

A dataset and bibliometric approach to estimating annual APCs for six scholarly publishers

Presentation at SPARC's OpenCon Community Calls

Leigh-Ann Butler, Scholarly Communication Librarian, University of Ottawa
ORCID: 0000-0002-3385-4729

Eric Schares, Engineering & Collection Analysis Librarian, Iowa State University
ORCID: 0000-0002-6292-8221

Outline

- Background
- Open dataset of annual APCs
 - Data sources and methods
 - Results
- Estimates of global APC spend
 - Research questions
 - Methods
 - Results
 - Limitations
- Conclusions and outlook

Article Processing Charges (APCs)

- How much APCs *should* cost
 - \$200 to 1,000 based on publishing costs
(Grossmann & Brembs, 2021)
 - Up to \$1,000
(Fair Open Access Alliance)

“The ability and willingness of consumers to pay for products influences supply-side pricing decisions.”

(Siler & Frenken, 2020)

Article Processing Charges (APCs)

→ How much APCs *actually* cost

→ Average/median gold APC

→ Journal level

→ \$889 (Siler & Frenken, 2020)

→ \$958 (Morrison et al., 2021)

→ \$1,068 (Simard et al., 2022)

→ \$1,977 (Butler et al., 2024)

→ **\$2,000** (Haustein et al., 2024)

→ Article level

→ \$1,800 (Solomon & Björk, 2016)

→ \$1,626 (Morrison et al., 2021)

→ \$1,989 (Butler et al., 2023)

→ **\$2,450** (Haustein et al., 2024)

→ Average/median hybrid APC

→ Journal level

→ \$3,137 (Butler et al., 2024)

→ **\$3,230** (Haustein et al., 2024)

→ Article level

→ \$3,000 (Solomon & Björk, 2016)

→ \$2,600 (OpenAPC, 2022)

→ \$2,905 (Butler et al., 2023)

→ **\$3,600** (Haustein et al., 2024)

Butler, L.-A., Matthias, L., Simard, M.-A., Mongeon, P., & Haustein, S. (2023). The oligopoly's shift to open access: How the big five academic publishers profit from article processing charges. *Quantitative Science Studies*, 4(4), 778–799.

https://doi.org/10.1162/qss_a_00272

Butler, L.-A., Hare, M., Schönfelder, N., Schares, E., Alperin, J.P., & Haustein, S. (2024). *An open dataset of article processing charges from six large scholarly publishers (2019-2023)*. arXiv. <https://arxiv.org/pdf/2406.08356>

Haustein, S., Schares, E., Alperin, J.P., Hare, M., Butler, L.-A., & Schönfelder, N. (2024). *Estimating global article processing charges paid to six publishers for open access between 2019 and 2023*. arXiv. <https://doi.org/10.48550/arXiv.2407.16551>

Morrison, H., Borges, L., Zhao, X., Kakou, T. L., & Shanbhog, A. N. (2021). Open access journals & article processing charges 2011–2021. <http://hdl.handle.net/10393/42327>

OpenAPC (16 May 2022). *OpenAPC Treemap*. Retrieved 16 May 2022 from https://treemaps.openapc.net/apcdata/openapc/#journal/is_hybrid=TRUE

Simard, M.-A., Basson, I., & Larivière, V. (2022). Geographic differences in the uptake of diamond open access and APCs. *Proceedings of the 26th International Conference on Science, Technology and Innovation Indicators*, Granada, Spain.

<https://doi.org/10.5281/zenodo.6975589>

Siler, K., & Frenken, K. (2020). The pricing of open access journals: Diverse niches and sources of value in academic publishing. *Quantitative Science Studies*, 1(1), 28–59. https://doi.org/10.1162/qss_a_00016

Solomon, D., & Björk, B.-C. (2016). Article processing charges for open access publication—The situation for research intensive universities in the USA and Canada. *PeerJ*, 4, e2264. <https://doi.org/10.7717/peerj.2264>

Background



Internet Archive Wayback Machine

Annual list prices: 2015 vs 2022 vs 2023

The image shows a collage of three screenshots from the Internet Archive Wayback Machine, illustrating the annual list price of the journal *Developmental Science* at different points in time. The screenshots are layered, with the 2015 version in the background, the 2022 version in the middle, and the 2025 version in the foreground. Each screenshot is annotated with a callout box containing the date and the corresponding price.

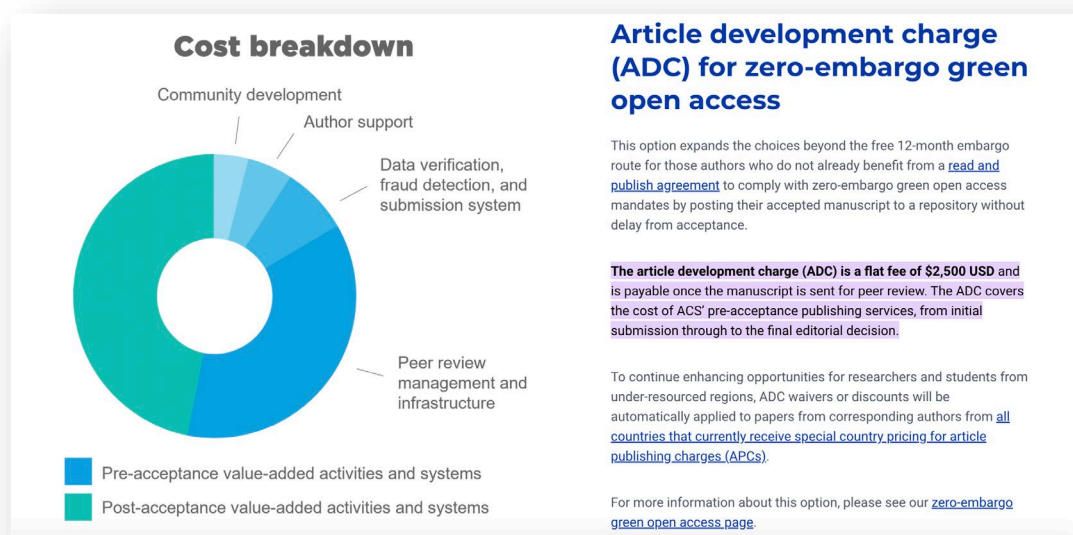
- 1 December 2015:** \$3,000
- 27 September 2022:** \$3,900
- 3 Feb 2025:** \$4,140

The screenshots show the journal's website interface, including the header, navigation menu, and article information. The 2025 screenshot specifically highlights the "Article Publication Charges (APCs)" section, which states: "If the Open Access option is selected, submissions will be subject to an APC if accepted and published in the journal: \$4140 USD / £2810 GBP / €3450 EUR".

New types of author fees

Article Development Charge (ADC)

- *American Chemical Society* introduces \$US 2,500 ADC fee
- Enables authors to immediately deposit accepted manuscript (green OA)
- Published version (VoR) remains paywalled



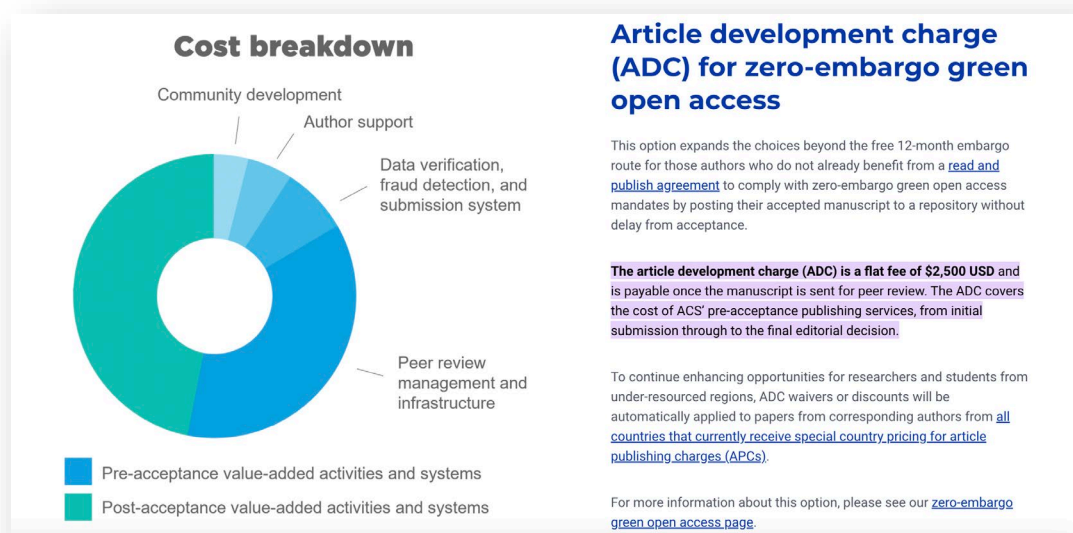
New types of author fees

Article Development Charge (ADC)

- *American Chemical Society* introduces \$US 2,500 ADC fee
- Enables authors to immediately deposit accepted manuscript (green OA)
- Published version (VoR) remains paywalled

Accelerated Review Fees

- Some publishers are introducing fees for accelerated review
 - Springer-Nature, *Advances in Therapy*: \$US 7,800 (hybrid)



Home > Advances in Therapy

Advances in Therapy

Publishing model
Hybrid

Publication fees: Upon acceptance of an article, authors will be required to pay the mandatory **Rapid Service Fee of €6250 / \$7800 / £5600**. The journal will consider fee discounts and waivers on the Rapid Service Fee for developing countries and this is decided on a case by case basis. If you would like to request a discount or waiver, please do so either ahead of submission or at the very start of the submission process. Requests made after this stage will not be considered.

Open access option: *Advances in Therapy* offers an open access option for all articles submitted to the journal. If you choose open access publication you **will be required to pay a fee of €3590 / \$4590 / £2890 (in addition to the mandatory Rapid Service Fee)**, upon acceptance of your article.

Advances in Therapy is an international, open choice, peer-reviewed (single-blind), and rapid publication journal. The scope of the journal is broad, covering the use of therapies, devices, and surgical techniques across all therapy areas. The key features of the journal are:

Rapid publication: The journal aims for a 2-week peer review, 3-4 weeks from acceptance to online.

Inclusivity: All scientifically sound research considered be it positive, confirmatory or negative data. Research is considered from clinical phase, real-world and health economics outcomes studies. Submissions are welcomed

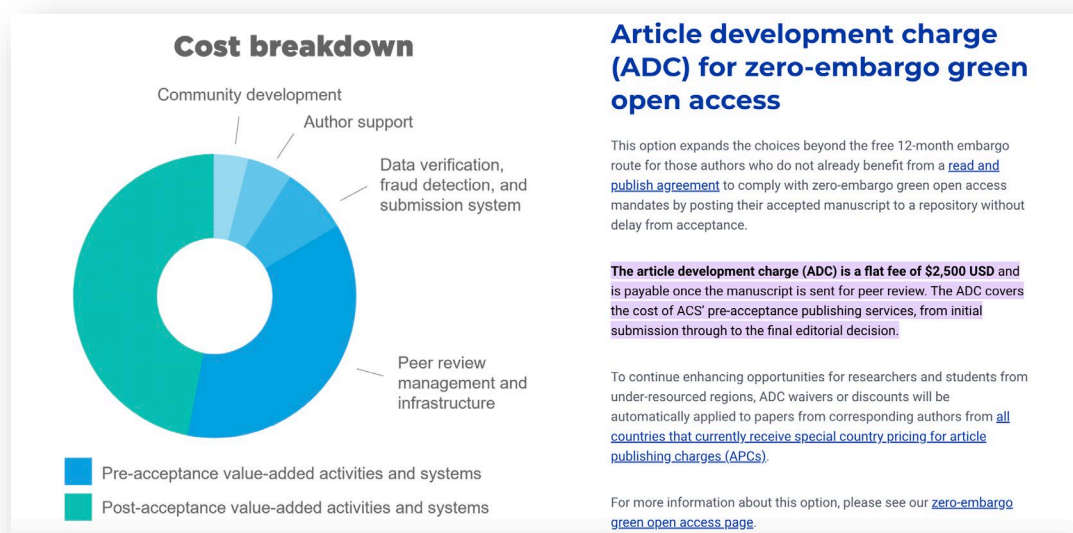
New types of author fees

Article Development Charge (ADC)

- *American Chemical Society* introduces \$US 2,500 ADC fee
- Enables authors to immediately deposit accepted manuscript (green OA)
- Published version (VoR) remains paywalled

Accelerated Review Fees

- Some publishers are introducing fees for accelerated review
 - Springer-Nature, *Advances in Therapy*: \$US 7,800 (hybrid)
 - *Dermatology and Therapy*: \$US 6,850 (gold)



Home > Advances in Therapy

Advances in Therapy

Home > Dermatology and Therapy

Dermatology and Therapy
Research, treatment and aesthetic interventions in dermatology

Publishing model
Open access

Submit your manuscript →

Publication fees: Upon acceptance of an article, authors will be required to pay the mandatory Rapid Service Fee of **€5500/\$6850/£4700**. There is an additional fee for podcast articles. The journal will consider fee discounts and waivers for developing countries and this is decided on a case by case basis. If you would like to request a discount or waiver please do so either ahead of submission or at the very start of the submission process. Requests made after this stage will not be considered.

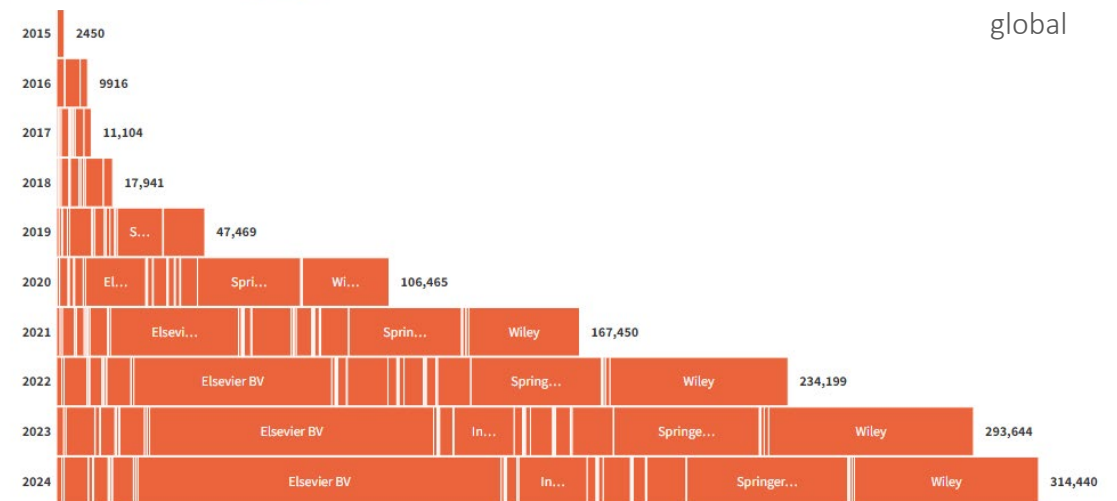
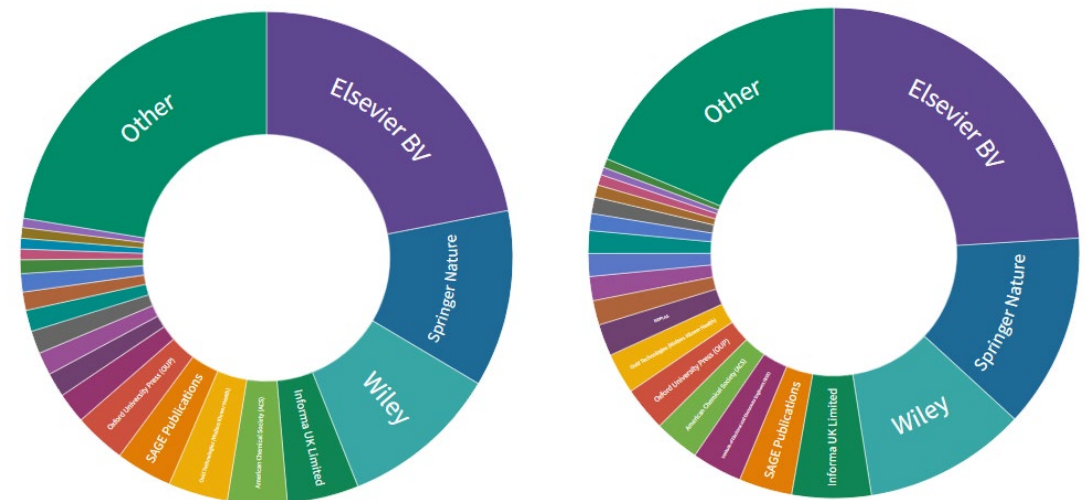
Overview

Dermatology and Therapy is an international, open access, peer-reviewed (single-blind), and [rapid publication journal](#). The journal is dedicated to the publication of high-quality clinical (all phases), observational, real-world, and health outcomes research around the discovery, development, and use of dermatological therapies. The key features of the journal are:

Background

Read-and-publish agreements (“transformative” agreements)

- Negotiated contract between institution and publisher
 - Library or consortium pays annual fee, eliminating or reducing author fees
 - Combines reading and publishing for a fixed price
- Original intention was to “transform” subscription journals to OA
 - Plan S Transformative Journals program failed
 - Hybrid OA had the same goal
- New “Big Deal”



Read-and-publish agreements (“transformative” agreements)



The screenshot shows the Plan S website header with the logo and tagline "Making full & immediate Open Access a reality". The navigation menu includes "Plan S", "Principles & Implementation", "Services", "cOAlition S", "News", "Resources", "FAQ", and "Blog". A decorative banner with various icons is below the navigation. The main content area features a "News" tab and a "Go back" button. The article title is "cOAlition S confirms the end of its financial support for Open Access publishing under transformative arrangements after 2024". The date is "26/01/2023". The article text discusses the end of financial support for transformative arrangements after 2024, with exceptions for national strategies and a cessation of support for Transformative Journals after June 2023.

Plan S
Making full & immediate
Open Access a reality

Plan S Principles & Implementation Services cOAlition S News Resources FAQ Blog

News

< Go back

cOAlition S confirms the end of its financial support for Open Access publishing under transformative arrangements after 2024

26/01/2023

[Transformative arrangements](#) – including [Transformative Agreements](#) and [Transformative Journals](#) – were developed to encourage subscription journals to transition to full and immediate open access within a defined timeframe (31st December 2024, as specified in the Plan S [Implementation Guidance](#)). After careful consideration of the outcomes of transformative arrangements, the leadership of cOAlition S reaffirms that, as a principle, its members will no longer financially support these arrangements after 2024.

Exceptionally, individual cOAlition S funders may still choose to financially participate in Transformative Agreements beyond 2024 as part of their respective national strategies. Such exceptions will be communicated on the cOAlition S website.

Support for Transformative Journals will also cease at the end of 2024. In anticipation of this, no new applications to this programme will be considered after the 30th of June 2023.

Read-and-publish agreements (“transformative” agreements)

Plan S
Making full & immediate
Open Access a reality

Plan S Principles & Implementation Services cOAlition S News Resources FAQ Blog

News

Analysis of the 2023 data shows that of the **996 titles** in the TJ programme:

- > 39 titles (4%) had flipped to full OA and thus had successfully transformed, in line with the programme objectives
- > 403 titles (40%) met or exceeded their OA growth targets
- > 552 titles (56%) failed to meet their OA growth targets and, had the TJ programme continued, would have been removed from the TJ programme
- > 2 titles (<1%) only started publishing in 2023 and thus did not have a 2023 TJ target.

A further 57 journals, all published by Cambridge University Press, are in the process of flipping in 2025. Springer Nature also indicated that 14 journals are likely to flip in 2025, though the titles affected are not yet in the public domain.

Note: Neither the American Society for Tropical Medicine and Hygiene (1 TJ) nor the IEEE (162 TJs) provided their TJ reports. As such, in this analysis, all these titles are deemed to have not met their OA penetration targets.

Category	Count	Percentage
Flipped to OA	39	4%
Met OA targets	403	40%
Failed to meet targets	552	56%
Other	2	0%

26/01/2023

[Transformative arrangements](#)
journals to transition to full
[Implementation Guidance](#)
that, as a principle, its mer

Exceptionally, individual o
respective national strateg

Support for Transformative
considered after the 30th c

Figure 1: Summary of the 2023 TJ data

Read-and-publish agreements (“transformative” agreements)

“The speed at which this transition is (barely) happening at the very large commercial (hybrid) publishers is so slow that the whole strategy is very likely to be abandoned despite its non-negligible advantages.”

de Castro et al. (2024)

Motivation

- Lack of transparency around the payment of APCs
- Need for reliable data to support evidence-based decision-making
- Unsustainability of the author-pays model
- Resources intended to support research are leaving academia to maximize shareholder profits

“If you end up paying [APCs], then you’re losing funds for other things, like laboratory chemicals,’ says Kowaltowski... And she wasn’t eager to tap her monthly paycheck of about \$3500 after taxes.”

Brainard (2024)



Annual APC dataset for six scholarly publishers

2019-2023

Building the open dataset

- APC list prices from
 - annual pricelists
 - scraped from journal web pages
- Collated into dataset
 - manual and automated methods used to combine files
 - process of data cleaning and metadata enrichment

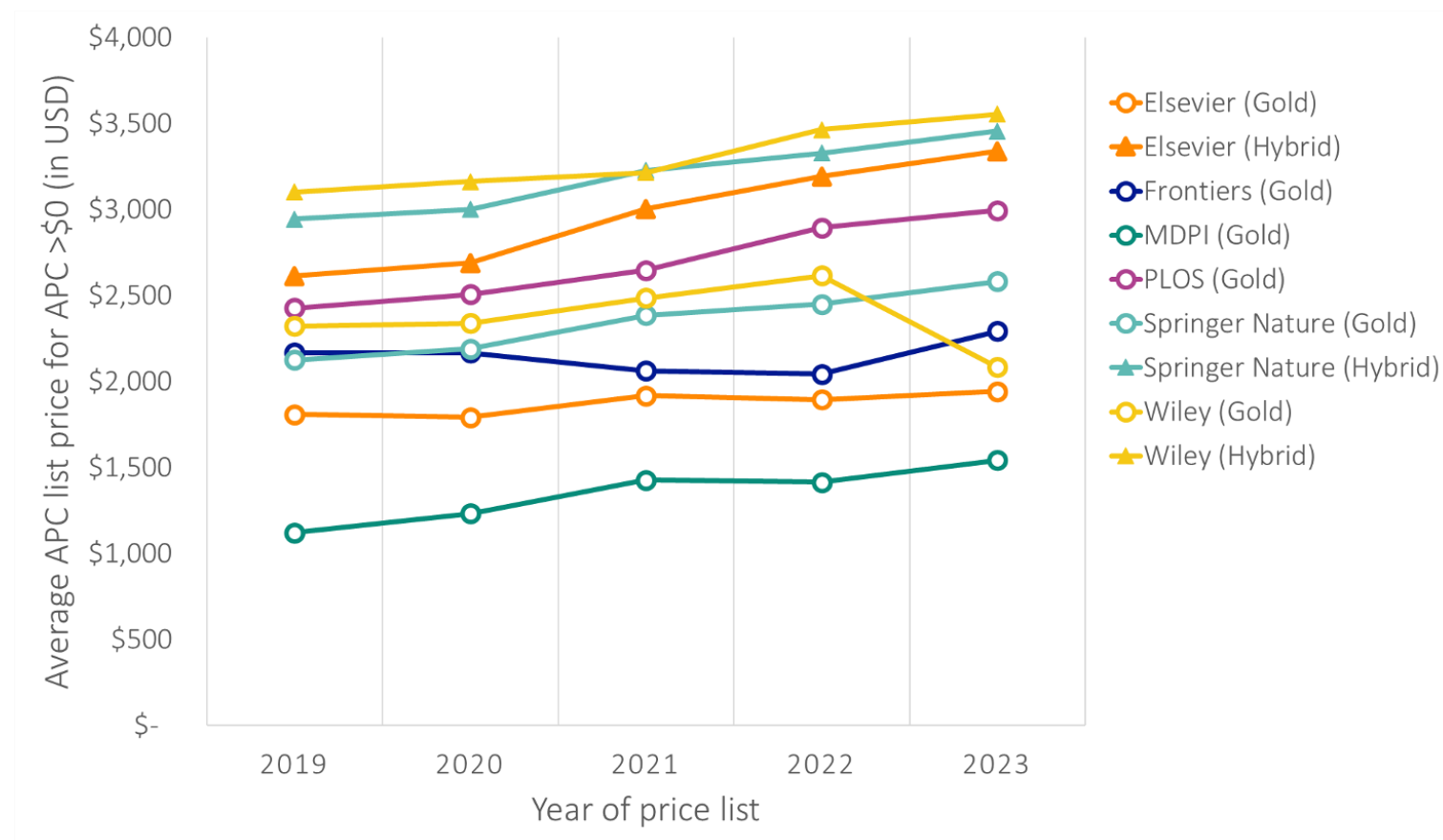
Publisher	OA status	Number of journal-year combinations	APC in USD		
			Min	Max	Average
all publishers		36,618	0	11,690	2,859
	Gold	8,499	0	8,900	1,977
	Hybrid	26,993	0	11,690	3,137
	No OA status provided	16	1,250	3,400	2,288
	No APC provided	1,110		n/a	
Elsevier		12,478	150	10,100	2,736
	Gold	2,515	200	8,900	1,891
	Hybrid	9,582	150	10,100	2,959
	No OA status provided	16	1,250	3,400	2,288
	No APC provided	365		n/a	
Frontiers	Gold	618	0	3,295	2,093
MDPI		1,676	0	2,895	1,383
	Gold	1,676	0	2,895	1,383
	No APC provided	32		n/a	
PLOS	Gold	50	1,595	6,300	2,740
Springer Nature		13,422	0	11,690	3,041
	Gold	2,312	0	6,850	2,348
	Hybrid	10,398	0	11,690	3,195
	No APC provided	712		n/a	
Wiley		8,374	0	6,100	3,106
	Gold	1,360	0	5,740	2,139
	Hybrid	7,013	950	6,100	3,294
	No APC provided	1		n/a	

Butler, L.-A., Hare, M., Schönfelder, N., Schares, E., Alperin, J.P., & Haustein, S. (2024). *An open dataset of article processing charges from six large scholarly publishers (2019-2023)*. arXiv. <https://arxiv.org/pdf/2406.08356>

Butler, L.-A., Hare, M., Schönfelder, N., Schares, E., Alperin, J.P., & Haustein, S. (2024). *Open dataset of annual Article Processing Charges (APCs) of gold and hybrid journals published by Elsevier, Frontiers, MDPI, PLOS, Springer-Nature and Wiley 2019-2023 (Version v1)* [dataset]. Harvard Dataverse. <https://doi.org/10.7910/DVN/CR1MMV>

Open dataset

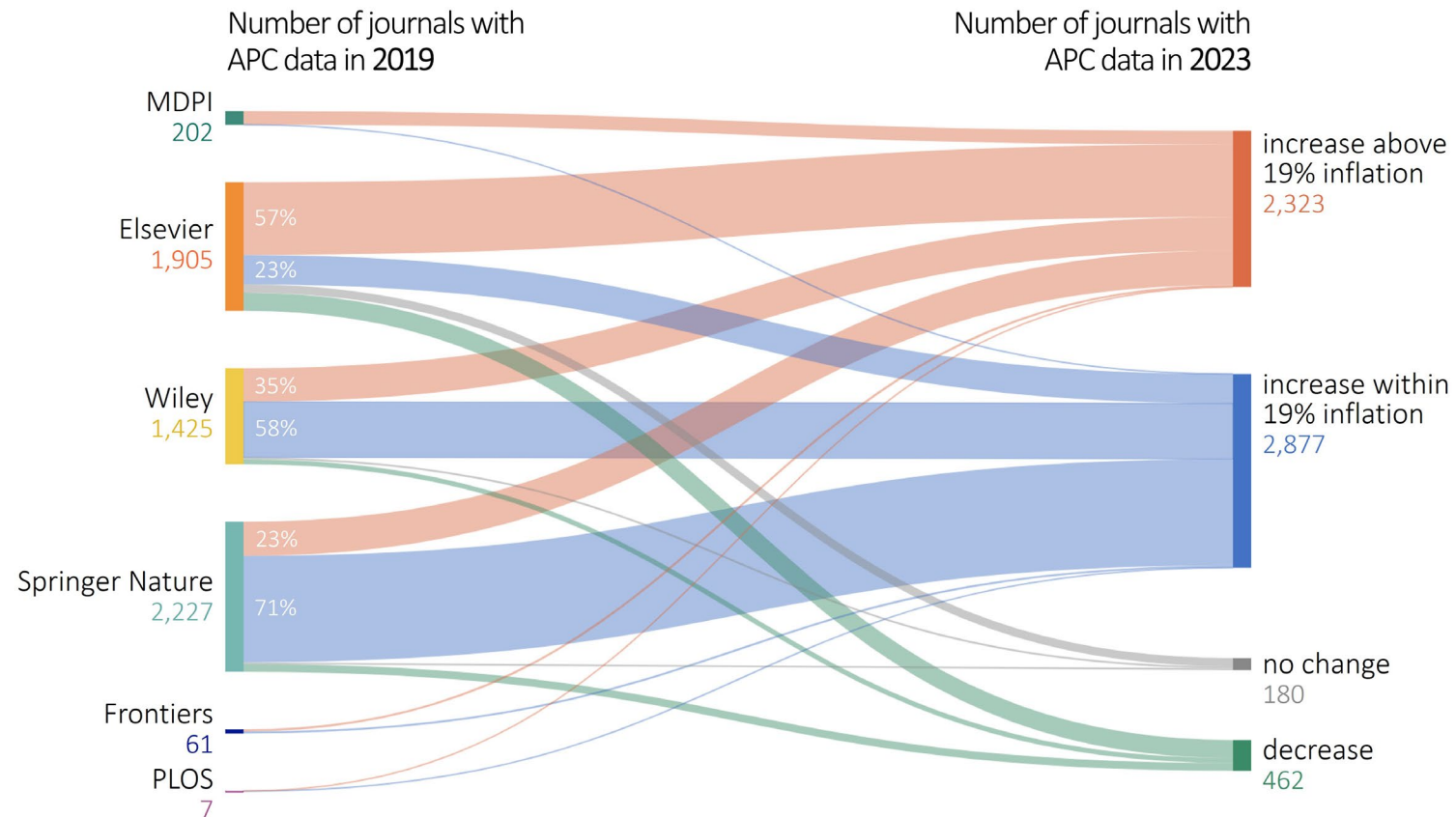
Average gold and hybrid APCs per publisher per year



Butler, L.-A., Hare, M., Schönfelder, N., Schares, E., Alperin, J.P., & Haustein, S. (2024). *An open dataset of article processing charges from six large scholarly publishers (2019-2023)*. arXiv. <https://arxiv.org/pdf/2406.08356>
Butler, L.-A., Hare, M., Schönfelder, N., Schares, E., Alperin, J.P., & Haustein, S. (2024). *Open dataset of annual Article Processing Charges (APCs) of gold and hybrid journals published by Elsevier, Frontiers, MDPI, PLOS, Springer-Nature and Wiley 2019-2023 (Version v1) [dataset]*. Harvard Dataverse. <https://doi.org/10.7910/DVN/CR1MMV>

Open dataset

Number of journals which decreased, increased or had a stable APC from 2019 to 2023



Butler, L.-A., Hare, M., Schönfelder, N., Schares, E., Alperin, J.P., & Haustein, S. (2024). *An open dataset of article processing charges from six large scholarly publishers (2019-2023)*. arXiv. <https://arxiv.org/pdf/2406.08356>

Butler, L.-A., Hare, M., Schönfelder, N., Schares, E., Alperin, J.P., & Haustein, S. (2024). *Open dataset of annual Article Processing Charges (APCs) of gold and hybrid journals published by Elsevier, Frontiers, MDPI, PLOS, Springer-Nature and Wiley 2019-2023 (Version v1) [dataset]*. Harvard Dataverse. <https://doi.org/10.7910/DVN/CR1MMV>

Open dataset

Available on Harvard Dataverse under CC-0 license – please reuse and remix!

The screenshot shows the Harvard Dataverse interface for the dataset "Open dataset of annual Article Processing Charges (APCs) of gold and hybrid journals published by Elsevier, Frontiers, MDPI, PLOS, Springer-Nature and Wiley 2019-2023". The page includes a navigation bar with "Add Data", "Search", "About", "User Guide", "Support", "Sign Up", and "Log In". The dataset title is prominently displayed, along with the version "Version 1.0". A "Cite Dataset" section provides the citation information and a link to "Learn about Data Citation Standards". A "Description" section details the dataset's origin and content. A "Subject" section lists "Computer and Information Science; Social Sciences". A "Related Publication" section cites the dataset's publication. The "License/Data Use Agreement" section shows the "CC0 1.0" license. On the right, there are buttons for "Access Dataset", "Contact Owner", and "Share", along with "Dataset Metrics" showing "2,414 Downloads".



Estimating global APC expenditure

Research Questions

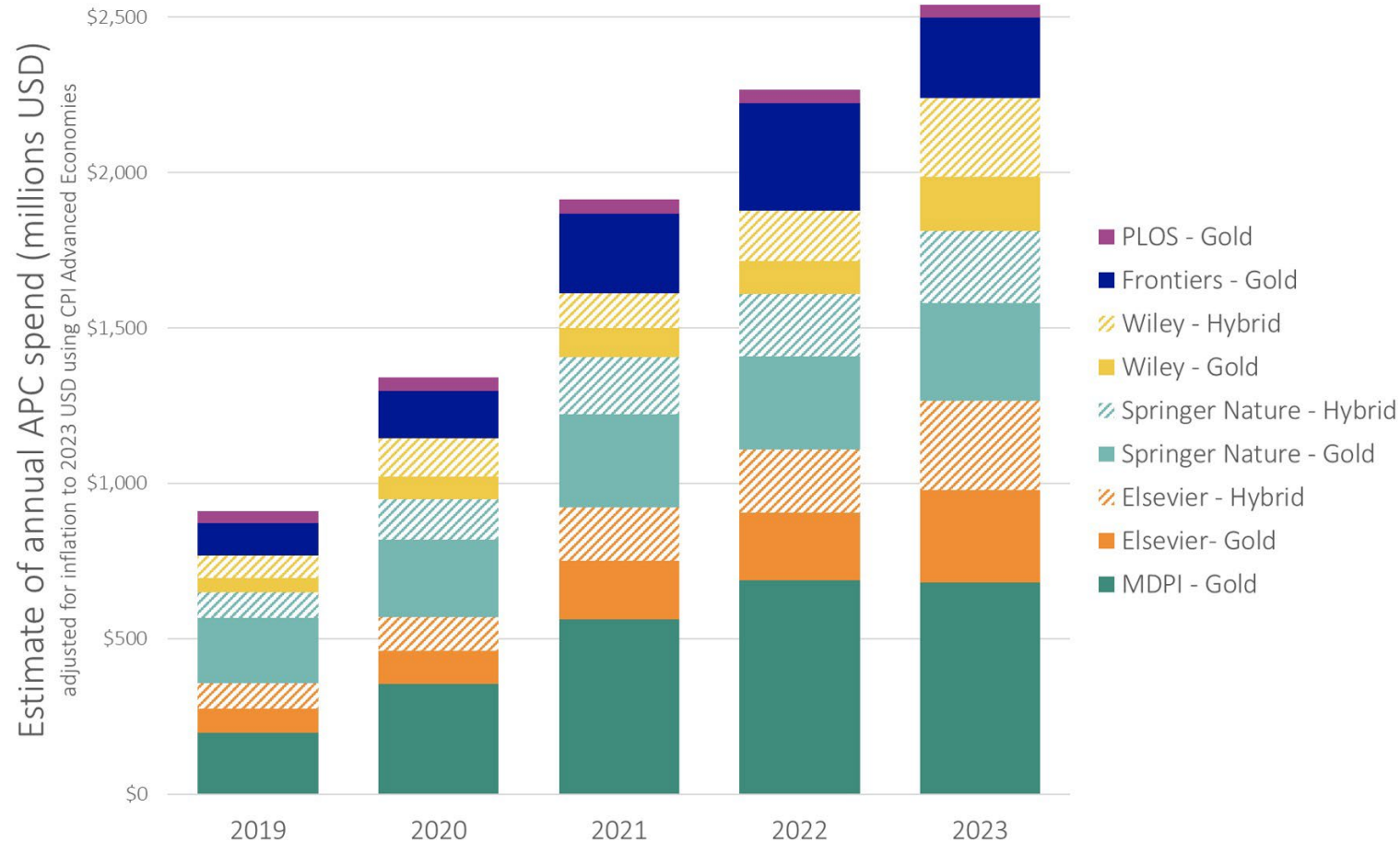
- How much was paid in APCs to these six publishers for the 2019–2023 period?
 - How did the estimated spend differ between gold and hybrid OA?
 - How did the estimated spend differ between publishers?
 - How did the estimated spend develop over time?
- How do gold and hybrid APCs paid (article level) compare to the APCs listed (journal level)?

Methods

- Number of “APC-able” papers per journal per year 2019-2023
 - Data from OpenAlex, type=article or review
 - Compared with Dimensions, estimates agree within 2%
- Determining hybrid and gold OA articles
 - Gold journal: all papers are “APC-able”
 - Hybrid: count only articles with a CC-BY license (not "delayed OA")
OpenAlex/Unpaywall improved OA status based on our feedback
- Spend estimate based on number of papers per journal per year with respective annual APC, adjusted for inflation to 2023 USD
- Considering 100% waivers in list price, but no individual waivers

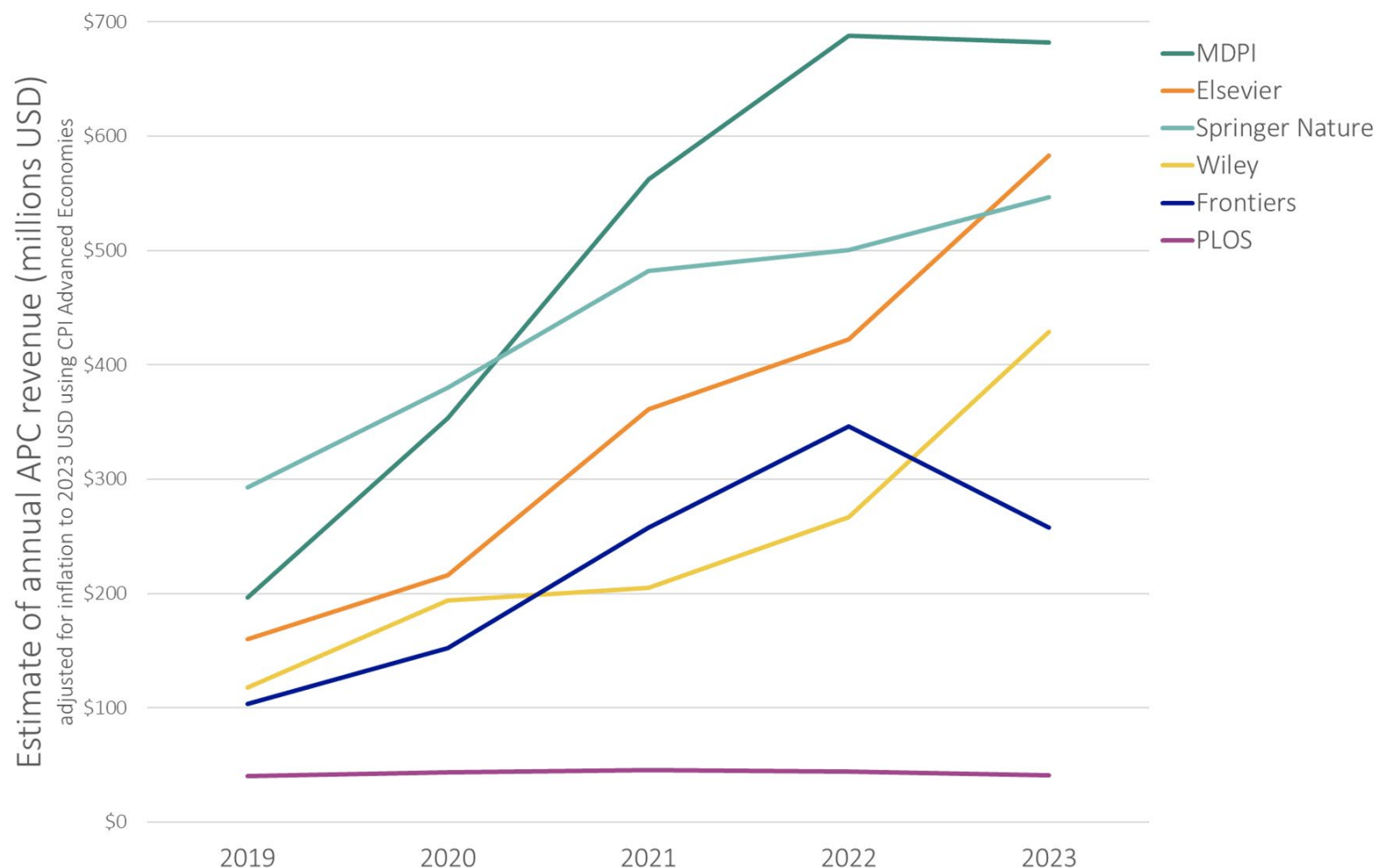
Estimating global APC expenditure

Results - \$8.968B total adjusted inflation to 2023 (\$8.35B nominal)



Estimating global APC expenditure

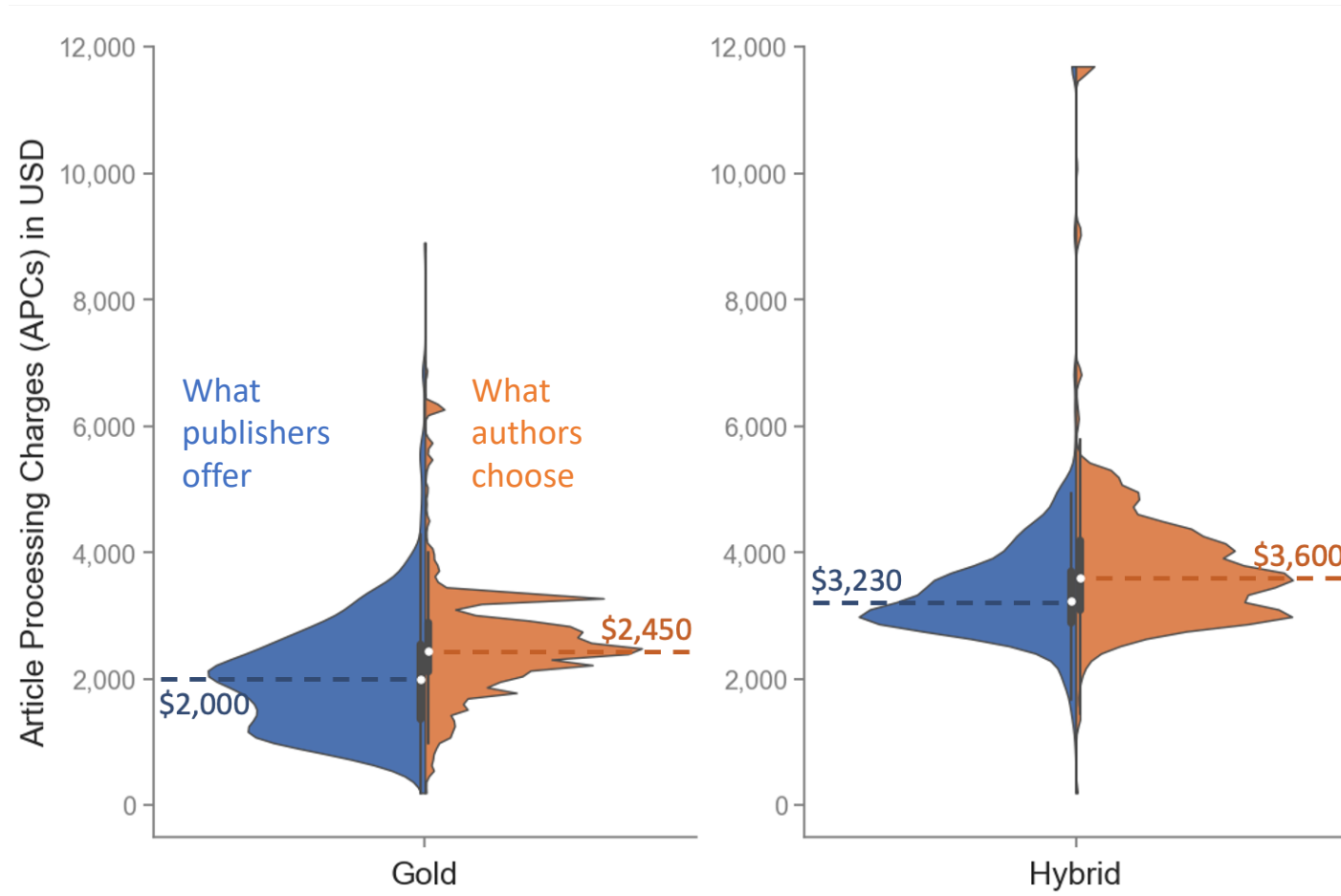
Results



Estimating global APC expenditure

Results

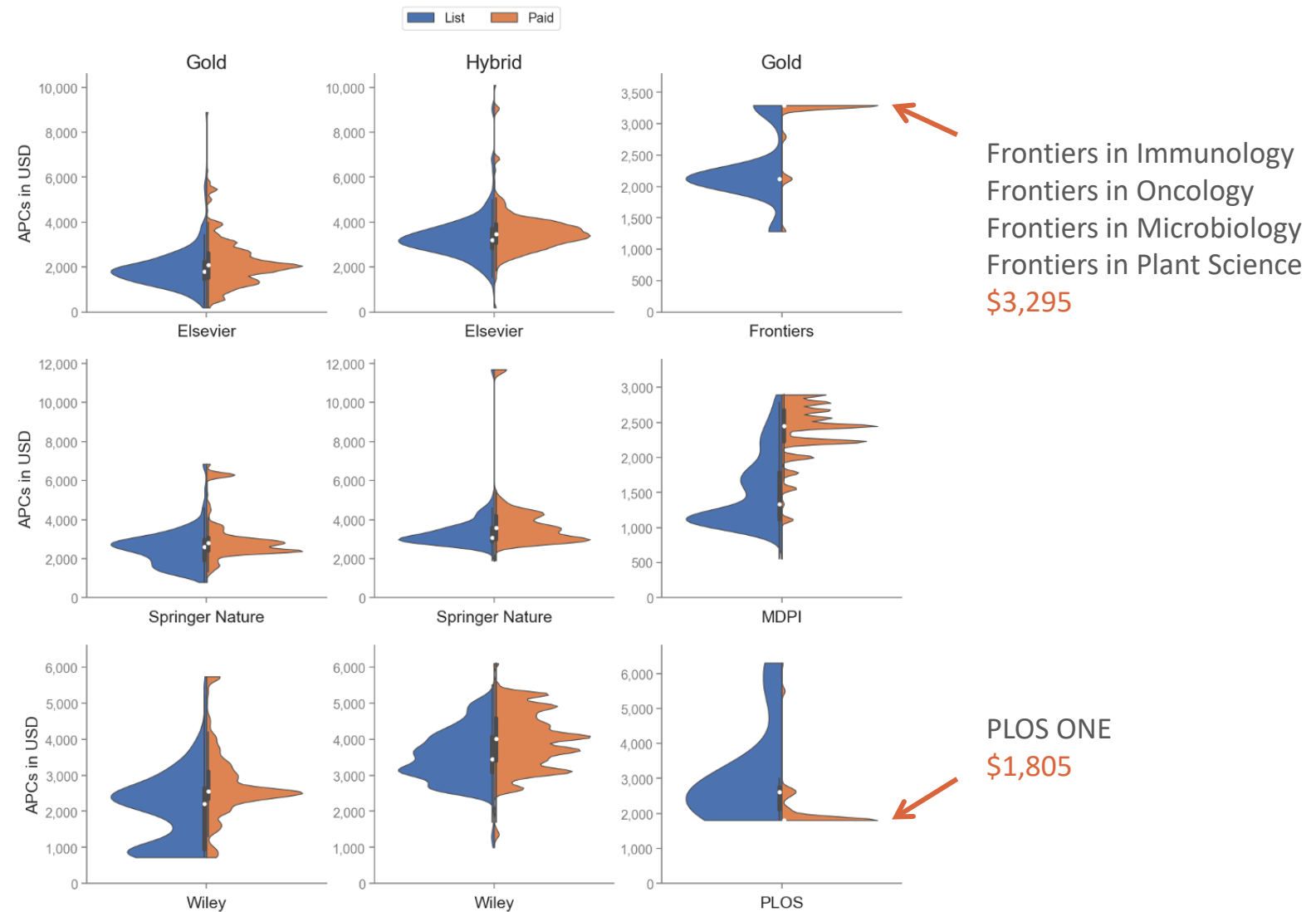
2023 listed vs. paid



Estimating global APC expenditure

Results

2023 listed vs. paid



Limitations

- Dataset collates information provided by publishers
- Results are an estimate due to a lack of transparency around APCs
- Do not consider individual and institutional discounts and waivers due to limits in publicly accessible information
- Do not consider read-and-publish agreements

Outputs

→ Dataset

- Butler, L.-A., Hare, M., Schönfelder, N., Schares, E., Alperin, J.P., & Haustein, S. (2024). *Open dataset of annual Article Processing Charges (APCs) of gold and hybrid journals published by Elsevier, Frontiers, MDPI, PLOS, Springer-Nature and Wiley 2019-2023* (Version v1) [dataset]. Harvard Dataverse.
<https://doi.org/10.7910/DVN/CR1MMV>

→ Data paper

- Butler, L.-A., Hare, M., Schönfelder, N., Schares, E., Alperin, J. P., & Haustein, S. (2024). *An open dataset of article processing charges from six large scholarly publishers (2019-2023)* (Version 1). arXiv.
<https://doi.org/10.48550/ARXIV.2406.08356>

→ Dashboard

- <https://www.scholcommlab.ca/apc-explorer/>

→ Global analysis preprint

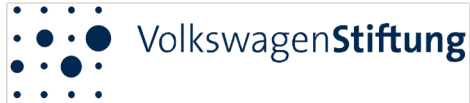
- Haustein, S., Schares, E., Alperin, J. P., Hare, M., Butler, L.-A., & Schönfelder, N. (2024). *Estimating global article processing charges paid to six publishers for open access between 2019 and 2023* (Version 1). arXiv. <https://doi.org/10.48550/ARXIV.2407.16551>



Conclusions and Outlook

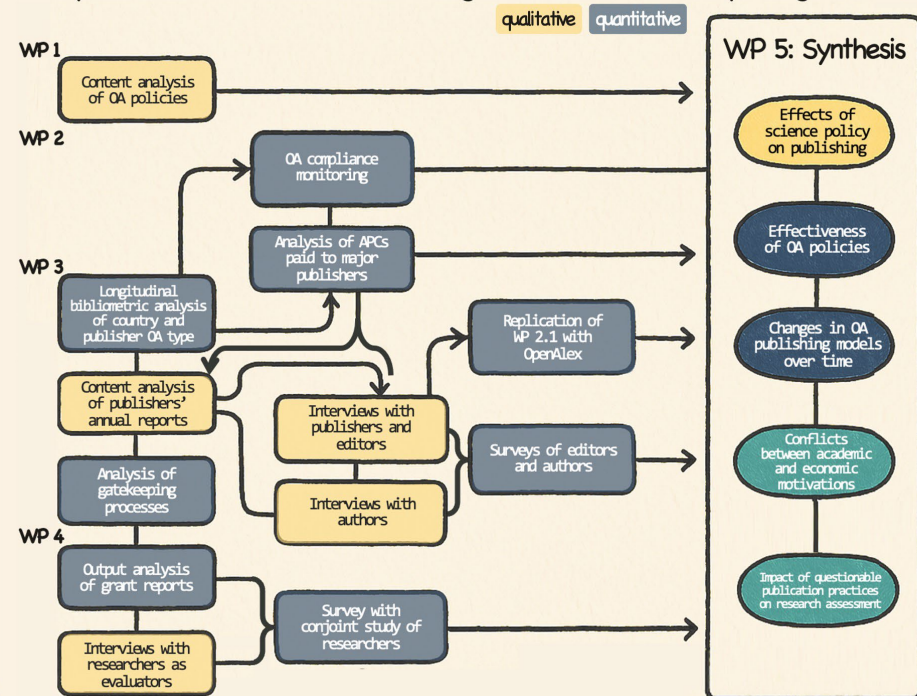
- **Global estimates of APC expenditure, using the dataset, shows us that:**
 - a massive amount of money is spent on APCs
 - APC expenditure is growing at an unsustainable rate
 - there is a disconnect between APC pricing and the cost to publish
- **The APC dataset can provide various types of analyses:**
 - estimating APC spend
 - supporting collections development
 - understanding costs and value of read-and-publish agreements
- **Continuing to build the APC dataset by:**
 - supplementing missing APC data
 - verifying journal OA status
 - expanding dataset to include APCs from additional publishers with a larger timeframe
- **Expanding analysis**
 - including author affiliations and countries to understand who pays
 - in-depth analysis by journal

Next steps: ROARA (€1.67million 2024-2028, PI Peters)

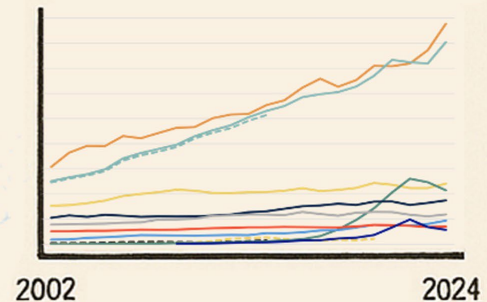
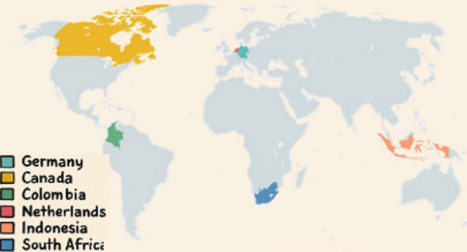


THE IMPACT OF OPEN ACCESS POLICIES ON THE ACADEMIC PUBLISHING MARKET AND ITS EFFECTS ON RESEARCH ASSESSMENT

Multiple mixed-methods research design based on five work packages (WPs)



Funded by a \$2.5 million grant from the Volkswagen Foundation, the *Repercussions of Open Access on Research Assessment (ROARA)* project analyzes open access policies in six countries and their effects on publishing market and behavior. The project seeks to investigate how publishers' economic interests clash with those of the academic community.



Scholarly publications are at the heart of the scholarly communication process and play a crucial role in research assessment practices.

About the project

The ROARA project (PI Prof. Dr. Peters) is funded by the Volkswagen Foundation with a €1.67 million grant from 2024 to 2027. All research outputs will be made available openly. More information can be found on the project website at scholcommlab.ca/research.





Thank you

leigh-ann.butler@uottawa.ca

eschara@iastate.edu

scholcommlab.ca