



A retrospective and prospective study of the evolution of APC costs for French institutions 2023-2030

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Some informations about the study

- Commanded by the French Ministry for Higher Education and Research (MESR)
- Purpose: Understanding the evolution of the costs for APCs as part of the multi-road to Open Access approach and balancing the various roads to OA.
- Execution: Antoine Blanchard and Diane Thierry (Dataactivist) and Maurits van der Graaf (Pleiade)
- Steering group: MESR; Couperin; CNRS; Didier Torny (expert)
- References:
 - Final report : doi:10.52949/26
 - Poster: <https://www.ouvrirlascience.fr/combien-coutent-les-apc-aux-institutions-de-recherche-francaises/>
 - Dataset: doi:10.57745/AQ0OPT
 - Source code: doi:10.5281/zenodo.6940484



Contents of this presentation

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- I. Study design
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A decorative graphic on the left side of the slide. It features a solid purple arrow pointing to the right, with several thin, curved purple lines extending upwards and outwards from its base. The background is a light purple gradient.

Study design



Construction of the dataset

1. We used the article-level dataset of the BSO dataset [[Baromètre de la science ouverte](#)] as the starting point. This dataset has all articles with a French co-author and with a DOI. The dataset is enriched with APC information from OpenAPC.
2. We enriched the dataset with information about the **nationality of the corresponding authors** from Web of Science.
3. In addition, we used Open Alex data to determine for which articles **an APC has been paid in Gold or Hybrid journals** and QOAM to determine the hybrid journals.

Content and study design

In this period Couperin had hardly any P&R agreement, thus practically all APCs are 'APCs in the wild'

Content of the dataset

- ▶ Articles with at least one French co-author
- ▶ Total: 1.032.517
- ▶ Years of publication: 2013-2020

Study design:

- ▶ Retrospective analysis based on the dataset 2013-2020
- ▶ Prospective analysis based on the trends for 2021-2030

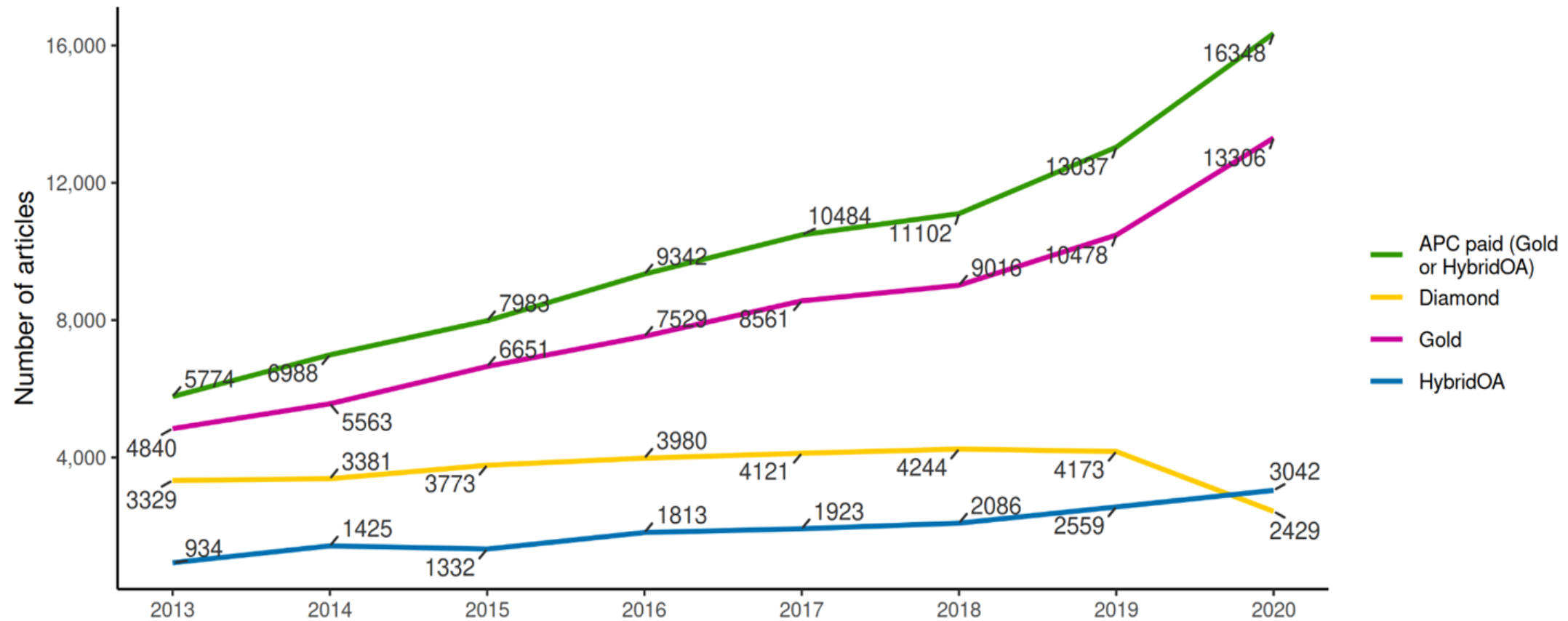


Retrospective analysis 2013 - 2020

Fig. 2

Evolution of OA articles at the site of the publisher by France-based corresponding authors, per color

The growth of articles with APC accelerates from 2018 onwards, mainly driven by Gold journals. The number of Diamond articles grows slightly in 2013-2018.



BSO data enriched with OpenAlex, Web of science, Couperin, QOAM. doi:10.57745/AQ0OPT

Source: Blanchard A., Thierry D., van der Graaf M. Retrospective and prospective study of the evolution of APC costs and electronic subscriptions for French institutions [Report]. French Ministry for Higher Education, Research and Innovation. July 2022. doi:10.52949/26

Four publishers' tiers

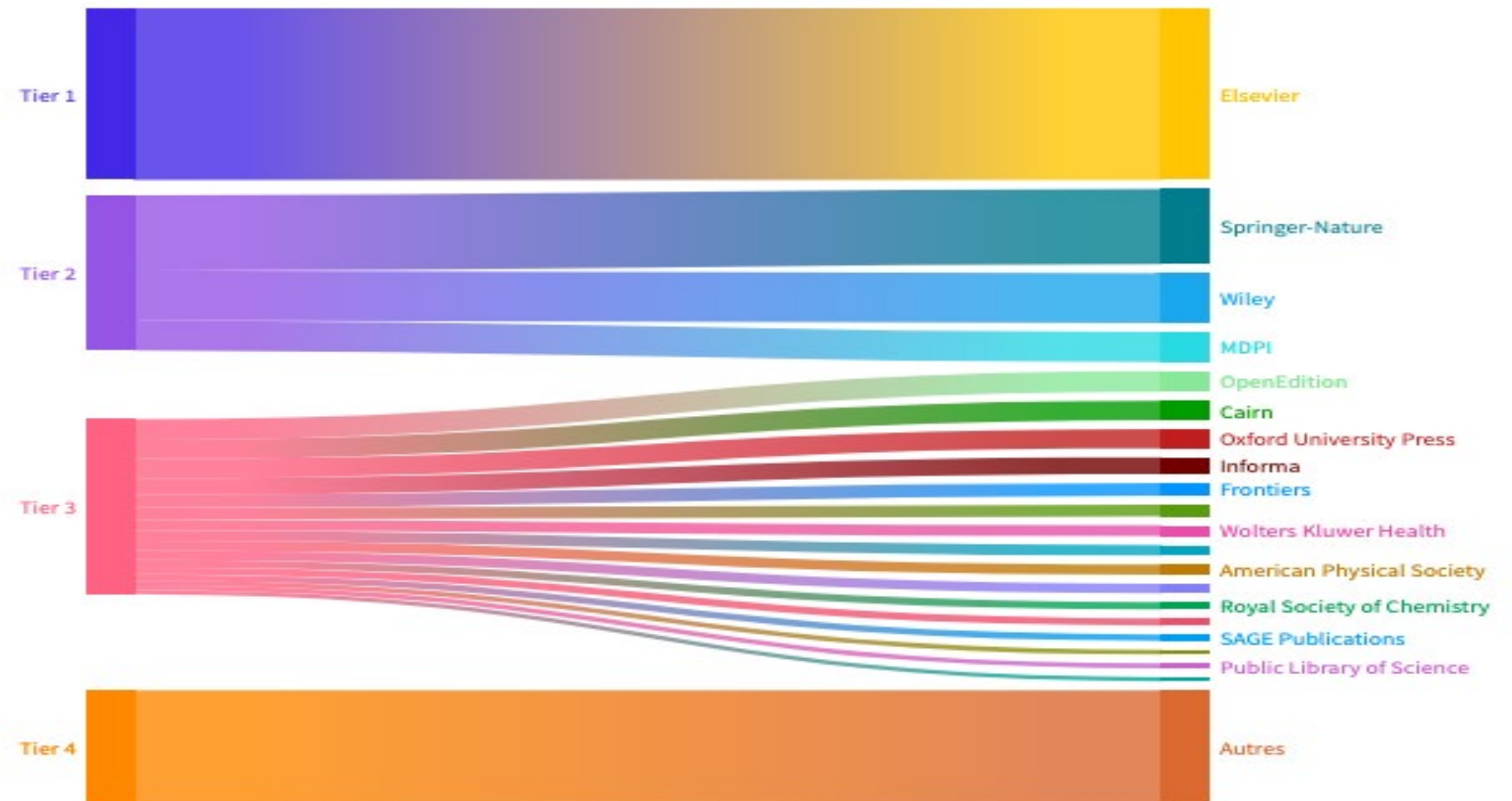
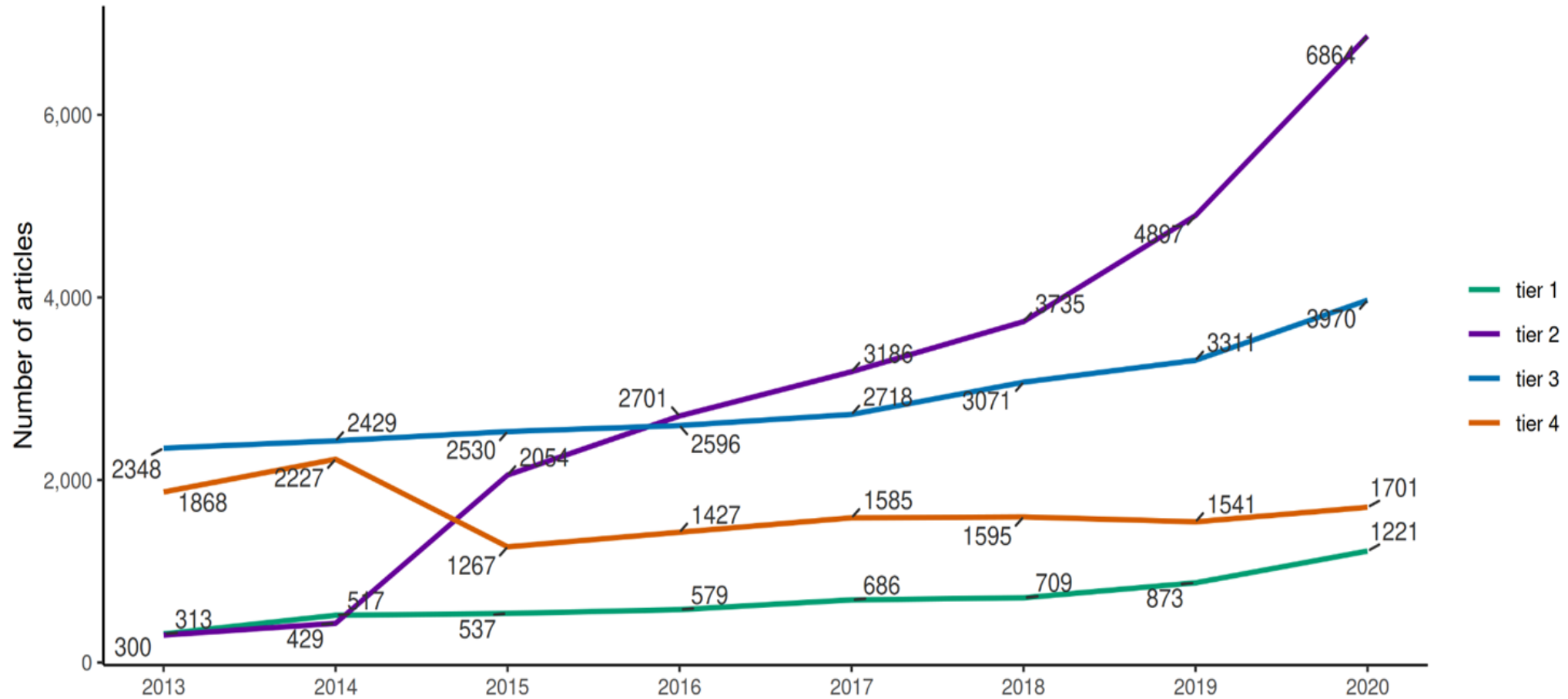


Fig. 3

Evolution of articles with APC and France-based corresponding authors, per publisher tier

APC-paid articles in journals from tier 2 publishers (Springer Nature, Wiley and MDPI) grow more rapidly than for tier 3 publishers, while tiers 1 (Elsevier) and 4 (the long tail of smaller publishers) exhibit a flat to limited growth rate.



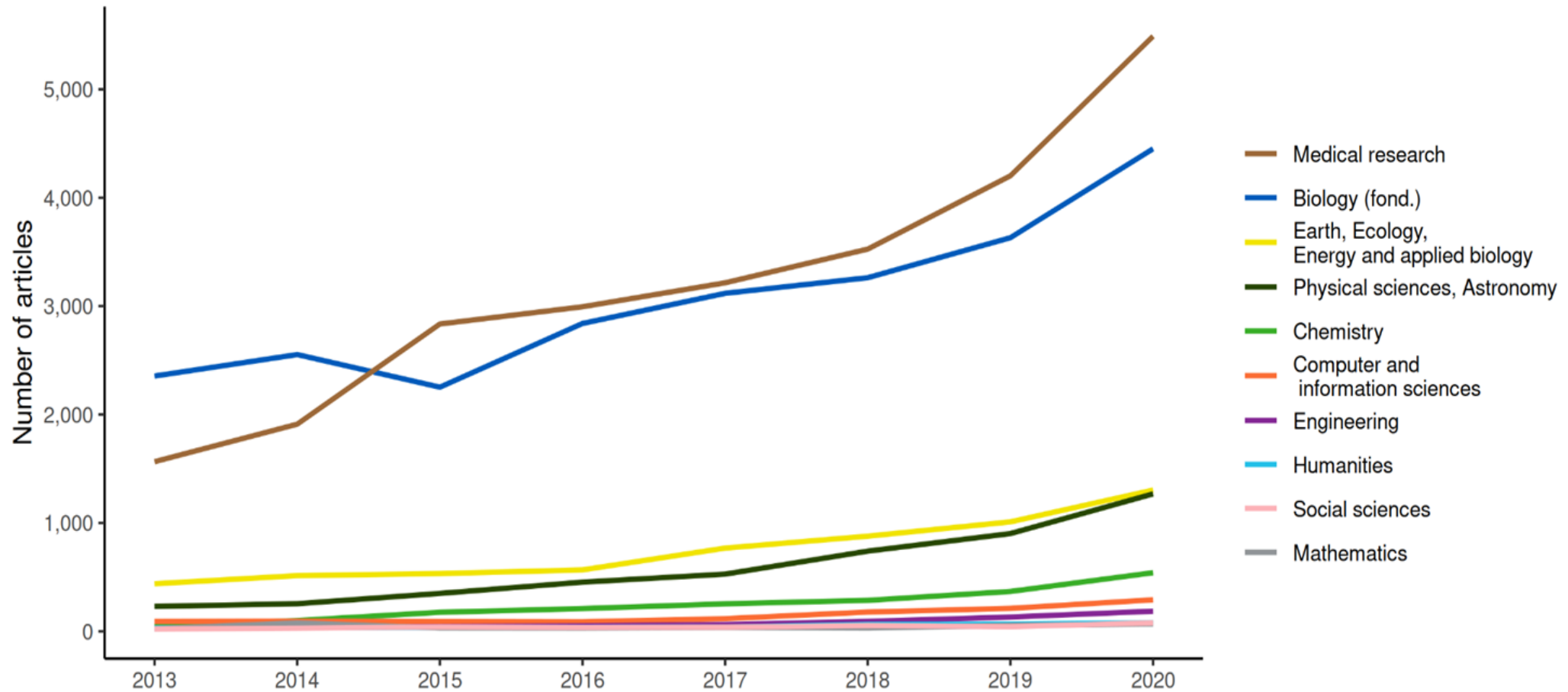
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Fig. 4

Evolution of articles with APC and France-based corresponding authors, per discipline

Medical Research and Biology represent 76 % of articles combined and exhibit a considerable growth. Earth, Ecology, Energy, and applied biology, and Physical sciences, Astronomy, are intermediate.



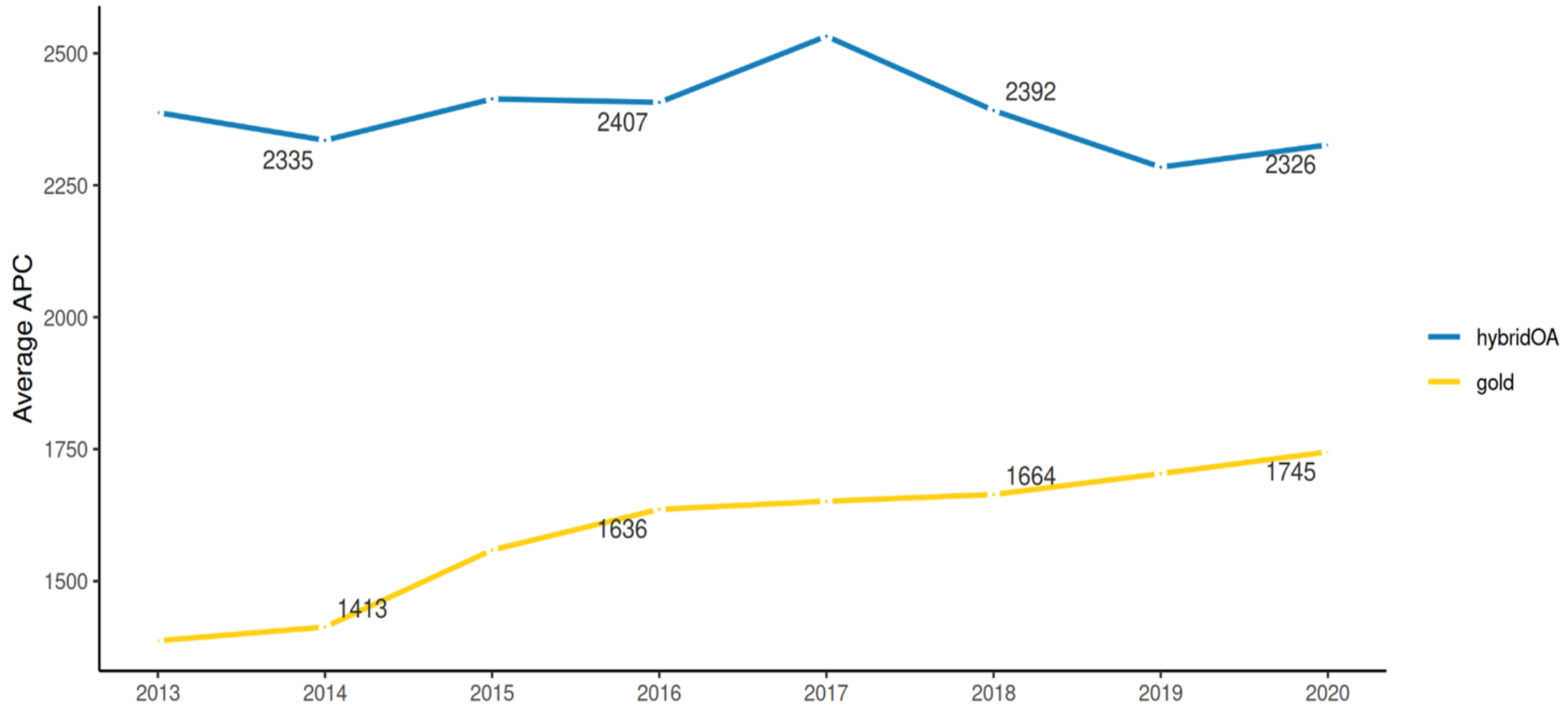
BSO data enriched with OpenAlex, Web of science, Couperin, QOAM. doi:10.57745/AQ0OPT

Source: Blanchard A., Thierry D., van der Graaf M. Retrospective and prospective study of the evolution of APC costs and electronic subscriptions for French institutions [Report]. French Ministry for Higher Education, Research and Innovation. July 2022. doi:10.52949/26

Fig. 7

Evolution of average APC paid by France-based corresponding authors per OA color

APCs for articles in Hybrid journals articles are stable at a high price level. APCs for articles in Gold journals are considerably lower but increased significantly over time.



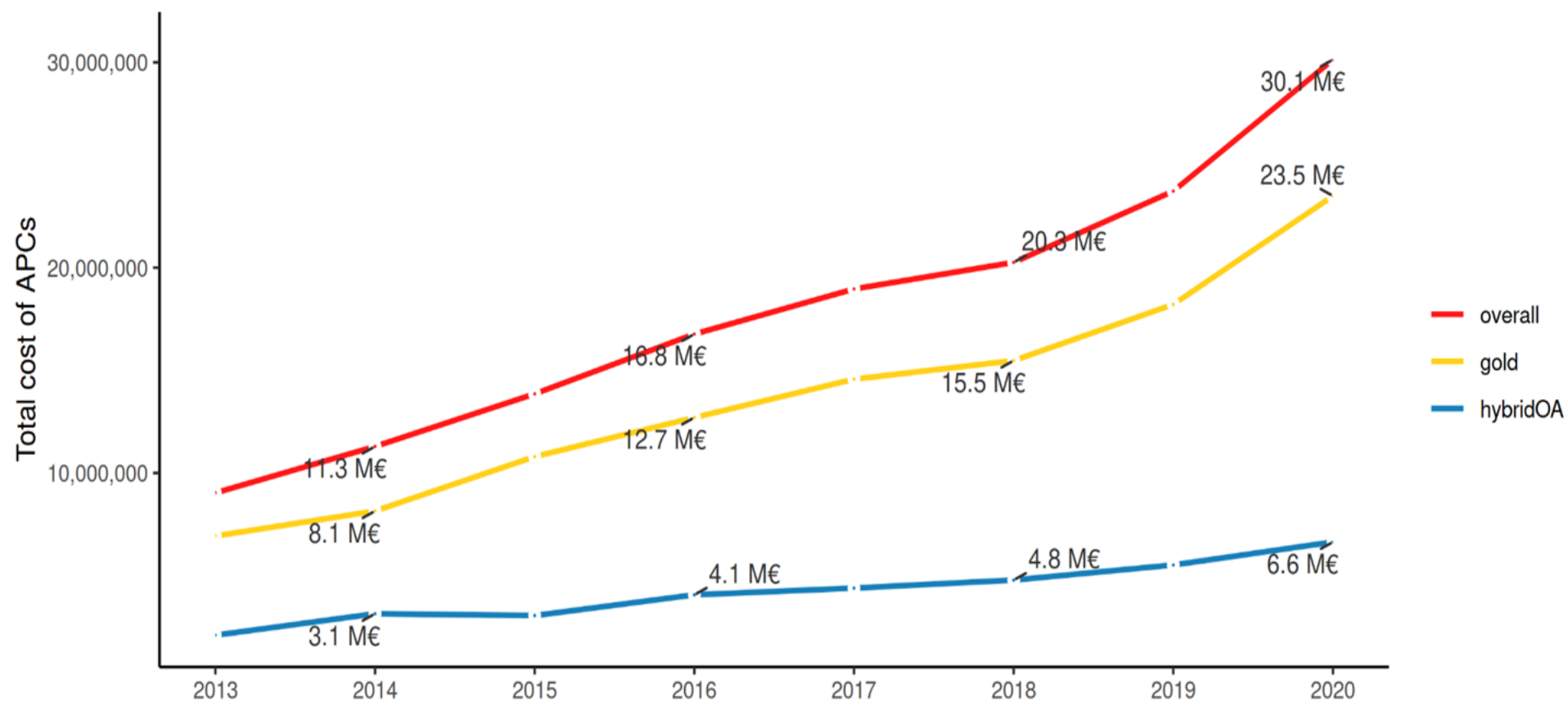
BSO data enriched with OpenAlex, Web of science, Couperin, QOAM. doi:10.57745/AQ0OPT

Source: Blanchard A., Thierry D., van der Graaf M. Retrospective and prospective study of the evolution of APC costs and electronic subscriptions for French institutions [Report]. French Ministry for Higher Education, Research and Innovation. July 2022. doi:10.52949/26

Fig. 10

Evolution of total cost of APCs paid by France-based corresponding authors, overall and per OA color, after reconstructing missing data

When correcting the data (missing APC price, missing nationality of the corresponding author), it is estimated that in 2020, French public institutions paid 30,1 M€ APCs, for a major part in Gold journals.



Mixed-effect model based on BSO data enriched with OpenAlex, Web of science, Couperin, QOAM. doi:10.57745/AQ0OPT

Source: Blanchard A., Thierry D., van der Graaf M. Retrospective and prospective study of the evolution of APC costs and electronic subscriptions for French institutions [Report]. French Ministry for Higher Education, Research and Innovation. July 2022. doi:10.52949/26



Prospective analysis 2021 - 2030

Based on a statistical method called 'mixed model'

And compared to an estimate of the total subscription costs 2021-2030

Estimate total subscriptions costs

Based on the ERE survey 2020

- 79.5 million euro for e-journals [1059 different products]
- 87.5 million euro in 2020 (corrected for non-responders)

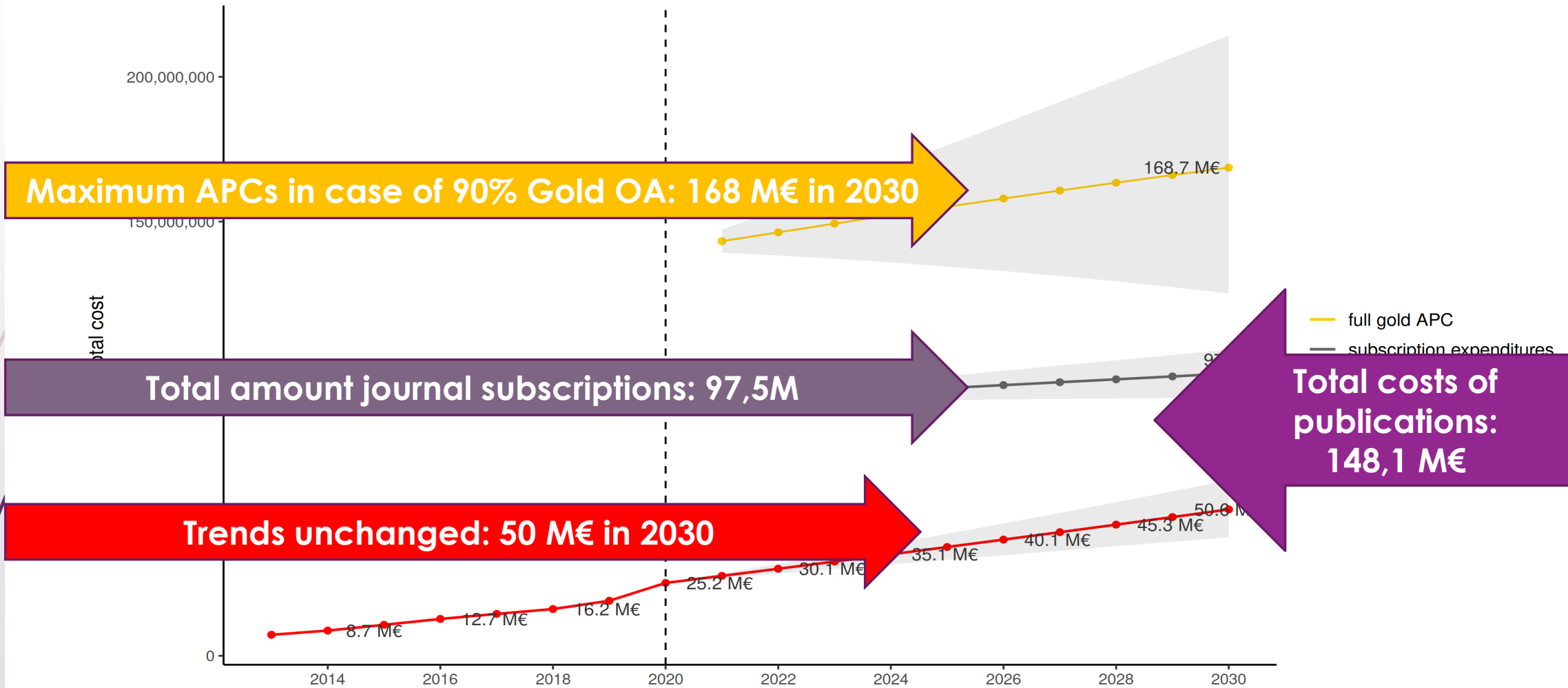
Linear regression for the prediction for 2030 based on the average price increase from 2014- 2021 as seen by Couperin (1,76%)

- 97.5 million predicted in 2030

Fig. 22

Summary of all simulations for the total cost of APCs as well as subscription expenditures (2021-2030)

The expected cost of APCs in 2030 is in the region of 50 M€ if all trends continue unchanged. Going up to 97,5 M€, the subscription expenditures by French institutions should be added to these APC costs.



Mixed-effect and linear regression models based on BSO data enriched with OpenAlex, Web of science, Couperin, QOAM. doi:10.57745/AQ0OPT
Source: Blanchard A., Thierry D., van der Graaf M. Retrospective and prospective study of the evolution of APC costs and electronic subscriptions for French institutions [Report]. French Ministry for Higher Education, Research and Innovation. July 2022. doi:10.52949/26



Total costs of publications

(excluding Diamond OA)

► Situation 2020:

- Subscriptions/ *Read & Publish*: 87,5 M€
- APCs: 30 M€
- **Total cost of publications: 117,5 M€**

► Estimates 2030:

- Subscriptions/ *Read & Publish*: 97,5 M€
- APCs: 50,6 M€
- **Coûts totaux des publications: 148,1 M€**



Some observations on articles with a French co-author

- APC-paid articles (Gold or HybridOA):
 - 20% (2020)
 - 76% in Biomedicine
- Gold versus HybridOA:
 - 2020: 81% Gold, 19% HybridOA
- Couperin (the French consortium):
 - \pm 60% of the articles published in journals contracted by Couperin
- Number of articles **with a French corresponding author** is stable around 80,000 per year



Two observations about the APC-model

APC-model worldwide: is it winning?

Articles published in January – August 2022; Web of Science; C. Petrou; Scholarly Kitchen]

Worldwide:

➤ Gold and Hybrid OA: 37,3%

Per region:

➤ Europe: 50% (30% Gold; 20% H

➤ USA: 30% (22% Gold; 9% HybridOA)

➤ Chine: 33% (30% Gold; 3% HybridOA)

➤ RoW: 27% (20% Gold; 8% HybridOA)

Biomedicine

Medicine general internal 70%

Pharmacology, pharmacy 41%

Public Env. occupational health 52%

Biological sciences

Biochemistry and molecular biology 50%

Cell biology 54%

Plant sciences 41%



Shortcomings APC-model

- **Inequality**

- **Financial issues:**

- Price inelasticity for high-reputation journals

- Prices not transparent

- Cost containment difficult

- **Quality issues:**

- More articles → more income ~ quality?

- Predatory journals [more recently paper mills, although not limited to OA-journals]