

We've got issues

Understanding the current strain on scientific publishing

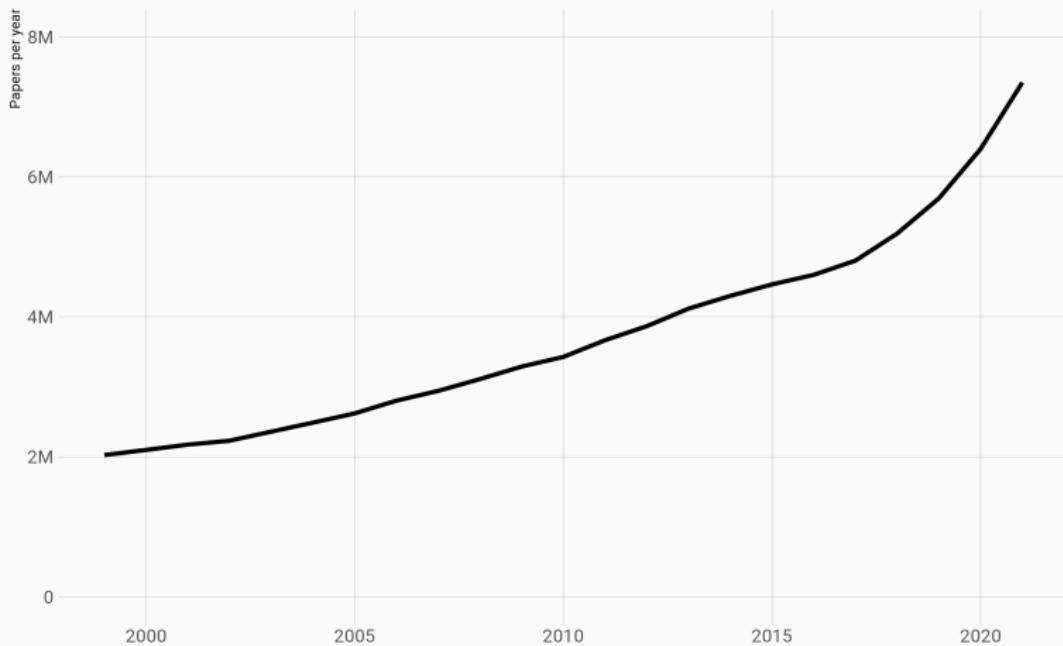
M. A. Hanson, P. Gómez Barreiro, **P. Crosetto**, D. Brockington

SNSF – April 19th 2023

Academic publishing is undergoing an exponential growth

New papers published each year in the world

Scimago database, all publishers



SJR data – analysis DB, PC, PGB, MH

This is mostly a good thing

- More scientists around
- More funds for research
- Open Access: more results available to anyone
- Web tools: faster dissemination of ideas
- Lower file drawer effects
- More replications, robustness, reviews, meta-analyses

Yet we've got issues

Editors resigning
over high fees

Chris Chambers  @chrisdc77 · 16h

Following Elsevier's decision to raise the APC for NeuroImage to \$3,450, all editors (inc. EiCs [@fmrib_steven](#) [@tobergmann](#) [@BirteUta](#)) from NeuroImage and NeuroImage:Reports have resigned, effective immediately. I am joining this action and have also resigned [imaging-neuroscience.org/Announcement.p...](#)

Elsevier: NeuroImage transition - all editors have resigned over the high publication fee, and are starting a new non-profit journal, Imaging Neuroscience

Summary: NeuroImage has long been the leading journal focusing on imaging neuroscience, with both the highest impact factor and the largest number of papers published annually. NeuroImage's editorial team has tried to convince Elsevier to reduce the publication fee from \$3,450, as we believe large profit is unethical and unsustainable. Elsevier is unwilling to reduce the fee; therefore, with great regret, all editors (more than 40 ~~and~~ **all** editors) of NeuroImage and NeuroImage:Reports have resigned. We are starting a new non-profit Open Access journal, *Imaging Neuroscience*, intended to replace NeuroImage as our field's leading journal.

19 671 1 617 360,6 k

Yet we've got issues

Gemma E Derrick @GemmaDerrick · 17 mars ...
Today I resigned my position as Editor-in-Chief of [@Public_MDPI](#). I do not consider our journal, Publications, to be predatory in any way but my decision is precipitated by a continual tension between my outward-facing role as Editor in Chief of Publications 1/3

11 106 247 114,2 k

Gemma E Derrick @GemmaDerrick · 17 mars ...
and increasing discourse within my own professional community around the predatory publishing practices of MDPI journals. The behaviour of our Editorial board has been exemplary, both in assuring the integrity and honesty of our peer review practices in upholding quality 2/3

1 3 52 12,1 k

Gemma E Derrick @GemmaDerrick · 17 mars ...
standards. Despite this, backstage practice of key values at MDPI are increasingly at odds with the values we prioritise in publication practices. I consider my time with the journal to be complete and am grateful for the experience but now is time is now to move on. 3/3

7 7 76 12,5 k

Editors resigning over **bad publisher practices**

Yet we've got issues

Paper mills
mass producing
fake articles

NEWS FEATURE | 23 March 2021

The fight against fake-paper factories that churn out sham science

Some publishers say they are battling industrialized cheating. A *Nature* analysis examines the 'paper mill' problem – and how editors are trying to cope.

Yet we've got issues



Nick Wise
@nickwizzo

...

The guest editor of an open special issue in [@Symmetry_MDPI](#) on e-learning openly **selling authorship of papers on e-learning**
mdpi.com/journal/symmet...

Traduire le Tweet

You can join the team of authors, if you wish.

The paper will be indexed in both Scopus (Q4) and Web of Science.
1st position costs €390, 2nd position €290, positions 3 to 6 €200.
Payment is after acceptance.
Would you like to be a part of the team? Register at

* ICT

Papers will be published in a book series indexed in Scopus (Q4) and Web of Science.
1st position costs €390, 2nd position €290, positions 3 to 6 €200.
Payment is after acceptance.
If you wish to join, please register at
<https://rtsarev.ru/coauthor/>

**Call for Scopus
coauthors
E-learning and
Economics
200 euro**

If you wish to be in the list of co-authors, you are welcome to join.
1st position costs €390, 2nd position €290, positions 3 to 6 €200.
Payment is after acceptance.
Are you with us? Please, register at
<https://rtsarev.ru/coauthor/>

#scopus #webofscience #wos
#science #coauthor #coauthorship

8:29 PM · 4 mars 2023 · 35,6 k vues

Authorship sales
rings

Yet we've got issues

Stunningly **prolific**
authors

EL PAÍS

ce & Tech

SILICON VALLEY - YOUTUBE - I

SCIENTIFIC ETHICS >

One of the world's most cited scientists, Rafael Luque, suspended without pay for 13 years

The prolific chemist, who has published a study every 37 hours this year, has been sanctioned by the University of Córdoba over his research work for other institutions in Russia and Saudi Arabia

Yet we've got issues

Pay to get faster
through peer-review

Dr Elizabeth Gadd @lizziegadd@mastodon.online
@LizzieGadd

"Accelerated publication" charges still make my eyes pop out of my head. taylorandfrancis.com/partnership/co...

Traduire le Tweet

...

Publish in 3 – 5 weeks from submission*

- Submission to acceptance: 2-3 weeks
 - 1-2 weeks for peer review†
 - 1 week for author revision
- Acceptance to online publication: 1-2 weeks, with proofs within 5 working days and 48 hours for author review

Publish in 7 – 9 weeks from submission*

- Submission to acceptance: 5-6 weeks
 - 3-4 weeks for peer review
 - 2 weeks for author revision
- Acceptance to online publication: 2-3 weeks, with proofs within 10 working days

Cost per article: \$7000 / €6200 / £5500

ALT

Cost per article: \$3900 / €3400 / £3000

4:30 PM · 4 avr. 2023 · 36,9 k vues

Yet we've got issues

PHR Public Health Reviews

CiteScore 9.6 How to publish Submit

Download Share

EDITORIAL

Public Health Rev. 17 November 2022
<https://doi.org/10.3389/phrs.2022.1605407>

«I Do Not Have Time»—Is This the End of Peer Review in Public Health Sciences?

Nino Kunzli^{1,2,3*}, Anke Berger^{1,3}, Katarzyna Czabanowska⁴, Raquel Lucas⁵, Andrea Madarasova Geckova⁶, Sarah Mantwill⁷ and Olaf von dem Knesebeck⁸

Check for updates

Editors **unable**
to find referees

Yet we've got issues

SCIENCEINSIDER | SCIENTIFIC COMMUNITY

Fast-growing open-access journals stripped of coveted impact factors

Web of Science delists some 50 journals, including one of the world's largest

28 MAR 2023 • 5:55 PM • BY JEFFREY BRAINARD



Mega-journals being
delisted from WoS

What's going on?

More is different

Growth is not **more of the same**:
growth means **change**.

- new practices
- new business strategies
- new incentives
- new constraints
- new meanings

4 August 1972, Volume 177, Number 4047

SCIENCE

More Is Different

Broken symmetry and the nature of
the hierarchical structure of science.

P. W. Anderson

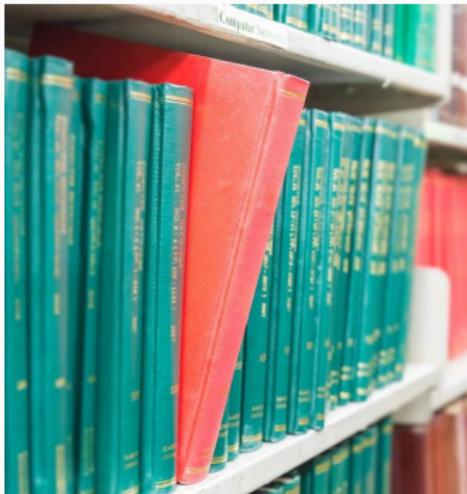
less relevance they seem to have to
very real problems of the rest of
science, much less to those of sc

The constructionist hypothesis fails
down when confronted with the
difficulties of scale and complexity.
Behavior of large and complex sys-
tems of elementary particles it
can not be explained by a simple
extrapolation of the properties of
entities of a few particles. Instead,
each level of complexity entirely
new properties appear, and the under-

A semantic shift

"Journal"

used to mean

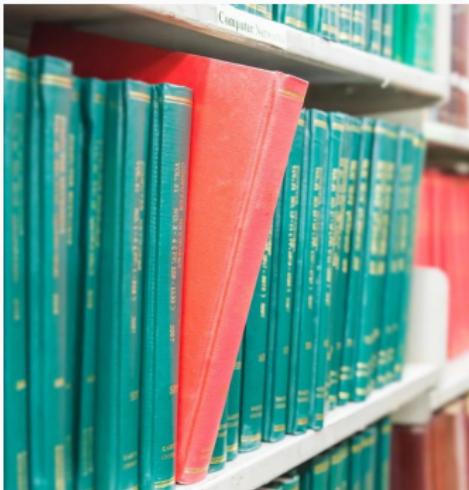


A physical object with
limited available space

A semantic shift

"Journal"

used to mean



A physical object with limited available space

now it also means

Open Access Article
CRF1 siRNA-Encapsulated PLGA Nanoparticles Suppress Tumor Growth in MCF-7 Human Breast Cancer Cells

Published: 7 April 2023
by

Cite Details
View Versions in:
MILTS and ATM Genes
in a Young Patient with MSI-H in a
Precancerous Colorectal Lesion
by Antonio Nolasco et al.
DOI: <https://doi.org/10.3390/genes10020170>
Published: 22 March 2023

Abstract: Mitochondrial oxidative phosphorylation (OXPHOS) system dysfunction in cancer cells has been exploited as a target for anti-cancer therapeutic interventions. The downregulation of CRF1 interacting factor 1 (CRIF1), an essential micro-Ribozyme factor, can impair mitochondrial function in various cell types. In this study, we investigated [...] Read more
► Show Figures

Open Access Article
Detailed Protein-Bound Urease Toxin Interaction Mechanisms with Human Serum Albumin in the Pursuit of Designing Competitive Binders

Published: 10 April 2023
by

Abstract: Molecular Analysis of KAT6B/Cathepsin B Proteins Induced Endothelial Cell Permeability and VEGF Secretion
by Yaxiong Guo and Venkateswara Kammulaapalli
DOI: <https://doi.org/10.3390/proteins24050564>
Published: 18 March 2023

Abstract: Chronic kidney disease is the gradual progression of kidney dysfunction and involves numerous co-morbidities, one of the leading causes of mortality. One of the primary complications of kidney dysfunction is the accumulation of toxins in the bloodstream, particularly protein-bound uremic toxins, which are mainly derived from dietary sources. [...] Read more
► Show Figures

Open Access Article
Crosstalk between Metabolite Production and Signaling Activity in Breast Cancer

Published: 10 April 2023
by

A limitless electronic repository with a name

A semantic shift

"Publication"

used to mean

- a handful of journals
- long delays
- low acceptance rates
- free for authors
- do it and thrive

⇒ *good science rejected?*

A semantic shift

"Publication"

used to mean

- a handful of journals
- long delays
- low acceptance rates
- free for authors
- do it and thrive

⇒ *good science rejected?*

now it also means

- thousands of journals
- short delays
- high acceptance rates
- authors pay
- don't do it and die

⇒ *bad science accepted?*

A semantic shift

"Special issue"

used to mean

- A once-in-a-while issue
- About a special topic
- Strict editor control
- regular > special

A semantic shift

"Special issue"

used to mean

- A once-in-a-while issue
- About a special topic
- Strict editor control
- regular > special

now it also means

- A many-a-day issue
- About any topic
- Relaxed editor control
- special > regular

A semantic shift

"Publisher business model"

used to mean

- Many small journals
- Readers pay
- \$ through subscription
- "*Polish your gems*"

Incentive to ↑ quality,
quantity? ...

A semantic shift

"Publisher business model"

used to mean

- Many small journals
- Readers pay
- \$ through subscription
- "*Polish your gems*"

Incentive to ↑ quality,
quantity? ...

now it also means

- Few mega-journals
- Authors pay
- \$ through publication
- "*Get authors on board*"

Incentive to ↑ quantity,
quality? ...

Our aim:
understanding the strain on publishing

A caveat: no need for "predatory" labels

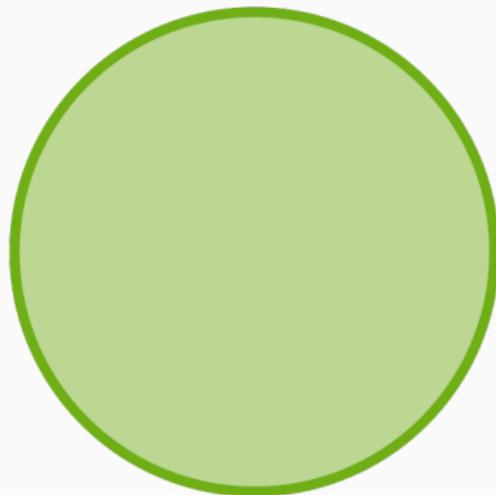
We don't think binary labels improve our understanding

There'll be no "predatory" judgments here

- outright fraudsters **do** exist (publishers *and* **authors**)
- agents just follow their **interest**
- **market rules** generate outcomes
- outcomes can be good or bad
 - for the different actors
 - for the **public good** that is science

Behold the scientific publishing system

Publishers



Researchers

Funders

What does the system **do?**

What are the **functions** the system fulfills...

for **Scientists**

- dissemination
- reputation
- sorting

for **Publishers**

- profits
- dissemination
- sustainability

for **Funders**

- selection
- prioritization
- public access

What do the different actors **want**?

What do different actors want from the system?

Scientists

- high reputation
- low effort
- stable reputation

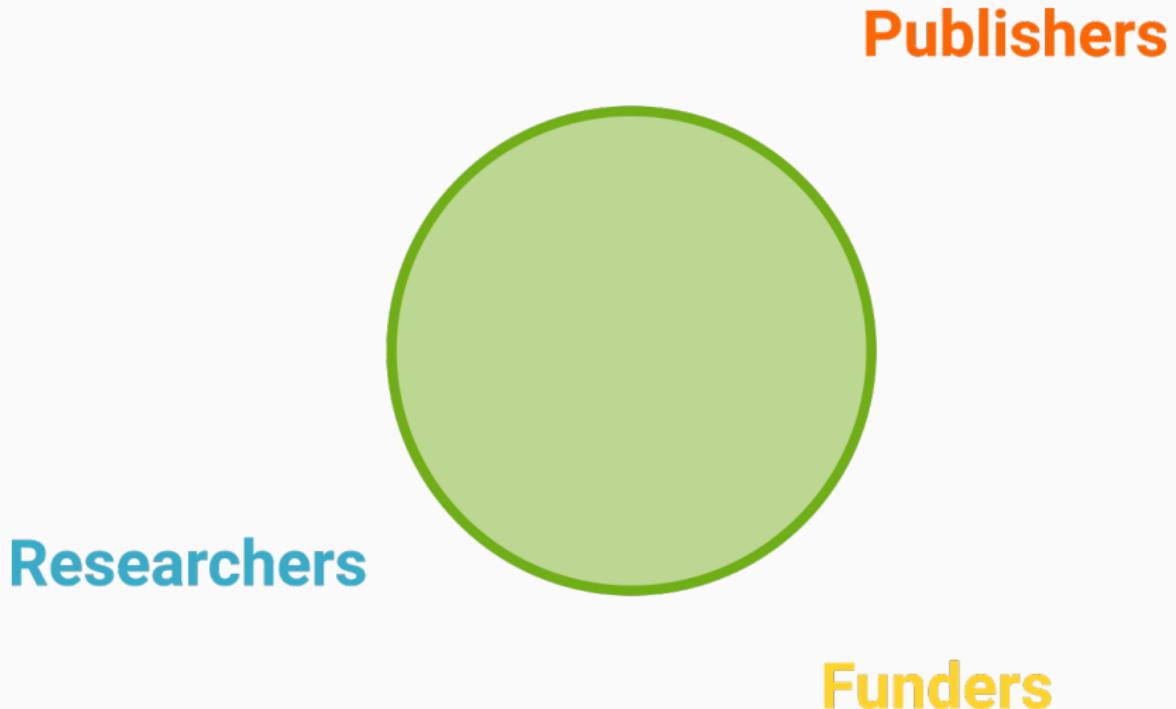
Publishers

- high reputation
- high quantity
- high revenue

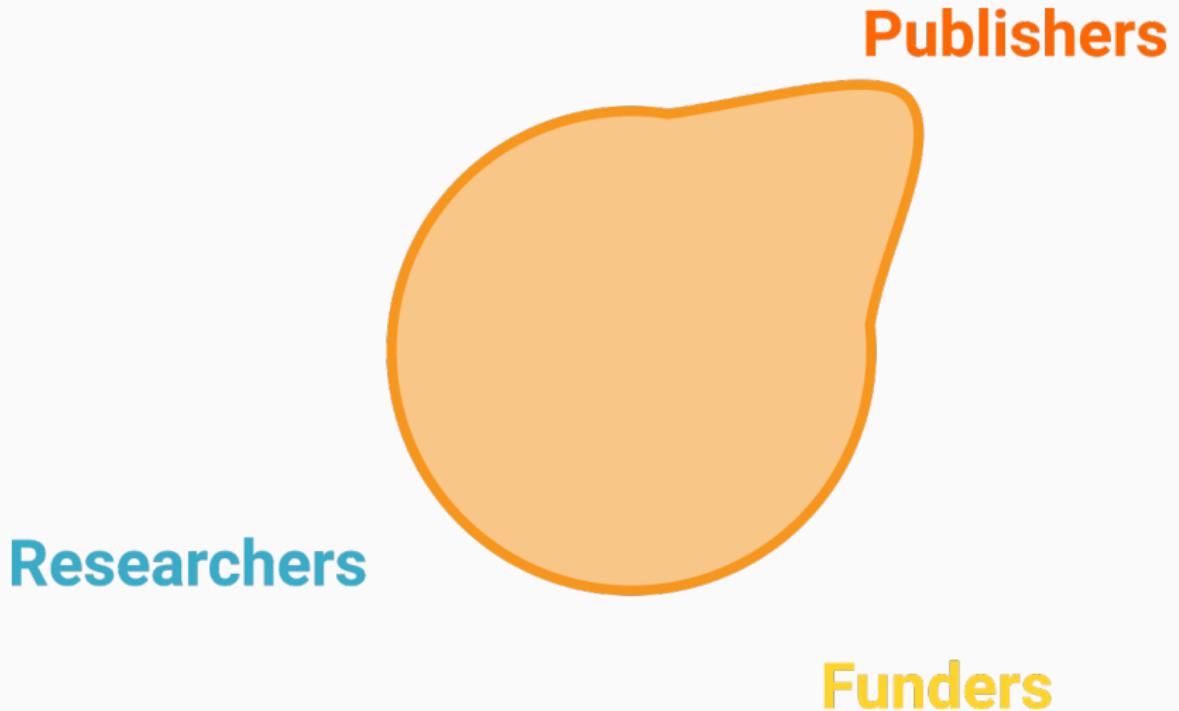
Funders

- stability
- true signal
- low spending

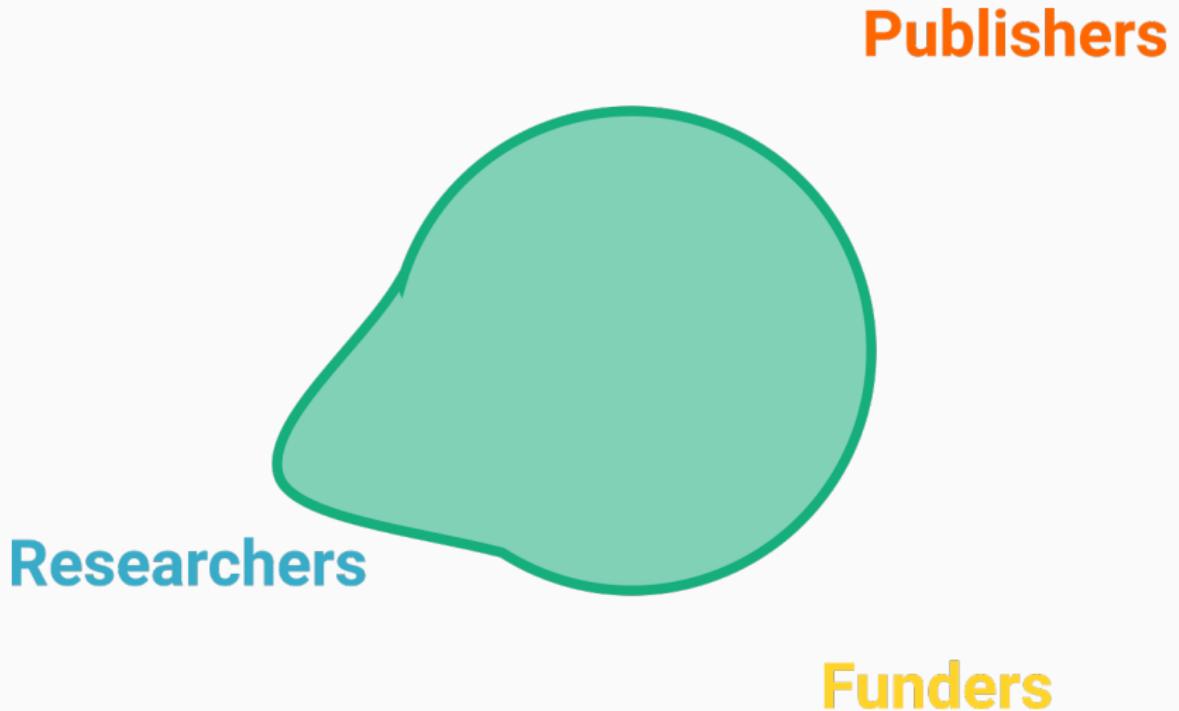
The system, growing under strain



The system, growing under strain

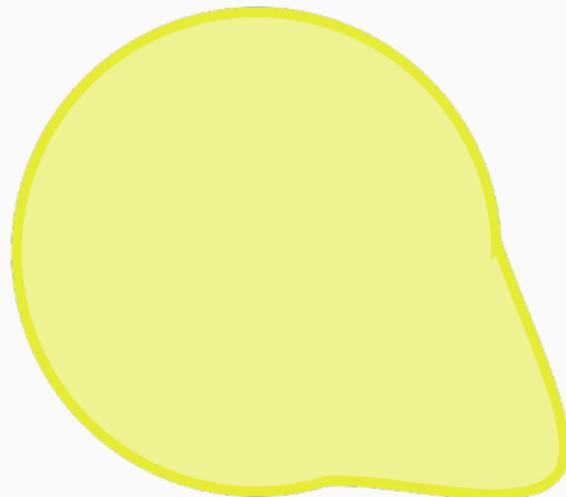


The system, growing under strain



The system, growing under strain

Publishers



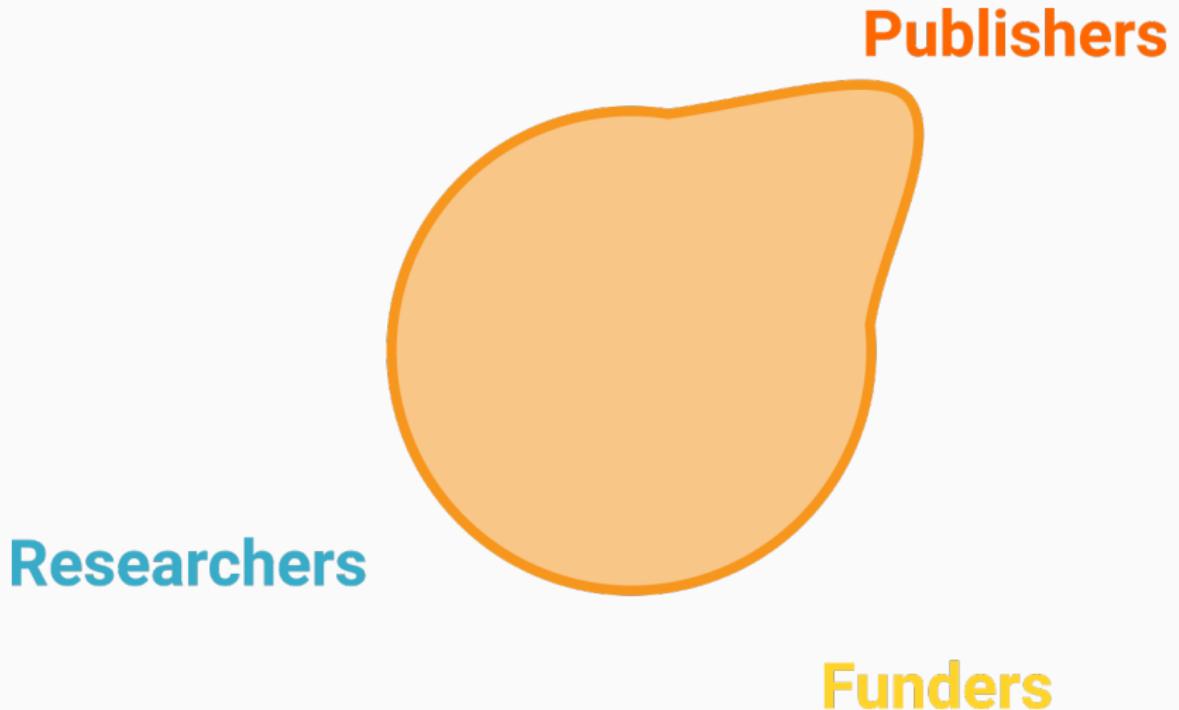
Researchers

Funders

Our analysis:

Understanding the strain put on the system
by evolving **publishers** practices

So, this



Data sources

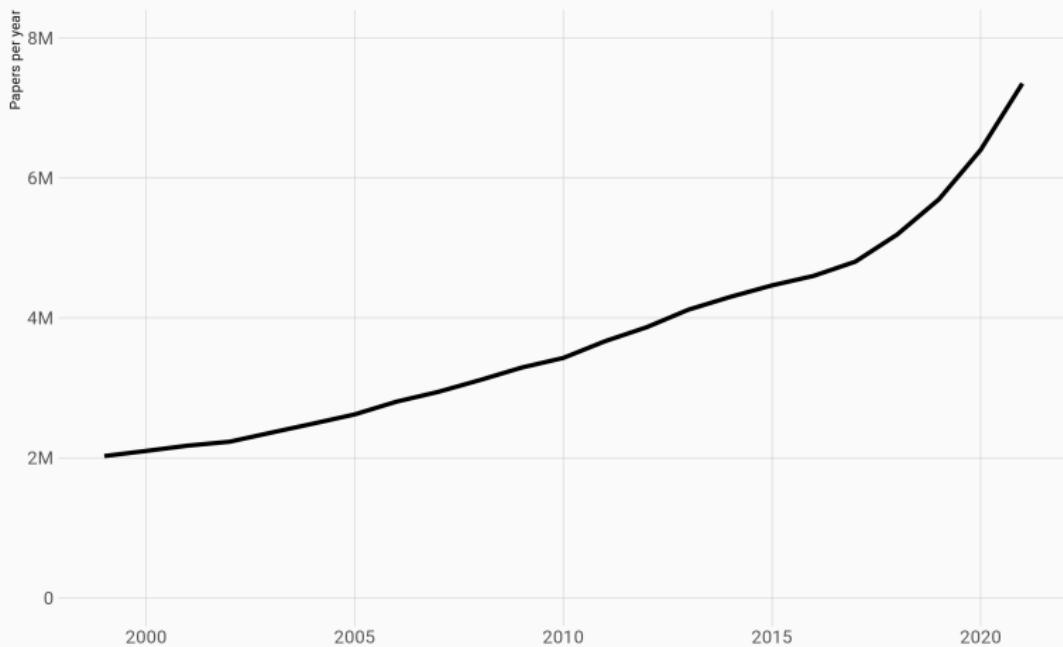
We exploit data coming from various sources:

- A full scrape of the **Scimago Journal Rankings** database
used for: comparisons across publishers, IF, SJR rank...
- **Web scrape** of MDPI, Frontiers, Hindawi, PLoS
used for: turnaround times, special issues
- First hand data from **publisher reports** and websites
used for: rejection rates

Which **trends and threats** are hidden by this exceptional growth?

New papers published each year in the world

Scimago database, all publishers



SJR data – analysis DB, PC, PGB, MH

Analysis plan

We single out **five** indicators of strain on the system:

- Number and **size** of journals
- Number and role of **Special Issues**
- **Turnaround** times
- **Rejection** rates
- Impact Factor **inflation**

None of them is critical *per se*

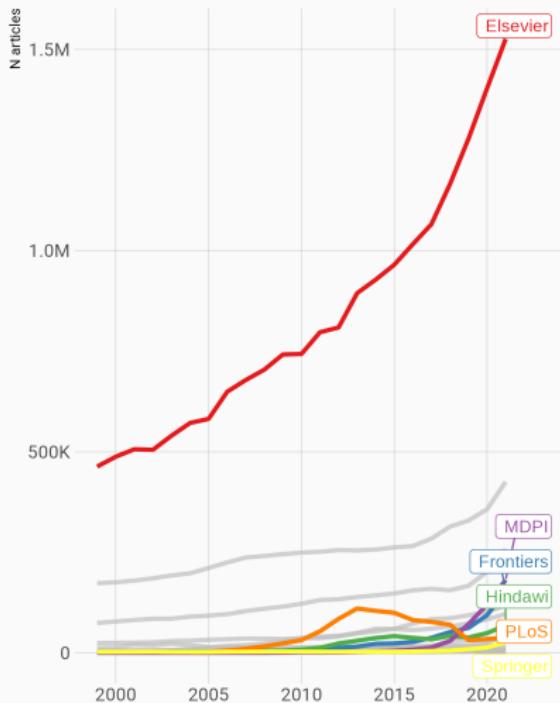
together they indicate **strain imposed by publishers**

Number of articles & journal size

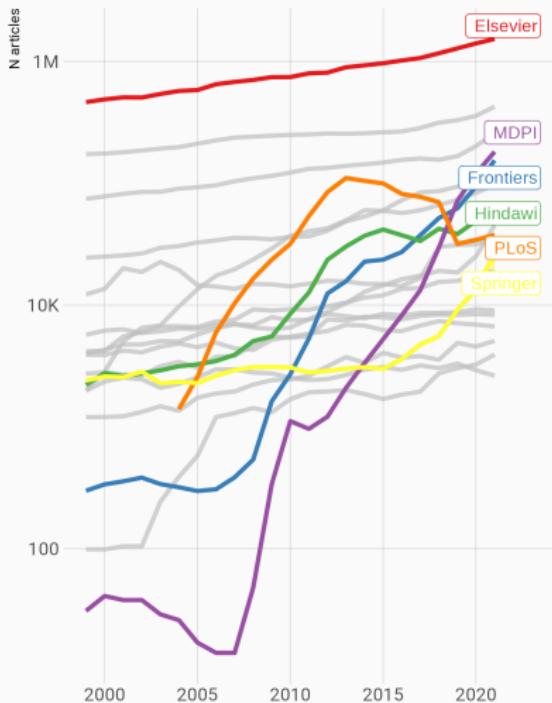
The rise of new publishers

Article growth by publisher, 1999-2021

Linear scale



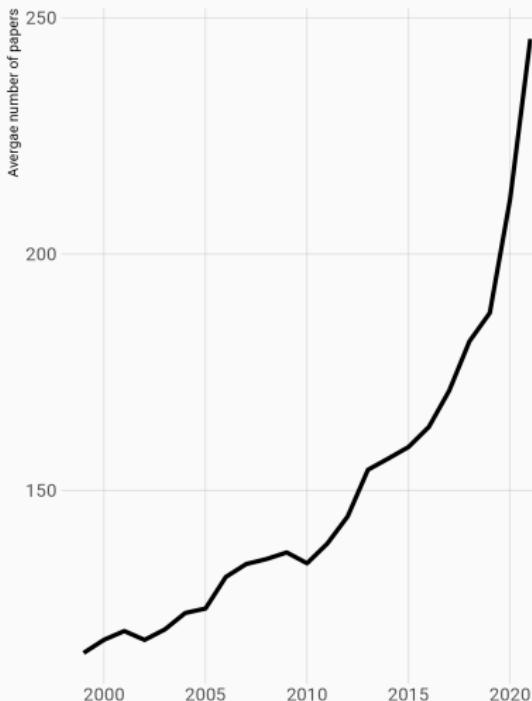
Log scale



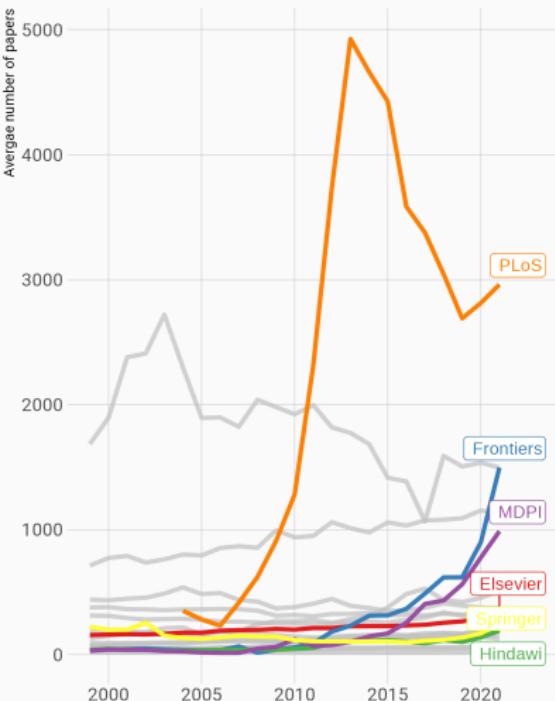
Bigger journals

Average number of papers per journal, 1999-2021

Overall



By publisher



The rise of mega-journals

Number of journals by class of size, 1999-2021

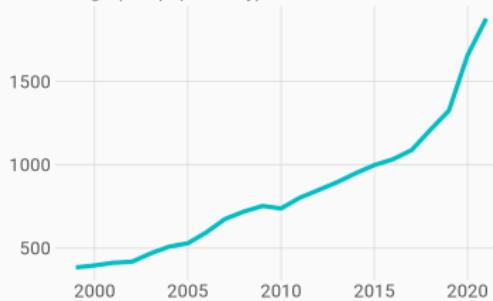
Small (<1 paper/week)



Medium (<1 paper/day)



Large (<10 papers/day)



Mega (>10 papers/day)



Scimago data – analysis MH, PC, PGB, DB

What's going on?

Trends:

- Growth means concentration, especially for new players

Why?

- Scientists tend to flock to journals with high reputation
- Hard to set up, but if you have one, exploit it

Threats

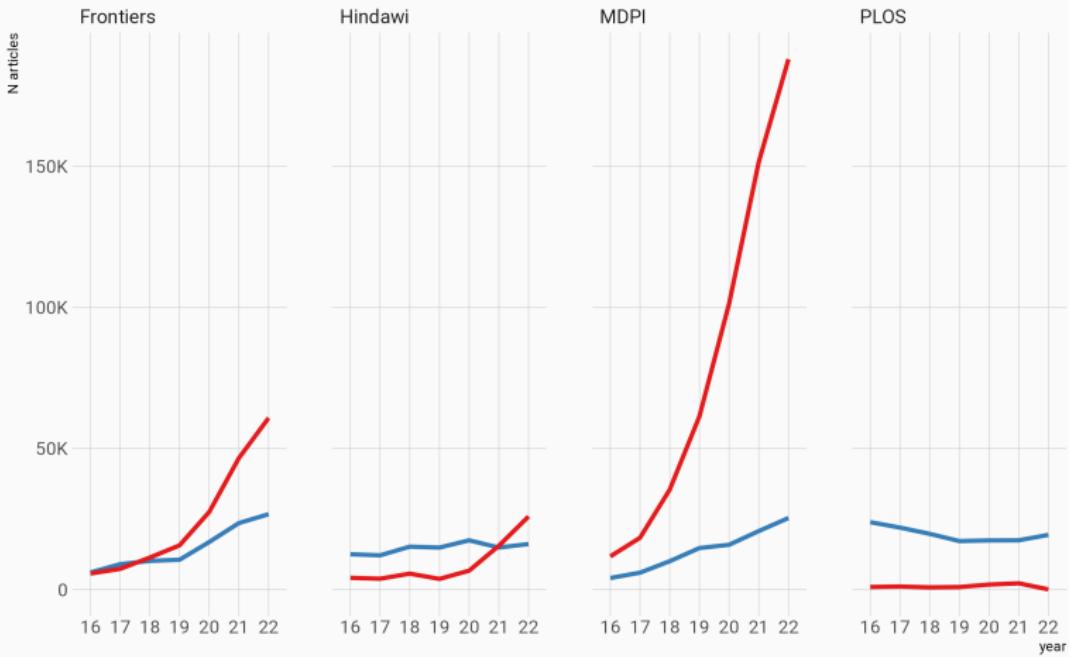
- How much can a journal inflate before it loses reputation?
- Risk of instability of quality signals

The role of special issues

Not so **special** after all

Regular and Special issues growth, 2016-22

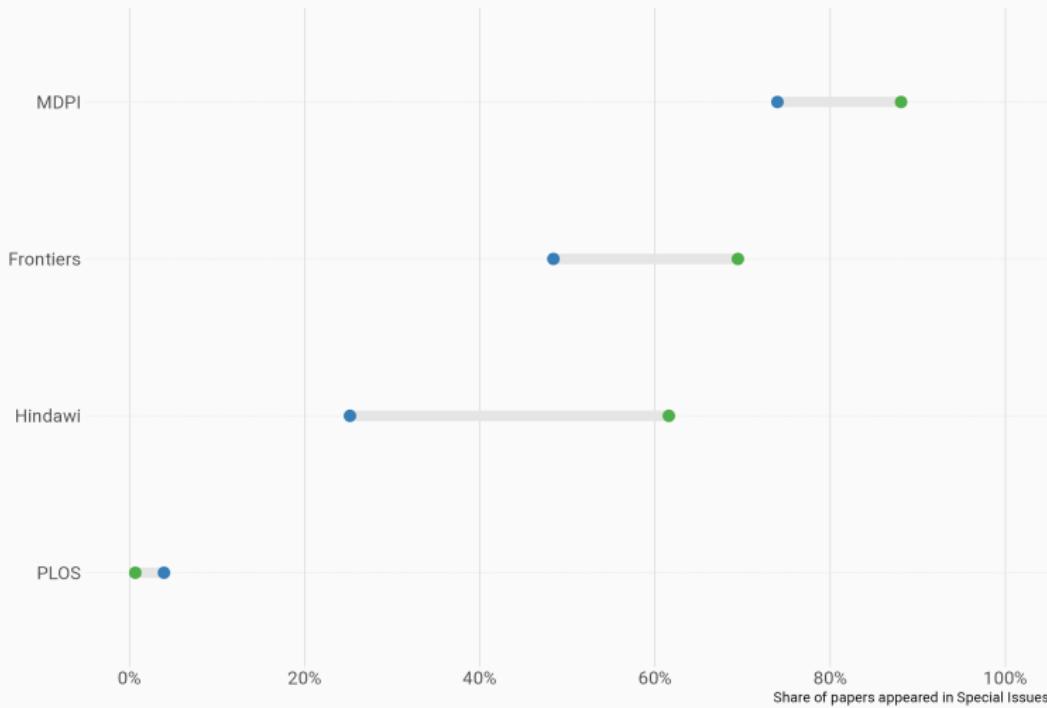
Special issues are called Collections at PLOS and Topics at Frontiers



Source: data scraped by @paolocrosetto & @pagomba – analysis MH, DB, PGB and PC

Journals at most big OA publishers are **mostly** special issues

Evolution of the share of Special Issues, 2016 to 2022



Source: data scraped by by @paolocrosetto & @pagomba – analysis MH, PC, PGB, DB

What's going on?

Trends:

- SI as a fantastic **engine of growth** for big OA publishers

Why?

- Mobilization of an **army of guest editors** & their networks

Threats

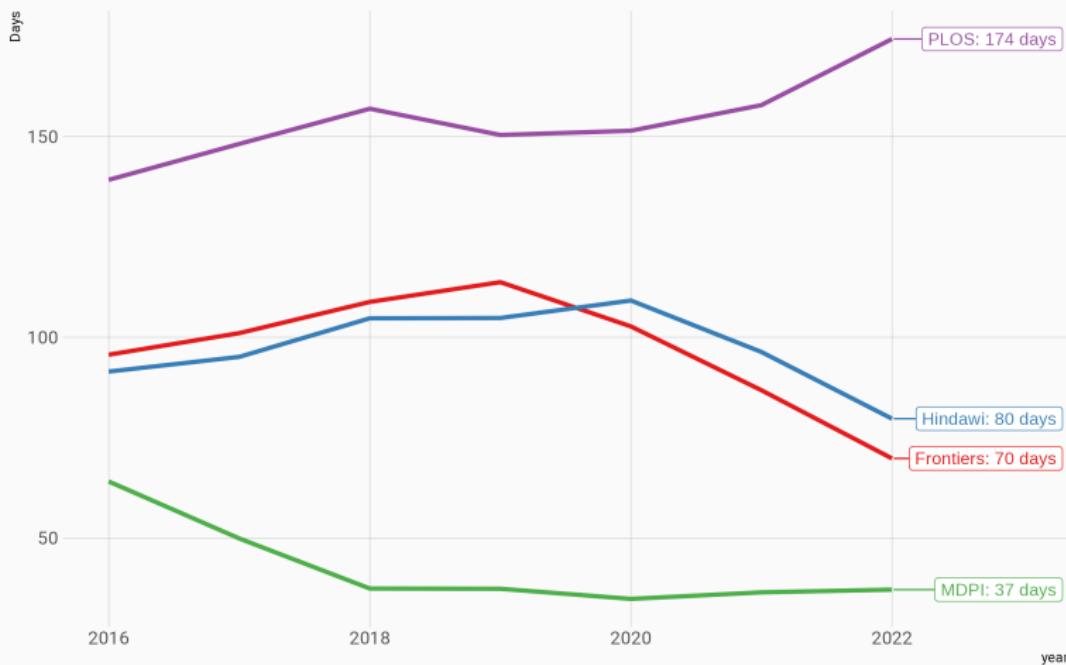
- Less control increases **chance of exploitation** by authors
- Potential **crisis** of the SI model (Hindawi, IJERPH delisting)

Turnaround times

Turnaround times have decreased for all for-profit OA publishers

Mean turnaround times by publisher, 2016-22

Submission to acceptance, including revisions (if any) -- all papers with turnaround time ≤ 1 year

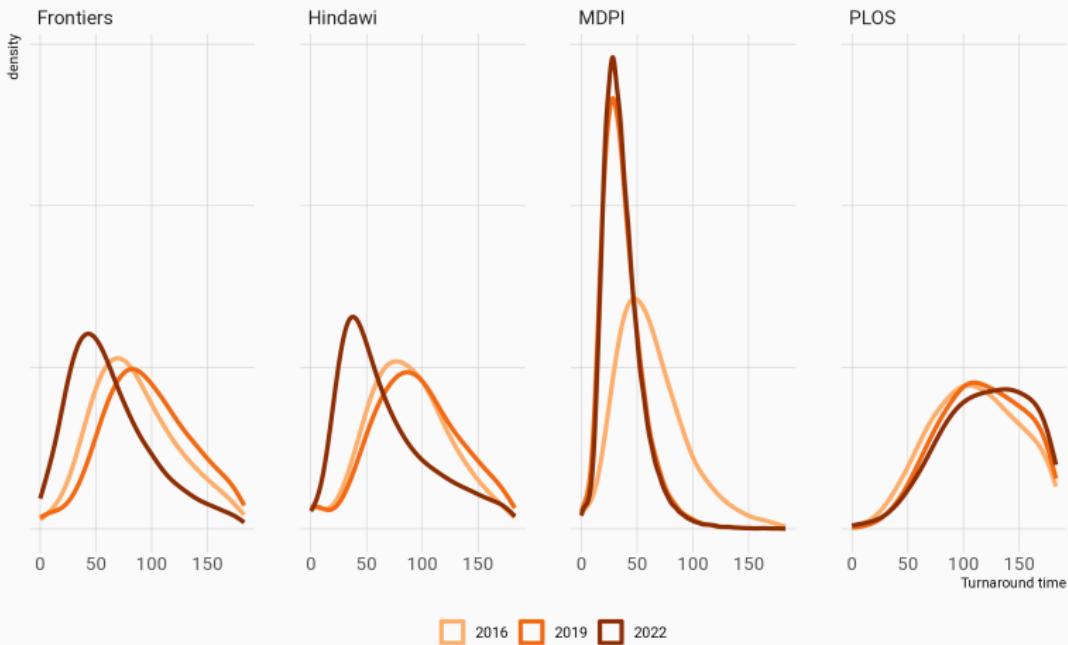


Source: data scraped on the publisher's website by @paolocrosetto & @pagombba, analysis MH, DB, PC, PGB

Turnaround times are getting more homogeneous

Evolution of the distribution of turnaround times by publisher -- 2016-19-22

Submission to acceptance, including revisions (if any) -- all papers with turnaround time ≤ 6 months



Source: data scraped on the publisher's website by @paolocrosetto & @pagomba, analysis by MH, PC, DB, PGB

What's going on?

Trends:

- TAT can be due to inefficiencies – good that they go down

Why?

- Convergence of authors & OA publishers incentives

Threats

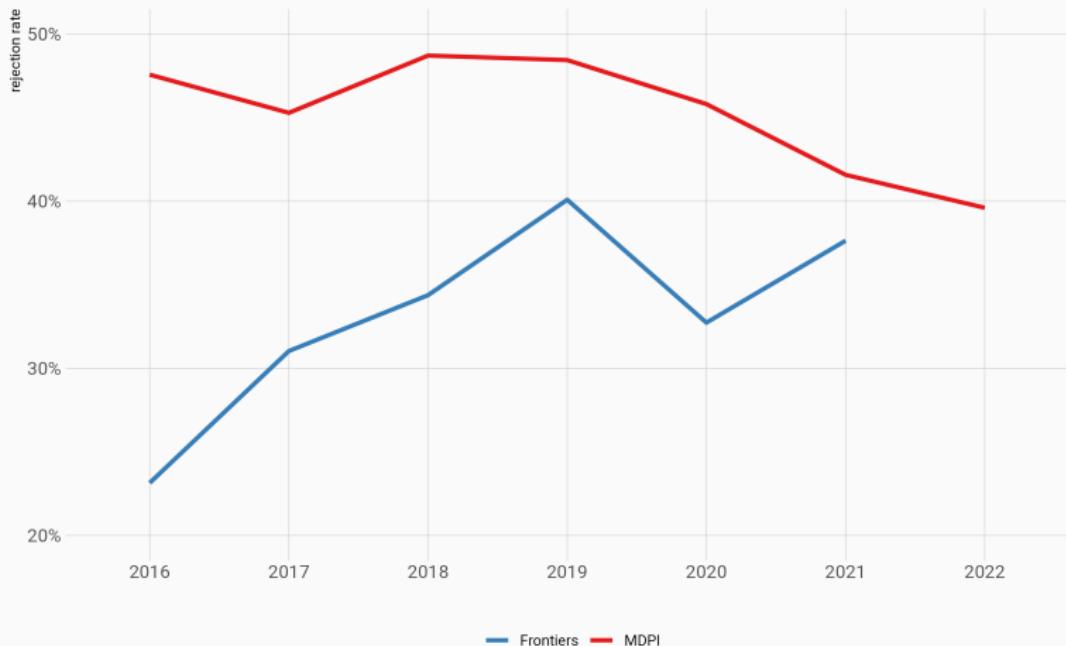
- Lower TAT must still allow for proper peer review
- Some TAT so low, it casts doubts on quality

Rejection rates

Rejection rates at MDPI and Frontiers

Evolution of rejection rates, 2016-22

Frontiers: aggregate rates only; MDPI: computed from rejection rates at each journal

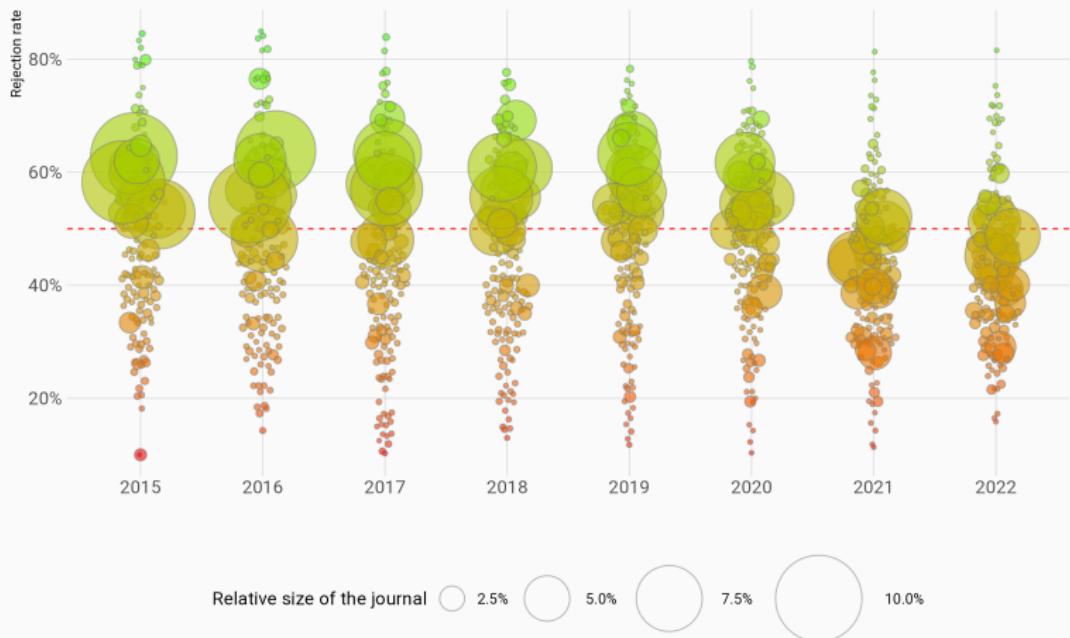


Source: data scraped on the publishers website, analysis by MH, PC, DB, PGB

A focus on MDPI

Evolution of rejection rates by relative size of the journal at MDPI, 2015-22

Only journals existing in 2015, size relative to MDPI total publications in a given year



Source: data scraped on the publishers website, analysis by MH, DB, PGB, PC

What's going on?

Trends:

- Rejection rates are **decreasing** at some key publishers
- **Increasing** at others
- Very little data

Why?

- **Convergence** of authors & OA publishers incentives

Threats

- Lower rejection rates might mean **lower quality**
- Risk of **instability** of quality signals

Impact Factor inflation

Indicators of impact: Impact factor, Scimago Journal Rank

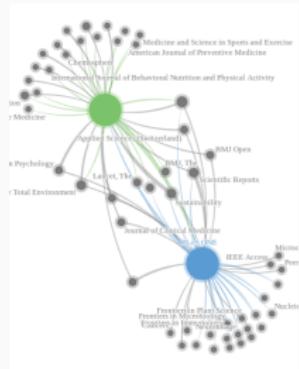
We measure **Impact Factor Inflation** as the ratio of IF to SJR

Impact Factor:

- cites/document at N years
- easily gamed

SJR: citation network counts

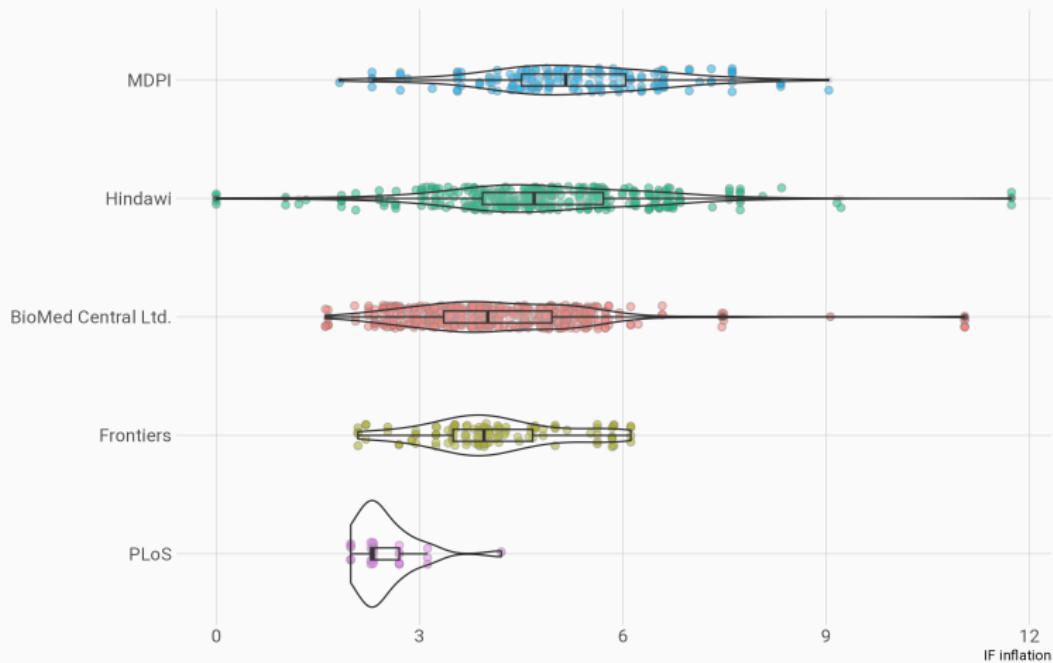
- Limits prestige from single source
- More prestige if cited by relevant journals
- Normalizes for field size
- Less easily gamed



IF inflation 2021: some publishers

Impact Factor inflation, 2021

2y cites over SJR

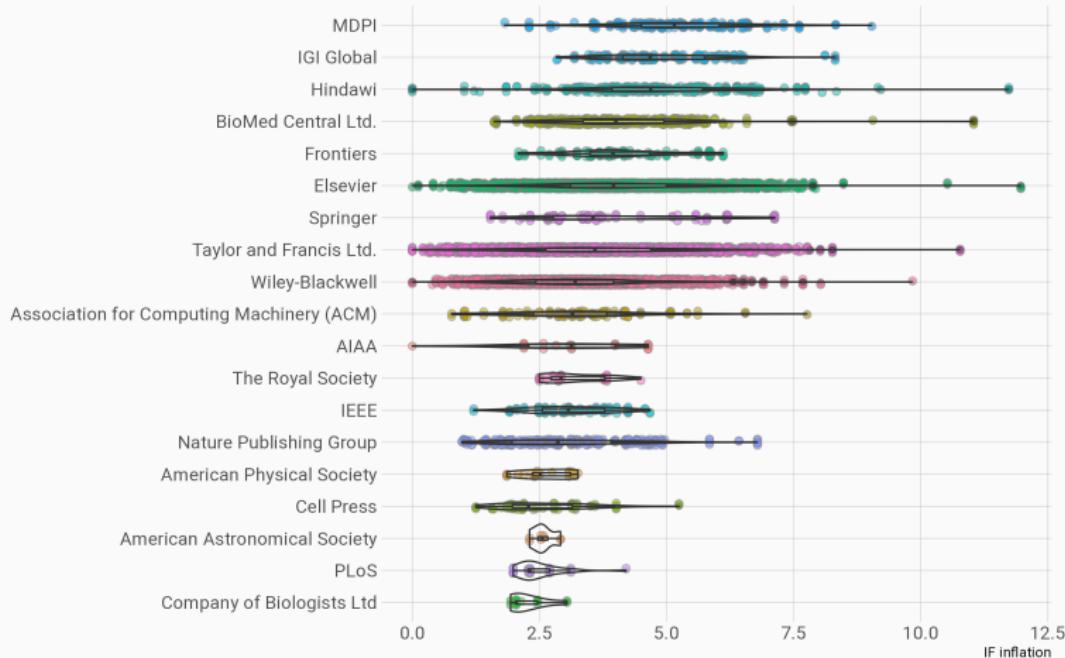


Scimago data – analysis MH, PC, PGB, DB

IF inflation 2021: more publishers

Impact Factor inflation, 2021

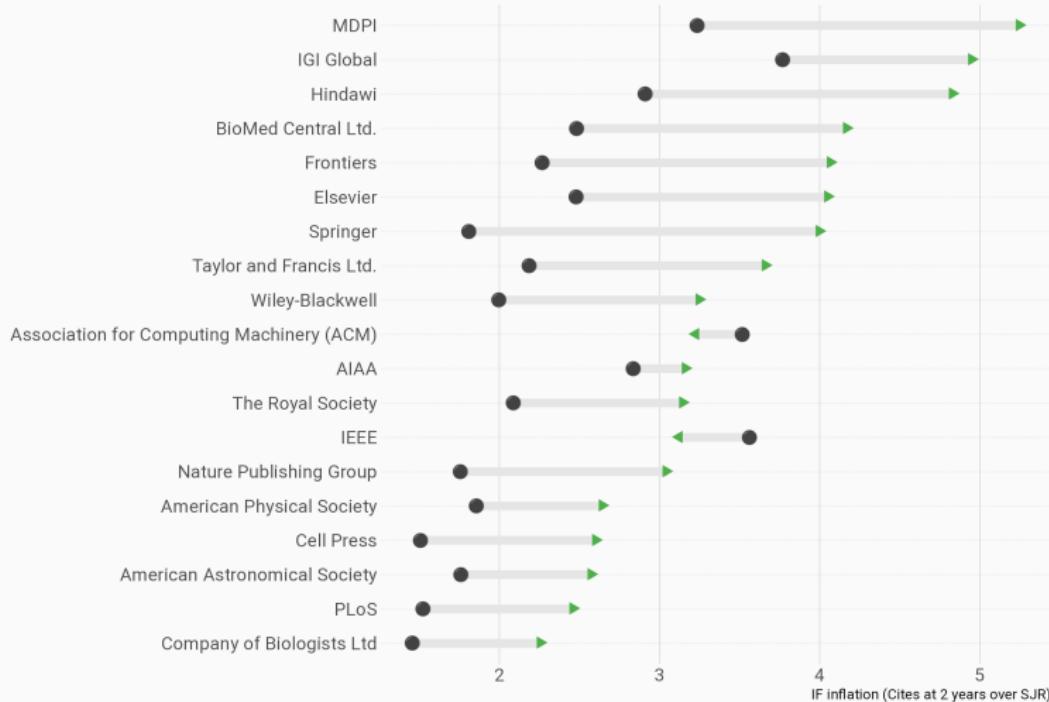
2y cites over SJR



Scimago data – analysis MH, PC, PGB, DB

Evolution of IF inflation

Evolution of Impact Factor inflation: 2015 to 2021



IF inflation (Cites at 2 years over SJR)

Scimago data – analysis MH, PC, PGB, DB

What's going on?

Trends:

- IF is **inflating** across the board – more so at some publishers

Why?

- **Goodhart's law:** *When a measure becomes a target, it ceases to be a good measure*

Threats

- Risk of **instability** of quality signals

A focus on MDPI

Strain indicators for MDPI

Strain indicators for MDPI: 2022 and evolution 2016-22

MDPI 20 largest journals as of 2022

JOURNAL	2022				CHANGE 2016-22			
	N	SHARE SI	TAT	REJECTION %	N	SHARE SI	TAT	REJECTION %
Int. J. Environ. Res. Public Health	17445	78%	42 days	45%	14.4x	+28pp	-27 days	-12pp
Sustainability	17394	77%	42 days	49%	12.8x	+10pp	-30 days	-13pp
Int. J. Mol. Sci.	16482	100%	35 days	51%	7.6x	+1pp	-19 days	-13pp
Appl. Sci.	13229	84%	38 days	43%	28x	+19pp	-23 days	-34pp
Sensors	10149	100%	38 days	40%	4.5x	+1pp	-30 days	-15pp
Energies	9843	80%	37 days	39%	8.9x	+10pp	-38 days	-22pp
Materials	9184	78%	37 days	29%	8.9x	+6pp	-17 days	-27pp
Molecules	9144	86%	34 days	37%	5.2x	+1pp	-11 days	-11pp
J. Clin. Med.	7641	99%	39 days	44%	65.9x	+17pp	-27 days	-2pp
Remote Sens.	6479	83%	43 days	55%	6.3x	+27pp	-43 days	-4pp
Cancers	6359	87%	39 days	52%	57.8x	+2pp	-29 days	18pp
Polymers	5625	100%	33 days	28%	12.7x	+23pp	-17 days	-13pp
Nutrients	5405	100%	34 days	47%	6.4x	+42pp	-27 days	-2pp
Mathematics	4931	86%	36 days	60%	71.5x	+35pp	-52 days	-22pp
Nanomaterials	4540	84%	32 days	35%	18.5x	+1pp	-20 days	-30pp
Electronics	4319	93%	35 days	42%	44.5x	+11pp	-36 days	-34pp
Water	4245	98%	40 days	40%	7x	+36pp	-36 days	-19pp
Foods	4187	99%	35 days	47%	48.7x	+19pp	-25 days	19pp
Cells	4181	91%	42 days	36%	92.9x	+2pp	-12 days	17pp
Animals	3666	98%	43 days	43%	46.4x	+54pp	-41 days	18pp

Source: data scraped on the publisher's website by @paolocrosetto & @pagomba, analysis DB, MH, PC, PGB

What's going on?

MDPI is the publisher putting by far more strain on the system

- Impressive, **exponential** growth
- MDPI journals mostly a collection of **loosely connected SI**
- TAT at the **lower bound** of the credible interval
- Rejection rates **decreasing** across the board
- **Highest IF inflation**

So, what?

Provisional lessons to be learned

- We think we have identified **5 indicators of strain** that can guide our understanding of the scientific publishing system.
- We **refrain from assigning "predatory" labels**, but we see high strain imposed over several dimensions as signals of a **critical situation**.
- Some publishers, as some **very prolific authors**, might be **stretching the system** too far.

Thank you!