

# We've got issues

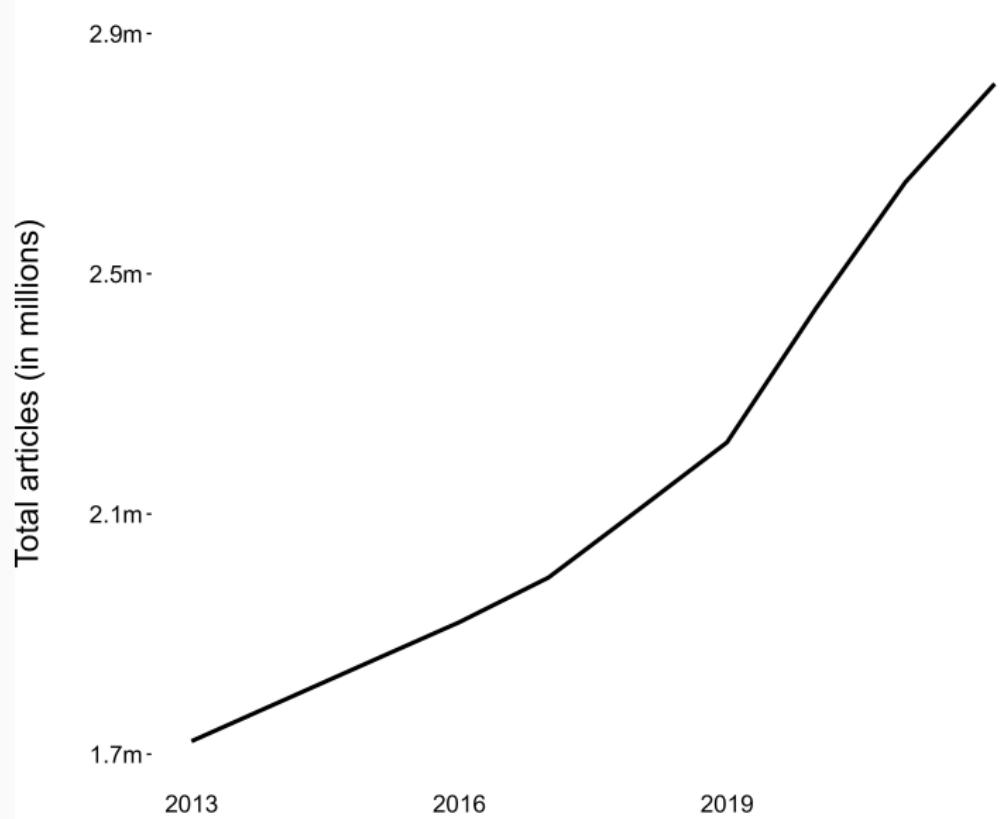
Understanding the current strain on scientific publishing

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

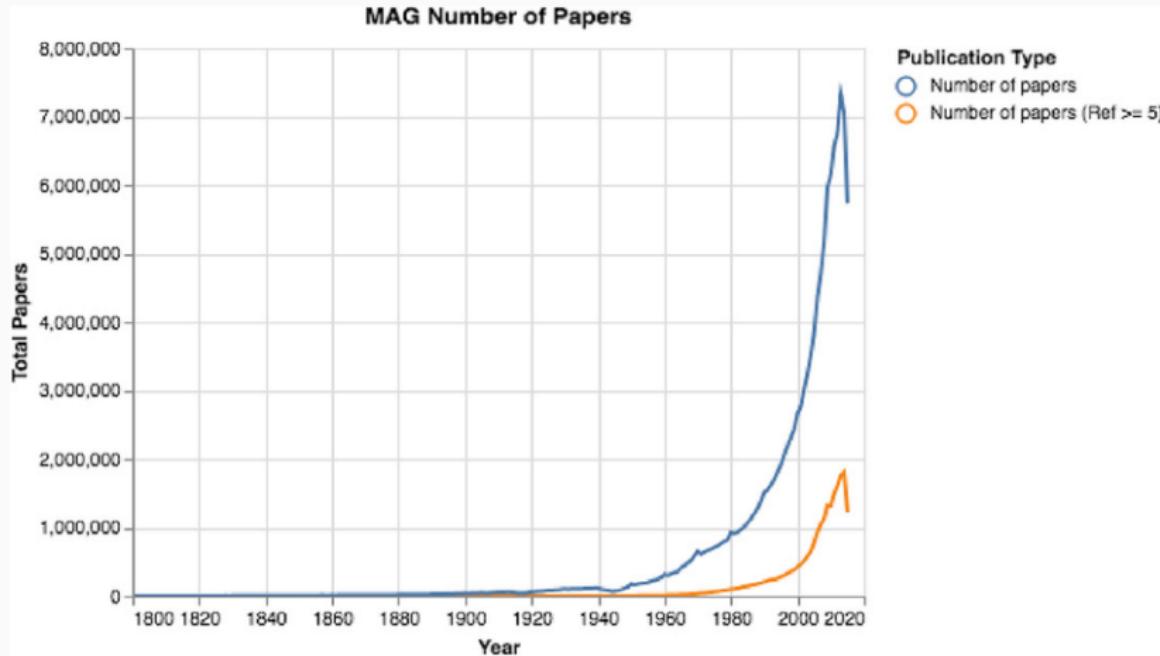
NEOMA BUSiness School – June 19th, 2024

# Academic publishing is undergoing an **exponential** growth



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

# This is not news



Source: Fire & Guestrin 2019

...and people have been complaining about it for a **long** time

In 1958, when James D. Watson worked his way up to the rank of associate professor at Harvard, the young biochemist had on his curriculum vitae 18 papers. One of them, published 5 years earlier, described the structure of deoxyribonucleic acid.

Today, the bibliography of a candidate facing a similar climb often lists 50 or even 100 papers.

As the comparison suggests, paper inflation has become a fact of academic life during the past two decades. This is

Science, March 1981

# a LONG time

ance and impudence.

Aristotle, when he enumerated the purposes (by which an author must be guided) and had come to the last one, therefore said: 'Everything else is either superfluousness or greed', by which he meant ignorance and insolence.

*34 The great number of scholarly works available is an obstacle on the path to attaining scholarship*

It should be known that among the things that are harmful to the human quest for knowledge and to the attainment of a thorough scholarship are the great number of works available, the large variety in technical terminology (needed for purposes) of instruction, and the numerous methods (used in those works). The student is required to have a ready knowledge of all that. Only then is he considered an accomplished scholar.

Thus, the student must know all the works, or most of them, and observe the methods used in them. His whole lifetime would not

# OLD MAN YELLS AT CLOUD

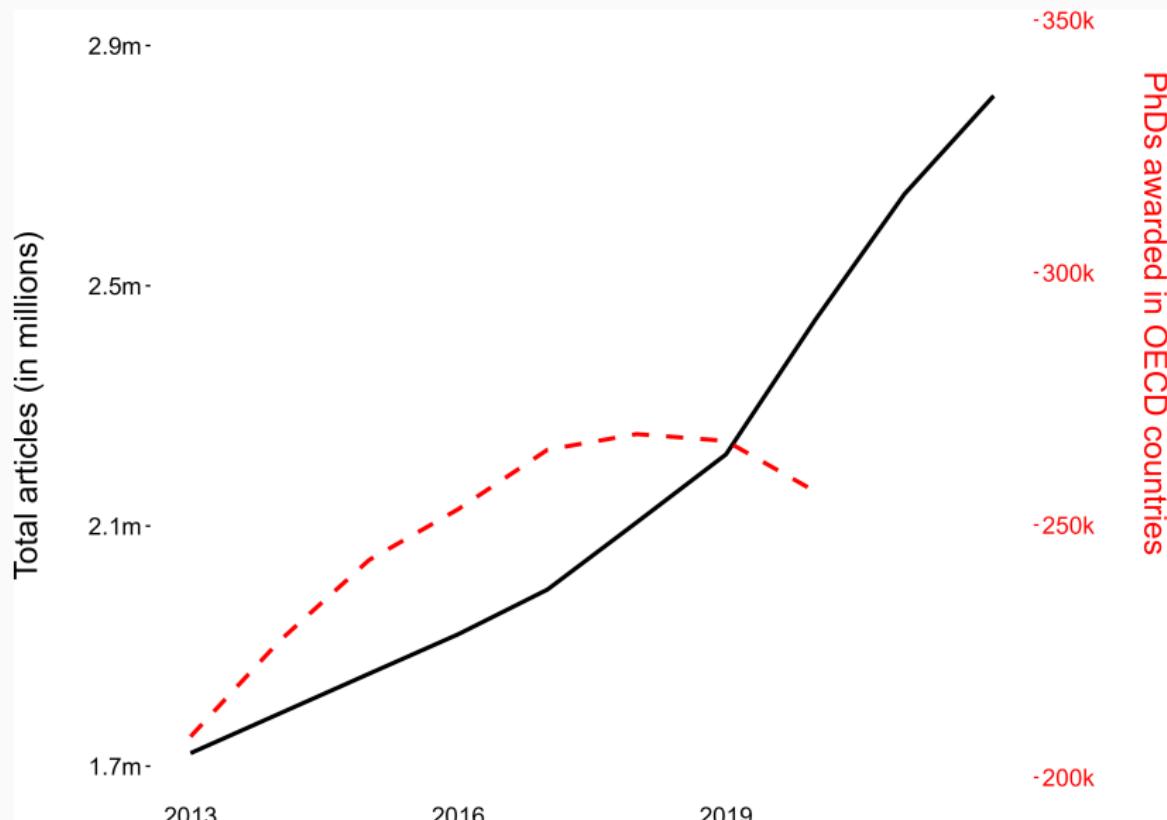


Older Abraham Simeon

## 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

Chris Chambers  @chrisdc77 · 16h

Following Elsevier's decision to raise the APC for NeuroImage to \$3,450, all editors (inc. EiCs [@fmrib\\_steven](#) [@tobermann](#) [@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 ~~a~~ ALTc 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

# ...and 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**

...and 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.

# ...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...](https://mdpi.com/journal/symmet...)

Traduire le Tweet

The 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

...and 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

# ...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...](http://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

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

ALT

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: \$3900 / €3400 / £3000

4:30 PM · 4 avr. 2023 · 36,9 k vues

# ...and we've got issues

PHR 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 Künzl<sup>1,2,3\*</sup>, Anke Berger<sup>1,3</sup>, Katarzyna Czabanowska<sup>4</sup>, Raquel Lucas<sup>5</sup>, Andrea Madarasova Geckova<sup>6</sup>, Sarah Mantwill<sup>7</sup> and Olaf von dem Knesebeck<sup>8</sup>

Editors **unable**  
to find referees

# ...and we've got issues

SCIENCEINSIDER | SCIENTIFIC COMMUNITY

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

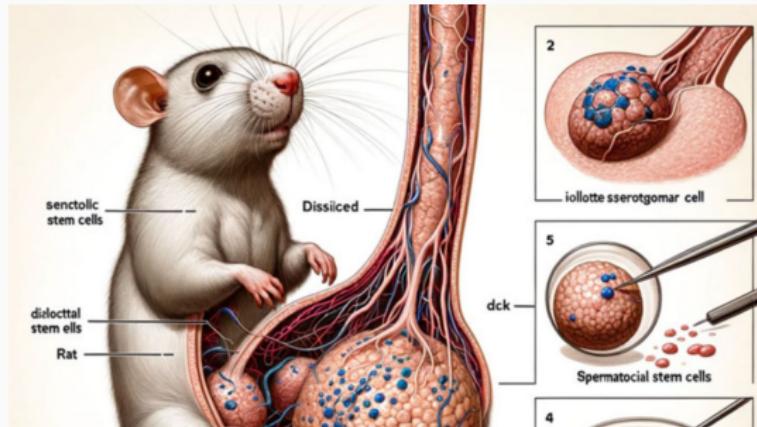
Web of Science delists some 50 journals, including one of the world's largest

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



Mega-journals being  
**delisted** from WoS

...and we've got issues



All this **before**  
the 2023 AI explosion

**How does publishing work?**

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

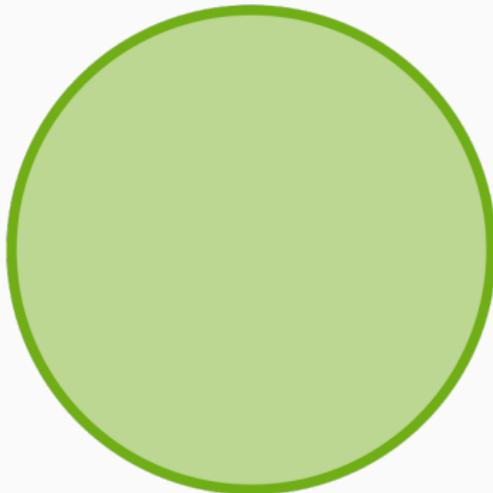
We don't think binary labels improve our understanding

**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

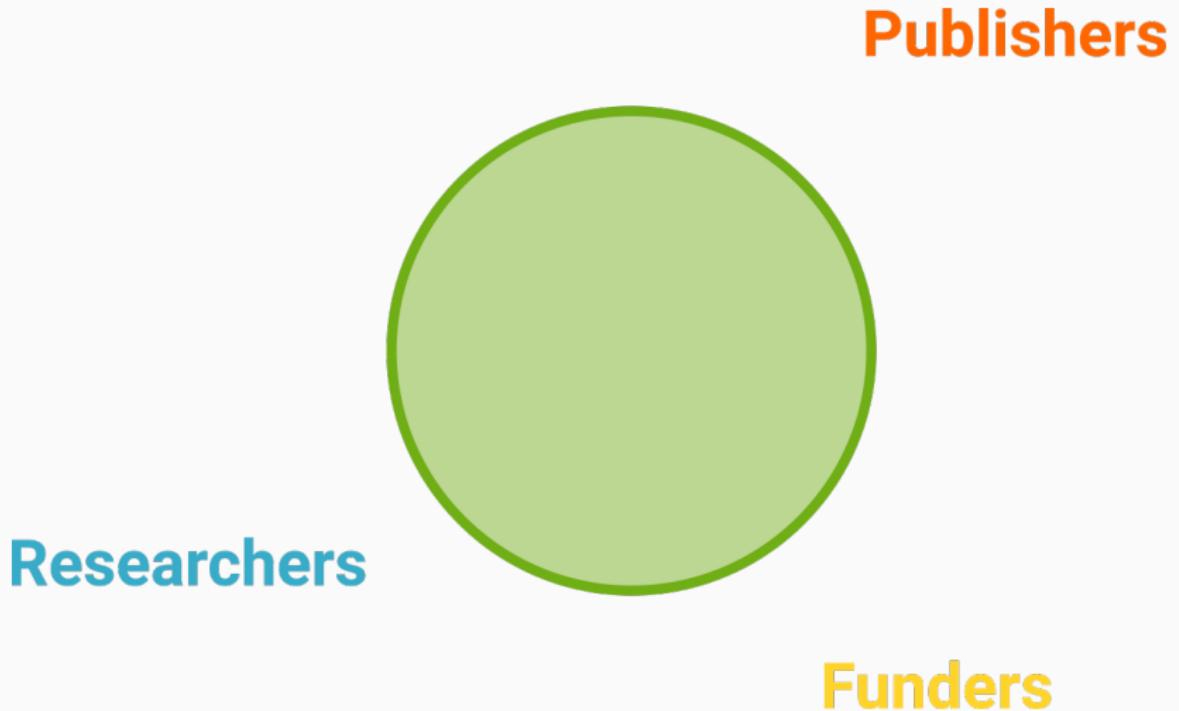
## Publishers

- high reputation
- high quantity
- high revenue

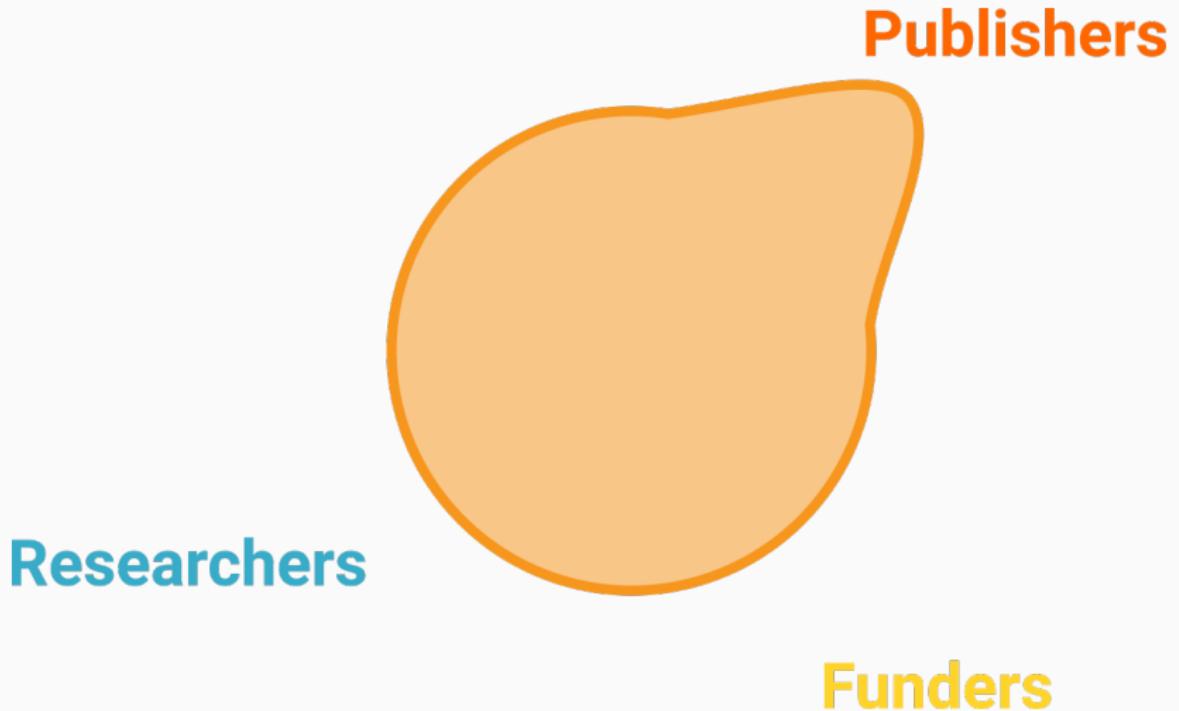
## Funders

- stability
- true signal
- low spending

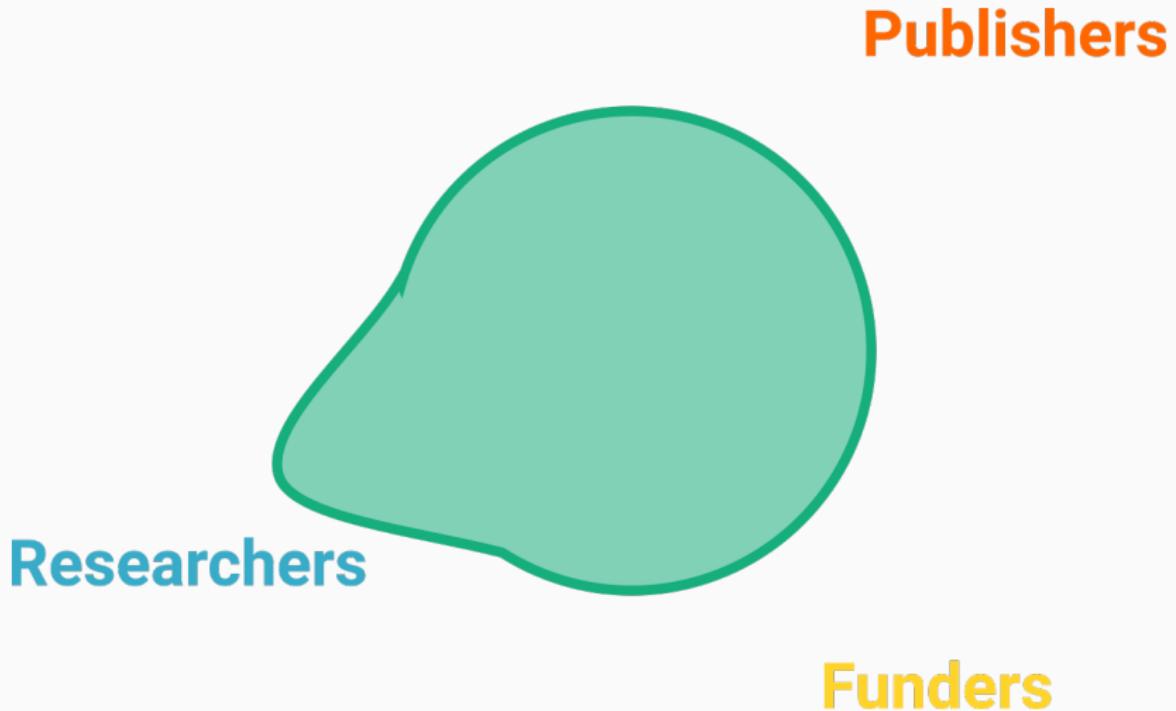
## The system, growing under strain



## The system, growing under strain

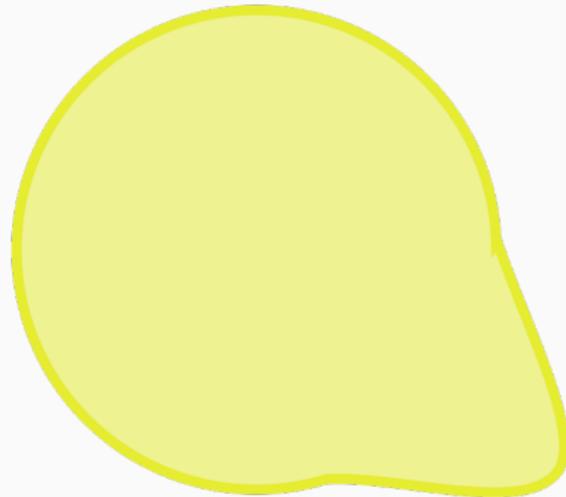


## The system, growing under strain



## The system, growing under strain

Publishers



Funders

**What is going on?**

# More is different

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

4 August 1972, Volume 177, Number 4047

**SCIENCE**

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

## More Is Different

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

P. W. Anderson

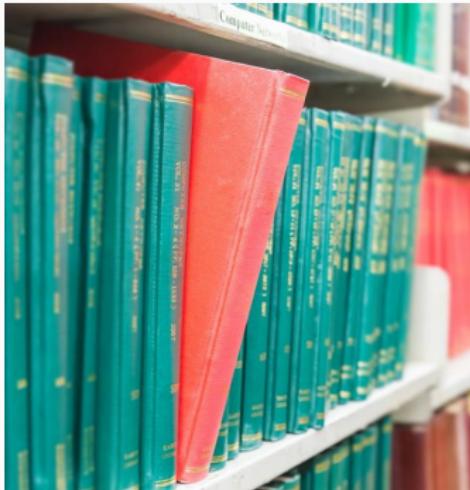
less relevance they seem to have to  
very real problems of the rest of  
science, much less to those of sc

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 derived by a simple  
of a single extrapolation of the  
erties of a few particles. Instead,  
each level of complexity entirely  
properties appear, and the under-  
ing of the new behaviors require

# 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 Jungsik Park, Kijan Lee, Seojeon Kim, Hyojung Park, Harsha Nagar, Se-Jeong Choi, Giang-Huong Vu, Miwon Kim, Eun-Ok Lee, Byung-Hwa Jeon, Sung-Hee Cho, and Kyung-Sub Kim  
DOI: 10.3390/prm24080143, https://doi.org/10.3390/prm24080143 (registering DOI: 10.3390/prm24080143)  
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-Riboswitch 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: 2 March 2023  
by Vida Dehghani-Nestor, Ave D. University, and Lary D. University  
DOI: 10.3390/prm2303002, https://doi.org/10.3390/prm2303002 (registering DOI: 10.3390/prm2303002)  
Abstract Chronic kidney diseases are the greatest 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 urease toxin, which is a major risk factor for mortality. [...] Read more  
► Show Figures

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

Published: 18 March 2023  
by Cagla Celik, Carlos Lascurain, María Pello-Ciudad, and Joaquin Depaele  
DOI: 10.3390/prm2303004, https://doi.org/10.3390/prm2303004 (registering DOI: 10.3390/prm2303004)

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?*

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

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? ...

now it also means

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

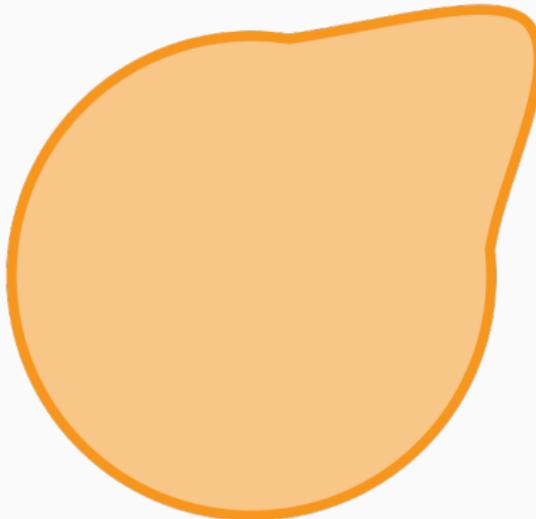
Incentive to ↑ quantity,  
quality? ...

Our analysis:

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

So, this

Publishers



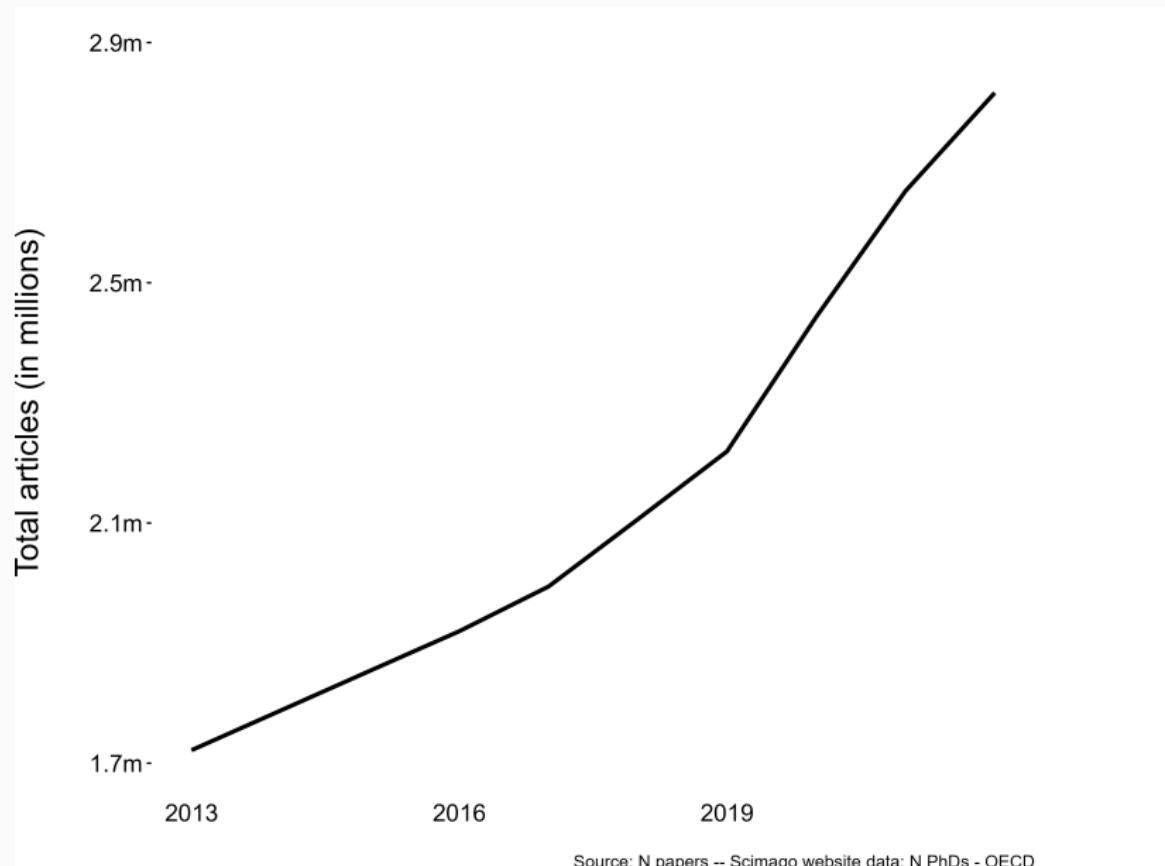
Researchers

Funders

Wanna know more? get our preprint



# Which trends and threats hide behind this exceptional growth?



## 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**

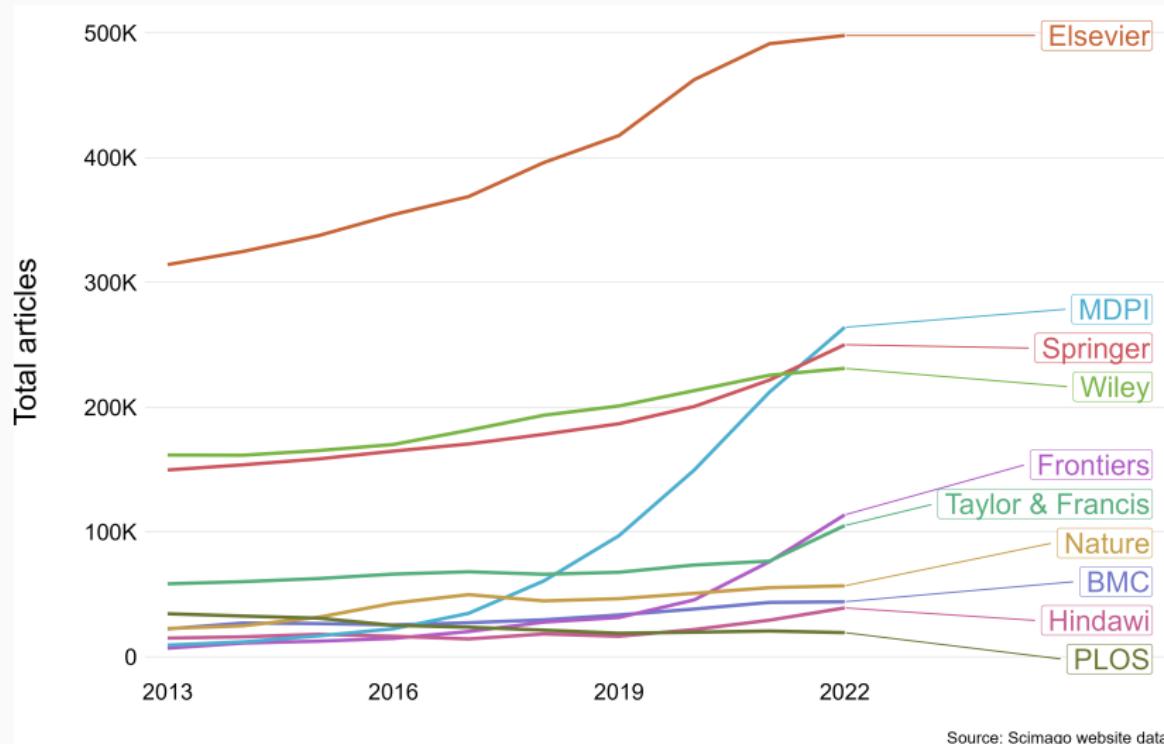
## Data sources

We exploit data coming from various sources:

- A full scrape of the **Scimago Journal Rankings** database  
*used for: comparisons across publishers, IF, SJR rank...*
- 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*

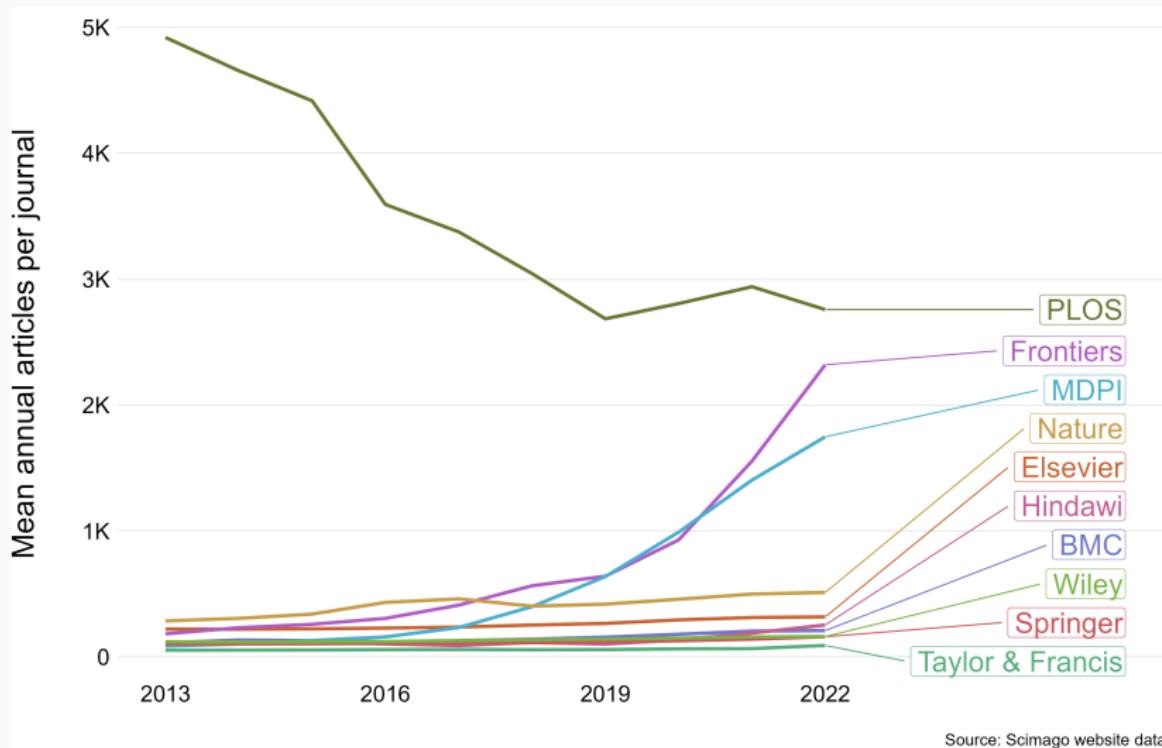
## **Number of articles & journal size**

# The rise of new publishers



Source: Scimago website data

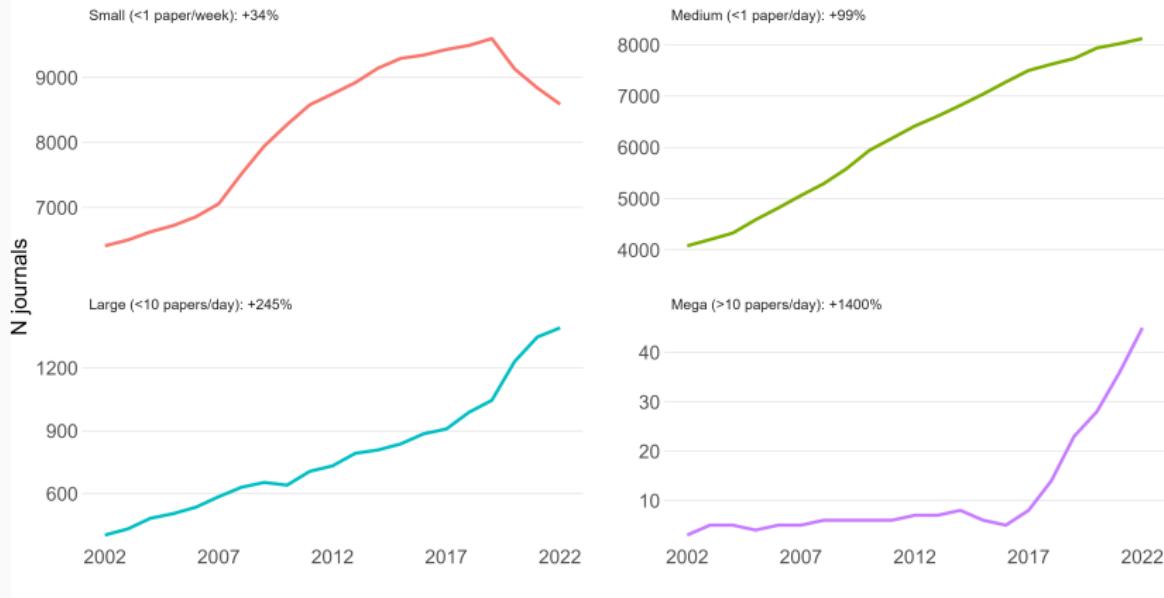
# Bigger journals



Source: Scimago website data

# The rise of mega-journals

Number of journals by class of size, 2002-22



Source: Scimago website data

## 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

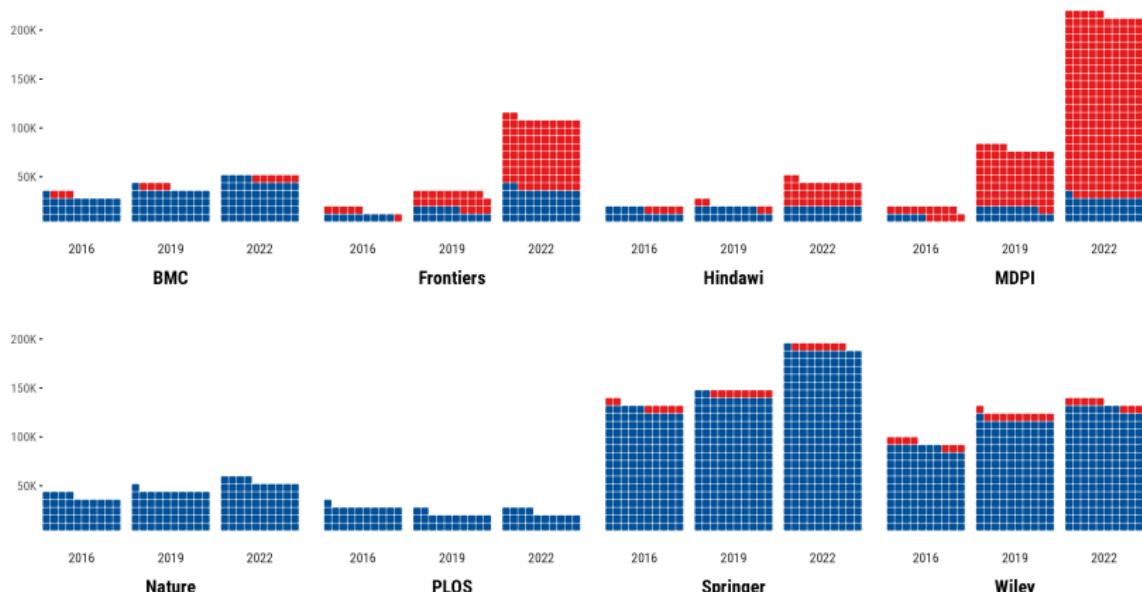
- How much can a journal inflate before it loses reputation?
- Risk of instability of quality signals

## **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



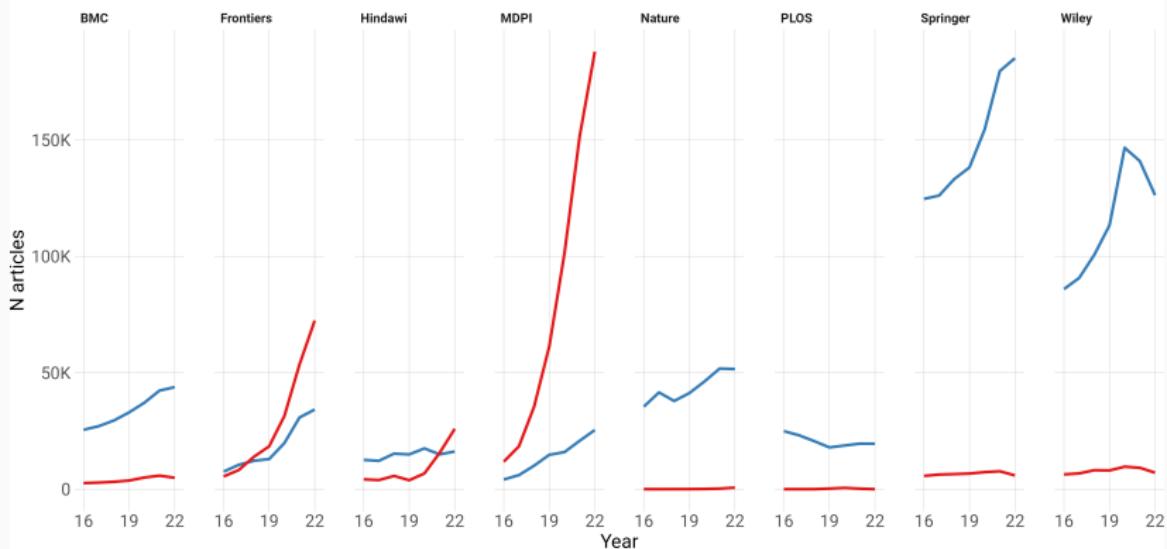
Source: data scraped from the publisher's website

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

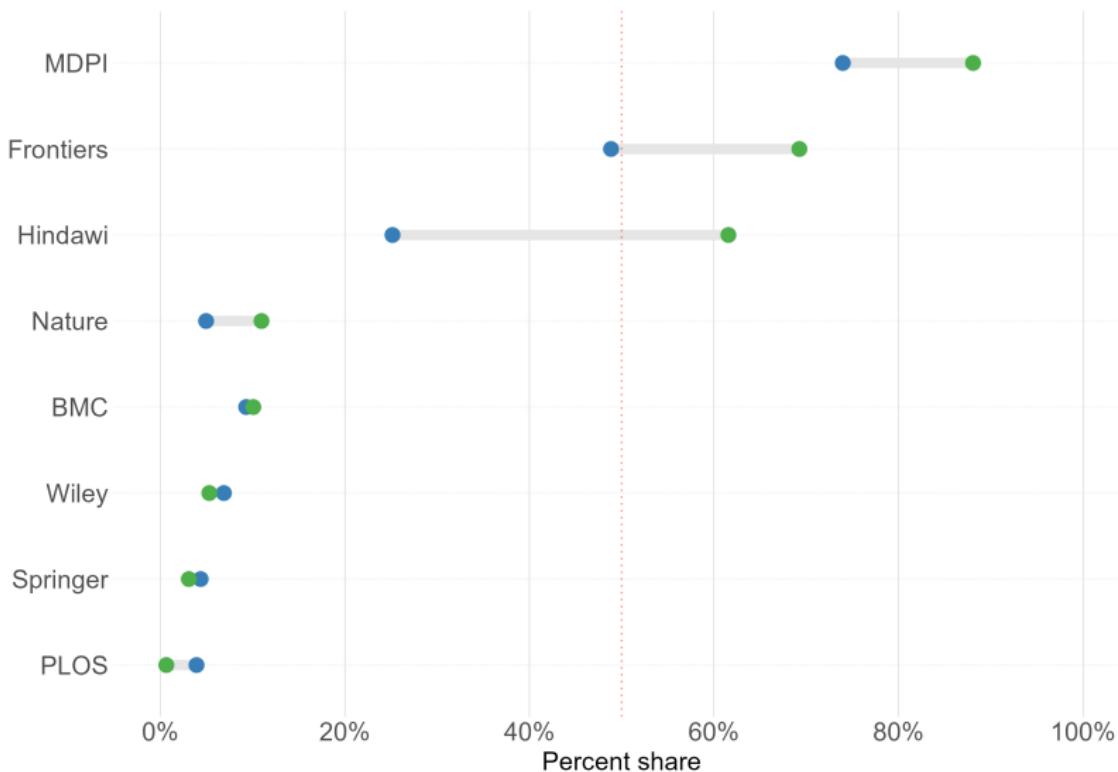


Source: data scraped from the publisher's website

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

# Journals at some 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?

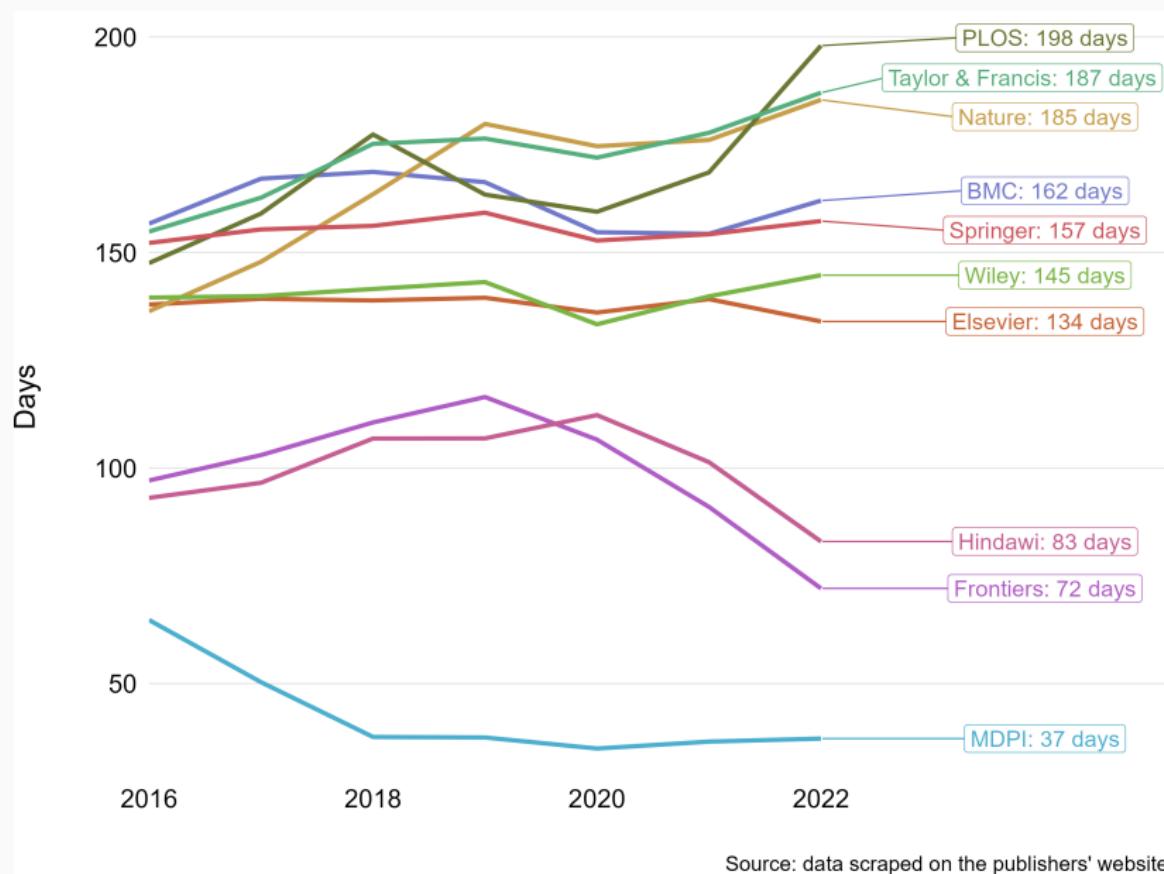
- Mobilization of an **army of guest editors** & their networks

### Threats

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

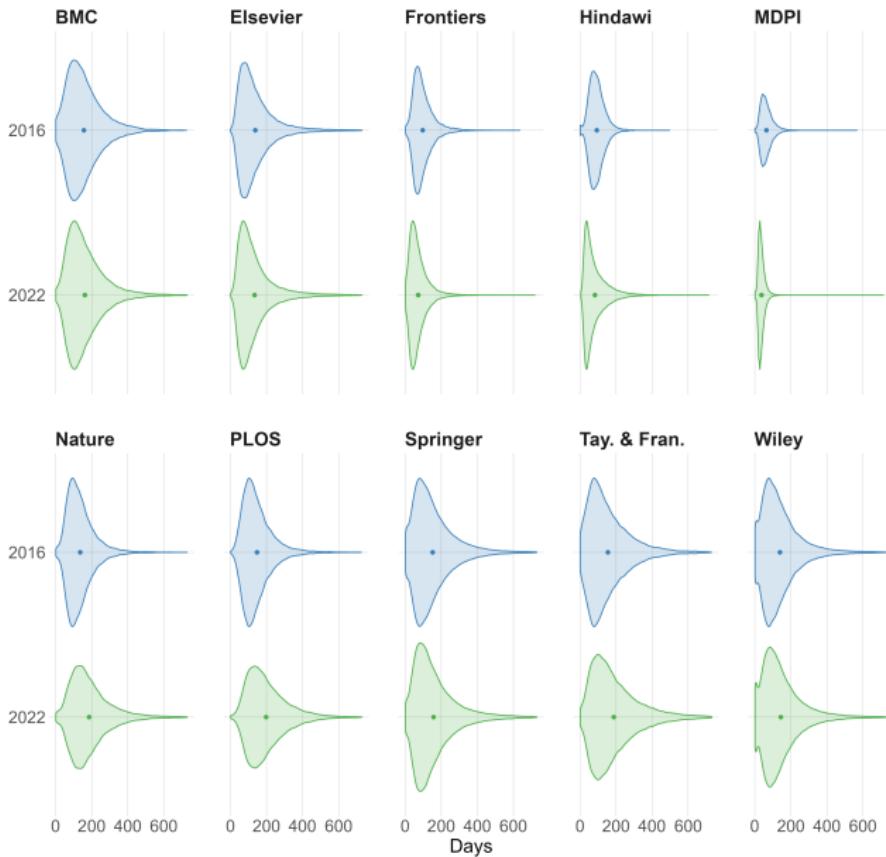
## **Turnaround times**

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

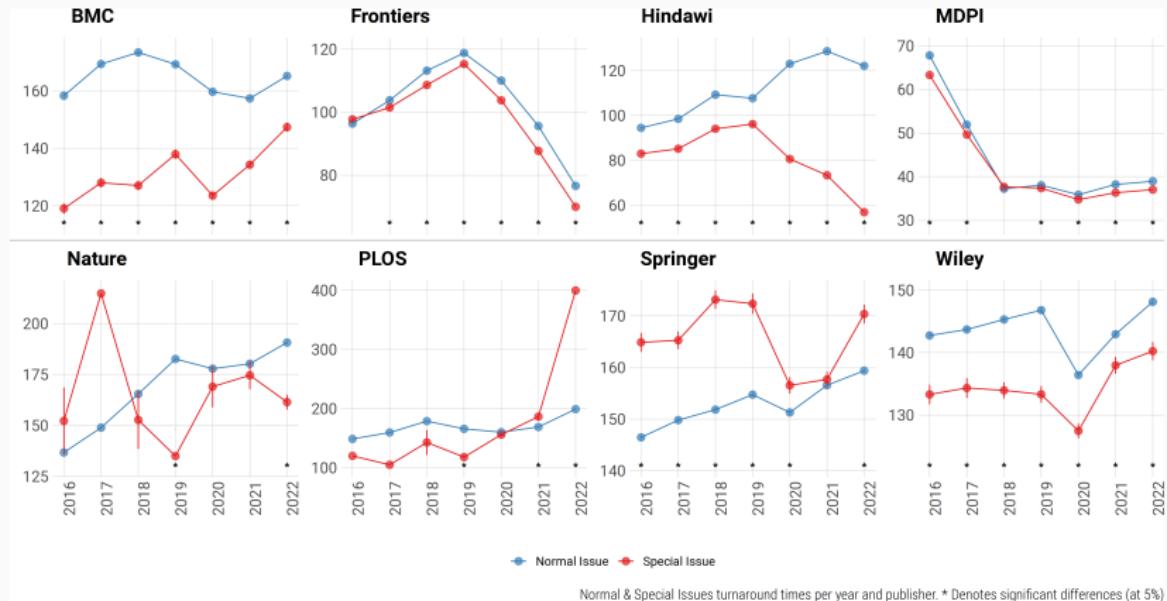


# Turnaround times are getting more homogeneous

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

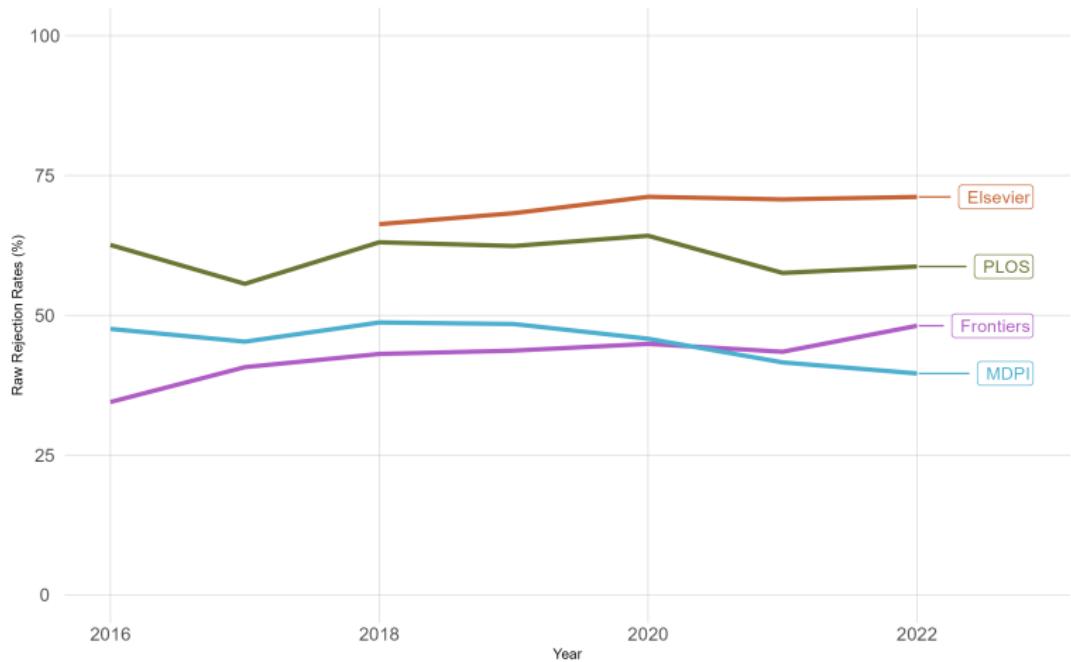
- Lower TAT must still allow for proper peer review
- Some TAT so low, it casts doubts on quality

## **Rejection rates**

# Rejection rates: absolute values

## Evolution of raw rejection rates

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

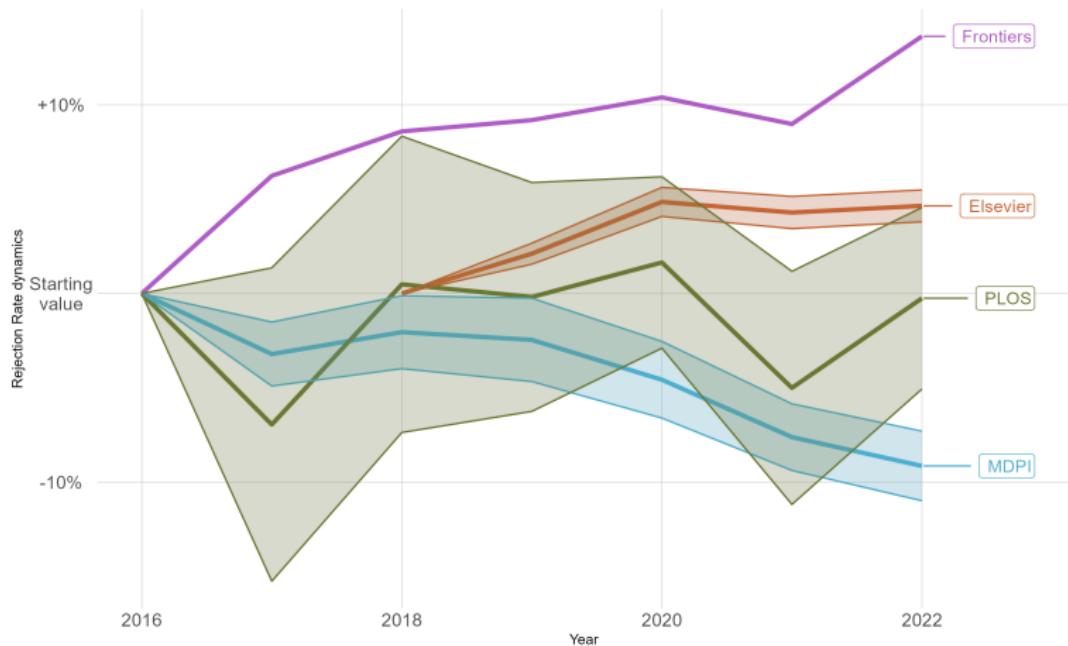


Source: web scraped data

# Rejection rates: normalized

## Evolution of normalised rejection rates

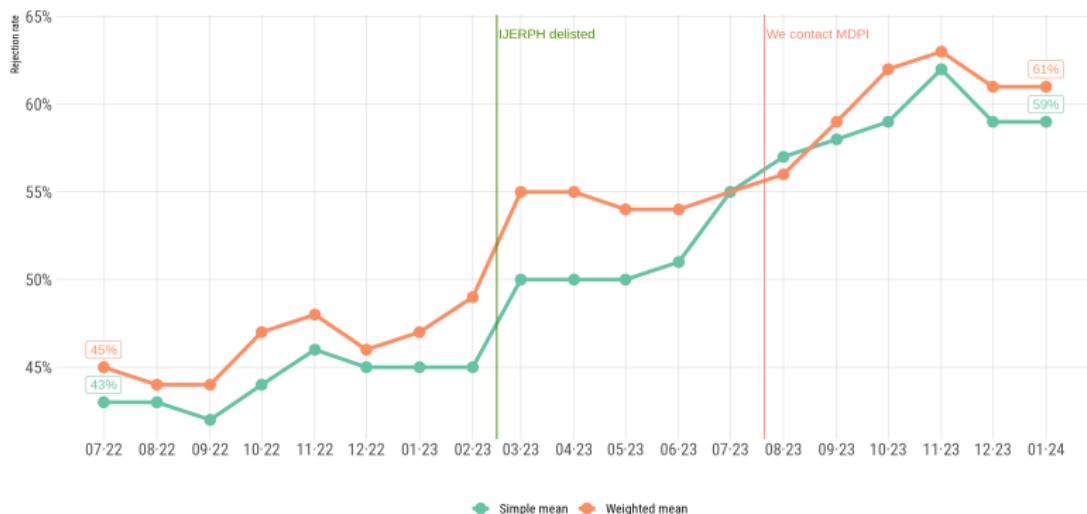
With respect to the first year in our dataset



# 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



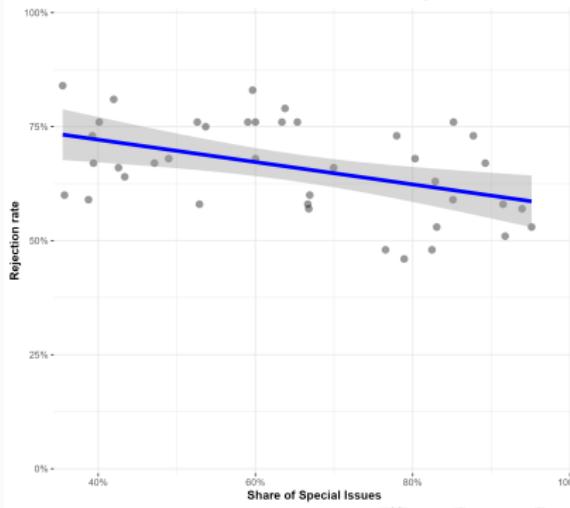
# More SIs, less rejections

## 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

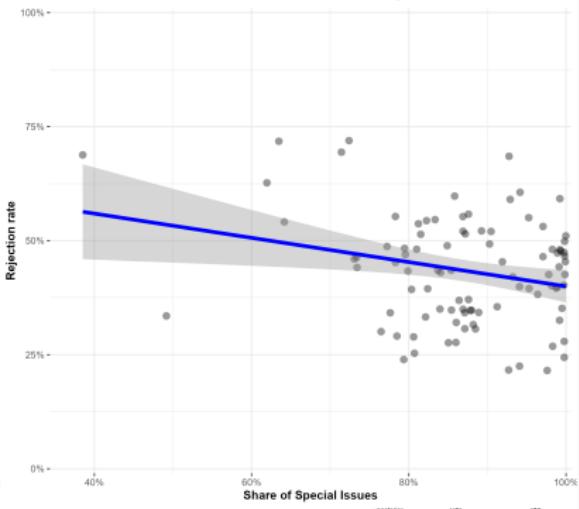
### Hindawi

$t_{Student}(72) = -6.07, p = 5.51e-08, \hat{r}_{Pearson} = -0.58, Cl_{95\%} [-0.72, -0.41], n_{pairs} = 74$



### MDPI

$t_{Student}(92) = -2.53, p = 0.01, \hat{r}_{Pearson} = -0.26, Cl_{95\%} [-0.44, -0.06], n_{pairs} = 94$



# 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

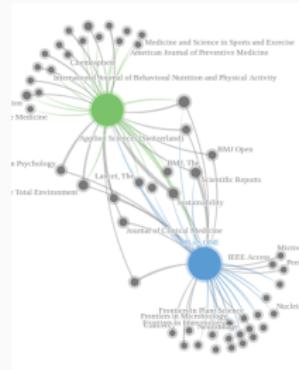
We measure **Impact Factor Inflation** as the ratio of IF to SJR

## Impact Factor:

- cites/document at N years
  - easily gamed

## SJR: citation network counts

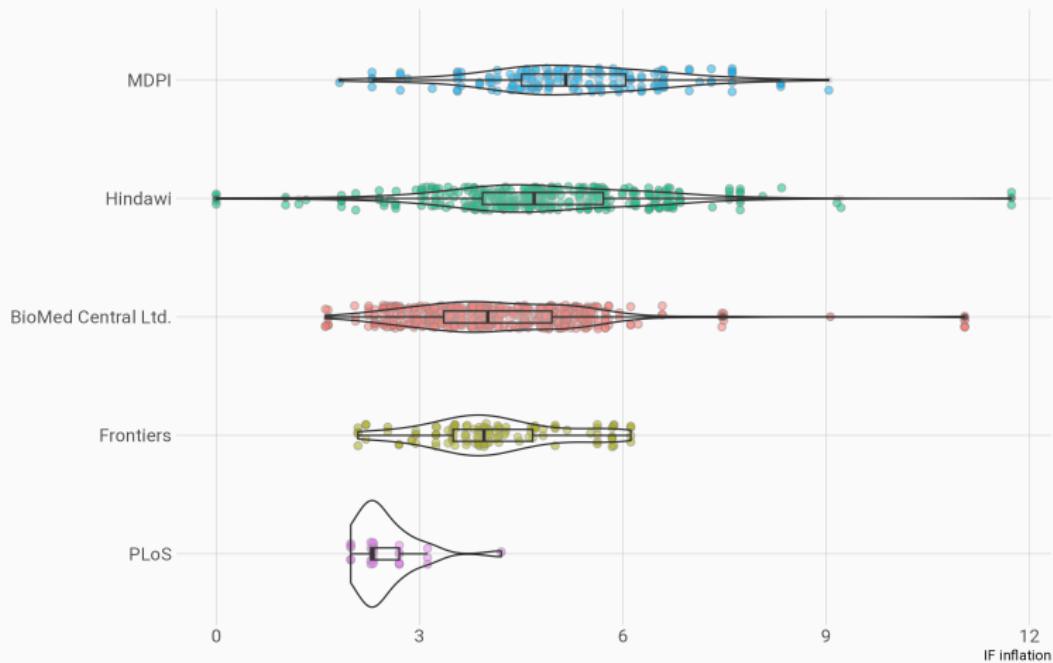
- Limits prestige from single source
  - More prestige if cited by relevant journals
  - Normalizes for field size
  - Less easily gamed



# IF inflation 2021: some publishers

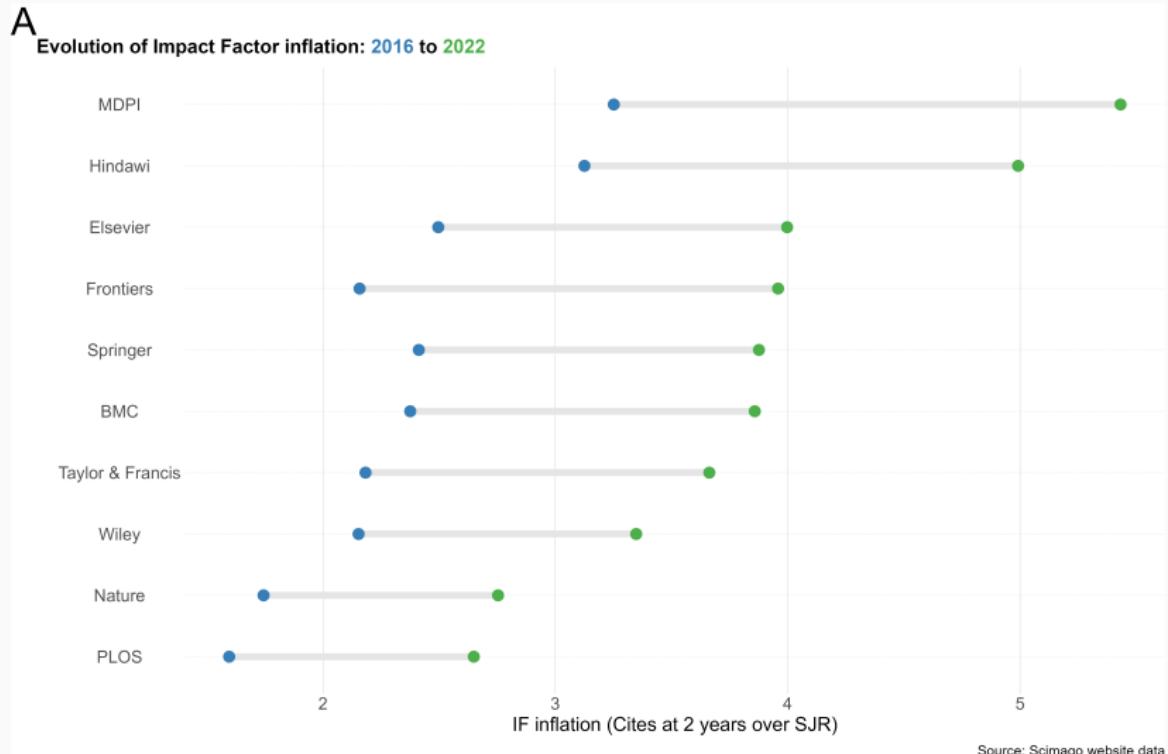
## Impact Factor inflation, 2021

2y cites over SJR

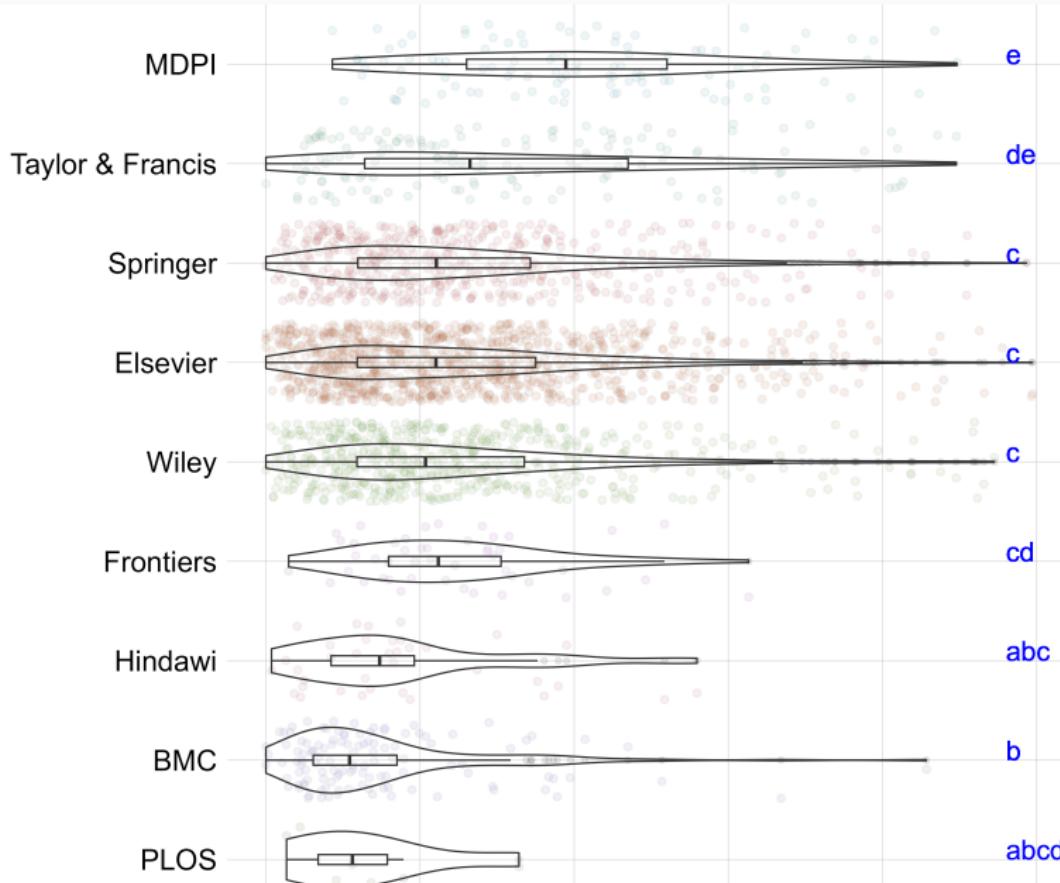


Scimago data – analysis MH, PC, PGB, DB

# Evolution of IF inflation



# IF inflation: why? Self-cites



## What's going on?

### Trends:

- IF is **inflating** – 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**

# 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*          | +1.9             |
| PLOS             | 19k            | 1%                  | 198                    | 59%            | 2.6              | -23%           | -3pp                | +50                    | -4pp           | +1.1             |

# At a glance

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

|                  | 2022           |                     |                        |                |                  | Change 2016-22 |                     |                        |                |                  |
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**Thank you!**