



Combatting Predatory Academic Journals and Conferences



REPORT

Table of Contents

Foreword	4
Working Group Members and Secretariat.....	5
Executive Summary.....	6
■ Chapter 1: The Growth and Prevalence of Predatory Journals and Conferences.....	12
1.1 What are predatory journals and conferences?	13
1.2 The growth and prevalence of predatory journals	14
1.3 The growth and prevalence of predatory conferences	17
1.4 The impact of predatory journals and conferences	18
1.4.1 Research impact.....	18
1.4.2 Public policy impact	20
1.4.3 Economic impact.....	22
1.5 The COVID-19 context	22
1.6 IAP study on predatory journals and conferences 2020-2022	24
■ Chapter 2: A Spectrum of Predatory Practices.....	26
2.1 Existing definitions and their limitations	26
2.2 Predatory journals.....	27
2.2.1 A spectrum of predatory behaviours for journals	28
2.3 Predatory conferences	33
2.3.1 A spectrum of predatory behaviours for conferences	34
■ Chapter 3: A Global Survey of Researchers	36
3.1 Researchers who participated	38
3.3 Direct experience of predatory journals and conferences	42
3.4 Impact of predatory journals and conferences	44
3.5 Recognising predatory journals and conferences	47
3.6 Researchers' perspectives on why predatory practices should be addressed	48
■ Chapter 4: Existing Tools and Interventions to Combat Predatory Practices	51
4.1 Exposing predatory journals and conferences	51
4.2 Avoiding predatory journals and conferences.....	53
4.3 Applying policies and regulations.....	56
4.4 Standard-setting for journals and conferences	57
4.5 Gaps in existing tools and interventions.....	59

Chapter 5: The Systemic Drivers of Predatory Practices	61
5.1 The monetisation and commercialisation of academic research output	61
5.1.1 Predatory publishing and the author-pays model of Open Access	62
5.1.2 Interventions addressing this issue	65
5.2 Research evaluation/assessment	65
5.2.1 Journal and institutional ranking	67
5.2.2 Interventions addressing this issue	68
5.3 Challenges and weaknesses in the peer-review system	69
5.3.1 Interventions addressing this issue	72
Chapter 6: Conclusions and Recommendations.....	73
6.1 Conclusions and key messages.....	73
6.2 A call to action	76
6.3 Recommendations	77
Appendices.....	87
A. The IAP study, May 2020-April 2022	87
B. The survey design.....	91
C. Survey methodology: statistics and assumptions	97
D. Condensed descriptors or typical markers of predatory journals	100
E. Condensed descriptors or typical markers of predatory conferences	101
F. Case studies of impactful interventions.....	102
References.....	105

Foreword

The InterAcademy Partnership (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:

- **Dr. Kelly Cobey**, formerly Investigator, Clinical Epidemiology Program, Ottawa Hospital Research Institute, Canada
- **Dr. Sepo Hachigonta**, Director of Strategic Partnerships, National Research Foundation of South Africa, South Africa
- **Professor Jeroen Huisman**, Professor, The Centre for Higher Education Governance Ghent. Belgium
- **Professor Gabriel Kabanda**, Secretary General, Zimbabwe Academy of Sciences, Zimbabwe
- **Professor Subhash Lakhota**, Banaras Hindu University Distinguished Professor and Science Engineering Research Board Distinguished Fellow, India
- **Dr. Alan Leshner**, Chief Executive Officer Emeritus, American Association for the Advancement of Science, United States of America
- **Dr. Catriona MacCallum**, Director of Open Science, Hindawi Publishing, United Kingdom
- **Professor James McCrostie**, Professor, Daito Bunko University, Japan
- **Professor Gianfranco Pacchioni**, Full Professor of Material Chemistry, University of Milano Bicocca, Italy
- **Professor Hebe Vessuri**, Guest Researcher, Environmental Geography Research Center, Autonomous National University of Mexico, Mexico

On behalf of IAP, we would like to thank the Project Co-Chairs, members of the Working Group, the Project Director and Secretariat, all contributing practitioners, everyone who participated in the survey, and our funder, The Gordon and Betty Moore Foundation.

Richard Catlow and Masresha Fetene
IAP Co-Chairs (Policy)

Working Group Members and Secretariat

Professor Abdullah Shams Bin Tariq (Co-Chair)

Professor of Physics,
University of Rajshahi,
Bangladesh.

Susan Veldsman (Co-Chair)

Director of the Scholarly Publication Unit,
Academy of Sciences in South Africa,
South Africa.

Professor Asfawossen Asrat Kassaye

Professor of Mining and Geological Engineering,
Botswana International University of Science and
Technology (BIUST), Botswana.
and
Professor of Geology
School of Earth Sciences, Addis Ababa University
(AAU)
Ethiopia.

Professor Enrico M. Bucci (May 2020-May 2021)

Adjunct Professor of Biomedical Scientific Integrity,
Temple University
US / Italy.

Professor Ana María Cetto

Research Professor and Senior Lecturer,
Instituto de Física, Universidad Nacional Autónoma
de México (UNAM),
Mexico.

Dr Victorien Dognon

Senior Lecturer and Researcher in Microbiology,
University of Abomey-Calavi,
Benin.

Professor Stefan Eriksson

Associate Professor and Senior Lecturer,
The Centre for Research Ethics & Bioethics, Uppsala
University,
Sweden.

Professor Dr Lai-Meng Looi

National Distinguished Professor and Senior
Consultant Histopathologist,
University of Malaya (UM),
Malaysia.

Professor Shaher Momani

Distinguished Professor of Mathematics
The University of Jordan,
Jordan
and
Dean, College of Humanities and Sciences,
Ajman University,
United Arab Emirates.

Professor Diane Negra

Professor of Film Studies and Screen Culture,
University College Dublin,
Ireland.

Rabab Ahmed Rashwan

General Manager, Publishing Department,
Academy of Scientific Research and Technology
(ASRT)
Egypt.

Dr Marcos Regis da Silva

Executive Director,
Inter-American Institute for Global Change
Research (IAI)
Uruguay.

Project Secretariat

Dr Tracey Elliott, IAP Project Director

Dr Teresa de la Puente (Stoepler), IAP Executive
Director, US Secretariat

Bisma Fazeen, IAP Research Associate

Sophia Nordt, IAP Senior Program Assistant

Paula Susarte Dealbert, Graphic Design Contractor

Executive Summary

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 - opening up 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. 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](#)), and, while there is relatively little literature in comparison on predatory conferences, it has been suggested that predatory conferences may outnumber real ones ([Grove et al, 2017](#)). 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, while dismissive attitudes amongst more established research and publishing communities may well have unintentionally assisted their growth.

The impact of the coronavirus (COVID-19) pandemic on these predatory practices may be further cause for concern, as poor-quality research and unscrupulous actors capitalise on the confusion and urgency caused by the pandemic, and 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.

"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

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

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.

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.

A revised definition and new tool: the spectrum approach

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.

With predatory practices on the rise 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 that are dynamic rather than static, and intensified by their rapid evolution and increasing sophistication. 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. 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.

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.

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. However, respondents worldwide are concerned that, if left unchallenged, predatory academic practices risk infiltrating and undermining 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 high-income countries. 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.

There was also evidence of individual and institutional collusion, manifesting itself in researchers knowingly publishing in predatory journals and participating in predatory conferences; institutional complacency or acceptance of predatory behaviours; and some leading institutions hosting predatory conferences to generate income while conferring predatory operators 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, while many did not know if they had (10%), 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.

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.

Tools and interventions to combat predatory practices

Existing tools and interventions designed to expose, stigmatise, avoid and prevent predatory practices are numerous and diverse. They include “watchlists”, “safelists”, checklists, guides, training and mentoring programmes, institutional and national policies and regulations, and standard-setting services for good practice. Their collective impact may only be limited, however, as they struggle to keep up with the adaptability and increasing range of tactics predatory practices 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, which will have more long-term, sustained impact.

Drivers of predatory practices

Little attention has been paid to the drivers of predatory practices. Known predatory publishers undoubtedly exploit the digitisation of academic publishing, commercial (or gold) open access and author-pays models to their advantage ([Siler, 2020](#); [Lakhoria, 2017](#)) and research evaluation criteria, based on quantity not quality, are likely to continue to fuel predatory practices. The authors identify three main drivers of predatory academic

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 lead to conflict with 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 in efforts to combat predatory journals and conferences, requiring urgent attention.

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 on 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 science funders and science governance organisations, 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 especially 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 actors 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 targeted at key stakeholders](#) whose influence or action can effect change: **researchers, leaders of Higher Education Institutions, science academies, research funders, libraries and indexing services, publishers 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 actors. Most immediately, raising awareness of the threat posed by predatory journals and conferences amongst researcher communities must be a priority and broad guidance for researchers is provided in the text box, based on this study and other published sources.

In conclusion, this report endeavours to account for a fast-evolving and complex subject in a fast-changing world of research production, communication and use. It focuses on the immediacy of raising understanding and awareness of predatory journals and conferences; stimulating more nuanced debates around them with key stakeholders; and recommending systemic interventions to help curb them. As such, this report is a snapshot of the literature and perceptions of key stakeholders, and is not intended as a report in isolation

or as a guidebook *per se*. This work complements ongoing projects in related areas³, research teams looking into predatory practices⁴, and various projects on research evaluation and impact⁵.

Broad guidance for researchers

Practise due diligence to minimise your risk of using predatory outlets: use the predatory journals and conferences spectra, and other guides and resources listed in the IAP report; do not rely exclusively on imperfect “watchlists” and “safelists”. The time you invest in researching an appropriate journal or conference is only a FRACTION of the time you spend on preparing your manuscript for publication or your presentation.

- Use the spectra as a meta-level navigation tool.
- Familiarise yourselves with the common and most reliable characteristics/traits of predatory journals and conferences ([Chapter 2](#), [Appendices D](#) and [E](#)). If the journal or conference meets more than two of these, this should ring alarm bells and they should be avoided.
- If a journal claims that it is indexed in a reputable index e.g. Scopus, Web of Science, check this for yourselves. If it is not true, the journal should be avoided.
- 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, if a journal is a member of COPE ([Committee on Publication Ethics](#)), where it must follow COPE’s publication ethics ([COPE Core Practices](#)).
- If your 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 your mentor/supervisor: if they are uninformed themselves, encourage them to train up.
- Be suspicious if a journal offers to publish your paper in an unfeasibly short time: good peer-review requires time.
- **Ignore SPAM e-mails: they will likely be SCAM e-mails.**

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 your academic career and that of your 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 of evidence, deterioration of scientific credibility, integrity and public trust) **and the risk of losing your work forever.**

If you are a supervisor or mentor, take responsibility and get on top of this issue so that you can support your students appropriately; seek institutional support/training to do this.

If you are a member of a learned society, such as your national academy or a scientific union, protect and champion ethical and proper professional conduct.

Familiarise yourselves with peer-review good practice and offer your services as a peer-reviewer to help build capacity.

Actively participate in committees/other platforms to advocate for quality-not-quantity research evaluation

Use journals and indexing services, universities, learned societies and academies fora as platforms for change.

Be activists – help effect change!

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 \(interacademies.org\)](#)

Chapter 1 The Growth and Prevalence of Predatory Journals and Conferences

Summary

Predatory publishers and predatory conference organisers are broadly understood as those motivated by profit rather than scholarship, who exploit the pressure on researchers to publish papers and participate in international conferences, respectively. Traits common to both so-called predatory journals and conferences 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.

Predatory journals and conferences are on the rise. The latest estimate of predatory journals is over 15,500 and some estimate, albeit anecdotally, that predatory conferences now outweigh genuine ones. There is growing evidence of the widening demographic of predatory practices and behaviours, in terms of geography, career stage and discipline, as well as their permeation into leading indexes, but their nature, prevalence and impact are not wholly understood.

Responding to this pervasive growth and an increasing disquiet amongst academics, this report is the main output of an InterAcademy Partnership (IAP) study on this issue, concerned that these predatory practices threaten to compromise the integrity of research if left unchallenged.

The digitisation of scholarly communication has undoubtedly revolutionised many aspects of the scientific endeavour by opening up avenues for more scientists to participate in the creation, access and dissemination of knowledge. However, this innovation has also helped to create an enabling environment for unethical research practices that undermine academic standards and research integrity. Shifting paradigms of research assessment/evaluation, institutional rankings, metrics and publishing business models have inadvertently allowed unacceptable academic and publishing practices to take root: these include so-called predatory journals and conferences.

In its 2016 report, “[Doing Global Science: a guide to responsible conduct in the global research enterprise](#)”, the [InterAcademy Partnership \(IAP\)](#) referred to the emergence of predatory open-access journals and advised researchers to be wary of publishing in them, warning of their potential to “*seriously damage the research enterprise*”. A year later, predatory journals were identified as one of the “*new forms of detrimental research practices*” threatening research integrity ([NASEM, 2017](#)). Five years on, the emergence of predatory journals would appear to be firmly rooted with over 15,500 worldwide, according to the latest numbers published in [Cabells’ Predatory Reports](#) (January 2022). Whilst in use for some years now, the notion of “predatory journals” for the first time features in the UNESCO World Science Report 2021 ([Schneegans et al., 2021](#)): “*Predatory journals significantly undermine the quality of published articles. There is a need for great transparency of the peer-review and journal publication processes to combat such predatory practices*”.

Yet the prevalence and impact of these journals worldwide are unclear and some studies reach contradictory findings. Touching almost every facet of scholarly communication, studies of, and opinions on, predatory publishing are variable and expanding ([Xia, 2021](#)). The past two years have seen a steady growth in publications and commentaries on predatory publishing, as well as an increasing number of watchlists and safelists prepared by professional associations, higher education institutions and government agencies, in addition to the established journal safelists provided by, for example, the [Directory of Open Access Journals](#) (DOAJ) and [Cabells](#). In contrast, there is relatively little literature or guidance on predatory conferences with

most of it in the form of editorials, commentaries and opinions rather than scientific studies ([Nisha et al., 2020](#)), despite reports that predatory conferences may now outnumber real or genuine ones ([Grove et al., 2017](#); [McCrostie, 2018](#)).

In addition to predatory journals and conferences, other academic practices that could be conceived as “predatory” include falsification of experimental evidence ([Fanelli, 2009](#)), paper-mills churning out fake papers on demand ([Krämer, 2021](#)), fake or embellished qualifications, such as “predatory PhDs” ([Darbyshire et al., 2020](#)) certificates, awards and medals ([van de Vosse, 2021](#)). Predatory pre-print servers are also springing up rapidly ([Moore, 2020](#)). These practices are all profit-motivated and operate largely without restraint; thriving in increasingly commercial academic cultures all over the world.

This report focuses on journals and conferences as vital, established and trusted sources of research communication. Peer-reviewed journals are the major instrument of academic research for the dissemination of new knowledge and advancement of our understanding of the natural world. Conferences further provide fora for researchers to present and discuss their findings with their peers, to engage with, listen and learn from others working at the frontier of their field, and to develop new, innovative collaborations and ideas.

1.1 What are predatory journals and conferences?

“Predatory journal” and “predatory conference” are typically defined as in Box 1.1.

Box 1.1: What are so-called predatory journals and conferences?

Predatory journals solicit articles from researchers through practices that exploit the pressure on researchers to publish. Features of predatory journals include rapid pay-to-publish models without rigorous peer-review, fake editorial boards falsely listing respected scientists, fraudulent impact factors, journal titles that are deceptively similar to those of legitimate journals, paid review articles that promote fake science, and aggressive spam invitations to submit articles, including outside of a researcher’s expertise. Furthermore, it is common practice for predatory journals to exploit the “author-pays” model of open access for financial gain.

Predatory conferences are a growing part of the academic landscape. They may be organised by these same publishers, or by specialised for-profit conference groups. They exploit the pressure on researchers to present their work, especially to international audiences. These conferences are characterised by a similar lack of peer-review of submitted abstracts and papers, may charge high fees with respect to the services provided, and often invite researchers to speak on topics outside their area of expertise; in the case of fake conferences, they do not take place at all.

It is worth caveating at the outset that the term “predatory” is problematic for at least three reasons:

- “Predatory journals” are not a universally agreed or recognised term; nor do they necessarily translate well. In Latin America, for example, there is talk of “spurious journals”; in Russia, “trash” or “garbage” journals; in India, predatory is used interchangeably with “dubious journals”; then there are “deceptive”, “dark”, “illegitimate” and “pseudo” journals, and – before anyone assumed the papers would be subsequently read- “write-only” journals. There is less literature on “predatory conferences” or meetings and to a large extent they have adopted the language from the journals’ context.
- The term implies there must be prey i.e. that all authors or participants who use them do so unwittingly, unknowingly, which is not always the case: the relationship can be less predator-prey and more “a new and ugly symbiosis” ([Kolata, 2017](#)).

- The term is insufficiently nuanced and poorly defined because it fails to distinguish between (a) deceptive, fraudulent journals / conferences, (b) low-quality outlets that might willingly disregard academic norms or be well-intentioned, and (c) high quality journals/conferences with some questionable practices. At best, the term predatory is provocative and attention-grabbing; at worst loaded and divisive, potentially penalising new entrants to the publishing and/or conferencing world and allowing unethical practices in established quality ones to go unabated.

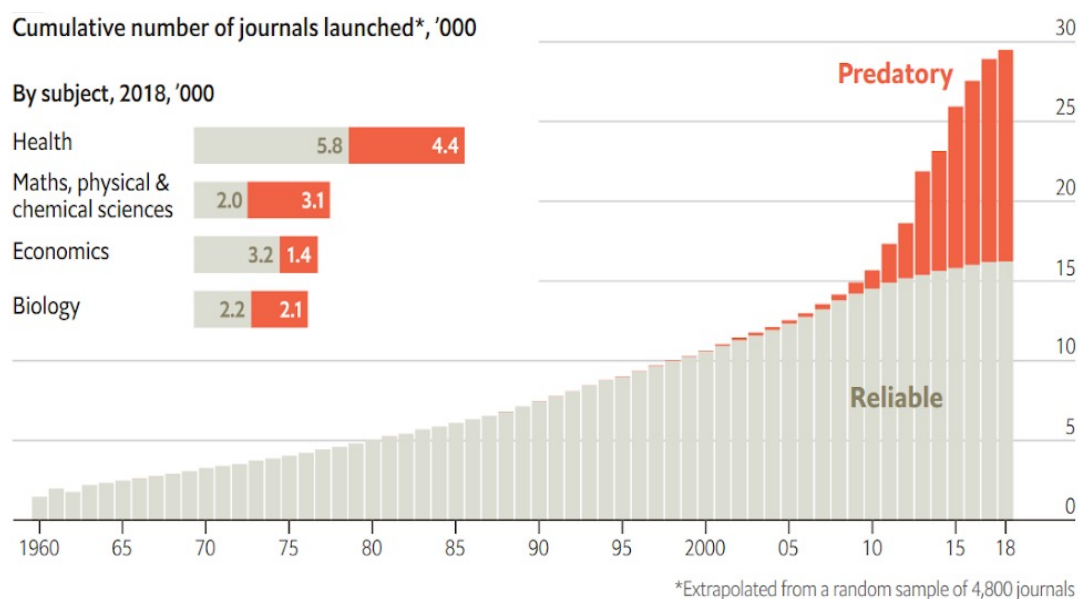
Accordingly, the authors of this report have undertaken to better define the range of what constitutes “predatory practices”, both in the context of journals and conferences ([Chapter 2](#)).

Whilst flawed, the term “predatory” is used throughout the report – and in its title- because it is the most commonly (if not universally) recognised term in the literature, and thus easier to source. For convenience, it is hereafter mainly used to refer to a range of predatory practices as a “catch all” and will be qualified later in the report. It may also be preceded with “so-called” to reinforce this point.

1.2 The growth and prevalence of predatory journals

Recent decades have witnessed a rapid growth in published research output, published in over 42,000 journals (as of 2018: approximately 33,100 English language; 9,400 non-English) and accounting collectively for over 3 million articles a year ([STM 2018](#)). Much of this can be explained by the increase in numbers of researchers worldwide ([UNESCO, 2021](#)), and the “publish or perish” academic culture that incentivises researchers to publish as many papers as they can ([Mandke, 2019](#)). These trends have also seen the **rise of predatory journals**, as illustrated in Figure 1.1, **that are purely profit-driven, featuring little if any peer-review and offering rapid turnaround in publication.**

Figure 1.1: Growth in number of predatory journals



Taken from <https://www.economist.com/graphic-detail/2020/05/30/how-to-spot-dodgy-academic-journals>

The constantly changing facets of journals and conferences involving predatory practices, and the rapid evolution in their operations and the way they manifest themselves ([Singh Chawla, 2021](#)), makes it difficult to pin down actual numbers of predatory journals (and, indeed, conferences). Nevertheless, several studies based on available databases reveal worrying figures. In 2020, *The Economist* reported at least 13,000 predatory journals worldwide ([The Economist, 2020](#)); an earlier study, 11,873 of them, with the publication volume of these journals rapidly increasing from 53,000 papers in 2010 to 420,000 papers in 2014 ([Shen & Bjork, 2015](#)). Having listed 10,332 predatory journals in 2018 ([Bjork et al, 2020](#)), **Cabells Predatory Reports now lists 15,574 journals (as of 4 January 2022), with around 150 journals added per month over the past three years** ([Linacre, 2021](#)). A new service from Inera – [Edifix](#) – enables authors to check references with the Cabells list, and finds that 4% of article citations are from predatory journals, with 22% of the articles including multiple predatory references ([Linacre, 2021](#)).

Predatory and unethical practices – including fake grant applications, PhDs and research papers – are commonplace in some countries, especially where publishing, funding and promotional systems are not open, transparent or accountable, and governance and/or capacity is weak ([McKenna, 2021](#); [Khan, 2021](#)). Less developed countries with less robust publication governance systems in place, fewer publishing options and potential language barriers are found to be especially prone ([Moher et al, 2017](#)).

While early studies indicate that as much as two-thirds of papers in predatory journals originate from Asia and Africa, predominantly India, Nigeria and Pakistan ([Bjork et al, 2020](#)), a more recent study has revealed that newly-rich (e.g. oil-rich) countries such as the Arabic countries, Kazakhstan, Iraq, Albania, Malaysia and Indonesia are now easy prey, due to an expanding research sector enhanced by rapid economic development ([Machacek & Srholec 2021](#)) – though this source has recently been retracted on the basis of possibly unreliable findings ([Machacek & Srholec 2021](#)), which the authors continue to contest ([Oransky, 2021](#)). With this caveat, Organisation of Islamic Cooperation (OIC) countries make up 17 of the top 20 countries where academics are publishing in predatory journals; five of them in the top 10 most research-productive OIC countries (Indonesia, Malaysia, Iraq, Nigeria and Egypt). Every sixth paper from Kazakhstan and Indonesia, or 17% of produced papers, fell into the predatory category, with Iraq's ratio nearly 13%, Malaysia's over 11%, Morocco and Jordan near 7%, while Libya, Tajikistan, Egypt and Syria were over 6% each. What is more, every fourth, sixth and ninth predatory journal article had a co-author from China, India and the United States, respectively. The authors argue that huge and rapid “petro-dollar” investment in universities in OIC countries has not been accompanied by the necessary upgrading of governance and evaluation systems, and conclude that factors that affect how research is organised, evaluated and funded are more relevant than language ([Machacek & Srholec 2021](#); [Amjad Khan, 2021](#)).

Evidence is emerging that predatory journals are a global problem, eroding an apparent comfort zone perceived by many in Europe and North America. Predatory publishing in Germany, for example, is reported to have quintupled since 2013, with the number of papers in the five biggest publishing houses tripling globally since 2013 ([NDR, 2018](#)). It is estimated that around 5% of Italian academics have published in predatory journals ([Bagues et al, 2019](#)) and that around 6% of papers by US academics appear in them ([The Economist, 2018](#)). Of articles in predatory journals with acknowledged funding sources, the US National Institutes of Health (NIH) was the most frequently named funder, with senior academics involved in many instances ([Moher et al, 2017](#)). A 2018 investigative journalism study examined 175,000 scientific articles from five known dubious publishing platforms and found that over 400,000 scientists worldwide had published in these journals from 2013 to 2018 alone, including prominent professors and private sector scientists ([NDR, 2018](#)).

The usual assumption is that most authors are misled or scammed into publishing in predatory journals e.g. [Cobey, 2017](#). Less experienced, early career researchers, predominantly from lower income countries,

are generally regarded as being especially prone to publishing in predatory journals ([Xia et al, 2015](#); [Moher et al, 2017](#)); the latter study reporting that 65% of authors of predatory journal articles had never published before, compared to 19% of those in vetted open-access journals. But there is also evidence to suggest that **some authors deliberately and knowingly publish in predatory journals to advance their own careers** ([Kolata, 2017](#); [Frandsen, 2018](#); [Nisha et al, 2020](#); [Seethapathy et al, 2015](#)). Some experienced researchers in Brazil have been reported to actively seek out predatory journals listed as such in their national ranking system, Qualis ([Perlin et al, 2018](#)).

Whilst predatory publications are proportionately small in Brazil, this proportion has grown exponentially in recent years for both early-career and established scholars ([Perlin et al, 2018](#)). In comparison to most regions of the world though, Latin America appears to be relatively unscathed by predatory publishing. Its academic publishing mode contrasts significantly to much of the rest of the world because journals are funded by research-intensive public universities and learned societies rather than commercial publishers, usually publishing open access without any author charges. There is accordingly less room for predatory publishers to do much business ([Nassi-Calo, 2015](#); [Shen & Björk, 2015](#)).

Research discipline as well as geography may also have some bearing on exposure to predatory publishing, although the literature is inconclusive. Some report that social sciences and life sciences are twice as likely to be encountered in predatory journals than health and physical sciences ([Machacek & Srholec 2021](#)). But most analyses of predatory publishing, such as those at the Ottawa Hospital Research Institute ([OHRI](#))⁶, have been conducted in biomedicine, medical and dental sciences, where predatory practices appear to be widespread. According to Cabells, medical disciplines are particularly targeted by predatory journals, with about a third of the journals listed in its Predatory Reports database in medical subjects ([Linacre, 2020](#)).

Predatory journals can find their way into leading indexes and databases, including Web of Science, Directory of Open Access Journals (DOAJ), PubMed and Scopus – the latter reportedly accounting for nearly 3% of papers indexed by it over a three year period ([Duc et al, 2020](#); [Severin & Low, 2019](#); [Manca et al, 2018](#); [Singh Chawla, 2021](#)). A high number of predatory journal articles are reportedly indexed in PubMed ([Manca et al, 2020](#)), the free-to-access biomedical database maintained by the US National Library of Medicine (NLM). At a regional level, the list of over 500 journals recognised and promoted in West Africa by the African Commission and pan-African and Malagasy Council for Higher Education (CAMES), responsible for coordinating higher education and research systems in Francophone Africa, contains at least 35 predatory journals or over 6% of its content, and efforts are ongoing to try to mitigate these (V. Dougnon, pers.comm). This infiltration places many more unsuspecting researchers at risk of being scammed by these journals, while also eroding trust in both established international and local indexing systems. Researchers can no longer presuppose that the inclusion of journals in a prestigious database guarantees the integrity of their authorship, peer-review and editing processes ([Oviedo-Garcia, 2021](#)).

The reasons for this infiltration are not well-understood and may be due to a number of phenomena, such as indexed reputable journals falling into predatory hands, the cloning or hijacking of legitimate journals, or vetting systems being outsmarted by sophisticated predatory practices. These phenomena have called into question the monitoring processes and quality assurance of indexing systems and led to an upsurge in systematic culling of predatory journals by DOAJ and SCOPUS in recent times, though some old content remains ([Singh Chawla, 2021](#)). There is a potential for well-intentioned, poorly resourced or less established

6 [Centre for Journalology \(ohri.ca\)](#)

journals with local, regional or niche value in some countries to be caught in the crossfire, suffering as collateral damage because they don't quite make the grade.

1.3 The growth and prevalence of predatory conferences

With the rise of predatory behaviour in the publishing industry, some predatory publishers have expanded their business models to make additional profits from predatory and fake conferences ([Himmelfarb Health Sciences Library](#)), as have some manufacturing companies looking to market their products, especially in the medical sector ([Sharma & Verma, 2020](#)). The [World Academy of Science, Engineering and Technology \(WASET\)](#) is a case in point. Listed as a predatory publisher by [predatory-publishing.com](#), WASET lists over 300 locations of planned conferences from April 2021 to December 2022 on its website, all in large cities or tourist spots, and each listing many conferences ([Xia, 2021](#)). In 2018, it was reported that WASET organised nearly 50,000 conferences, with an estimated revenue of nearly US\$4.5m ([Eckert et al, 2018](#)).

Predatory conference providers are for-profit companies that tend to hold multiple, low quality “academic” meetings to make money rather than support scholarship; provide no effective peer-review or scrutiny for speaking at their events; employ deceitful practices such as concealing their for-profit status, their HQ location or their true ownership; and making false claims about peer-review. Predatory conference organisers can often be easier to track than predatory conferences *per se* because conferencing practices are evolving rapidly, conference names change constantly and online and in-person events are too numerous to address ([McCrostie, pers.comm](#)). Typically, predatory conferences are designed around broad, nebulous concepts that can attract as many researchers from as many disciplines as possible. Their lure is understandable if there is a perceived pressure to attend conferences: for example, Taiwan's postgraduate education system is run on a points-based system with generous government subsidies, so the more conferences attended, the greater the chance of promotion and payment ([McCrostie, 2016](#)). Choices made by researchers often reflect systemic incentives.

The literature on predatory conferences is relatively sparse compared to predatory journals, and much of it is anecdotal and found in opinion pieces and reviews ([Pecorari, 2021](#)). Nevertheless, predatory conference organisers do appear to be growing in size. In 2017, it was estimated that predatory and fake conferences outnumber real ones ([Grove et al, 2017](#)) due to the demand to present internationally, although the evidence for this declaration is unclear. Predatory, fake and questionable conferences are now taking place in nearly every major city in the world every month, and in some cities every week ([McCrostie, 2018](#); [McCrostie, 2018](#)). With increasing competition, even smaller cities have become targets: they compete for national and city funds such as Meetings-Incentives-Conferences-Exhibitions (MICE) subsidies, designed to attract conferences and their delegations to their cities: a type of conferences industry “tourism”, where municipal and regional pro-business practices may inadvertently support predatory conferences ([McCrostie, 2020, pers.comm](#)).

Predatory conferences also appear to be growing in sophistication: once convening events in small hotel conference rooms, they now hold much larger events in, for example, university conference centres in the UK, USA, and Canada. They bill Nobel prize winners and other high-profile figures on their programmes and in their publicity materials to make their events more enticing and compete with legitimate conference providers and academic membership associations: identity theft is common ([Pai & Franco, 2016](#)).

The relative lack of coverage in existing literature could be interpreted as a more accepting or dismissive attitude towards predatory conferences, viewing participating in these as “one-off” lapses that cause no substantive harm, and no permanent or traceable mark on a researcher's record. In other words, they are perceived to be less harmful than predatory journals and akin, perhaps, to having picked a bad holiday

package. Indeed, predatory conferences may have become a big problem because the research community is doing nothing to address them, with little action taken to warn researchers or institutions and even less to disincentivise those who use or help organise them ([McCrostie, 2018](#)).

There is evidence to suggest that predatory conferences exist because some well-established academics and institutions support them, knowing that they are predatory ([Lem et al, 2017](#)), and that the more sophisticated ones offer a veneer of legitimacy that can trick researchers at any stage of their career, including retired scholars ([Mackenzie, 2019](#)). Predatory conferences have been described as a “dark side of open access” ([Cress, 2017](#)), trading on the naivety of academics looking to progress or accelerate their careers. Much like predatory journals, they “thrive on the ignorance and naivety of early-stage, inexperienced, ambitious, and ingenuous researchers”, and on “senior researchers, despite knowing the downsides” ([Nisha et al, 2020](#)).

Multi/cross/trans-disciplinarity may make predatory conferences more difficult to distinguish by legitimising the convening of different disciplines that may appear to be largely unrelated, perhaps around nebulous concepts like ‘communication’. Efforts to tackle predatory conferences on this basis may disadvantage those that are genuinely seeking innovation by convening different disciplines, e.g. frontiers of science meetings, or those in new and fast-evolving areas of multi, cross- and transdisciplinarity. Prevalent across many disciplines, much of the published evidence sits with dental sciences ([Heasman, 2019](#)), anaesthesiology ([Sharma & Verma, 2020](#)) and nursing ([Darbyshire, 2018](#)). Indeed, predatory conferences appear to be especially acute in vocational education such as medical and dental professions, and show no sign of slowing down.

1.4 The impact of predatory journals and conferences

The impact of predatory practices in journals and conferences is unclear in the literature. Some have argued that the degree to which predatory journals are harmful to research is exaggerated because the majority of papers published in them are rarely, if at all, cited (e.g. [Björk et al, 2020](#)), and that only poor research tends to be published in them. Others state that papers in predatory journals are more likely to be cited by less experienced researchers in countries/regions where predatory journals are already a problem ([Akca & Akbulut, 2021](#); [Frandsen, 2017](#)), further compounding problems for less advantaged researchers. **Whether good research is lost or poor research is propagated, the research system is the victim of predatory practices.**

1.4.1 Research impact

The degree to which predatory journals and conferences “contaminate” research literature is debatable, especially relative to poorly designed studies reported in “non-predatory” literature (which may be less easy to identify and thus under-reported). Research fraud, data manipulation, paper mills, ghost writing and a reticence to publish null, negative and inconclusive results also play their part in “polluting” the literature.

In its recent report on the [Future of Scientific Publishing \(2021\)](#), the International Science Council (ISC) quotes a Nature article stating that “*Those who are misled (by predatory journals) should be aware that publishing in such journals has very little impact on science* ([Singh Chawla, 2020](#))” because papers in predatory journals tend not to be cited. The ISC concludes that “*the harm that such journals do is to use up the time and resources of academics who might otherwise be better employed, and to contribute to the long tail of inconsequential research*”. This statement was based on a study by [Björk et al, 2020](#), who found that, over a five-year period since their publication, 56% of papers published in predatory journals hadn’t attracted any citations at all and less than 3% attracted more than 10 citations (compared to an estimated 24% of published papers, ([Van Noorden et al, 2014](#))). But this survey was based on a small sample size and looked at it from a quality angle only: citation is also affected by other criteria – funding, facilities, geography,

research area, etc. – which were not factored in, and the estimated number of papers in predatory journals is now over a million. Further, other authors are showing that citations can be high in some countries where predatory journals are already a problem, such as Turkey ([Akca & Akbulut, 2021](#)). Björk *et al*’s analysis does not account for other direct and indirect impacts of predatory publishing, such as the deceit, financial cost, the journals’ refusal to retract flawed papers (so they remain in the system and can still be cited or used by those inside or outside of academia⁷), as well as the reputational damage to individuals, institutions and – more broadly- legitimate open-access journals ([Jamieson *et al*, 2019](#)). Nevertheless, their argument does strengthen the disincentive for researchers to publish in predatory journals if they want their work cited.

Though all researchers can fall “prey”, the literature generally (but not exclusively) concludes that **early-career researchers (ECRs) and those from lower income countries are especially vulnerable** to predatory journals and conferences because they may lack both the knowledge of these practices and the support for dealing with them ([McKenna, 2021](#); [Larkin, 2018](#); [Świgoń *et al*, 2020](#)). Researchers in countries with particularly robust assessment systems based on quantitative metrics are especially hard hit ([Xia, 2021](#))- for example, in countries where awarding of PhDs is conditional on publishing a minimum number of papers or the award of a Masters degree requires presentation of a final year research project in a conference, placing further pressure on researchers at an early stage of their career. These assessment systems can also incentivise researchers to publish in so-called international rather than local journals, undermining the value of the latter. This devaluing of knowledge produced in different settings is potentially catastrophic because such knowledge is required to meet societal and environmental challenges, both local and global, besides publishing in international journals being more expensive. Many locally produced journals in Latin America and India, for example, are often not considered in promotion and tenure track positions; a situation that compromises their viability and potential impact ([Chavarro *et al*, 2017](#); [Lakhotia, 2018](#) respectively).

Furthermore, as predatory journals scam researchers and research institutions financially and typically refuse to reject flawed papers, they risk tarnishing the reputation of legitimate open-access journals ([Singh Chawla, 2020](#)). Legitimate journals are also adopting an increasing “publish anything anywhere” mentality which means they are being bombarded by low quality papers which have significant opportunity costs, slowing down peer-review and publishing processes, and potentially compromising the efficiency and credibility of research and publishing systems ([Crotty, 2017](#)).

Predatory journals and conferences provide easy routes for untrustworthy science (whether flawed, fabricated, falsified or plagiarised). Such outlets provide easily accessible platforms for fake science or pseudoscience and conspiracy theories to thrive e.g. HIV-AIDS and climate change denial, anti-vaccination scaremongering, and bogus claims of alien life, which can subsequently be referenced by journalists and activists ([Brown, 2015](#); [Brown & Lewis, 2021](#)). Box 1.2 provides a specific example.

Some major corporations can help fuel predatory journals and conferences, most notably in the pharmaceutical sector ([Deprez & Chen, 2017](#)). Sponsored clinical research of dubious quality can be presented to medical practitioners at predatory, or at least questionable conferences, with potentially serious healthcare consequences. Medical and other vocational students are relatively inexperienced or very busy when it comes to identifying predatory journals and conferences. There is also the **opportunity cost**: busy scientists in academia, vocational training and industry, whose time is at a premium, may only have one or two opportunities to publish in a peer-reviewed journal or participate in conferences, wasting them on predatory or fake ones.

7 A limitation of citations is that while they are a good proxy for uptake by the science community, they may not reflect use by policymakers and others outside academia, with potentially damaging consequences.

Robust and trustworthy science can find its way into predatory journals: legitimate biomedical research, for example ([Shamseer, 2021](#)). This research may not be properly indexed or archived, as indexing and bibliometric services endeavour to weed out these predatory journals: as a result, the research community cannot source potentially legitimate papers through typical search strategies and databases, and the knowledge is lost and may never contribute to future research or inform policy. Further, predatory publishers have been reported to hold submissions hostage, refusing to allow them to be withdrawn and thereby preventing submission in another, more reputable journal ([McCook, 2016](#); [Molteni, 2016](#)). Good research presented at predatory conferences, and then often subsequently published in predatory journals, may also be irretrievably lost to the knowledge base.

The consequences of predatory publishing on the research enterprise include dilution and distortion of evidence in systematic reviews ([Hayden, 2020](#)); deterioration of scientific credibility and integrity, “doping” of academic careers and the loss of research funding ([Gades & Toth, 2019](#); [Cortegiani et al, 2020](#)).

BOX 1.2: Fuelling pseudoscience: a case study

The journal “Progress in Physics” is not indexed in any reputable database and confesses that its articles “*may not necessarily represent the scientific views of the Editorial Board or its individual members.*” [1]. Accordingly, papers published in it often focus on fringe topics in physics that are not typically discussed in serious journals. Authors attracted to publishing their ideas in this journal include those advocating for so-called “free energy”, a proposed physical concept enabling a Perpetual Motion Machine, which is physically impossible; or those opposing the fundamentals of the relativity theory without a clear basis for doing so. One editor of this journal is a proponent of a new type of matter in the universe which he calls “Unmatter” [2]. Journals such as this can function as outlets for fake or pseudo-science.

[1] Progress in Physics;. Available from: <http://www.ptep-online.com/>.

[2] Smarandache F. A New Form of Matter – Unmatter, Composed of Particles and Anti-Particles. Progress in Physics. 2005;1(1).

[Acknowledgement for this analysis: Philipp Mika Wolf, Uppsala University]

In summary, publishing in predatory journals, or giving presentations in predatory conferences that publish their abstracts or proceedings in these journals, are potentially damaging in terms of (1) the loss of new knowledge; (2) the waste of research time and resources (people and materials); and (3) hampering the efficiency, impact and diversity of the research process, including the distortion and dilution of research.

1.4.2 Public policy impact

The literature is divided on whether papers in predatory journals are cited and used by other researchers or users in other sectors, such as policymaking. **Since predatory journals propagate non-peer-reviewed or non-quality-assured research, “contamination” of the knowledge base with poor, flawed or fraudulent papers finding their way into public policy is a very real prospect.**

Exacerbating this is the problem of retracting papers and how, even once retracted, these papers continue to pollute the literature and are used by the media and others without the technical knowledge to judge the quality of the data for themselves. An infamous example of this retraction problem is that of the paper linking autism to MMR vaccines in the reputable journal, The Lancet, which was only retracted after 12 years and caused untold damage in terms of public health and misinformation ([Sathyanarayana & Andrade, 2011](#)).

Publishing in predatory journals, fabricated data and academic plagiarism erodes public confidence in the scientific and medical professions, devalues legitimate science, and undermines public support for evidence-based policy: *“The world is facing a huge threat from....the pollution of science and medicine by plagiarism, fraud, and predatory publishing. If the medical and scientific communities continue to remain in publication pollution denial, the trustworthiness, utility, and value of science and medicine will be irreparably damaged”* ([Caplan, 2015](#)).

Most studies of predatory practices have looked at biomedicine and been led by health professionals ([Mertkan et al, 2021](#)). 192 potential predatory journals have been identified in the fields of neurology and neurosciences, and 59 in rehabilitation; 11-20% of them indexed in PubMed (Manca et al, [2017a](#) and [2017b](#)). Medical, nursing and dental policies and practices are informed by published literature and the consequences of poor or fake research may be particularly damaging. With patients looking to online sources for self-help medical advice, they can find research published in predatory journals (as well as pre-prints that are not peer-reviewed) through a simple Google search, making it difficult for them to distinguish credible, evidence-based information from poor and misleading research. The rise in vaccine hesitancy, a major threat to public health, is compounded by publishing poor, distorted or fake results in predatory journals. Reference to such flawed work in Wikipedia, educational materials and medical/clinical guidelines risks embedding it as proven science ([Kousha & Thelwall, 2017](#)). In turn, this flawed material is picked up by news articles and social media, and unleashed on the public unfamiliar with the rigours of scientific review, leading to public confusion and harm ([Severin & Low, 2019](#)). Journalists and other users without the right knowledge and training may inadvertently reference/report work in predatory outlets, or find in them “evidence” for their own views/politics. In this way, deficient unvetted research that seems to have scholarly credibility feeds a broader destabilisation of the academic enterprise. As already indicated, the potential to unknowingly or knowingly spread misinformation or low-quality information gives licence for fake news stories and conspiracy theories to thrive. Flawed science on contentious topics (e.g. vaccination, climate change) is then used by advocacy groups to promote their own agenda and influence government and policy-makers. Even if only a small proportion of such work may be directly harmful, the long-term and cumulative onslaught of flawed science can substantially erode scientific evidence informing public policy.

Predatory publishing can also open the door for unscrupulous industry actors to attempt to curtail competitors’ market presence and promote their own ideas or products in predatory journals, with potentially serious consequences for the consumer. A case study by [Tindall et al \(2021\)](#) illustrated how a ruthless manufacturer of bacterial endotoxin tests published in a journal with little or no peer-review to shed doubt on recombinant DNA technology, neglecting relevant literature, using poor references to papers and judgmental and non-scientific language. This negligence and blatant disregard for robust peer-review can hamper progress in pharmaceutical development and manufacturing, and risk lives; providing a further example of the very real and tangible effects the misuse of “predatory” publishing outlets can have on the public.

Similarly, industry-funded studies that promote products such as e-cigarettes can be published rapidly and without scrutiny in such journals and be claimed as authoritative peer-reviewed research. A 2018 study in Germany found that 5,000 German researchers had published in predatory journals, including employees of some of its top 30 companies ([NDR, 2018](#)).

The unprecedented scope, scale and pace of research publication and research use during the COVID-19 pandemic has brought to the fore significant failures associated with poor choice of research question, poor quality study design and conduct, and in the reporting and use of outputs to inform policy and practice increases risks to patients, wastes resources and can distort decision-making and public perception ([IAP, 2021](#)). Ongoing research is exploring 200 Covid-related articles in predatory journals (as listed in Cabells’

Predatory Reports), which include papers on ivermectin and hydroxychloroquine trials without proper controls and consideration of new symptoms of Covid, none of them verifiably peer-reviewed (Linacre, pers. comm). These papers may inform potentially harmful public policies or self-treatment.

1.4.3 Economic impact

The scale of the economic cost of “predatory” journals and conferences is difficult to estimate, as is its cost relative to that of, say, poorly designed and reported studies in “non-predatory” literature. Even excluding the costs associated with eventually publishing in a predatory journal or speaking at a predatory conference, the global cost of researchers managing spam e-mails from publishers or organisers could well exceed the estimated cost of time spent peer-reviewing papers- amounting to an estimated US\$2.6 billion, with additional costs for anti-spam technology ([Teixeira da Silva et al, 2020](#)). Some disciplines may be more prone to spam e-mails than others, such as dentistry and medicine, with clinical repercussions too ([Sousa et al, 2021](#)).

Major costs associated with research waste (of people, money and materials) and post-acceptance costs (value added services after peer-review- design, copy-editing, translating, typesetting, re-drawing of figures, proofreading, printing) are likely to be significant, putting a major financial toll on authors.

The amount of article processing charges (APCs) drained off to predatory journals was estimated to be USD 74 million in 2014 ([Shen & Bjork, 2015](#); [Crawford, 2015](#)), based on the lower average APC charge by predatory journals of USD 178 per article and the volume of 420,000 articles in 2014. The lower APC would have been particularly attractive to authors from low-income countries, many of whom may have to pay APC out of their own pocket. In today’s world, this market would have grown considerably. In a more recent study of listed predatory journals, journals were searched for articles on “coronavirus”, “COVID-19”, or “SARS-CoV2” published during January-May 2020, and 367 articles were found to be published across nearly 14% of the journals, with over 80% of them charging Article Processing Charges (APCs) at an estimated cumulative cost of over USD 46,000 ([Vervoort et al, 2020](#)).

These estimates do not factor in costs associated with the time, effort and resources (human, materials and funds) that have been spent in the conduct of a piece of research, which would also be wasted if the published findings are lost in predatory journals. In biomedical and physical sciences, the waste and other intangible losses are especially pervasive: lab supplies, experimental setups, fieldwork expenses, etc. in addition to staff time and salary. In biomedicine, animal and human experiments are performed with the expectation that some good arises from them, yet millions of animals and thousands of humans have been involved in experiments that never find their way into properly peer-reviewed publications ([Shamseer, 2021](#)) The loss of animal lives, risks to human research subjects and betrayal of public trust are immeasurable in monetary terms.

1.5 The COVID-19 context

This report was prepared during the global COVID-19 pandemic and its impact on the evolution of predatory journals and conferences is not clear. Studies of its impact on scholarly publishing more generally speak to systemic problems, if not to predatory publishing *per se*, such as exposing poor quality research, retractions of high-profile papers, the lack of data sharing and the growth of preprints ([Glasziou et al, 2020](#)).

According to [LitCovid](#), a site devoted to tracking research on COVID-19, over 216,400 CV-19 related articles have been posted to PubMed (as of 28 January 2022), and the speed with which these articles have been processed and published raises concern. Article processing times have seemingly been dramatically cut in an effort to get research out to the public quickly, even among legitimate and highly respected journals,

making distinguishing predatory journals all the more difficult and leading to frequent retractions of COVID-19 related articles ([Bueter, 2020](#)). Pre-prints have become mainstream and thousands of them have found their way into academic journals: whilst not peer-reviewed or vetted by experts, they have been cited and promoted by the media ([Teixiera da Silva, 2020](#); [Teixiera da Silva, 2020](#)), leading to a call for strict ethical guidelines for pre-print journals and authors.

Early indications are that **unscrupulous publishers may be capitalising on the confusion and urgency caused by the pandemic by publishing more low-quality and misleading research** ([Vervoort et al, 2020](#); [Tiwari & Kaur, 2020](#)). The range of journals impacted may be wider than those relating purely to virology, immunology and epidemiology, and reach medical, biological sciences, social science and other STEM or humanities ([Allen, 2021](#)).

With respect to predatory conferences, **COVID-19 is already proving to be a gamechanger for conferencing practices**. Home working and travel restrictions have fuelled the predominance of virtual and hybrid conferences ([Falk & Hagsten, 2020](#)) and these will continue to establish themselves and proliferate as technologies become more sophisticated and this mode of working more engrained. **It remains to be seen if these trends will help or hinder the prevalence and evolution of predatory conferences**. On the one hand, it may make it easier to establish online predatory conferences and more difficult to determine markers of legitimacy or to quality assure them. On the other hand, it may curtail them, without the lure of travelling to an appealing destination and as the capacity to organise legitimate online events increases ([see Table 1.1](#)). The prevailing view is that **a stronger case can be made for the pandemic fuelling predatory conferences than curtailing them** e.g. [Agrawal & Das, 2021](#), who lament that there are no central or global authorities monitoring this. It seems highly likely that (post-) pandemic predatory conference practices will evolve in different ways with increasing virtual and hybrid working, and characterisations needing to be revisited and redefined.

Table 1.1: The possible impact of CV-19 on predatory conferences

Helps predatory conferences	Hinders predatory conferences
<p>Communication tools are becoming more sophisticated and easier to use.</p> <p>Online conferences make it more difficult to differentiate and quality assure predatory and legitimate conferences, e.g. without meeting other delegates.</p> <p>Profit margins are higher as it is cheaper to produce.</p> <p>Academics have more money for events as no travel or hotel costs.</p> <p>Arranging participation in virtual conferences is less time-consuming than physical, in-person ones.</p> <p>Lockdown has enabled more time to write academic papers and created a demand for having rapid channels to publish and discuss research, to connect and exchange ideas.</p> <p>CV-19 as a “hot topic”, with a transdisciplinary dimension, may fuel predatory conferences.</p>	<p>There are more opportunities to network in the digital domain.</p> <p>There is more capacity to organise legitimate conferences/events.</p> <p>Virtual conferences have less appeal to researchers without the lure of appealing destinations.</p> <p>Registration fees and profit margins are lower, as related profit-driven tactics, e.g. hotel bookings, become irrelevant.</p> <p>Reputable academic institutions may be more predisposed to organising their own virtual major events at relatively low cost and high profit margins (by attracting large numbers of registrants).</p>

In short, the pandemic has prompted a shift in working practices ([Gkeredakis et al, 2021](#)), which may well have some bearing on predatory practices: with openness and transparency being key principles for averting misconduct and bad practice in research, doing more work in isolation or at close quarters risks creating an environment that enables such practices to thrive.

1.6 IAP study on predatory journals and conferences 2020-2022

This report is the main output of a two-year study under the aegis of the InterAcademy Partnership (IAP) exploring so-called predatory academic journals and conferences ([IAP, 2022](#)).

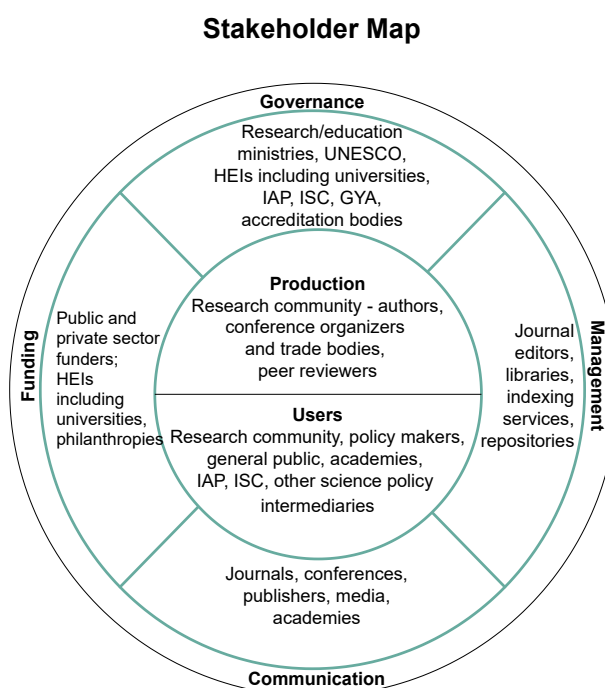
What is IAP?

IAP is a network of over 140 global, regional and national academies representing over 30,000 leading scientists, engineers and health professionals in over 100 countries.

Academies are the hallmarks of, and advocates for, quality science: peer-review is at their heart and they uphold the highest standards of academic practice, governance and leadership. Young and senior academy members and the wider research community can provide a wealth of global insight, from early career to established researchers, to gauge the prevalence and impact of predatory practices and behaviours, identify ways to curb and combat them, and serve as conduits to help raise awareness of the issue. Academies can be important institutional champions for tackling this and other pervasive or systemic problems in research.

Led by an international expert [Working Group](#), the overarching objective of the study was to develop a global strategy for combatting predatory journals and conferences, and to move them from marginal to mainstream debate amongst key stakeholders (listed at [Figure 1.2](#)). The study was not designed to expose culprits, but to understand and then find ways to address practices that undermine the integrity and purpose of science communication.

Figure 1.2: Schematic of key stakeholders in the research communication ecosystem



Recognising the systemic and pervasive nature of predatory practices, a range of methodologies were deployed, including a unique survey of researchers around the world, stakeholder dialogues with key sectors, and regional outreach webinars. This mixed methodology approach supplemented published knowledge on predatory journals and conference practices; helped raise awareness, especially amongst the research community; provided evidence on why they need to be combatted urgently; and informed the study's recommendations for a global strategy to this effect. Further details of the study and its methodologies are found in [Appendices A, B and C](#).

This report is structured around four observations made by the Working Group:

- Current definitions of predatory journals and conferences risk oversimplifying the complexity of predatory practices and are not yet universally applicable or agreed [[Chapter 2](#)].
- The awareness of researchers on predatory practices is not clear, nor have they had a strong voice on this issue; their perspectives and stories are largely untold [[Chapter 3](#)].
- There are useful tools and resources already available to help mitigate risk, and a range of interventions being put into practice at all levels; learning should be shared widely [[Chapter 4](#)].
- The systemic drivers of predatory journals and conferences are rarely discussed and require urgent clarification and action [[Chapter 5](#)].

The report's conclusions and recommendations are set out in [Chapter 6](#).

Chapter 2 A Spectrum of Predatory Practices

Summary

Predatory journals and conferences are on the rise, diversifying and becoming more sophisticated, with the distinction between fraudulent, fake, poorly resourced, low quality, legitimate but unethical publishing and conferencing practices growing less apparent. This makes it more difficult for scholars to avoid inadvertently or unknowingly using them, and for these practices to be tracked or monitored over time with any confidence.

Most existing definitions do not account for this complexity and are perceived to be biased towards the Northern hemisphere and English language. The binary, polarised approach of predatory and non-predatory, “watch” and “safe” lists is inadequate.

Predatory journals and conferences are described here as belonging to 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 ([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 the middle area of this spectrum or continuum of practices getting larger and more confusing, it is anticipated that this approach can stimulate a new, more nuanced conversation.

This chapter endeavours to define comprehensively what constitutes predatory academic practices, as a prerequisite for assessing the scale and impact of so-called predatory journals and conferences and designing and implementing effective interventions to address them.

2.1 Existing definitions and their limitations

As noted in Chapter 1, the term “predatory” is not used universally and can be problematic: at best, the term is provocative and attention-grabbing; at worst, loaded, misleading or divisive. Some argue that the term is weighted against lower income countries and locally produced journals with limited capacity/resources, and potentially penalises new entrants to the publishing world ([Raju, 2018](#)). Predatory also implies *criminal* behaviour, yet there are other publishing practices in high-quality, established journals that are accepted as common practice but arguably unethical and rarely challenged.

Furthermore, common discourse on so-called predatory publishing, predominantly in commentaries and opinion pieces, regularly uses judgemental and emotive language, such as metaphors and images of fear, fakery and exploitation, and depicts predator-prey imagery - a shark, wolf, a Venus flytrap, a hydra-headed monster ([Inouye & Mills, 2021](#)). The term “predatory” implies there is “prey”, yet researchers engaging with these journals and conferences are not always “prey”: some may engage willingly rather than being deceived ([Kolata, 2017](#)). This calls for a different approach, accepting that scholars might knowingly participate in predatory practices, and arguably represents an even more serious situation, where different actors join forces to prioritise their self-interest at the expense of good scholarship. The real prey in such a scenario is research and the users of this research.

Major research journals have adopted and normalised this emotive and value-laden discourse, with relatively few offering alternative perspectives or critiques. Further, much of the predatory publishing narrative continues to draw on Jeffrey Beall's influential but flawed work characterising predatory journals and their conflation with the Open Access movement ([Krawczyk & Kulczycki, 2021](#)): more on this in [Chapter 5](#). Nevertheless, some authors have argued that the term “predatory” is over-simplistic ([Reynolds, 2016](#)), conflates misconduct and poor quality (Eriksson & Helgesson, 2017), and disadvantages emerging research universities ([Smart, 2017](#)).

So-called predatory practices in the academic sphere account for a range of services that exploit researchers, scholarly communication and knowledge-sharing for one primary reason: profit (economic or other kinds of self-interest). This chapter focuses on what actions or practices inherently undermine the integrity and purpose of scholarly communication while profiting from them, not why or who is practising them.

2.2 Predatory journals

There have been numerous attempts to establish a single definition of predatory journals and predatory publishing (examples are included in the footnote⁸). These endeavour to provide a generic consensus definition that applies to all disciplines, but they generally do not satisfactorily address one of the key facets of predatory publishing: the lack of rigorous peer-review as a means of ensuring quality content marked by an original, distinct contribution to knowledge. This is because peer-review is too subjective (in most journals it is confidential and anonymised) for inclusion in an objective definition.

The most widely accepted definition is the Nature 2019 “international consensus” ([Grudniewicz et al, 2019](#)):

Predatory journals and publishers are entities that prioritise self-interest at the expense of scholarship and are characterised by false or misleading information, deviation from best editorial and publication practices, a lack of transparency, and/or the use of aggressive and indiscriminate solicitation practices.

Whilst more comprehensive than any other definition previously published, it is not easily operationalised by users in its current form, nor does it distinguish between deceptive and low-quality journals; a task that is difficult and time-consuming, placing additional burden on scientific publishing and felt more acutely in resource-poor developing countries. Some authors argue that **there can be no “black and white” definition because predatory publishing encompasses a spectrum of activities, wide-ranging in type and degrees of ethicality and legitimacy** ([Siler, 2020](#); [Cobey et al, 2018](#)). While accepting that high quality publishing has a high cost, leading journals charging higher than necessary fees, for example, could still be deemed as economically exploitative or unethical but would not be classified as predatory *per se*.

Distinctions between predatory and reputable publishing may be growing less apparent and harder to define with the growing cost of high-quality publishing, the commercialisation of academia and its outputs, and the concomitant appeal of certainty, rapidity and low barrier access that attract academics to publish in so-called predatory journals. The growing power of publishing conglomerates that produce or rely heavily on metrics, such as impact factor and the digitisation of submission practices, have come to dominate the academic publishing ethos. Profit modelling in such conglomerates may entail increasing the number of journals and/or their issues and extensive “netting” practices designed to “capture” as many submissions as possible and convert them into published articles e.g. [Sage Path](#). Compounding this,

8 For example: Beall (2016) <https://doi.org/10.6017/ihe.2016.86.9358>; OSI (2019) OSI Brief: Deceptive publishing | OSI Global; The Committee on Publication Ethics (COPE) (2019) Predatory publishing | COPE: Committee on Publication Ethics

researchers seeking rapid production of papers are (when they can afford it) increasingly using ancillary paid services to support their publishing efforts (for example, in order to prepare manuscripts for publication), which can undermine respect for principles of integrity and invite contract cheating ([City Students' Union, 2020](#)). As the number of commercial actors rises, it becomes harder to distinguish legitimate from questionable “services” such as ghost-writing or plagiarism concealment.

Some reputable journals have taken up practices marked by diminishing rigour, such as side-stepping knowledgeable and impartial peer-review, skipping second-stage review, reducing rejection rates, and non-transparent retraction processes ([Brembs, 2018](#)). Those that are struggling to establish themselves or get a foothold in a discipline may adopt “good enough” peer-review assessment rather than stipulating further revision. Cronyism is not uncommon, with journals publishing articles by their own editorial board members with regularity and/or publishing reviews of books authored by academics associated with the journal or a particular institution ([Flaherty, 2018](#)). Such practices are not fraudulent but they are unethical, and risk compromising the quality of, and trust in, research. These tensions arise, in part, because the publishing system is ill-adapted to today’s speed of information flow and volume of research papers: the irony being that poor publishing practices may be an adaptation that allows predatory publishing to flourish. Similarly, established “quality” journals may be increasingly drawn into a commercial trap or loop where they start to compete for articles of varying quality in their Mega Open Access journals with APC models ([Spezi et al, 2017](#); [Lakhotia, 2017](#)).

The search for an absolute definition of what constitutes a “predatory journal” becomes meaningless as practices evolve. **Adopting the term predatory practices or behaviours makes it possible to identify bad practices regardless of whether a journal practising them is, or should be, considered “predatory”.** Excellence and rigour in research and its communication are required from all actors, and practices undermining such aspirations should not be acceptable, wherever they occur.

Adoption of the concept of ‘predatory practices’ is still in line with the international consensus definition but now as practices in scholarly publishing that prioritise self-interest (typically maximising their revenue) at the expense of scholarship. Commercial interests *per se* are not a bad thing but they become a problem when they cloud the judgement of journals and publishers and risk undermining the quality of their services.

2.2.1 A spectrum of predatory behaviours for journals

A spectrum of journals encompasses a continuum from journals characterised by purely fraudulent and illegal practices to quality journals that nevertheless deploy some unethical practices that could be criticised for being predatory in nature ([Figure 2.1](#)). In moving away from the binary choice of “good” or “bad” journals, the spectrum makes it possible to distinguish between a range of practices, from fraudulent ones to those that compromise quality scholarly communication. Implicit in the spectrum is that authors and/or institutions can engage in these practices knowingly. It is anticipated that this spectrum approach can provide a starting point for further discussion on publishing good practice and research integrity.

The spectrum accommodates the following types of journals:

- **Fraudulent journals** are those that commit fraud (often via the Internet) in some way. Such practices are illegal, even criminal in nature: for example, phishing or using false identities to deceive someone. One typical example in this context is that of so-called **hijacked journals** ([Butler, 2013](#)), sometimes referred to as cloned journals ([Asim & Sorooshian, 2020](#)), where someone assumes the identity of a legitimate academic journal in order to acquire its business. This typically involves an imposter journal

setting up a fake, duplicate website making use of the title, ISSN, layout and information belonging to a reputable journal. Sometimes, a malicious actor might even “snatch” the actual official domain of a reputable publisher, i.e. take over its web address ([Bohannon, 2015](#)). Authors will, in these cases, unknowingly send their papers and fees to counterfeit journals, thus running the risk of losing their money, ownership of their paper and perhaps reputation. Hundreds of journals have been hijacked to-date ([Brezgov, 2020](#)). Another example is publishers who re-publish papers already in legitimate journals, without any permission to do so. This is a copyright infringement, enabling the publisher to give the appearance of publishing high-quality papers from established researchers. The most famous example of a fraudulent publisher is the OMICS Publishing Group, which was ordered by a US federal judge to pay over \$50 million in damages for deceiving thousands of authors who published in its journals or attended its conferences ([Brainard, 2019](#)). The Federal Trade Commission brought them to court for breaches of trade regulations. Authors are advised to avoid these journals at all costs.

- **Deceptive journals**, sometimes called ‘deceitful’ journals, are characterised by the publisher giving false or misleading information about their publishing charges, the services they provide (like indexing, peer-review, or having an impact factor), where the publisher is based, or the identity of the owner, editor or members of the editorial board. In their use of deception, these journals are undoubtedly unethical but only arguably fraudulent or even criminal: this is a grey area and subject to further investigation. Nevertheless, they are always acknowledged as violating research integrity ([ALLEA, 2017](#)). Deception is always a breach of trust and indefensible: any instance of deceptive practices puts a journal or publisher in this category (which, for many, entails the very essence of “predatoriness”). Authors are again advised to avoid these journals at all costs.
- In contrast to deceptive journals, **low-quality journals** are characterised by cumulative criteria, where the scale and scope of these criteria determine its editorial quality. Unlike deceptive journals, they cannot be fought through legal action but instead require a more refined evaluation, according to how they fare against cumulative criteria of predatory practices. Authors are advised to beware: these journals might have many predatory markers and the advice is not to publish in them, though they may not be called predatory journals outright.

The middle part of the spectrum is the most difficult to navigate. Here, a distinction is made between three close but distinct categories of low-quality journals, characterised by typical low-quality markers or behaviours. A single journal might be hard to place definitively into one of these categories, but it is possible to distinguish them in principle.

- **Unacceptable low-quality journals**, where the quality is so problematic that it undermines scholarly communication and even research infrastructure, do a disservice to science by making it hard to communicate research results or engage in scientific discourse. This is an ethical lapse: even though such a journal is not deceiving an author about its services, it is putting revenue before its (supposed) mission to serve science. Examples include journals that accept cursory peer-review that fails to assess papers in a meaningful way; a reluctance to investigate accusations or allegations of fraudulent or incorrect papers they have published; the lack of contact details for their editorial board; or absenting the articles they publish from well-used indexes.
- **Low-quality journals** show behaviours that are suggestive of or risk substandard publishing, that some critics might classify as predatory. These markers are not sufficient in nature or number to definitively characterise the journal as fraudulent, deceptive or unacceptably low quality but are concerning nonetheless. Examples of typical practices include some low-quality markers previously mentioned; the use of aggressive or indiscriminate solicitation practices; the journal website or correspondence

presenting contradictory statements or being generally low quality (lacking information, dead links, bad formatting, spelling and grammar mistakes, an abundance of ads, etc.); or the lack of transparent publishing policies.

- **Well-intentioned, promising low-quality journals** encompass those that are trying to be of service to science. Low quality markers are present but few, and are mitigated by the journal or publisher endeavouring to provide a reliable, trustworthy space for scientific discourse. Such journals are promising in that they could, with some support, develop into quality journals. With the rise of low-cost, open publishing, some libraries and indexing services provide such support, in the recognition that a single umbrella of ‘predatory publishing’ can both harm the open access cause and inhibit publishing in lower income countries ([Reynolds, 2016](#), [Smart, 2017](#)). Authors are advised that these are not the best place to publish, but they may do so with care: it will not be an offence to publish here, but they may not get full credit.
- **Questionable quality journals** is a further category made possible through the use of a broader lens of predatory practices rather than a substantive and categorical definition of predatory journals. It becomes all the more relevant as established, reputable and legacy or traditional publishers and journals compete with those of dubious quality and adopt practices marked by diminishing rigour. A common way of competing with other journals is to promise rapid peer-review: one often-discussed publisher, Multidisciplinary Digital Publishing Institute, or MDPI, provides a good example. It was listed as predatory by Beall but the various journals under its aegis show differing characteristics; some problematic, others widely supported by scientists. A recent look at its business practices ([Petrov, 2020](#)) shows that the common characteristic across its journals is the phenomenal speed of publishing: MDPI claims that median time from submission to publication was just 39 days for articles published in 2019. In a short time, this service has transformed MDPI into the fifth largest publisher in the world, in relation to journal paper output. This competition may provoke other publishers into changing their behaviour: for example, [PeerJ](#) proudly claims that its median is 30 days to first decision to cater for a growing demand for faster reviews ([Nguyen et al, 2017](#)). Such market-driven behaviour can result in paper processing that is too fast, too cursory and less concerned about quality, so that substandard papers are published. This type of behaviour will ultimately undermine public trust in research and, accordingly, such bad practices must be called out, whether or not they appear in an outlet labelled as ‘predatory’. A quality publisher or journal is one that engages with its critics and openly considers ways to rectify bad practice. Authors are advised to publish in quality journals without these questionable practices but this may be unavoidable at times.

Supporting the spectrum in Figure 2.1, [Appendix D](#) lists typical traits or markers used to classify predatory journals, organising them into three categories:

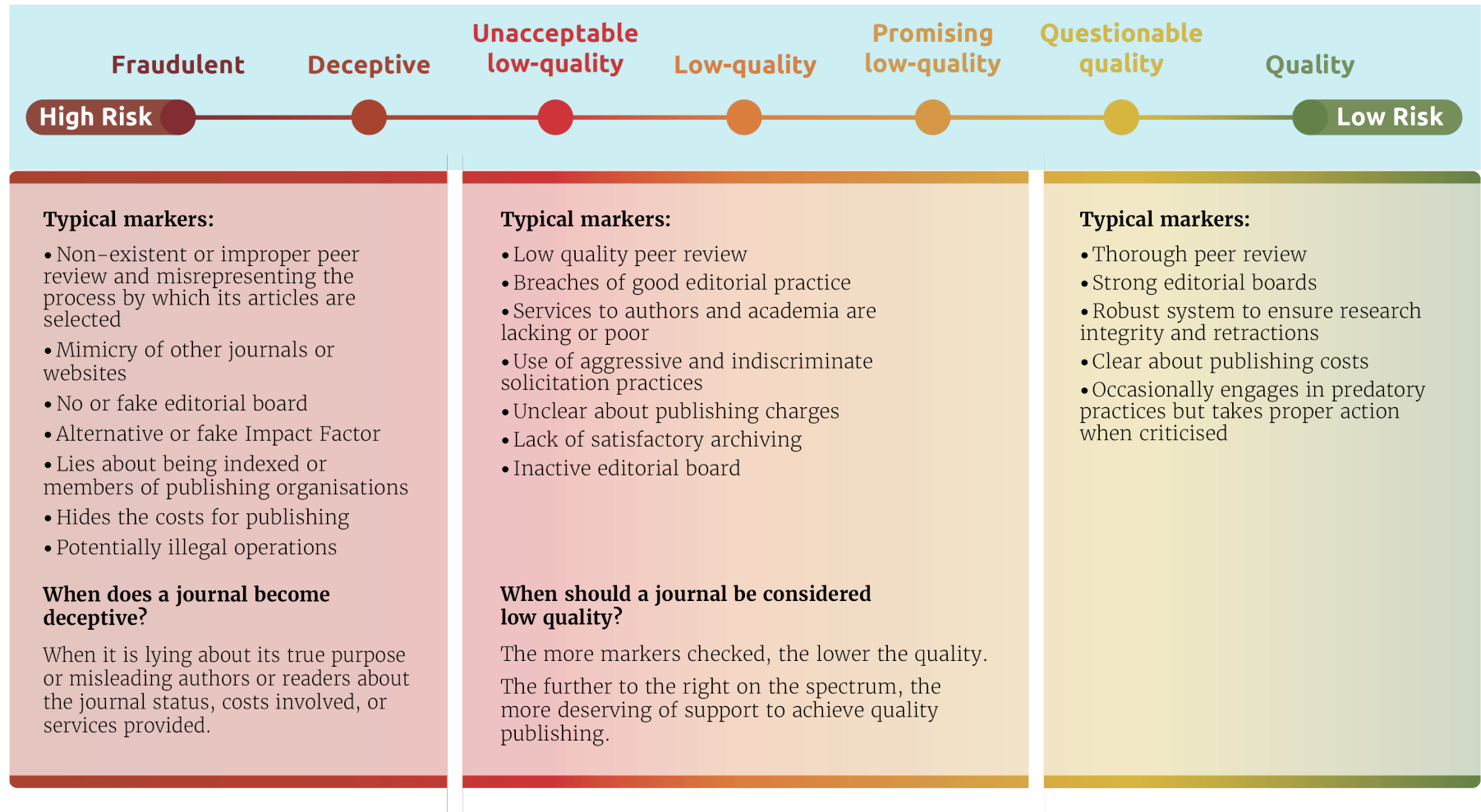
- deceptive journals (which should not be tolerated);
- unacceptably low-quality journals (which require immediate correction); and
- low-quality journals (which require correction and support to become quality ones)

In compiling these markers from the literature, a number were rejected because they are too subjective or ambiguous: such as the assumption of malicious purpose or bad faith by the journal or publisher, which can only be speculative; the journal is unknown to the author and their colleagues, which may not necessarily be true; regional bias in its editorial board or among scientists publishing with it, which risks being discriminatory; the inclusion of ‘quasi-science’ papers e.g. parapsychology, which is a scientific judgement; article processing charges are either too high or too low, which is subjective and dependent on the services provided; the publisher is launching too many journals at once, which may simply be good business practice; the lack of a regular publishing scheme, which is neither a good nor bad trait; and a journal is publishing

an unusually small, unusually large, or markedly variable number of articles each year. New online trends in publication are likely to foster variable outputs and practices, and making any judgement on what constitutes good or bad practice is unwise. Finally, a previously used marker – that of journals not using standard identifiers such as ISSNs or DOIs or using them improperly – is arguably redundant as predatory journals become more sophisticated and increasingly use such instruments ([Linacre, 2020](#)).

This spectrum approach is a stimulus for starting a new, more nuanced conversation that avoids the binary 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 differ in different geographic contexts. The spectrum supplements the “international consensus” definition published in Nature (2019) as a tool for user communities to better understand and navigate their way around them.

Figure 2.1: A spectrum of predatory behaviours for journals



2.3 Predatory conferences

“Suspicious” conferences were first reported 20 years ago ([Cohen, 2013](#)), yet there has been relatively little reported on them compared to their journal counterparts. Predatory conferences are complex in nature and, like predatory journals, come in different shapes and sizes; the lack of conference industry standards only exacerbates this ([Xia, 2021](#)). Some authors and institutions have endeavoured to characterise predatory conferences (a few examples are provided in the footnote⁹) but these are largely piecemeal and untested ([Nisha et al, 2020](#)).

There are **many commonalities between predatory journals and predatory conferences**. Whilst there is no agreed definition by the research community, broadly predatory, fraudulent and fake (those that do not take place at all) conferences do not support scholarship but are purely concerned with profit. They tend to be organised by profit-driven companies who prey on the demand from academics, perhaps especially early career researchers, to present and publish their work. If duped, an academic can expect the meeting to be cancelled but fees retained, poor quality or totally absent peer-review, potentially chaotic organisation and a meaningless – even nonsensical – technical programme; additionally, they will be out of pocket for registration fees, travel and accommodation, not to mention the resources expended to prepare the presentation, abstract and any associated paper ([Chivers, 2019](#); [Mackenzie, 2019](#)). Predatory conferences have the potential to catalyse professional disenchantment particularly among junior scholars starting to feel their way in the profession.

Assembling a predatory conference is easy: online, legitimate academic conference content and online personal profiles can all too easily be copied or amended, and passed on to unsuspecting researchers. There is evidence that these practices, like their sister predatory journals, are becoming more sophisticated and less easy to distinguish ([Stoye, 2019](#)). While there is less in the literature on predatory conferences than journals, there are a few loose and at times contradictory definitions (examples are provided in the footnote¹⁰). Predatory conferences have most recently been classified according to five categories of strength or reliability ([Pecorari, 2021](#)), organised on a scaling slide of usability/ease as the basis of guidance for researchers.

There are also several sources listing **common traits, checklists or “red flags”** that researchers can use which are summarised in Box 2.3: as indicated, and in much the same way as those for predatory journals, some listed common traits are unreliable and cannot be taken for granted.

9 For example: [Memon, A.R., & Azim, M.E. \(2018\). Predatory conferences: Addressing researchers from developing countries. Journal of the Pakistan Medical Association 68\(11\): 1691–1695; \[Think.Check.Attend.; ENAGO Academy\]\(#\)](#)

10 Examples include [McCrostie, J. \(2018\). Predatory conferences: A case of academic cannibalism. International Higher Education, \(93\), 6–8. <https://doi.org/10.6017/ihe.0.93.10425>; \[Think.Check.Attend.; ENAGO Academy\]\(#\)](#)

Box 2.3: Summary of common traits of predatory conferences:

- They are all deceitful in some capacity
- They are all profit-driven and often hide this fact
- They fail to conduct rigorous peer-review
- They have quick turnarounds and high acceptance rates of abstracts/papers
- They list established researchers' names on programmes, in marketing materials or on advisory boards (often without obtaining their consent and difficult to verify)
- They hold many conferences in different fields at the same time and/or in different cities throughout any year

Also cited as typical markers, though the authors deem them to be less reliable:

- They can charge disproportionately high fees
- Their written communication is unprofessional, poor or inconsistent
- They often have “international” in their title

2.3.1 A spectrum of predatory behaviours for conferences

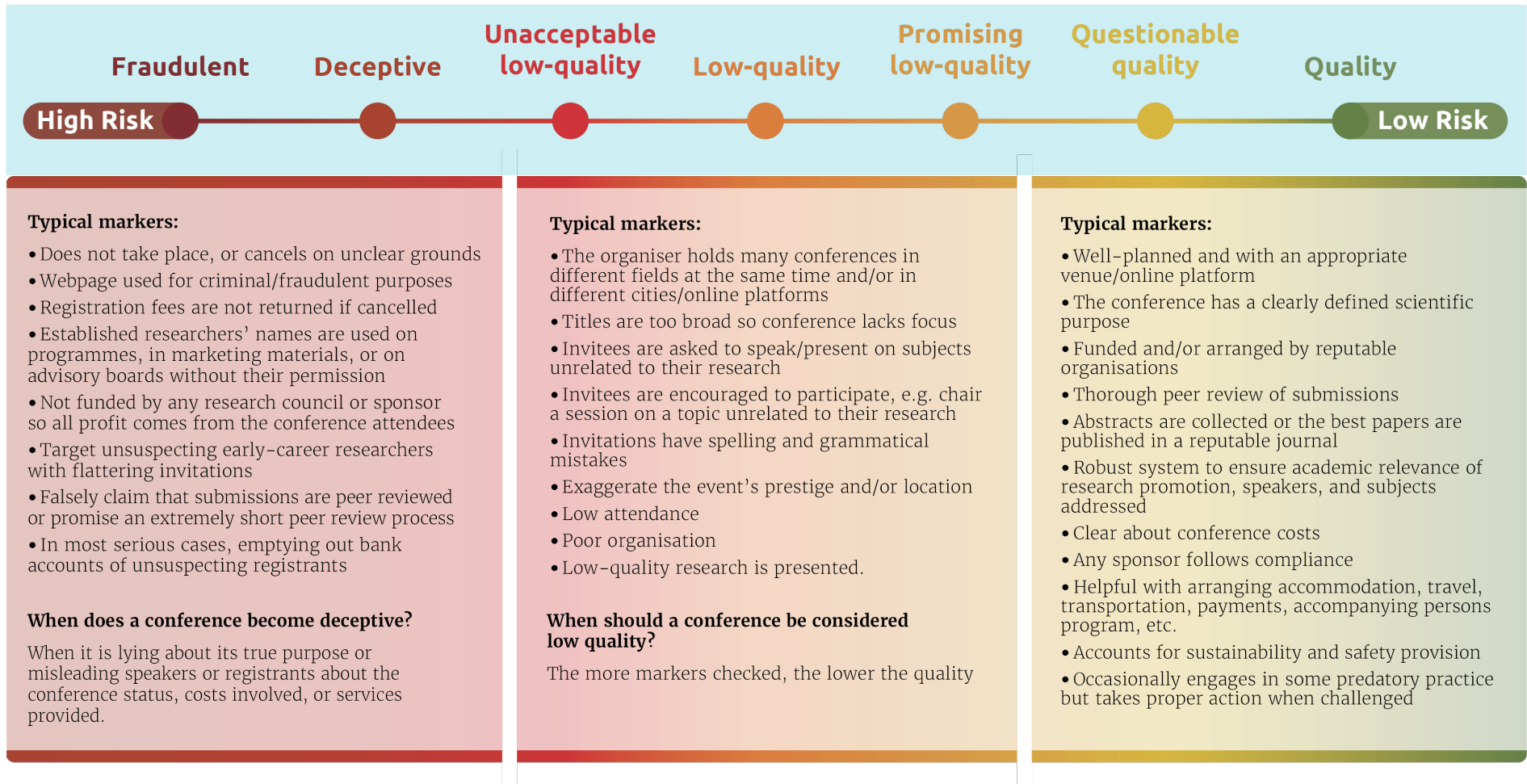
Much like journals- there are likely to be advantages to introducing a **spectrum of conference practices or behaviours** ([Figure 2.2](#)) that range from fraudulent or fake to low-quality and unethical; from conferences that never take place at all, to those that do take place but are meaningless or poorly attended, to those that are simply mediocre in quality (where perhaps all submitted papers are accepted) or have high or even unrealistically low registration fees. **The boundary line between predatory and legitimate but unethical conferencing practices is likely to be as porous as it is with journals, and users are advised to avoid the left-side of the spectrum and exercise caution in the middle.**

Mirroring the analysis of predatory journals, and supporting the spectrum ([Figure 2.2](#)), [Appendix E](#) condenses the typical markers/descriptors for predatory conferences into three categories:

- fake and deceptive conferences (which should not be tolerated);
- unacceptably low-quality conferences (which require immediate correction); and
- low quality conferences (which require correction and support to become quality ones).

This spectrum approach for predatory behaviours in academic conferencing is again a stimulus for starting a new, more nuanced conversation that avoids the binary classification of good and bad, safe and watch, conferences. As with the journals' spectrum, it is fundamentally about transparency rather than making value judgements. The spectrum can serve as a tool for user communities to better understand and navigate their way around the growing number of hybrid and virtual academic conferences, and in-person ones where safe.

Figure 2.2: A spectrum of predatory behaviours for conferences



Chapter 3 A Global Survey of Researchers

Summary

The perspectives of scholars and researchers on predatory journals and conferences are rarely documented; their experiences and stories largely untold. A unique global survey of researchers was conducted to understand their relative awareness, exposure and vulnerability across different geographies, disciplines, career stages and gender. The survey also provided an opportunity for those with personal experience of predatory practices to shed light on the impact of these practices, and provide compelling evidence on why they need to be addressed with urgency.

Over 80% of the 1,872 survey respondents indicated that predatory practices are already a serious problem or on the rise in their country of work. Early career researchers in low and middle-income countries were more likely to perceive this problem.

Nearly a quarter of the respondents from 112 countries, and across all disciplines and career stages, indicated that they had either published in a predatory journal, participated in a predatory conference, or did not know if they had. The majority of those who did so unknowingly cited a lack of awareness of predatory practices; whereas the majority of those who did so knowingly cited the need to advance their careers.

In contrast to some previous studies, the survey data indicated that there is no significant relationship between using predatory outlets and academic career stage or gender, but that both discipline and the economic status of the country in which a researcher works do have some bearing on apparent exposure/vulnerability. There are also indications that predatory practices may have become institutionalised and engrained in some research cultures, given reference to peer pressure and institutional inertia.

The impact of predatory practices manifests itself in different ways – research, economic and public policy, with further granularity within these. If left unchallenged, the global research community is concerned about poor or lost research undermining the credibility of the research enterprise, poor research being used to misinform public policy, and a widening research gap between low and high income countries.

These survey results have revealed a mix of concern, confusion and relative indifference, which has helped to shape targeted recommendations for key stakeholders later in the report.

Based largely on bibliometric analyses, there is a growing body of evidence on the scale of predatory journals, and to a lesser extent predatory conferences, that suggests these practices appear to be widespread and on the rise. These studies place different emphases on the vulnerability to, and prevalence of, predatory journals: for example, on the relative extent to which senior and early career scientists publish in them or where they manifest themselves geographically.

In contrast, there are few studies on the perceptions of the research community itself: their relative awareness, exposure and vulnerability, and how these relate to variables like geography, academic career stage, discipline and gender. Similarly, there are few first-hand accounts from the research community on its direct experience of predatory practices and how it mitigates them.

This chapter reports on a survey of the research community as a novel contribution to the understanding of predatory journals and conferences, especially in terms of their prevalence and impact. In this context,

impact is understood as the perceived impact of predatory practices at different levels (individual, systemic and societal) and the anticipated impact should these practices be left unchallenged. Prevalence is explored as the perceived prevalence of predatory journals and conferences based on key researcher demographics (geography, career stage, discipline, gender). The survey explores these demographic characteristics to determine particularly vulnerable groups, which are noted, excluded or inconclusive in the current literature.

Available in seven languages (Arabic, Chinese (simplified Mandarin), English, French, Portuguese, Russian and Spanish), the survey was as open and inclusive as practicable. The survey was shared with all IAP national members, its regional networks and sister networks- the Global Young Academy and National Young Academies, World Academy of Science (TWAS), International Science Council (ISC) and the Organisation for Women in Science for the Developing World (OWSD) – through numerous media channels. Each provided conduits to their own members and alumni and through them their respective institutional and professional networks. The survey was also shared with contacts in key stakeholder groups (including those at [Appendix A](#)). Participation was voluntary and anonymous.

The survey itself is at [Appendix B](#) and focuses on four main sections ([Box 3.1](#)). The questions were a mix of qualitative (open-ended text) and quantitative (multiple choice, ranking and Likert scale) questions and [Appendix C](#) describes the mixed method design, statistical tests and assumptions in more detail¹¹.

Box 3.1 Survey design

- **Demographics:** Demographics fields designating the country in which respondents work, their gender, academic career stage, any academy and/or professional affiliation, and discipline (including trans- and multi-disciplinary research fields). This helped the study gauge where there is interest, concern, a prevalence of predatory practices, and/or perceived acceptability or vulnerability.
- **Recognising a predatory journal or conference:** gauging present understanding of these practices in the research community provided a useful baseline for the study on which to build new and champion existing interventions, and gain insight into any common misunderstandings or preconceptions. Respondents were asked to: (i) identify scenarios or signs that would rouse their suspicion, based on a Likert (strongly agree to strongly disagree) scale; (ii) indicate how they would go about checking whether a journal or conference was predatory; (iii) indicate the extent to which they thought predatory practices are already a problem in their country of work to gauge their perception or awareness.
- **Personal experience:** to gauge the extent and impact of predatory practices, respondents were asked about their own personal experience with, in turn, predatory journals and conferences, and whether they had used them, knowingly or unknowingly. This was perhaps the most challenging part of the survey, where respondents may have felt exposed or compromised, in spite of assurances in the survey of anonymisation.
- **Interventions:** to seek ideas on ways in which predatory practices could be combatted, together with any examples of good practice i.e. interventions that have worked, or are working, well and could be shared and/or scaled up. Respondents were asked about practical solutions, as well as what they perceived as the main challenges/barriers, to inform the project's recommendations and their target audience(s). Looking ahead, respondents were asked how they think predatory journals and conferences might develop over the next decade or two, if left unchallenged. Those interested in getting involved further in the study – either as case studies or perhaps future advocates – were invited to provide their contact details for follow-up.

11 Should further information be required, please contact secretariat@iappartnership.org

Four considerations of the data require highlighting at the outset:

1. The term “predatory” was not defined in the survey to avoid leading respondents, so their understanding may have been variable.
2. The results were based on respondents’ perceptions of prevalence and impact, so are used as a proxy, mapping experiences and opinions rather than a direct measure.
3. Self-selection (i.e. choosing to reply or not) may have had two counter effects: (i) those who are unconcerned about predatory practices and/or do not believe they should be combatted would not necessarily have participated in the survey; and (ii) the survey content may have deterred some respondents from participating in the survey or completing it truthfully, in fear of reprisals or repercussions in spite of assurances of anonymity.
4. Some regions were underrepresented: the majority of respondents were male, from higher-income countries who had not, to their knowledge or admission, published in predatory journals or participated in predatory conferences. The findings were interpreted in this context.

With these considerations in mind, the authors make a cautious case for this survey sample being a reasonable proxy for the global research community.

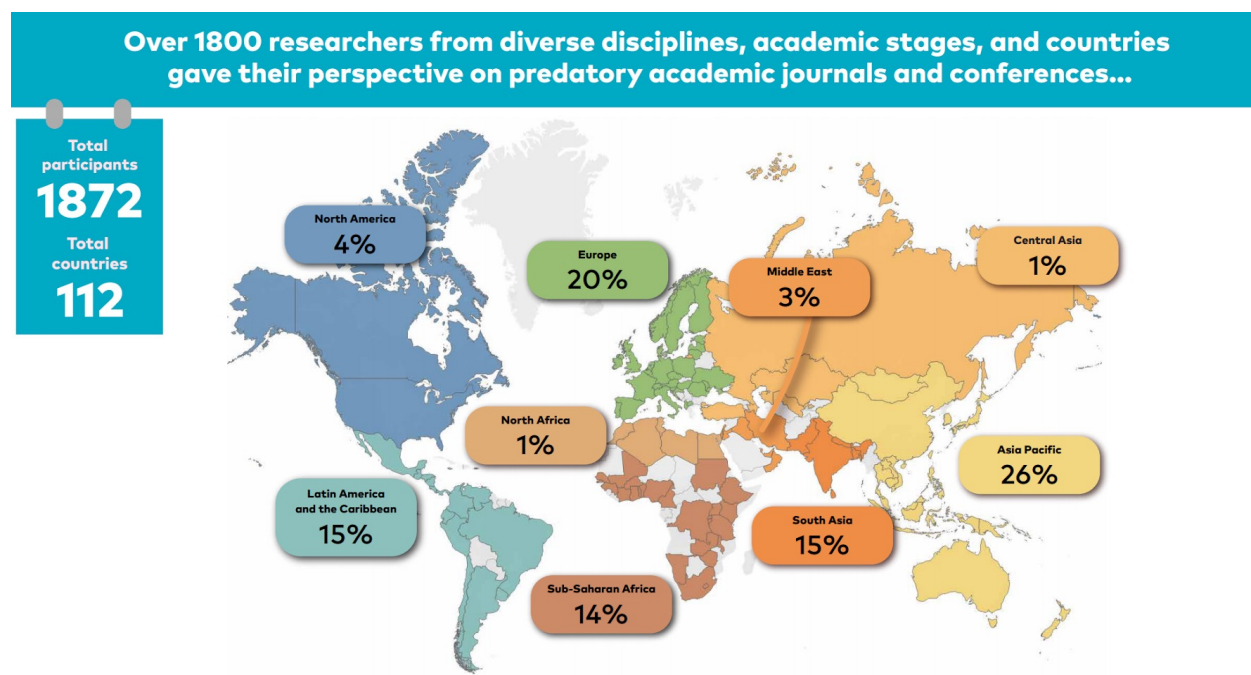
3.1 Researchers who participated

Over 1800 researchers from wide-ranging geographies, disciplines and career stages voluntarily completed the survey in full, constituting a 73% completion rate (1872 of 2575) based on those who successfully submitted the survey¹².

Respondents were working in 112 countries in all world regions, with the largest proportions from Asia Pacific, EU member countries, South Asia, Latin America and the Caribbean, and Sub-Saharan Africa ([Figure 3.1](#)). The least represented regions were North Africa, Central Asia, the Middle East, non-EU member European countries and North America, which in some regions may reflect the lack of reach/working connections there e.g. Central Asia, and in others an apparent lack of interest e.g. North America. Most respondents chose to participate in the survey in English, with 10% (276 of 2575) of respondents participating in the other available languages. In terms of country income status, 41% of respondents were from higher-income countries (HIC), 32% from upper-middle-income (UMIC), 25% from lower-middle-income (LMIC) and 2% from low-income countries (LIC), according to World Bank income categories.

¹² The survey was inclusive and anonymous; therefore, utilising only completed responses minimised duplicate responses and discounted largely uncompleted surveys. It is not clear why the non-completion rate was high (27%) - there may have been technical problems or they didn’t have time to complete it - but on the positive side, they may have learned a little more about predatory academic practices and heightened their awareness.

Figure 3.1 Demographic breakdown of survey respondents by geographic region



All academic career stages, from established senior academicians to less-experienced researchers, such as graduate students and early career researchers, were represented (see [Figure 3.2](#)): the majority of them (62%, or 1159 of 1872) mid- and advanced career researchers. Just over half of all respondents were academy members or alumni. All disciplines were represented to varying degrees, with a predominance of life, medical and physical sciences (see [Figure 3.3](#)). Two-thirds of the respondents were male.

Figure 3.2: Demographic breakdown of survey respondents by academic career stage

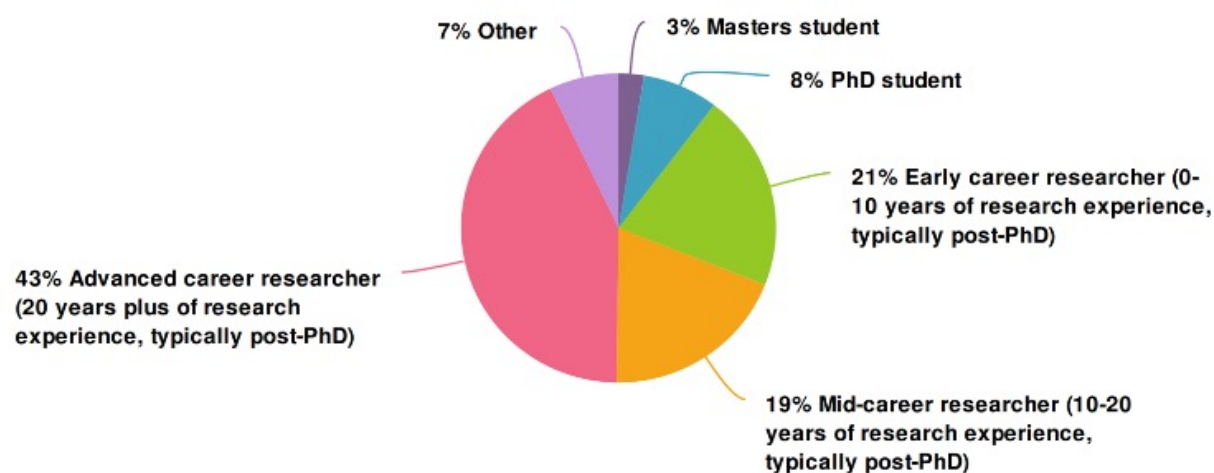
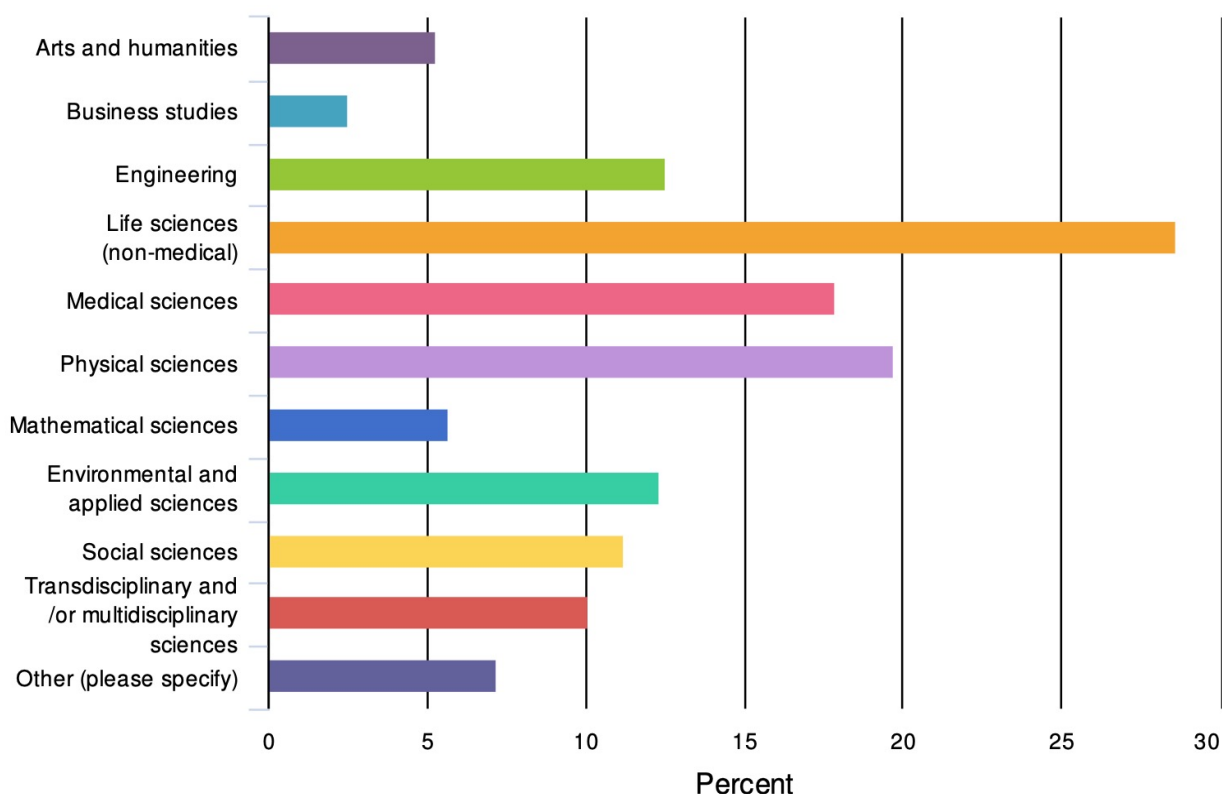
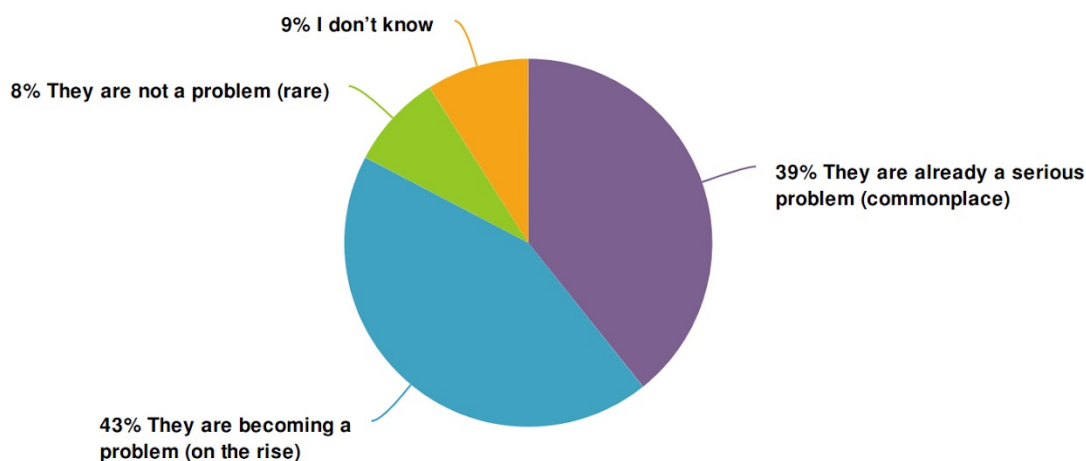


Figure 3.3: Demographic breakdown of survey respondents by discipline

3.2 Perceived prevalence of predatory journals and conferences

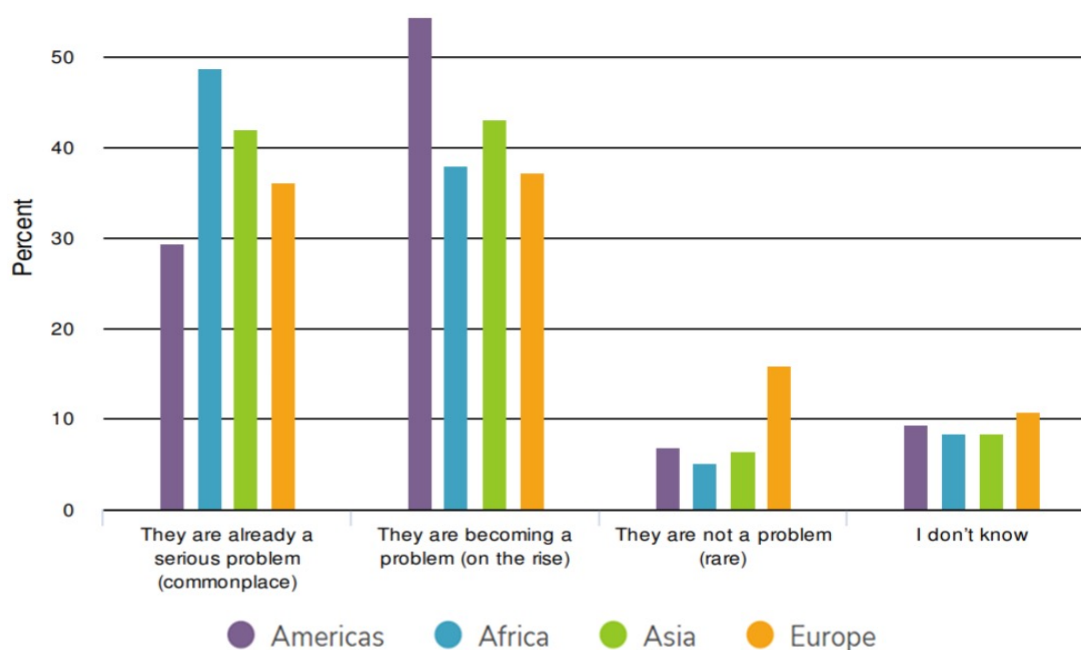
Respondents were asked to gauge how prevalent they thought predatory practices are in their own country of work ([Figure 3.4](#)). **Over 80% (1537 of 1859) of respondents perceived predatory practices to be a serious problem (39% or 731 of 1859) or on the rise (43% or 806 of 1859) in their country of work.**

Figure 3.4: Responses to question on prevalence of predatory practices in their country

Using a chi square test of independence ([Appendix C](#)) to identify any significant relationship between demographic characteristics and a respondent's perception of predatory academic practices in their country, the results indicated that there was no significant relationship between discipline or gender and their perception of any problem. In contrast, a respondent's region, economic status of the country in which they work, and their career stage did have some bearing on whether or not they perceived predatory practices as a problem in their country.

Looking regionally ([Figure 3.5](#)), researchers in Africa were more likely to perceive these practices are already a problem than any other region, while those in the Americas (largely Latin America) were more likely to be concerned that they are on the rise. Proportionately more in Europe thought predatory practices are not a problem in their country.

Figure 3.5: Regional breakdown of responses on the degree to which they perceive predatory practices are a problem in their country of work



Supporting data: Africa had the highest proportion of respondents who indicated they are already a serious problem at 49% or 135 of 277 (cf 39% or 731 of 1859 globally); the Americas, the highest proportion who indicated they are on the rise at 54% or 199 of 366 (cf 43% or 806 of 1859 globally); and Europe, the highest proportion who think predatory practices are NOT a problem in their country at 16% or 61 of 382 (cf 8% or 154 of 1859 globally).

Through further investigation using a multinomial logistic regression analysis ([Appendix C](#)), the survey results indicated that **respondents in some regions perceived predatory practices to be more of a problem than in others**: those in South Asia, Latin America & the Caribbean and Sub-Saharan Africa significantly more so than those in the EU, for example. The concern of researchers in Latin America may seem paradoxical given the high regard and relative resilience of the Latin-American publishing model; but it may also illustrate that, while researchers there recognise it is not yet a serious problem, they are concerned that they are on the rise and risk compromising something important and unique in their own system (i.e. they have something special to lose).

Those respondents in lower and middle-income countries demonstrated more concern, based on their perception, than those in higher-income ones. This corroborates much of the literature and the project's

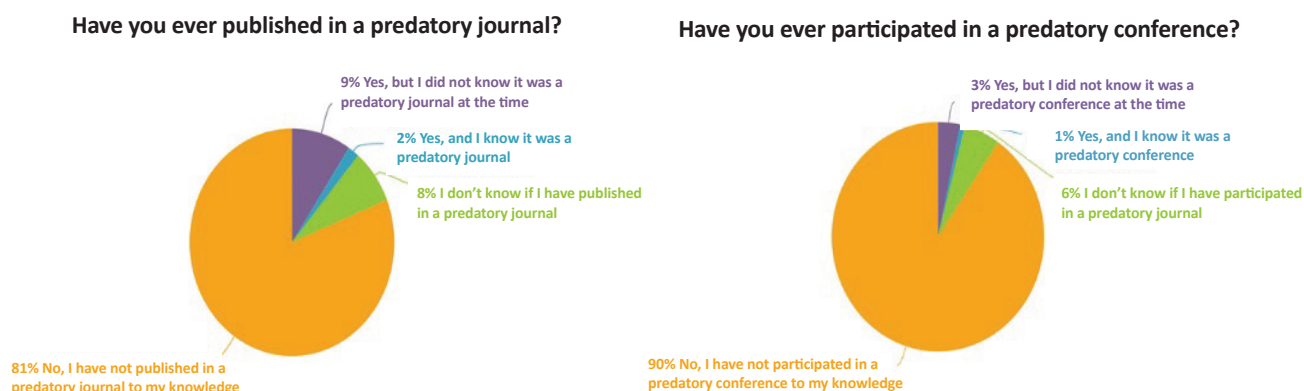
stakeholder focus groups that researchers in low-income countries are more exposed to these practices than their counterparts in high-income countries. This may also reflect more publishing and presenting opportunities being available to researchers in “the North” and/or perhaps even some complacency that this is someone else’s problem.

In terms of career stage, **perceived prevalence was less pronounced with experienced researchers** and they were more inclined to have a firm view one way or another (in comparison to not knowing), compared to less experienced ones. This **reinforces the importance of targeting graduate and early career researchers for training to improve their understanding and minimise their risk.**

3.3 Direct experience of predatory journals and conferences

The most sensitive question in the survey (albeit anonymised) was that of whether respondents had already used predatory outlets, whether knowingly or unknowingly ([Figure 3.6](#)).

Figure 3.6: Response to question on whether a respondent had ever (a) published in a predatory journal and/or (b) presented at a predatory conference



Nearly a quarter of respondents (24% or 445 of 1859) had either used a predatory journal or conference (14% or 268 of 1859) or did not know if they had (10% or 177 of 1859). Of the 14%, 11% responded in relation to predatory journals. The did-not-knows illustrate how difficult it can be to differentiate fraudulent and legitimate journals/conferences, or perhaps a reluctance to say one way or another. These figures may be an underestimate of the true proportion of academics who have either been scammed, deliberately used predatory outlets, or are unclear, because (1) over half of them were members or alumni of academies, enjoying the professional support that their membership provides, and likely to be better sighted/aware of these practices; and (2) some respondents may not have wanted to admit their mistakes or transgressions.

These figures are worryingly high and – if the survey sample can be used as a reasonable proxy for the global research community as a whole – would suggest that predatory practices require urgent attention. Using the global population of researchers in 2018 at 8.8 million full time equivalent (having grown 19% since 2013) ([UNESCO Science Report: Towards 2030](#); [Naujokaitytė, 2021](#)), extrapolating the 11% of respondents who knowingly or unknowingly published in predatory journals would project to around 968,000 researchers; 14% (both journals and conferences) would project to over 1.2 million researchers. Taking into account the rapid research capability growth in the LMICs and likely consequence of the pandemic pushing up global R&D investment ([Cookson, 2021](#)), these figures could be much higher.

An alternative approach is to use the UNESCO figure of 1,368 researchers/million population in 2018 and a global population today estimated at 7.9 billion (worldpopulationreview.com), where the number of researchers impacted by predatory journals (at 11%) would equate to 1.19 million. Taking the 14% of respondents for both predatory journals and conferences, this figure increases to over 1.5 million researchers. **Impacting at least one million researchers around the world, these predatory academic publishing and conferencing practices deserve more attention and action than they currently receive.**

The rationale for using predatory outlets was also explored ([Figure 3.7](#)).

Figure 3.7: Reasons for using predatory services, knowingly or unknowingly



For those who used predatory outlets unknowingly¹³, i.e. were scammed, their given reasons were a lack of awareness of predatory practices (95% or 164 of 172), the need to advance their career (56% or 89 of 160), the convenience of the services (45% or 73 of 164) and encouragement by their peers (39% or 63 of 162) [note: they were able to check more than one reason]. For those who published knowingly¹⁴, the main driver was to advance their careers, followed by convenience and encouragement by their peers. Indeed, there was anecdotal evidence to suggest that the use of predatory journals and conferences is embedded, or at least tolerated, in some institutions and networks.

Hypothesis testing using the chi square test of independence ([Appendix C](#)) found no significant relationship between whether an individual published in a predatory journal or participated in a predatory conference and their academic stage or gender. This would suggest that **academic stage and gender are not contributing factors i.e. researchers in either of these demographics are equally likely to publish in a predatory journal or participate in a predatory conference.** This contradicts many published studies (e.g. [Kurt, 2018](#); [Frandsen, 2017](#)) arguing that early career researchers are more likely to use predatory services because of pressure to satisfy metrics. More established, even retired, researchers may be equally likely to use them but for different reasons: for example, they may be less proficient at ICT, or more prone to vanity publishing, as well as being more likely to have disposable income.

¹³ Those who admitted to using predatory outlets unknowingly comprised 9%, or 167 of 1859, of all respondents; or 84%, or 174 of 208, of those who admitted using them, whether knowingly or unknowingly.

¹⁴ Those who admitted to using predatory outlets knowingly comprised 2%, or 33 of 1859, of all respondents, or 16%, or 33 of 208, of those who admitted using them, whether knowingly or unknowingly.

In contrast, **researchers in low and middle-income countries were more likely to report they had used predatory practices, or not know if they had, than those in higher-income ones.** This could be explained in several ways: these regions may be targeted more by predatory outlets because opportunities for researchers are fewer; there are more barriers e.g. language; research governance systems may be less established; and research numbers are growing faster in LMIC and LIC countries. It further reinforces the importance of targeting interventions (awareness raising, training, guidance) in these countries.

Research discipline also had some bearing on whether researchers had indicated they had used predatory journals or conferences.

- *Researchers in arts and humanities were more likely to indicate they had published in predatory journals:* the reason for this is not clear but could potentially be a reflection of the number of smaller and/or more localised journals (many in different languages) in these fields, some without the tradition of peer-review, or of researchers more inclined to publish alone, i.e. with less peer support, than those in natural sciences.
- *Researchers in transdisciplinary studies and engineering were more likely to indicate they had participated in predatory conferences.* With the growth in transdisciplinary research, it may be more difficult to recognise reliable journals and conferences that publish across fields. Most established researchers are aware of the respected journals in their particular field, and discipline-specific lists of “good” and “bad” journals are plentiful, but transdisciplinary research brings less clarity. Engineering conferences may be more important professionally than those in other fields because they provide opportunities to promote commercially-driven prototypes and products: as such, researchers in engineering may be targeted by predatory outlets.

3.4 Impact of predatory journals and conferences

(i) Impact on researchers

Being deceived by predatory outlets can lead to reputational damage, tarnishing a researcher’s credibility. If research published in predatory journals or presented in predatory conferences tends not to be cited, it is invisible ([Donovan, 2017](#)). If it is cited or found out, it may be viewed as tainted or substandard or even fraudulent work by association, inflicting serious and lasting damage on researchers who have fallen victim to such scams, or – worse still – knowingly used them in spite of these risks: tainted CVs, the loss of valid research, the loss of self-worth, the inability to withdraw or republish their work elsewhere. There can also be an emotional cost: the amorphous but debilitating loss of morale or confidence; the feeling of guilt or shame when duped or scammed. This side of the story has not really been told and the survey endeavoured to explore this further.

The survey asked structured and open-ended questions about the personal and professional impact of a respondent’s experience. A content analysis ([Appendix C](#)) was used to identify the main themes that arose from their answers and sought to quantify them to identify majority and minority experiences.

For predatory journals, 132 respondents chose to explain how publishing unknowingly or knowingly impacted them. Six themes, intersecting both professional and personal impact, were identified: (in descending order) Negative Feeling, No Impact, Change in Behaviour, Loss of Academic Knowledge, Gained Knowledge/Awareness, and Waste of Time, Energy and/or Money.

The most common negative feelings articulated by survey respondents were regret, frustration, disappointment, shame and annoyance. Some expressed regret that they had lost their academic work

to a predatory journal and did not gain the exposure or the impact they wanted from their work. Others lamented the waste of money, energy and/or time (Box 3.2)

Box 3.2: Quotes from those who published in predatory journals unknowingly (9%):

“Unfortunately, I had over 20-25 papers sacrificed in these journals. They can’t be considered for promotion, and I become a questionable researcher everywhere my CV goes. Everyone looked down on me. I lost a few good friends and even broke into tears once in public because I was so ashamed. It was a truly painful experience. I hope no other academic experiences what I went through.”

“It has delayed my PhD completion by many years because after that discouragement came in, I disconnected and am now trying to pick up the pieces. It is hard. “

“Wherever my CV went (whether it was to societal memberships, communities of practice or hiring institutions), people would highlight and question about those predatory publications. It has become a really obvious black dot in my career.”

“The academic world is ruthless and relentless. People judge without understanding what happened.”

In contrast, albeit in an already small group, 27% (or 36 of 132) of respondents who had used predatory journals noted “no impact” at the professional or personal level. This may reflect any number of (i) respondent complacency or acceptance that these practices are a normal part of academic life; (ii) a lack of mentoring, policing or quality assurance to pick up these practices and disincentivise users; or (iii) respondents brushing off their experience as a lesson learned. Certainly, some respondents referred to their learning experience, and how it had raised their awareness of these practices and perhaps made them less predisposed to falling prey to them again (though the survey did not specifically seek to identify repeat offenders or explore their behaviour). In some cases, the experience empowered respondents to take action or change their behaviour in some way.

Of the 71 respondents who had participated in predatory conferences (4% of respondents), there were similar themes of personal and professional impact, ‘though a higher proportion noted a positive impact as participation still enabled them to see new places and meet new people, irrespective of whether it added value to their research. Due to small numbers, there is a limit to what these survey data can reveal but arguably there should be a growing sense of urgency to improve understanding of these predatory conference practices with the post-pandemic rise of online events and conferences; and, more generally, to draw on personal stories to illustrate the potential risks and consequences of using predatory journals and conferences, as a deterrent or disincentive for others.

(ii) Institutional impact

Damage to an institution’s researchers can extend to the institution itself, through the implication of poor research and governance, inadequate mentoring of postgraduate students and young academics, and ineffective support for good scholarship. Contrary to the aim of every academic institution to rise in ranking or prestige in the academic world, association with predatory practices can carry reputational risk. The risk to an institution of participating in, or even hosting, a predatory conference may be less of a stigma than its researchers publishing in predatory journals, but cross-promotional offers (using conferences to publish in conference proceedings and equally predatory journals) may exacerbate this. Legitimate publishers will also be impacted by these cross-promotional offers; for example, through erosion of trust, being undercut in pricing, and/or risking accidental involvement when approached by predatory outlets.

The survey found suggestions of institutional collusion or tolerance and researchers being encouraged by their supervisors and/or peers to use predatory outlets. Senior academics who tend to publish in predatory journals may extend the harm as role models to their students and junior colleagues. There are also signs of institutional collusion in predatory conferences and affiliation to legitimate national and international bodies, as these survey testimonials illustrate:

“The lead author suggested we publish in a predatory journal after a few rejections and one co-author was an editor at the journal, which made it difficult to criticize.”

*“I was asked to keynote a conference in Kenya and was told by my international body that this was a legitimate conference. I paid for myself to attend and on the first day it became clear to me that the conference was predatory. I informed the international body and organisers. Nothing was done by the international body. I think there was a hesitancy to offend African partners, which to me is a huge problem as it perpetuates the predatory practices. I was very upset by the experience especially as **I expected an esteemed international fully accredited body to take these breaches seriously**”.*

*“It had the **vener of respectability as it was housed in a college of the University of Oxford**. I knew it was a private initiative, but the group that participated had strong academic ties. What made me suspicious was the way they handled the conference volume and the fact that the conference company that organized the conferences (there were more than one and in a variety of subjects) disappeared after three years.”*

*“**The invitation was in an IUCN Newsletter** - so it was thought to be legitimate - I did not go to the conference - was in Kathmandu but two of my colleagues arrived and there was no conference. It is however seemingly **connected to a credible university in the UK**.”*

Social media is further fuelling predatory practices, through platforms like LinkedIn.

*“There are **many ‘organisers’ actively connecting and promoting their events on LinkedIn**. There is no vetting and sometimes, there are mutual connections between us and that leads to us thinking this is a legitimate account, organising an event.”*

“Cette expérience a été très choquante et nous a permis de dorénavant faire attention à tout ce qui est reçu à travers le net. En effet, on ne sait pas qui se cache derrière notre écran et nous parle.”

*Engl: “This experience was very shocking and allowed us from now on to **pay attention to everything that is received through the net**. Indeed, we do not know who is hiding behind our screen and talking to us.”*

(iii) Economic impact

The economic impact of predatory journals is difficult to assess. Taking the estimated and likely conservative figure of 1 million researchers impacted by predatory journals ([section 3.3](#)), two different types of economic losses are set out here as illustrations:

- Referring to research waste (wastage of funds spent on conducting the research - consumables, equipment, salaries, etc) if research findings are lost to a predatory journal (i.e. pre-publication costs):

With a ballpark figure¹⁵ of USD 25,000 for generating one research paper in a molecular biology lab in Malaysia (based on the number of publications expected from funded research at a university in this a upper-middle-income country; Looi, pers.comm), and modelled against an earlier study ([Moher et al, 2017](#)) revealing that 17% of papers in predatory journals have acknowledged funding, the funding waste would translate as **USD 4.2 billion**. Although this is illustrative and hypothetical, universities, research institutions and funding bodies should take note that this waste is not a trivial sum.

- Referring to the money drained off to predatory journals through APCs (i.e. publication costs):

With [Shen & Bjork \(2015\)](#) estimating the amount of article processing charges (APCs) drained off to predatory journals to be USD 74 million in 2014 (using the lower average APC charge by predatory journals of USD 178 per article and the volume of 420,000 articles in 2014), today's conservative estimate would be **at least USD 178 million** (retaining the 2014 figure). This is on top of research costs (as above). Any low APC that undercuts APCs of reputable journals will be particularly attractive to authors in low-income countries, many of whom will have to pay them out of their own pocket. With the rapid growth of research in LMICs, this may well be a significant underestimation but it demonstrates that predatory journals are a lucrative business, and will grow even faster if no serious attempts are made to stop them.

3.5 Recognising predatory journals and conferences

The survey sought to gain a better understanding of the preferred tools and resources that researchers use to help them avoid predatory journals and conferences. These are typically “**self-help**” tools, such as looking for revealing signs as they understand them (97% of respondents) or using published checklists of “good” (61%) and “bad” journals (68%) ([Figure 3.8](#)). They were least likely to not bother checking (49%) or consult their institution's review board or ethics committee (assuming they had one) (34%).

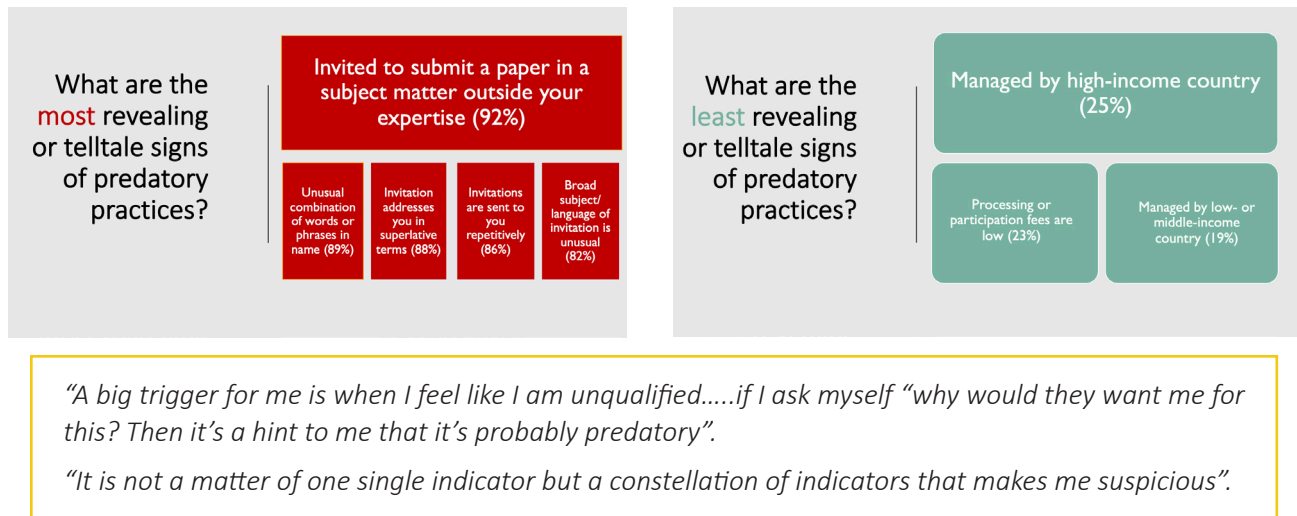
Figure 3.8 Respondents' Likert response to how they would check for predatory practices



¹⁵ This is not easy and will be dependent on geography and discipline. For example, one author – a SSH scientist working in Ireland – estimated a minimum €4k per paper; another – a geologist in Ethiopia – estimated anything between USD-3k-10k, depending on the nature of the research (field-based, intensive laboratory work, large scale field expeditions).

[Figure 3.9](#) illustrates what respondents felt were the most and least revealing signs of predatory practices.

Figures 3.9: The most and least revealing signs of predatory practices identified by respondents, with two particularly illuminating quotes.



3.6 Researchers’ perspectives on why predatory practices should be addressed

Respondents were asked whether and why they thought predatory practices should be addressed, and what the consequences of not doing so might be. In both instances, statements were provided and respondents invited to use Likert scale (strongly agree to strongly disagree) options.

Over 90% of respondents (1730 of 1846) thought predatory practices should be addressed, for three broad reasons:

- to preserve the integrity of (98% or 1679 of 1716), and public trust in (97% or 1668 of 1710), research;
- to ensure that research informing policy is rigorous (92% or 1570 of 1703); and
- to protect personal/academic (93% or 1598 of 1714) and institutional (89% or 1520 of 1708) reputation.

Of the small minority (2% or 35 of 1846) of an already small number who did not think they needed to be addressed, the primary reason was because they did not think papers published in predatory journals would be cited (81% or 26 of 32).

The perceived consequences of failing to address predatory practices are illustrated in [Figure 3.10](#). The primary concerns amongst respondents are that predatory practices *risk* fuelling misinformation in public policy with potentially damaging consequences; infiltrating and undermining the whole research enterprise; and further widening the gap between high income and low income countries (according to 82%, 69% and 58%, respectively, of survey respondents).

Figure 3.10: Respondents' views on the consequences of failing to address predatory practices

In relation to the widening research gap, it is estimated that roughly 75% of predatory journals target researchers in low and middle-income countries ([Callaghan & Nicholson, 2020](#)). Notably, Asia and Africa, key targets of predatory publishing, contribute 60% and 17% of the global population, respectively. These are where the largest number of young researchers reside, where there is greatest need for capacity-building of research governance and integrity, and where the promotion of good research will be a game-changer to leapfrog ahead. **In exploiting scientists in low and middle-income countries, where more than 80% of the global population resides and where, it could be argued, good science will result in the greatest public good, predatory journals and conferences risk causing serious harm.**

Relatively few survey respondents agreed with the statement that “predatory practices will continue to exist but not be a significant problem for the majority” (36%), and fewer still that “they will fade out naturally” (10%). In terms of challenges and barriers to combatting predatory practices, 85% of respondents perceived the **main challenge to be the commercial interests of the publishing industry** (85%). Other challenges – in descending order- were:

- It is difficult for researchers to distinguish predatory from non-predatory outlets (56%)
- It has already permeated widely amongst researchers (55%)
- Policymakers are unlikely, or cannot be relied upon, to effect change (49%)
- Demand for predatory journals is too high (35%)

In conclusion, this chapter has provided a researcher perspective on predatory journals and conferences. The implications of these survey findings are that these predatory practices may have infiltrated a wider demographic of scholarship than previously thought, with researchers in all career stages needing to be on their guard, especially in lower and middle-income countries and in the arts and humanities, engineering and transdisciplinary studies. With lack of awareness being cited as the primary reason for having used predatory outlets, broad-brush interventions across the research community as a whole may be advisable. Targeted awareness-raising of early-career researchers and students, to instil good practice early on in their

careers, and of research supervisors and mentors, as advocates for the importance of rigour and care in publishing and conferencing decisions, could be especially impactful. With the vast majority of respondents indicating that these practices should be addressed and that they are already a problem or on the rise in their country of work, there is clearly a significant concern at the researcher level.

The next chapter looks at tools and resources already in the public domain, and interventions being implemented at all levels, to help researchers in particular.

Chapter 4 Existing Tools and Interventions to Combat Predatory Practices

Summary

Interventions designed to mitigate the use of predatory journals and conferences are numerous and diverse. They serve to (i) expose or stigmatise these practices, such as “watchlists” and the efforts of self-organised research communities; (ii) train researchers so they can avoid these practices and minimise their own risk, such as “how to identify” guides and training programmes; (iii) apply regulations to create disincentives, such as national and institutional policies; and (iv) assist all journals and (to a lesser extent) conferences, including low-quality and/or local ones who may show some predatory characteristics but are well-intentioned, by setting principles of transparency and editorial best practice. Some of these resources are free while others are pay-for/subscription-based; some are mandatory while others are voluntary.

This chapter highlights some of these resources and provides regional, national, sectoral and institutional case studies as illustrations to share learning. While examples are numerous, evidence of their impact is limited and they are likely to struggle to keep up with the adaptability and increasing range of tactics predatory outlets use. The common, and it would seem most popular, resources of binary “safelists” and “watchlists” that endeavour to delineate good practices from bad ones are flawed and risk disadvantaging less-established journals and conferences. The plethora of checklists of common traits can be helpful but also confusing and do not account for a dynamic system of predatory practices.

All of these tools and interventions play their part, especially awareness raising to mitigate personal risk. But missing are global interventions and those that address systemic issues driving predatory practices and behaviours, their intended and unintended consequences: these will have long-term, sustained impact and need to be addressed as a matter of urgency.

Effective interventions are vital if predatory journals and conferences are to be combatted. Current interventions vary in form, ranging from awareness raising, training and induction to guides and lists, promotion of good practice, standard-setting, institutional policies and national regulations. These operate at multiple levels: institutional, national, regional and global.

A variety of actors have a stake in these interventions, and include journal editors, authors, publishers, conference organisers, academies and scholarly societies, librarians, journal information and indexing services, research administrators, students, supervisors, mentors, funders and policy makers.

4.1 Exposing predatory journals and conferences

Exposing or naming-and-shaming fraudulent and deceptive journals and conferences is perhaps the most prominent intervention for combatting predatory practices, but also one of the most problematic. Lists of “good” and “bad” journals, and (less prominently) conferences, are popular because they are easy to use for busy researchers.

Continued reference to, and (in part) reliance on, [Beall's list](#) of potential predatory publishers and journals is an illustration of this demand. Beall's list undoubtedly paved the way for other initiatives designed to tackle predatory publishing, some of which are freely accessible, e.g. [Predatory-publishing.com](#) (an independent

and anonymous group), and others which are paywalled – such as [Cabells Predatory Reports](#). Paywalled resources are those that are not publicly available and researchers or their institutions need to pay to access the content. Due to commercial sensitivities, it is not always clear how some of these paywalled resources select their criteria for inclusion. Cabells provide a searchable database that identifies deceptive and fraudulent journals, based on over 70 behavioural indicators to flag potentially exploitative or dishonest operations. It makes its criteria and development (if not its Predatory Reports service) openly available to be used by all researchers; has developed an alert system for subscribing universities when predatory journals are accessed from their servers; and engages with most “at risk” academic communities to help them navigate their way around predatory publishing practices (Simon Linacre, pers.comm). Cabells also publishes a “safe list” – now called [Journalytics](#) – that catalogues journals meeting their quality criteria, and other entities have followed suit.

Jeffrey Beall was also one of the first to highlight “predatory meetings”, compiling a [list](#) of organisers he judged to sit in this domain (now unavailable). **There appear to be very few lists for predatory conferences, compared to journals:** a Google search found only one, [KScien](#), operating out of Kurdistan. Whilst Beall played a significant role in recognising the issue of predatory journals, publishers and conferences, his lists were not curated systematically, and his criteria for finding and listing them were not transparent ([Silver, 2017](#)). Yet still they are used and cited frequently.

Lists are problematic generally. They are difficult to keep up-to-date, especially as predatory practices and outlets evolve; they risk being libellous (the downfall of Beall, in fact [[What is Beall’s list?, 2021](#)]), **and they polarise what is a much more complex spectrum of predatory behaviour**, as described in Chapter 2. Nevertheless, they are favoured by users because they are relatively quick and efficient (as the survey in Chapter 3 has indicated).

Some countries have prepared their own checklists for their respective research communities. For example, the University Grants Commission (UGC) in India, together with over 30 universities and academic disciplinary bodies, has prepared a [safelist](#) of credible journals/respectable titles to fend off “trash” titles. Having found that more than one-third of articles and authors who published in predatory journals came from the Indian research community ([Patwardhan et al, 2018](#)) and 88% of journals on the UGC safelist were predatory or dubious journals, in 2018 the UGC removed 4,305 dubious journals from a list of publications used for evaluating national academic performance ([“India culls 4,305 dubious journals”, 2018](#)).

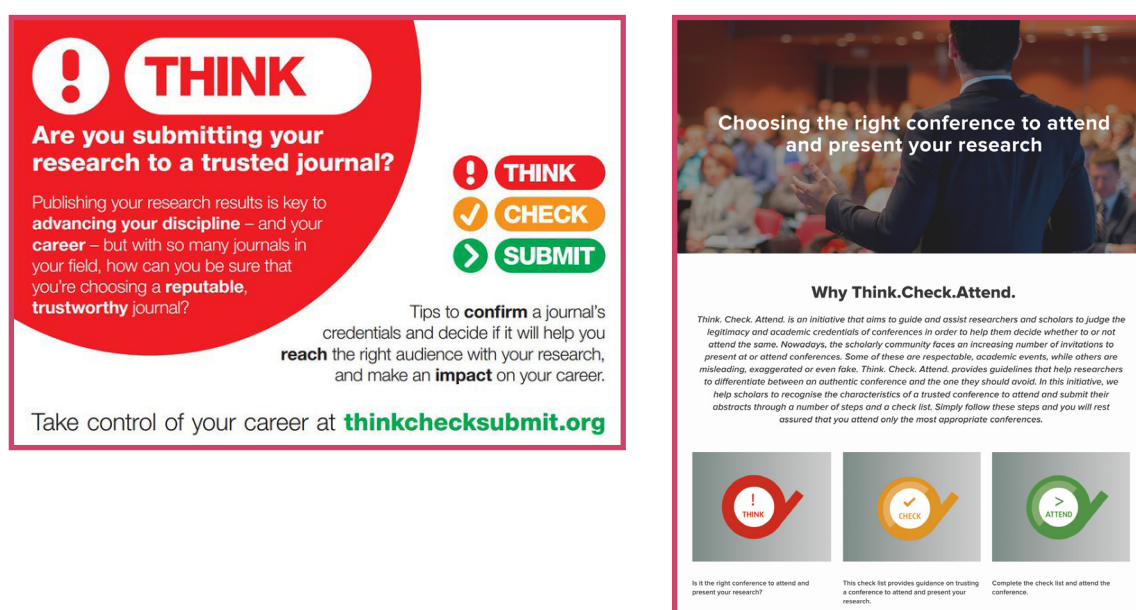
In other countries, **researchers have organised themselves as watchdog communities.** [Dissernet](#) is a prominent Russian example; a free online resource managed by a community network of professional scientists from across disciplines, both in Russia and abroad, as well as journalists, civil activists and other volunteers. Their objective is to identify and investigate academic fraud, plagiarism, fake science and gross violations of thesis preparation and defence. Since 2013, this independent, volunteer network has exposed tens of thousands of plagiarists and fake dissertations ([Neyfakh, 2016](#)) and contributed to a 2019 Commission report, led by the Russian Academy of Sciences (RAS), that forced Russian journals to retract more than 800 papers ([Chawla, 2020](#)). In 2020, the RAS published its own list of deceptive journals designed to track deceptive and dishonest behaviours, including purchased author credentials, plagiarism, translation plagiarism and false claims of peer-review, and causing Scopus and Web of Science to drop those included in their own indexes ([Abalkina, 2021](#)).

4.2 Avoiding predatory journals and conferences

Self-help checklists of typical characteristics or traits of predatory journals and conferences are also popular. They help researchers identify trusted journals, publishers and conferences in which to publish and present their work. These require more time on the part of the user but can be useful in terms of identifying bad practice and minimising personal risk. However, while appearing to simplify decision-making, there are now a plethora of published checklists for both predatory journals and conferences which may overwhelm and confuse authors looking for efficient tools to guard against using them; given their similarity, some have called for the creation of one evidence-based tool serving authors from all disciplines ([Cukier et al, 2020](#)).

Two major free-of-charge examples for checking predatory journals and conferences are [Think.Check.Submit](#) and [Think.Check.Attend](#), respectively ([Figure 4.1](#)).

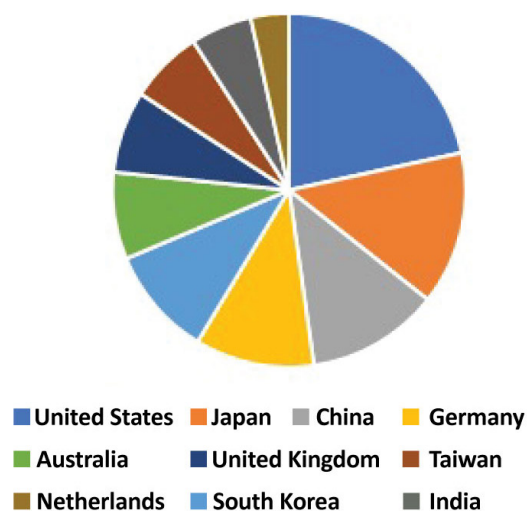
Figure 4.1 Useful online resources



Think.Check.Submit. (TCS) is a campaign supported by a cross-industry coalition of international organisations who work in scholarly communication (including DOAJ, INASP, OASPA and the ISSN International Centre; described later in this chapter). This widely used checklist is available in nearly 40 languages, from Albanian to Vietnamese. It now includes a [checklist for authors](#) who wish to verify the legitimacy of publishers of books and monographs.

Modelled on TCS and hosted by KnowledgeE, based in the United Arab Emirates, Think.Check.Attend. Is a checklist for predatory conferences. Less established than TCS, a 2021 (unpublished) analysis of users accessing the TCA website and accompanying [conference checker tool](#), has shown the top 10 source countries are in high and upper-middle-income countries, rather than lower-income ones, which may be a reflection of the growing concern in these countries or TCA not yet reaching researchers elsewhere ([Figure 4.2](#)).

Figure 4.2: Analysis of users accessing Think.Check.Attend. and its conference checker, as of September 2021



In addition to these tools, numerous other resources are available to help researchers identify poor publishing and conferencing practices, spurred on by rousing calls to action (Eriksson & Helgesson, 2017). Some examples are provided in Table 4.1 and provide useful reading material for those wanting to know more.

Table 4.1a Examples of guides and resources for identifying predatory journals

- [Think. Check. Submit. \(thinkchecksubmit.org\)](https://thinkchecksubmit.org/)
- [AuthorAID - A beginner's guide to avoiding 'predatory' journals \(using your critical thinking skills\)](#)
- [Centre for Journalology \(ohri.ca\)](https://ohri.ca/centres/centres-for-journalology/)
- [Cabells Predatory Reports](#)
- [COPE discussion document on predatory publishing](#)
- [INASP's Guide to the Journal Publishing Practices and Standards \(2017\)](#)
- [Predatory publishers | Scholarly Communication \(cam.ac.uk\)](https://www.cam.ac.uk/research-support/publishing/predatory-publishers)
- [Latindex Guide for Editors](#)
- <https://onlinelibrary.wiley.com/doi/epdf/10.1002/leap.1135>
- [Home - Predatory Journals and Conferences \(predatory-publishing.com\)](https://predatory-publishing.com/)
- [OSI Brief: Deceptive publishing | OSI Global](#)

Table 4.1b Examples of guides and resources for identifying predatory conferences

- <https://thinkcheckattend.org/>
- [AuthorAID - What are 'predatory' conferences and how can I avoid them?](#)
- [9 Signs a conference is a big fat fake \(exordo.com\)](https://exordo.com/9-signs-a-conference-is-a-big-fat-fake/)
- <https://www.enago.com/academy/tips-identify-avoid-predatory-conferences/>
- [Proposed Criteria for Identifying Predatory Conferences - scholarlyoa.com](https://scholarlyoa.com/proposed-criteria-for-identifying-predatory-conferences/)
- [Predatory conferences | Predatory Publishing \(ntu.edu.sg\)](https://ntu.edu.sg/predatory-conferences/)
- [The Complexity of The Questionable: Fighting the battle against 'predatory conferences' \(iccwORLD.org\)](https://iccwORLD.org/the-complexity-of-the-questionable-fighting-the-battle-against-predatory-conferences/)
- <https://www.pcma.org/fake-predatory-conferences/>

Raising awareness of predatory journals and conferences is imperative for graduate schools and HEIs, such as universities: the complexity of these practices requires researchers at all career stages to be supported and mentored to help them cultivate a deeper understanding of risks and consequences (Eaton, 2018). According to the survey (Chapter 3), lack of awareness of predatory conferences would appear to be especially acute. There is also a growing concern expressed in specialised and vocational journals that medical and dental students, in particular, are being increasingly targeted by predatory outlets. Publishing in medical journals and presenting at health conferences are valued accomplishments across the continuum of medical education, and instrumental in securing places on competitive residency programmes, yet publication ethics and appraisal of journal and publisher credibility are not included in medical training programmes (Mercier *et al.*, 2017). IAP's [Young Physicians Leadership \(YPL\) programme](#) might be a possible route for such training.

One of the leading authorities on predatory publishing in health and biomedicine, the Ottawa Hospital Research Institute's (OHRI) Journalology group has developed two interesting resources for researchers, clinicians, funders and publics: (1) a [one-stop shop](#) of resources on predatory publishing, which collates policies/statements from funders/institutions/universities that address predatory journals, as well as educational materials; and (2) (in development) a digital journal authenticator tool to help stakeholders (whether authors, funders or users of research) to detect predatory characteristics of journals, based on a journal's operational practices and transparency policies. Their website also helpfully assists researchers who believe they may already have published in a predatory journal and how they should try to rectify this (Figure 4.3).

Figure 4.3: What to do if you submit to a predatory journal?



Taken from the Centre of Journalology website ([ohri.ca](#))

Some universities have also started to provide support services for users, especially through their own library services. Examples include Cambridge and Portsmouth Universities in the UK with their online guide and checklist ([Sewell, 2017](#); [“Predatory Journals and Publishers-University of Portsmouth”, 2021](#)). In the US, the Clemson University Libraries collates materials on predatory publishing and “unsavory research” ([Clemson Universities Libraries](#)), and TexasTech University has a dedicated page of resources on predatory journals and conferences, including a consultation request service with one of their librarians ([TexasTech University](#)). The latter has one of the few research groups ([Morris, 2019](#))- STEPP, funded by the US National Science Foundation- reviewing watch- and safe-lists and ethical publishing codes ([Koerber et al, 2020](#)).

Some networks and institutions provide mentoring services, workshops and online webinars for their members on how to select the right journals and conferences, and avoid predatory ones. [AuthorAid](#), funded by INASP, UKAid and SIDA, provides a free service for mentoring and training researchers in LMICs, including helpful online resources (MOOCs, videos, guides) on scientific writing, how to choose a journal in which to publish, a Q&A service and guide to predatory journals for researchers ([Nobes, 2018](#)). AuthorAid also works with The Organisation for Women in Science for the Developing World (OWSD) on its induction/orientation programme for early career researchers ([Thomson, 2020](#)). As part of its study on predatory practices, IAP is developing training resources, especially but not exclusively for the research community ([IAP, 2022](#)).

Some national science academies have been proactive in assisting their members and wider research communities in their countries. Two examples are provided in [Appendix F](#) as case studies and first-hand accounts from some of the authors of this report, which readers may find helpful. They comprise an intervention by the Ethiopian Academy of Sciences to implement a national journal evaluation and accreditation system, subsequently taken up by its science ministry; and a national evaluation by the Academy of Science of South Africa. Examples of wide-ranging interventions by universities in the Arab region are also included in [Appendix F](#).

4.3 Applying policies and regulations

Recognising the dangers that predatory journals and conferences pose, a growing number of national research funding agencies have implemented policies and regulations to mitigate them.

Supporting its safelist of credible journals, the University Grants Commission (UGC) in India has set up a Consortium for Academic and Research Ethics ([CARE](#)) to promote research publications in reputed journals; develop a methodology for identifying quality journals, especially in local languages; discourage publication in predatory and questionable journals; and promote research integrity and publication ethics. CARE identifies journals of dubious quality and practice, and issues periodic guidelines and lists of journals passing its scrutiny. All research institutions in India must have guidelines for avoiding publication in predatory journals and there is a compulsory course for all PhD scholars in India on Research Ethics. In parallel, [Guidelines for Assessment of Research output and Ethics in Research](#) have been prepared by science academies in India. CARE is taking a hard line approach ([Patwardhan, 2019](#)), instructing its universities to ignore publications and presentations in predatory outlets in all future evaluations, and to publicly challenge any attempts to compromise academic integrity. UGC’s university accreditation process will account for any evidence of predatory publishing as an institutional disincentive:

“The University Grants Commission (UGC) has made it clear that any publications in predatory, dubious journals or presentations and dubious conferences will not be considered for academic selection, confirmation, promotion, performance and appraisal, besides award of scholarship or academic degrees or credits in any form.” ([Mullick, 2019](#)).

Preliminary indications are that this concerted national effort in India is already having an impact, and its focus on Indian language journals is helping to raise their visibility, legitimacy and value ([Patwardhan & Nagarkar, 2021](#)) .

In China, the Ministry of Science and Technology (MOST) is responsible for deterring and investigating scientific misconduct. MOST has recently developed a “warning list” or watchlist of predatory journals, which focuses primarily on fully-OA, international journals and accounts for almost a quarter of all fully-OA Chinese content ([Petrou, 2021](#)). Any researcher who publishes in a predatory journal will get a warning and be given no credit for prospective grants, recruitment or promotion: as the world’s largest producer of scientific papers, these rules could put some predatory journals out of business ([Cyranoski, 2018](#)).

On a smaller scale, the Swiss National Science Foundation (SNSF) has published a [position statement on predatory journals](#), publicly available on its website. This statement defines predatory journals and advises researchers to think carefully about where they publish their work and recommends sources to consult. Similarly, the National Institutes of Health (NIH) in the US have created a “[Statement on Article Publication Resulting from NIH Funded Research](#)” which was developed to encourage publishing of papers in reputable journals. The statement encourages funded researchers to adhere to best practices promoted by professional scholarly publishing organisations and avoid publishing in journals that do not have a clearly stated and rigorous peer-review process. The National Science Centre (NCN), the largest research funding agency in Poland, goes one step further and states that if articles financed by NCN funds are published in journals not satisfying standards for peer-review, then the grant numbers will have to be removed from the publications and funds returned to the NCN ([Błocki, 2018](#)).

To-date, there are very few examples of national interventions to address predatory conferences. South Korea’s Ministry of Education is one: it is presently devising a system for helping its researchers avoid predatory conferences ([Sonne et al, 2020](#); [Zastrow, 2019](#)).

4.4 Standard-setting for journals and conferences

Libraries, abstracting and indexing services work at the interface between knowledge production and publishing, and in many ways much of the workload in combatting predatory journals falls to them. Together with journal editor associations, they play a vital role in helping to identify predatory journals and distinguish them from low quality and unethical practices. **There are several leading agencies at the global level who work tirelessly to distinguish legitimate journals and publishers from non-legitimate ones, and set principles of transparency and editorial best practice.** These include:

- [Committee on Publication Ethics, \(COPE\)](#), which provides leadership and guidelines on publication ethics, and practical resources including user-friendly [flowcharts](#) on handling different aspects of publication ethics issues;
- [Directory of Open Access Journals \(DOAJ\)](#), a community-curated online directory that indexes and provides access to high quality, open access, peer-reviewed journals;
- [Open Access Scholarly Publishers Association \(OASPA\)](#), a diverse community of organisations that encourage and enable open access as the predominant model of communication for scholarly outputs;
- [International Standard Serial Number International Centre \(ISSN\)](#), an intergovernmental organisation which manages the identification and description of serial publications and ongoing resources, print and online, in any subject;

- [World Association of Medical Editors \(WAME\)](#), who seek to foster international cooperation, among and education of, medical journal editors; and
- [STM](#), is a global trade association for academic and professional publishers who work to ensure that research is of high quality, trustworthy and easy to access.

The [Journal Publishing Practices and Standards guide](#), [COPE's publications ethics guidelines and toolkit](#), and [DOAJ's services](#) all set journal standards, as do editorial policies of leading journals - [Nature](#), [Science](#) and others. Conference standards are less visible.

Box 4.1: A global governance body or “Latindex for the world”?

Academic publishing was historically located within learned societies and undertaken solely for the purpose of knowledge communication, rather than financial gain. Commercial operations came into effect as printing and publishing became more specialised, and gradually governance and the balance of power shifted from academia to profit-driven enterprises. Now, the market is open and almost anyone anywhere can start a publishing company or journal. The shift towards online and open access publishing, author-pays models, and more economical and widely available technology, has facilitated this trend.

Academic publishing presently lacks any governance body or regulatory authority to (1) provide authentication or accreditation of the legitimacy of an academic publisher or individual journal, and (2) set minimum standards of quality and practice, and promote their compliance; one that is globally recognised and can certify genuine and legitimate operators that fulfil the fundamental requirements of integrity and professionalism in academic publishing.

Latindex does this at the regional level. Based in Mexico (at UNAM), this information system relies on each of its 24 member countries to service a collection centre, national coordinator and group of document specialists who feed the system with updated information on the journals published in their country. Collection centres in Europe and Asia register those titles whose contents are the result of Latin American, Hispanic and Portuguese studies; titles published in North America, Africa and Oceania are collected at UNAM.

One key feature of Latindex is a directory (Directorio) that registers every single journal title within its scope, including research, technical, professional and popular science journals; currently numbering more than 28,000 titles and each described with up to 50 metadata. Above this sits a catalogue (Catálogo), a more restrictive and strictly curated subset of the Directorio of journal titles that fulfil editorial minimum quality criteria and are checked for typical predatory traits. This two-layer approach accounts, at least in part, for the comparatively lower propensity of predatory publishing in the Latin American region. The existence of an authoritative list of quality journals can serve both as a barrier for predatory publishing and a de facto safelist for authors; the non-commercial, mostly academic and not-for-profit nature of the majority of journals produced in the region is a further deterrent.

An equivalent of Latindex operating at the global level could help ensure minimum standards of ethics and professionalism among every listed publisher and/or journal title (additional to the ISSN register), as well as promote good editorial practice. An international governing body like UNESCO, or another organisation with a global mandate such as the ISSN, could oversee this role, drawing on existing infrastructure such as the National ISSN Centres, national or large university libraries and/or information centres. The network of institutions could be structured by region, to account for diversity of cultures, practices and resources, in partnership with other leading organisations like DOAJ.

At the regional level, [Latindex](#) deserves particular attention. Its indexing work is based on the principles of fairness, inclusiveness and respect for diversity, for the benefit of quality, non-profit, accessible science publishing. Academic publishing in Latin America does not rely on commercial publishers so the degree of

predatory journals and conferences is small relative to the rest of the world, though numbers are slowly increasing (Latindex, in press). Latindex is active in its attempts to curb predatory (“spurious”) journals in the region, identifying common traits and developing a set of guidelines for reviewers and for editors, both in Spanish and (translated by IAP) [English](#). Latin America’s model is upheld as a viable and enviable framework for curbing predatory publishing and safeguarding research output within academia (Box 4.1).

A challenge faced by researchers and editors alike is that none of the established databases listing quality journals – DOAJ, Scopus, Web of Science, Cabells etc – are 100% inclusive, so that thousands of journals found on one database are not found on others ([Pollock & Michael, 2019](#)). This adds to the confusion for researchers/authors looking for guidance.

Publishers are also making significant efforts to combat predatory publishing and protect the reputation of their industry. It is in their interests to do so because predatory and unethical publishing practices build distrust between publishers and researchers, and risk undermining credible platforms, especially innovative, non-traditional publishing systems. Leading publishers proactively screen out problems by identifying signs of systematic manipulation of authorship, peer-review and images. They add hurdles and checklists to their procedures to make poor or questionable practices easier to detect (e.g. looking out for authorship changes, recommended reviewers) and to enhance quality (e.g. through reproducibility checklists for authors).

With regard to conferences, the International Congress and Convention Association [ICCA](#), which represents associations who manage the logistics of international events, maintains a list for its members of what it assesses are around 100 predatory conference organisers, to help them decide whether to take up business offers.

In relation to the overwhelming growth in spam e-mails from predatory and other outlets, more effective anti-spam technology and educating academics to be able to distinguish genuine and spam e-mails must be a first line of defence ([Baker, 2020](#)). Other plausible interventions include increasing the prices of mass e-mailing, increasing penalties or disincentives for academics who use predatory services, strengthening incentives for good scholarly practice and improving e-mail filtering technology ([Teixeira da Silva, 2020](#)). Some have suggested that universities should take legal action against the “tsunami of spam emails” from predatory publishers ([Grove, 2021](#)).

4.5 Gaps in existing tools and interventions

This chapter has illustrated some of the tools and interventions at global, regional, national and local/institutional levels, across different sectors and stakeholder communities. Many of these interventions are localised, rather than global and systemic, and their efficacy is unclear. Very few interventions focus on predatory conferences.

At the global governance level, there appears to be little recognition of predatory practices. Survey respondents have called for a global compact on publication and ethics but this requires collective action. While UNESCO is leading a Recommendation on Open Science, and the International Science Council on the future of scholarly communication, predatory practices feature only marginally. COMEST, The World Commission on the Ethics of Scientific Knowledge and Technology (under the aegis of UNESCO), has not directly addressed predatory practices. Nor, it would seem, have many of the global and regional networks of universities.

Yet governments and universities are key influencers and levers. During the course of this study, members of the intergovernmental organisation (IGO), the InterAmerican Institute for Global Change Research (IAI), adopted a Decision ([“Decisions of the 29th Meeting”, 2021](#)) directed to its Directorate and science policy

advisory structures to work with national and international academies of science, scientific publishers, universities and other relevant partners to raise awareness, and prevent the growth of, fraudulent and predatory publishing in the Americas. This Decision puts predatory academic practices on the radar of member governments and creates a platform for future cooperation. **More decisions, directives and recommendations are required amongst other IGOs (at global and regional levels) to build a common shared purpose and momentum to effect change.** UNESCO could lead this charge, supported by IAP and ISC as required, by adopting a resolution on predatory publishing and conferences, which would assist efforts to combat these practices at a global scale. This could even be taken to the UN General Assembly for the adoption of a resolution to build even greater ownership and momentum.

The penultimate chapter identifies systemic drivers, or root causes, of predatory practices and some of the interventions that are either being implemented or urgently needed to combat these practices in a more impactful and sustained way.

Chapter 5 The Systemic Drivers of Predatory Practices

Summary

Predatory practices are symptomatic of three drivers: (1) the monetisation and commercialisation of academic research output, including an academic publishing system that can risk putting proprietary and commercial interests ahead of research integrity, and the unintended consequences of the current academic publishing models, in particular the author-pays (pay-to-publish, pay-to-present) model of Open Access; (2) research assessment/evaluation – the metrics by which research is evaluated and careers are shaped, together with journal and institutional ranking; and (3) challenges and deficiencies in the peer-review system: the lack of transparency (whether fully open, anonymised or a hybrid of the two) and the lack of training, capacity and recognition of peer-reviewers.

All of these drivers are patently systemic, with shifting paradigms of research communication, assessment, peer-review, rankings, metrics and business models allowing predatory practices to firmly take root. Geographic and cultural biases, together with a lack of awareness and technical capacity, further exacerbate them.

The rise in predatory journals and conferences cannot be seen in isolation. The unintended consequences of all three systemic drivers need to be addressed as a matter of urgency by multiple stakeholders.

Traditional academic publishing models, research evaluation and peer-review systems have never been entirely immune from exploitation and malpractice (such as plagiarism, paper mills, ghost writing and salami slicing) by multiple stakeholders, making the system vulnerable to overt commercial predation. The rapid evolution and lack of transparency of publishing models, together with critical institutional and professional shifts in academia that focus on metrics where published papers are at their heart, have created fertile ground for predatory and increasingly unethical actors to exploit academics. In this context, three main drivers are discussed in more detail, as root causes of predatory behaviour.

5.1 The monetisation and commercialisation of academic research output

The perception of the global research community, as indicated in the survey described in Chapter 3, is that the “commercial interests of the publishing industry” are a primary driver of predatory journals and conferences. This is certainly an important part of a wider malaise of the research ecosystem: that of its monetisation and commercialisation.

Academic publishing has come to be marked by the growing power and influence of a handful of conglomerates who rely heavily on metrics (such as impact factor, citation score and the digitisation of submissions) and whose services are not entirely transparent (such as workflows, quality control, peer-review and pricing mechanisms) ([MacDonald, 2015](#); [Larivière et al., 2015](#); [Stern & O’Shea, 2019](#)). This system can put proprietary and commercial interests ahead of research integrity. In its [2021 report](#), the International Science Council noted that the “essential concern of a profitable commercial publishing enterprise...is to minimize unit production costs and to maximize scale..... Publishing at scale necessarily means being less selective in what is published....introducing new lower-quality journals, or mega-journals with less selective peer-review policies. Organizing peer-review processes is administratively burdensome, and there are clearly cost advantages for a journal publisher in reducing a journal’s overall rejection rate and assessment costs. Taken to its extreme this has led to the emergence of so-called ‘predatory publishing.’”

There is a concomitant concern that academic cultures around the world are moving towards commercialisation and marketplace conduct, fuelled by free-market capitalism, deregulation and declining government spending ([Arend, 2017](#)). Any organisation that puts their own commercial interests before science and society, and ahead of good practice, open science and scholarship, feeds into this system and plays its part in fuelling predatory practices.

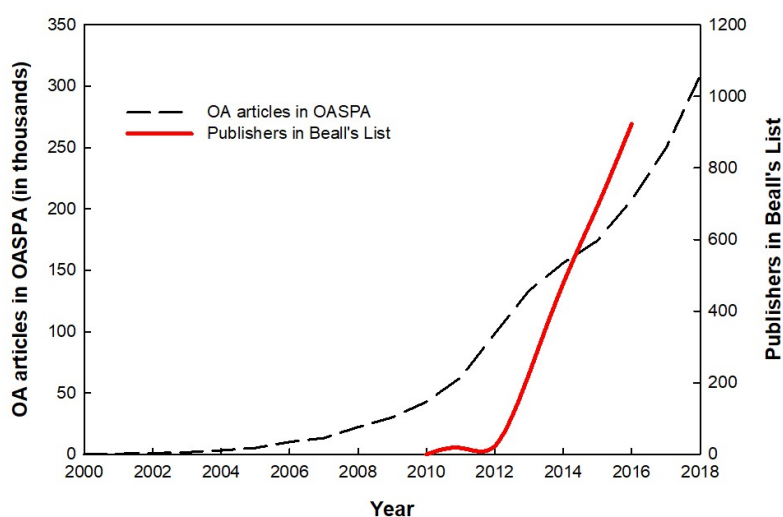
Predatory conferences are another indication of the growing commercialisation of academic research. Profit-driven entities, such as publishers, conferencing organisations, venues and hotels, all play their part in servicing academic conferences, creating opportunities for predatory actors. The lack of transparency in the services they provide, together with a lack of standards and norms in this industry, make it prone to abuse. Academic institutions themselves, including top tier universities, may not practise due diligence and inadvertently collude with predatory conference organisers, as they capitalise on the location of their physical premises and campuses: leading universities such as Oxford and Harvard have venue-hosted and profited from them ([McCrostie, 2018](#)).

5.1.1 Predatory publishing and the author-pays model of Open Access

The still evolving Open Access (OA) publishing model has been blamed as a key driver of predatory academic practices e.g. [Beall, 2013](#) and [Hagner, 2018](#). OA has seemingly provided an attractive business model for commercial publishers who publish research findings under OA for a sizable fee, with many research funding agencies acting in concert with them by making OA compulsory for scholarly publications. The general tendency for the highest impact factor journals to be the most expensive in terms of annual subscription fees has driven higher article processing charges (APCs) in high impact OA journals, i.e. the same commercial interest of the publishing industry is also duplicated in the OA business model.

The emergence and growth of predatory journals does appear to show some correlation with the development of OA ([Figure 5.1](#)) and author-facing OA charges in the name of APCs provide a ‘predatory’ incentive for less scrupulous publishers to publish articles quickly and without appropriate quality control ([Siler, 2020](#)). However, predatory publishing and OA have been unhelpfully conflated, largely as a legacy of Beall’s characterisation ([Krawczyk & Kulczycki, 2021](#)) and perhaps reflecting the still evolving and complex nature of OA models.

Figure 5.1: The growth of predatory publishers in Beall’s list, used as a proxy for the growth of predatory publishing, and the number of OA articles in OASPA, used as a proxy for growth of OA showing a seemingly strong correlation.



[Data from: [Brezgov, 2019](#), and [Redhead/OASPA, 2019](#)]

An economic modelling of predatory journal publishing by [Xia, 2019](#) has shown that the rate of growth of OA journal publishing has overtaken the rate of growth of the researcher population worldwide, and that the rapid scale of development of predatory journals has resulted in a decline in publication quality. However, there is no evidence to suggest that OA journals contain lower quality outputs, compared to subscription and hybrid journals; nor that they are better or worse when it comes to impact ([Langham-Putrow et al, 2021](#); [Björk & Solomon, 2012](#)). **OA *per se* should not be blamed for the growth of predatory publishers: the principles and benefits of open access publishing are incontrovertible.**

However, the author-pays model of OA is particularly prone to abuse and thus vulnerable to predatory incursion. Beall ascribed predatory publishing to a consequence of gold OA and in particular its author-pays variant because it creates perverse incentives, fuels a greater disparity between researchers working in solvent and those in less-privileged institutions, and provides greater leverage for publishers to raise charges at will ([Beall, 2013](#)). No longer needing to sell to readers, it is now economically advantageous to accept more papers, irrespective of their quality. Even a decade ago, predatory publishing was described as a “natural extreme” of the author-pays model of OA ([Anderson, 2012](#)).

If an institution or author cannot cover the high APCs, a journal that charges low APCs combined with promises of rapid publication and/or a reputation for easy acceptance, becomes an attractive alternative for many. The author-pays model can outprice many researchers, especially in lower income countries and/or at early career stages, who cannot afford to pay the fees ([Edem et al, 2021](#)); further fuelling inequity and potentially driving them into the arms of lower cost predatory publishers. In this way, researchers and scholars from lower income countries or resource-poor institutions may be “doomed to remain knowledge consumers rather than knowledge producers, generating and perpetuating an inequitable and exclusive knowledge ecosystem, unless they can find cheaper ways to publish their work” ([Gadagkar, 2016](#)). A recent study ([Smith et al., 2022](#)) has confirmed that “APCs are a barrier to OA publication for scientists from the Global South”. The author-pays model is no better for research funders: where research grants provide for publishing costs, the funder still pays twice – first to produce the research and second to publish it- so in many ways it is comparable with earlier reader-pays models.

Many have argued for diamond or platinum OA as a solution, where the absence of APCs removes cost barriers for researchers and the publisher’s conflict of interest in accepting article submissions ([Cobo, 2014](#)). But these forms of OA are not without their own challenges, comparable to those for poorly-resourced journals ([Bosman et al, 2021](#)). With the author-pays model being the main way major established publishers (whether commercial or non-profit) flip subscription journals to open access, effecting a transition from this model is challenging. Nevertheless, other potential models exist and merit careful consideration: these are outlined in Box 5.1. As a coalition of major funders, the growing [Plan S/Coalition S movement](#) is likely to play a significant part in determining future models of OA, with increased leverage for the author-pays model potentially playing into the hands of for-profit, aggressively commercial and sometimes predatory academic publishing.

In the competition for author fees, legitimate OA publishers are being manoeuvred into promising shorter submission-to-publication times in order to compete in a crowded market with an increasing number of fraudulent players; thereby potentially weakening their own peer-review processes and making predatory practices all the more difficult to distinguish ([Beall, 2012](#)). The creation of reputable OA mega-journals (such as PLOS One, Scientific Reports and Heliyon) has led to large profits for publishers and helped fuel rapid turnaround time for peer-review and corner-cutting, such as making manuscript rejection criteria less stringent ([Hagner, 2018](#)). This creates opportunities for predatory publishers as they exploit the new norm of a single journal publishing in any subject in a digital format.

Box 5.1: Illustrative examples of alternative economic models of OA to the author-pays model*Green and Diamond OA*

There are strong and successful cases of green OA (preprint or self-archive, e.g. [arXiv](#)) and diamond OA (institutionally rather than author funded, like the not-for-profit Latin American model) and many argue for a transition to these. In fact, 70% of DOAJ listed journals are published without any author charges, mostly as Diamond OA. Advocates of Diamond OA proclaim this is a move in the right direction and will ensure that publishing works towards a better future, rather than accepting an unavoidable decline. It may also be a way of reclaiming ownership of academic publishing.

Flipping subscription journals

The author-pays gold OA model is being used to incrementally “flip” subscription journals by repurposing subscription funds to cover author charges. Alternative, viable models include:

- [SCOAP3 - Sponsoring Consortium for Open Access of Publications in Particle Physics](#)
SCOAP3 uses existing library subscription funds, in some cases with supplementary funding, and flips the publishing model. It has enrolled 3000+ libraries from 44 countries and converted almost all articles published in particle physics to OA. The amount contributed by each country is commensurate with its share in the worldwide scientific output in particle physics. SCOAP3 makes approximately 8,000 articles per year OA. It remains to be seen if this model can be transferred to other disciplines.
- [OLH - Open Library of Humanities](#)
Operating as a consortium of libraries, in a similar model to SCOAP3, the OLH is adapted to the very different dynamic of humanities; again there are no author-facing charges.
- [Subscribe2Open \(S2O\)](#)
There are a few ongoing experiments under the broad category of Subscribe2Open (S2O) being tested by the PLOS Community Action Plan and Annual Reviews. Essentially, once the total subscription crosses a certain threshold, the journal becomes OA. The model uses the same library subscription funds, but the ultimate aim is open access.

While OA provides ready access to scholarly literature by enabling unrestricted re-use, its sustainability could be challenged in a widely unregulated scholarly publishing market ([Tennant et al, 2016](#)). [Fyfe et al, 2017](#) argue that “current OA publishing policy, and many other proposals for the reform of academic publishing, have been too focused on the opportunities and financial challenges of the most recent changes in digital communications technologies and have given undue weight to commercial concerns”. They also argue that the dominance of publication metrics and quantitative indicators in defining academic careers has driven the commercialisation of research. The demand for a higher number of articles by researchers (“publish or perish”) is fuelling the demand for predatory publishers. Higher APCs are associated with increased article volumes, so that APC hyperinflation is not suppressed through market competition and author choice ([Khoo, 2019](#)). Instead, demand for scholarly journal publications continues unabated and supports APC hyperinflation to the detriment of researchers, institutions and funders. Alternative models - such as those in Box 5.1 - should be explored. Other examples include the UNESCO-supported [Global Alliance of OA Scholarly Communication Platforms](#); the [Free Journal Network](#), controlled by the scholarly community; transformative agreements or “read and publish” ([Hinchliffe, 2020](#)) and the over 70% of fully OA journals indexed in the DOAJ that do not charge APCs ([Morrison, 2019](#)).

In summary, predatory publishers are exploiting expensive publishing fees and the author-pays model by established publishers on the one hand, and compulsory OA requirement by funders on the other. Some

researchers in lower income countries who are not able to pay subscription fees to get access even to their own articles, and who are not able to pay the high APC charges in reputable OA journals, resort (whether knowingly or unknowingly) to affordable OA predatory journals to publish their articles.

There has been considerably less research on predatory conferences, yet they have also been described as a “dark side of open access” ([Cress, 2017](#)), trading on the naivety of academics looking to progress or accelerate their careers. They now cross multidisciplinary boundaries and are particularly acute in vocational education (such as medical [[Sharma & Verma, 2020](#)] and dental [[Heasman, 2019](#)] professions).

5.1.2 Interventions addressing this issue

Examples of potentially impactful interventions to help address the monetisation and commercialisation of research are described in several studies (e.g. [Watkinson et al, 2012](#); [Peterson et al, 2013](#)). They include institutions offering funding support to Open Access journals (e.g. [COPE](#)); institutions and research funders exploring means of opening access to scholarship regardless of journal policies (e.g. [NIH](#) and [Wellcome Trust](#)); academic libraries with a scholarly publishing service as well as the [Library Publishing Coalition](#); and the [African Academy of Sciences \(AAS\) Open Research Platform](#) providing rapid and transparent publishing for researchers in Africa, in part to help curb predatory publishing.

Subsidising non-commercial academic publishing can facilitate more equitable communication of research by redirecting funds currently dedicated to pay-for-access fees to subsidising academic publishing directly, without profit-making intermediaries ([Fyfe et al, 2017](#)). The same authors call for interventions by all key stakeholders: (i) HEIs to lead, rather than react to, changes in publishing practices, for example by ensuring that copyright is retained by its author or by meeting more of the publishing costs; (ii) academies, learned and professional societies to facilitate debate and raise awareness amongst their members; (iii) funders, universities, national governments and international agencies to work together on non-profit OA models; (iv) individual academics to exercise more due diligence in the publishers they work for; and (v) publishers to explore alternative economic models of OA to replace the author-pays model. The Institute of Physics (IoP) Publishing, for example, has recently announced that it will waive APCs to publish in its OA journals for all researchers in low-income countries, in its commitment to increase global equity and inclusion in publishing ([Harper, 2021](#)). In France, not-for-profit diamond OA journals are being backed by the state, universities and academic societies ([Matthews, 2021](#)) to build a more diverse and fair publishing ecosystem; stimulated in part by [Science Europe’s study](#) on diamond OA journals.

5.2 Research evaluation/assessment

Research evaluation systems are a key driver of predatory journals and conferences because they have created a system weighted towards the quantity rather than quality of research, which can be exploited by predatory actors and gamed by some researchers.

In its recent report, the ISC noted: “Given the profusion of demands for assessment, the temptation for those tasked with it is to reach for a routinely accumulated proxy metric for excellence rather than an expert evaluation of a candidate’s work. The danger is that a proxy, rather than a direct measure, can have unintended consequences and can be ‘gamed’.” ([ISC, 2021](#)). Others have made similar points, such as the Indian National Science Academy ([Chaddah & Lakhotia, 2018](#)). In the survey reported in Chapter 3, “needing to advance my career” was the second highest reason for researchers knowingly or unknowingly using predatory journals or conferences: “You need to publish in a predatory journal to stay in the race”, stated a respondent, in one anecdote amongst many.

Bibliometric indicators designed to measure the impact of publications in the advancement of knowledge are now being used ostensibly as tools to measure the quality of research i.e. equating research quality with publication-related metrics, such as number of publications, citations and impact factors. From the development of citation indexing as a tool for information retrieval to its application in research evaluation, bibliometric methods have been misused and had a deleterious effect on scholarly communication ([Haustein & Larivière, 2019](#)). Scientific production has become a key criterion for individual promotion and institutional ranking (including the social prestige and quality of universities), and consequently one of its main sources of power and legitimacy: current research evaluation systems have created perverse effects, including plagiarism, impact factor inflation, salami slicing ([Elsevier, 2019](#)) and a rise in predatory journals ([San Fabián Maroto, 2020](#)).

Profit-motivated academic and publishing practices (in some cases, unethical and open to abuse) are gaining new traction and providing a broader range of services, as research output comes under increasing accountability and scrutiny, and research careers grow more competitive. Under pressure, researchers may be tempted to resort to predatory journals and conferences with the sole purpose of getting their PhDs (where they are conditional on publication or conference attendance), being hired or promoted, or having their research projects financed (e.g. [Abad-García, 2018](#); [Omobowale et al, 2014](#)). *“PhDs by publication encourage low-quality and repetitive science and are bedevilled by self-plagiarism and copyright problems, amid widespread anxiety about the proliferation of predatory publishers and conference organisers”* ([Grove et al, 2021](#)). In response, some institutions are tightening up their quality criteria for thesis-related papers, restricting them to specified journals or getting rid of them altogether (e.g. [Ross et al, 2021](#)).

In the “publish or perish” ethos of today’s research enterprise, quantitative measures take precedence over more qualitative aspects of academic performance. More traditional, deliberative protocols of research and professional evaluation are becoming less important, as publication-related metrics replace the judgement of experts in relevant field(s) ([Oravec, 2017](#)). These metrics are often more rapid and potentially minimise bias, but some argue that subject expertise is critical in determining the originality, substance and impact of any piece of research ([Spence, 2019](#)). In many universities, increasingly centralised, metrics-oriented work allocation models devalue traditional advisory and mentoring responsibilities so that senior faculty may be disincentivized to fulfil these roles. This can include sharing knowledge with junior colleagues and research students on quality academic publication outlets and conferences, leaving them with a critical deficit of professional knowledge and poorly placed to make discriminating judgments on how to shape and direct their scholarly output. In this climate, early career researchers are sent the signal that scholarly outputs are their *raison d’être*, laying the groundwork for gravitation towards predatory journals and conferences, and feeding the predatory economy. Accepting the importance of accountability, rigorous research assessment that relies on expertise is a vital practice in academia; when it is short-circuited, it can make space for the interventions of non-academic, profit-motivated parties. Indeed, some will argue that universities have shifted from education and training institutions to published paper factories, targeted by paper mills and essay writing services ([QAA, 2020](#); [Else & Van Noorden, 2021](#)).

Russia provides an illustrative national case study ([see Box 5.2](#)).

Box 5.2: Russia: an illustration of the impact of research evaluation on predatory publishing

According to studies by the Russian Academy of Sciences and Dissertat, the number of Russian authors publishing in so-called predatory journals increased significantly from 2011-12 when the national policy for research evaluation was changed to focus on quantitative measures, such as numbers of publications and citations in Scopus and Web of Science (Abalkina, 2021).

Russian universities promptly amended their promotion and recruitment criteria to maximise government funding based on these metrics; only quantity, not quality, was evaluated. Paper mills, selling co-authorship of fake scientific papers, and predatory journals (some of them indexed in Scopus and Web of Science) began to flourish, creating a business model where these mills and journals were fuelled by scholars compensated by their universities, who in turn received more government funding. Translation plagiarism was also able to thrive through predatory and hijacked journals, with top Russian academics complicit.

Investigations of plagiarised publications in predatory journals have not yet led to significant dismissals from university posts, and predatory practices continue to flourish in Russia. According to the 2020 RAS report, more than 1,100 Russian authors published over 23,000 papers in over 90 “foreign” predatory journals.

Research evaluation has created perverse incentives for researchers and institutions, not only to turn a blind eye to predatory and unethical practices but even to collude with them. The survey described in Chapter 3 exposed potential evidence of institutional collusion and peer pressure; being “encouraged by my peers” being the fourth reason for using predatory outlets, though this may simply reflect a lack of awareness. Nevertheless, institutions and individuals are encouraged to self-promote and reciprocate citations, creating a vicious cycle driven by a search for personal or institutional profit or gain ([Oransky, 2020](#); [Oviedo-Garcia, 2021](#)).

5.2.1 Journal and institutional ranking

Journal and institutional ranking as assessment tools also play their part. Papers retracted due to data falsification or fabrication (as opposed to error) are increasing and are disproportionately found in some journal rankings and indexes ([Fang et al, 2012](#)). Additionally, journals sometimes conspire to cite each other’s papers in a mutual effort to increase their impact factors (see e.g. [Van Noorden, 2013](#)).

A growing number of predatory journals are infiltrating citation databases ([Severin & Low, 2019](#), [Manca et al, 2017](#); [Cortegiani et al, 2019](#)), or making up their own ‘impact factors’, thereby deceiving authors and librarians. A recent study found that nearly 3% of articles indexed in Scopus (324 journals with 164,000 articles during the period 2015-2017) were contained in journals found on Beall’s 2017 list ([Krawczyk & Kulczycki, 2021](#)). This also helps fuel the growing business of purchasing article publishing opportunities and selling the ensuing publications. Based on an analysis of such practices, [Brembs et al, 2013](#) argue that any journal rank (not only the currently favoured Impact Factor) has a similar negative impact on scholarly communication and go as far as to suggest abandoning journals altogether in favour of a library-based communication system.

Academic research is now regarded as one of the most significant ranking criteria in higher education institutions. The ranking of universities and other higher educational institutions has gained broad international attention with many ranking systems throughout the world, like Shanghai Jiao Tong, the Times Higher Education Supplement (THES) and QS World University Rankings. The purpose of most ranking systems is to identify top institutions for consumers, classify institutions by their research activity,

support funding requests, and compare institutions within countries and across the globe ([Aguillo et al., 2010](#); [Vernon et al., 2018](#)). These systems rely heavily on publication and citation metrics and use research productivity (typically defined by the number of peer-reviewed articles included in Web of Science or Scopus) to evaluate and rank universities, and in turn the researchers who work in them ([Frey & Rost, 2010](#)). But research productivity does not equate to research quality and creates perverse incentives to publish anywhere ([Ventura & Mombru, 2006](#)).

Driven by ranking systems, universities and other HEIs have devised institutional policies that (i) incentivise researchers to publish, especially in highly ranked international journals, and cite liberally; (ii) shape promotion criteria and renewal of contracts around publication numbers; (iii) frame graduate and postgraduate studies around the necessity to publish before being awarded a PhD or Masters degree; and (iv) encourage collaboration among researchers at international, national and institutional levels. The stakes are high for researchers to publish, putting undue pressure on them and turning many to pay-to-publish schemes, or present their work in weak scholarly venues. Some report that academics most likely to publish in predatory journals are those with doctorates obtained in local institutions and with significant career time ahead of them ([Perlin et al., 2018](#)).

The perverse incentives created by research evaluation need to be addressed urgently but this will not be easy. There is a growing global disconnect and divergence in research metric systems around the world, making it more challenging to define shared values and devise a global strategy for tackling predatory practices that can also be sensitive to local context. Further, any intervention must permeate all levels - global, regional, national, institutional, research team, project, individual: they are all interconnected, as metrics cascade through the system.

5.2.2 Interventions addressing this issue

There is a growing momentum to reduce the emphasis of quantity of publications in research assessment, at multilateral and national levels. Multilaterally, the 2014 [Declaration on Research Assessment \(DORA\)](#) aims to advance how scholarly research is assessed by evaluating the quality rather than quantity of research. It categorically discourages the use of journal-based metrics, like Journal Impact Factors, to assess a researcher's contribution or when looking to hire, promote, or fund. At the time of writing, nearly 21,000 organisations and individuals in 153 countries have signed the declaration and committed to reform, and DORA now provides practical guidance to help them effect change. But DORA alone cannot turn the tide: systemic change requires fundamental shifts in policies, processes and power structures, as well as entrenched norms and values ([Hatch & Curry, 2020](#)).

Recognising the vital role of funders ([Curry et al., 2020](#)), the Global Research Council (GRC) is championing [Responsible Research Assessment \(RRA\)](#) amongst its membership of major funders around the world. The European Commission has recently published [Reforming research assessment – the way forward](#), following a [2020 Science Europe](#) report which calls for qualitative assessment and a wider range of research outputs and activities to be taken into account. Other important sources include [The Metric Tide](#), [Leiden Manifesto](#) and [Hong Kong Principles](#).

At the national level, a number of countries are now deploying different assessment models: for example, national funding agencies in [Belgium](#), [The Netherlands](#), [Switzerland](#) and the [UK](#) who are all using “narrative CVs” (the latter building on work by the UK's national science academy, the [Royal Society](#)). In China, in 2020,

the leading ministries of S&T and education implemented a nationwide policy banning all universities and research institutions from setting quantitative goals and from offering financial incentives for researchers' publishing behaviour using SCI-related metrics. The National Natural Science Foundation of China (NNSFC) now forbids using national grants to encourage paper production: as the world's leading producer of scientific publications, these policy changes could transform the global landscape of scientific publishing and research assessment, and "predatory journals....might end up losing a large chunk of their Chinese patrons" ([Qingyang Li, 2020](#)). Australia's Western Sydney University has tightened up its quality criteria for thesis-related papers, restricting them to specified journals, to tackle unintended consequences of "PhDs by publication"; its School of Nursing and Midwifery specifies that papers must appear in outlets in the top 75 percent of the SCImago Journal Rank ([Ross et al, 2021](#)). While well-intentioned, interventions of this sort have unintended consequences: they depend on journal ranking which, in turn, depends almost entirely on impact factor. Furthermore, not all journals are listed on established indexes or ranking systems – like those in emerging areas of knowledge or multi/cross-disciplinary in nature – and may be disadvantaged.

The impact of these interventions on predatory practices will become clearer over time, but certainly funding bodies appear to be more proactive on this issue than the research community. Mindful of this, the IAP, Global Young Academy (GYA) and International Science Council (ISC) have recently embarked on a scoping exercise to explore how the research community can best engage and help shape future paradigms of research evaluation.

5.3 Challenges and weaknesses in the peer-review system

Peer review is the hallmark of scientific publishing. It is a critical safeguard in protecting a high-quality system of scientific knowledge and in maintaining public trust in science. **Predatory journals exploit challenges and weaknesses in the traditional closed peer-review process. Without the need to validate their claims of conducting peer review, fraudulent journals can be difficult to distinguish from legitimate ones** ([Dobusch & Heimstadt, 2019](#)).

Lack of transparency

Publication practices differ between countries and academic disciplines, but peer review is standard practice for mainstream scientific journals and a cornerstone of research ([Kelly et al, 2014](#); [Gannon, 2001](#); ["Statement of Principles", 2018](#)). Peer review is not perfect: it is fraught with biases. Reviewers might rate papers by famous authors or from top universities/companies more highly ([Tomkins et al, 2017](#)); editors and reviewers may be biased against authors who do not speak their own language or come from other regions (["Global State of Peer-review", 2018](#)); and gender bias has been reported in several studies ([Helmer et al, 2017](#); ["Nature's Sexism", 2012](#)).

In an attempt to minimise these biases, peer-review processes became confidential or closed in nature (single or double-blind). **It is this confidentiality that has made it possible for fraudulent or deceitful journals to thrive by practising dubious peer-review processes (lacking rigour, trust and accountability) that go unnoticed, or by omitting them altogether.** In having little or no peer review, these journals can accept more papers in less time to maximise their profit through the APCs. For low-quality journals, the lack of expert peer reviewers and policies to guide their work might be hidden in this closed process, and similarly difficult to discern. Further, the lack of transparency makes it difficult to identify malpractice and biases throughout the entire process ([Narasimhan, 2019](#)). Confidential peer review is built on a trusting relationship between authors, readers and the journal/publisher: if this relationship does not exist, there is no quality assurance process. Transparent peer review makes it easier to identify legitimate peer review and expose and de-legitimise predatory journals.

There are different versions of transparent peer review but at its core is the content of reviewers' reports getting posted alongside the article. This brings greater accountability to the process and recognition for the work of peer reviewers and editors. It works by publishing a comprehensive peer-review history on [Publons](#), alongside each published article. Each element of the peer-review process is assigned a unique digital object identifier so that readers can reference and cite relevant peer-review content.

Journals using transparent peer review do not need to be fully open: reviewers can choose to remain anonymous and journals can continue to use single- or double-blind review during the review process ([Wiley, n.d.](#)). Such a “hybrid” model avoids pressuring reviewers to disclose their identity, thereby avoiding fears of reprisal or making it harder to collaborate thereafter. Elsevier has found that only ca. 8% of their surveyed referees agree to reveal their identity and appear to prefer to protect their anonymity without compromising transparency of the process ([Bravo et al, 2019](#); [Wolfram et al, 2020](#)).

A hybrid, transparent peer-review model makes it possible to ascertain the quality and rigour of the review. Peer-review is more accountable because potential conflicts of interest, bias and prejudice are easier to detect, and everyone involved in the process is potentially accountable for any misrepresentation or poor quality work. Such a model also helps recognise the peer-review process as scientific output in its own right. Consequently, this may offer greater incentive to publish in mainstream scientific journals where publication is aligned with recognised and verifiable outputs. Greater transparency would also enhance capacity building in peer review by providing early-career researchers with models and examples to follow when given the chance to act as a reviewer ([ALLEA-GYA-STM, 2021](#)).

Lack of recognition

The role of the peer reviewer is perhaps the most harshly criticised and least valued part of the research process; it is not recognised in research evaluation/assessment and receives relatively little professional training and support ([Gouri Panicker, 2019](#); [Catlow, 2017](#)). Peer reviewing traditionally has been given low merit value, resulting in low willingness to perform the task and no real pressure from reviewers for more visibility of their work. Editors have reported increasing difficulties in finding reviewers willing to devote the time necessary for this work ([Bakker & Traniello, 2019](#); [Willis, 2016](#)), and many reviewers complain about experiencing “reviewer fatigue” ([Breuning et al, 2015](#); [Fox et al, 2017](#)). These may be related to peer review being time constrained, deemed extra-curricular (unpaid work carried out in personal time) or simply not being valued ([Kelly et al, 2014](#) ; [Räsänen & Louhiala, 2021](#)).

Furthermore, attempts to recognise peer-review activity (such as the [Publons](#) service) have also been gamed by predatory journals, and institutions and researchers. Publons has had predatory journals on its system, and it has been used to recognise peer-reviews for internal institutional recognition, even though they have been perfunctory at best ([Van Noorden, 2020](#)).

Lack of capacity

With these disincentives, peer-review capacity is an increasing problem: it has created an imbalance in the distribution of peer review across the research enterprise, with a disproportionately low number of peers performing most of the reviews ([Kovanis et al, 2016](#)). This risks hiding predatory journals still further.

Demand for peer review (number of manuscripts submitted to journals) far exceeds supply (number of reviews completed) in “emerging economies” such as China, India, Turkey, Iran, South Korea, Taiwan and others

([Publons, 2018](#)). Biased reviewer selection may partially account for this: 96% of editors, who are responsible for reviewer selection, are themselves from “established” regions whereas only 4% are from “emerging” regions. The low proportion of reviews taking place in emerging regions may, in part, contribute to geographic bias and unsatisfactory norms for peer review. A Publons study found that 83% of academic survey respondents believe that **greater recognition and career incentives would have a positive impact on the efficacy of the peer-review process because it would encourage researchers to serve as reviewers**. A further incentive would be for publishers to pay peer reviewers for their services ([Brainard, 2021](#)): with peer review time-consuming and rewards intangible, not to mention the ethics of publishers charging researchers sizeable fees for a service partially supported by researchers working for free, paying peer reviewers could help fuel both the capacity and diversity of the global pool of peer reviewers. The downside of this model is that it risks introducing perverse incentives and unethical behaviour from both reviewer (seeking to make a bit of money and/or appease publishers to stay on their paybooks) and publisher (seeking to minimise article rejections).

Lack of academic ownership

There is also a growing debate about whether peer review needs to be so strongly linked to journals. Maintaining control of peer review provides publishers with credibility and legitimacy. Other forms of peer review, such as open participation or open platforms, means publishers would no longer be the main guarantors of scientific credibility and quality, but could instead be shared with academic communities. The values of credibility and quality are increasingly associated with open science ([TOP Guidelines](#)¹⁶) so that even if journals prefer to retain most of the responsibility for scientific rigour, it seems that an increased usage of open identities, open reports and open interactions are inevitable, should reviewers agree. New technologies also provide an opportunity to reform peer review from an open science perspective ([ALLEA-GYA-STM, 2021](#)) and scholars are seeking to explore the “*varied experiments that are currently being undertaken by scholarly publishers and others in peer review and related quality control approaches*” ([RORI, n.d](#)). For example, some journals are starting to outsource the peer-review process, accepting articles reviewed by a non-profit, cross-disciplinary “peer community” organisation ([O’Grady, 2021](#)), joining discipline-specific peer communities who are largely funded by universities and academic societies. It means that researchers can avoid paying APCs and, if effectively scaled up, will force publishers to justify the prices they charge and potentially reduce demand for predatory journals.

Lack of peer-review guidelines and editorial training for good practice

If the responsibility for peer review is moved from journals and publishers to new arenas where academia itself assumes responsibility for an open exchange of peer views, some authors suggest this may require the establishment of an independent regulatory entity such as a Global Peer Review Platform (GLOPERP): such an entity could define standards, certify journals that follow the standards and list those who don’t, be a repository for expert peer reviewers, and host a world peer-review congress ([Ferreira et al, 2015](#)).

Certainly, fostering good peer-review practice and editorial training is imperative. In its guidance on open peer review ([PLOS](#)), PLOS points out that journals and funders could explicitly practice retribution against peer reviewers as misconduct with consequences so that a transparent process, open to public scrutiny, could reduce the opportunities to engage in negative behaviours ([Bastian, 2018](#)). A reviewer’s code of conduct ([Gerwing et al, 2021](#)) is another suggestion.

16 See here the various standards proposed as the TOP factor, <https://www.topfactor.org/>.

Finally, peer review is complex and requires further research itself, not least to promote standards, to deepen the understanding of how peer review works ([Tennant & Ross-Hellauer, 2020](#)) and to understand how it can be more effective ([Bruce et al, 2016](#)). **Critically, if a system can be developed to establish what constitutes quality peer review and review reports are made public, then it will be all the more difficult for predatory journals to thrive.**

5.3.1 Interventions addressing this issue

The lack of transparent peer-review processes has been identified as a driver of predatory practices, as well as fuelling systemic biases. There are sources of peer-review good practice, metrics, open peer-review models and protocols already in the literature. Examples include the Global Research Council ([GRC](#)) [peer-review principles](#), [COPE's ethical guidelines for peer reviewers](#), [Publon's guide](#), [PLOS resources](#), and peer-review guidelines from leading research funders e.g. the [UK's ESRC](#) and publishers e.g. Wiley.

In curbing predatory practices, other potential interventions involving different stakeholders include: linking research funding to publication in journals favouring transparent (or open) peer review; creating and using new frameworks for transferring manuscripts and review reports between different peer-review systems ([Jones et al, 2021](#); [Kelesidou, 2020](#)); enabling public community comments on preprints to complement formal peer review (e.g. [PLOS' preprint commenting pilot](#)); journals awarding bonus points to reviewers for use towards OA fees ([Gurwitz, 2017](#)); encouraging academic institutions and universities to promote publication in journals adopting such peer-review processes; encouraging academic institutions and universities to provide incentives (economical or merit-based) for their researchers to conduct peer reviews and especially to participate in transparent peer review; and lobbying governments to raise the awareness of the benefits of transparent peer review in international fora, and even the adoption of resolutions or decisions by countries participating in these fora.

Finally, traditionally, peer review has been given low merit value, resulting in a shortage of peer reviewers and placing pressure on a relatively small pool of them. Most journals provide no training, there are almost no tangible rewards, and little, if any, acknowledgement. It is a time-consuming task, with several sources quoting the average time spent on each review as being as much as 6 hours or more ([Riley & Jones, 2016](#)). **Wider recognition of the value of serving as a peer reviewer could be an important part of academic professional development.** These could include peer review itself being acknowledged as academic output, some acknowledgement in print, feedback on review quality, and continuing professional development ([Warne, 2016](#)).

The next and final chapter sets out conclusions and recommendations for all key stakeholders, designed to address these systemic drivers and other priorities identified throughout the report.

Chapter 6 Conclusions and Recommendations

Summary

This report has endeavoured to contribute to the **collective understanding of what constitutes predatory journals and conferences**; help **raise awareness** of them across all communities in the research communication ecosystem, especially amongst researchers; and articulate the **imperative to combat them with urgency**.

Eight broad conclusions are set out, together with recommendations to address them. These recommendations comprise **short-term, relatively easy-to-implement actions designed to help researchers minimise their risk**, and **longer-term, more challenging, systemic actions that address the drivers of predatory practices and behaviours**. Recommendations are **targeted at specific stakeholder communities** who can effect change and the transition to a fairer, more equitable system that recognises local and regional challenges and sensitivities.

The monetisation and commercialisation of research output, and their unintended consequences, need to be addressed urgently. Research evaluation needs to be reframed so that it accounts for more qualitative, impactful measures, and recognises the vital role of peer-reviewers. The peer-review process itself requires greater transparency (whether fully open, anonymised or hybrid), and increased training and capacity of peer-reviewers.

The global research community, and especially those responsible for its governance, have a responsibility to help shape these efforts and put researchers at the heart of solutions for sustained and impactful change. This must be a shared responsibility involving key stakeholder communities, which would undoubtedly be strengthened by a global resolution at IGO level (such as UNESCO).

Recent years have seen a steady growth in research papers and commentaries on predatory journals and, to a far less extent, predatory conferences, as well as an increasing number of tools and interventions by different stakeholders at different levels. Their impact is as yet unclear, but it is unlikely that they will be able to keep up with the dynamic nature of predatory practices and behaviours. This chapter sets out the authors' main conclusions and recommendations for key stakeholders on practicable actions that are likely to have the most impact. Taken on their own, each recommendation will have limited impact but, implemented together, they can stimulate long-term, systemic change.

6.1 Conclusions and key messages

1. Current definitions of predatory academic practices are inadequate.

Current definitions conflate different behaviours, ranging from fraudulent, deliberately deceitful practices to poorly resourced or poor-quality ones, to questionable or unethical ones in quality outlets. No published definition adequately accounts for this complexity or fluidity: in reality, there is a spectrum of behaviours for both journals and conferences which could serve as a more nuanced definition. Distinguishing between these behaviours is difficult but necessary for interventions to be appropriately designed and targeted, and to minimise further bias in an academic publishing system already heavily weighted towards North America, Europe and the English language.

The journals and conferences spectra are dynamic, not static. Designations are fluid: journals or entire publishing enterprises and conferences can move in either direction, and labels may be disputed.

Interventions are required for all behaviours in the spectra. The term “predatory” is typically used in the literature for the illegal, deceitful end of the spectra: these journals and conferences should be avoided. At the other end, there are legitimate journals and conferences with practices that may weaken research integrity and go largely unchallenged. These should be challenged for the good of the future of academic publishing. The middle ground is a grey area and should be navigated with caution. All are “predatory” to varying degrees.

2. Awareness and understanding of predatory practices and behaviours are generally poor.

Compounded by this complexity, awareness and understanding of predatory journals and conferences – including how and why to avoid them, and the consequences of not doing so – are generally poor across the research community. There is an urgent need to deliver more targeted and robust training materials and resources 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 predatory practices.

3. Predatory actors and outlets are becoming more sophisticated and fraudulent journals can find their way into trusted indexes.

Compounding this complexity still further, predatory outlets and practices continue to evolve and re-invent themselves; their diversification and sophistication making it increasingly difficult for scholars to differentiate them from legitimate, well-indexed journals with a strong record of adherence to peer-review norms. The inclusion of some “predatory” journals in leading indexes and databases further adds to the confusion. Good practice must prevail but to do so it must be easier for users anywhere in the world to navigate a system that minimises systemic bias and is cognisant of the very appeal of predatory services (ease, speed, cost).

4. Predatory journals and conferences are on the rise, impacting at least a million researchers and costing billions in wasted or compromised research.

The latest estimate is over 15,500 “predatory” journals, with “predatory” conferences possibly outnumbering real ones. The impact of COVID-19 on working practices is likely to further fuel them. The global survey has been a wake-up call, revealing that predatory journals and conferences are pervading all geographies, disciplines and academic career stages. Over 80% of the 1,800+ survey respondents perceive that these practices are already a problem or on the rise in their country of work, with the economic status of the country in which a researcher works, and to a lesser extent discipline, having some bearing on their perception.

Nearly a quarter of respondents admitted they had (largely unknowingly) published in a “predatory” journal or participated in a “predatory” conference (14%), or did not know if they had (10%). Using this as a crude proxy for the global research community, 14% equates to over 1.2 million researchers worldwide and billions of US dollars in research budget (time, people, materials). Such data strikingly illustrate that this is not a marginal problem.

5. Predatory journals and conferences risk becoming engrained in research culture and institutionalised.

The survey has also revealed that not all researchers are scammed or constitute “prey”: some researchers knowingly use predatory outlets to advance their careers, satisfy timelines for graduation, employment

and promotion, or because of peer pressure. Further, there are indications that predatory practices are becoming institutionalised and engrained in research culture as a means to advance research careers or institutional ranking. Peer pressure featured prominently in the survey responses and some institutions appear to be complicit in fuelling and legitimising predatory practices, for example by insufficient policing, turning a blind eye or providing venues for predatory conferences.

Manifesting itself in different ways (e.g. research quality, reputational risk, emotional toil, economic waste, policy influence), the impact of predatory practices is wholly underplayed in the literature. Predatory practices are wasteful intellectually and economically; hamper the efficiency, impact and diversity of the research process; and are potentially dangerous in misinforming public policy. If these impacts are better understood, they may serve as both an incentive for researchers to practice due diligence to minimise their risk of using predatory outlets and a disincentive for them to use these outlets knowingly.

More research is required to understand the impacts of predatory practices at all levels and predatory conferences in particular, where literature is presently sparse.

6. The monetisation and commercialisation of academic research output help drive predatory practices and behaviours. This includes an academic publishing system whose proprietary and commercial interests may compromise research integrity, and the unintended consequences of the current academic publishing models, in particular the author-pays (pay-to-publish, pay-to-present) model of Open Access. If left unchallenged, they risk undermining the integrity of, and public trust in, research and research-informed policymaking. “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 exploits researchers, policymakers and the public.

7. Contemporary research evaluation systems are a major driver of predatory practices.

The quantitative (quantity over quality) nature of research assessment systems all over the world place 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 research evaluation systems and practices so that they are equitable, more impactful and fit-for-purpose.

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.

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. Moreover, the role of a peer reviewer is the least valued, recognised and supported area of the research process. The lack of professional recognition of, and training for, peer review creates both disincentive to serve as a peer reviewer and, as demand exceeds supply, incentive 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, and further research on models for its evolution as research outputs diversify, are all required urgently. Adoption of transparent peer review as the norm, with flexibility on disclosure of identity, can greatly discourage predatory practices.

6.2 A call to action

Multiple stakeholders must play their part in minimising the damage caused by predatory practices, most immediately:

- to raise awareness of predatory practices, the repercussions of not addressing them, and their threat to both science and society;
- to avoid engaging with, and legitimising, so-called predatory journals, publishers and conferences; create disincentives for researchers who use them, whether knowingly or unknowingly; and promulgate good practice in publishing and conferencing choices;
- to work collaboratively on efforts to reduce the commercialisation and monetisation of academia; promote open science and a move towards diamond OA or other such non-commercial models;
- to reject the overuse and reliance on quantitative metrics in research evaluation (including using quantitative metrics more rationally and intelligently), and promote ways of recognising research quality; and
- to strengthen the institution of transparent peer review in academia, through merit systems, policies and support structures at all levels.

It is anticipated that this report will provide a timely stimulus for critical and coordinated action. The paradigm shift in working practices brought about by the pandemic has added to the urgency, with a marked rise in public interest in, and public scrutiny of, science. Action is required from all key stakeholders in the research communication ecosystem: there is no room for ignorance, complacency or inertia- the stakes are too high.

Critically, this action must engage:

- **Universities, academies, wider academic leadership and researchers themselves** to act in concert regarding messaging around predatory practices that diminish and damage academic life, by (i) awareness raising of the dangers of predatory journals and conferences amongst their communities through training and mentoring services; (ii) championing and setting standards for research integrity and best practice; (iii) recognising peer-review as a highly valued responsibility; and (iv) recovering some ownership of the publishing process and strengthening its function as a vital scientific service to the scholarly community.
- **Research funders, grant agencies and academic performance assessment systems** in changing research metrics and evaluation systems to be based more on expert assessment and qualitative indicators and less on quantitative ones (reducing the pressure on, and avoiding undue incentives for, researchers to publish and present their work); and in subsidising new models of publishing led by scholarly and non-profit organisations.
- **The commercial and non-profit publishing industry**, whose interests often drive much of the systemic exclusivity and bias, in promoting alternative publishing models and helping to transform scientific publishing; resetting peer-review processes and defining fairer, more inclusive models for academic publishing.
- **Libraries and indexing services**, working at the research – publishing interface, in promoting good practices and identifying fraudulent ones, making it easier for researchers, funders and publishers to navigate the system.
- **Intergovernmental (IGOs) and international science organisations** in driving a global compact or consensus for change, in the context of wider open science and academic publishing initiatives on which they already lead. If UNESCO could persuade the members to the UN General Assembly, for example, to adopt a Resolution on predatory publishing, then this would put it firmly on the political agenda.

6.3 Recommendations

Recommendations are tabulated below, with indicative timeframes for implementation:

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

Table 6.1: Headline recommendations

1. Current definitions of predatory academic practices are inadequate.	
Recommendations	Target stakeholders
<ul style="list-style-type: none"> ■ 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. ■ Conduct more empirical research on predatory conferences 	<p>All authors /researchers seeking to publish a paper; training providers (see 2); those publishing research and commentaries on predatory practices; libraries and indexing services.</p> <p>Research funders and research community</p>
2. Awareness and understanding of predatory practices and behaviours are generally poor.	
Recommendations	Target stakeholders
<ul style="list-style-type: none"> ■ 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. ■ 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). 	<p>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.</p>

3. Predatory practices are becoming more sophisticated, and fraudulent journals can find their way into trusted indexes.

Recommendations	Target stakeholders
<ul style="list-style-type: none"> 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. 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. 	<p>Publishers, libraries, library associations, indexing services.</p> <p>Conference associations/ bodies and university representative bodies.</p>

4. Predatory practices are growing, impacting at least a million researchers and costing billions in wasted research.

Recommendations	Target stakeholders
<ul style="list-style-type: none"> 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. 	<p>UNESCO, other InterGovernmental Organisations (IGOs), regional and national governments, IAP, GYA, ISC, GRC, publishers, universities, libraries, indexing and conferencing services, ISSN.</p>

5. Predatory practices risk becoming engrained in research culture and institutionalised.

Recommendations	Target stakeholders
<ul style="list-style-type: none"> 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. 	<p>Universities, HEIs, academies, funders, conference associations, research community.</p>

Indicative timeframes for implementation:

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

6. The commercialisation and monetisation of academic research is a major driver of predatory practices and behaviours.

Recommendations	Target stakeholders
<p>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.</p>	Universities, HEIs, learned and professional societies, scientific unions and academies; IAP, ISC, TWAS.
<p>Where practicable, establish, strengthen and subsidise low-cost academic publishing houses owned by universities, academies and professional societies, or their consortia.</p>	As above, with governments and funders.
<p>Promote non-commercial models of journal indexing and publishing, setting explicit standards and expectations.</p>	Funders, universities, national governments, multilateral organisations.
<p>Replace the “author-pays” or “pay to publish” model with alternative economic models of OA to cover the costs associated with academic publishing.</p>	Publishers, funders, universities, academies.








7. Research evaluation/ assessment is a major driver of predatory practices and behaviours.

Recommendations	Target stakeholders
<p>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.</p>	Universities, HEIs, learned and professional societies, scientific unions and academies; IAP, ISC, TWAS.
<p>Support well-intentioned low-quality journals by, for example:.</p> <ul style="list-style-type: none"> 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.
<p>Advocate for responsible research assessment amongst research funders, to include:</p> <ul style="list-style-type: none"> 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.
<p>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.</p>	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. 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.

Recommendations	Target stakeholders
<p> Commission more research on peer review, to help promote standards and understand how peer review works, and could evolve in future.</p>	IGOs, Governments, research funders.
<p> 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.</p> <p> Award bonus points to reviewers for use towards OA fees.</p> <p> Promote publication in journals with transparent and/or open peer review processes and link financial support to publication in these journals.</p> <p> 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.</p> <p> 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.</p>	<p>Universities, HEIs, learned and professional societies, scientific unions and academies; IAP, ISC, TWAS</p> <p>Research funders, GRC.</p> <p>Publishers, universities, academies, libraries and indexing services.</p> <p>UNESCO and other IGOs and multilaterals; ISC.</p>
<p> 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</p>	Publishers, universities, academies, libraries and indexing services.

Indicative timeframes for implementation:

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

Table 6.2 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 of evidence, 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.

6.4 Next steps

IAP's work continues on dissemination of these recommendations to their target audiences, drawing on its own academies' networks and those of its sister organisations. It is anticipated that study materials and learning will 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 practices are to be combatted successfully.

IAP has partnered with the Global Young Academy and International Science Council to explore ways to reform research evaluation because it lies at the heart of systemic problems in research today, including predatory practices in academia. This collaboration will help ensure that the research community has a voice and is at the forefront of new reforms, working with other key stakeholders. Opportunities for working with UNESCO and the International Science Council will also continue to be explored to help reference predatory practices within the wider context of open science and the future of scholarly communication, respectively.

Those who are interested in picking up any aspects of this report, especially how to implement the recommendations, are encouraged to contact the IAP Secretariat at secretariat@iappartnership.org.

Appendix A The IAP study, May 2020-April 2022

(i) Study objectives

The objectives of the study informing this report were to (1) define and improve the understanding of what constitutes predatory journals and conferences; (2) gauge their prevalence and impact; (3) review current interventions to combat them; (4) identify the drivers of these practices; and (5) make recommendations to key stakeholders in the research communication ecosystem who can effect change.

(ii) Working Group (report authors)

Drawing on its extensive global network, IAP established a diverse [international expert working group](#)¹⁷, representing different geographic, disciplinary and sectoral perspectives. Working Group members were drawn from nominations from IAP member academies, the Global Young Academy and International Science Council, with expertise in library sciences, publishing and editing, research funding, multilateral governance and various disciplinary research sectors. The group was supported by a professional study director and secretariat, primarily supported by the US National Academies of Sciences, Engineering and Medicine (NASEM).

(iii) Study methodology

Recognising the systemic and pervasive nature of predatory practices, a number of different methodologies were deployed. A mixed methods approach incorporated both qualitative and quantitative methods of collection and analysis to gain insight from key stakeholder communities on predatory journals and conferences.

a. Stakeholder focus groups

The Working Group heard evidence from **leading thinkers and key stakeholder groups**, identified by the Working Group and Secretariat: representatives from the research community, research funders, university/HEI and graduate school administrators, publishers, libraries and indexing services, international science governance organisations, and international conference bodies and experts.

Seven stakeholder focus groups were organised by sector and insight from these is weaved throughout the report, helping to shape the targeted recommendations for each community.

(i) Research community

- Dr Bruce Alberts (former Editor-in-Chief, Science)
- Dr Kelly Cobey (Investigator, Ottawa Hospital Research Institute, Canada)
- Professor Goran Hermerens (Chair of the Permanent Working Group for Science and Ethics, All European Academies, Europe)
- Professor Subhash C. Lakhotia (Distinguished Professor, Banaras Hindu University, India)

17 Combatting Predatory Academic Journals and Conferences (interacademies.org)

- Professor Johann Mouton (Director, Centre for Research on Evaluation, Science and Technology, University of Stellenbosch, South Africa)
- Dr Olga Ustyuzhantseva (Director, Centre for Policy Analysis and Studies of Technologies, National Research Tomsk State University, Russia)
- Dr Koen Vermeir (Past-Co-Chair, Global Young Academy, France)

(ii) Research funders

- Professor Paola Bovolenta (Chair of the European Research Council (ERC) Working Group on Open Access and member of the ERC Scientific Council)
- Dr Rachel Bruce (Head of Open Research, UK Research and Innovation, UK)
- Dr Sepo Hachigonta (Director of Strategic Partnerships, National Research Foundation, South Africa)
- Dr Robert Kiley (Head of Open Research, The Wellcome Trust, UK)
- Dr John Parker (Program Director, Science & Technology Studies and Ethical & Responsible Research, National Science Foundation, US)
- Professor Bhushan Patwardhan (Vice-Chairman, University Grants Commission, India)

(iii) Universities and academia

- Dr Tonya Blowers (Programme Coordinator, Organisation for Women in Science for the Developing World)
- Professor Amy Koerber (Principal Investigator, STEM Training in Ethics of Publication Practices, TexasTech University, US)
- Dr Elizabeth Marincola (Senior Advisor, Science Communications and Advocacy, African Academy of Sciences)
- Professor Jonathan Morris (Chair, U21 Deans and Directors of Graduate Studies, Universitas21)
- Dr Joanna Newman (Chief Executive and Secretary General, Association of Commonwealth Universities)

(iv) Publishers

- Dr Chris Graf (Director of Research Integrity, Wiley Publishing)
- Dr Rebecca Lawrence (Managing Director, F1000 Research)
- Dr Catriona MacCallum (Director of Open Science, Hindawi Publishing)
- Dan Morgan (Director of Communications and Community Relations, Public Library of Science, PLOS)
- Dr David Ross (Vice President, Open Research, SAGE Publishing)
- Dr Emma Wilson (Director of Publishing, Royal Society of Chemistry, UK)

(v) Libraries and indexing services

- Dr Gaëlle Bequet (Director, ISSN International Centre)
- Professor Ana Maria Cetto (Founding President, LATINDEX)

- Dr Helena Asamoah Hassan (Executive Director, African Library and Information Associations and Institutions, AfLIA)
- Dr Iryna Kuchma (Open Access Programme Manager, Electronic Information for Libraries, EIFL)
- Simon Linacre (Director, International Marketing & Development, Cabells)
- Dr Tom Olijhoek (Editor-in-Chief, Directory of Open Access Journals, DOAJ)
- Dr Nandita Quaderi (Editor-in-Chief, Clarivate Analytics)

(vi) International science governance organisations

- Professor Geoffrey Boulton (Chair, The Future of Scientific Publishing, International Science Council, ISC)
- Luiz Cadenas (Executive Director, RedCLARA, Latin America)
- Dr Deborah Poff (former Chair, Committee on Publication Ethics, COPE)
- Professor Deborah Oughton (Member, World Commission on the Ethics of Scientific Knowledge and Technology, COMEST, UNESCO)
- Dr Ana Persic (Acting Chief of Section, Science Policy and Partnerships, UNESCO)
- Nick Shockey (Director of Programs & Engagement, Scholarly Publishing and Academic Resources Coalition, SPARC)

(vii) International conference bodies.

- Marcos van Itterzon (Director of Research, International Congress and Convention Association, ICCA)
- Kamran Kardan (founder and Chief Executive Officer, Knowledge E Publishing)
- Professor James McCrostie (Professor, Department of Business Administration, Daito Bunka University, Japan)

Questions they were asked to address:

1. To what extent do you think predatory and unethical practices (journals, conferences, other) are a problem?
2. How are they impacting (i) your sector; (ii) your specific organisation; and, as appropriate, (iii) you personally?
3. What is your sector (and/or your organisation) doing to combat them now or in the pipeline? Please provide examples of interventions that constitute good practice (things that are working well) that could be scaled up/adapted, and bad practice (things that are not working well).
4. What do you think are the root causes of predatory and unethical practices; and, accordingly, what main systemic changes need to happen to minimise them?
5. How can this IAP project best add value and make an impact in combatting predatory practices?
 - What sort of recommendations would be most practicable and impactful, especially with regard to your own sector?
 - What would be the necessary pre-conditions for change in your own sector?

b. Survey of global research community

A vital part of this study was the design, implementation and analysis of a **landmark survey** of the global research community – the largest of its kind on this issue. It served two primary objectives: (1) to inform the study on effective ways to lessen the impact of predatory practices and protect researchers everywhere, and (2) to raise awareness of these practices amongst the global research community. The design of the survey is at [Appendix B](#) and methodology at [Appendix C](#).

c. Regional webinars

Five webinars were delivered in November-December 2021 to complement the survey and help raise awareness of predatory academic practices, using the channels previously described.

This mixed methodology approach supplemented published knowledge on predatory journals and conferences; helped raise awareness, especially amongst the research community; provided compelling evidence on why they need to be urgently combatted; and strengthened the study's recommendations for an effective global strategy to this effect.

Appendix B The survey design

Predatory journals, publishers, and conferences are on the increase. These practices threaten to cause long-term damage to research and researchers. Although several studies suggest the problem is widespread and increasing, the true extent globally is unknown, which makes addressing these practices more difficult. You can help and, at the same time, better equip yourself to avoid them.

As part of the InterAcademy Partnership (IAP) study [Combatting Academic Predatory Journals and Conferences](#), the purpose of this survey is to understand the extent and impact of predatory journals and conferences across geographic regions, disciplines and career stages as experienced by members of the global research community. In doing so, the study can recommend more effective ways to combat predatory practices and protect researchers at all stages of their career.

We encourage you to complete the survey in your individual capacity, reflecting on your personal experience rather than on behalf of your institution(s). Please be assured that this initiative does not seek to expose or reprimand anyone but to understand the prevalence of predatory practices. There are no right or wrong answers. The survey should take 15-20 minutes to complete and you have the option to save and return to it later. Your responses will be completely anonymized and your participation is voluntary.

Many thanks in advance.

Please direct any questions to the IAP Secretariat at secretariat@iappartnership.org

* **Mandatory questions.** All others are optional.

Section 1: Demographic information

1. In which country do you presently work? *

2. Gender *

3. Academic stage *

4. Are you a member or alumnus of a national or international merit-based academy? *

☐

I am a member or alumnus of a national young academy

☐

I am a member or fellow of a national academy

☐

I am a member or alumnus of both a national and a national young academy

☐

I am a member or alumnus of an international academy e.g. GYA, TWAS

☐

I am NOT a member or alumnus of any academy

If yes, which one(s)?

If you are a member of other professional networks or bodies, which you think deserve mention, then please list them here.

5. What discipline(s) do you broadly represent? Please select category(ies) that best represent your current work: *

<input type="checkbox"/> Arts and humanities	<input type="checkbox"/> Business studies	<input type="checkbox"/> Engineering	<input type="checkbox"/> Life sciences (non-medical)
<input type="checkbox"/> Medical sciences	<input type="checkbox"/> Physical sciences	<input type="checkbox"/> Social sciences	<input type="checkbox"/> Environmental and applied sciences
<input type="checkbox"/> Social sciences	<input type="checkbox"/> Transdisciplinary and /or multidisciplinary sciences		
<input type="checkbox"/> Other			

Section 2: Recognising a predatory journal or conference

6. Which of the following situations would make you suspicious that you are being solicited by a predatory journal or conference?
Please select one box for each option

	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
You are invited to submit a paper in a subject matter outside your expertise					
The invitation addresses you in superlative terms					
There is an unusual combination of words and phrases, or loosely related fields of study, in the journal title or conference name					
The journal or conference has an unusually broad subject matter coverage					
The language of the invitation has grammatical errors					
The language of the invitation is unusual for your professional practice					
The editorial board or conference organisers are not well-known in your research field					
The processing or participation fee is high					
The processing or participation fee is low					
There is a promise of rapid processing of your paper					
The journal or conference claims a high impact factor or prestigious standing					
Invitations are sent to you repetitively					
The journal or conference website does not include subject matter that is at the frontier of knowledge					
The journal or conference website does not include seminars or guidelines that update professional practice					
The journal or conference is not linked to a professional organisation or university					
There is poor/unprofessional (e-)mail formatting/presentation					
The high-level speakers in the programme are listed "subject to confirmation"					
The journal or conference is managed by a high-income country					
The journal or conference is managed by a low or middle-income country					
You simply don't recognise the journal, conference or participants					
Other (please specify)					

7. How would you check whether a journal or conference is predatory? Please select one box for each option.

	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Not an option
I would seek a colleague's opinion						
I would look for revealing signs of predatory practices as I understand them						
I would check against a published list of predatory journals or conferences ("blacklists")						
I would check against a published list of legitimate journals or conferences ("whitelists")						
I would check my institution's written guidance						
I would consult my institution's research management unit/equivalent						
I would consult a librarian						
I would consult a friendly journal editor						
I would consult my institutional review board/ ethics committee						
I would check on the internet for any indications e.g. warnings from previous victims						
I would not bother to check						
Other (please specify)						

8. How much of a problem do you think these predatory practices are for researchers in the country where you currently work?

☐ They are already a serious problem
 ☐ They are becoming a problem
 ☐ They are not a problem (rare)
 ☐ I don't know

Please provide additional details explaining your response (optional)

Section 3: Personal experience

9. Have you ever published in a predatory journal? (Please note that this question is NOT intended to expose or reprimand participants but to understand the prevalence of predatory journals)

☐ Yes, but I did not know it was a predatory journal at the time
 ☐ Yes, and I knew it was a predatory journal
 ☐ I don't know if I have published in a predatory journal
 ☐ No, I have not published in a predatory journal to my knowledge

If yes, why? Please select one box for each option.

	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I was unaware it was a predatory journal					
I did not think I would be accepted by high-impact quality journals					
Publication in academic journals is necessary to progress my career					
It was generally faster, cheaper and/or easier than other journals					
I was encouraged by my peers to publish in journals in which they have previously published					
Other (please specify)					

10. What was the impact of this experience professionally?

11. What was the impact of this experience personally / emotionally?

12. Have you ever participated in, or been a victim of, a predatory conference? (Please note that this question is NOT intended to expose or reprimand participants but to understand the prevalence of predatory conferences)

☐ Yes, but I did not know it was a predatory conference at the time

☐ Yes, and I knew it was a predatory conference

☐ I don't know if I have participated in a predatory conference

☐ No, I have not participated in a predatory conference to my knowledge

If yes, why? Please select one box for each option.

	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I was unaware it was a predatory conference					
I did not think I would be accepted by major/well-known conferences					
It was necessary to progress my career					
It was generally faster, cheaper and/or easier than other conference processes					
I was encouraged by my peers to attend conferences they have previously attended					
Other (please specify)					

13. What was the impact of this experience professionally?

14. What was the impact of this experience personally / emotionally?

Section 4: Interventions

15. Do you think predatory practices in scholarly publishing and/or conferences should be combatted?

☐ Yes

☐ No

☐ I don't know

If yes, why? Please select one box for each option.

	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
To preserve the integrity of the research enterprise					
To protect personal / academic reputation					
To protect institutional reputation					
To ensure that evidence-informed policymaking is rigorous					
To protect the public from unsubstantiated information, with potentially damaging consequences					
To preserve public trust in research					
Other (please specify)					

16. What do you perceive as the main challenges / barriers for combatting predatory practices in scholarly publishing and/or conferences?
Please select one box for each option.

	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
It is driven by commercial interests of the publishing industry					
It has already permeated widely amongst researchers					
It is not perceived to be a significant problem warranting change					
The demand for predatory journals is too high					
Too many of my/our peers have published in predatory journals					
Policymakers are unlikely, or cannot be relied upon, to effect change					
It is difficult for many researchers to distinguish predatory from non-predatory journals and conferences					
Other (please specify)					

17. What do you think are practicable solutions for combatting them?
Please select one box for each option.

	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Providing educational materials for students and / or researchers at all/any levels					
Providing guidance for university/research administrators					
Providing checklists for genuine and/or predatory journals					
Calling out / stigmatizing predatory journals					
Establishing global non-commercial accreditation or certification authority(ies) for journals					
Adopting open peer review models					
Building better safeguarding capacity (e.g. training) in academic institutions					
Capping Article Processing Charges (APCs)					
Stopping "author pays" models					
Overhauling research evaluation and criteria for career advancement					
Other (please specify)					

18. If unchecked and unchallenged, how do you think predatory journals and conferences will develop over the next 10-20 years?
Please select one box for each option.

	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
They will infiltrate and undermine the whole research enterprise					
They will fuel misinformation in public policy with potentially damaging consequences					
They will continue to exist but not be a significant problem for the majority					
They will fade out naturally					
They will further widen the research gap between high income and low income countries					
Other (please specify)					

19. What role do you think IAP - its merit-based academies and their regional networks - should play in combatting predatory journals and conferences? [IAP is the global network of 140 science, engineering and medical academies]

☐ Academies should be lead agencies against predatory practices

☐ Academies should support other agencies/initiatives that can make a difference

☐ Academies have no role/cannot make a difference

Please explain your answer (optional)

20. Would you like to share any further experience(s) of publishing in a predatory journal or participating in a predatory conference?

☐ Yes, and I am happy to be named

☐ Yes, but I would prefer to remain anonymous

☐ No

Additional information about the survey

After completing and submitting the survey, if you are interested in information regarding the results, please go to the [Combating Academic Predatory Journals and Conferences](#) page where the project will be updated regularly.

Privacy policy

The InterAcademy Partnership (IAP) values its participants' privacy. Therefore, all information provided to IAP by you (the respondent) in this survey will only be used as a tool in understanding the extent and impact of predatory journals and conferences across geographic regions, disciplines, and career stages. This Policy applies to the IAP and it governs any and all data collection usage. Through participation in this survey, you are therefore consenting to these data collection procedures. No individual responses provided to this survey will be shared with third-party entities.

Acceptance of Terms

By participating in this survey, you are hereby accepting the terms and conditions of this Privacy Policy. If you are not in agreement with our Policy, then you should refrain from participation in this survey.

Providing Personal Information or Contacting IAP

Providing identifying information such as an email address for further communication or contacting IAP requires the acquisition of senders' email address in order to give feedback on their inquiry, and implies also the acquisition of other personal data included in the message. Users are recommended not to provide sensitive data of theirs or of third parties, in particular those related to health, without having previously given their consent in the manner prescribed by law.

How to Contact Us

If you have any questions or concerns regarding this Privacy Policy related to this survey, please contact us via the email address below. Email: secretariat@iapartnership.org

Appendix C Survey methodology: statistics and assumptions

The survey comprised a mixed method design with multiple choice, Likert style (strongly agree to strongly disagree), and open-ended questions allowed for a variety of analyses, both quantitative and qualitative. Four steps were followed: (1) becoming familiar with the sample of respondents and coding additional demographics retroactively¹⁸; (2) identifying relevant descriptive statistics; (3) hypothesis testing using chi square test for independence and multinomial logistic regression; (4) identifying complementary and conflicting qualitative data to produce well-rounded findings.

Survey analysis framework

Quantitative analysis	Qualitative analysis
<ul style="list-style-type: none"> descriptive statistics (demographic) hypothesis testing using the chi square test of independence and multinomial logistic regression analysis. 	<ul style="list-style-type: none"> illuminating anecdotal quotes and stories from respondents content analysis, based on supporting evidence, conflicting evidence, major themes and word frequency.

I. Breakdown of Respondents

Country Income Status

Country Income	Country Income Counts	Country income %
Low Income Country	41	2%
Lower Middle Income Country	468	25%
Upper Middle Income Country	597	32%
High Income Country	766	41%
Vertical Sum	1872	100%

Geographic regions

Regions	Regional Counts	Regional Percentages
Asia Pacific	488	26%
Central Asia	27	1%
Middle East	52	3%
South Asia	277	15%
EU Europe	334	18%
Non-EU Europe	49	3%
Latin America and the Caribbean	285	15%
North America	82	4%
North Africa	24	1%
Sub-Saharan Africa	254	14%
Vertical Sum	1872	100%

Continents

Continents	Continent Counts	Continent Percentages
Americas	367	20%
Africa	278	15%
Asia	844	45%
Europe	383	20%
Vertical Sum	1872	100%

¹⁸ Additional demographics were geographic region and country economic status (according to the World Bank)

Academic Career Stage

Academic Career Stage	Academic Career Stage Counts	Academic Career Stage %
Masters student	48	3%
PhD student	146	8%
Early career researcher (0-10 years of research experience, typically post-PhD)	386	21%
Mid-career researcher (10-20 years of research experience, typically post-PhD)	359	19%
Advanced career researcher (20 years plus of research experience, typically post-PhD)	800	43%
Other	133	7%
Vertical Sum	1872	100%

Discipline

Disciplines	Discipline Counts	Discipline Percentages
Arts and humanities	99	4%
Business studies	46	2%
Engineering	233	9%
Life sciences (non-medical)	536	22%
Medical sciences	335	13%
Physical sciences	369	15%
Mathematical sciences	107	4%
Environmental and applied sciences	230	9%
Social sciences	211	8%
Transdisciplinary and /or multidisciplinary sciences	189	8%
Other	135	5%
Vertical Sum	2490	100%

Academic Affiliation

Academy Affiliation	Academy Affiliation Counts	Academy Affiliation Percentages
I am a member or alumnus of a national young academy	113	6%
I am a member or fellow of a national academy	755	37%
I am a member or alumnus of both a national and a national young academy	48	2%
I am a member or alumnus of an international academy e.g. GYA, TWAS	255	12%
I am NOT a member or alumnus of any academy	873	43%
Vertical Total	2044	100%

Gender

Gender	Gender Counts	Gender Percentages
Male	1213	65%
Female	629	34%
Gender Variant / Non-conforming	9	0%
Prefer not to answer	21	1%
Vertical Sum	1872	100%

II. Hypothesis Testing

Perceived equivalence

Chi Square Test of Independence Results

Demographic Characteristic	Chi Square Test Results
Academic Career Stage	χ^2 (15, N = 1859) = 67.3, $p < .001$, Cramer's V=0.110
Country Income Status	χ^2 (9, N = 1859) = 69.6, $p < .001$, Cramer's V=0.112
Discipline	χ^2 (3, N = 1859) = 0.635-4.34, $p = 0.227-0.888$, Cramer's V=0.0185-0.0483
Geographic Region	χ^2 (27, N = 1859) = 130, $p < .001$, Cramer's V=0.153

Regression Results available upon request at secretariat@iapartnership.org

Publishing in a Predatory Journal

Chi Square Test of Independence Results

Demographic Characteristic	Chi Square Test Results
Academic Career Stage	χ^2 (15, N = 1859) = 22.4, $p = 0.097$, Cramer's V=0.0634
Country Income Status	χ^2 (9, N = 1859) = 59.3, $p < .001$, Cramer's V= 0.103
Discipline	χ^2 (3, N = 1859) = 0.564-9.06, $p = 0.029-0.905$, Cramer's V=0.0174-0.0698
Gender	χ^2 (9, N = 1859) = 5.96, $p = 0.744$, Cramer's V=0.0327

Regression Results available upon request at secretariat@iapartnership.org

Participating in a Predatory Conference

Chi Square Test of Independence Results

Demographic Characteristic	Chi Square Test Results
Academic Career Stage	χ^2 (15, N = 1723) = 17.5, $p = 0.291$, Cramer's V=0.0581
Country Income Status	χ^2 (9, N = 1723) = 31.0, $p < .001$, Cramer's V=0.0774
Discipline	χ^2 (3, N = 1723) = 0.439-22.8, $p = < .001-0.932$, Cramer's V=0.0160-0.115
Gender	χ^2 (9, N = 1723) = 10.8, $p = 0.292$, Cramer's V=0.0457

Regression Results available upon request at secretariat@iapartnership.org

Appendix D Condensed descriptors or typical markers of predatory journals

Deceptive journals 'one strike & you're out'	Unacceptably low quality journals 'doing an injustice to science'	Low quality journals – 'cause for concern'
<p>Deception by false family resemblance (mimic legitimate journals web, title, etc.)</p> <p>Sell authorship</p> <p>Give false or misleading information on the extent of peer review, how papers are chosen, selectivity and rejection rate (in fact publishing any article for which the APC is paid)</p> <p>Publish original papers when they are previously published</p> <p>False editorial board</p> <p>False location of the journal, publisher or managing office</p> <p>Falsely state they are indexed in a particular index or a member of publishing organisations or academic societies</p> <p>Falsely state impact factor (or uses a deceptive, alternative IF)</p> <p>Deceptive author fees (or extra costs for colour images, etc.)</p> <p>Poor quality of journal services, e.g. copyediting, proofreading, digital preservation or plagiarism checks</p> <p>Copyright ownership</p> <p>Fraudulent use of ISSNs</p> <p>Relationships with for-profit partner companies.</p>	<p>Rapid, cursory or non-expert peer review; no peer review policy</p> <p>No contact information provided</p> <p>Editorial board members unverifiable or the same over several journals</p> <p>Un-cooperative when misconduct is suspected</p> <p>Reluctant to assist when a retraction is asked for, or asking for a fee</p> <p>Unclear about copyright/licences</p> <p>Not a member of/not following best practice guidelines from ICMJE, OASPA, COPE, CSE, EASE etc.</p> <p>Publish papers unrelated to the journal's scope or papers of very low quality that will only 'pollute science'</p> <p>A substantial level of plagiarism and duplicate publications with other 'predatory' journals</p> <p>Is not indexed in any well-known index</p> <p>Does not allow search engines to crawl the published content, preventing the content from being indexed</p> <p>Copy-proofs (locks) their PDFs, thus making it harder to check for plagiarism</p> <p>Publishes only research results that favour the interests of a particular group or organisation.</p>	<p>Weak editorial board(s)</p> <p>Use of aggressive and indiscriminate solicitation practices</p> <p>Website or e-mails present contradictory statements and are low quality (lacking information, dead links, bad formatting, spelling and grammar mistakes, an abundance of ads, etc.)</p> <p>Lack a retraction policy, publication ethics policy, or declaration of ethical approvals, IP, conflicts-of-interest, or study funding</p> <p>Low quality journal services, e.g. copy-editing, proofreading, or plagiarism checks</p> <p>No peer review policy</p> <p>No retractions, corrections or expressions of concern found</p> <p>Lack a digital preservation plan</p> <p>Unclear whether journal makes unauthorised use of images without permission from copyright owners</p> <p>The publisher has an optional "fast-track" fee-based service for expedited peer review which appears to provide assured publication with little or no vetting.</p>

Appendix E Condensed descriptors or typical markers of predatory conferences

Fake/deceptive conferences 'one strike & you're out'	Unacceptably low-quality conferences 'doing an injustice to science'	Low quality conferences 'cause for concern'
<p>Take the name of another conference which already exists</p> <p>Organisers are not open about their fees</p> <p>Unusually frequent conferences (if a conference is held at multiple times in different cities, or the organiser is holding multiple conferences in different fields at the same time, this is suspicious)</p> <p>No peer review despite claims</p> <p>Falsely claim to be a non-profit organiser or hide relationships with for-profit partner companies</p> <p>Falsely claim the involvement of people on advisory boards or organising committees, or of universities or academies as partners or sponsors</p> <p>List contact details that are non-existent or fake to hide the identity of organisers or their country of origin</p> <p>Organisers falsely claim academic qualifications</p> <p>Organisers publish journals that consist primarily of conference papers</p> <p>Organiser promises that papers will be published in unnamed, indexed journals</p> <p>Spam emails to people outside the conference field</p> <p>Conferences are regularly cancelled or conference venues changed at short notice</p> <p>Conference is not listed on the website of an academic society or publisher that is claimed as a sponsor</p> <p>Conference website is unstable or has no record of conferences in previous years</p> <p>Charge combined registration fees and journal publishing charges</p>	<p>Language on the conference website is poorly written with lots of mistakes</p> <p>Organisers' contact details are missing, or aren't quite right, or they are unknown</p> <p>Peer reviewers work in a subject matter outside their field of expertise</p> <p>Inadequate or absent peer review</p> <p>Machine-generated or other "sting" abstracts or papers get accepted</p> <p>Submitted abstracts or papers receive acceptance within a week and/or before the Call for Papers has closed</p> <p>Call for Papers submission deadlines are disregarded</p> <p>Conference papers get funnelled to known or suspected predatory journals</p> <p>Those involved have connections to other predatory conferences or journals</p> <p>Inflation of "best paper" prizes</p> <p>Regularly accept undergraduate papers</p> <p>Use students as peer reviewers</p> <p>Hidden person registering the organisation or conference websites</p> <p>Conference dinners/tours are for profit</p> <p>Mimicking of established conferences</p> <p>Conference websites with misspellings, grammar mistakes & bad English</p> <p>No limit on the number of presenters for a paper</p> <p>Organised by a for-profit entity, rather than a credible scholarly or scientific society</p> <p>Technical programme is very broad (no specialisation/unusual combination of disciplines)</p> <p>Conference websites and emails resemble travel brochures rather than conference notices</p>	<p>Conference has an overly ambitious title</p> <p>Renowned institutions are sponsoring low-profile conferences</p> <p>Acceptance of virtual presentations that are not presented to an audience</p> <p>Inadequate conference proceedings</p> <p>Misleadingly using the term "international" in the organisation name or conference title</p> <p>Peer review is not independent; the conference organiser, owner, or employees review submissions</p> <p>No attempt to preserve conference proceedings or make them available</p> <p>Use private e-mail address(es)</p> <p>E-mail solicitation with exaggerated conference descriptors</p> <p>A no-refund policy for registration fees</p> <p>One person is allowed to make multiple presentations to a single conference</p>

Appendix F Case studies of impactful interventions

CASE STUDY #1: Addressing predatory scholarly publishing in Ethiopia

The Ethiopian Academy of Sciences (EAS), cognisant of the challenges posed by the proliferation of low quality and predatory journals in scholarly publications in the country, conducted a study in 2016-2017 to address journal evaluation and accreditation issues in order to improve research and journal quality. The major objectives of the study were: (i) exploring the status of scholarly journals in Ethiopia; (ii) identifying the benefits of instituting a national system of journal evaluation and accreditation; (iii) establishing international benchmarks for such a practice; and (iv) recommending a practical mechanism for introducing such a system in Ethiopia.

Among the numerous findings of the study, the poor quality of “peer review” in most of the journals was particularly striking, making journal publishing an uphill struggle in Ethiopia. Editors of many journals have singled out the “article reviewing process” as the most chronic challenge, due to (in order of importance): (i) lack and unavailability of qualified reviewers; (ii) low quality of submitted manuscripts; (iii) lack of recognition of journals at all levels; (iv) academic promotion being the overriding motivation of many authors; (v) low scholarly writing skills of authors; (vi) lack of experienced and well-published staff eligible for editorial board membership; (vii) lack of capacity-building training for editors and journal support staff; and (viii) rampant plagiarism by authors.

Based on the findings, the EAS proposed a **national journal evaluation and accreditation system** to: (i) promote excellence in scholarship within Ethiopia; (ii) promote international standards in journal publishing and globally position Ethiopian scientific outputs; (iii) establish and periodically update a core list of accredited journals in Ethiopia that serve as role models for emerging journals; (iv) promote the kind of research that, among others, addresses national needs; (v) identify challenges in journal publishing so as to facilitate enabling interventions at the national and institutional levels; (vi) encourage stronger linkages between scholarly publishing, graduate research and mentorship; and (vii) provide uniform standards for assessing the scholarly merit of locally published researchers.

Adopted by the Ministry of Science and Higher Education (MoSHE) via a directive in September 2019, the main tenets of this system are quality assurance in scholarly research and publication, and deterrence of unethical and predatory behaviours. Accordingly, **the evaluation system focuses on the quality of the content of published articles as well as on the rigour of the peer-review process.** Evaluation is based on 12 generic criteria, scored according to their impact on the quality of research and publications. Any journal scoring an average of at least 50 points, and at least 50% of the points allotted to the five major criteria (i.e., those allotted 10-25 points each) are accredited. Every journal is evaluated every three years by external subject reviewers and a panel of editorial experts.

Scoring system for evaluation system

The first cycle of journal evaluation and accreditation was conducted in 2020. Among the 34 journals applying for accreditation, only 16 (47%) of them qualified as credible and reputable journals and were accredited for the next three years. **The accreditation system has already had a visible impact on the proceedings of academic promotions, while it prompted unaccredited journals to seriously re-evaluate their editorial policies and guidelines.** In the long term, the Accrediting Agency needs to put in place mechanisms for strengthening emerging journals, motivating their editors and building the capacity of researchers, as well as a mechanism for rewarding best performing journals that serve as role models for other journals, eventually leading to excellence in scholarly research in the country.

CASE STUDY #2: Addressing predatory scholarly publishing in South Africa

Scholarly publishing in South Africa is driven and influenced by the Department of Higher Education (DHET) policy of paying subsidies to universities for research publications published in journals of accredited indexes. This is the major driver behind the increase in publication outputs since 2005 and has become the major incentive for many academics to publish, and to publish as many articles as quickly as they can. This driver has led to unintended consequences and necessitated corrective measures to be put in place.

An Academy of Science of South Africa (ASSAf) commissioned report exploring scholarly publishing in the country (2005 – 2014) found disturbing indications of predatory publishing and questionable editorial practices (ASSAf, 2019). Since the introduction of the state-funded publication system in 1986, university research publication output had grown concomitantly with the Rand value awarded per publication, as did concern over quality of output. Using Beall's list as a starting point, 58 journal titles, featuring 4,246 South African-authored papers (2005-2014), were qualified into four categories:

1. **"Not predatory:** in these cases, it is believed that Beall was simply wrong in his classification of the journal or there was insufficient evidence to make such a claim"
2. **"Strong evidence for predatory:** there was concurrence with Beall's classification"
3. **"Weak evidence for predatory:** some evidence that the journal might be a predatory journal, but the evidence was not strong enough to make a definite judgment"
4. **"Insufficient evidence:** in these cases, no pertinent evidence could be found to make a judgment either way, so these journals should probably be tagged as 'not predatory'".

These categories were used to give a more refined, nuanced assessment of the extent of predatory publishing in South Africa: **an estimated figure of 3.4% of total articles over the past ten years were judged to be predatory, with figures rising more steeply from 2011.** Academics in all South African universities were found to be involved, with social sciences and humanities, economic and management sciences dominating. All 48 journals categorised under 2 and 3 were included on the DHET acceptable for funding list, and amounted to an estimated cost of Euros 5.8-17.6 million (calculated at Euro 5.8k per paper). (Mouton and Valentine, 2017: 8).

The ASSAf report made recommendations at systemic, institutional and individual levels. **Ensuing countermeasures by the DHET, National Research Fund (NRF) and some universities appear to have curbed predatory practices in South Africa, with the incidence of predatory publishing by South African academics (in DHET accredited journals) evidently peaking in 2014-15 and subsequently declining.**

Academy of Science of South Africa (ASSAf). 2019. Twelve years: Second ASSAf Report on Research Publishing in and from South Africa. Pretoria: ASSAf.

Mouton J, & Valentine A. 2017. The extent of South African authored articles in predatory journals. *S Afr J Sci.* 2017;113(7/8), Art. #2017-0010, 9 pages. <http://dx.doi.org/10.17159/sajs.2017/20170010>

Mouton, J et al. 2019. The Quality of South Africa's Research Publications. Stellenbosch: CREST. <https://www0.sun.ac.za/crest/wp-content/uploads/2021/01/quality-of-south-africas-research-publications.pdf>

CASE STUDY #3: Addressing predatory scholarly publishing in the Arab region

Universities, research institutions and researchers in Arab countries suffer from predatory journals, with some predatory publishers located in the region. Several interventions have been implemented in the Middle East region to curb and combat predatory journals. Examples include:

- The University of Jordan, **Jordan**, financially incentivises its researchers to publish in high-quality journals with Impact Factors issued by the Journal Citation Report (Clarivate Analytics). On finding that one of its faculty had published extensively in one single journal (Fresenius Environmental Bulletin, Impact Factor = 0.37 and listed on Scopus), whose 100% acceptance rate turnover ranged from 1 to 28 days, this **journal was subsequently “blacklisted” so that authors using it would not be financially incentivised or promoted on the basis of publishing there.**
- The University of Baghdad and Middle Technical University, **Iraq**, runs **training programmes and workshops for faculty members, researchers and students on journal selection, listing both accredited local and global high impact publishing authorities and lists of predatory journals and publishers.** A number of other universities in Iraq have followed suit: the Al-Nahrain University **does not promote anyone who has published in predatory journals** ([Al-Fanar Media, 2015](#)). Tikrit University has published **information on “sober” and predatory global indexes** ([Tikrit University, 2020](#)); and the University of Al-hamdaniya has held **workshops about methods of checking the quality of scientific journals** in Scopus-indexed journals and predatory journals in the College of Education ([Al-hamdaniya University, 2019](#)).
- The Beirut Arab University, Lebanon, provides researchers and faculty with **a set of criteria to help them assess journal metrics** ([list of criteria](#)).
- The Suez Canal University and Mansoura University, **Egypt**, holds **workshops for researchers and faculty members on international publishing and avoiding predatory journals** ([Suez Canal University, 2021](#)) and provides an **online Q and A** on approved scientific journals, Beall’s list, predatory journals and methods they use to entrap researchers (Mansoura University, 2019), respectively. Similarly, the Arab Democratic Center in Egypt with its German counterpart hosts **conferences on the quality and evaluation of publishing** in Arab Countries ([Arab Democratic Center, 2020](#)).
- The Guelma University and Zian Achour University, **Algeria**, provides **online materials to help researchers publish high quality papers in reputable journals** ([Guelma University, 2020](#)) and will host an **international conference** in 2021 on evaluating scientific publishing ([Zian Achour University, 2021](#)).
- The Deanship of Scientific Research of King Saud University, **Kingdom of Saudi Arabia (KSA)**, provides [useful websites](#) for researchers, faculty members and students on **how to write valuable research papers.**

References

African Academy of Sciences AAS Open Research. <https://aasopenresearch.org/>

Abad-García, M. F. (2019). Plagiarism and predatory journals: A threat to scientific integrity. *Anales De Pediatría* (English Edition), 90(1). <https://doi.org/10.1016/j.anpede.2018.11.006>

Abalkina, A. (2021, February 3). Guest post- unethical practices in research and publishing: Evidence from Russia. *The Scholarly Kitchen*. <https://scholarlykitchen.sspnet.org/2021/02/04/guest-post-unethical-practices-in-research-and-publishing-evidence-from-russia/>

Agrawal, A. K., & Das, S. (2021). Beware of predatory conferences: A pandemic through another pandemic. *Indian Journal of Psychological Medicine*, 43(4), 365–366. <https://doi.org/10.1177/02537176211023280>

Aguillo, I. F., Bar-Ilan, J., Levene, M., & Ortega, J. L. (2010). Comparing University Rankings. *Scientometrics*, 85(1), 243–256. <https://doi.org/10.1007/s11192-010-0190-z>

Akça, S., & Akbulut, M. (2021). Are predatory journals contaminating science? an analysis on the Cabells' predatory report. *The Journal of Academic Librarianship*, 47(4), 102366. <https://doi.org/10.1016/j.acalib.2021.102366>

ALLEA – GYA – STM Workshop: The future of peer-review in scholarly communications. (2021). *Global Young Academy*. <https://globalyoungacademy.net/wp-content/uploads/2021/01/2020-ALLEA-GYA-STM-PeerReview-summary.pdf>.

Allen, R. M. (2021). When peril responds to plague: Predatory Journal engagement with covid-19. *Library Hi Tech*, 39(3), 746–760. <https://doi.org/10.1108/lht-01-2021-0011>

Amjad Khan, A. (2021, June 26). Rising reliance on predatory publishing as research expands. *University World News*. <https://www.universityworldnews.com/post.php?story=2021062608133724>

Anderson, K. (2012, March 6). 'Predatory' open access publishers- the natural extreme of an author-pays model. *The Scholarly Kitchen*. <https://scholarlykitchen.sspnet.org/2012/03/06/predatory-open-access-publishers-the-natural-extreme-of-an-author-pays-model/>

Anderson, R. (2019, March 19). Osi Brief: Deceptive publishing. *OSI Global*. <https://osiglobal.org/2019/03/19/osi-brief-deceptive-publishing/>

Anderson, R. (2021, August 3). Revisiting- the tyranny of unintended consequences: Richard Poynder on open access and the Open Access Movement. *The Scholarly Kitchen*. <https://scholarlykitchen.sspnet.org/2021/08/04/revisiting-the-tyranny-of-unintended-consequences-richard-poynder-on-open-access-and-the-open-access-movement/?informz=1>

Arend, R. J. (2017). The unethical monetization of business schools (and what we can do about it). *Journal of Management Inquiry*, 27(1), 96–100. <https://doi.org/10.1177/1056492617707658>

Asim, Z., & Sorooshian, S. (2019). Clone Journals: A threat to Medical Research. *Sao Paulo Medical Journal*, 137(6), 550–551. <https://doi.org/10.1590/1516-3180.2018.0370160919>

AuthorAID. <https://www.authoraaid.info/en/about/>

- Bagues, M., Sylos-Labini, M., & Zinovyeva, N. (2019). A walk on the wild side: 'predatory' journals and information asymmetries in scientific evaluations. *Research Policy*, 48(2), 462–477. <https://doi.org/10.1016/j.respol.2018.04.013>
- Baker, S. (2020, January 8). Dealing with spam emails 'costs academia more than peer-review'. *Times Higher Education (THE)*. <https://www.timeshighereducation.com/news/dealing-spam-emails-costs-academia-more-peer-review>
- Bakker, T. C., & Traniello, J. F. (2019). Peer-review reciprocity and commitment to manuscript evaluation. *Behavioral Ecology and Sociobiology*, 73(3). <https://doi.org/10.1007/s00265-019-2647-2>
- Bastian, H. (2020, May 18). Signing critical peer-reviews & the fear of retaliation: What should we do? Absolutely Maybe. <https://absolutelymaybe.plos.org/2018/03/22/signing-critical-peer-reviews-the-fear-of-retaliation-what-should-we-do/>
- Beall, J. (2012). Predatory publishers are corrupting open access. *Nature*, 489(7415). <https://doi.org/10.1087/20130203>
- Beall, J. (2013). Predatory publishing is just one of the consequences of Gold Open Access. *Learned Publishing*, 26(2), 79–83. <https://doi.org/10.1087/20130203>
- Beall, J. (2013). Unethical practices in scholarly, open-access publishing. *Journal of Information Ethics*, 22(1), 11–20. <https://www.proquest.com/docview/1661653670>
- Beall's list of potential predatory journals and publishers. <https://bealllist.net>
- Björk, B.-C., & Solomon, D. (2012). Open access versus subscription journals: A comparison of scientific impact. *BMC Medicine*, 10(1). <https://doi.org/10.1186/1741-7015-10-73>
- Björk, B.-C., Kanto-Karvonen, S., & Harviainen, J. T. (2020). How frequently are articles in predatory open access journals cited. *Publications*, 8(2), 17. <https://doi.org/10.3390/publications8020017>
- Blocki, Z. (2018). Letter from Prof. dr hab. Zbigniew Blocki. Krakow. https://web.archive.org/web/20190304231709/https://ncn.gov.pl/sites/default/files/pliki/2018_09_18_list_dyrektora_ncn_ws_predatory_journals.pdf
- Bohannon, J. (2015). Feature: How to hijack a journal. AAAS Articles DO Group. <https://doi.org/10.1126/science.aad7463>
- Bosman, J., Frantsvåg, J-E., Kramer, B., Langlais, P-C. and Proudman, V. 'OA Diamond Journals Study. Part 1: Findings'. Zenodo, 9 March 2021. <https://doi.org/10.5281/zenodo.4558704>
- Brainard, J. (2019, April 3). U.S. judge rules deceptive publisher should pay \$50 million in damages. *Science*. <https://www.science.org/content/article/us-judge-rules-deceptive-publisher-should-pay-501-million-damages>
- Brainard, J. (2021, March 1). The \$450 question: Should journals pay peer-reviewers? *Science*. <https://www.science.org/content/article/450-question-should-journals-pay-peer-reviewers>
- Bravo, G., Grimaldo, F., López-Iñesta, E., Mehmani, B., & Squazzoni, F. (2019). The effect of publishing peer-review reports on referee behavior in five scholarly journals. *Nature Communications*, 10(1). <https://doi.org/10.1038/s41467-018-08250-2>

- Brembs, B. (2018). Prestigious science journals struggle to reach even average reliability. *Frontiers in Human Neuroscience*, 12. <https://doi.org/10.3389/fnhum.2018.00037>
- Brembs, B., Button, K., & Munafò, M. (2013). Deep impact: Unintended consequences of journal rank. *Frontiers in Human Neuroscience*, 7. <https://doi.org/10.3389/fnhum.2013.00291>
- Breuning, M., Backstrom, J., Brannon, J., Gross, B. I., & Widmeier, M. (2015). Reviewer fatigue? why scholars decline to review their peers' work. *PS: Political Science & Politics*, 48(04), 595–600. <https://doi.org/10.1017/s1049096515000827>
- Brezgov, S. (2019, June 6). Beall's list of Predatory publishers 2017. scholarlyoa.com. <https://scholarlyoa.com/bealls-list-of-predatory-publishers-2017/>
- Brezgov, S. (2020, March 17). Hijacked journals. scholarlyoa.com. <https://scholarlyoa.com/hijacked-journals/>
- Brown, Michael J.I. (2019, March 11). Vanity and Predatory Academic Publishers Are Corrupting the Pursuit of Knowledge. *IFLScience*, <https://www.iflscience.com/editors-blog/vanity-and-predatory-academic-publishers-are-corrupting-pursuit-knowledge/>.
- Brown, M. J. I., & Lewis, G. (2021, April 21). Dumb or dumber? Jim Carrey's anti-vax antics expose the tactics of internet cranks. *The Conversation*. https://theconversation.com/dumb-or-dumber-jim-carreys-anti-vax-antics-expose-the-tactics-of-internet-cranks-44236#comment_720456
- Bruce, R., Chauvin, A., Trinquart, L., Ravaud, P., & Boutron, I. (2016). Impact of interventions to improve the quality of peer-review of Biomedical Journals: A Systematic Review and meta-analysis. *BMC Medicine*, 14(1). <https://doi.org/10.1186/s12916-016-0631-5>
- Bueter, R. (2020, September 16). Predatory journals in the age of covid-19. *Himmelfarb Library News*. <https://blogs.gwu.edu/himmelfarb/2020/09/16/predatory-journals-in-the-age-of-covid-19/>
- Butler, D. (2013). Sham journal scam authors. *Nature*, 495(7442), 421–422. <https://doi.org/10.1038/495421a>
- Cabells Predatory Reports. About Predatory Reports. Cabells International. (n.d.). <https://www2.cabells.com/about-predatory>
- Callaghan, C. W., & Nicholson, D. R. (2020). Predatory publishing and predatory journals: A critical review and proposed research agenda for Higher Education. *Journal of Further and Higher Education*, 44(10), 1433–1449. <https://doi.org/10.1080/0309877x.2019.1695762>
- Campbell, B. (2021, January 21). 9 signs a conference is a big fat fake. *Blog | Ex Ordo*. <https://www.exordo.com/blog/9-signs-this-is-a-fake-conference/>
- Caplan, A. L. (2015). The problem of publication-pollution denialism. *Mayo Clinic Proceedings*, 90(5), 565–566. <https://doi.org/10.1016/j.mayocp.2015.02.017>
- Catlow, R. (2017). Peer-reviewers need more nurturing. *Nature*, 552(7685), 293–293. <https://doi.org/10.1038/d41586-017-08289-z>
- Chaddah, P., & Lakhotia, S. C. (2018). A policy statement on “dissemination and evaluation of research output in India” by the Indian National Science Academy (New Delhi). *Proceedings of the Indian National Science Academy*, 97. https://www.researchgate.net/publication/325212180_A_Policy_Statement

[on Dissemination and Evaluation of Research Output in India” by the Indian National Science Academy New Delhi](#)

Chavarro, D. A., Tang, P., & Rafols, I. (2016). Why researchers publish in non-mainstream journals: Training, Knowledge Bridging, and Gap Filling. SSRN Electronic Journal. <https://ssrn.com/abstract=3014349>

Chawla, D. (2020). Russian journals retract more than 800 papers after ‘bombshell’ investigation. Science. <https://doi.org/10.1126/science.aba8099>

Chivers, M. (2019, September 11). Can you spot a predatory conference? The Publication Plan for everyone interested in medical writing, the development of medical publications, and publication planning. <https://thepublicationplan.com/2019/08/30/can-you-spot-a-predatory-conference/>

City Students’ Union (2020, June 10). Academic integrity and contract cheating: the pitfalls of paying someone to do your studies for you. <https://www.citystudents.co.uk/news/article/6013/Academic-integrity-and-contract-cheating-the-pitfalls-of-paying-someone-to-do-your-studies-for-you/>

Cobey, K. (2017). Illegitimate journals scam even senior scientists. Nature, 549(7670), 7–7. <https://doi.org/10.1038/549007a>

Cobey, K. D., Lalu, M. M., Skidmore, B., Ahmadzai, N., Grudniewicz, A., & Moher, D. (2018). What is a predatory journal? A scoping review. F1000Research, 7, 1001. <https://doi.org/10.12688/f1000research.15256.2>

Cobo, C. (2014, November 17). (gold) Open access: The two sides of the coin. Cristobal Cobo. <http://blogs.oii.ox.ac.uk/cobo/?p=967>

Cohen, J. (2013). Meetings that flatter, but may not deliver. Science, 342(6154), 76–77. <https://doi.org/10.1126/science.342.6154.76>

Consortium for academic and research ethics. University Grants Commission: Consortium for academic and research ethics. (n.d.). <https://ugccare.unipune.ac.in/apps1/home/index>

Cookson, C. (2021, June 10). Coronavirus has ‘energised’ science spending, says UNESCO . Financial Times. <https://www.ft.com/content/b83e9ae5-f769-4f6b-b7de-5a1d01f2d927>

Cope: Committee on publication ethics. COPE: Committee on Publication Ethics. (n.d.). <https://publicationethics.org/>

COPE: Committee on Publication Ethics. Flowcharts (n.d.). <https://publicationethics.org/guidance/Flowcharts>

Cortegiani, A., Ippolito, M., Ingoglia, G., Manca, A., Cugusi, L., Severin, A., Strinzel, M., Panzarella, V., Campisi, G., Manoj, L., Gregoretti, C., Einav, S., Moher, D., & Giarratano, A. (2020). Inflated citations and metrics of journals discontinued from scopus for publication concerns: The ghos(t)copus project. F1000Research, 9, 415. <https://doi.org/10.12688/f1000research.23847.1>

Cortegiani, A., Manca, A., Lalu, M., & Moher, D. (2019). Inclusion of predatory journals in Scopus is inflating scholars’ metrics and advancing careers. International Journal of Public Health, 65(1), 3–4. <https://doi.org/10.1007/s00038-019-01318-w>

Council of Scientific and Industrial Research. (2019). CSIR Guidelines for Ethics in Research and in Governance. New Delhi. https://www.ccmb.res.in/newsfiles/year-2020/csir_ethics_2020.pdf

- Crawford, W. (2015, November 9). PPPPredatory Article Counts: An Investigation, Part 1. Walt at random. <https://walt.ishost.org/2015/11/ppppredatory-article-counts-an-investigation-part-1/>
- Cress, P. E. (2017). Are predatory conferences the dark side of the Open Access Movement? *Aesthetic Surgery Journal*, 37(6), 734–738. <https://doi.org/10.1093/asj/sjw247>
- Crotty, D. (2017, February 1). The downside of Scale for Journal Publishers: Quality Control and filtration. The Scholarly Kitchen. <https://scholarlykitchen.sspnet.org/2016/03/22/the-downside-of-scale-for-journal-publishers-quality-control-and-filtration/>
- Cukier, S., Helal, L., Rice, D. B., Pupkaite, J., Ahmadzai, N., Wilson, M., Skidmore, B., Lalu, M. M., & Moher, D. (2020). Checklists to detect potential predatory biomedical journals: A systematic review. *BMC Medicine*, 18(1). <https://doi.org/10.1186/s12916-020-01566-1>
- Curry, S., de Rijcke, S., Hatch, A., Pillay, D. (Gansen), van der Weijden, I., Wilsdon, J. (2020): The changing role of funders in responsible research assessment: progress, obstacles and the way ahead. Research on Research Institute. Report. <https://doi.org/10.6084/m9.figshare.13227914.v1>
- Cyranoski, D. (2018). China introduces sweeping reforms to crack down on academic misconduct. *Nature*, 558(7709), 171–171. <https://doi.org/10.1038/d41586-018-05359-8>
- Darbyshire, P. (2018). Fake news. fake journals. fake conferences. what we can do. *Journal of Clinical Nursing*, 27(9-10), 1727–1729. <https://doi.org/10.1111/jocn.14214>
- Darbyshire, P., Hayter, M., Frazer, K., Ion, R., & Jackson, D. (2020). Hitting rock bottom: The descent from predatory journals and conferences to the predatory Phd. *Journal of Clinical Nursing*, 29(23-24), 4425–4428. <https://doi.org/10.1111/jocn.15516>
- Deprez, E. E., & Chen, C. (2017, August 29). Medical Journals Have a Fake News Problem. [Bloomberg.com. https://www.bloomberg.com/news/features/2017-08-29/medical-journals-have-a-fake-news-problem](https://www.bloomberg.com/news/features/2017-08-29/medical-journals-have-a-fake-news-problem)
- DOAJ: Directory of Open Access Journals. <https://doaj.org/about/>
- Dissernet. <https://www.dissertnet.org/>
- Dobusch, L., & Heimstädt, M. (2019). Predatory publishing in management research: A call for open peer-review. *Management Learning*, 50(5), 607–619. <https://doi.org/10.1177/1350507619878820>
- Donovan, S. K. (2017). Research that isn't read doesn't exist. *Nature*, 550(7675), 188–188. <https://doi.org/10.1038/550188e>
- Declaration on Research Assessment DORA. <https://sfdora.org/>
- Duc, N., Hiep, D., Thong, P., Zunic, L., Zildzic, M., Donev, D., Jankovic, S., Hozo, I., & Masic, I. (2020). Predatory open access journals are indexed in reputable databases: A revisiting issue or an unsolved problem. *Medical Archives*, 74(4), 318. <https://doi.org/10.5455/medarh.2020.74.318-322>
- Eaton, S. E. (2018). *Avoiding Predatory Journals and Questionable Conferences: A Resource Guide*. Calgary, Canada: University of Calgary. <http://dx.doi.org/10.11575/PRISM/20>
- Eckert, S., Krause, T., & Sumner, C. (2018). Inside the fake science factory. The Def Con, 11 August. Las Vegas. DEF CON® 26 Hacking Conference. <https://defcon.org/html/defcon-26/dc-26-index.html#dc26early3>

The Economist Newspaper. (2018, June 23). Some science journals that claim to peer-review papers do not do so. The Economist. <https://www.economist.com/science-and-technology/2018/06/23/some-science-journals-that-claim-to-peer-review-papers-do-not-do-so>

The Economist Newspaper. (2020, May 30). How to spot dodgy academic journals. The Economist. <https://www.economist.com/graphic-detail/2020/05/30/how-to-spot-dodgy-academic-journals>

Edem, B., Nkireuwendem, E., & Wariri, O. (2021). Voices in the wilderness: How exclusionist article processing charge policies of academic journals underscore what is wrong with Global Health. The Lancet Global Health, 9(9). [https://doi.org/10.1016/s2214-109x\(21\)00262-x](https://doi.org/10.1016/s2214-109x(21)00262-x)

Edifix. <https://edifix.com/>

Else, H., & Van Noorden, R. (2021, March 23). The fight against fake-paper factories that churn out Sham Science. Nature News. <https://www.nature.com/articles/d41586-021-00733-5>

Elsevier. (2019). FACTSHEET: Salami Slicing. https://www.elsevier.com/_data/assets/pdf_file/0011/653888/Salami-Slicing-factsheet-March-2019.pdf

Enago Academy. (2021, September 30). Tips on how to identify and avoid predatory conferences. Enago Academy. <https://www.enago.com/academy/tips-identify-avoid-predatory-conferences/>

Eriksson, S., & Helgesson, G. (2017). Time to stop talking about ‘predatory journals.’ Learned Publishing, 31(2), 181–183. <https://doi.org/10.1002/leap.1135>

The European Code of Conduct for Research Integrity. ALLEA. (2017). <https://allea.org/code-of-conduct/>

Falk, M. T., & Hagsten, E. (2020). When International Academic Conferences Go Virtual. Scientometrics, 126(1), 707–724. <https://doi.org/10.1007/s11192-020-03754-5>

Fanelli, D. (2009). How many scientists fabricate and falsify research? A systematic review and meta-analysis of Survey Data. PLoS ONE, 4(5). <https://doi.org/10.1371/journal.pone.0005738>

Fang, F. C., Steen, R. G., & Casadevall, A. (2012). Misconduct accounts for the majority of retracted scientific publications. Proceedings of the National Academy of Sciences, 109(42), 17028–17033. <https://doi.org/10.1073/pnas.1212247109>

Ferreira, C., Bastille-Rousseau, G., Bennett, A. M., Ellington, E. H., Terwissen, C., Austin, C., Borlestean, A., Boudreau, M. R., Chan, K., Forsythe, A., Hossie, T. J., Landolt, K., Longhi, J., Otis, J.-A., Peers, M. J., Rae, J., Seguin, J., Watt, C., Wehtje, M., & Murray, D. L. (2015). The evolution of peer-review as a basis for scientific publication: Directional selection towards a robust discipline? Biological Reviews, 91(3), 597–610. <https://doi.org/10.1111/brv.12185>

Flaherty, C. (2018, March 2). Study finds evidence of institutional favoritism in Academic Publishing. Inside Higher Ed. <https://www.insidehighered.com/news/2018/03/02/study-finds-evidence-institutional-favoritism-academic-publishing>

Fox, C. W., Albert, A. Y., & Vines, T. H. (2017). Recruitment of reviewers is becoming harder at some journals: A test of the influence of reviewer fatigue at six journals in ecology and evolution. Research Integrity and Peer-review, 2(1). <https://doi.org/10.1186/s41073-017-0027-x>

- Frandsen, T. F. (2017). Are predatory journals undermining the credibility of Science? A bibliometric analysis of citers. *Scientometrics*, 113(3), 1513–1528. <https://doi.org/10.1007/s11192-017-2520-x>
- Frandsen, T. F. (2019). Why do researchers decide to publish in questionable journals? A review of the literature. *Learned Publishing*, 32(1), 57–62. <https://doi.org/10.1002/leap.1214>
- Frey, B. S., & Rost, K. (2010). Do rankings reflect research quality? *Journal of Applied Economics*, 13(1), 1–38. [https://doi.org/10.1016/s1514-0326\(10\)60002-5](https://doi.org/10.1016/s1514-0326(10)60002-5)
- Fyfe, A., Coate, K., Curry, S., Lawson, S., Moxham, N. & Rostvik, C.M. (2017) Untangling academic publishing: a history of the relationship between commercial interests, academic prestige and the circulation of research. University of St Andrews , St Andrews. <https://doi.org/10.5281/zenodo.546100>
- Gadagkar, R. (2016). The ‘pay-to-publish’ model should be abolished. *Notes and Records: the Royal Society Journal of the History of Science*, 70(4), 403–404. <https://doi.org/10.1098/rsnr.2016.0039>
- Gades, N. & Toth, L. (2019). How to Avoid Becoming Easy Prey for “Predatory” Journals and Why It Matters. *Comparative medicine*. 69. 164-166. https://www.researchgate.net/publication/337672234_How_to_Avoid_Becoming_Easy_Prey_for_Predatory_Journals_and_Why_It_Matters
- Gannon, F. (2001). The Essential Role of Peer-review. *EMBO Reports*, 2(9), 743–743. <https://doi.org/10.1093/embo-reports/kve188>
- Gerwing, T. G., Allen Gerwing, A. M., Choi, C.-Y., Avery-Gomm, S., Clements, J. C., & Rash, J. A. (2021). Re-evaluation of solutions to the problem of unprofessionalism in Peer-review. *Research Integrity and Peer-review*, 6(1). <https://doi.org/10.1186/s41073-020-00107-x>
- Gkeredakis, M., Lifshitz-Assaf, H., & Barrett, M. (2021). Crisis as opportunity, disruption and exposure: Exploring emergent responses to crisis through digital technology. *Information and Organization*, 31(1), 100344. <https://doi.org/10.1016/j.infoandorg.2021.100344>
- Glasziou, P.P., Sanders, S., Hoffmann, T. (2020). Waste in covid-19 research *BMJ*, 369. <https://www.bmj.com/content/369/bmj.m1847>
- Gouri Panicker, S. (2019). An inquiry on transparency of peer-reviewing of journals. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3459418>
- Grove, J. (2021, August 2). ‘UUK should sue predatory publishers over tsunami of spam’. *Times Higher Education (THE)*. <https://www.timeshighereducation.com/news/uuk-should-sue-predatory-publishers-over-tsunami-spam>
- Grove, J., McCrostie, J., Moran, J., Furnham, A., & Ross, J. (2017, October 26). Predatory conferences ‘now outnumber official scholarly events’. *Times Higher Education (THE)*. <https://www.timeshighereducation.com/news/predatory-conferences-now-outnumber-official-scholarly-events>
- Grove, J., Ross, J., Liu, J., Nicolson, E., Morgan, J., & Basken, P. (2021, July 14). Predatory journals undermining Phd by Publication Route. *Times Higher Education (THE)*. https://www.timeshighereducation.com/news/predatory-journals-undermining-phd-publication-route?utm_source=newsletter&utm_medium=email&utm_campaign=editorial-daily&mc_cid=338c294cae&mc_eid=d8a40e5d67
- Grudniewicz, A., Moher, D., Cobey, K. D., Bryson, G. L., Cukier, S., Allen, K., Arden, C., Balcom, L., Barros, T., Berger, M., Ciro, J. B., Cugusi, L., Donaldson, M. R., Egger, M., Graham, I. D., Hodgkinson, M., Khan, K.

- M., Mabizela, M., Manca, A., Lalu, M. M. (2019). Predatory journals: No definition, no defence. *Nature*, 576(7786), 210–212. <https://doi.org/10.1038/d41586-019-03759-y>
- Gurwitz, D. (2017). Award bonus points to motivate reviewers. *Nature*, 542(7642), 414–414. <https://doi.org/10.1038/542414d>
- Hagner, M. (2018). Open access, data capitalism and academic publishing. *Swiss Medical Weekly*, 148(78). <https://doi.org/10.4414/smw.2018.14600>
- Harper, R. (2021, July 12). Researchers from low-income countries to benefit from APC-Free OA Publishing in all IOP publishing journals. IOP Publishing. <https://iopublishing.org/news/researchers-from-low-income-countries-to-benefit-from-apc-free-oa-publishing-in-all-iop-publishing-journals/>
- Hatch, A., & Curry, S. (2020). Changing how we evaluate research is difficult, but not impossible. *ELife*, 9. <https://doi.org/10.7554/elife.58654>
- Haustein, S., & Larivière, V. (2014). The use of Bibliometrics for assessing research: Possibilities, limitations and adverse effects. *Incentives and Performance*, 121–139. https://doi.org/10.1007/978-3-319-09785-5_8
- Hayden, J. A. (2020). Predatory publishing dilutes and distorts evidence in systematic reviews. *Journal of Clinical Epidemiology*, 121, 117–119. <https://doi.org/10.1016/j.jclinepi.2020.01.013>
- Heasman, P. A. (2019). Unravelling the mysteries of Predatory Conferences. *British Dental Journal*, 226(3), 228–230. <https://doi.org/10.1038/sj.bdj.2019.101>
- Helmer, M., Schottdorf, M., Neef, A., & Battaglia, D. (2017). Gender bias in scholarly peer-review. *ELife*, 6. <https://doi.org/10.7554/elife.21718>
- Hong Kong principles. World Conferences on Research Integrity. (2019). <https://wcrif.org/guidance/hong-kong-principles>
- INASP's Guide to the Publishing Practices and Standards (JPPS) Framework. <https://www.journalquality.info/en/wp-content/uploads/sites/3/2017/09/INASP-JPPS-Standards-Guide-ENG-Digital.pdf>
- India culls 4,305 dubious journals from approved list. *Nature Index*. (2018, May 3). <https://www.natureindex.com/news-blog/india-culls-four-thousand-three-hundred-dubious-journals-from-approved-list>
- Inouye, K., & Mills, D. (2021). Fear of the academic fake? journal editorials and the amplification of the 'predatory publishing' discourse. *Learned Publishing*. <https://doi.org/10.1002/leap.1377>
- InterAcademy Partnership. <https://www.interacademies.org/iap/about>
- InterAcademy Partnership. Combatting predatory academic journals and conferences. (n.d.). <https://www.interacademies.org/project/predatorypublishing>
- InterAcademy Partnership. (2016). *Doing Global Science: A Guide to Responsible Conduct in the Global Research Enterprise*. Princeton; Princeton University Press. https://www.interacademies.org/sites/default/files/publication/9780691170756_secured.pdf
- Inter-American Institute for Global Change Research. (2021, June). Decisions of the 29th Meeting of the Conference of the Parties to the Inter-American Institute for Global Change Research. <https://www.iai.int/administrador/assets/images/ckfinder/files/Decisions%20of%20the%2029th%20Meeting.pdf>

International Conference Alert. <https://conferencealert.com/>

International Congress and Convention Association (ICCA). <https://www.iccaworld.org>

International Science Council. (2021). Opening the record of science: Making scholarly publishing work for science in the Digital Era. <https://doi.org/10.24948/2021.01>

ISSN International Centre. <https://www.issn.org>

Jamieson, K. H., McNutt, M., Kiermer, V., & Sever, R. (2019). Signaling the trustworthiness of Science. *Proceedings of the National Academy of Sciences*, 116(39), 19231–19236. <https://doi.org/10.1073/pnas.1913039116>

Janicke Hinchliffe, L. (2020, October 10). Read-and-publish? publish-and-read? A primer on transformative agreements. The Scholarly Kitchen. <https://scholarlykitchen.sspnet.org/2019/04/23/transformative-agreements/>

Johnson, R., Watkinson, A., & Mabe, M. (2018, October). The STM Report: An overview of scientific and scholarly publishing. The Hague; International Association of Scientific, Technical and Medical Publishers. https://www.stm-assoc.org/2018_10_04_STM_Report_2018.pdf

Jones, L., Rossum, J. van, Mehmani, B., Black, C., Kowalczyk, M., Alam, S., Moylan, E., Stein, G., & Larkin, A. (2020, July 12). A standard taxonomy for Peer-review. OSF. <https://osf.io/68rnz/>

Kelesidou, F. (2020, June 29). Publishers working together – lessons from a global pandemic. Hindawi. <https://www.hindawi.com/post/publishers-working-together-lessons-global-pandemic/>

Kelly, J., Sadeghieh, T., & Adeli, K. (2014). Peer-review in Scientific Publications: Benefits, Critiques, & A Survival Guide. *EJIFCC*, 25(3), 227–243. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4975196/>

Khoo, S. Y.-S. (2019). Article Processing Charge Hyperinflation and price insensitivity: An open access sequel to the serials crisis. *LIBER Quarterly: The Journal of the Association of European Research Libraries*, 29(1), 1–18. <https://doi.org/10.18352/lq.10280>

Koerber, A., Starkey, J., Ardon Dryer, K., Cummins, R., Eko, L., & Kee, K. (2020). A Qualitative Content Analysis of Whitelists vs Blacklists: How do they address the issue of predatory publishing? *Journal of Academic Librarianship*, 1-10. A Qualitative Content Analysis of Whitelists vs Blacklists: How do they address the issue of predatory publishing? — Texas Tech University Scholars. <https://scholars.ttu.edu/en/publications/a-qualitative-content-analysis-of-whitelists-vs-blacklists-how-do>

Kolata, G. (2017, October 30). Many academics are eager to publish in worthless journals. *The New York Times*. <https://www.nytimes.com/2017/10/30/science/predatory-journals-academics.html>

Kousha, K., & Thelwall, M. (2017). News stories as evidence for research? BBC citations from articles, books, and Wikipedia. *Journal of the Association for Information Science and Technology*, 68(8), 2017–2028. <https://doi.org/10.1002/asi.23862>

Kovanis, M., Porcher, R., Ravaud, P., & Trinquart, L. (2016). The global burden of journal peer-review in the biomedical literature: Strong imbalance in the collective enterprise. *PLOS ONE*, 11(11). <https://doi.org/10.1371/journal.pone.0166387>

- Krawczyk, F., & Kulczycki, E. (2021). How is open access accused of being predatory? the impact of Beall's lists of predatory journals on academic publishing. *The Journal of Academic Librarianship*, 47(2), 102271. <https://doi.org/10.1016/j.acalib.2020.102271>
- Krämer, K. (2021, June 11). Publishers grapple with an invisible foe as huge organised fraud hits scientific journals. *Chemistry World*. <https://www.chemistryworld.com/news/publishers-grapple-with-an-invisible-foe-as-huge-organised-fraud-hits-scientific-journals/4013652.article>
- Kurt, S. (2018). Why do authors publish in predatory journals? *Learned Publishing*, 31(2), 141–147. <https://doi.org/10.1002/leap.1150>
- Lakhotia, S. C. (2017). The fraud of Open Access Publishing. *Proceedings of the Indian National Science Academy*, 90. https://www.researchgate.net/publication/315057317_The_Fraud_of_Open_Access_Publishing
- Lakhotia, S. C. (2018). Why are Indian research journals not making a mark? – Enemy is within. https://www.researchgate.net/publication/329876112_Why_are_Indian_research_journals_not_making_a_mark_-_Enemy_is_within
- Langham-Putrow, A., Bakker, C., & Riegelman, A. (2021). Is the Open Access Citation Advantage Real? A systematic review of the citation of Open Access and subscription-based articles. *PLOS ONE*, 16(6). <https://doi.org/10.1371/journal.pone.0253129>
- Larivière, V., Haustein, S., & Mongeon, P. (2015). The oligopoly of academic publishers in the Digital Era. *PLOS ONE*, 10(6). <https://doi.org/10.1371/journal.pone.0127502>
- Larkin, M. (2018, October 11). To thwart predatory publishing, we need to work together. *Elsevier Connect*. <https://www.elsevier.com/connect/to-thwart-predatory-publishing-we-need-to-work-together>
- Latindex. (2020). Identification and treatment of spurious journals in Latindex Guide for Editors. https://www.latindex.org/lat/documentos/Latindex_Identification_treatment_of_spurious_journals-Guide_for_Editors.pdf
- Leiden Manifesto for Research Metrics. www.leidenmanifesto.org
- Lem, P., Basken, P., & Moran, J. (2017, January 12). Warning: Conmen and Shameless scholars operate in this area. *Times Higher Education (THE)*. <https://www.timeshighereducation.com/comment/warning-conmen-and-shameless-scholars-operate-area>
- Library Publishing Coalition. <https://librarypublishing.org>
- Linacre, S. (2020, December 2). The source / what to know about ISSNs. *The Source*. <https://blog.cabells.com/2020/12/02/what-to-know-about-issns/>
- Linacre, S. (2020, July 15). The source / Cabells' top 7 palpable points about predatory publishing practices. *The Source*. <https://blog.cabells.com/2020/07/15/cabells-top-7-palpable-points-about-predatory-publishing-practices/>
- Linacre, S. (2021, September 1). The source / mountain to climb. *The Source*. <https://blog.cabells.com/2021/09/01/mountain-to-climb/>

- MacDonald, F. (2015, June 12). These five companies control more than half of academic publishing. ScienceAlert. <https://www.sciencealert.com/these-five-companies-control-more-than-half-of-academic-publishing>
- Macháček, V., & Srholec, M. (2021). Retracted article: Predatory Publishing in scopus: Evidence on cross-country differences. *Scientometrics*, 126(3), 1897–1921. <https://doi.org/10.1007/s11192-020-03852-4>
- Macháček, V., & Srholec, M. (2021). Retraction note to: Predatory publishing in scopus: Evidence on cross-country differences. *Scientometrics*. <https://doi.org/10.1007/s11192-021-04149-w>
- Mackenzie, R. J. (2019, July 11). Inside a “fake” Conference: A journey into predatory science. *Technology Networks*. <https://www.technologynetworks.com/tn/articles/inside-a-fake-conference-a-journey-into-predatory-science-321619>
- Manca, A., Cugusi, L., Cortegiani, A., Ingoglia, G., Moher, D., & Deriu, F. (2020). Predatory journals enter biomedical databases through public funding. *BMJ*, m4265. <https://doi.org/10.1136/bmj.m4265>
- Manca, A., Martinez, G., Cugusi, L., Dragone, D., Dvir, Z., & Deriu, F. (2017). The surge of predatory open-access in neurosciences and neurology. *Neuroscience*, 353, 166–173. <https://doi.org/10.1016/j.neuroscience.2017.04.014>
- Manca, A., Martinez, G., Cugusi, L., Dragone, D., Mercuro, G., & Deriu, F. (2017). Predatory open access in rehabilitation. *Archives of Physical Medicine and Rehabilitation*, 98(5), 1051–1056. <https://doi.org/10.1016/j.apmr.2017.01.002>
- Manca, A., Moher, D., Cugusi, L., Dvir, Z., & Deriu, F. (2018). How predatory journals leak into pubmed. *Canadian Medical Association Journal*, 190(35). <https://doi.org/10.1503/cmaj.180154>
- Mandke, K. (2019, October 10). Publish or Perish: How Is This Still A Thing? *Nature news*. <https://socialsciences.nature.com/posts/52940-is-it-publish-or-perish-for-phd-students>
- Matthews, D. (2021, July 19). France to back not-for-profit diamond journals. *Times Higher Education (THE)*. <https://www.timeshighereducation.com/news/france-back-not-profit-diamond-journals>
- McCook, A. (2016, September 1). U.S. government agency sues publisher, charging it with deceiving researchers. *Retraction Watch*. <http://retractionwatch.com/2016/08/26/u-s-government-group-sues-publisher-charging-it-with-deceiving-researchers/>
- McCrostie, J. (2016, August 2). Taiwan’s great academic rip-off. *Taipei Times*. <http://www.taipeitimes.com/News/feat/archives/2016/08/03/2003652340>
- McCrostie, J. (2018). Predatory conferences: A case of academic cannibalism. *International Higher Education*, (93), 6–8. <https://doi.org/10.6017/ihe.0.93.10425>
- McCrostie, J. (2018, April 9). Predatory conferences – a case of academic cannibalism. *University World News*. <https://www.universityworldnews.com/post.php?story=20180409123131407>
- McKenna, S. (2021, November 5). Why developing countries are particularly vulnerable to predatory journals. *The Conversation*. <https://theconversation.com/why-developing-countries-are-particularly-vulnerable-to-predatory-journals-86704>

- McMillan, D. (2019, October 14). What to do about fake and predatory conferences. PCMA. <https://www.pcma.org/fake-predatory-conferences>
- Mercier, E., Tardif, P.-A., Émond, M., & Le Sage, N. (2017). Predatory publishers and fraudulent conferences: Perspectives and implications for novice researchers. *Perspectives on Medical Education*, 6(6), 433–434. <https://doi.org/10.1007/s40037-017-0381-x>
- Memon, A. R., & Azim, M. E. (2018). Predatory conferences: Addressing researchers from developing countries. *JPMA. The Journal of the Pakistan Medical Association*, 68(11), 1691–1695. <https://pubmed.ncbi.nlm.nih.gov/30410151>
- Mertkan, S., Onurkan Aliusta, G., & Suphi, N. (2021). Profile of authors publishing in ‘predatory’ journals and causal factors behind their decision: A systematic review. *Research Evaluation*. <https://doi.org/10.1093/reseval/rvab032>
- Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management. ISBN: 1902369273. <https://doi.org/10.13140/RG.2.1.4929.1363>
- Moher, D., Shamseer, L., Cobey, K. D., Lalu, M. M., Galipeau, J., Avey, M. T., Ahmadzai, N., Alabousi, M., Barbeau, P., Beck, A., Daniel, R., Frank, R., Ghannad, M., Hamel, C., Hersi, M., Hutton, B., Isupov, I., McGrath, T. A., McInnes, M. D., ... Ziai, H. (2017). Stop this waste of people, animals and money. *Nature*, 549(7670), 23–25. <https://doi.org/10.1038/549023a>
- Molteni, M. (2016, September 19). The FTC is cracking down on predatory science journals. *Wired*. <https://www.wired.com/2016/09/ftc-cracking-predatory-science-journals/>
- Moore, A. (2020). Predatory preprint servers join predatory journals in the paper mill industry.... *BioEssays*, 42(11), 2000259. <https://doi.org/10.1002/bies.202000259>
- Morris, M. K. (2019, September 25). Professors Receive NSF Grant to Develop Training for Recognizing Predatory Publishing. *TTU*. <https://today.ttu.edu/posts/2019/09/Stories/koerber-predatory-publishing>
- Morrison, H. (2019). OA Main 2019: Dataset, documentation and open peer-review invitation. Sustaining the knowledge commons. <https://sustainingknowledgecommons.org/2019/11/20/oa-main-2019-dataset-documentation-and-open-peer-review-invitation/>
- Mohd Daud, N. (2018, December 19). The Complexity of The Questionable: Fighting the battle against ‘predatory conferences.’ *International Congress and Convention Association*. <https://www.iccaworld.org/knowledge/article.cfm?artid=589>
- Mudur, G. S. (2020, August 18). Institute for Quick and dirty science fools journal. Covid: Institute for Quick and Dirty Science fools journal - *Telegraph India*. <https://www.telegraphindia.com/india/covid-institute-for-quick-and-dirty-science-fools-journal/cid/1789383>
- Mullick, R. (2019, June 17). UGC move to thwart ‘pay and publish trash’ culture. *Hindustan Times*. <https://www.hindustantimes.com/education/ugc-move-to-thwart-pay-and-publish-trash-culture/story-AP0BFFrbNuL1mN5WNbgCjI.html>
- Narasimhan, S. D. (2019, September 19). A Commitment to Gender Diversity in Peer-review. *Cell*. Retrieved January 10, 2022, from [https://www.cell.com/cell/fulltext/S0092-8674\(19\)30962-6](https://www.cell.com/cell/fulltext/S0092-8674(19)30962-6)

- Narodowe Centrum Nauki. (2018, September 18). List: Dyrektora Ncn Ws Predatory Journals. Krakow. https://www.ncn.gov.pl/sites/default/files/pliki/2018_09_18_list_dyrektora_ncn_ws_predatory_journals.pdf
- Nassi-Calò, L. (2015, November 13). Open access in Latin America free of predatory journals. SciELO in Perspective. <https://blog.scielo.org/en/2015/11/13/predatory-journals-the-dark-side-of-open-access/#.YctW-2hKg2x>
- National Academies of Sciences, Engineering, and Medicine. (2017). Fostering Integrity in Research. National Academies Press. <https://doi.org/10.17226/21896>
- Nature's sexism. (2012). Nature, 491(7425), 495–495. <https://doi.org/10.1038/491495a>
- Naujokaitytė, G. (2021, June 14). Number of scientists worldwide reaches 8.8m, as global research spending grows faster than the economy. Science. <https://sciencebusiness.net/news/number-scientists-worldwide-reaches-88m-global-research-spending-grows-faster-economy>
- NDR (2018, July 19). More than 5,000 German scientists have published papers in pseudo-scientific journals. NDR.de- Der NDR- Presse. https://www.ndr.de/der_ndr/presse/More-than-5000-German-scientists-have-published-papers-in-pseudo-scientific-journals,fakescience178.html
- Neyfakh, L. (2016, May 22). The craziest black market in Russia isn't for oil or guns. it's for dissertations. Slate Magazine. http://www.slate.com/articles/news_and_politics/cover_story/2016/05/the_thriving_russian_black_market_in_dissertations_and_the_crusaders_fighting.html?via=gdpr-consent
- Nguyen, V. M., Haddaway, N. R., Gutowsky, L. F., Wilson, A. D., Gallagher, A. J., Donaldson, M. R., Hammerschlag, N., & Cooke, S. J. (2015). How long is too long in contemporary peer-review? perspectives from authors publishing in conservation biology journals. PLOS ONE, 10(8). <https://doi.org/10.1371/journal.pone.0132557>
- Nisha, F., Das, A. Tripathi, M. Stemming the rising tide of predatory journals and conferences: A selective review of literature. Annals of Library and Information Studies Vol. 67, September 2020, pp. 173-182 https://www.researchgate.net/publication/344782523_Stemming_the_rising_tide_of_predatory_journals_and_conferences_A_selective_review_of_literature
- Nobes, A. (2018, July 24). A beginner's guide to avoiding 'predatory' journals (using your Critical Thinking Skills). AuthorAID. <https://www.authoraaid.info/en/news/details/1310/>
- O'Grady, C. (2021, April 19). Fifteen Journals to outsource peer-review decisions. Science. <https://www.science.org/content/article/fifteen-journals-outsource-peer-review-decisions>
- Omobowale, A. O., Akanle, O., Adeniran, A. I., & Adegboyega, K. (2013). Peripheral scholarship and the context of foreign paid publishing in Nigeria. Current Sociology, 62(5), 666–684. <https://doi.org/10.1177/0011392113508127>
- OASPA: Open Access Scholarly Publishers Association. <https://oaspa.org/>
- Oransky, I. (2020, June 29). Major indexing service sounds alarm on self-citations by nearly 50 journals. Retraction Watch. <https://retractionwatch.com/2020/06/29/major-indexing-service-sounds-alarm-on-self-citations-by-nearly-50-journals/>
- Oransky, I. (2021, September 9). Authors object after Springer Nature Journal Cedes to publisher Frontiers' demand for retraction. Retraction Watch. <https://retractionwatch.com/2021/09/07/authors-object-after->

[springer-nature-journal-cedes-to-publisher-frontiers-demand-for-retraction/](#)

Oravec, J. A. (2017). The manipulation of scholarly rating and measurement systems: Constructing Excellence in an ERA of academic stardom. *Teaching in Higher Education*, 22(4), 423–436. <https://doi.org/10.1080/13562517.2017.1301909>

OSI Brief (2019) Deceptive publishing. <https://osiglobal.org/2019/03/19/osi-brief-deceptive-publishing/>

Ottawa Hospital Research Institute (OHRI) Centre for Journalology One-Stop-Shop. www.ohri.ca/journalology/one-stop-shop-predatory-journals

Oviedo-García, M. Á. (2021). Journal citation reports and the definition of a predatory journal: The case of the multidisciplinary digital publishing institute (mdpi). *Research Evaluation*, 30(3), 405–419. <https://doi.org/10.1093/reseval/rvab020>

Pai, M., & Franco, E. (2017, February 10). Predatory conferences undermine science and scam academics. HuffPost. <https://www.huffpost.com/archive/ca/entry/predatory-conferences>

Patwardhan, B. (2019). Why India is striking back against predatory journals. *Nature*, 571(7763), 7–7. <https://doi.org/10.1038/d41586-019-02023-7>

Patwardhan, B., & Nagarkar, S. (2021). The UGC-care initiative: Indian Academia's quest for research and Publishing Integrity. *First Monday*. <https://doi.org/10.5210/fm.v26i10.10349>

Patwardhan, B., Nagarkar, S., Gadre, S. R., Lakhotia, S. C., Katoch, V. M., & Moher, D. (2018). A critical analysis of the 'UGC-approved list of journals.' *Current Science*, 114(06), 1299. <https://doi.org/10.18520/cs/v114/i06/1299-1303>

Pecorari, D. (2021). Predatory conferences: What are the signs? *Journal of Academic Ethics*, 19(3), 343–361. <https://doi.org/10.1007/s10805-021-09406-4>

PeerJ. <https://peerj.com/benefits/peer-review-timeline/>

Perlin, M. S., Imasato, T., & Borenstein, D. (2018). Is predatory publishing a real threat? evidence from a large database study. *Scientometrics*, 116(1), 255–273. <https://doi.org/10.1007/s11192-018-2750-6>

Perlin, M. S., Imasato, T., & Borenstein, D. (2018, September 21). The alarming rise of predatory journals. *University World News*. <https://www.universityworldnews.com/post.php?story=20180918144241202>

Perlin, M. S., Imasato, T., & Borenstein, D. (2018, September 10). Predatory publishers threaten to consume public research funds and undermine national academic systems – the case of Brazil. *Impact of Social Sciences*. <https://blogs.lse.ac.uk/impactofsocialsciences/2018/09/06/predatory-publishers-threaten-to-consume-public-research-funds-and-undermine-national-academic-systems-the-case-of-brazil/>

Peterson, A. T., Emmett, A., & Greenberg, M. L. (2013). Open access and the author-pays problem: Assuring access for readers and authors in the Global Academic Community. *Journal of Librarianship and Scholarly Communication*, 1(3). <https://doi.org/10.7710/2162-3309.1064>

Petrou, C. (2020, August 10). Guest post – MDPI's remarkable growth. *The Scholarly Kitchen*. <https://scholarlykitchen.sspnet.org/2020/08/10/guest-post-mdpis-remarkable-growth/>

Petrou, C. (2021, April 14). Guest post – an early look at the impact of the Chinese Academy of Sciences Journals Warning list. The Scholarly Kitchen. <https://scholarlykitchen.sspnet.org/2021/04/14/guest-post-an-early-look-at-the-impact-of-the-chinese-academy-of-sciences-journals-warning-list/>

Plan S: Making full and immediate Open Access a reality. Plan S Home Comments. (n.d.). <https://www.coalition-s.org/>

PLOS. (2021, January 29). Open peer-review. PLOS. <https://plos.org/resource/open-peer-review/>

Pollock, D., & Michael, A. (2019, July 22). News & Views: Where can I publish? Delta Think. <https://deltathink.com/news-views-where-can-i-publish/>

Predatory Conferences. KScien. (n.d.). <http://kscien.org/predatory.php?id=7>

Predatory conferences. Predatory Publishing. (n.d.). <https://blogs.ntu.edu.sg/lib-predatorypublishing/predatoryconferences/>

Predatory Journals and Publishers. University of Portsmouth Library - Predatory Journals and Publishers. (2021, August 27). <https://library.port.ac.uk/predatory-journals-and-publishers.html>

Predatory journals and Publishers: Home. Research and Course Guides. (n.d.). <https://clemons.libguides.com/predatorypub>

Predatory publishers threaten to consume public research funds and undermine national academic systems – the case of Brazil. Impact of Social Sciences. (2018, September 10). <https://blogs.lse.ac.uk/impactofsocialsciences/2018/09/06/predatory-publishers-threaten-to-consume-public-research-funds-and-undermine-national-academic-systems-the-case-of-brazil/>

Predatory-publishing.com. <https://predatory-publishing.com/>

What is Beall's list?: Why was it shut down? Predatory Journals and Conferences. (2021, March 17). <https://predatory-publishing.com/what-is-bealls-list-why-was-it-shut-down/>

Predatory publishing: Predatory conferences. Research Guides. (n.d.). <https://guides.himmelfarb.gwu.edu/PredatoryPublishing/Conferences>

Publons' Global State of Peer-review 2018. (2018). <https://doi.org/10.14322/publons.gspr2018>

Qingyang Li, S. (2020, November 19). The end of publish or perish? China's new policy on Research Evaluation. MPIWG. <https://www.mpiwg-berlin.mpg.de/observations/1/end-publish-or-perish-chinas-new-policy-research-evaluation>

Quality Assurance Agency for Higher Education. (2020). Contracting to Cheat in Higher Education: How to Address Essay Mills and Contract Cheating. <https://www.qaa.ac.uk/docs/qaa/guidance/contracting-to-cheat-in-higher-education-2nd-edition.pdf>

Quinn, B. (n.d.). Predatory publishing and predatory conferences: Home. Texas Tech University Libraries. <https://guides.library.ttu.edu/c.php?g=543301>

Raju, R. (2018, February 7). Predatory publishing from a global south perspective. Library Publishing Coalition. <https://librarypublishing.org/predatory-publishing-global-south-perspective/>

- Räsänen, J., & Louhiala, P. (2021). Should acknowledgments in published academic articles include gratitude for reviewers who reviewed for journals that rejected those articles? *Theoria*, 87(3), 713–728. <https://doi.org/10.1111/theo.12310>
- Redhead, C. (2021, August 23). Rate of growth for CC by articles in fully-OA journals continues for OASPA members. OASPA. <https://oaspa.org/growth-continues-for-oaspa-member-oa-content/>
- Reforming research assessment – the way forward. European Commission - European Commission. (2021, November 30). https://ec.europa.eu/info/news/reforming-research-assessment-way-forward-2021-nov-30_en
- Research on Research Institute (RORI) Projects. (n.d.). <https://researchonresearch.org/projects#!tab/273951116-5>
- Responsible research assessment. Responsible Research Assessment | Global Research Council. (n.d.). <https://www.globalresearchcouncil.org/news/responsible-research-assessment/>
- Résumé for researchers. Royal Society. (n.d.). <https://royalsociety.org/topics-policy/projects/research-culture/tools-for-support/resume-for-researchers/>
- RetractionWatch (2021). <https://retractionwatch.com/2021/09/07/authors-object-after-springer-nature-journal-cedes-to-publisher-frontiers-demand-for-retraction/>
- Reynolds, R. R. (2016). The predatory publishing phenomenon: Dead end or just an inconvenience on the road to a new scholarly publishing landscape? *Insights the UKSG Journal*, 29(3), 233–238. <https://doi.org/10.1629/uksg.325>
- Riley, B. J., & Jones, R. (2016). Peer-review: Acknowledging its value and recognising the reviewers. *British Journal of General Practice*, 66(653), 629–630. <https://doi.org/10.3399/bjgp16x688285>
- Roser, M., Ritchie, H., & Ortiz-Ospina, E. (2013)- “World Population Growth”. *OurWorldInData.org*. <https://ourworldindata.org/world-population-growth>
- Ross, J. (2021, July 9). Australian universities crack down on predatory journals. <https://www.insidehighered.com/news/2021/07/09/australian-universities-crack-down-predatory-journals>
- Roth, D. (n.d.). Open access: Questionable conferences. LibGuides. <https://libguides.caltech.edu/c.php?g=512665&p=3503029>
- Sage journals participating in Sage Path Service : Sage ... Sage Journals. (n.d.). <https://journals.sagepub.com/page/participating-journals-sage-path>
- San Fabián Maroto, J. L. (2020). El reconocimiento de la actividad Investigadora universitaria como mecanismo de Regulación del Mercado Académico. *Márgenes, Revista De Educación De La Universidad De Málaga*, 1(1). <https://doi.org/10.24310/mgnmar.v1i1.7208>
- Sarabipour, S., Khan, A., Seah, S., Mwakilili, A. D., Mumoki, F. N., Sáez, P. J., Schwessinger, B., Debat, H. J., & Mestrovic, T. (2020). Evaluating features of scientific conferences: A call for improvements. <https://doi.org/10.1101/2020.04.02.022079>
- Sathyanarayana Rao, T. S., & Andrade, C. (2011). The MMR vaccine and autism: Sensation, refutation, retraction, and fraud. *Indian Journal of Psychiatry*, 53(2), 95. <https://doi.org/10.4103/0019-5545.82529>

Schneegans, S., Lewis, J., & Straza, T. (Eds.). (2021). UNESCO Science Report: the race against time for smarter development. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000377433>

SCICV – SNSF tests new CV format in biology and medicine. Swiss National Science Foundation (SNSF). (n.d.). <https://www.snf.ch/en/LSM3H14z1Fk295tT/news/news-200131-scicv-snsf-tests-new-cv-format-in-biology-and-medicine>

Science Europe. (2021). OA Diamond Journals Study. Science Europe. <https://scienceeurope.org/our-resources/oa-diamond-journals-study/>

Science Europe. (2020). Position statement research assessment processes. Science Europe. <https://www.scienceeurope.org/our-resources/position-statement-research-assessment-processes/>

Seethapathy, G. S., Santhosh Kumar, J. U., & Hareesha, A. S. (2016). India's scientific publication in predatory journals: need for regulating quality of Indian science and Education. *Current Science*, 111(11), 1759. <https://doi.org/10.18520/cs/v111/i11/1759-1764>

Severin, A., & Low, N. (2019). Readers beware! Predatory journals are infiltrating citation databases. *International Journal of Public Health*, 64(8), 1123–1124. <https://doi.org/10.1007/s00038-019-01284-3>

Sewell, C. (2017, April 3). Predatory publishers. Open Research. <https://osc.cam.ac.uk/about-scholarly-communication/author-tools/considerations-when-choosing-journal/predatory-publishers>

Shamseer, L. (2021, March 3). “Predatory” Journals: An Evidence-Based Approach To Characterizing Them and Considering Where Research Ought to Be Published (dissertation). UO Research. Retrieved 2022, from <https://ruor.uottawa.ca/handle/10393/41858>.

Sharma, H., & Verma, S. (2020). Predatory conferences in biomedical streams: An invitation for academic upliftment or Predator's looking for prey. *Saudi Journal of Anaesthesia*, 14(2), 212. https://doi.org/10.4103/sja.sja_668_19

Shehata, A. M., & Elgllab, M. F. (2018). Where Arab social science and humanities scholars choose to publish: Falling in the predatory journals trap. *Learned Publishing*, 31(3), 222–229. <https://doi.org/10.1002/leap.1167>

Shen, C., & Björk, B.-C. (2015). ‘Predatory’ open access: A longitudinal study of article volumes and market characteristics. *BMC Medicine*, 13(1). <https://doi.org/10.1186/s12916-015-0469-2>

Siler, K. (2020). Demarcating spectrums of Predatory Publishing: Economic and institutional sources of academic legitimacy. *Journal of the Association for Information Science and Technology*, 71(11), 1386–1401. <https://doi.org/10.1002/asi.24339>

Siler, K. (2020, May 26). There is no black and white definition of predatory publishing. *Impact of Social Sciences*. <https://blogs.lse.ac.uk/impactofsocialsciences/2020/05/13/there-is-no-black-and-white-definition-of-predatory-publishing/>

Siler, K., Vincent-Lamarre, P., Sugimoto, C. R., & Larivière, V. (2021). Predatory publishers' latest scam: Bootlegged and rebranded papers. *Nature*, 598(7882), 563–565. <https://doi.org/10.1038/d41586-021-02906-8>

Silver, A. (2017). Controversial website that lists ‘predatory’ publishers shuts down. *Nature*. <https://doi.org/10.1038/nature.2017.21328>

- Singh Chawla, D. (2020). Predatory-Journal Papers Have Little Scientific Impact. *Nature*. <https://doi.org/10.1038/d41586-020-00031-6>
- Singh Chawla, D. (2021, February 8). Hundreds of ‘predatory’ journals indexed on Leading Scholarly Database. *Nature News*. <https://www.nature.com/articles/d41586-021-00239-0>
- Smart, P. (2017). Predatory journals and researcher needs. *Learned Publishing*, 30(2), 103–105. <https://doi.org/10.1002/leap.1101>
- Smith, A.C., Merz, L., Borden, J.B., Gulick, C. K., Kshirsagar, A.R., Bruna, E.M. (2022) Assessing the effect of article processing charges on the geographic diversity of authors using Elsevier’s “Mirror Journal” system. *Quantitative Science Studies*; 2 (4): 1123–1143. doi: https://doi.org/10.1162/qss_a_00157
- SNSF. What is the SNSF’s position with regard to predatory journals? Open Access. (2019, April 29). <https://oa100.snf.ch/en/faq/what-is-the-snsfs-position-with-regard-to-predatory-journals/>
- Sonne, C., Ok, Y. S., Lam, S. S., Rinklebe, J., Alstrup, A. K. O., & Kim, K.-H. (2020). First predatory journals, now conferences: The need to establish lists of fake conferences. *Science of The Total Environment*, 715, 136990. <https://doi.org/10.1016/j.scitotenv.2020.136990>
- Sousa, F. S., Nadanovsky, P., Dhyppolito, I. M., & Santos, A. P. (2021). One year of unsolicited e-mails: The modus operandi of predatory journals and Publishers. *Journal of Dentistry*, 109, 103618. <https://doi.org/10.1016/j.jdent.2021.103618>
- Spence, C. (2018). ‘Judgement’ versus ‘metrics’ in higher education management. *Higher Education*, 77(5), 761–775. <https://doi.org/10.1007/s10734-018-0300-z>
- Spezi, V., Wakeling, S., Pinfield, S., Creaser, C., Fry, J., & Willett, P. (2017). Open-access mega-journals. *Journal of Documentation*, 73(2), 263–283. <https://doi.org/10.1108/jd-06-2016-0082>
- Statement on Article Publication Resulting from NIH Funded Research. (2017, November 3). <https://grants.nih.gov/grants/guide/notice-files/not-od-18-011.html>.
- Statement of Principles on Peer/Merit Review 2018. (2018). Global Research Council. https://www.globalresearchcouncil.org/fileadmin/documents/GRC_Publications/Statement_of_Principles_on_Peer-Merit_Review_2018.pdf.
- Stern, B. M., & O’Shea, E. K. (2019). A proposal for the future of Scientific Publishing in the Life Sciences. *PLOS Biology*, 17(2). <https://doi.org/10.1371/journal.pbio.3000116>
- STM. <https://www.stm-assoc.org/about-stm/>
- Stoye, E. (2019, September 18). Predatory conference scammers are getting smarter. *Chemistry World*. <https://www.chemistryworld.com/news/predatory-conference-scammers-are-getting-smarter/3009263.article>
- Strengthening research on COVID-19 during the pandemic. (2021, May). InterAcademy Partnership. <https://www.interacademies.org/publication/strengthening-research-covid-19-during-pandemic>.
- Świgoń, Marzena & Nicholas, David & Herman, Eti & Xu, Jie & Abrizah, A. & Rodriguez-Bravo, Blanca & Boukacem-Zeghmouri, Chérifa & Watkinson, Anthony & Polezhaeva, Tatiana. (2020). Early career researchers and predatory publishing: the views and behaviours of the millennials. <https://www.researchgate>.

[net/publication/345692099_Early_career_researchers_and_predatory_publishing_the_views_and_behaviours_of_the_millennials](#)

Teixeira da Silva, J. A. (2020). An alert to COVID-19 literature in predatory publishing venues. *The Journal of Academic Librarianship*, 46(5), 102187. <https://doi.org/10.1016/j.acalib.2020.102187>

Teixeira da Silva, J. A. (2020). Silently withdrawn or retracted preprints related to covid-19 are a scholarly threat and a potential public health risk: Theoretical arguments and suggested recommendations. *Online Information Review*, 45(4), 751–757. <https://doi.org/10.1108/oir-08-2020-0371>

Teixeira da Silva, J. A., Al-Khatib, A., & Tsigaris, P. (2019). Spam emails in academia: Issues and costs. *Scientometrics*, 122(2), 1171–1188. <https://doi.org/10.1007/s11192-019-03315-5>

Tennant, J. P., & Ross-Hellauer, T. (2020). The limitations to our understanding of Peer-review. *Research Integrity and Peer-review*, 5(1). <https://doi.org/10.1186/s41073-020-00092-1>

Tennant, J. P., Waldner, F., Jacques, D. C., Masuzzo, P., Collister, L. B., & Hartgerink, C. H. (2016). The academic, economic and societal impacts of open access: An evidence-based review. *F1000Research*, 5, 632. <https://doi.org/10.12688/f1000research.8460.3>

Think. Check. Attend. <https://thinkcheckattend.org/>

Think. Check. Submit. <https://thinkchecksubmit.org/>

Thomson, J. (2020, November 17). Jennifer Thomson on Publishing: International reputation and predatory journals [Video]. YouTube. <https://youtu.be/qviBuJaqv38>.

Tindall, B., Uhlig, T., & Perdomo-Morales, R. (2021). The important distinction between peer-reviewed and predatory journals: A bacterial endotoxin test case. *Publishing Research Quarterly*, 37(3), 399–406. <https://doi.org/10.1007/s12109-021-09818-5>

Tiwari, P., & Kaur, H. (2020). The flood of covid-19 publications: A word of caution. *SN Comprehensive Clinical Medicine*, 2(12), 2511–2513. <https://doi.org/10.1007/s42399-020-00656-8>

Tomkins, A., Zhang, M., & Heavlin, W. D. (2017). Reviewer bias in Single- versus Double-Blind Peer-review. *Proceedings of the National Academy of Sciences*, 114(48), 12708–12713. <https://doi.org/10.1073/pnas.1707323114>

UKRI (n.d.) Introducing a better way for you to evidence your contributions. <https://www.ukri.org/apply-for-funding/how-were-improving-your-funding-experience/introducing-a-better-way-for-you-to-evidence-your-contributions/>

UNESCO. (2021). UNESCO Recommendation on Open Science. <https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en>

U.S. Department of Health and Human Services. (n.d.). When and how to comply. National Institutes of Health. <https://publicaccess.nih.gov/>

U.S. National Library of Medicine. (n.d.). LitCovid - NCBI - NLM - NIH. National Center for Biotechnology Information. <https://www.ncbi.nlm.nih.gov/research/coronavirus/>

- van de Vosse, E. (2021, November 23). Predatory award organization – yet another scam- and how to avoid it. EV Science Consultant. <https://www.evscienceconsultant.com/blog/predatory-award-organization-new-scam>
- Van De Walle, R. (2019, January 7). “We no longer wish to participate in the ranking of People” Ghent University wants to become a place where talent feels valued and nurtured. Transformative learning. <https://transformativelearning.education/2019/01/07/we-no-longer-wish-to-participate-in-the-ranking-of-people-ghent-university-wants-to-become-a-place-where-talent-feels-valued-and-nurtured/>
- Van Noorden, R. (2013). Brazilian citation scheme outed. *Nature*, 500(7464), 510–511. <https://doi.org/10.1038/500510a>
- Van Noorden, R. (2020). Hundreds of scientists have peer-reviewed for predatory journals. *Nature*. <https://doi.org/10.1038/d41586-020-00709-x>
- Van Noorden, R., Maher, B., & Nuzzo, R. (2014, October 29). The top 100 papers. *Nature News*. <https://www.nature.com/news/the-top-100-papers-1.16224>
- Ventura, O. N., & Mombrú, A. W. (2006). Use of bibliometric information to assist research policy making. A comparison of publication and citation profiles of full and associate professors at a School of Chemistry in Uruguay. *Scientometrics*, 69(2), 287–313. <https://doi.org/10.1007/s11192-006-0154-5>
- Vernon, M. M., Balas, E. A., & Momani, S. (2018). Are University Rankings useful to improve research? A systematic review. *PLOS ONE*, 13(3). <https://doi.org/10.1371/journal.pone.0193762>
- Vervoort, D., Ma, X., & Shrimme, M. G. (2020). Money down the drain: Predatory publishing in the COVID-19 ERA. *Canadian Journal of Public Health*, 111(5), 665–666. <https://doi.org/10.17269/s41997-020-00411-5>
- Warne, V. (2016). Rewarding reviewers- sense or sensibility? A Wiley Study explained. *Learned Publishing*, 29(1), 41–50. <https://doi.org/10.1002/leap.1002>
- Watkinson, C., Murray-Rust, C., Nesdill, D., & Mower, A. (2012). Library Publishing Services: Strategies For Success. Something’s Gotta Give. <https://doi.org/10.5703/1288284314935>
- Wellcome Trust Open Access Policy. <https://wellcome.org/grant-funding/guidance/open-access-guidance/open-access-policy>
- Wiley Author Services. Increasing transparency in peer-review. Transparent Peer-review. (n.d.). <https://authorservices.wiley.com/Reviewers/journal-reviewers/what-is-peer-review/transparent-peer-review.html>
- Willis, M. (2016). Why do peer-reviewers decline to review manuscripts? A study of reviewer invitation responses. *Learned Publishing*, 29(1), 5–7. <https://doi.org/10.1002/leap.1006>
- Wilsdon, J., Allen, L., Belfiore, E., Campbell, P., Curry, S., Hill, S., Jones, R., Kain, R., Kerridge, S., Thelwall, M., Tonkler, J., Viney, I., Wouters, P., and Johnson, B. (2015). The Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management. <https://doi.org/10.13140/RG.2.1.4929.1363>
- Wolfram, D., Wang, P., Hembree, A., & Park, H. (2020). Open peer-review: Promoting transparency in open science. *Scientometrics*, 125(2), 1033–1051. <https://doi.org/10.1007/s11192-020-03488-4>

Woolston, C. (2021). Impact factor abandoned by Dutch university in hiring and promotion decisions. *Nature*, 595(7867), 462–462. <https://doi.org/10.1038/d41586-021-01759-5>

World Association of Medical Editors (WAME). <https://www.wame.org>

Xia, J. (2019). Economic modelling of Predatory Journal Publishing. *Publishing Research Quarterly*, 35(3), 377–390. <https://doi.org/10.1007/s12109-019-09661-9>

Xia, J. (2021). Predatory publishing. ROUTLEDGE. <https://www.routledge.com/Predatory-Publishing/Xia/p/book/9780367465322>

Xia, J., Harmon, J. L., Connolly, K. G., Donnelly, R. M., Anderson, M. R., & Howard, H. A. (2014). WHO publishes in “predatory” journals? *Journal of the Association for Information Science and Technology*, 66(7), 1406–1417. <https://doi.org/10.1002/asi.23265>

Young Physician Leaders (YPL). InterAcademy Partnership. (n.d.). <https://www.interacademies.org/project/young-physician-leaders-ypl>

Yousefi-Nooraie, R., Shakiba, B., & Mortaz-Hejri, S. (2006). Country development and manuscript selection bias: A review of published studies. *BMC Medical Research Methodology*, 6(1). <https://doi.org/10.1186/1471-2288-6-37>

Zastrow, M. (2019, November 6). South Korea clamps down on academics attending ‘weak’ conferences. *Nature News*. <https://www.nature.com/articles/d41586-019-03372-z>

