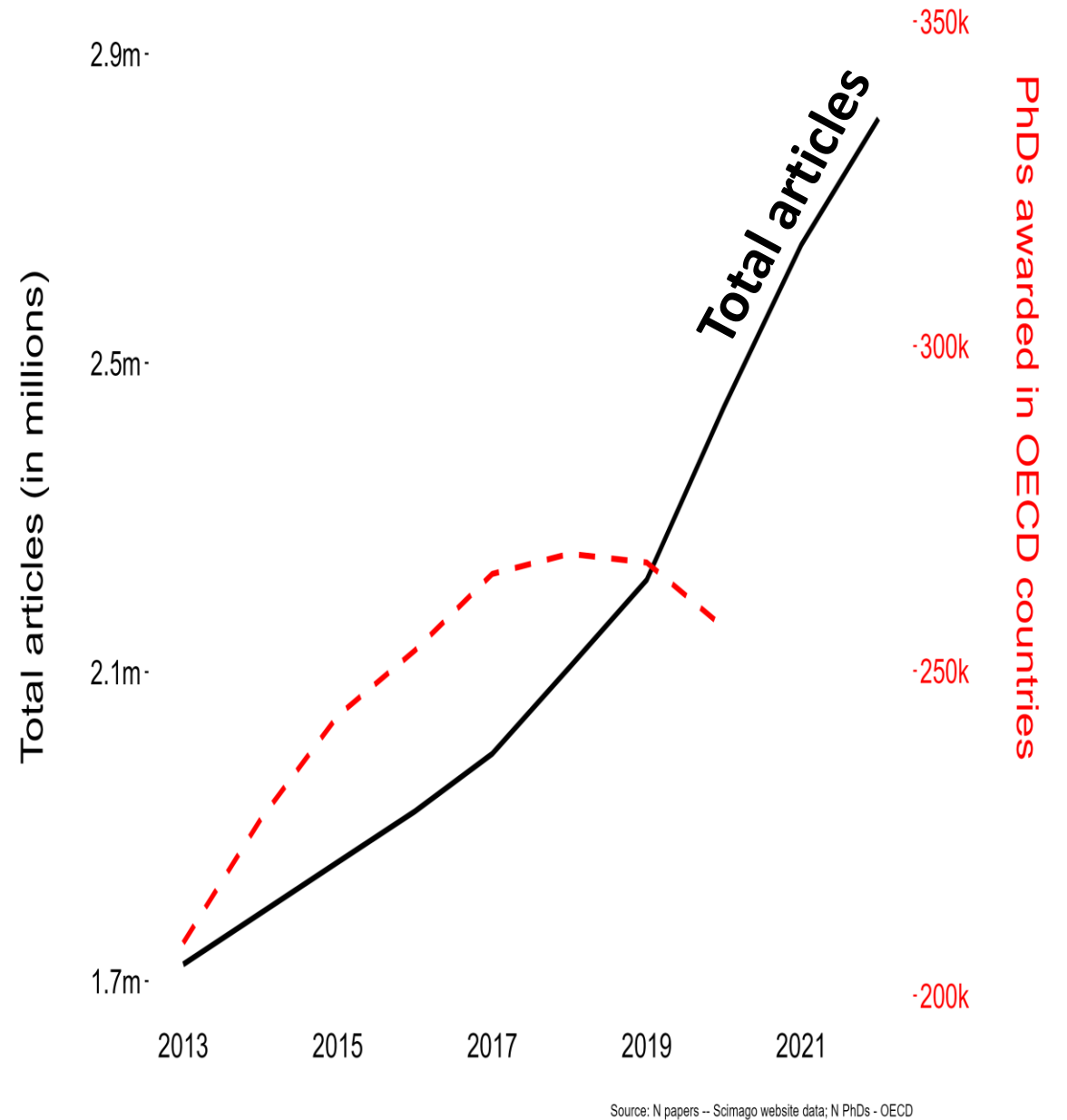


# The **strain** on scientific publishing

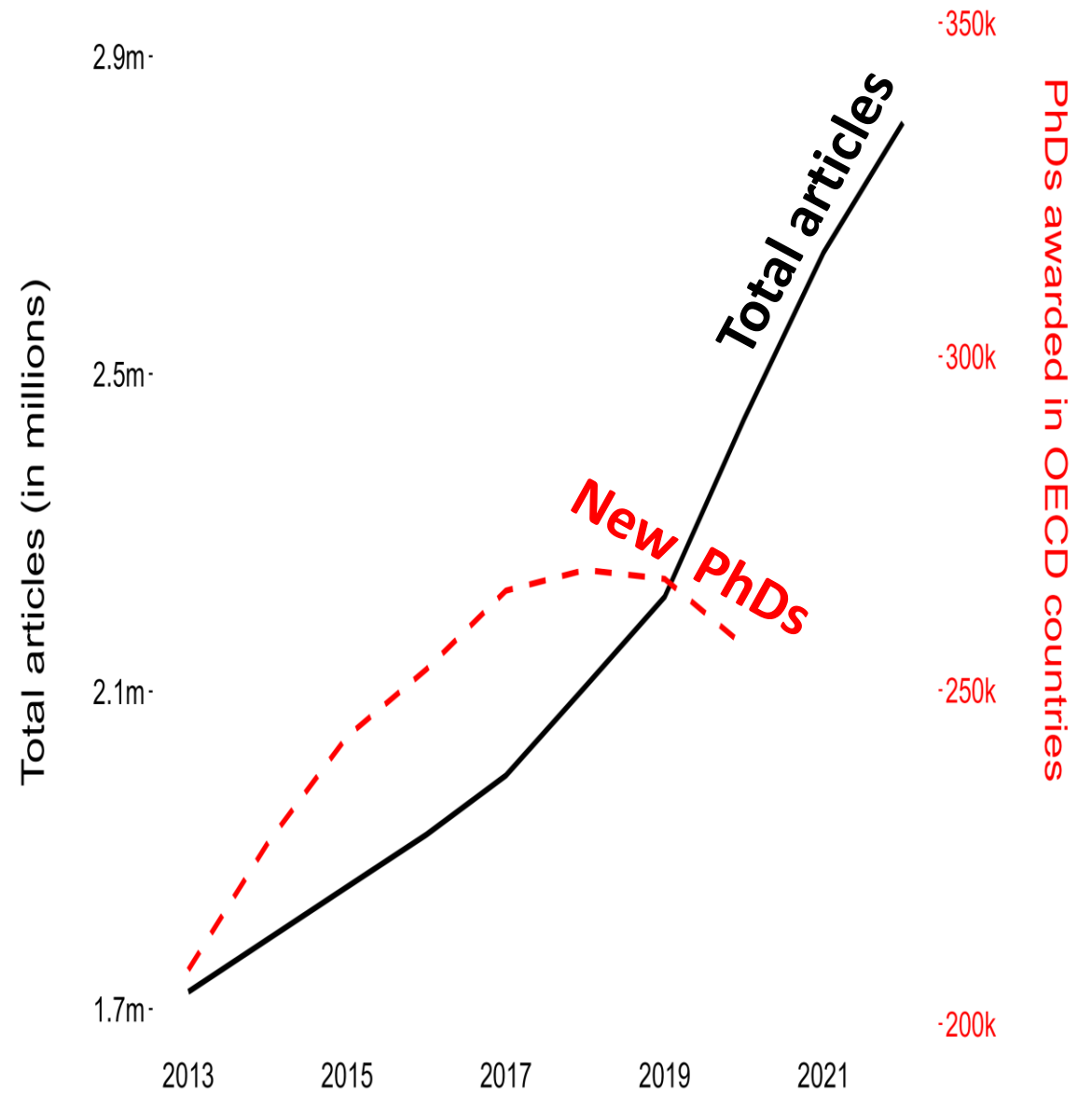
**Mark Austin Hanson<sup>1</sup>, Pablo Gomez-Barreiro<sup>2</sup>, Paolo Crosetto<sup>3</sup>, Dan Brockington<sup>4</sup>**

# 1. Article growth is exponential



1. Article growth is exponential

2. *Scientist recruitment isn't keeping up*



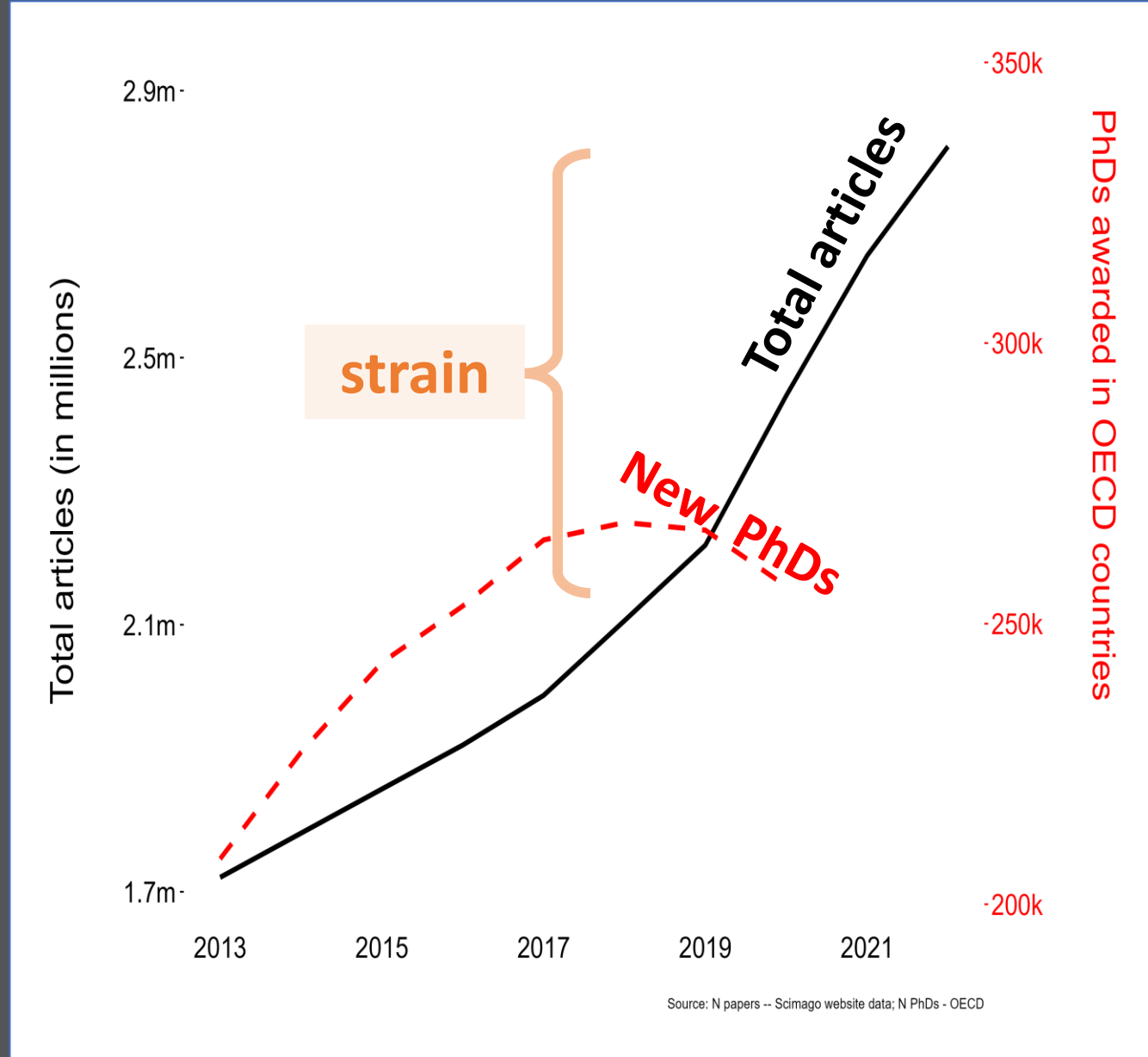
Source: N papers -- Scimago website data; N PhDs - OECD

# The strain on scientific publishing

1. Article growth is exponential
2. *Scientist recruitment isn't keeping up*

*What is going on???*

Insert QR code here, and doi/citation



# This could be **good**?

- Combat ***systemic biases*** in STEM
- *Positive result* bias
- Investment in ***Global South***
- Advancing technology?



*Yet we've got **issues**...*

Editors resigning

Reviewers overworked

Paper mills and fraud

...

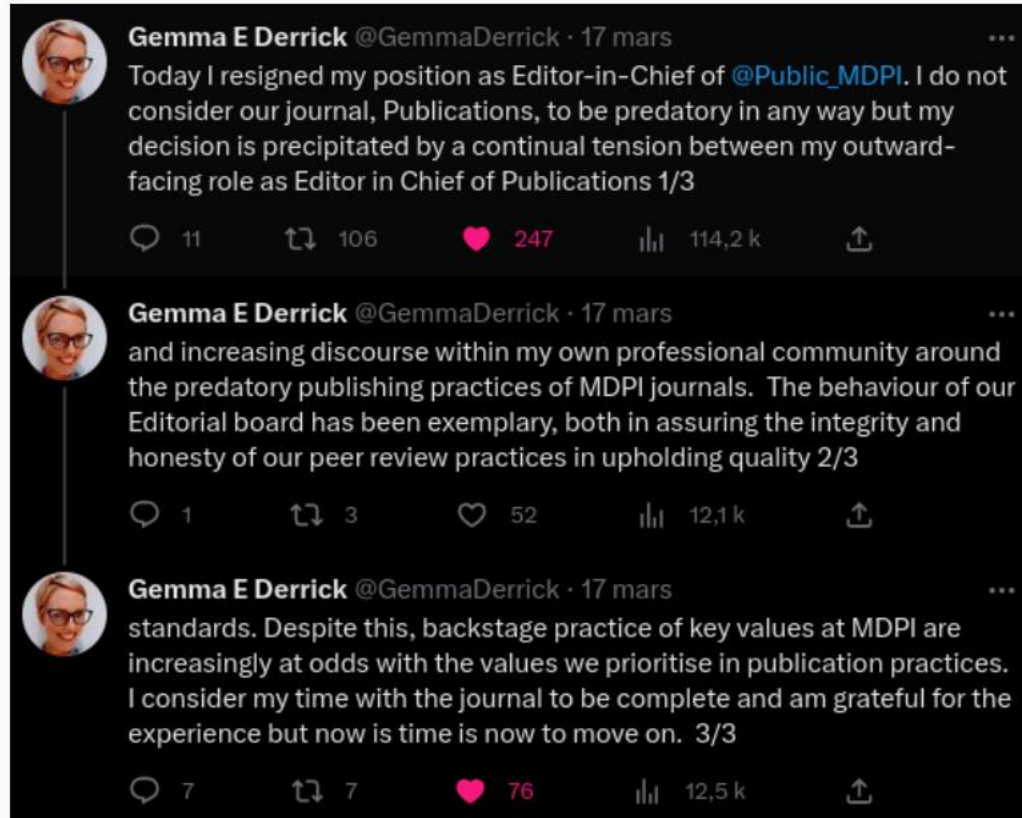
***What is going on???***

# Yet we've got issues

Editors resigning  
over **high fees**



# Yet 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.

# 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...](https://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. <b>1st position costs €390</b>, 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 <a href="https://rtsarev.ru/coauthor/">https://rtsarev.ru/coauthor/</a></p>
<p><b>Call for Scopus coauthors E-learning and Economics 200 euro</b></p>	<p>If you wish to be 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 yu with us? Please, register at <a href="https://rtsarev.ru/coauthor/">https://rtsarev.ru/coauthor/</a></p> <p>#scopus #webofscience #wos #science #coauthor #coauthorship</p>

8:29 PM · 4 mars 2023 · 35,6 k vues

Authorship sales  
rings

# Yet 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 Künzli<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

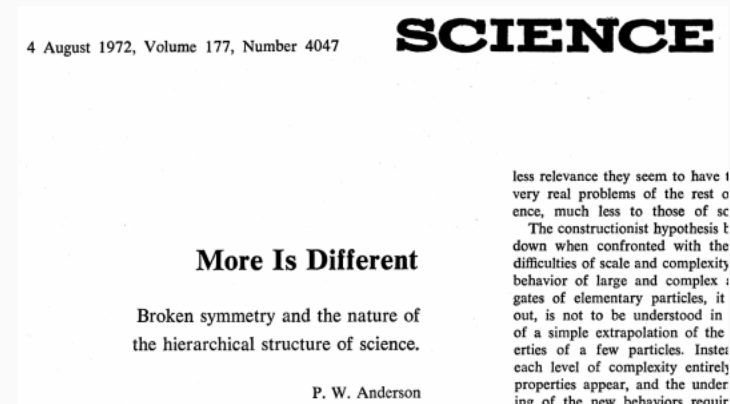
# Yet we've got issues



Mega-journals being  
**delisted** from WoS

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

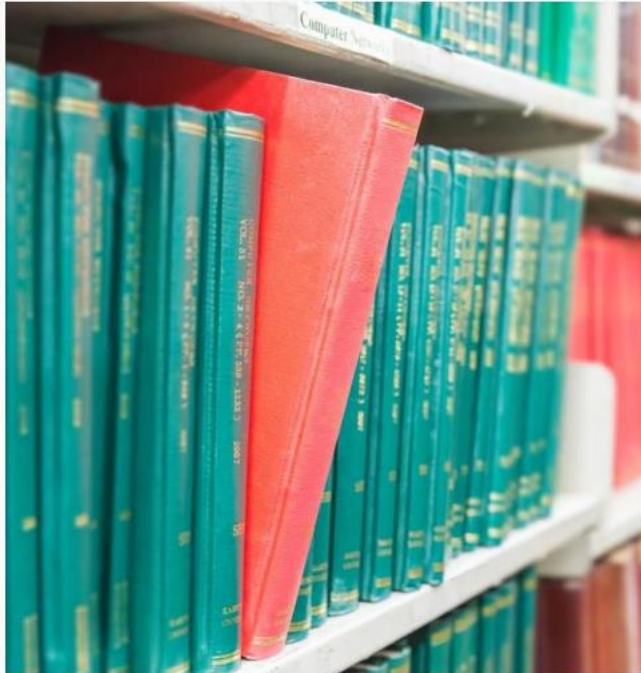
- new practices
- new business strategies
- new incentives
- new constraints
- new **meanings**



# A semantic shift

"Journal"

used to mean



A physical object with  
limited available space

# A semantic shift

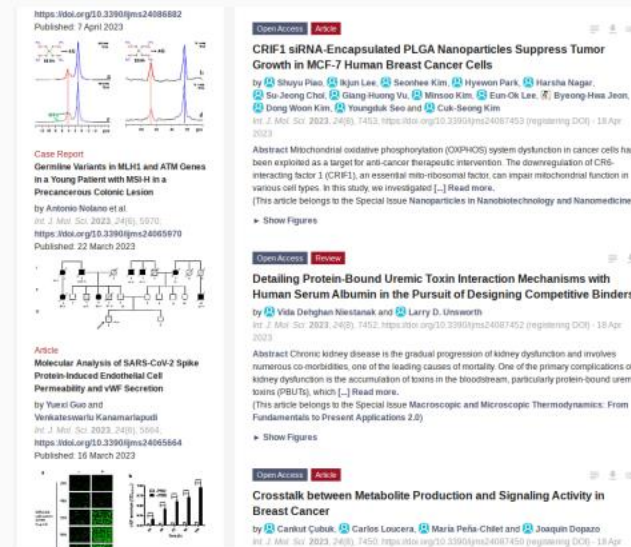
"Journal"

used to mean



A physical object with limited available space

now it also means



A limitless electronic repository with a name

# A semantic shift

## "Publication"

used to mean

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

→ good science got  
rejected?



# A semantic shift

## "Publication"

used to mean

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

→ good science got rejected?

now it also means

- Thousands of journals
- short delays
- 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

## "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? ...

# 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? ...

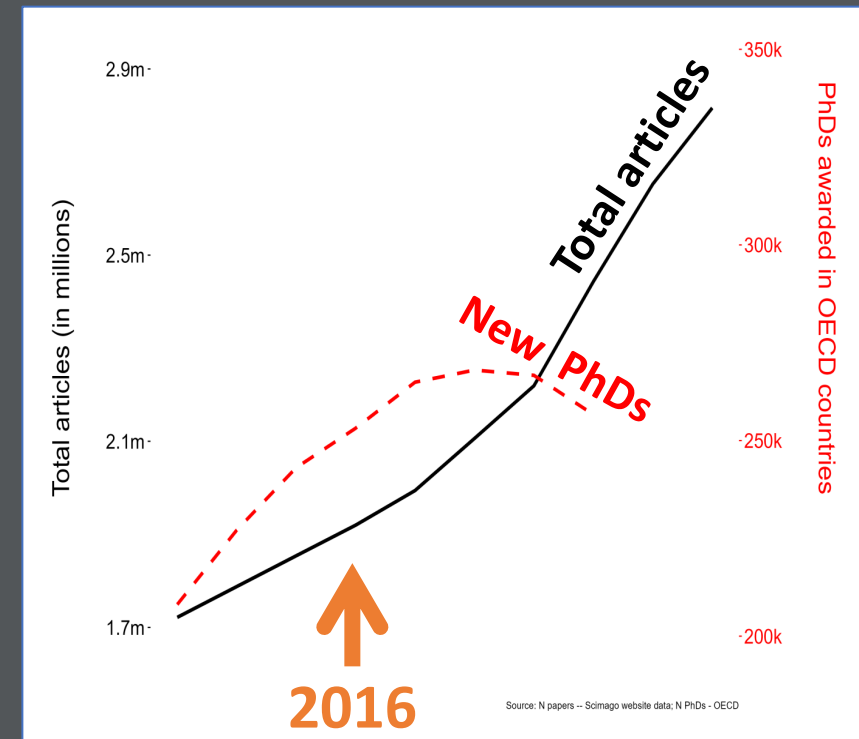
**Our aim:**  
**understanding** the strain on publishing

# Growth in articles → “strain”

## Annual articles (Web of Science\*Scopus)

2016: ~ 1.9 million

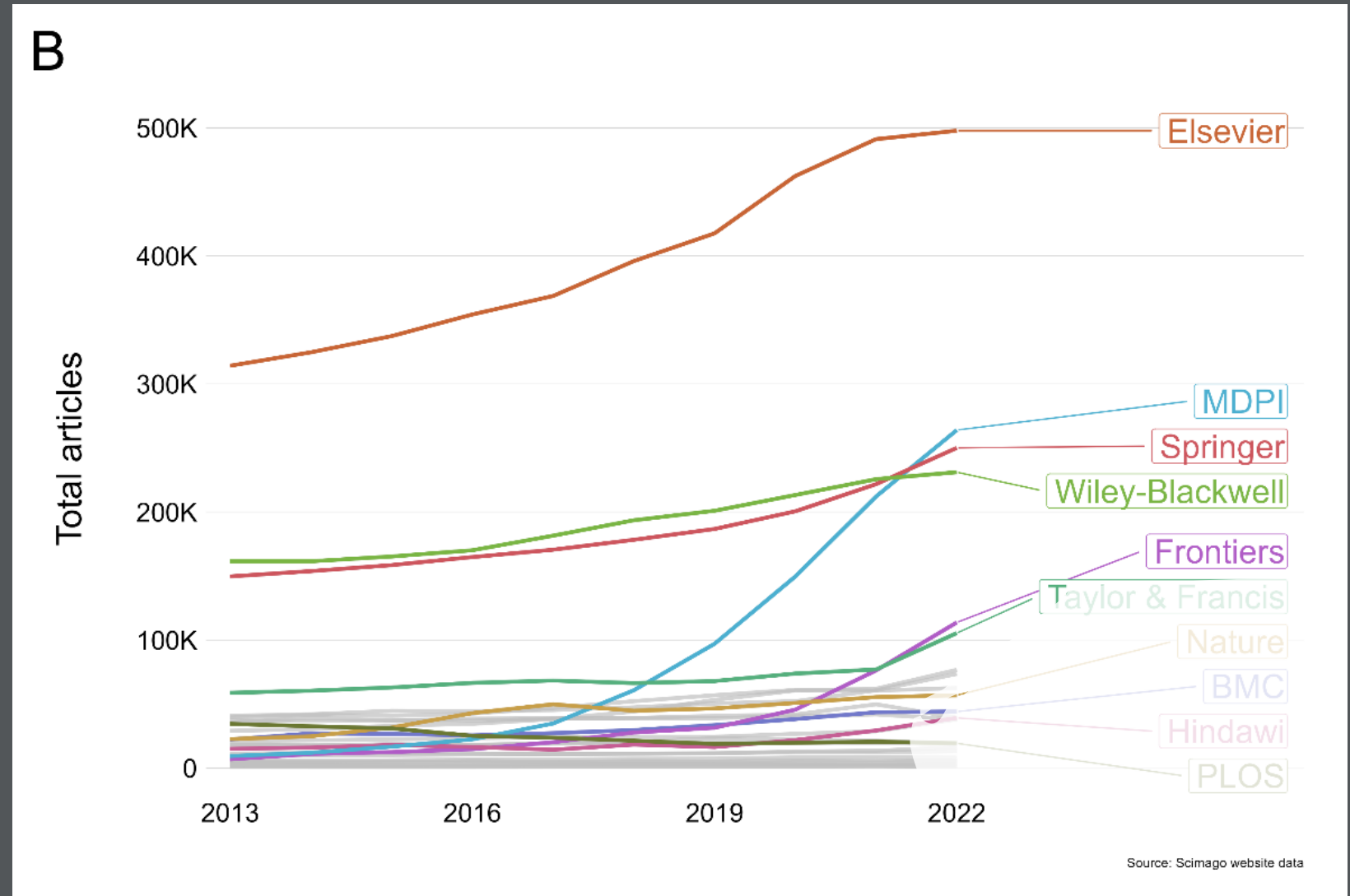
2022: ~ 2.8 million



# Growth in articles → “strain”

## Five publishers:

- **MDPI** (27%)
- Elsevier (16%)
- Frontiers (10%)
- Springer (10%)
- Wiley (7%)



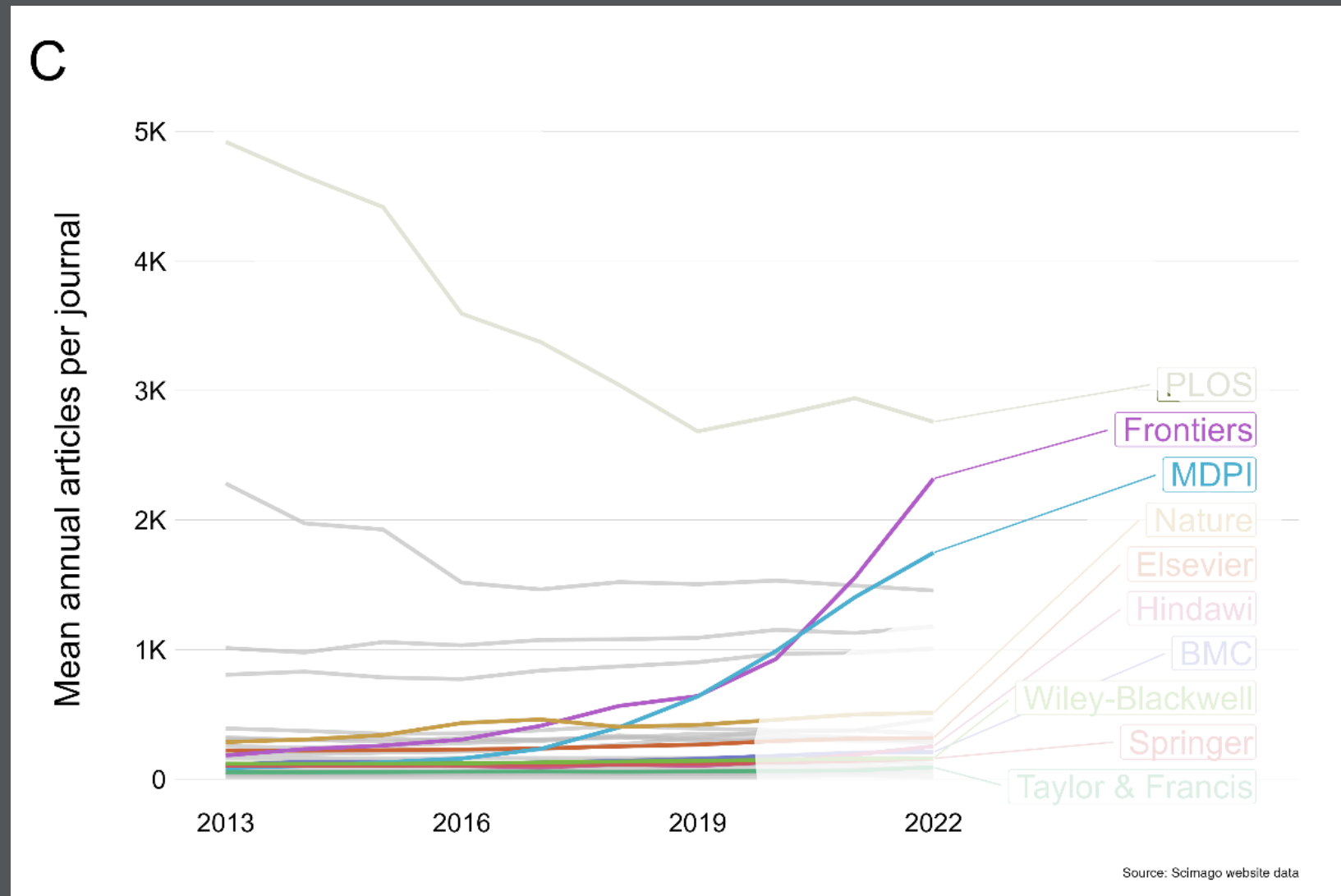


# Growth in journal size

New!!!

*“Mega journals”*

- MDPI
- Frontiers



# Strain: what's going on?

## Trends

- Two strategies:
  - Growth in journals
  - Growth in *articles per journal*

## Threats

- “publish or *perish*”
- Information overload...

# The role of *special issues*

# The role of *special issues*

*“Special”*

# Not so special issues...

Three players:

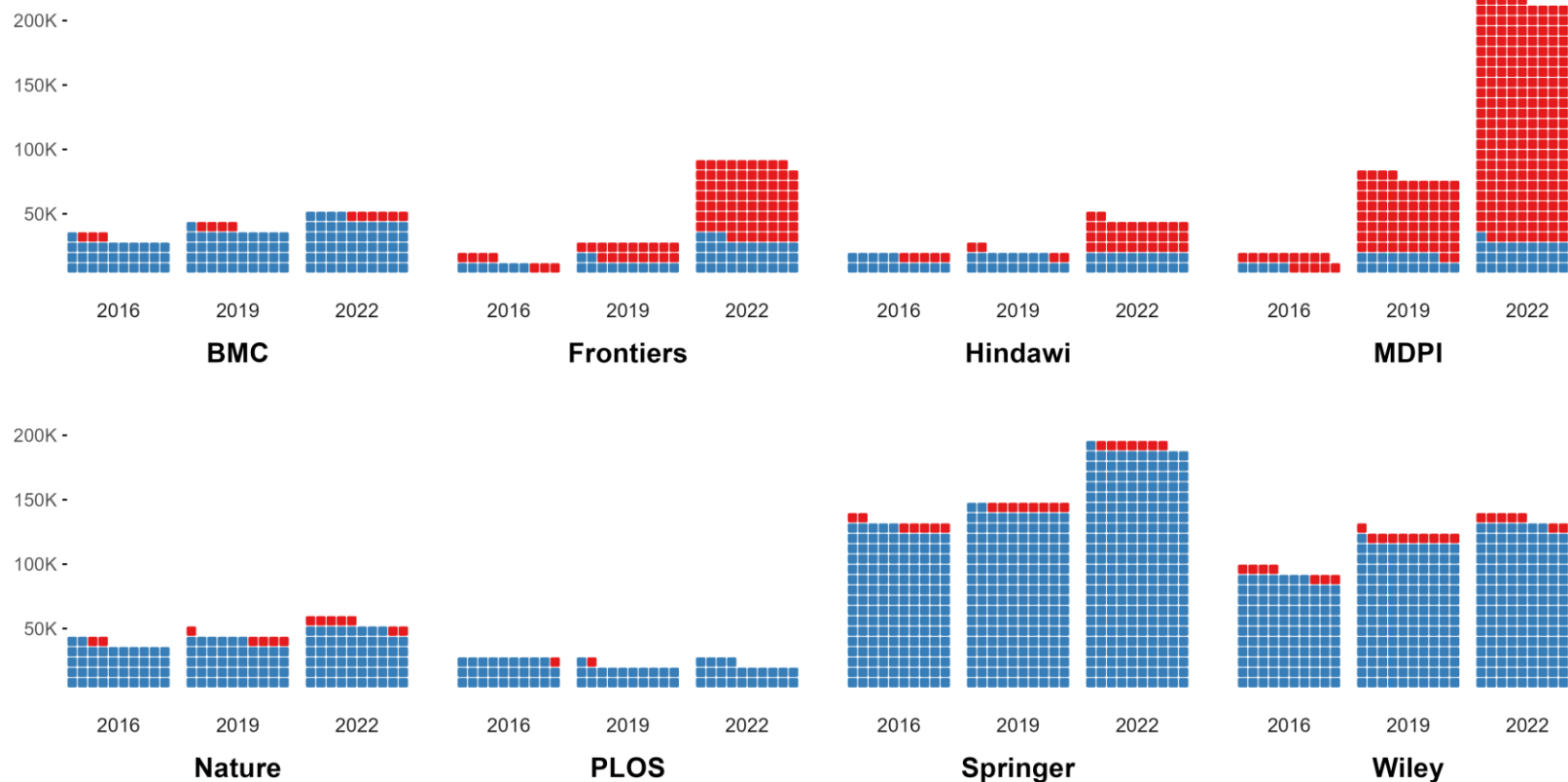
MDPI

Frontiers

Hindawi

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 issues...

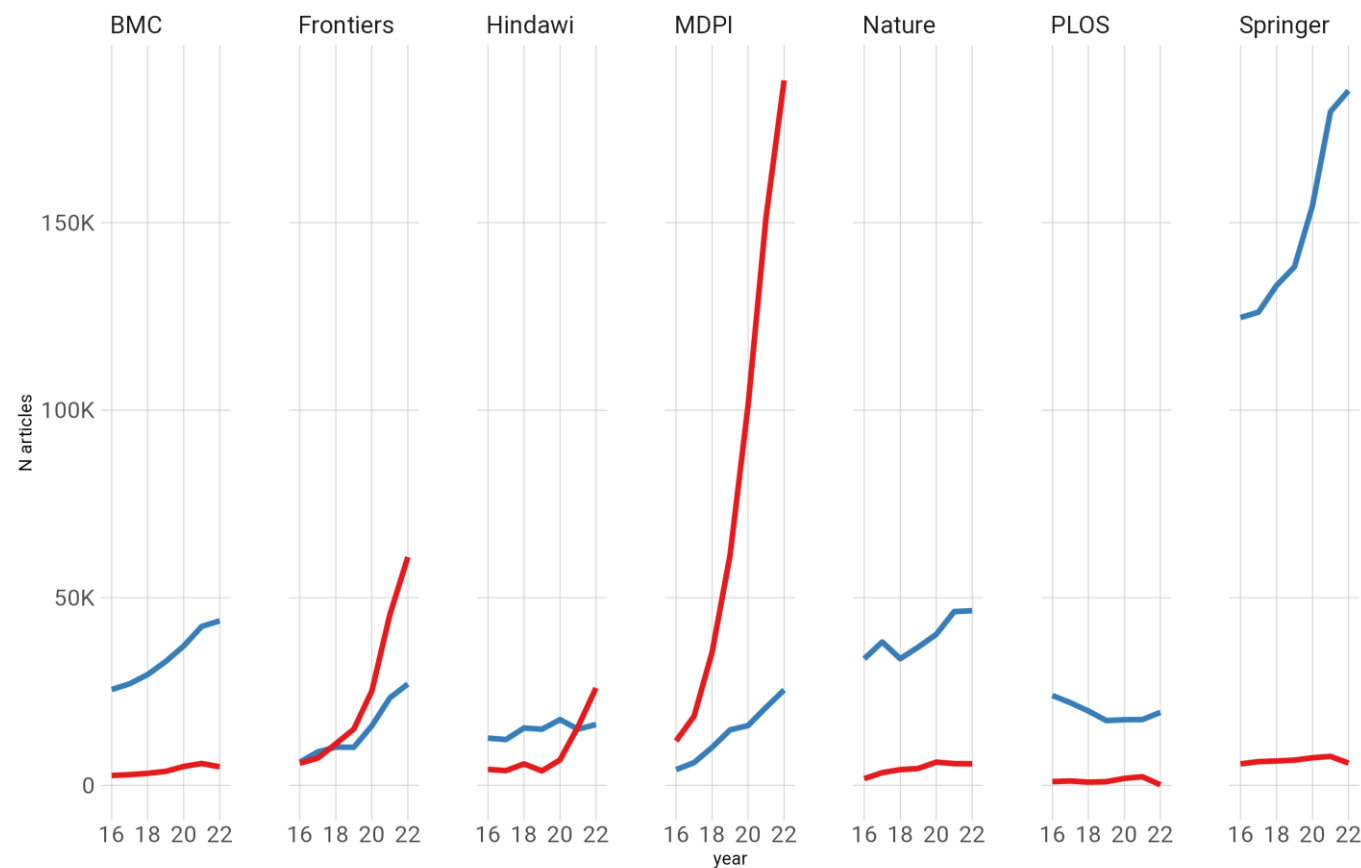
Three players:

MDPI

Frontiers

Hindawi

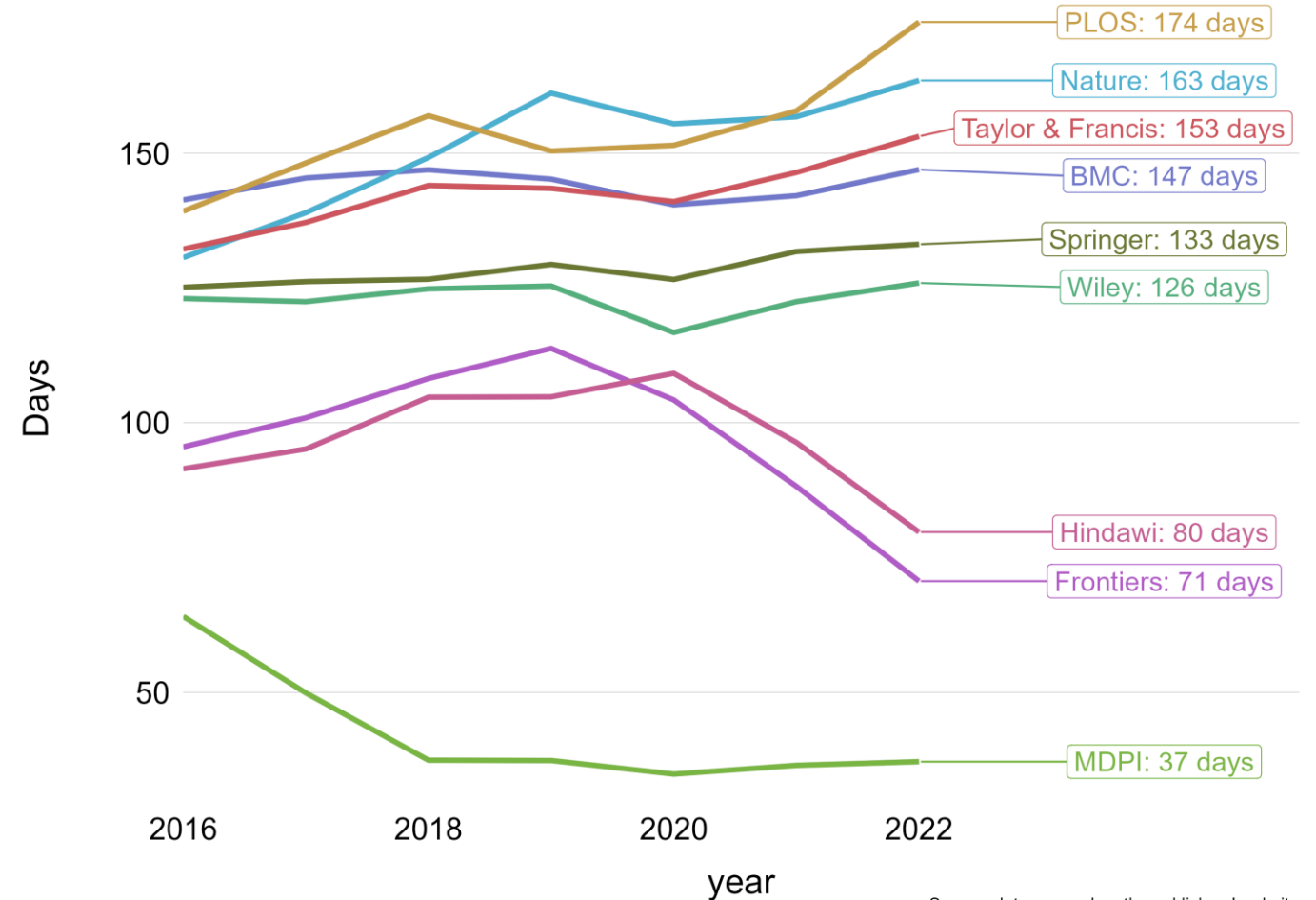
Number of papers published in regular vs special issues, 2016-22



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.

# Not so special issues... but... that turnaround!

Submit → Accept  
*including revisions...*

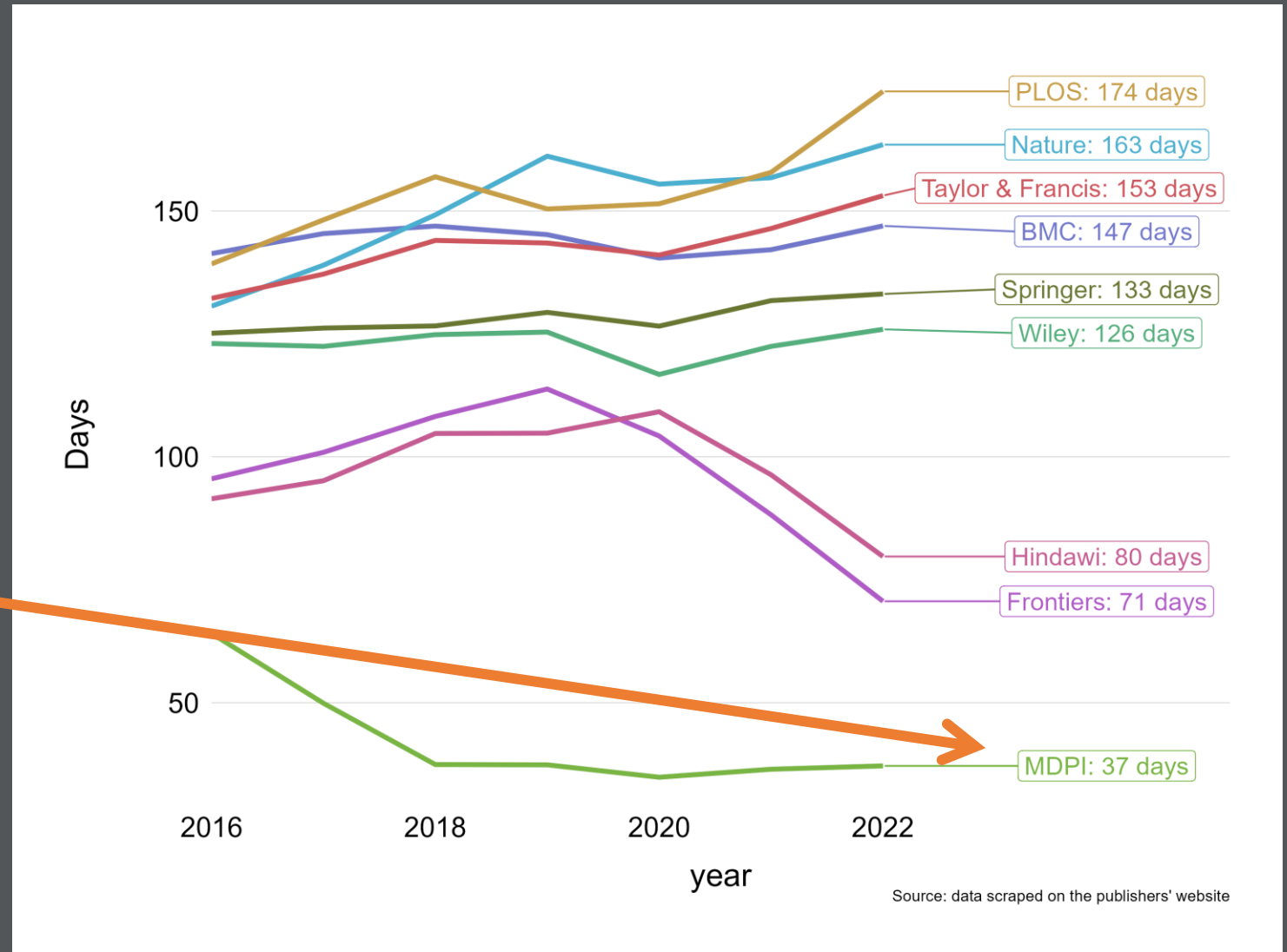


Source: data scraped on the publishers' website

# Not so special issues... but... that turnaround!

Submit → Accept  
*including revisions...*

Is it really possible  
to review **so fast**?



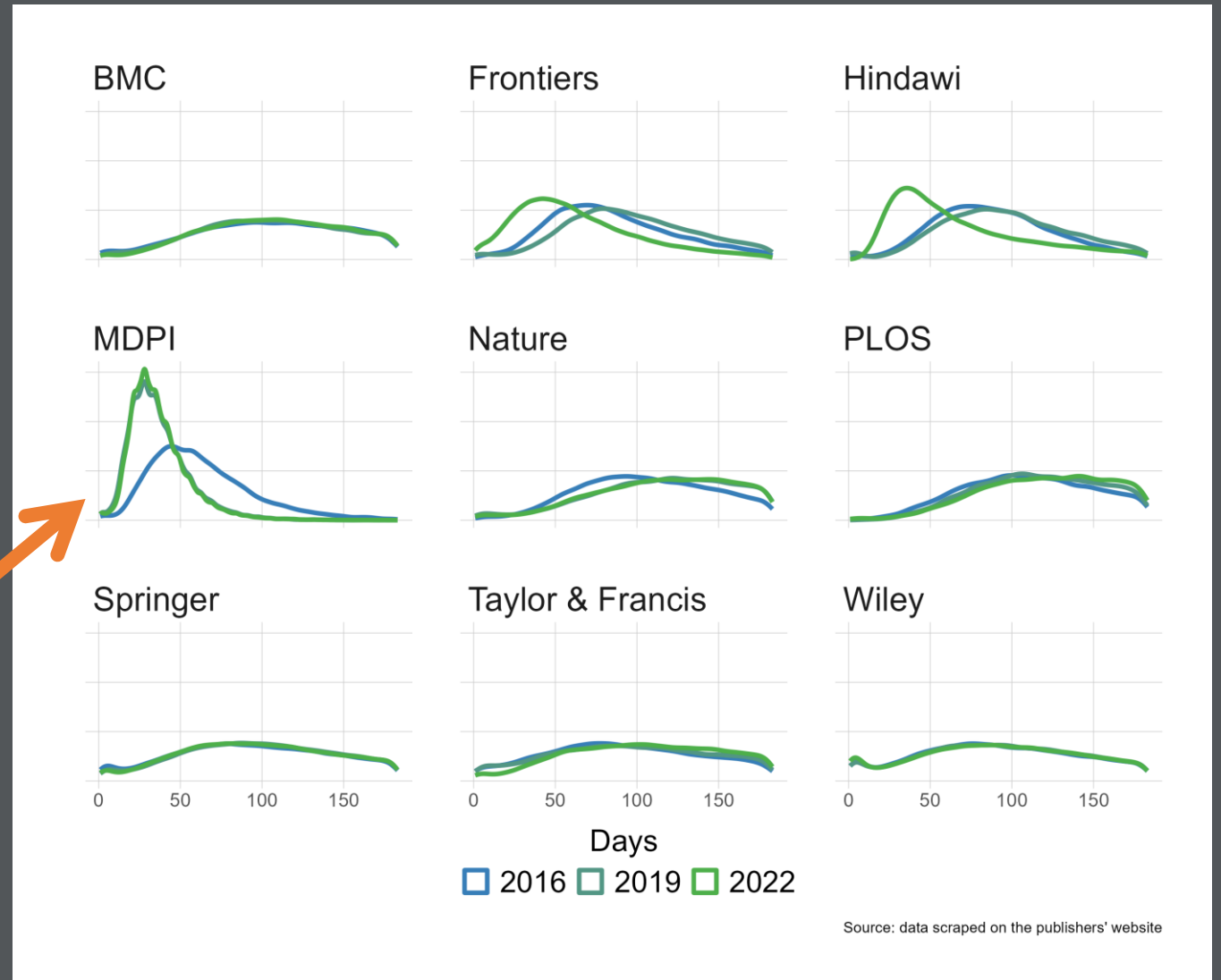


# Not so special issues... but... that turnaround!

Submit → Accept  
*including revisions...*

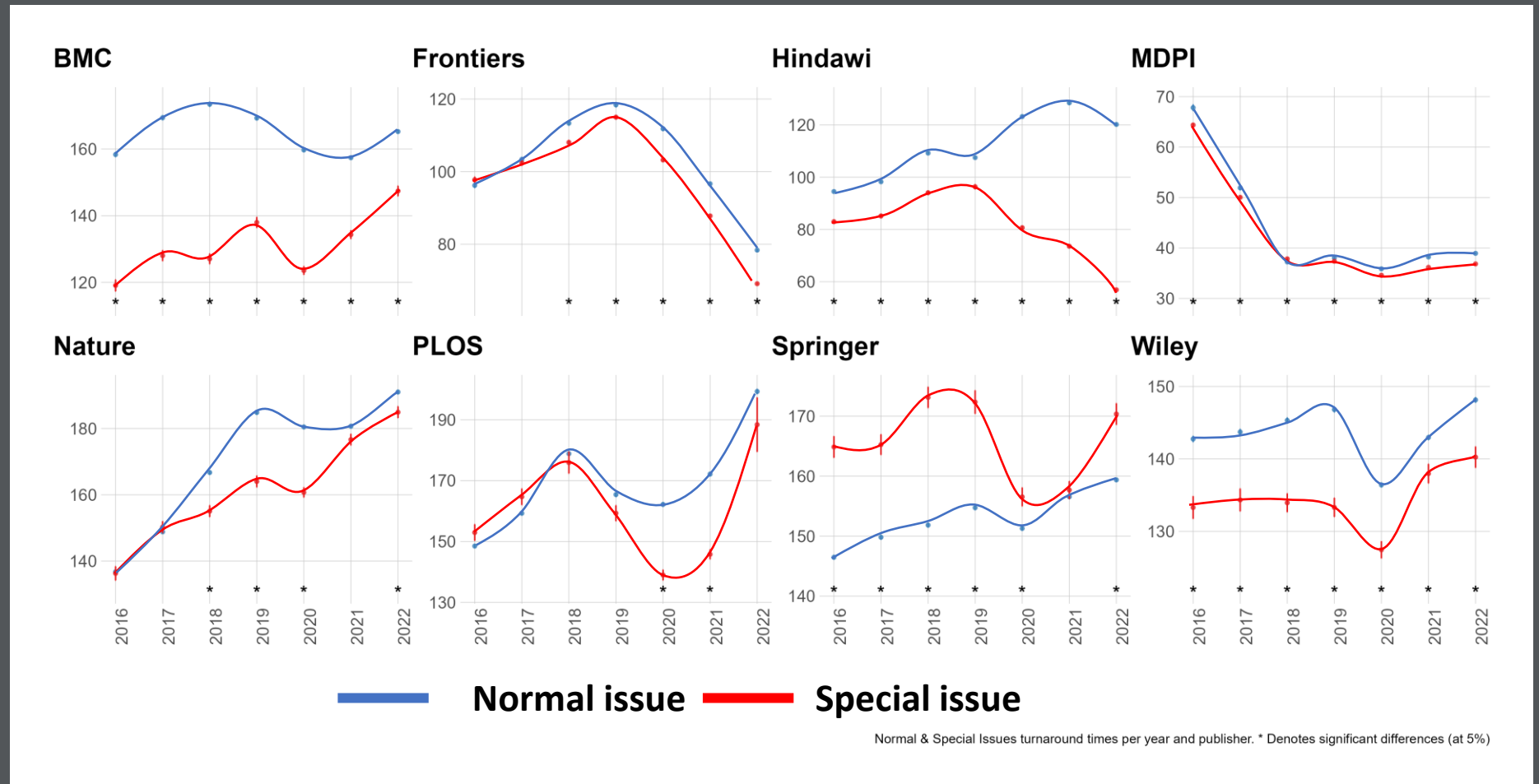
Is it really possible  
to review so fast?

And so  
**consistently?**



# Not so special issues... but... that **turnaround!**

Special  
issue  
articles  
published  
**faster**



# Special issues: what's going on?

## Trends

- “Special” issues are a fantastic engine for growth

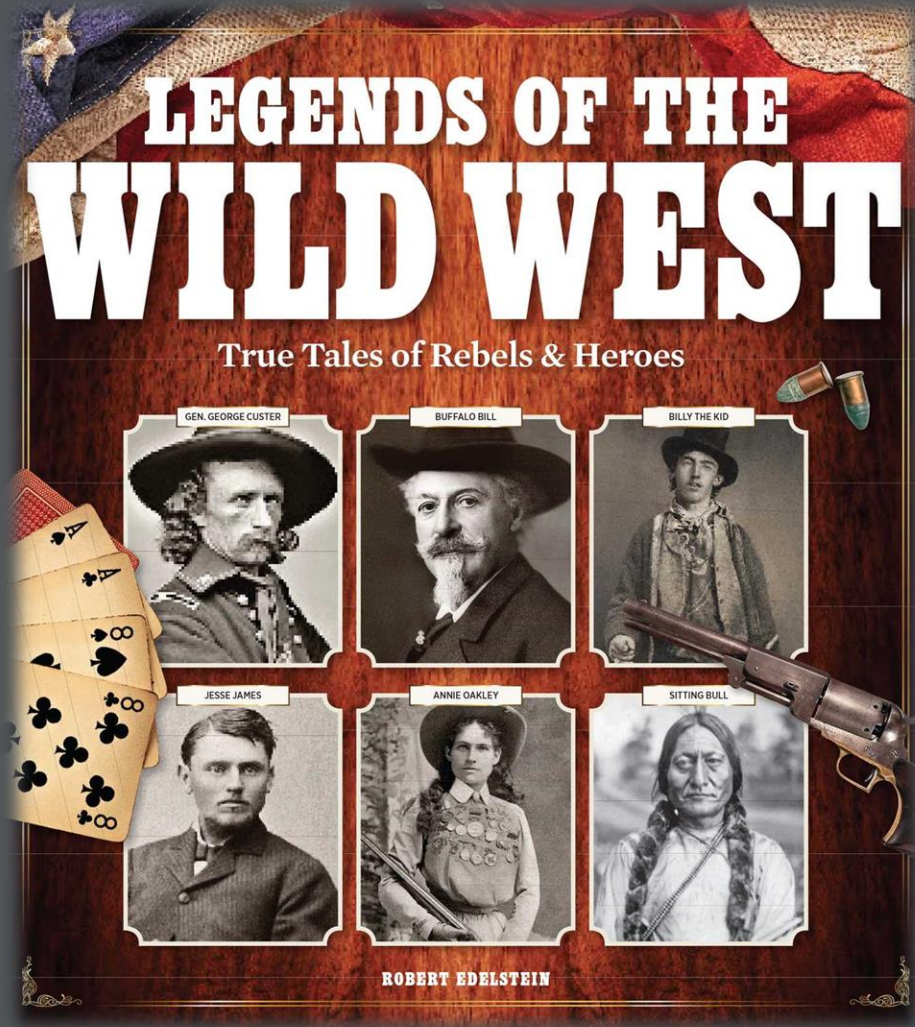
## Why?

- Guest editors + reviewer networks → **scalable**

## Threats

- Can one do **quality** peer review so fast?

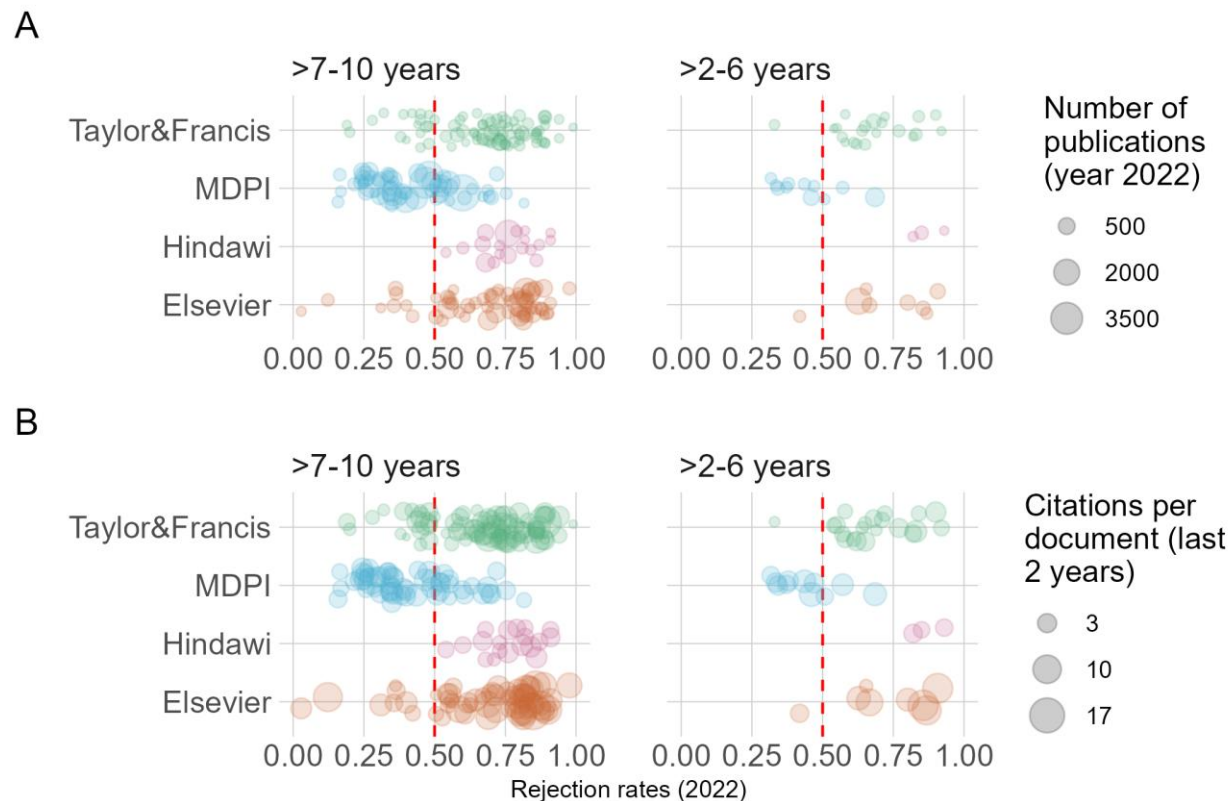
# The wild west: *rejection rates*



# Rejection rates: rarely public

## Many caveats...

- No universal definition
- Reject + **resubmit** = ...?



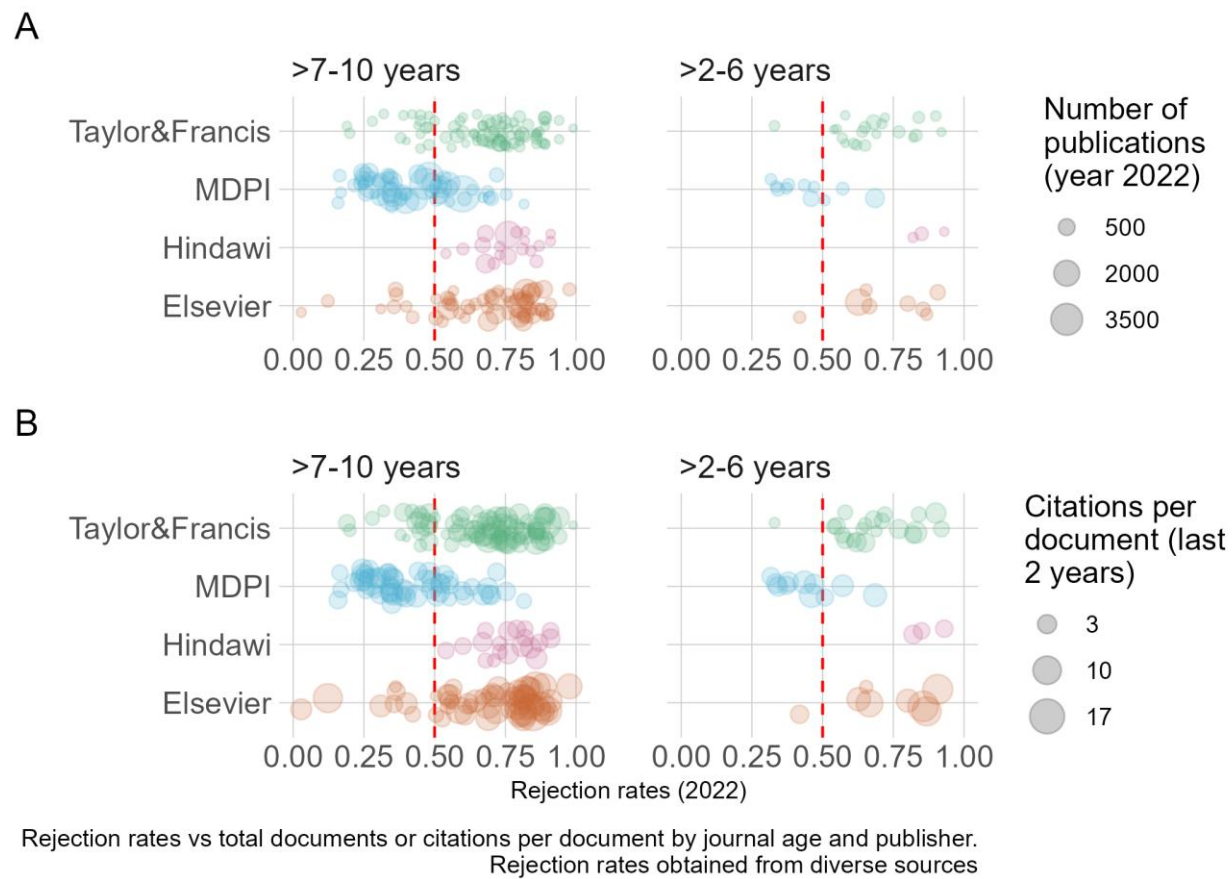
Rejection rates vs total documents or citations per document by journal age and publisher.  
Rejection rates obtained from diverse sources

# Rejection rates: rarely public

## Many caveats...

- No universal definition
- Reject + resubmit = ...?

*Within* publisher...?



# Rejection rates: rarely public

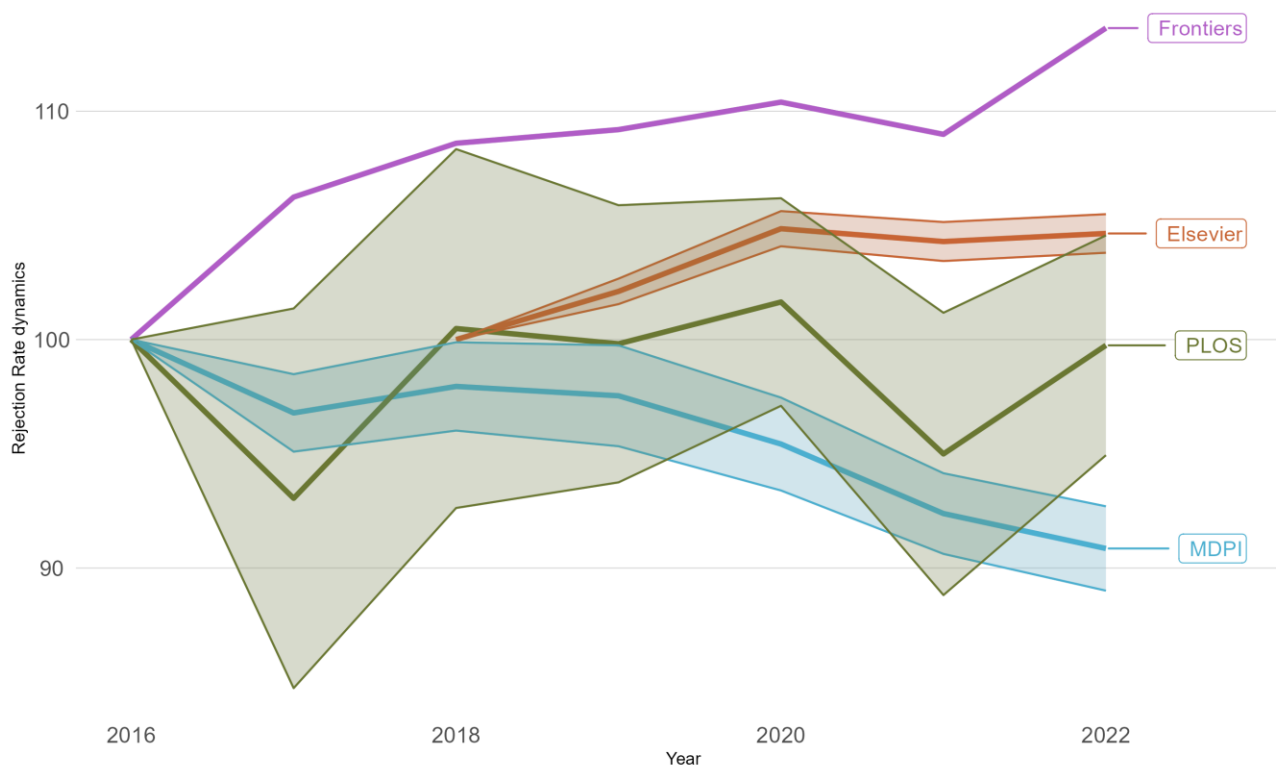
## Many caveats...

- No universal definition
- Reject + resubmit = ...?

*Within* publisher...?

### Evolution of normalised rejection rates

First year in our dataset = 100



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

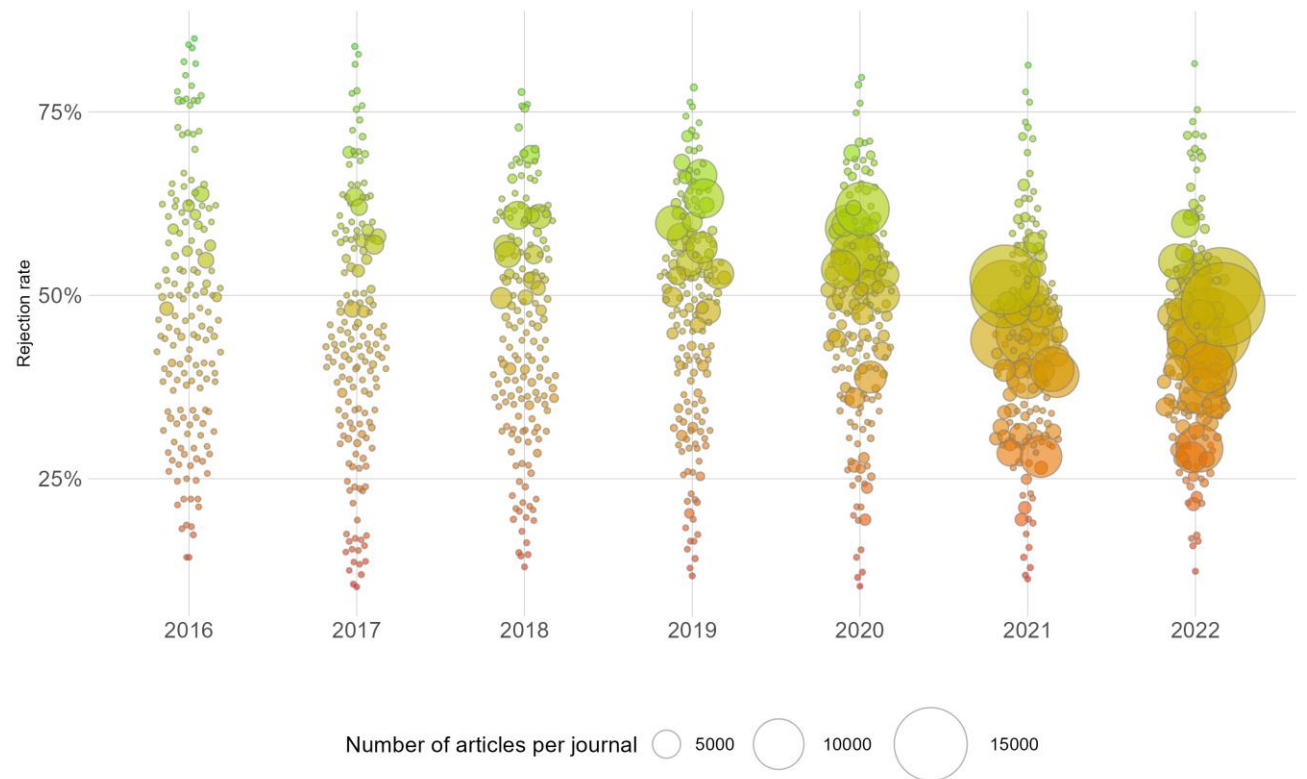
# Rejection rates: rarely public

## MDPI again...

- Journal scope?
- Guest editors...

Evolution of rejection rates by relative size of the journal at MDPI, 2016-22

Only journals existing in 2016



Source: data scraped on the publisher's website



# Rejection rates: what's going on?

## Trends

- Not transparent

## Threats

- Publisher dictate **scope**

**Inflation:**

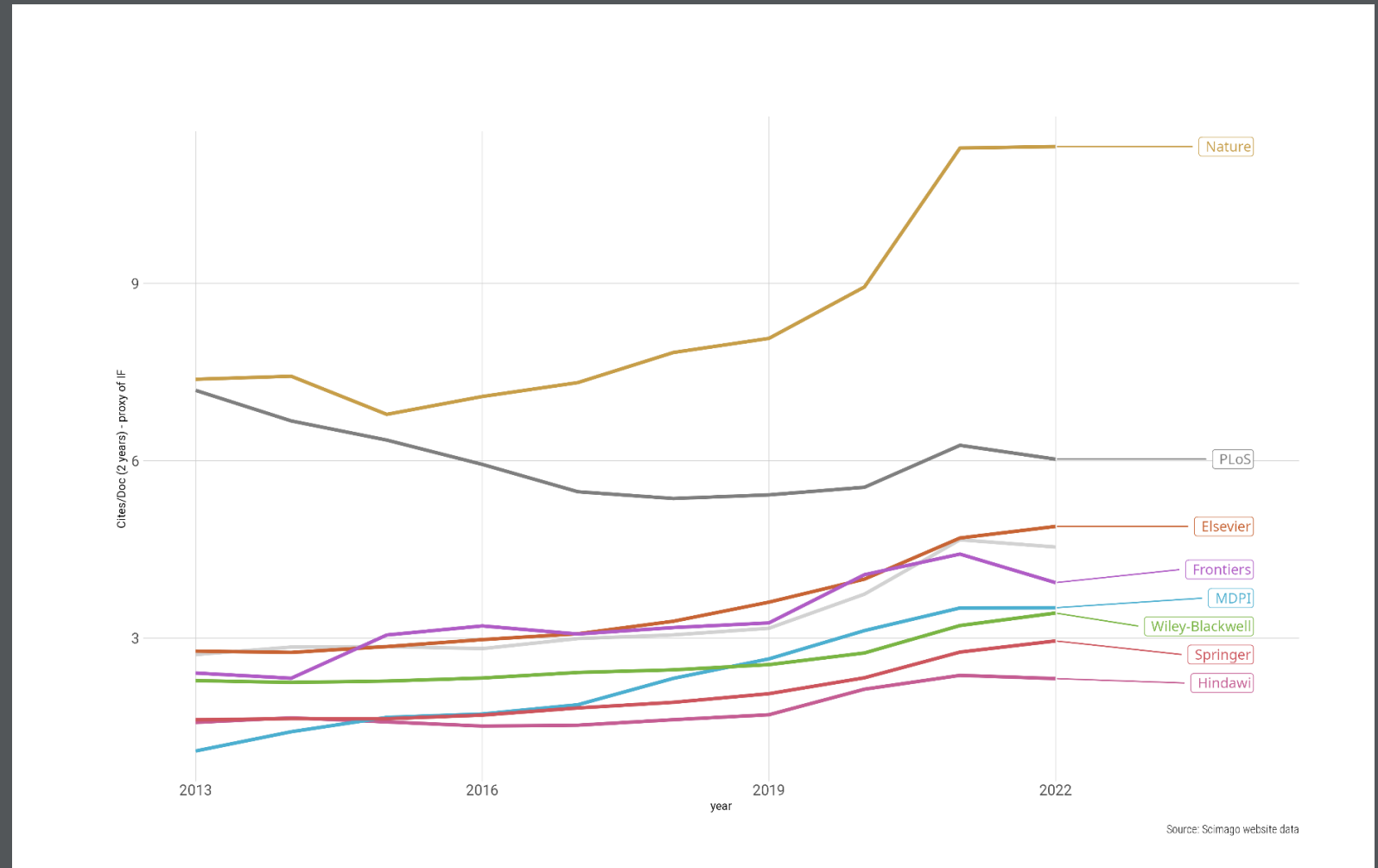
**Inflation:** pound sterling, *but also Impact Factor*

*also housing... food... life...*

# Impact inflation

## Impact factor

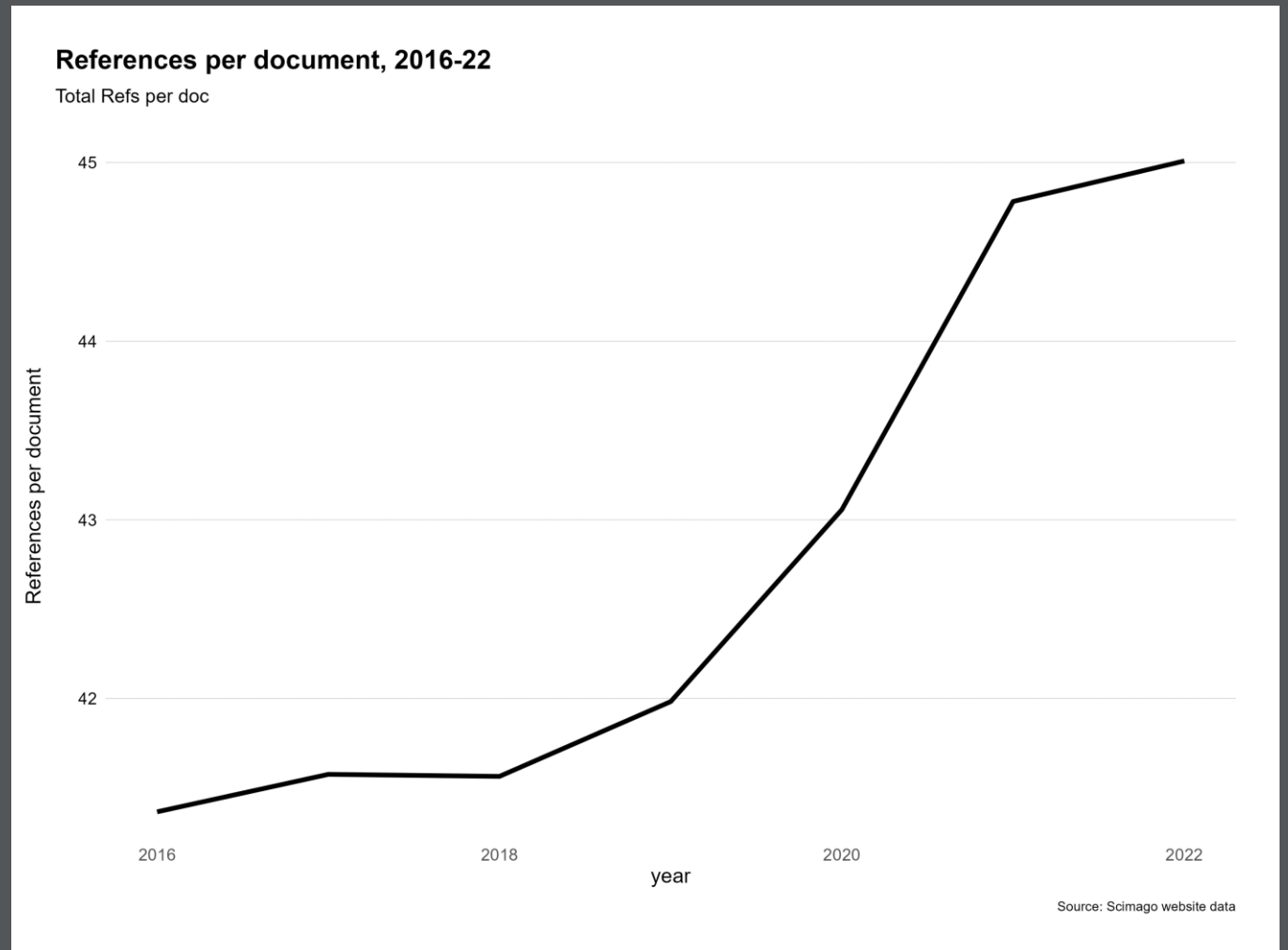
- Increased universally



# Impact inflation

## Impact factor

- Increased universally
- Refs per doc part of it...
- COVID (not whole story)



# Impact inflation

# Impact inflation

## Impact Factor (IF)

- Total citations (2 years)

**N citations**

# Impact inflation

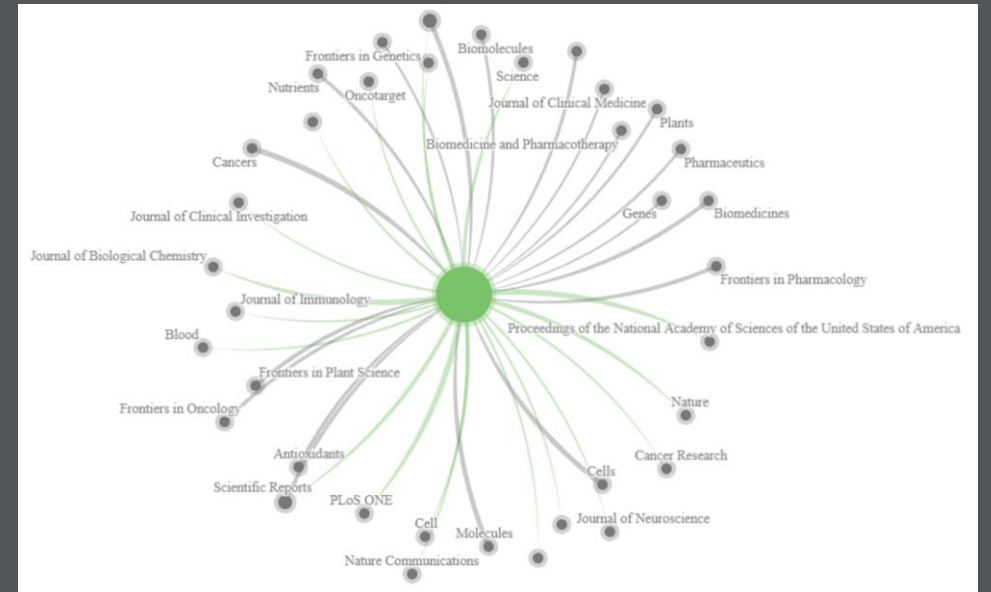
## Impact Factor (IF)

- Total citations (2 years)

N citations

## Scimago Journal Rank (SJR)

- Network approach
- Self-cites *not rewarded*





# Impact inflation

## Impact Factor (IF)

- N citations

## Scimago Journal Rank (SJR)

- Network... self-cites...

$$\frac{IF}{SJR}$$



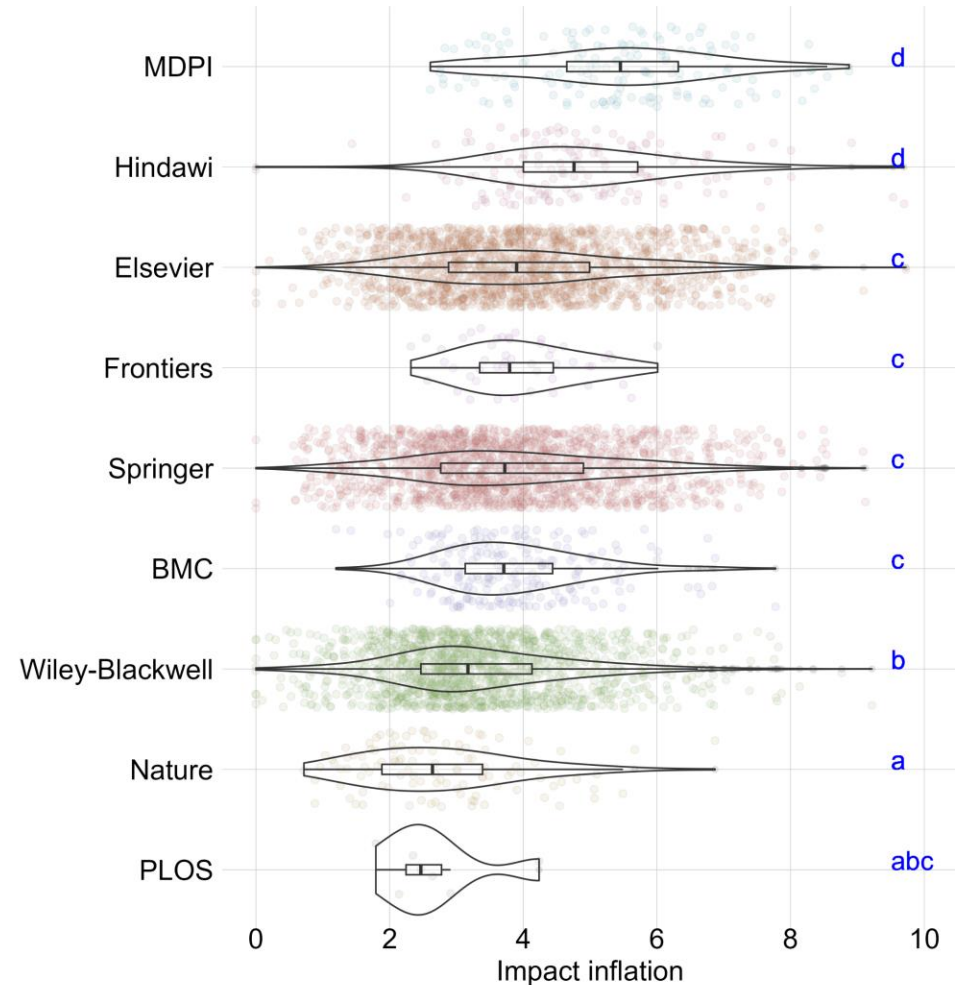
**“Impact Inflation”**

# Impact inflation

## Impact inflation

- MDPI
- Hindawi

but not *Frontiers*...

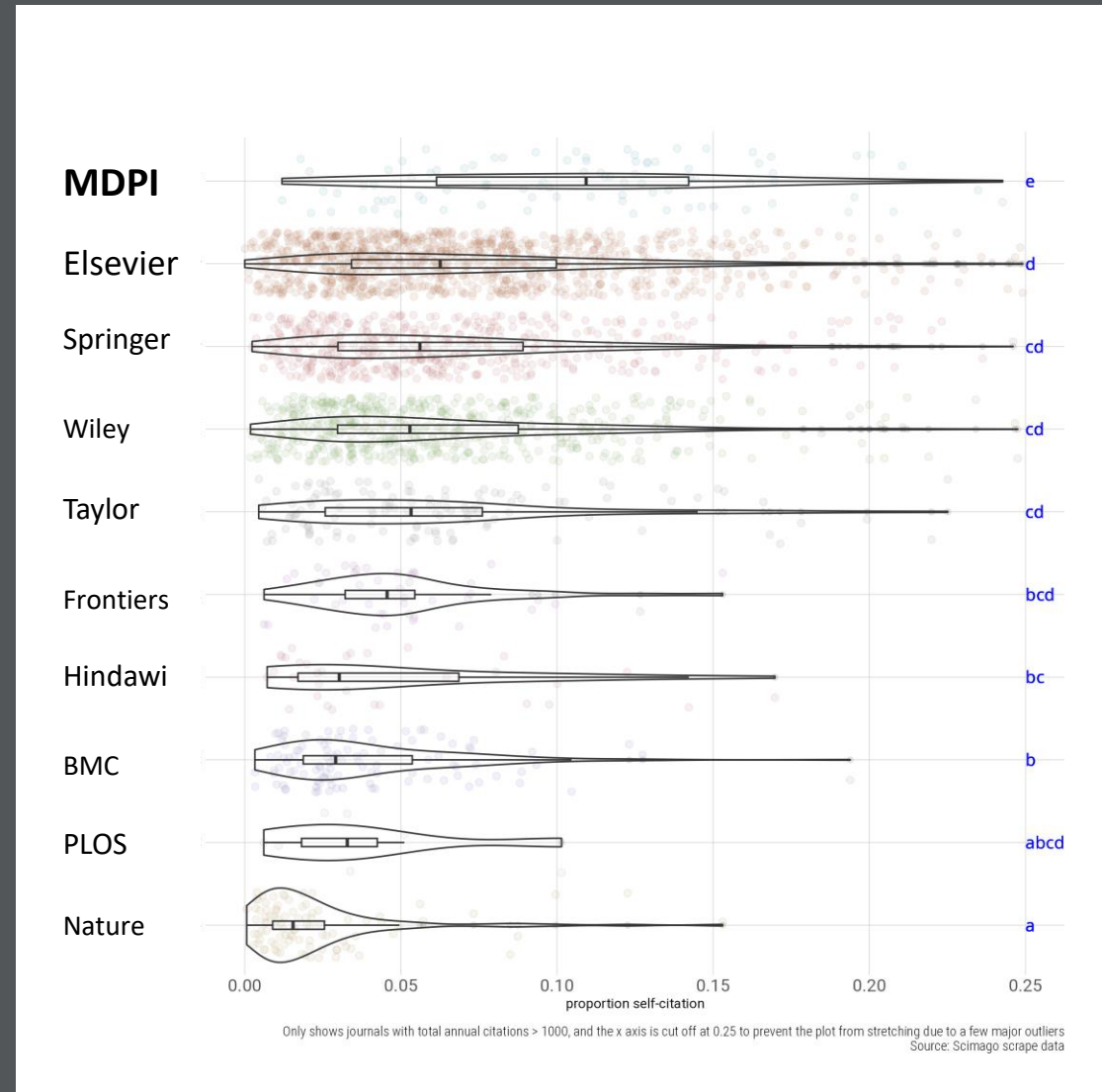


The x-axis is limited at 10 to prevent the plot from stretching to show just a few major outliers  
Source: Scimago website data

# Self-citations: MDPI

## Self-cite rate

- MDPI

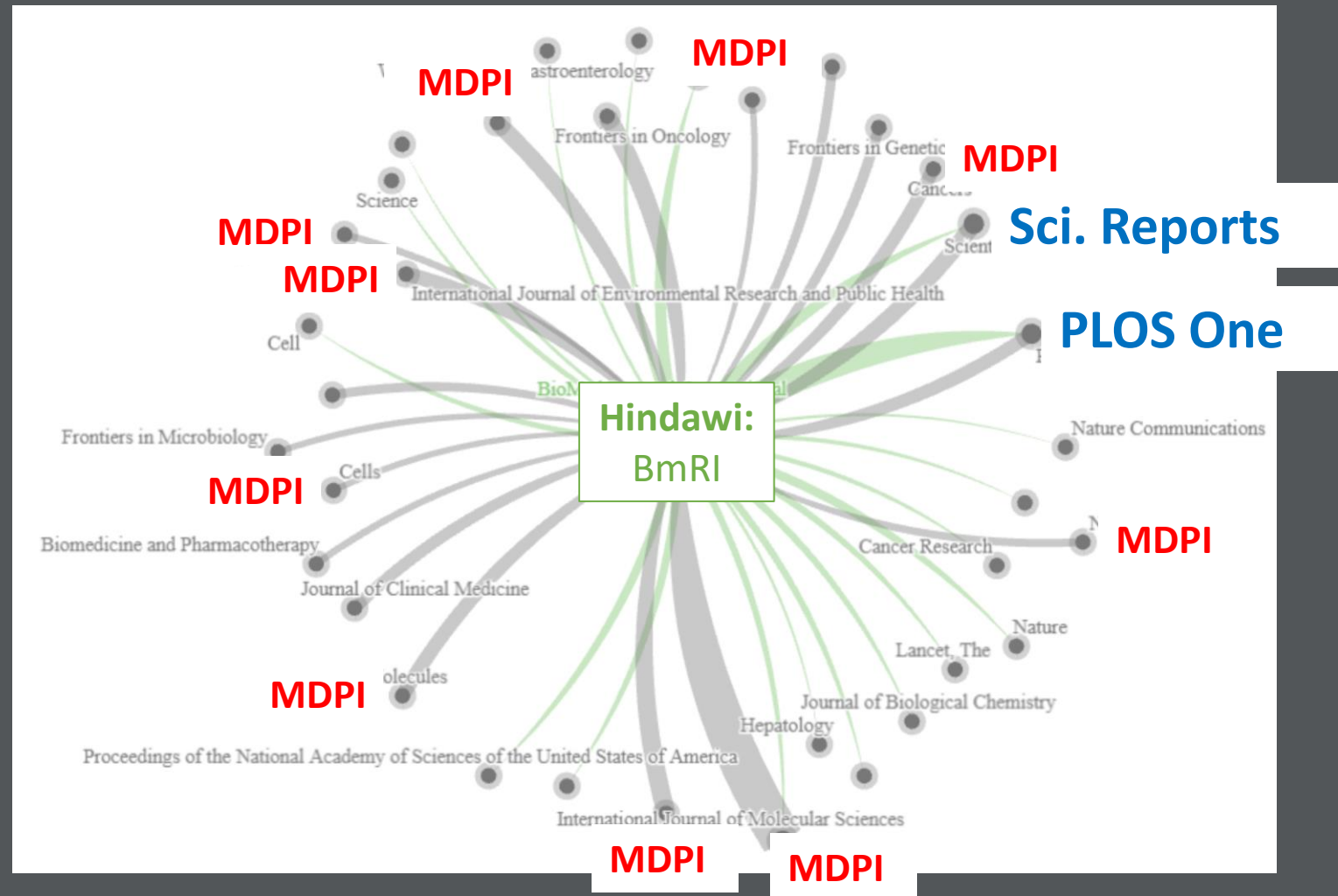


# Universal impact inflation

Hindawi high Impact  
Inflation due to...?

# Impact Inflation

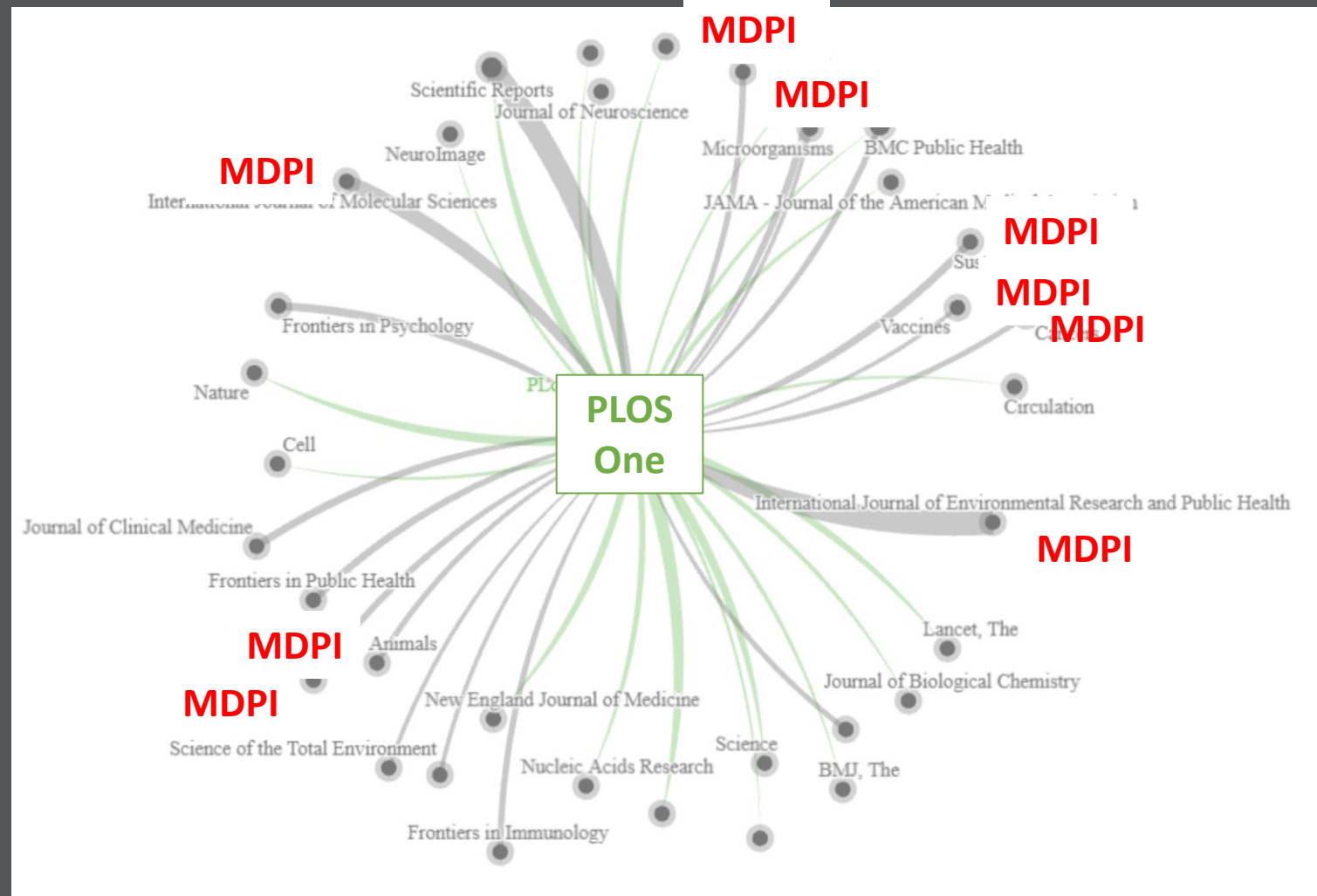
Hindawi high Impact Inflation **due to MDPI**



# Universal impact inflation: MDPI SJRs low?

**MDPI:** nobody is returning the favour...

*how the math works...*



# What's going on?

## Trends

- Everyone's IF is going up
- One group (MDPI) self-cites a lot

## Why?

- Lots of citations from a few low-rank journals

## Threats

- **Quality** signals distorted, threat to naïve scientists

# What is going on?

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

	2022					CHANGE 2016-22		
	TOTAL PAPERS	SHARE SPECIAL ISSUE	TURNAROUND TIME (DAYS)	REJECTION RATE	IMPACT INFLATION	NUMBER PAPERS	SHARE SPECIAL ISSUE	TURNAROUND TIME (DAYS)
Overall	2816k	38%	136	60%	3.3	+47%	+27pp	+2
Elsevier	498k	--	--	71%	4.0	+41%	--	--
MDPI	264k	88%	37	40%	5.4	+1080%	+14pp	-33
Springer	250k	3%	136	--	3.9	+52%	-1pp	+2
Wiley-Blackwell	231k	5%	149	--	3.3	+36%	-2pp	+4
Frontiers	114k	69%	71	48%	4.0	+675%	+20pp	-20
Taylor & Francis	105k	--	167	--	NA	+59%	--	+15
Nature	57k	11%	171	--	2.8	+32%	+6pp	+42
BMC	44k	10%	142	--	3.9	+73%	+1pp	+10
Hindawi	39k	62%	111	--	5.0	+139%	+36pp	+16
PLOS	19k	1%	170	59%	NA	-23%	-3pp	+21

pp = 'percentage points'. Source: data scraped on the publishers' website or publishers' own publications. Overall: SI, TAT, Rejection % based on publishers with available data only. N per Scimago dataset. Elsevier: rejection rate change starts from 2018. All publishers: Special Issues sometimes named differently.



# What is going on: ... **one group** stands out

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

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# What's going on?

## Why?

- **MDPI** is very successful
- Authors must *publish or perish*
- Funders place this pressure on authors

# What's going on?

## Why?

- MDPI is very successful
- Authors must *publish or perish*
- Funders place this pressure on authors

## Threats

- Huge waste of time and money (!!!)
  - *Writing, reviewing, editing*
- **Quality signals** distorted: nobody wins

# Conclusion: we need to **respond to strain**

**Exponential growth** is ultimately unsustainable

**Funders, universities,** have biggest role to regulate the system (Wellcome, 2020)

# End

**A journal's Impact Factor  
tells me how good  
someone's research is.  
*Right? Wrong!***

**Find out how to use  
metrics responsibly.**



[sfdora.org](http://sfdora.org)



University of Exeter

# Quality signals can be informative



RESEARCH ARTICLE | Open Access | CC BY-NC-ND

## In which fields are citations indicators of research quality?

Mike Thelwall , Kayvan Kousha, Emma Stuart, Meiko Makita, Mahshid Abdoli, Paul Wilson, Jonathan Levitt





First published: 04 May 2023 | <https://doi.org/10.1002/asi.24767> | Citations: 3

**REF vs. IF: Spearman's  $r$  = up to 70% !!** (e.g. clinical medicine)

# Quality signals can be informative

**JASIST**  
JOURNAL OF THE ASSOCIATION FOR INFORMATION SCIENCE AND TECHNOLOGY

*asis&t*  
Association for Information Science and Technology

RESEARCH ARTICLE |  Open Access |    

Ir  
M  
Jo  
Fir

$$\text{“Impact Inflation”} = \frac{IF}{SJR}$$

*even more informative...*

# Quality signals can be informative

*If we protect the publishing  
ecosystem...*