Open Science

Key issues for action

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UNESCO

OST OBSERVATOIRE DES SCIENCES ET DES TECHNOLOGIES

érudit

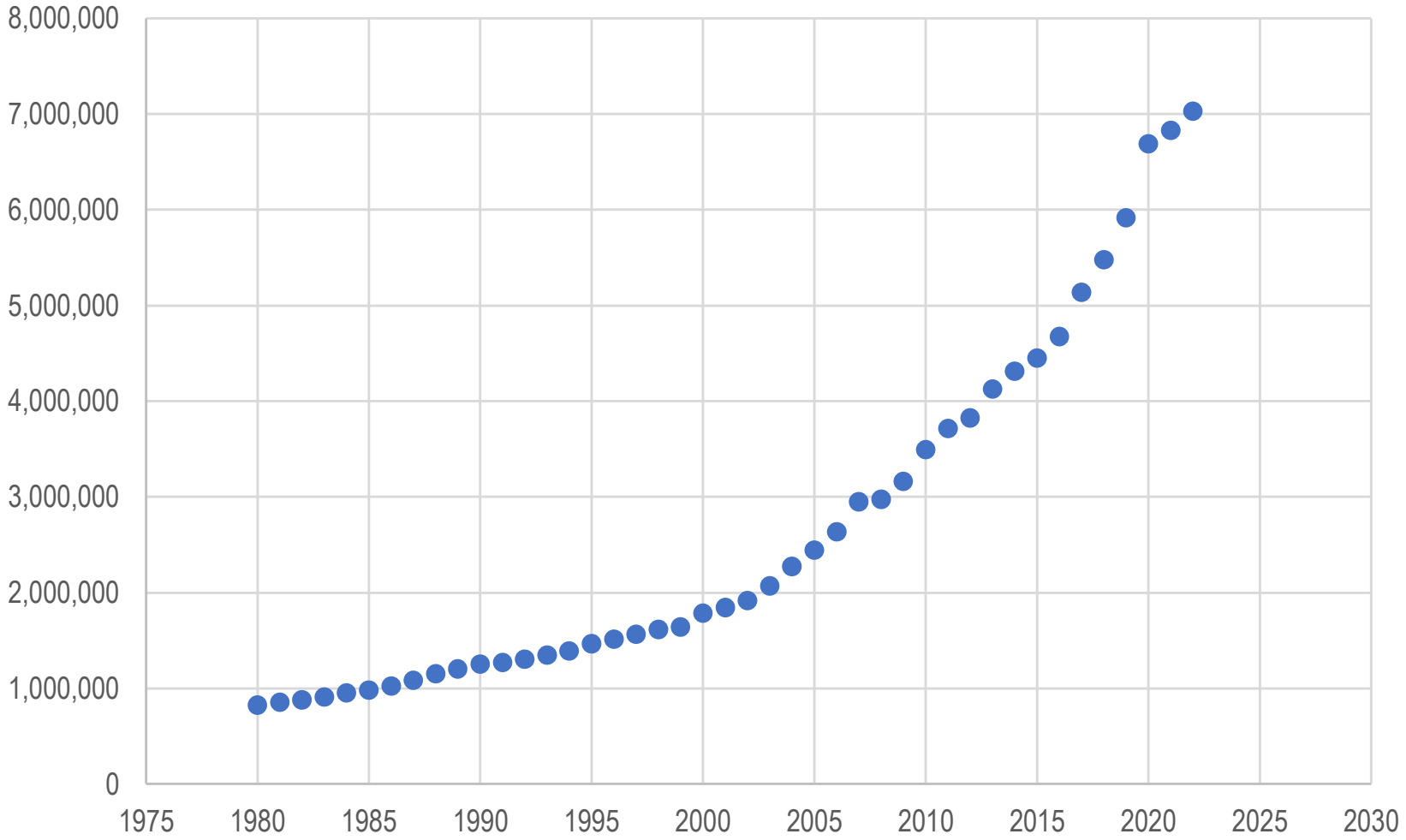
Plan

- Changing role of scholarly publications
- Issues around open access
- Key issues for action

Scholarly publishing

- Is increasingly important in researchers' careers
  - Publishing as signal of research activity
  - Peter Higgs published his last paper in 1979—he considered that he did not have anything to say anymore…
    - The Nobel Prize is not won by numbers of papers
- Growth in research evaluations based on bibliometrics
  - Replace or complement peer review
  - Impact factors and citations
  - Are the basis of most university rankings

Total papers published, 1900-2023



Source: dimensions.ai database

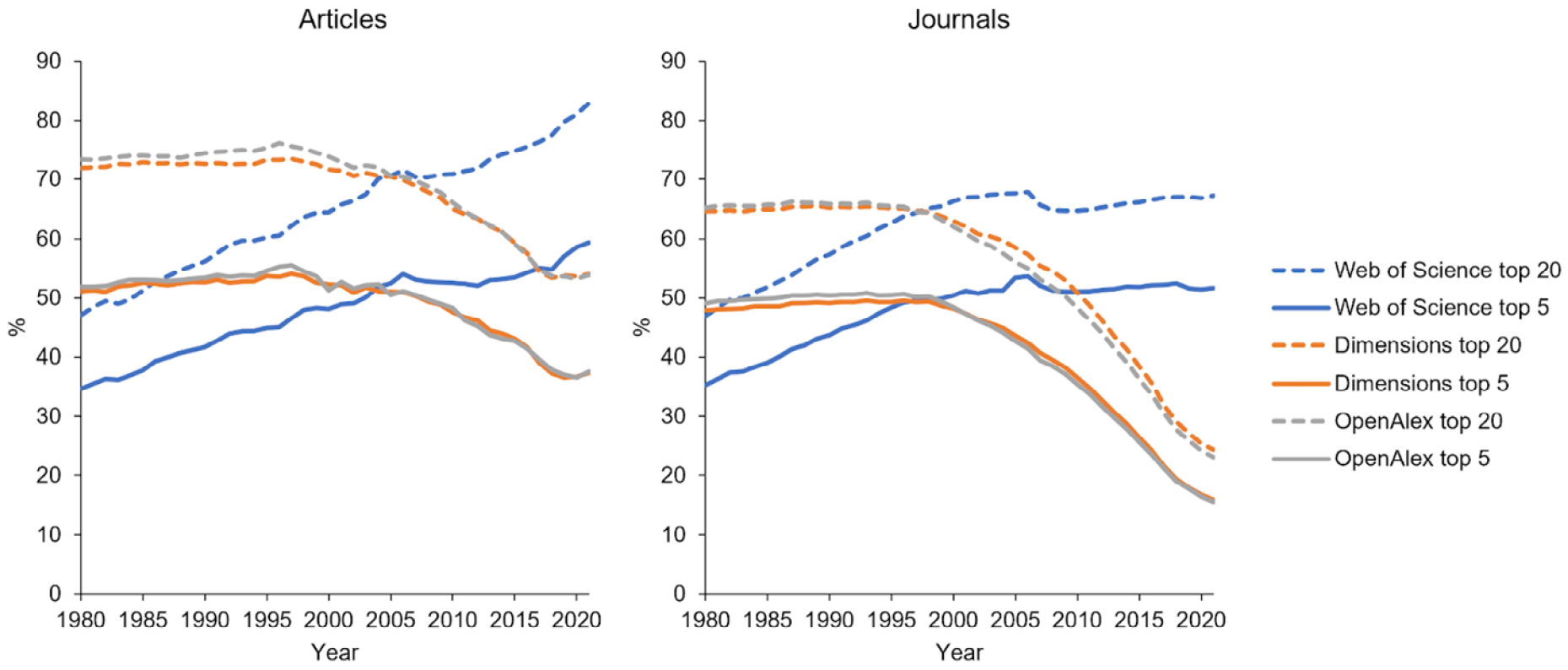
Corporate control of publishing

Forbes magazine and Elsevier (1995)

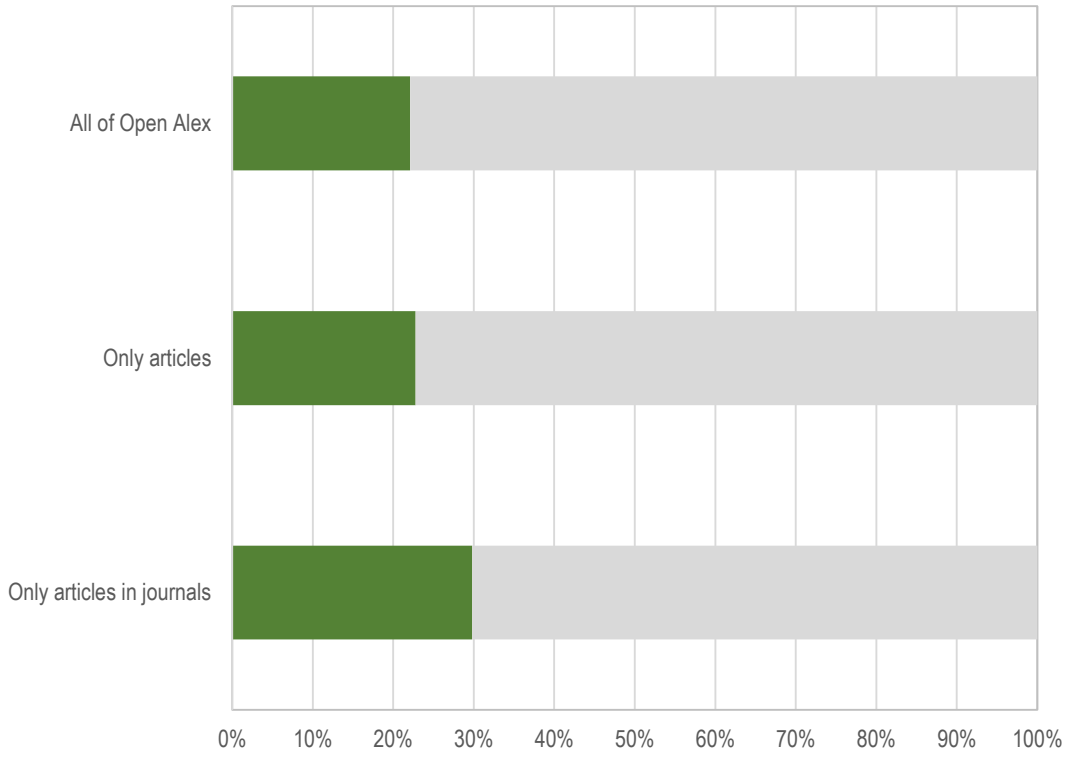
- Elsevier, the largest publisher of scientific journals, would be “the internet’s first victim”.
- “The web had been created to bring academics together; now it offered them a way of sharing their research online for free. What need would anyone have for fusty, expensive journals?”

Who controls scholarly journals?

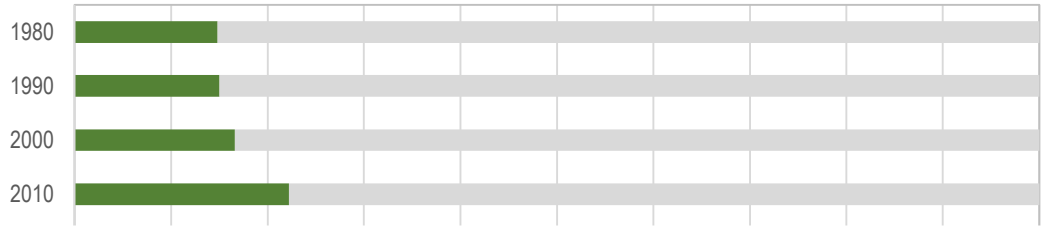
Percentage of papers controlled by top publishers



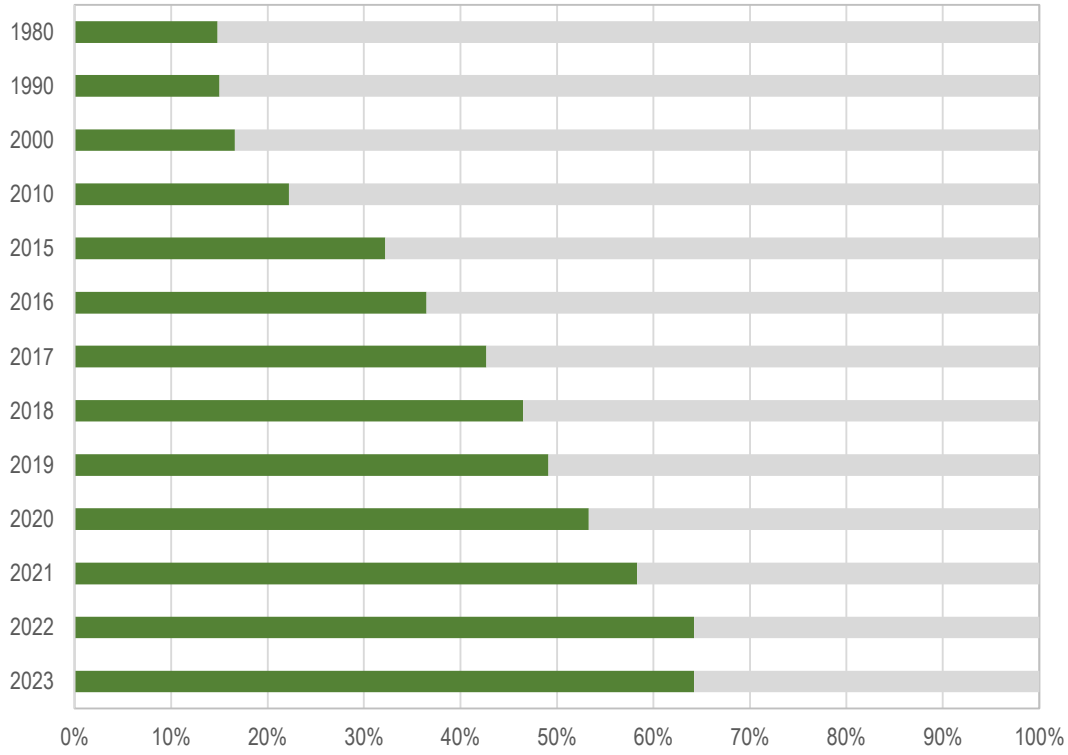
Percentage of OA papers



Percentage of OA papers



Percentage of OA papers



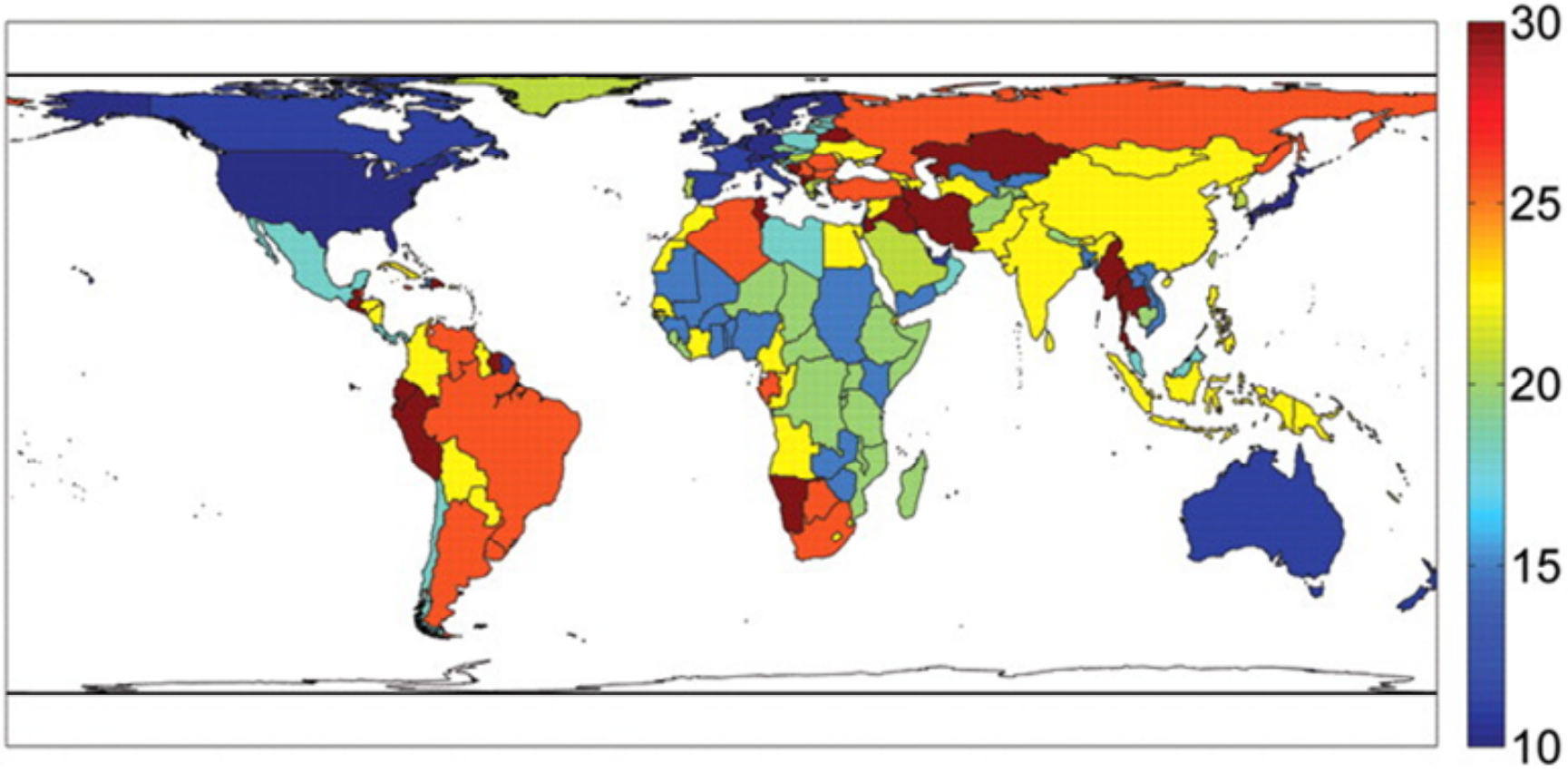
Preprinting policies of journals/publishers

OA policy	N. Publishers	%
Pre evaluated and post evaluation versions	497	32
Post evaluated version only	508	33
Pre evaluated version only	109	7
Forbidden	432	28

- At the level of journals: more than 85% allow it.
- IEEE, Springer, Elsevier, Wiley, Sage, American Physical Society allow self-archiving
- American Chemical Society, American Society of Mechanical Engineers (ASME) do NOT allow self-archiving

OA and references

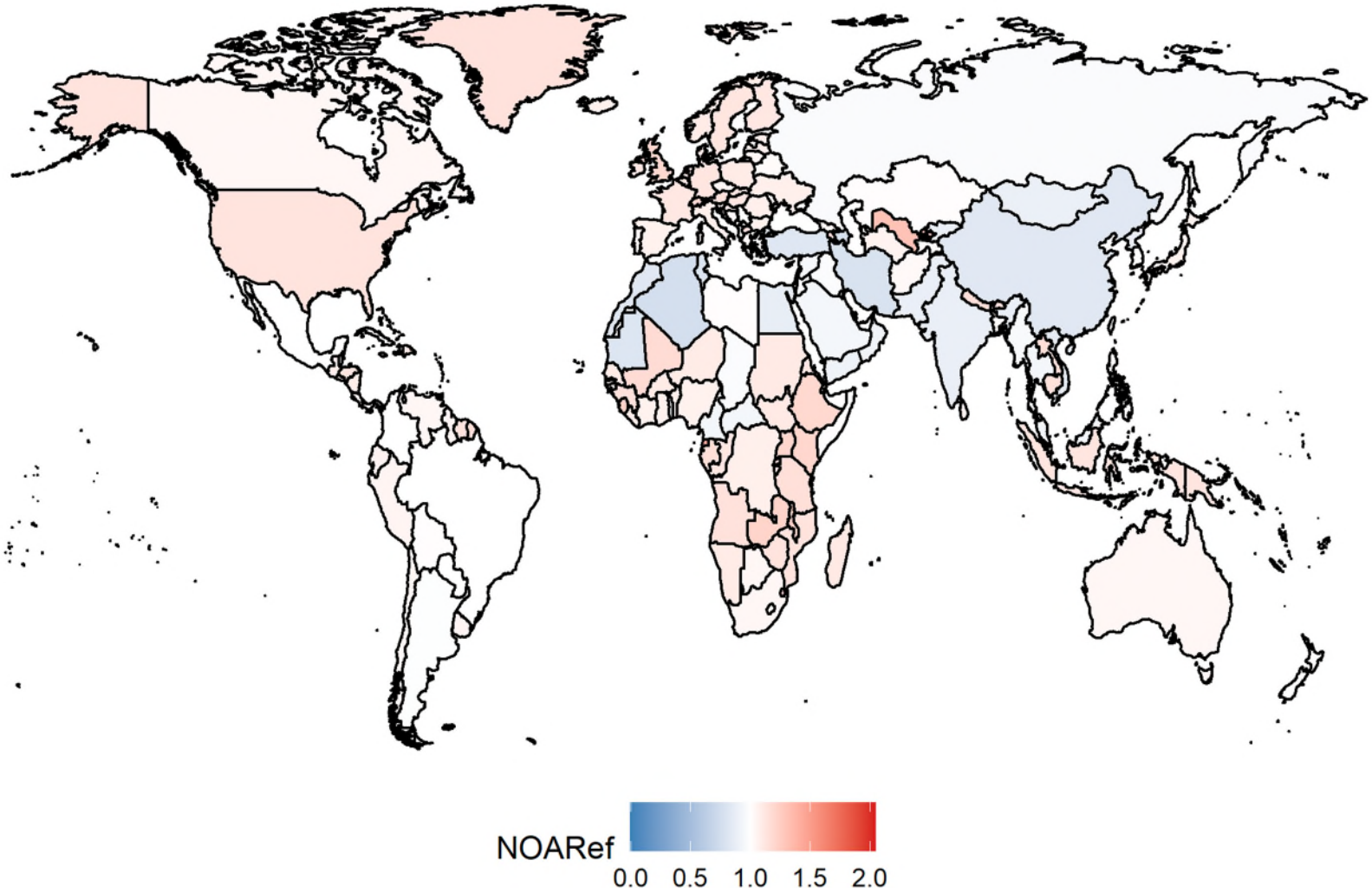
Evans & Reimer, 2009



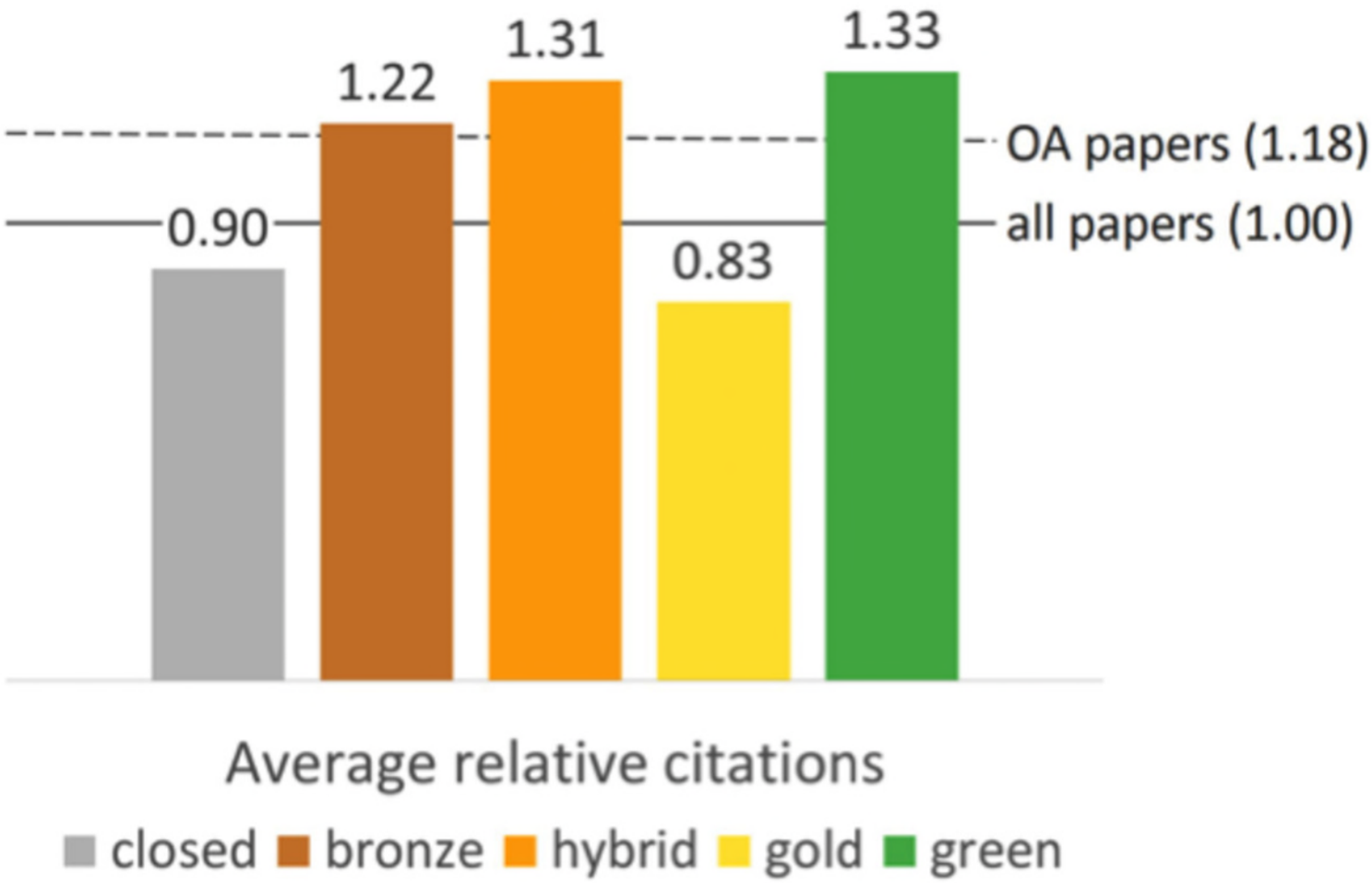
- Developing countries cite more OA
  - But that effect is decreasing

OA and references

Basson et al., 2024

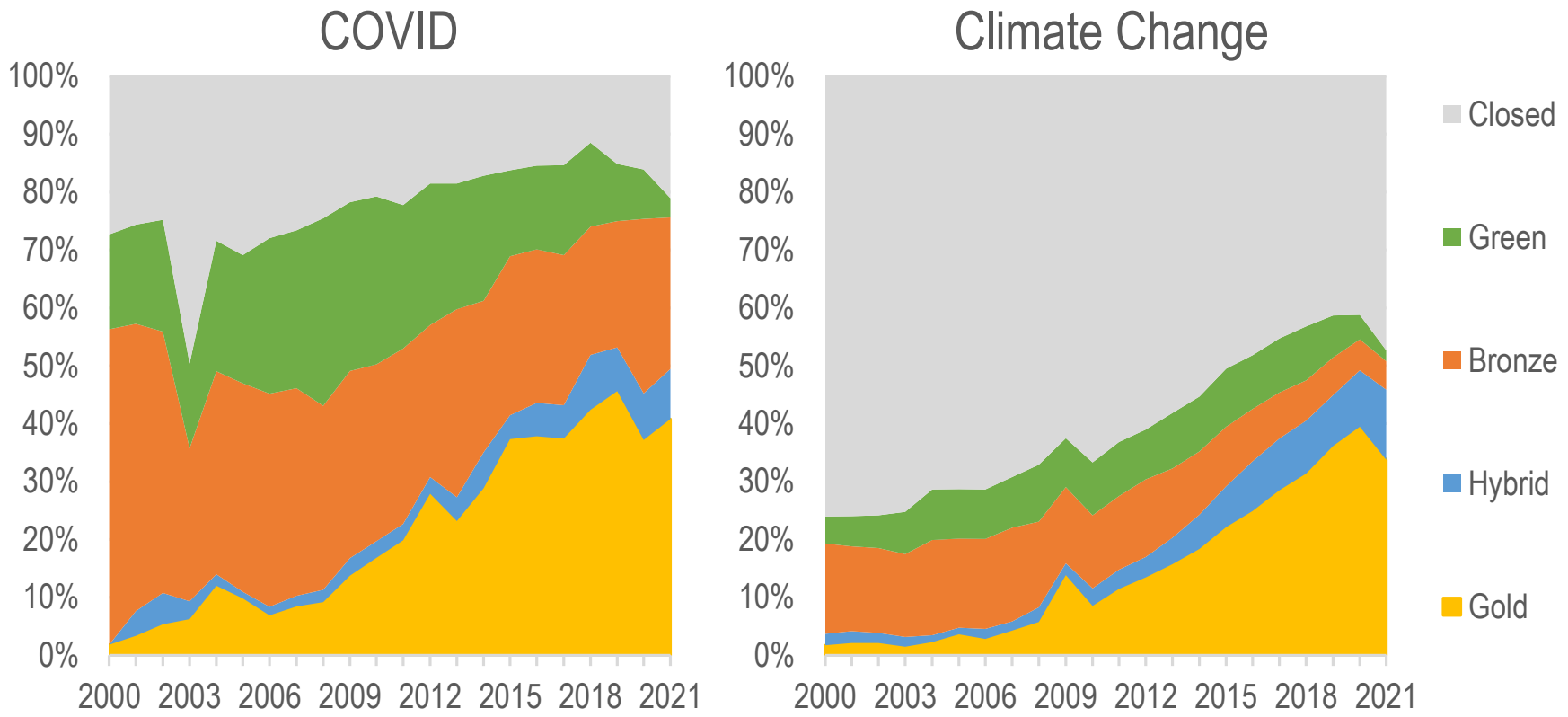


OA and citations



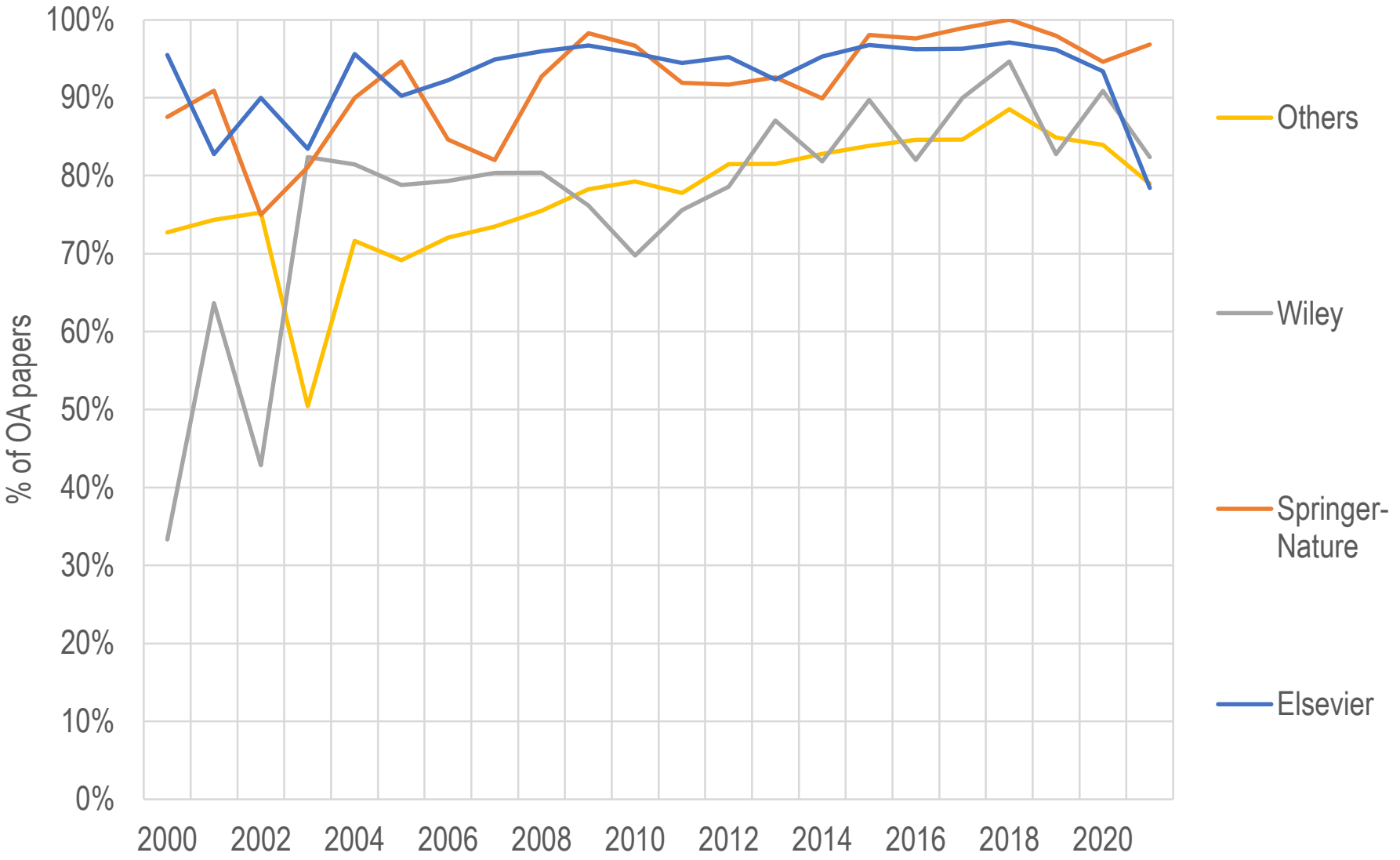
Global issues

Percentage of OA papers, COVID and climate change



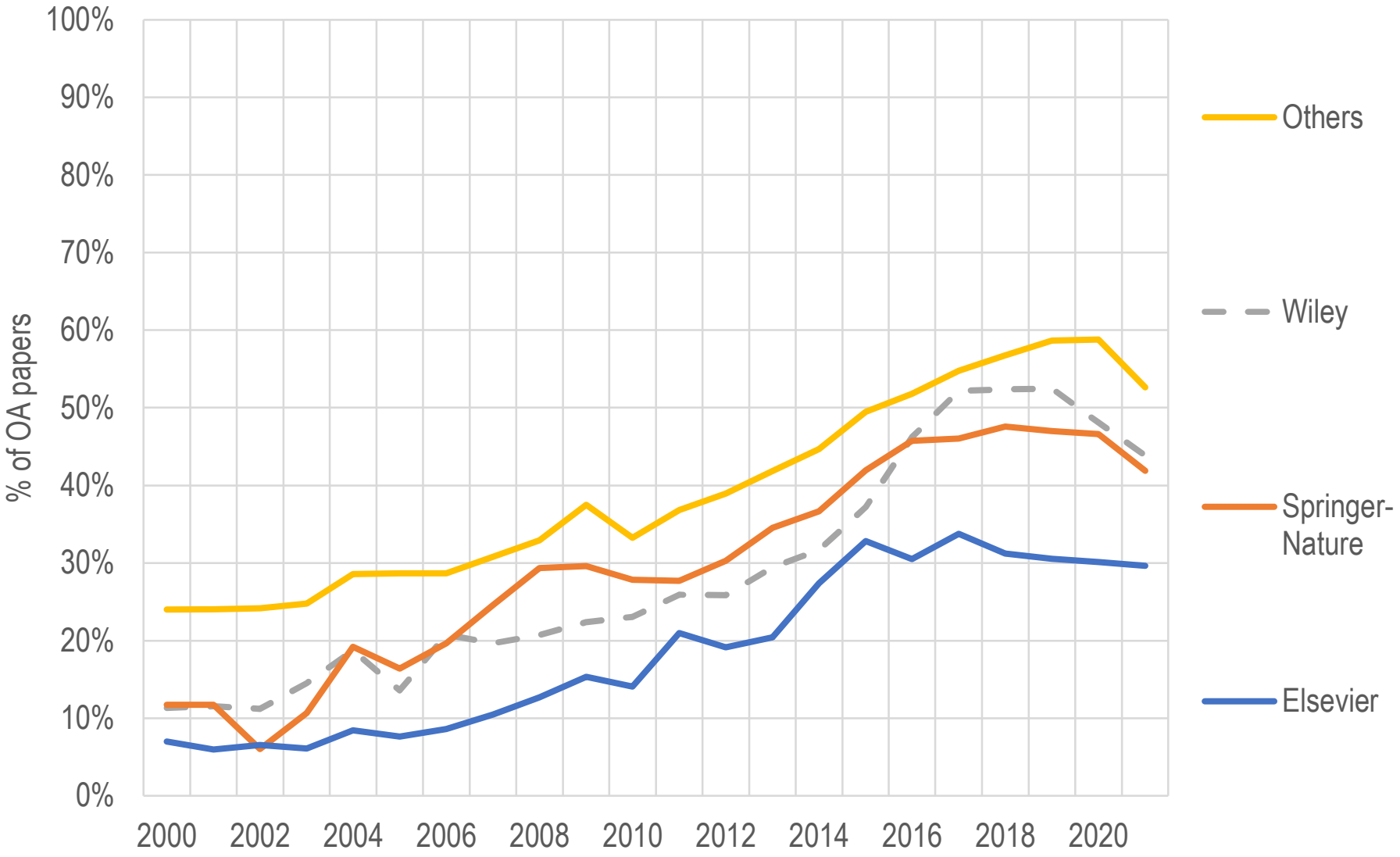
Source: dimensions.ai database

Percentage of OA papers, COVID



Source: dimensions.ai database

Percentage of OA papers, climate change



Source: dimensions.ai database

Adverse effects : predatory publishers

- APCs as an acceptable practice
- For profit publishing as an acceptable practice
- Pressures to publish
- Common language
- Not limited to journals:
  - Conferences
  - Networking
  - Indicators

OMICS example

- 700 journals covering all disciplines, but mostly concentrated in medicine
- About 80,000 articles since 2007
- Publication fees of 1200$US on average
  - Potential revenuesof $90M!!!
- Use knock-off impact factors
- In 2018, the *US Federal Trade Commission* has won a $50M US lawsuit for deceptive practices (no peer review, no indexing)

First strategy: *rebranding*

- From 2015, OMICS purchased several small editors, both predatory and emerging:
  - Londgom (Belgium and Spain)
  - iMedPub LTD (UK)
  - Hilaris (Belgium)
  - Trade Science (UK)
  - Pulsus Group (Canada)

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- Retrospective rebranding of OMICS journals as affiliated with those publishers
- A publisher with no reputation is better than an editor with a bad reputation

Advances in Pharmacoepidemiology & Drug Safety

- First issue in 2012 under OMICS

Advances in Pharmacoepidemiology & Drug Safety (october 2013)

ISSN: 2167-1052

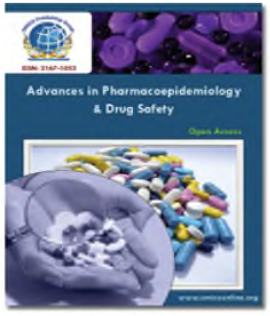
Advances in Pharmacoepidemiology & Drug Safety

Open Access

Upcoming Event

About the Journal

Editors Recommendation for Indexing



Advances in Pharmacoepidemiology and Drug Safety is the science concerned with the benefit and risk of drugs used in populations and the analysis of the outcome of drug therapies. Pharmacoepidemiologic data comes from both clinical trials and epidemiological studies with emphasis on methods for the detection and evaluation of drug-related adverse effects, assessment of risk vs benefit ratios in drug therapy, formulation and interpretation of regulatory guidelines.

The journal includes a wide range of fields in its discipline to create a platform for the authors to make their contribution towards the journal and the editorial office promises a peer review process for the submitted manuscripts for the quality of publishing.

Advances in Pharmacoepidemiology and Drug Safety is an Open Access journal and aims to publish most complete and reliable source of information on the discoveries and current developments in the mode of original articles, review articles, case reports, short communications, etc. in all areas of the field and making them freely available through online without any restrictions or any other subscriptions to researchers worldwide.

The journal is using Editorial Tracking System for quality in review process. Editorial Tracking is an online manuscript submission, review and tracking systems. Review processing is performed by the editorial board members of Advances in Pharmacoepidemiology and Drug Safety or outside experts; at least two independent reviewers approval followed by editor approval is required for acceptance of any citable manuscript. Authors may submit manuscripts and track their progress through the system, hopefully to publication. Reviewers can download manuscripts and submit their opinions to the editor. Editors can manage the whole submission/review/revise/publish process.

Aims and Scope

Advances in Pharmacoepidemiology & Drug Safety (october 2013)

Advances in Pharmacoepidemiology & Drug Safety

- First issue in 2012 under OMICS
- OMICS logo removed in 2015

Advances in Pharmacoepidemiology & Drug Safety (february 2015)

ISSN: 2167-1052

Advances in Pharmacoepidemiology & Drug Safety

Search.. search

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Français | English

Useful Links

- Benefits of Publishing
- Submit Manuscript
- NIH Funded Work
- Proposal for Association / Society
- Propose Special Issue
- Recommend this Journal
- Email Alerts

OMICS eBooks Group | Young Scientist Award

Related Journals

- Journal of Drug Metabolism & Toxicology

Upcoming Event

Upcoming Special Issues

Special issue entitled: "Recent Trends in Pharmacokinetics/Pharmacodynamics" has been edited by

Richard L. Slaughter
Professor of Pharmacy Practice
Associate Dean for Pharmacy
Wayne State University
USA
Tel: 313-577-8502

Special issue entitled: "Drug Discovery and ADMER of Drugs" has been edited by

Shufeng Zhou
Assoicate Dean
Department of Pharmaceutical Sciences
University of South Florida, USA
Tel: 813 974 6276, Fax: 813 905 9885

Advances in Pharmacoepidemiology & Drug Safety (february 2015)

Advances in Pharmacoepidemiology & Drug Safety

- First issue in 2012 under OMICS
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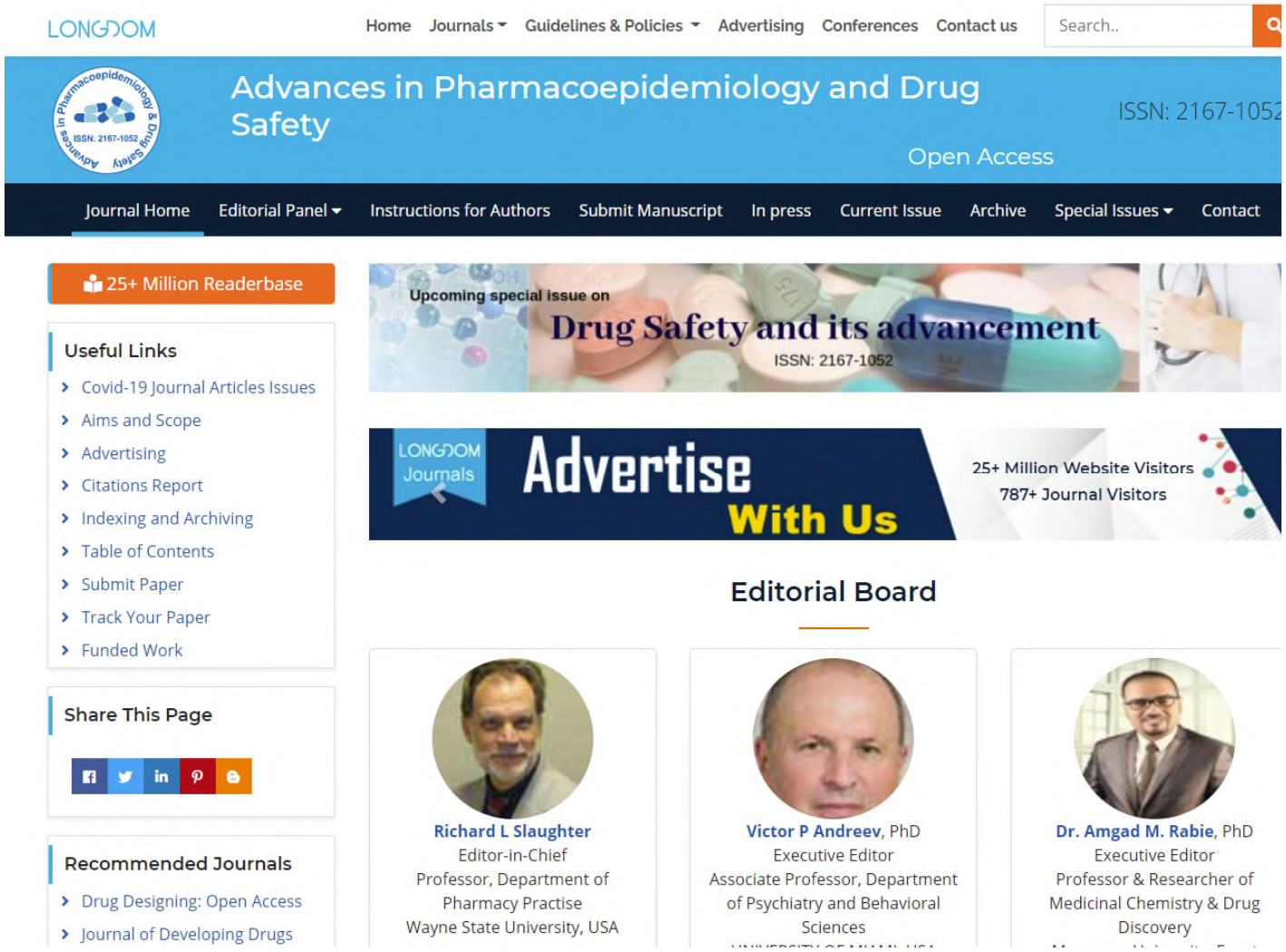
- Rebranding under Longdom in 2019

Advances in Pharmacoepidemiology & Drug Safety (january 2021)

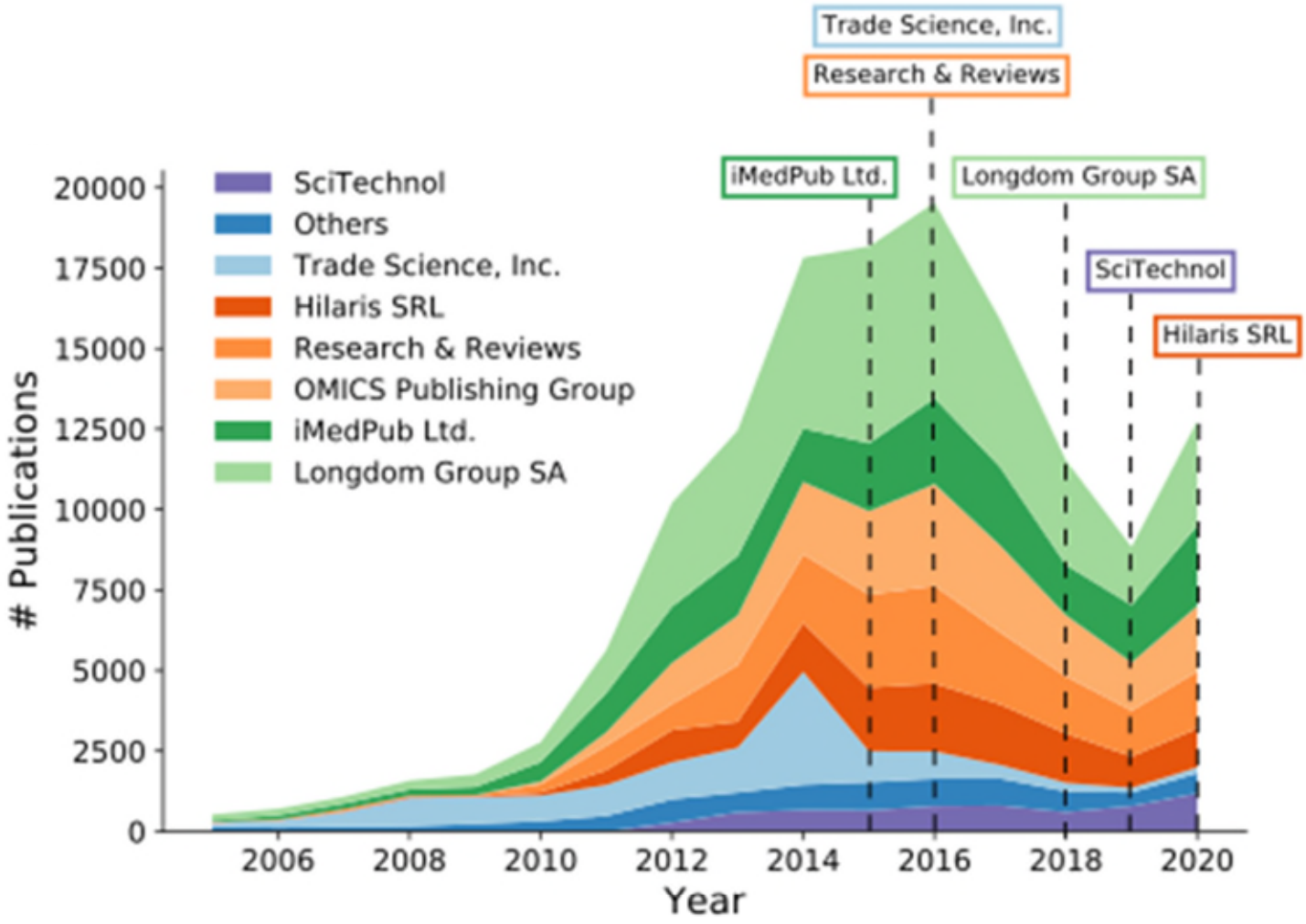


Advances in Pharmacoepidemiology & Drug Safety (january 2021)

Advances in Pharmacoepidemiology & Drug Safety

- First issue in 2012 under OMICS
- OMICS logo removed in 2015
- Rebranding under Longdom in 2019
- When founded, the journal had two editors in chief: Robert H. Howland (University of Pittsburgh) and Richard L. Slaughter (Wayne State University).
- When the journal became an Longdom imprint in 2019, Slaughter became the sole editor in chief. The only issue is that he died in 2016!

Rebranding
Number of papers by imprint



Second strategy: *hijacking*

- Plagiarized articles (and authors) from legitimate journals
- Journal of Bone Research and Reports copies the content from Bone Reports (Elsevier)
- Three cases:
  - Identical copy
  - Transated and retranslated copy
  - Unrelated content!!
- Aims to fill in the journal with what appears as legitimate content

Journal of Bone Research and Reports

Extended Abstract
Vol. 4, Iss. 1
2019

MRI-derived bone consistency index correlates to bone composition and mechanical stiffness

Abigail L. Honga , Mikayel Ispiryana , Mugdha V. Padalkarb , Brandon C. Jonesa,c , Alexandra S. Batzdorfa , Snehal S. Shetyec , urban center Pleshkob , Chamith S. Rajapaksea,c,

a Department of Radiology, University of Pennsylvania, us of America b Department of engineering science, Temple University, us of America c Department of orthopedical Surgery, University of Pennsylvania, us of America, E-mail: chamith@mail.med.upenn.edu

ABSTRACT

The MRI-derived consistency index (PI) could be a non-invasively obtained biomarker supported Associate in Nursing ultrashort echo time sequence that pictures each certain and pore water protons in bone, adore water guaranteed to organic scleroprotein matrix and freely moving water, severally. This live is understood to powerfully correlate with the particular meter animal tissue bone consistency. However, it's unknown whether or not PI might also be able to directly quantify bone organic composition and/or mechanical properties. we tend to investigated this in human body tibiae by scrutiny PI values to close infrared spectral imaging (NIRSI) integrative knowledge and mechanical compression knowledge. knowledge were obtained from a cohort of eighteen tibiae from male and feminine donors with a mean ± Mount Rushmore State age of seventy ± twenty one years. Biomechanical stiffness in compression and NIRSI-derived albuminoid and certain water content all had vital inverse correlations with PI (r = −0.79, −0.73, and −0.95 and p = zero.002, 0.007, and < 0.001, respectively). The MRI-derived bone PI alone was a moderate predictor of bone stiffness (R2 = zero.63, p = 0.002), and variable analyses showed that neither animal tissue bone cross-sectional space nor NIRSI values improved bone stiffness prediction compared to PI alone. However, NIRSI-obtained albuminoid and water knowledge along were a moderate predictor of bone stiffness (R2 = zero.52, p = 0.04). Our knowledge validates the MRI-derived consistency index as a powerful predictor of organic composition of bone and a moderate predictor of bone stiffness, and conjointly provides preliminary proof that NIRSI measures could also be helpful in future pre-clinical studies on bone pathology.

Bone fractures cause a high risk to the aging and unhealthy population, and assessments of bone mineral density (BMD) ar usually accustomed determine a patient's risk of fracture. for instance, various studies have shown that ladies with low bone density within the radius or bone ar at magnified risk of hip fracture, resonance imaging (MRI) ultrashort echo time (UTE) is a picture acquisition protocol that has incontestible hefty capability for imaging bone.

The borderline sample preparation, non-destructive nature of the scan, and relative speed of NIRSI makes it a perfect technique for investigation of changes in water content, distribution, and surroundings in pre-clinical studies of bone pathology and medical specialty.

Here, we tend to speculate that animal tissue PI will give correct measurements of bone organic material composition compared to NIRSI knowledge. we tend to additional speculate that,

This work is partly presented at 16th Global Experts Meeting on Pathology and Laboratory Medicine, July 08-09, 2019 Osaka, Japan

ELSEVIER

Bone Reports
Volume 11, December 2019, 100213

MRI-derived bone porosity index correlates to bone composition and mechanical stiffness

Abigail L. Hong [a], Mikayel Ispiryan [a], Mugdha V. Padalkar [b], Brandon C. Jones [a, c], Alexandra S. Batzdorf [a], Snehal S. Shetye [c], Nancy Pleshko [b], Chamith S. Rajapakse [a, c]

https://doi.org/10.1016/j.bonr.2019.100213

Abstract

The MRI-derived porosity index (PI) is a non-invasively obtained biomarker based on an ultrashort echo time sequence that images both bound and pore water protons in bone, corresponding to water bound to organic collagenous matrix and freely moving water, respectively. This measure is known to strongly correlate with the actual volumetric cortical bone porosity. However, it is unknown whether PI may also be able to directly quantify bone organic composition and/or mechanical properties. We investigated this in human cadaveric tibiae by comparing PI values to near infrared spectral imaging (NIRSI) compositional data and mechanical compression data. Data were obtained from a cohort of eighteen tibiae from male and female donors with a mean ± SD age of 70 ± 21 years. Biomechanical stiffness in compression and NIRSI-derived collagen and bound water content all had significant inverse correlations with PI (r = −0.79, −0.73, and −0.95 and p = 0.002, 0.00 and <0.001, respectively). The MRI-derived bone PI alone was a moderate predictor of bone stiffness (R^2 = 0.63, p = 0.002), and multivariate analyses showed that neither cortical bone cross-sectional area nor NIRSI values improved bone stiffness prediction compared to PI alone. However, NIRSI-obtained collagen and water dat

Hijacking: translating English into *English*

The MRI-derived ~~porosity~~consistency index (PI) ~~is~~could be a non-invasively obtained biomarker ~~based on an~~supported Associate in Nursing ultrashort echo time sequence that ~~images both bound~~pictures each certain and pore water protons in bone, ~~corresponding to~~adore water ~~bound~~guaranteed to organic ~~collagenous~~scleroprotein matrix and freely moving water, ~~respectively~~severally. This ~~measure~~live is ~~known~~understood to ~~strongly~~powerfully correlate with the ~~actual volumetric cortical~~particular meter animal tissue bone ~~porosity~~consistency. However, ~~it is~~it's unknown whether or not PI ~~may~~might also be able to directly quantify bone organic composition and/or mechanical properties. ~~We~~we tend to investigated this in human ~~cadaveric~~body tibiae by ~~comparing~~scrutiny PI values to ~~near~~close infrared spectral imaging (NIRSI) ~~compositional data~~integrative knowledge and mechanical compression ~~data. Data~~knowledge. knowledge were obtained from a cohort of eighteen tibiae from male and ~~female~~feminine donors with a ~~mean ± SD~~mean ± Mount Rushmore State age of ~~70 ± 21 years.~~seventy ± twenty one years. Biomechanical stiffness in compression and NIRSI-derived ~~collagen~~albuminoid and ~~bound~~certain water content all had ~~significant~~vital inverse correlations with PI (~~$r =$~~ r = −0.79, −0.73, and −0.95 and ~~$p = 0$~~ p = zero.002, 0.007, and < 0.001, respectively). The MRI-derived bone PI alone was a moderate predictor of bone stiffness (~~$R^2 = 0$~~R2 = zero.63, ~~$p = 0$~~ p = 0.002), and ~~multivariate~~variable analyses showed that neither ~~cortical~~animal tissue bone ~~cross-sectional area~~crosssectional space nor NIRSI values improved bone stiffness prediction compared to PI alone. However, NIRSI-obtained ~~collagen~~albuminoid and water ~~data together~~knowledge along were a moderate predictor of bone stiffness (~~$R^2 = 0$~~R2 = zero.52, ~~$p = 0$~~ p = 0.04). Our ~~data~~knowledge validates the MRI-derived ~~porosity~~consistency index as a ~~strong~~powerful predictor

What do we need to do?

- Support collective infrastructures
  - Financial investments
  - Community engagement
- Reform research assessment
  - This is EVERYONE’s responsibility
  - What roles for indicators? And which ones?
- Develop coherent policies
  - Acknowledge disciplinary / national differences in evaluation systems, publication practices

PathOS_EU

PathOS

Open Science Impact Pathways

https://pathos-project.eu/

Evidence of Open Science Impact: Findings, Challenges, Prospects

Tony Ross-Hellauer, Know-Center GmbH & TU Graz

Oxford Research on Research Webinar

25 April 2024

Funded by the European Union

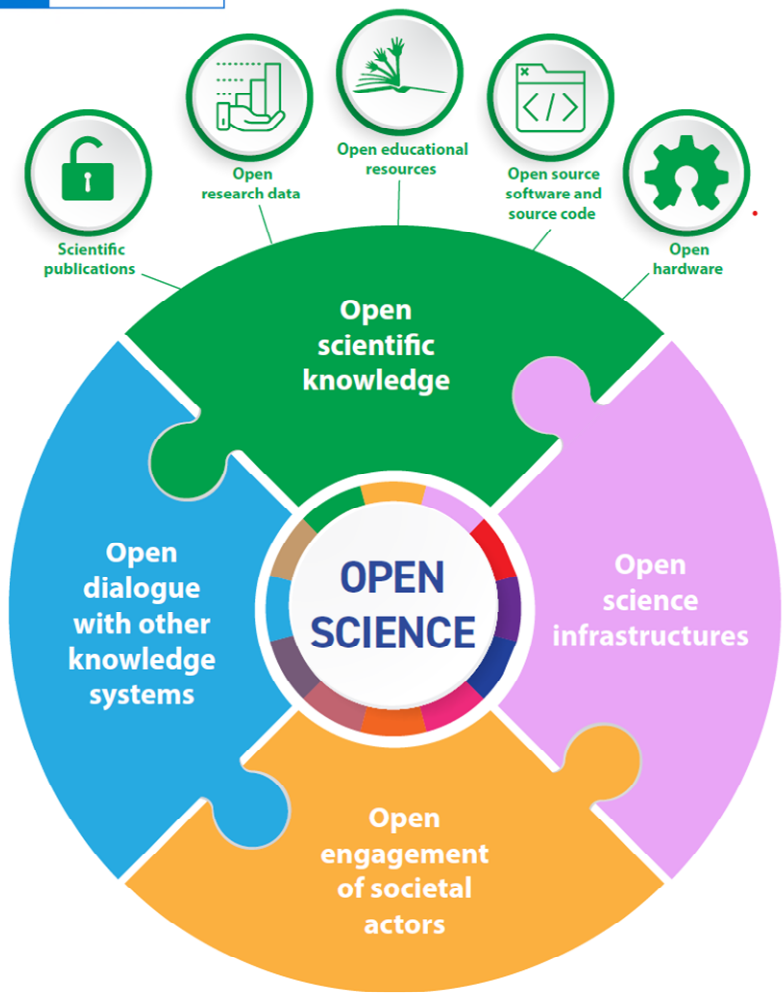
What is Open Science?

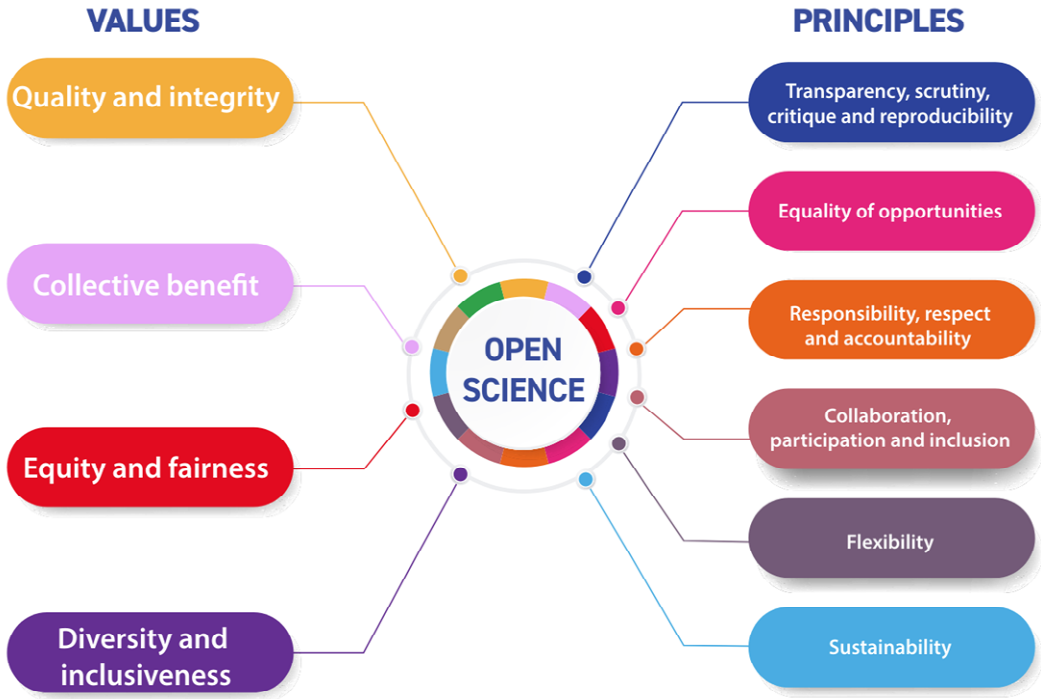
Per 2021 *UNESCO Recommendation on Open Science,* Open Science aims to:

- “make multilingual scientific knowledge openly available, accessible and reusable for everyone”
- “increase scientific collaborations and sharing of information for the benefits of science and society”
- “open the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community.”

https://unesdoc.unesco.org/ark:/48223/pf0000379949

Open Science is a diverse bunch of *practices* and *principles*





Are our plans working?

Image : Envato Elements

What are the longer-term consequences of not only making things open, but the ways we are going about it?

On unintended consequences and “grimpact”

How are we monitoring Open Science?

- Is Open Science achieving its aims?
- How is this routinely measured?
- Primary focus on ***uptake***, not ***impact***
  - How do we know if the intended longer-term consequences of transition to Open Science are actually being realised?
  - This work often left to we researchers …

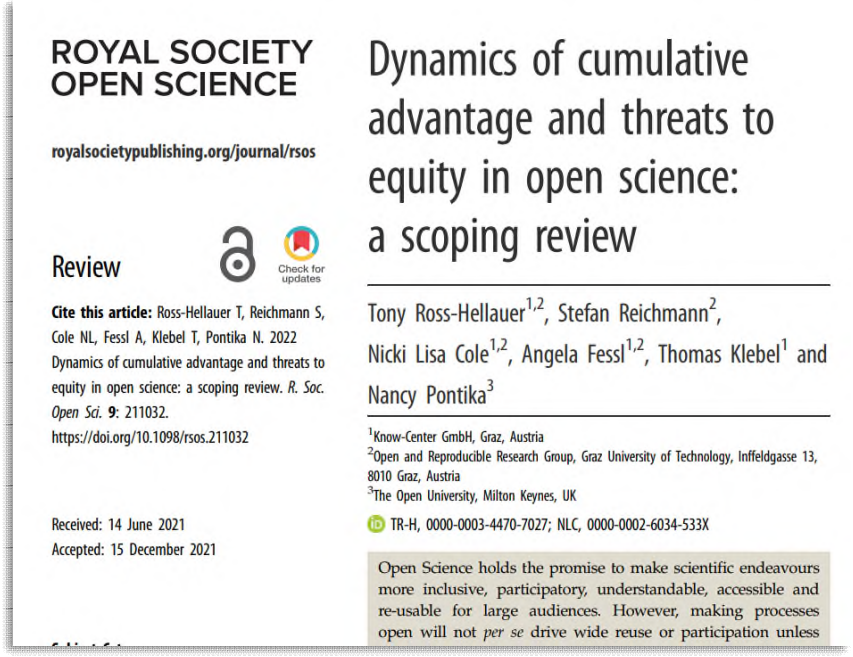
Example: [French Open Science Monitor]

Open = equitable?

https://on-merrit.eu/

- Open Science is not a unified ideology but a diverse bunch of principles and practices
- Collective benefit, equity, inclusivity are often stated as core aims, but just because things are “open” will not necessarily ensure this
- Factors like region, gender, discipline and access to resources will continue to shape the possibilities of participation in an Open Science world
- There are various routes to implementation of Open Science; the “how” is crucially important

Q. Might Open Science be at risk in some cases of reinforcing existing privileges or creating new ones?



ROYAL SOCIETY OPEN SCIENCE

royalsocietypublishing.org/journal/rsos

Review

Cite this article: Ross-Hellauer T, Reichmann S, Cole NL, Fessl A, Klebel T, Pontika N. 2022 Dynamics of cumulative advantage and threats to equity in open science: a scoping review. *R. Soc. Open Sci.* **9**: 211032.
https://doi.org/10.1098/rsos.211032

Received: 14 June 2021
Accepted: 15 December 2021

Dynamics of cumulative advantage and threats to equity in open science: a scoping review

Tony Ross-Hellauer[1,2], Stefan Reichmann[2], Nicki Lisa Cole[1,2], Angela Fessl[1,2], Thomas Klebel[1] and Nancy Pontika[3]

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Open Science holds the promise to make scientific endeavours more inclusive, participatory, understandable, accessible and re-usable for large audiences. However, making processes open will not *per se* drive wide reuse or participation unless

Scoping review of 268 relevant studies

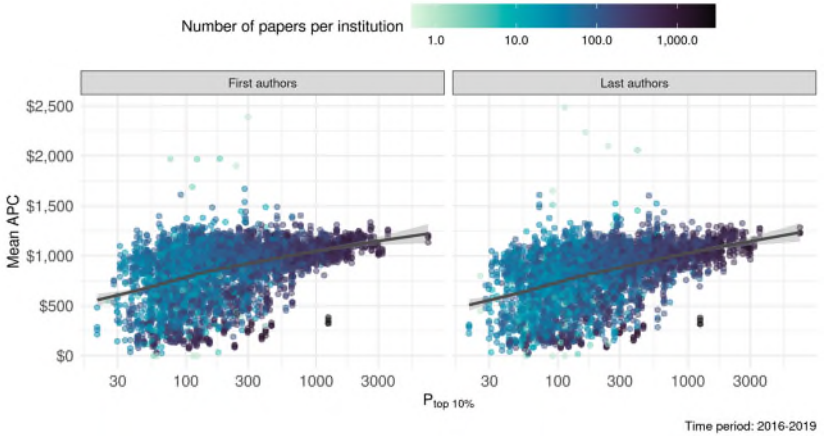
Threats identified:

- Costs of participation
- Cumulative nature of data inequalities
- Lack of reward structures
- Exclusion of societal voices
- Platform-logics
- Discriminatory OA APC business-model

Institutional resources and APCs are linked

- Bibliometric study sampling 1.5 million journal articles
- Data from OpenAlex, DOAJ, CWTS Leiden Ranking, World Bank
- **Researchers from better resourced institutions publish more APC-based OA and pay higher APCs**
- **OA publishing involving APCs is creating a new barrier for who publishes where**
  - Voices from societies and communities less embedded in global science are further marginalised
  - Global issues need global perspectives, APC-OA is leading to the opposite
  - Existing inequities are amplified (citation advantage, future reward structures)

Klebel, Thomas & Tony Ross-Hellauer; The APC-barrier and its effect on stratification in open access publishing. *Quantitative Science Studies* 2023; 4 (1): 22–43. doi: https://doi.org/10.1162/qss_a_00245



So what are the impacts of Open Science?

(And how are we monitoring them for the longer term?)

PathOS literature review

Primary objective

To establish what evidence exists in the literature regarding the (1) academic, (2) societal, and (3) economic impacts of Open Science.

Secondary objectives

- Synthesise knowledge on types of impacts
- Specific enabling and/or inhibiting factors, any negative impacts
- Trade-offs amongst types of impact
- Notes on quality assessment (e.g., causality vs. correlation, methodological weaknesses)

Study preregistered on OSF on 31 October 2022 https://osf.io/m4rnc

Search keywords

High-level concept	Element of OS	Impact	Academic Impact	Societal Impact	Economic Impact
Lower-level concepts	Open Science Open Access Open/FAIR Data Open Methods Open Code Citizen Science Open Evaluation	Effect Outcome	Efficiency Productivity Quality Education Reproducibility Reuse Citations Collaboration Equity, Diversity and Inclusion	Societal impact Trust Education/understanding Engagement Government policy Sustainable Development Goals Environment/climate Health COVID Participation	Economic impact Financial/monetary impact Cost/benefit analysis Input-output modelling Return on investment Productivity Innovation Patenting New products/services
Search terms	"open scien*" "science 2.0" "open data" "FAIR data" "open access" "open code" "citizen science" "open peer review" OR "open metric*"	impact* effect* outcome*	quality citation* integrity equi* collaborat* trust efficien* re-us* OR reus* productiv*	engag* educat* trust polic* sdg OR "sustainable development goal*" gender diversit* health environment* OR climat* covid* OR coronavirus* participat*	econom* financ* cost* mone* cba bca "input-output" "return on investment" "patent*" "innovation*" "efficiency gain*" "saving" "product*"

Methods

Studies followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) methodology

- Step 1: identify relevant studies
  - Initial search for academic literature in Scopus and Web of Science
  - Snowball search using OpenAlex API
  - Targeted web search for grey literature
- Step 2: selection of eligible studies by screening titles, abstracts, then full-texts
  - Paper must provide evidence of academic, societal OR economic impact of Open Science generally, or from Open Access, Open/FAIR Data, Open Methods, Open Code, Citizen Science OR Open Evaluation
- Step 3: data extraction from included studies
  - Key information: methods, findings, type of impact, aspect of OS
- Step 4: synthesis of data and reporting
  - Pre-registered protocol: https://osf.io/m4rnc
  - Preliminary results: https://zenodo.org/records/10666427
  - Final results reported in 3 separate papers

Academic impact

- 311 included studies (after database search, over 400 after snowball/grey lit search)
- Main findings
  - OA Citation Advantage: Large literature, but only partly convincing evidence
  - Evidence for Open Access APC model fostering inequalities
  - Open/FAIR Data associated with data reuse and a citation advantage for associated papers
  - Positive effect of Open Data on computational reproducibility
  - Open Code and Software produce efficiency gains in software development and may also increase citations of associated papers.
  - Evidence that Citizen Science is increasing efficiency and scope of data collection
  - Open peer review shows neutral to positive effects on review quality
- Main challenge
  - Often insufficient evidence to establish causal claims, in particular for citation advantage of Open Access and Open Data
- *Paper in progress*

Societal impact

- 196 included studies
- Main findings
  - Majority of evidence pertains to Citizen Science (83.2% of papers), with some from Open Access (14.3%) and limited evidence from other OS aspects
  - Evidence shows impact in terms of education and awareness (57.1% of papers), climate and environment (49%), and engagement (32.1%)
    - Policy and governance (25.5%), equity and empowerment (18.4%), and health (16.8%)
- Challenges/evidence gaps
  - Limited evidence of causation
  - No evidence of impact from Open/FAIR data identified
  - Questionable evidence of societal impact from Open Access (altmetrics)
  - Difficult to measure and study societal impacts in the medium and long-term
- *Paper preprinted and under journal review: Cole et al. 2024.*

Economic impact

- 70 included studies
- Main findings
  - Some evidence of cost savings (faster access to knowledge and avoiding duplication) as a direct economic impact
    - However little empirical evidence of positive benefits of Open Access and Open/FAIR data on industry
  - Medical and biotech sectors show the greatest evidence of benefits from Open Science
  - Evidence stems largely from case studies (lack of models for broad economic assessments)
- Challenges/evidence gaps
  - Great difficulties in identifying either business (turnover/profits) or macroeconomic impacts (productivity increases/employment)
    - Lack of sufficient evidence for comparing similar cases; lack of transparency in internal accounting
  - No standardised metrics to measure results on a project-by-project basis in companies
  - Reluctance of companies to publish detailed data on research costs
  - Limited interest/evidence on causation of economic impacts in public research
  - More case studies and broader assessments are needed to allow for meta-analyses
- *Paper in progress*

Challenges

- Lack of robust evidence, except in key areas
- Suggests we've been too focused on monitoring the uptake of Open Science, not its actual impacts
- Causality/correlation: difficulty of directly measuring relationships between interventions, outcomes, and impacts
- Lack of standards for defining and measuring OS impact
- Many case studies, often from those linked to initiatives (publication bias?)
- Streetlight effect – measuring what's easy to measure
- Qualitative and mixed methods approaches are needed to study impact pathways and identify causal factors
  - Requires additional resources and funding

Publications and next steps

- **Initial report on database search results:** Klebel, T., Cole, N. L., Tsipouri, L., Kormann, E., Karasz, I., Liarti, S., Stoy, L., Traag, V., Vignetti, S., & Ross-Hellauer, T. (2023). PathOS - D1.2 Scoping Review of Open Science Impact. Zenodo. https://doi.org/10.5281/zenodo.7883699
- **Preprint of full results for societal impact:** Cole, N. L., Kormann, E., Klebel, T., Apartis, S., & Ross-Hellauer, T. (2024, February 21). The societal impact of Open Science–a scoping review. https://doi.org/10.31235/osf.io/tqrwg
- **Write-up of full results for academic and economic impact underway**
- **Zotero library available:** https://pathos-project.eu/os-impact-evidence-library

PathOS OS Indicator Handboo
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https://handbook.pathos-project.eu/

- Covers various aspects of quantifying impacts of Open Science
- First release covers Open Science uptake and reproducibility, academic, societal and economic impact to come
- If an indicator can be readily operationalised, we aim to provide ready-to-go recipes to support its implementation
- Also include more speculative indicators, not yet easily operationalised
- Includes opening chapter

Thank you

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For more about the ON-MERRIT project: https://on-merrit.eu/

PathOS_EU

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