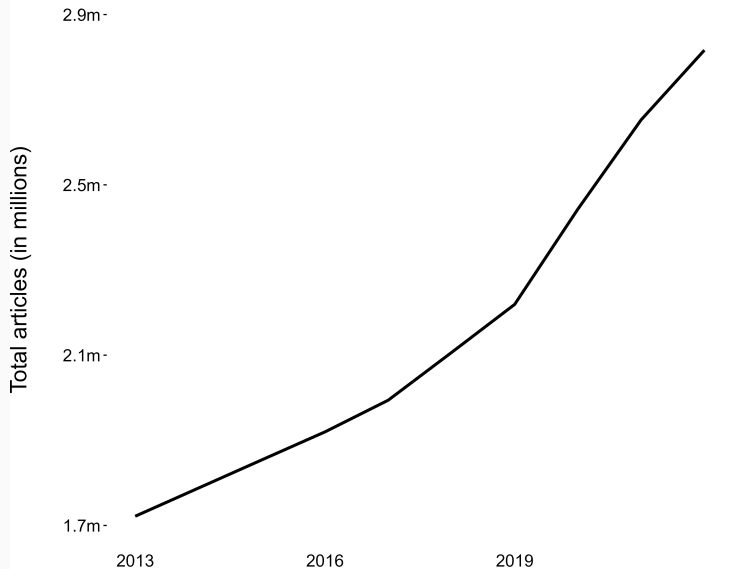


We've got issues

Understanding the current strain on scientific publishing

M. A. Hanson, P. Gómez Barreiro, **P. Crosetto**, D. Brockington
Scientific publishing day at Saclay - March 21st, 2024

Academic publishing is undergoing an **exponential growth**

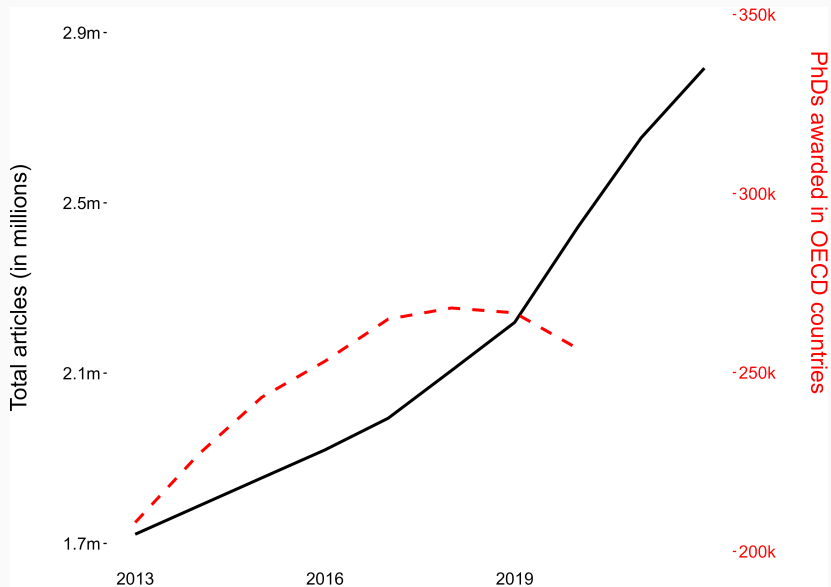


Source: N papers -- Scimago website data; N PhDs - OECD

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

But the **number of scientists** has hit a limit



Source: N papers -- Scimago website data; N PhDs - OECD

...and we've got issues

Editors resigning
over high fees



...and we've got issues



Editors resigning
over **bad publisher practices**

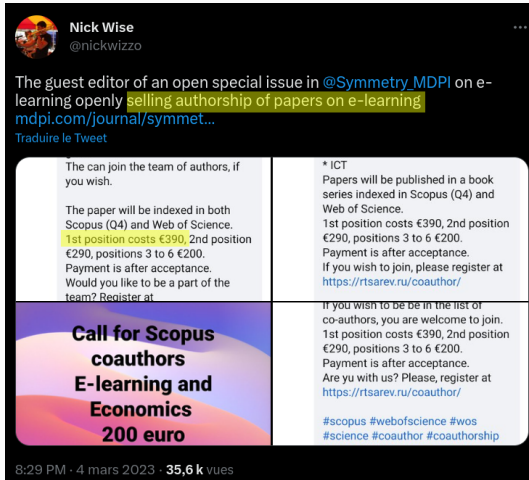
Paper mills
mass producing
fake articles

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.

...and 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](#)

<p>The can join the team of authors, if you wish.</p> <p>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</p>	<p>* 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/</p>
<p>Call for Scopus coauthors E-learning and Economics 200 euro</p>	<p>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/</p> <p>#scopus #webofscience #wos #science #coauthor #coauthorship</p>

8:29 PM · 4 mars 2023 · **35,6 k** vues

Authorship sales rings

...and we've got issues

Stunningly prolific
authors

EL PAÍS

Science & Tech SILICON VALLEY · YOUTUBE ·

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

...and 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*	Publish in 7 – 9 weeks from submission*
<ul style="list-style-type: none">• Submission to acceptance: 2-3 weeks<ul style="list-style-type: none">◦ 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	<ul style="list-style-type: none">• Submission to acceptance: 5-6 weeks<ul style="list-style-type: none">◦ 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	Cost per article: \$3900 / €3400 / £3000

4:30 PM · 4 avr. 2023 · 36,9 k vues

ALT

...and we've got issues

 **Public Health Reviews** CiteScore 9.6 [How to publish](#) [Submit](#)

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

Editors **unable**
to find referees

...and we've got issues



Mega-journals being
delisted from WoS

How does publishing **work**?

A caveat: **no need** for "predatory" labels

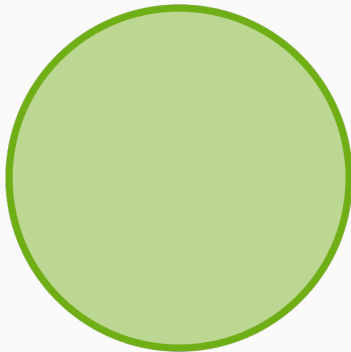
We don't think binary labels improve our understanding

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
- stability

Publishers

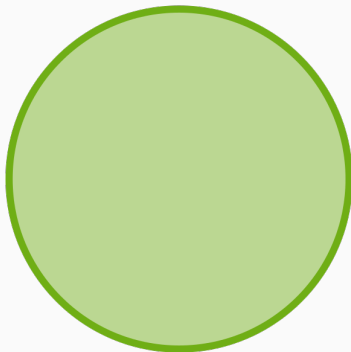
- high reputation
- high quantity
- high revenue

Funders

- stability
- true signal
- low spending

The system, **growing** under strain

Publishers

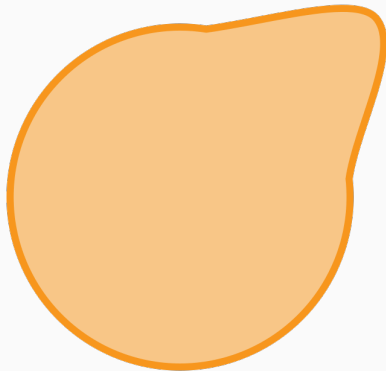


Researchers

Funders

The system, **growing** under strain

Publishers

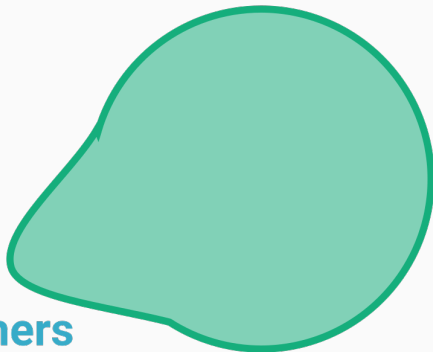


Researchers

Funders

The system, **growing** under strain

Publishers



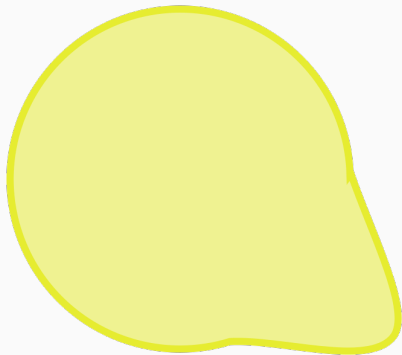
Researchers

Funders

The system, **growing** under strain

Publishers

Researchers



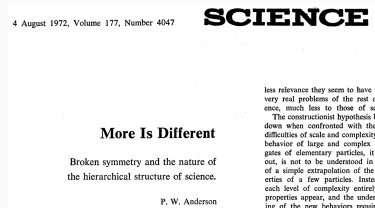
Funders

What is **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**



A semantic shift

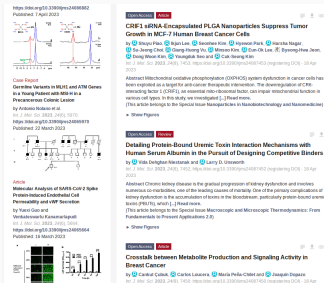
"Journal"

used to mean



A physical object with limited available space

now it also means



A limitless electronic repository with a name

"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?*

"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

"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"*

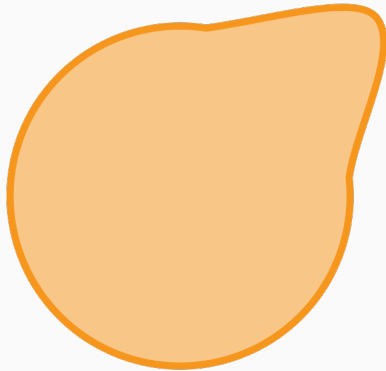
Incentive to ↑↑ quantity,
quality? ...

Our analysis:

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

So, this

Publishers



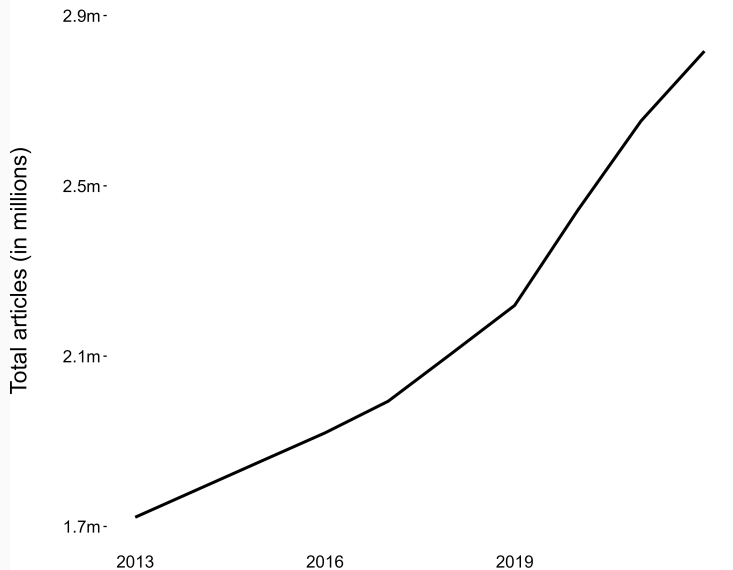
Researchers

Funders

Wanna know more? **get our preprint**



Which **trends and threats** hide behind this exceptional growth?



Source: N papers -- Scimago website data; N PhDs - OECD

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**

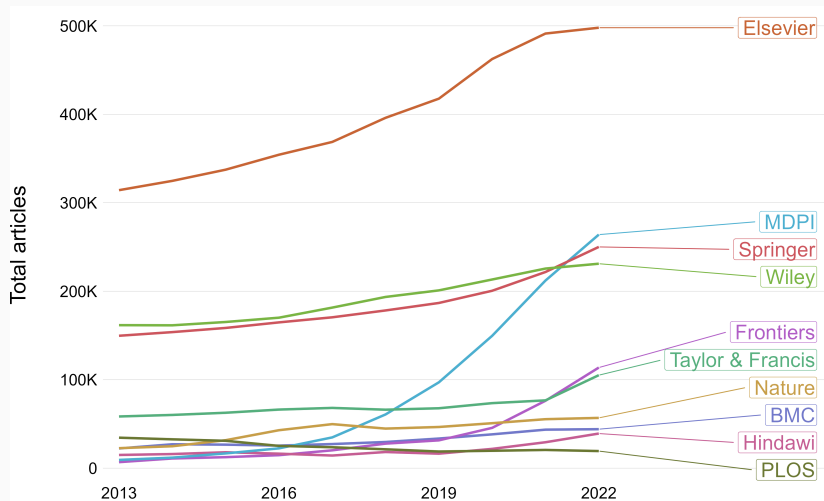
None of them is critical *per se*
together they indicate **strain imposed by publishers**

We exploit data coming from various sources:

- A full scrape of the **Scimago Journal Rankings** database
used for: comparisons across publishers, IF, SJR rank...
- OECD and US NSF data
used for: number of PhDs awarded per year
- **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

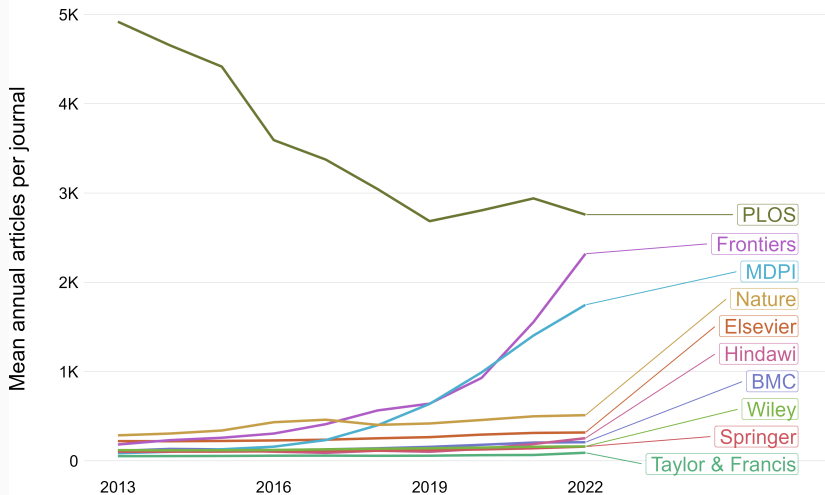
Number of articles & journal size

The rise of **new** publishers



Source: Scimago website data

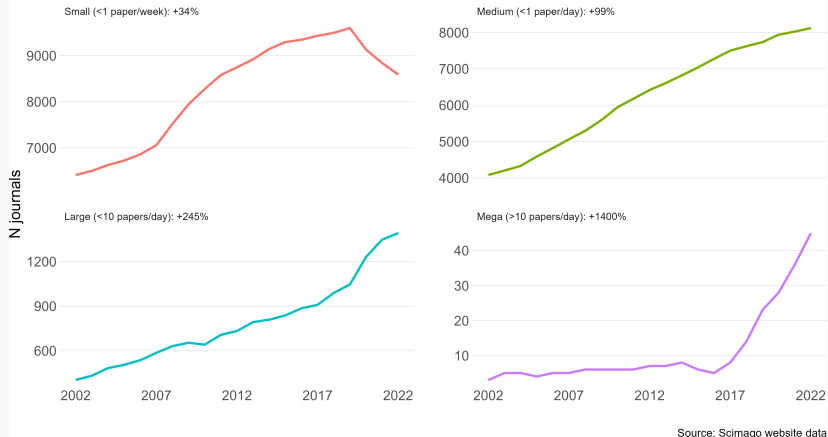
Bigger journals



Source: Scimago website data

The rise of **mega-journals**

Number of journals by class of size, 2002-22



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

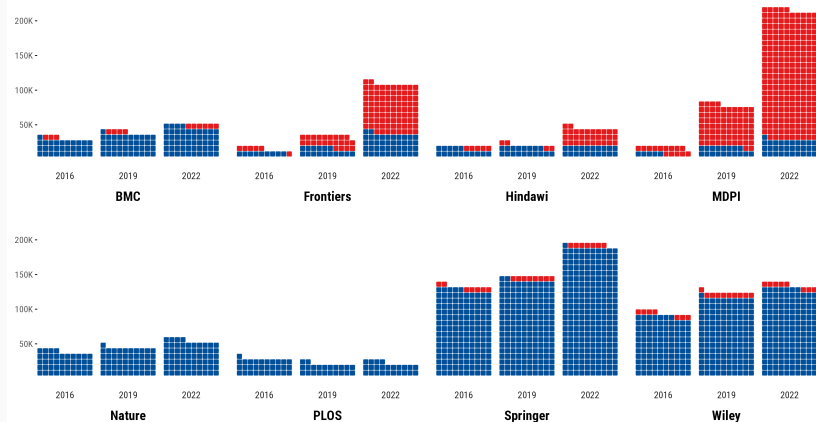
- How much can a journal **inflate** before it **loses** reputation?
- Risk of **instability** of quality signals

The role of special issues

Not so special after all

Number of papers published in regular vs special issues, 2016-22

One square = 800 articles



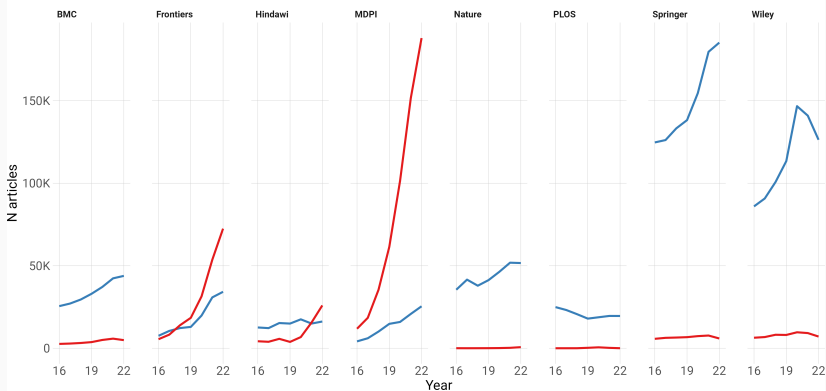
Source: data scraped from the publisher's website

Note: Special issues are called Collections at PLOS and Topics at Frontiers. For MDPI Collections, Sections and Topics not shown.

Not so special after all

Number of papers published in regular vs special issues, 2016-22

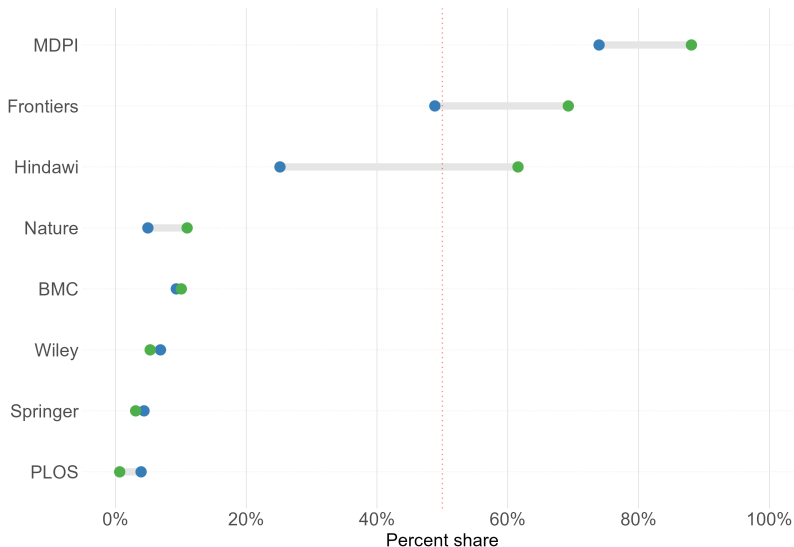
Wiley decrease in 2022 likely due to limited coverage of Wiley papers in 2022



Source: data scraped from the publisher's website
Notes: Special issues are called Collections at PLOS and Topics at Frontiers. For MDPI Collections, Sections and Topics not shown.

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

Evolution of the share of papers appearing in Special Issues, 2016 to 2022



Source: data scraped from the publishers' website
Special issues are called Collections at PLOS and Topics at Frontiers. For MDPI Collections, Sections and Topics not shown.

What's going on?

Trends:

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

Why?

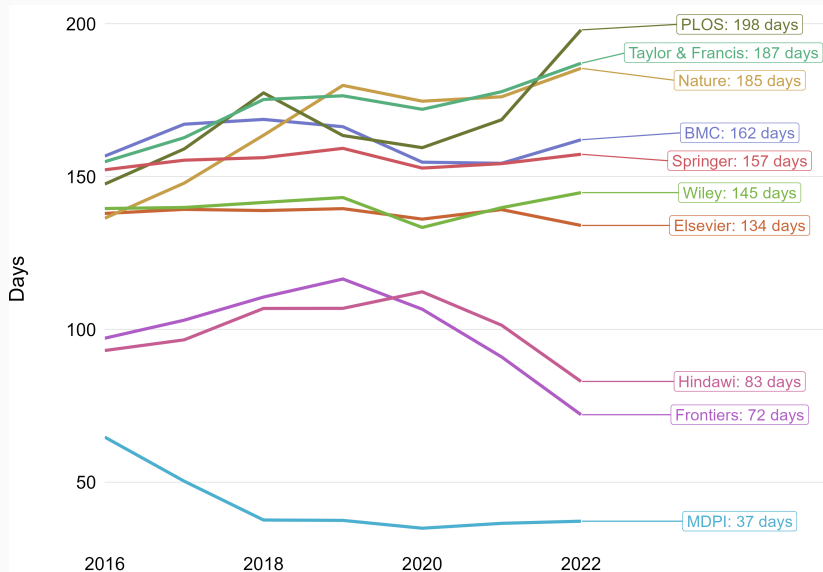
- Mobilization of an **army of guest editors** & their networks

Threats

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

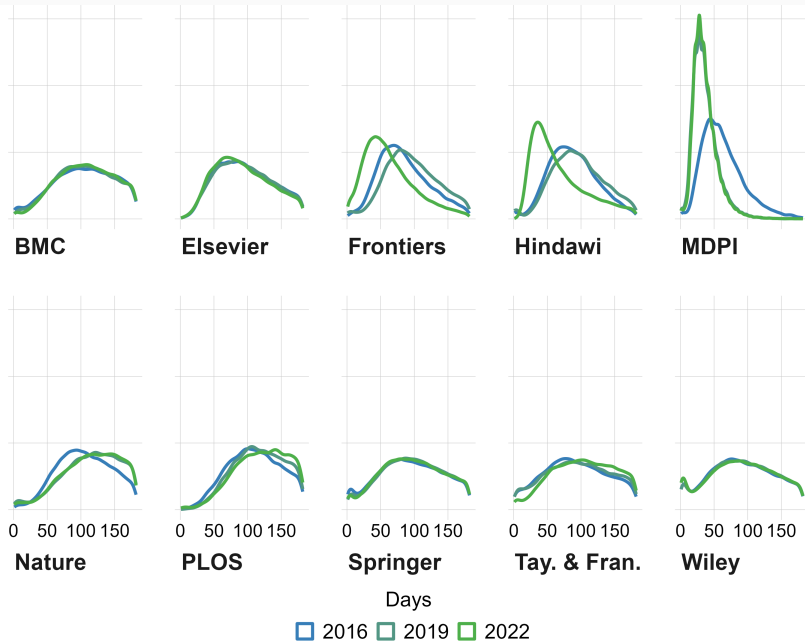
Turnaround times

Turnaround times have **decreased** for all for-profit OA publishers



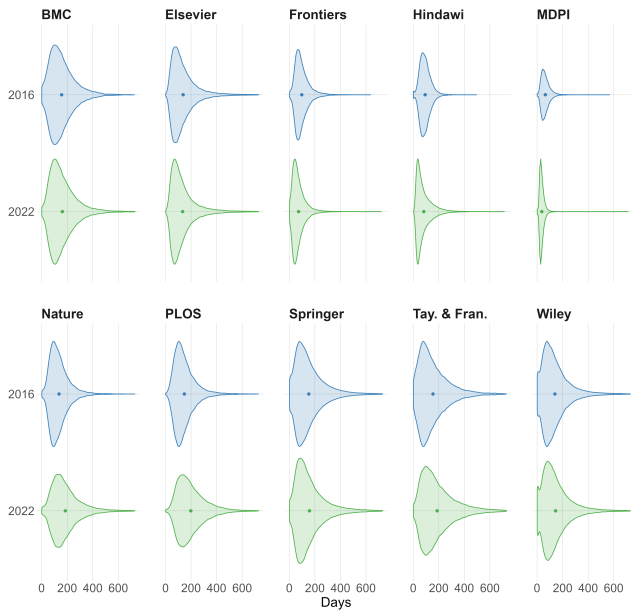
Source: data scraped on the publishers' website

Turnaround times are getting **more homogeneous**

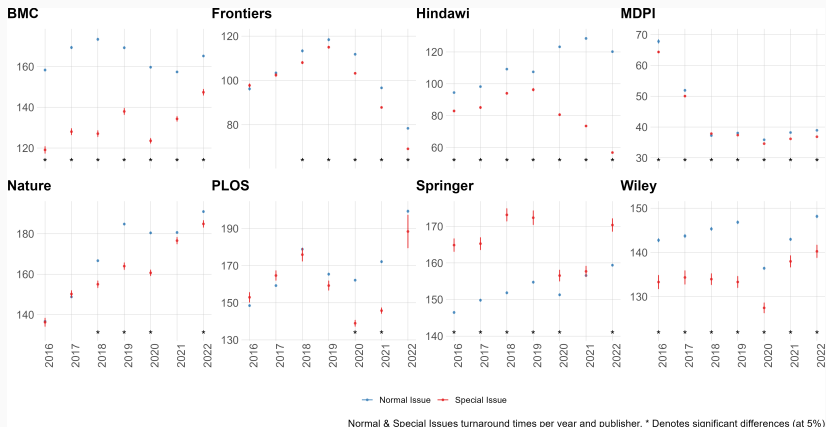


Turnaround times are getting **more homogeneous**

Article heterogeneity in turnaround times by publisher, 2016-22



Lower TATs for Special Issues



What's going on?

Trends:

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

Why?

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

Threats

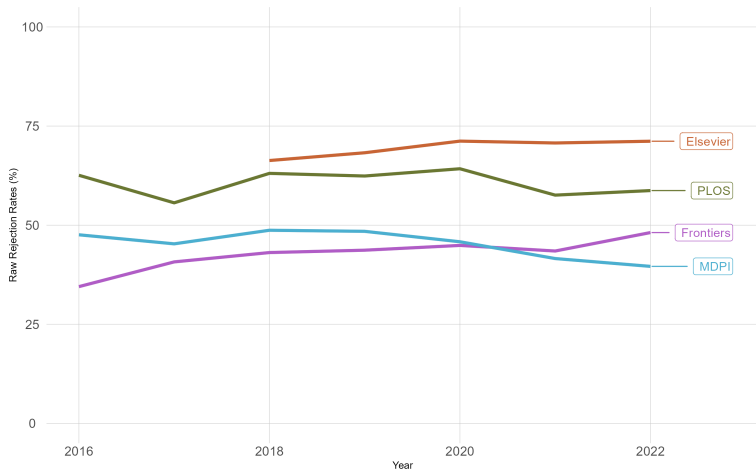
- Lower TAT must still allow for **proper peer review**
- Some TAT **so low**, it casts doubts on quality

Rejection rates

Rejection rates: absolute values

Evolution of raw rejection rates

Raw rejection rates calculated by publishers using own protocols (not standardised)

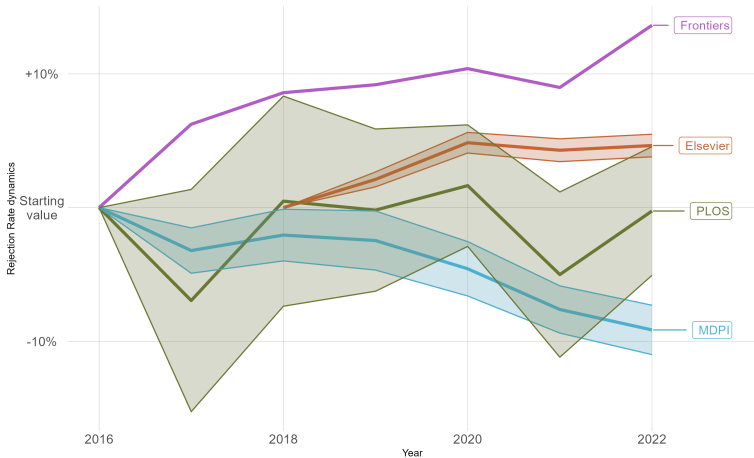


Source: web scraped data

Rejection rates: **normalized**

Evolution of normalised rejection rates

With respect to the first year in our dataset

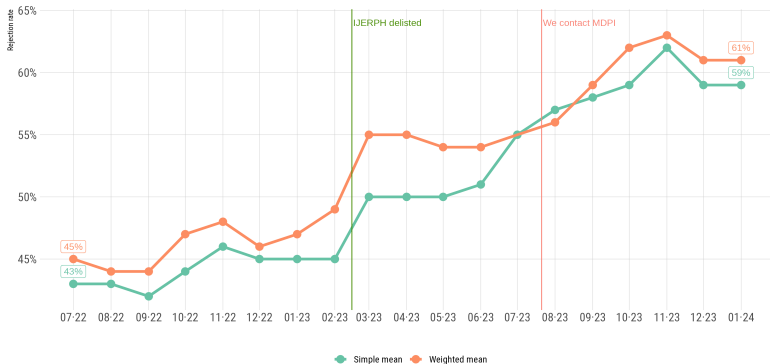


Shaded areas represent 95% CI, Frontiers has no CI as Frontiers data are aggregate over all journals from annual reports
Source: web scraped data

To be fair: RR at MDPI on the rise since 2023

Monthly Rejection rates at MDPI, 2022-2023

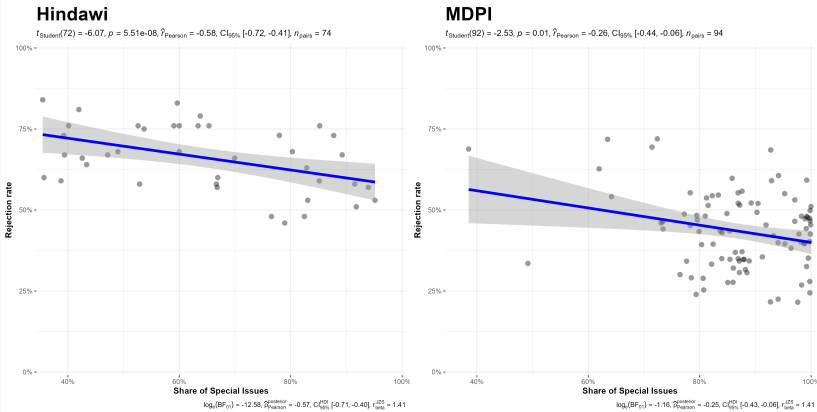
Simple or weighted by the number of papers published in each journal



More SIs, less rejections

Share of Special Issues and Rejection Rate at Hindawi and MDPI

92 MDPI journals with an IF as of January 2023, 72 Hindawi journals for which we have data



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

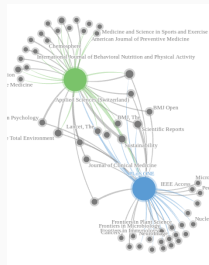
We measure **Impact Factor Inflation** as the ratio of IF to SJR

Impact Factor:

- cites/document at N years
- easily gamed

SJR: citation network counts

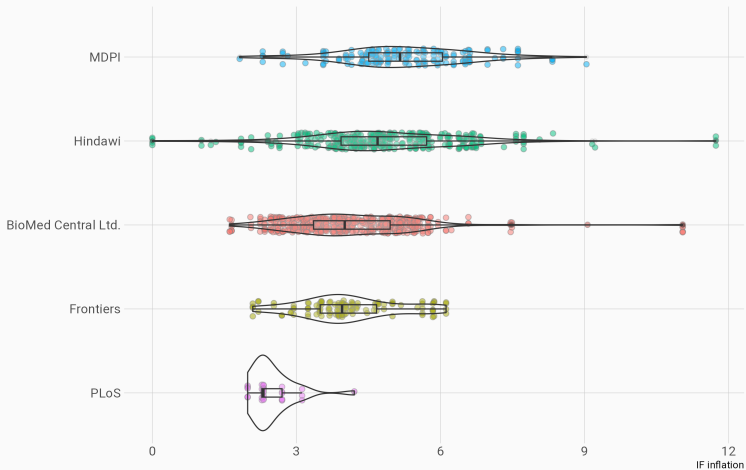
- Limits prestige from single source
- More prestige if cited by relevant journals
- Normalizes for field size
- Less easily gamed



IF inflation 2021: some publishers

Impact Factor inflation, 2021

2y cites over SJR

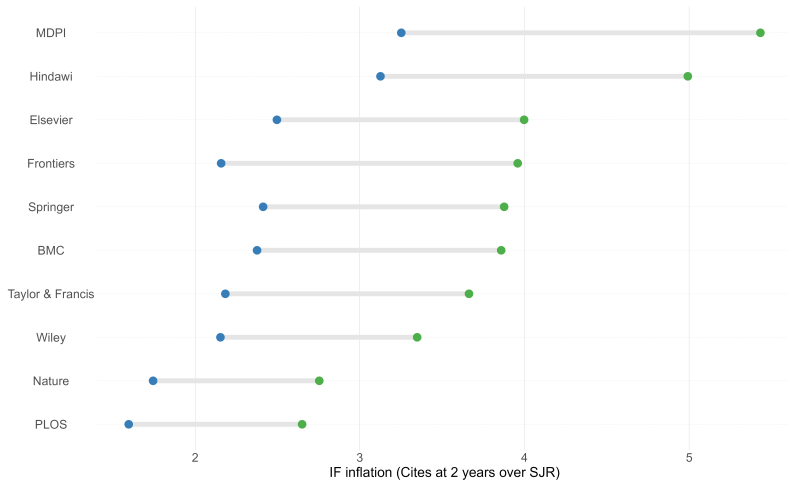


Scimago data -- analysis MH, PC, PGB, DB

Evolution of IF inflation

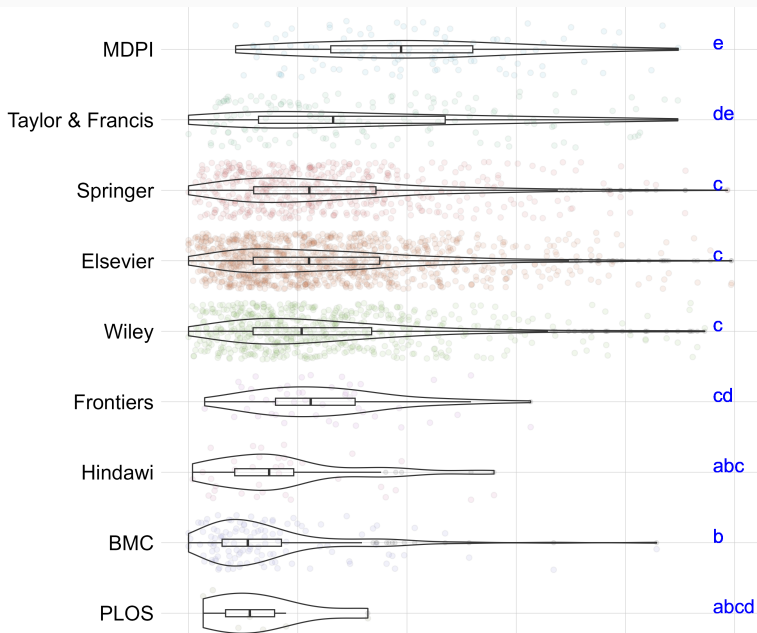
A

Evolution of Impact Factor inflation: 2016 to 2022



Source: Scimago website data

IF inflation: why? **Self-cites**



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

At a glance

Strain indicators at a glance: 2022 and evolution 2016-22

	2022					Change 2016-22				
	TOTAL ARTICLES	SHARE SPECIAL ISSUE	TURNAROUND TIME (DAYS)	REJECTION RATE	IMPACT INFLATION	TOTAL ARTICLES	SHARE SPECIAL ISSUE	TURNAROUND TIME (DAYS)	REJECTION RATE	IMPACT INFLATION
Overall	2816k	38%	116	62%	3.3	+47%	+27pp	-23	-1pp	+1.1
Elsevier	498k	--	134	71%	4.0	+41%	--	-4	+5pp*	+1.5
MDPI	264k	88%	37	40%	5.4	+1080%	+14pp	-28	-8pp	+2.2
Springer	250k	3%	157	--	3.9	+52%	-1pp	+5	--	+1.5
Wiley	231k	5%	145	--	3.3	+36%	-2pp	+5	--	+1.2
Frontiers	114k	69%	72	48%	4.0	+675%	+20pp	-25	+14pp	+1.8
Taylor & Francis	105k	--	--	--	3.7	+59%	--	--	--	+1.5
Nature	57k	11%	185	--	2.8	+32%	+6pp	+49	--	+1
BMC	44k	10%	162	--	3.9	+73%	+1pp	+5	--	+1.5
Hindawi	39k	62%	83	74%	5.0	+139%	+36pp	-10	+3pp ^o	+1.9
PLOS	19k	1%	198	59%	2.6	-23%	-3pp	+50	-4pp	+1.1

Strain indicators at a glance: 2022 and evolution 2016-22

	2022					Change 2016-22				
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Taylor & Francis	105k	--	--	--	3.7	+59%	--	--	--	+1.5
Nature	57k	11%	185	--	2.8	+32%	+6pp	+49	--	+1
BMC	44k	10%	162	--	3.9	+73%	+1pp	+5	--	+1.5
Hindawi	39k	62%	83	74%	5.0	+139%	+36pp	-10	+3pp ^o	+1.9
PLOS	19k	1%	198	59%	2.6	-23%	-3pp	+50	-4pp	+1.1

What can **you** do?

Explore our data!

We built a tool that lets you explore data journal by journal

https://pagoba.shinyapps.io/strain__explorer/



How to **survive** in this system

as a reader Read.The.Papers. No shortcut. Discuss. Use social media.

How to **survive** in this system

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as an author If it looks too good to be true, it ain't true. No shortcut. Be aware.

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as a practitioner Science is still alive and kicking. Under a pile of mediocre stuff. Be aware. Dig deeper.

as a funder Focus on quality rather than quantity. Beware of the perverse effects of your incentives.

Thank you!