research governance institutions - universities, research funders and professional and representative bodies, such as academies - have a responsibility to reform the research evaluation system so that it is more equitable, impactful and fit-for-purpose, building on an already growing momentum of responsible research assessment led by some scholarly organisations and research funders.*

8. **Predatory practices exploit weaknesses in the peer-review system: the lack of transparency in the peer-review process, and the lack of training, capacity and recognition of peer reviewers.** Peer review is the least supported and documented area of the research process. The lack of clarity and transparency in the peer-review process, originally designed to minimise bias in the system through confidentiality, enables predatory practices to go unnoticed and unchallenged. The lack of professional recognition of, and training for, peer review creates both disincentives to serve as a peer reviewer and, as demand exceeds supply, incentives to cut corners and reduce rigour, making the promise of predatory services all the more appealing. *Increasing peer-review transparency (whether fully open, anonymised or hybrid), training, fostering and rewarding good practice are all required urgently; as is further research on models for its evolution as research outputs diversify.*

Recommendations relating to each of these conclusions are set out at Table 1 and organised by stakeholder community, whose influence or action can effect change, at Table 2: researchers, leaders of Higher Education Institutions, science academies, research funders, publishers, libraries and indexing services, conference associations and international science governance organisations. Together, these recommendations provide a global strategy for combatting predatory journals and conferences, and the drivers, structures and associated services supporting them. Some actions can be implemented with immediate effect; others require longer-term, sustained implementation to effect systemic change. All must recognise that knowledge/research production, communication and governance systems continue to evolve, so space must be made for new, more innovative and inclusive players.

This summary report supports a full report which the authors recommend reading: it gives a more detailed and nuanced account of a fast-evolving and complex subject in a rapidly changing world of research production, communication and use. Further, this work complements ongoing projects in related areas[3], and by several research teams looking into predatory practices[4], and various projects on research evaluation and impact[5].

Recommendations, materials and learning from the IAP study and its accompanying report can inform webinars, training programmes, continuous professional development (CPD) and research integrity courses run by academic networks all over the world. An integrated, collaborative effort is imperative if predatory academic practices are to be combatted successfully.

For further information, please contact the IAP Secretariat at secretariat@iapartnership.org

3 For example, the International Science Council's initiative on The future of scientific publishing and UNESCO's Recommendation on Open Science

4 For example, the Ottawa Hospital Research Institute (OHRI) Centre of Journalology; the STEPP initiative at TexasTech University; and several teams in Europe.

5 Examples include the Global Research Council's Responsible Research Assessment initiative, the EU Commission's Reforming Research Assessment: the way forward and the GYA-IAP-ISC Initiative on Research Evaluation (interacademies.org)

Table 1: Recommendations by conclusion

1. Current definitions of predatory academic practices are inadequate.	
Recommendations	**Target stakeholders**
Adopt a spectrum approach that recognises the fluidity of academic publishing and conferencing practices and identifies typical markers along this spectrum to (1) help researchers choose appropriate journals and minimise their risk, and (2) inform future research, debate and commentary on these practices. Do not rely on imperfect "watch" and "safe" lists.	All authors /researchers seeking to publish a paper; training providers (see 2); those publishing research and commentaries on predatory practices; libraries and indexing services.
Conduct more empirical research on predatory conferences	Research funders and research community

2. Awareness and understanding of predatory practices and behaviours are generally poor.	
Recommendations	**Target stakeholders**
Implement robust training on publishing choices (to help authors balance rigour, speed and value for money) and on predatory publishing and conferences for all researchers from graduate level onwards, whether integrated into existing research integrity and/or ethics courses, or bespoke ones designed to reflect new knowledge on predatory practices and behaviours.	Universities and other HEIs; graduate schools; learned and professional societies, scientific unions and academies; IAP, the International Science Council (ISC), Global Young Academy (GYA), The World Academy of Sciences (TWAS), Global Research Council (GRC), national research funders; libraries and indexing services.
Train up supervisors and mentors to research students at all levels, research funders, librarians and indexers as a mandatory part of their Continuous Professional Development (CPD).	

3. Predatory practices are becoming more sophisticated, and fraudulent journals can find their way into trusted indexes.	
Recommendations	**Target stakeholders**
In addition to training for librarians and indexers, **share experiences of tackling predatory journals and conferences and develop common tools** to improve coherence in addressing them.	Publishers, libraries, library associations, indexing services.
Develop a governance mechanism (such as a kitemark) **for certifying an academic conference/event's quality and/or an equivalent to a COPE flowchart** to set conference standards and to use as a guide for attendees and funders to prioritise their time and resources.	Conference associations/ bodies and university representative bodies.

Indicative timeframes for implementation:

with immediate effect medium-term, over the next 6-12 months longer-term, over the next 2-3 years.

4. Predatory practices are growing, impacting at least a million researchers and costing billions in wasted research.	
Recommendations	**Target stakeholders**
Lead a renewed and concerted, cross-sectoral global effort to address this issue, including the adoption of recommendations / resolutions at the intergovernmental level. Explore the value of **establishing a global non-profit accreditation body** or consortium of existing actors for academic publishing and conferencing.	UNESCO, other InterGovernmental Organisations (IGOs), regional and national governments, IAP, GYA, ISC, GRC, publishers, universities, libraries, indexing and conferencing services, ISSN.

5. Predatory practices risk becoming engrained in research culture and institutionalised.	
Recommendations	**Target stakeholders**
Embed institutional processes to promote good practice in publishing and conferencing choices; to safeguard against use of predatory journals and conferences; and to prevent institutions from hosting predatory conferences. **Adopt due diligence mechanisms within academic institutions for mentoring and supervision.** **Provide disincentives for repeat offenders** e.g. refusing to appoint, promote, fund or recognise them. **Conduct more research on the impacts of predatory practices and on predatory conferences in particular.**	Universities, HEIs, academies, funders, conference associations, research community.

6. The commercialisation and monetisation of academic research are a major driver of predatory practices and behaviours.	
Recommendations	**Target stakeholders**
Promote open, inclusive, global discussion on how to work together to transition to a low-cost, sustainable, online and less profit-driven model of academic publishing. Ensure that the research community has a voice in shaping future models, such as copyright retention by author/researcher.	Universities, HEIs, learned and professional societies, scientific unions and academies; IAP, ISC, TWAS.
Where practicable, **establish, strengthen and subsidise low-cost academic publishing houses owned by universities, academies and professional societies, or their consortia.**	As above, with governments and funders.
Promote non-commercial models of journal indexing and publishing, setting explicit standards and expectations.	Funders, universities, national governments, multilateral organisations.
Replace the "author-pays" or "pay to publish" model with alternative economic models of OA to cover the costs associated with academic publishing.	Publishers, funders, universities, academies.

Indicative timeframes for implementation:

with immediate effect medium-term, over the next 6-12 months longer-term, over the next 2-3 years.

7. Research evaluation/ assessment is a major driver of predatory practices and behaviours.	
Recommendations	**Target stakeholders**
Stigmatise fraudulent and unacceptably low-quality publications presented for research assessment or promotion at the level of stigmatising plagiarism, and disqualify applications which include these publications.	Universities, HEIs, learned and professional societies, scientific unions and academies; IAP, ISC, TWAS.
Support well-intentioned low-quality journals by, for example: • developing institutional support systems to help local institutional/society journals to enhance their quality; • providing training on editorial quality to editors and editorial board members of local journals; • developing accreditation systems for quality control of local journals.	Publishers, libraries and indexing services, funders, universities.
Advocate for responsible research assessment amongst research funders, to include: • quality not quantity of published papers i.e. overall impact of research • removing financial incentives for publishing papers • researchers they fund must publish in journals with clear evidence of peer review • reviewing any requirements for mandatory conference attendance and earmarked funding in grant allocations.	Research funders, universities, HEIs, ISC, IAP, TWAS, academies and learned societies.
Overhaul funding, recruitment, promotion and recognition criteria: quantity of research (number of published papers) should be discarded and replaced with evaluation of the quality of research.	Research funders, universities, HEIs, ISC, IAP, TWAS, academies and learned societies.

Indicative timeframes for implementation:

with immediate effect medium-term, over the next 6-12 months longer-term, over the next 2-3 years.

8. The lack of transparency and capacity of the peer-review process, together with the lack of professional recognition of peer reviewers, are a further driver of predatory practices.	
Recommendations	**Target stakeholders**
Commission more research on peer review, to help promote standards and understand how peer review works, and could evolve in future.	IGOs, Governments, research funders.
Embed professional recognition of peer-review and editorial roles, in equal terms to publishing a review article, or other written output, etc., and include them in research assessment, promotion and recognition criteria.	Universities, HEIs, learned and professional societies, scientific unions and academies; IAP, ISC, TWAS
Award bonus points to reviewers for use towards OA fees.	Research funders, GRC.
Promote publication in journals with transparent and/or open peer review processes and link financial support to publication in these journals.	Publishers, universities, academies, libraries and indexing services.
Build a global pool of reviewers, editors and researchers to advise and share good practice; to develop training programmes and promote and/or build on existing reviewers' codes of conduct to foster good peer review practice; and to promote existing peer-review manuals/guidelines for authors, editors and reviewers.	UNESCO and other IGOs and multilaterals; ISC.
Raise awareness of the benefits of transparent peer review (fully open, anonymised and hybrid), in international fora and meetings and encourage the adoption of resolutions or decisions by their participating states.	Publishers, universities, academies, libraries and indexing services.
Make transparent peer review the norm (co-publication of the review report), with flexibility on the disclosure of names and level of blindness of the review process	

Indicative timeframes for implementation:

with immediate effect medium-term, over the next 6-12 months longer-term, over the next 2-3 years.

Table 2: Recommendations by stakeholder community

Research community (authors, supervisors, mentors)

Recommendations

Practice due diligence to minimise risk: use the spectrums and other guides and resources listed in this report; do not rely exclusively on imperfect "watch" and "safe" lists:

- Use the spectrums as meta-level navigation tools.
- Get to know the common and most reliable characteristics/traits of predatory journals and conferences. If the journal or conference meets more than two of these, this should ring alarm bells and they should be avoided.
- If a journal purports to be indexed in a reputable index e.g. Scopus, Web of Science, check personally and if found untrue, avoid such journals.
- Check if a journal is listed in DOAJ (Directory of Open Access Journals); if it is, the journal is less likely to be problematic because it has been vetted. Similarly, check if a journal is a member of COPE (Committee on Publication Ethics), where it must follow COPE's publication ethics (COPE Core Practices).
- If a researcher's institution has its own list(s) of acceptable and unacceptable journals, or subscribes to Cabells Predatory Reports, use them with caution and cross-check with other resources in this report.
- Seek advice from their mentor/supervisor: if they are uninformed themselves, encourage them to train up.

Stop knowingly publishing in, or citing, predatory journals or presenting at predatory conferences and wasting time and money on them. Do not act as reviewers for them or sit on their editorial committees. Consider the harm to a researcher's academic career and that of their students/team: there may be **serious personal repercussions** (such as reputational risk, disqualification for tenure, loss or return of research funding), **serious scientific consequences** (such as dilution or distortion oevidence, deterioration of scientific credibility, integrity and public trust) **and the risk of losing their work forever.**

Supervisors and mentors need to take responsibility and get on top of this issue so that they can support their students appropriately; seek institutional support/training to do this and/or do their own research.

Ignore SPAM e-mails: they will likely be SCAM e-mails.

Where appropriate, researchers should **familiarise themselves with peer-review good practice** and **offer their services as a peer reviewer to help build capacity.**

Actively participate in committees/other platforms to advocate for quality-not-quantity evaluation. Use journals and indexing services, universities and academies fora as platforms for change. **Be activists – help effect change.**

Higher Education Institutions, including universities

Recommendations

- **Urgently put in place robust training and awareness programmes** for faculty and students on the dangers of predatory journals and conferences. Inform their students, researchers and faculty of the reality and consequences of predatory journals and conferences.
- **Mainstream publishing, conferencing and peer-review good practice** into Continuous Professional Development (CPD) and research integrity courses.
- **Exclude all papers published in predatory journals or presented at predatory conferences** in academic promotions, annual evaluations and incentive programmes.
- **Treat engagement with predatory journals and conferences as a deviation from good research practice and implement policies to disincentive their use.**
- **Revise recruitment and career progression criteria** and establish proper, qualitative peer evaluation: deploy disciplinary experts to lead recruitment, review and promotion practices, and minimise the reliance on quantity of research outputs and purely bibliometric evaluation practices.
- **Recognise and integrate peer-review responsibilities** into evaluation criteria to reinforce their value.
- **Practice due diligence when negotiating institutional deals** with unknown, fraudulent or low quality journals and with conferencing arrangements (do not host predatory conferences). This will also minimise reputational risk.
- **Reconsider/nuance policies** that require research degrees (MSc, PhD) to be conditional on publications and/or presentation at (international) conferences.
- **Advocate for these changes in all universities and HEIs** through institutional twinning, partnership and network arrangements to help effect systemic change and build a level playing field.

Multilateral organisations

Recommendations

- **UNESCO to adopt a resolution, decision or declaration to curb the growth of predatory practices,** either separate to or within the context of its Open Science Recommendation, as a way to engage national governments.
- **UNESCO, IAP and other willing bodies to lead a debate on the value of establishing a global body for governance and accreditation for academic publishing**, which could be ratified by the State Parties under UNESCO.

Academies

Recommendations

- **Highlight the dangers of predatory journals and conferences, and sensitive their members:**
  - » **Mainstream good publishing and conferencing practice in academy business** e.g. council, executive and membership meetings to raise awareness. This could include appointing high-profile ambassadors/advocates.
  - » **Mandate that all members of their academy avoid predatory journals and conferences, and create disincentives to use them** (including withdrawing or suspending academy membership).
- **Ensure that any academy-run grants programmes disincentivise predatory publishing.**
- **Ensure criteria for academy membership in future are consistent with a more progressive research culture** (one that includes qualitative measures e.g. of societal impact).
- **Advocate for the mainstreaming of publishing, conferencing and peer-review good practice** into Continuous Professional Development (CPD) and research integrity courses across academia.
- **Practice due diligence when providing venues for third parties** to minimise the risk of hosting fraudulent or low quality conferences and to minimise reputational risk.
- Similarly, **practice due diligence in allowing third parties to use academy names and logos**: stop unauthorised use or abuse of them by predatory actors; again, to help minimise reputational risk.
- **Be advocates on the national and regional stage for the reform of research evaluation.**
  - » **Lead by example** and integrate other metrics/skills - e.g. engaging with society, science communication, influencing policy- into academy nominations processes.
  - » **Establish working dialogues with their national funding agency and STI government department** to advocate for coherent national policies to curb predatory practices.
  - » **Lobby their regional and global academies' networks** to take this issue seriously.
- Where academies have a publishing arm, **implement or strengthen systems to minimise predatory behaviour/infiltration.**
- **Contribute to the debate about alternative forms of scientific publishing in future; endorse this report and implement its recommendations.**
- **IAP, ISC and TWAS to sign up to DORA** and build active advocacy for its wider support.
- **IAP, GYA and TWAS, together with ISC, prepare a statement on predatory practices, research integrity, publishing ethics and research culture**, and use the statement and this report as key awareness-raising and dissemination tools.

Research funders and research ministries

Recommendations

- **Review and reform metrics for evaluating grant applications and recipients** so that they account for quality rather than quantity, impact rather than numbers, to help effect change in research culture.
- **Provide robust training courses** on responsible scholarly communication, the dangers of predatory journals and conferences for researchers, and resources available to them, as a prerequisite for receiving funding.
- **Stipulate when making awards/grants that papers should appear in and cite journals of good standing**. Require an explanation for why a (prospective) grant holder has published in predatory journals or presented at predatory conferences, and take a hard-line (e.g. a time-limited disqualification from further funding) if not satisfied with their reply. This will help create disincentives and advantage those who are "clean".
- **Discount any predatory journals and conferences** from the candidacy they receive.
- If non-members, **contact the Global Research Council about its Responsible Research Assessment Initiative** and learn from national funding agencies who are already effecting change.
- **Develop, implement and audit policies that promote responsible scholarly communication of work funded by them**, and ensure researcher compliance.
- **Fund or leverage funding for research into predatory journals and conferences** to better understand them, improve scholarly communication and inform policies and tools that are more impactful.
- **Fund or leverage funding for more research into peer review**, to help promote standards and understand how peer review works, and could evolve in future.

Publishers

Recommendations

- **Waive APCs to publish in OA journals for all researchers in low-income countries**, in a commitment to increase global equity and inclusion in publishing.
- **Implement alternatives to the "author pays" or "pay to publish" model of OA funding** e.g. subscribe-to-open, Diamond OA, the SCOAP3 model.
- **Avoid proliferating numbers and issues of journals.**
- **Have an open and transparent policy on predatory journals and the rationale for retracting papers.**
- **Explore and implement more transparent peer-review policies and processes.**
- **Facilitate quality over quantity of papers** through rigorous refereeing and review processes, and exploring ways of incentivising editors and reviewers.

Libraries and indexing services

Recommendations

- Provide **training and raise awareness of predatory journals for L&IS staff.**
- **Conduct periodic reviews and strengthen the criteria for the incorporation of journals on their databases**, and cross-reference periodically with Cabells and similar services.
- **Work as a global consortium to produce a non-profit global list akin to the Latindex's Catalogue that sets minimum standards of quality and practice, and promotes their compliance.**
- Offer **professional training for doctoral students and early career researchers**, emphasising the norms and conventions of peer-reviewed journal publication, highlighting the features of predatory and low-quality outlets as a means of avoiding them.
- **Advise university presses and their editors** on best practices on scholarly publishing.
- **Share their experiences on predatory publishing with other L&IS and develop common tools to improve coherence** e.g. through library associations.
- As good practice, **libraries could mark papers in their own bibliographies when they have appeared in disputed journals**; the papers may be fine but the journal dubious.
- As good practice, **indexing services could have two layers in their indexes**: one being comprehensive, trying to cover all journals, and another being more discerning, carefully omitting ones showing predatory behaviour.
- **Make their open access funds and discounts available only for use with quality journals.**

Conference associations/ bodies

Recommendations

- **Develop a mechanism for certifying an academic event's quality or legitimacy,** working with conference professionals and university representative bodies.
- **Develop, or raise the profile of existing, checklists and guides for academic conferences** e.g. Think.Check.Attend.
- **Explore international kitemarks/standards, metrics or guidelines for quality conferencing.**
- Develop a **COPE flowchart/equivalent** to set standards for conferences.
- Consider a **conference impact factor (CIF)** akin to a journal impact factor (JIF) as a tool for attendees and funders to prioritise their time and resources.

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