

# A Study of Institutional Spending on Open Access Publication Fees in Germany

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## ABSTRACT

Publication fees as revenue source in open access publishing hold a prominent place on the agenda of researchers, policy makers, and academic publishers. This study contributes to the evolving empirical basis on funding these charges. Drawing on self-reported data from 30 German universities and research organisations between 2005 and 2015, expenditure on open access publication fee increased over the years in Germany. Spending amounted to 9,627,537 €. The average payment was 1,298 €, and the median 1,231 €. 94% of the total article volume included in the study was supported in accordance with the price cap of 2,000 €, a limit imposed by the Deutsche Forschungsgemeinschaft (DFG) as part of its funding activities for open access funding at German universities. Expenditure varied considerably at the institutional level. There were also differences in how much the institutions spent per journal and publisher. This reflects, at least in parts, that varying pricing schemes leading to discounted publication fees were in place. With an indexing coverage of 99%, Crossref, a DOI minting agency for scholarly literature that also provides bibliographic metadata, thoroughly indexed the open access journals articles included in the study. A comparison with related openly available cost data from Austria (FWF) and the UK (Wellcome Trust, Jisc) shows that German universities and research organisations mostly funded fully open access journal articles. By contrast, hybrid journal articles accounted for the largest share of spending according to the Austrian and UK data. Fees paid for hybrid journals were on average more expensive than fully open access journals.

Keywords: Open access, open access journal, scholarly publishing, publication fees, article processing charges, science policy

## INTRODUCTION

### General Background

The rise of open access journals has been matched by the increasing relevance of publication fees in academic publishing (Davis and Walters, 2011; Laakso and Björk, 2012; Pinfield, 2015). To cover these fees, also referred to as article-processing charges (APCs), authors tend to make use of funding that grant agencies or academic institutions provide (Suber, 2012). However, the question of how and to what extent these research support activities are effective in terms of the number of supported articles and their associated costs remains under debate.

The study of institutional spending on open access journal articles has been limited for several reasons. The first is that payment of these charges is fragmented across the budgets of grant agencies, research institutions, and libraries, or is covered by personal budgets. A comprehensive 2015 survey asked 9,645 authors from various disciplines how they financed publication fees, and it revealed that the majority of the respondents had access to research funding or institutional support to cover these charges. By contrast, 12 % paid publication fees individually (Dallmeier-Tiessen et al., 2011). These results are consistent with similar findings from other studies. Previous studies also found that funding sources exist primarily in higher-income countries, mainly to support research articles in the biological and physical sciences (Solomon and Björk, 2011). Personal budgets, however, are likely used to cover lower publication fees (Björk, 2015; Solomon and Björk, 2011).

Another key problem in this regard is that funding for open access journals using publication fees lacks transparency because the parties involved – authors, universities, funders, and publishers – do not release information about who pays for what or the costs of publishing (Björk and Solomon, 2014); this

situation is similar to the lack of transparency regarding journal subscriptions (Lawson and Meghreblian, 2015). To date, empirical studies examining publication fees have obtained price estimates by surveying authors (Dallmeier-Tiessen et al., 2011) or obtained them from journal websites. Using the latter method, two studies investigating journals across a broad range of disciplines calculated similar price averages that ranged between \$ 904 (Solomon and Björk, 2012) and \$ 923 (Walters and Linvill, 2011), as well as considerable price variation across journals and publishers. Accordingly, Solomon and Björk (2012) suggested using publication fees to cluster fully open access journal into several groups. In descending order, these are high-impact journals, followed by biomedicine journals from commercial publishers, large multi-disciplinary journals, and mid-price journals from commercial publishers covering a large spectrum of disciplines. Lower-priced journals are those published by academic societies and by publishers from low-income countries.

Nevertheless, it remains unclear which factors contribute to pricing in academic publishing. Generally, these might include article processing, impact, rejection rates, management and investment, and profit margins (Noorden, 2013). While fixed prices for individual articles are common, agreements between publishers and institutions can lead to discounts, and publishers sometimes waive publication fees for authors from low-income countries (Björk and Solomon, 2012; Lawson, 2015c). Other factors leading to variable pricing schemes include submission or page charges (Björk and Solomon, 2012).

Hybrid journals substantially add to the complexity of open access funding (Björk and Solomon, 2014; Kingsley, 2014; Pinfield et al., 2015). These journals, which allow articles to be published immediately as open access after a charge is paid, rely on both subscriptions and publication fees as revenue sources. Although the uptake of open access through hybrid journals was described as lower and more expensive than that of fully open access journals (Björk and Solomon, 2014; Solomon and Björk, 2012), this model has gained increasing attention because of recent open access science policies, notably from the UK (Pinfield, 2015).

To address the problems of fragmented spending on publication fees and the lack of transparency about what is being paid, some European research funders and research-performing institutions have recently begun to disclose their expenditures for publication as open data. To the best of our knowledge, the first research funders to provide such data were the Wellcome Trust (Kiley, 2014) and the Austrian Science Fund FWF (Reckling and Kenzian, 2014). The not-for-profit company Jisc followed this example by collecting data from UK universities (Lawson, 2015b). Disclosed as publicly available spreadsheets, these data-sets self-report expenditures along with bibliographic information, including title, journal and publisher, and a persistent identifier for the publisher's version. Curatorial efforts focussed on the disambiguation of publisher and journal titles as well as on detecting duplicates and persistent identifiers to the full text including the Digital Object Identifier (DOI) (Neylon, 2014; Woodward and Henderson, 2014). A preliminary version of Jisc's cost data was examined by Pinfield et al. (2015). Although the average spending on publication fees remained stable across universities, the authors found large price variations, as well as a varying number of articles supported by UK universities between 2007 and 2014, findings which confirm earlier studies that collected price information from journal websites (Solomon and Björk, 2012).

## **Central funding for publication fees in Germany**

This paper focuses on how much German universities and research organisations spend on open access publication fees. In Germany, the Deutsche Forschungsgemeinschaft (DFG), the largest German research funder, has strongly influenced how universities manage institutional support for these charges. Before the DFG started to pay for centrally funded publication fees on a pro rata basis through its "Open-Access Publishing" programme in 2011, only a few central funds existed (Eppelin et al., 2012). This is similar to the situation described in Canada (Hampson, 2014) and the UK (Pinfield and Middleton, 2012). The DFG has enforced a set of criteria with which grantees have to comply and which has resulted in similar policies regarding support for publication fees across German universities (Fournier and Weihberg, 2013). These criteria exclude the sponsorship of articles in hybrid journals and the funding of articles for which the publication fee exceeds € 2,000<sup>1</sup>. Grantees agree not only to pay for APCs, but also to find ways to improve the handling of those financial transactions. These ways include central invoicing schemes and memberships that are agreed upon by university libraries and publishers and that often lead to a discount on publication fees (Fournier and Weihberg, 2013).

<sup>1</sup>Guidelines for the funding program can be found here: [http://www.dfg.de/formulare/12\\_20/](http://www.dfg.de/formulare/12_20/)

Non-university research organisations, i.e., institutes organised in the Fraunhofer-Gesellschaft, Helmholtz-Gemeinschaft, Leibniz-Gemeinschaft, and Max-Planck-Gesellschaft, are not eligible for this DFG funding programme. However, in response, some organisations have adopted similar processes to support authors. The Max-Planck-Gesellschaft operates its long-standing open access activities, including handling spending and publisher agreements centrally, through the Max Planck Digital Library (MPDL) (Schimmer et al., 2013; Sikora and Geschuhn, 2015), while the Leibniz-Gemeinschaft set up a dedicated open access fund in 2016.

The evolving institutional support for covering open access publication fees has led to calls for a unified approach towards open access funding in Germany. The MPDL called for re-allocating subscriptions in favour of open access journals in 2015 (Schimmer et al., 2015). At the same time, the Allianz der Wissenschaftsorganisationen<sup>2</sup>, a science policy board representing all major research organisations in Germany, marked price transparency as one way to sustain an “adequate open access publication system” (Bruch et al., 2015). Reflecting Austrian and UK initiatives to share institutional spending on open access publication fees as open data, as well as professional discussions on open access publishing, Bielefeld University Library began to openly share its payment of publication fees in May 2014. After engaging with the working group “Electronic Publishing” of the Deutsche Initiative für Netzwerkinformation (DINI)<sup>3</sup>, other German institutions joined under the umbrella of the Open APC initiative soon after (Apel et al., 2014–2016).

### Research question

The aim of this study was to examine how much German universities and research organisations spent on open access publication fees. Using self-reported cost data from the Open APC initiative, the analysis focussed on the amount that was being spent on publication fees, and compared these expenditure with data from related Austrian and UK initiatives, in terms of both size and the proportion of articles being published in fully and hybrid open access journals. We also investigated how thoroughly self-reported articles were indexed in Crossref, a DOI minting agency for scholarly literature, and analysed how the institutional spending was distributed across publishers and journal titles.

## METHODS AND MATERIALS

We analysed self-reported cost data released by the Open APC initiative on May 13, 2016,<sup>4</sup> to assess institutional spending on open access publication fees in Germany. In addition to administrative data about the amount paid per article including value added tax, the reporting institution, and the year of invoicing, we used information about whether an article was published in a fully open access journal or in a hybrid journal, as well as the DOI reported in the data-set.

We fetched bibliographic metadata for each article from Crossref on May 19, 2016, on the basis of the reported DOIs. Although the Open APC initiative gathered metadata representing publishers and journals from Crossref as well, this information was retrieved at the time when the participating institutions submitted their expenditure. The Open APC initiative kept track of the date when these data-sets were submitted with Git, a version control system, increasingly used for enabling reproducible research (Ram, 2013), and made this information available via GitHub to be transparent over time. However, during these data collection activities Crossref had regularly updated metadata to represent ongoing mergers of publishing houses. A prominent example in this regard was the merger of the two large publishing houses Springer Business + Media and Nature Publishing Group announced on May 6, 2015, that operated as Springer Nature at the time of our study. To reflect these dynamics in academic publishing, we decided to retrieve updated bibliographic metadata from Crossref, and to merge these records with the administrative information rather than re-using the historical publisher and journal information contained in the Open APC data-set.

We used the R package rcrossref (Chamberlain et al., 2016), developed and maintained by the rOpenSci initiative<sup>5</sup>, to access Crossref’s REST API<sup>6</sup>. We requested the XML-based format `application/vnd.crossref.u` in which full and abbreviated journal titles as well as the ISSN media types, the International Standard

<sup>2</sup>[http://www.dfg.de/en/dfg\\_profile/alliance/index.html](http://www.dfg.de/en/dfg_profile/alliance/index.html)

<sup>3</sup><http://dini.de/english/ag0/e-pub0/>

<sup>4</sup><https://github.com/OpenAPC/openapc-de/tree/v2.4.3>

<sup>5</sup>rOpenSci: <https://ropensci.org/>

<sup>6</sup>[https://github.com/CrossRef/rest-api-doc/blob/master/rest\\_api.md](https://github.com/CrossRef/rest-api-doc/blob/master/rest_api.md)

Serial Number used to identify journals, were distinguished. It also contained normalised publisher information, thus avoiding confusion about naming of publishing houses other studies were faced with when working with self-reported data (Woodward and Henderson, 2014). In cases where no bibliographic information could be obtained, we used the Open APC values. Because Crossref was not the only registration agency for DOIs, but also the agencies DataCite and Medra minted DOIs for scholarly work, we furthermore obtained the DOI agency for each article with the help of the rcrossref client.

Data collection also involved obtaining cost data from related open data initiatives. To compare self-reported spending on open access journal articles by Germany universities and research organisations with that of other initiatives, we consulted the openly available data-sets from the the Austrian Science Fund FWF (Reckling and Rieck, 2015; Rieck et al., 2016), Jisc (Lawson, 2015a, 2016) and the Wellcome Trust (Kiley, 2015, 2016). For analysis, we obtained the overall publication fee spending on both fully and hybrid open access journal articles. In the case of FWF, we gathered the cost information from the accompanying spending reports. We used the spreadsheet data to calculate Wellcome Trust's and Jisc's spending, and converted the prices from GBP to Euro in accordance with the average foreign exchange reference rates provided by the European Central Bank. Our comparison of the open data initiatives focussed on the last two years 2014 and 2015. Because Wellcome Trust's spending was reported for the fiscal periods 2013 - 2014 and 2014 - 2015, we referred to the average exchange rates of the full two-year period as we could not determine the actual invoicing dates from the data. We excluded articles from the analysis with missing information about the cost or the journal type. In the case of Jisc's 2014 data (Lawson, 2015a), for instance, we excluded spending on 2,812 publications that amounted to 4.861.772 € from the analysis because no publication type was given in the data-set.

Data curation activities of the Open APC initiative and those of the other initiatives differed in some respects. For instance, whereas the DOI was a mandatory element in the Open APC data template that the participating institutions were required to report, in case of the Wellcome Trust spending data, DOIs were additionally identified by automated compliance checks. Our first screening of the data-sets revealed that some articles published in Crossref-indexed journals lacked a DOI. Because of these different methods to curate the cost data, and as our main focus was institutional funding for publication fees in Germany, we decided to only compare German spending with that reported by other initiatives. We, therefore, did not analyse the distribution of spending over publishers and journal titles, or the indexing coverage in Crossref for the Austrian and UK spending data.

## RESULTS

### Cost Data

After excluding payments being made for non-journal articles as well as articles invoiced in 2016, we retrieved 7,417 open access journal articles 30 German universities and research institutions financially supported between 2005 and 2015. As illustrated in Figure 1, payments made for open access journal articles increased over the years. While one institution supported 5 articles in 2005, most institutions included in our study shared their expenditure from 2013 onwards. With 1,999 articles, the year 2015 was best represented. However, at the time of analysis, not all, but 27 institutions contributed cost information, suggesting a time lag between payments made and reporting these spending to the Open APC initiative.

#### Figure 1: Growth of Open APC Initiative

Among all articles, fees amounted to 9,627,537 € including value added tax, the average payment was 1,298 € (Median = 1,231 €). Figure 2 presents the distribution of institutional spending on publications. We observed that 6,996 (94 %) of the publication fees were paid in accordance with the DFG price cap of 2,000 €. Most payment on publication ranged between 1,000 - 1,250 €.

#### Figure 2: Distribution of institutional spending on publication fees by German research organisations

#### Figure 3: Institutional spending on publication fees by German research organisations per year

Figure 3 presents institutional spending per article and year. Large price variations could be observed. Publication fees that were paid by the German universities and research organisations ranged between 40 € and 7,419 € (SD = 486). However, the average price paid varied somewhat during the period 2011 and 2015 (1239 - 1423 €).

The number of APC payments per institutions varied considerably (see Table 1). With 2,856 reported articles, the Max Planck Society contributed 39 % of the overall article volume. By contrast, we observed

a lower number of supported open access journal articles for several universities that only recently begun to set up centrally managed open access funds to cover publication fees.

**Table 1: Institutional spending on open access publications (in €)**

### 0.1 Comparison of related cost data-sets

Table 2 compares Open APC spending data with that of the Austrian FWF, as well as with Jisc's and Wellcome Trust's expenditure. Prices were converted according to the average Euro exchange rate of the examined periods, and gathered for both fully and hybrid open access journals. The comparison revealed that the Open APC initiative lacked cost information about hybrid journals, whereas the related Austrian and UK open data initiatives reported a large share of spending on these journals between 2014 and 2015. Over the years 2005 – 2015, 3 out of 30 German universities and research institutions reported 60 hybrid journal articles to the Open APC initiative, representing 0.81 % of all articles included in the data-set. In terms of the number of supported articles and the amount being spent on publication fees, by contrast, the Open APC data-set provided the most comprehensive price information for fully open access journals compared to what the Austrian and UK initiatives had reported.

Comparison of average prices revealed that publishing in hybrid journals was, on average, more expensive than in fully open access journals. Price differences between these two categories were also reported earlier, indicating that prices for fully open access journals were on average lower (Pinfield et al., 2015; Solomon and Björk, 2012). In 2014 and 2015, the mean price for fully open access journals calculated from all data-sets was below the DFG price cap of 2,000 €.

### Crossref indexing

To identify publication fee spending on the article-level, as well as to gather bibliographic metadata, DOIs were a mandatory part of the Open APC initiative's data collection activities. The participating institutions reported DOIs for 7,373 out of 7,417 articles. Using these DOIs, we retrieved additional metadata from Crossref for 7,346 publications, representing 99 % of the total article volume. Articles for which no metadata could be obtained, were registered with the DOI agency DataCite (10 articles) or Medra (two articles). For eight articles, our parser could not gather the XML resource, although these publications were registered with Crossref at the time of our study. Seven DOIs reported to the Open APC initiative did not resolve.

### Cost data by publisher and journal

We used the DOI to automatically fetch publisher and journal names for each article from the Crossref REST API. Table 2 shows the top ten publishers in terms of the number of financially supported articles. These publishers represented 92 % of all articles included in our data-set. In total, payments were made to 139 publishing houses. In comparison with data from the UK, we observed a greater share on total spending of some open access publishers. Pinfield et al. (2015), for instance, reported remarkably lower numbers for the open access publishers MPDI, Copernicus, and Hindawi.

**Table 2: Publication fees paid per publisher (in €)**

Most of publication fee spending in Germany was on articles published in Springer Nature journals, likely profiting from the merge with the open access publisher BioMed Central in 2008, and that between the well-established publishers Springer Science + Business Media and Nature Publishing Group in 2015. Using the Crossref-Member-ID instead of the publisher name, we were able to differentiate between journals formerly published by Springer Science + Business Media and Nature Publishing Group. In terms of articles, the majority of payments made were for publications in journals formerly associated with Springer Science + Business Media. Springer Science + Business Media journals accounted for 2,027 articles, representing 94 % of the overall Springer Nature article volume recorded by the Open APC initiative, and 92 % in terms of the amount being spent. Median publication fee spending slightly differed between Springer Science + Business Media (1,355 €) and Nature Publishing (1,386 €). However, price variation was higher for Nature Publishing journals (SD = 848€) compared with that of the former Springer Science + Business Media titles (SD = 313 €).

In contrast to Springer Nature, other well-established publishing houses such as Elsevier and Wiley-Blackwell ranked lower in our analysis.

**Table 3: Publication fees paid per journal (in €)**

Prices also varied within journals. Based on the number of articles paid for, Table 3 illustrates the top ten out of 732 journals. We normalised PLOS journal titles, because the name changes from "PLOS" to

254 “PLOS” was only partly represented in the Crossref metadata at the time of our study. Articles published  
255 in the top ten journals represent 45 % of the overall article volume. The multidisciplinary journal PLOS  
256 ONE ranked highest. In addition, the journals New Journal of Physics, Atmospheric Chemistry and  
257 Physics Discussions and Frontiers in Psychology, all of which publish contributions from all branches of  
258 their respective discipline, were also well represented in our study. In the case of Atmospheric Chemistry  
259 and Physics Discussions, the large price range can be explained by the fact that this journal charges per  
260 page and also takes the submission’s file format into consideration.

## 261 DISCUSSION

262 In Germany, institutional spending on publication fees charged by open access journals has increased over  
263 the years. These findings are consistent with the general trend of publication fees as revenue source for  
264 open access publishing (Davis and Walters, 2011; Laakso and Björk, 2012; Pinfield, 2015). They also  
265 demonstrate the growing institutional support for researchers in Germany to cover these charges (Fournier  
266 and Weihberg, 2013). Similar to the expenditure on publication fees at an institutional level in the UK  
267 (Pinfield et al., 2015), spending volume varies across the German universities and research organisations.  
268 With a proportion of 39 % of the total article volume, the Max Planck Society, a large non-university  
269 research organisation, supported most open access journal publications included in our study. A possible  
270 explanation is the centralised library support at the Max Planck Society where the Max Planck Digital  
271 Library has managed open access agreements with publishers over the last decade on behalf of most  
272 Max Planck institutes (Schimmer et al., 2013; Sikora and Geschuhn, 2015). This centralised approach  
273 presumably not only resulted in a large number of supported open access articles, but also in central  
274 access to cost data provided by publishers, as well as in advanced capabilities and skills needed to report  
275 on these expenditure on a regular basis. Many universities and research organisations, on the other hand,  
276 disclosed a remarkably lower number of supported articles.

277 To answer data curation issues while unifying UK spending data (Neylon, 2014; Woodward and  
278 Henderson, 2014), re-using DOIs to gather bibliographic metadata from Crossref is a promising approach.  
279 In our study, Crossref thoroughly indexed open access journal articles disclosed in the Open APC data-set,  
280 providing information about publisher and journal titles for 99 % of all articles included in the Open  
281 APC data-set. Making use of metadata from Crossref, therefore, reduces extensive validation work  
282 of bibliographic records as long as the DOIs are made available in the cost data. Beyond identifying  
283 publishers and journals, mandatory reporting of DOIs in the spending data can also increase the re-use  
284 of such data to study other aspects of open access journals using publication fees. For instance, impact  
285 analyses in the field of altmetrics make heavy use of DOIs as well (Haustein, 2016). Drawing on Crossref  
286 has the potential to increase the comparability of cost data to prepare future negotiations with publishers  
287 on open access agreements, because Crossref’s metadata represents current developments in academic  
288 publishing in terms of ongoing mergers of publishing houses. In addition to these practical consequences,  
289 future comparative studies of publication fee spending using data on the article-level can also benefit from  
290 such an approach.

291 This study is limited in some respects. One is that we cannot assess whether publishers and journals  
292 granted publication fee discounts. The Open APC initiative uses a minimal data scheme to encourage  
293 self-reporting, and, therefore, does not track this kind of information. However, large price ranges  
294 suggests that different pricing levels and varying pricing schemes are in place, an observation also made  
295 earlier (Pinfield et al., 2015; Solomon and Björk, 2012). Adding to this complexity, it is likely that some  
296 institutions only paid parts of the publication fee. Take for instance the journal Nature Communication.  
297 Charges reported to the Open APC initiative ranged between 2000 €, the DFG price cap, and 4.403  
298 €, a journal that can be grouped as pricy high-impact journal according to Solomon and Björk (2012).  
299 Although such payments being made from several budgets are a proposed strategy to sustain publication  
300 funds at German universities (Fournier and Weihberg, 2013), these pro-rata payment were not made  
301 transparent in the Open APC data, leading to a possibly flawed representations of publication fee spending  
302 in Germany. In another case, one university included its contributions to the SCOAP<sup>3</sup> consortia and  
303 presumably divided the sum by the articles published by their authors in SCOAP<sup>3</sup>-covered journals.<sup>7</sup>  
304 This is very arbitrary, since averages for an institution can only be determined after the end of a full 3-year  
305 funding cycle. Other factors affecting price variations are exchange rates and different tax rates for some

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organisations in Germany. For instance, the Max Planck Society has a limited input tax reduction. The refund of input value added tax for publication fees is 20 %. To increase the transparency of publication fee spending, Pinfield et al. (2015) generally suggested to disclose tax rates and the currency the payment was made in future cost data-sets. In addition, the Open APC data-set does not track funding sources so that we cannot determine which funders co-financed publication fees.

It must also be noted that reporting to the Open APC initiative is voluntary. Therefore, not all institutions in Germany that provide central funding for publication fees contribute cost data to this initiative. In a qualitative survey, asking why German institutions are reluctant to share their cost data through the Open APC initiative, one institution feared that an increase in transparency would allow publishers to adjust prices in their favour. Others pointed out that the workload to produce such a data-set could be too extensive (Deppe, 2015). As no reliable registry of institutional open access funds or related support structures in Germany exists, we cannot assess the number of non-participants in Germany.

Our analysis of how institutional spending for open access articles was distributed over publishers and journals indicates that open access publishing is heterogeneous and concentrated at the same time. While we were able to identify 139 individual publishing houses that were supported by the German universities and research organisations, the distribution is highly skewed. Ten publishers collected 92 % of open access publication fee spending, being consistent with an observed high concentration of few publishers in current academic publishing (Larivière et al., 2015). However, our study could not confirm that publications in open access journals owned by traditional publishing houses account for most of the spending on publication fees as observed by Pinfield et al. (2015). Rather, open access publishers such as Public Library of Science (PloS), Copernicus, or MPDI rank higher in our study than in the analyses of cost data in the UK.

One possible explanation why traditional publishers are less well represented in our study is the lack of cost information about hybrid open access journals. 99 % of all articles German universities and research organisations financially supported were published in fully open access journals. This presumably reflects the DFG funding policy that opposes paying for open access articles published in hybrid journals. However, while reviewing self-reported cost data from Austria and the UK where hybrid open access journals are generally supported, we observe a much higher share of payments for articles in hybrid open access journals. Because publication fee spending is fragmented and often in-transparent, it remains open to speculation whether authors affiliated with German universities and research organisations avoid opting for open access when publishing in hybrid journals, or simply use other budgets that are not covered by the Open APC initiative.

## CONCLUSION

Our study reveals the size and extent of spending on open access journals using publication fees in Germany. Drawing on self-reported cost data from the Open APC initiative, support from German universities and research institutions have grown over the years. Comparing these expenditure with those from Austria and the UK, German open access funding is mostly focussed on fully open access journals, raising important questions about hybrid open access journals as publication venue. Given our findings, and in light of the general discussion about funding policies addressing hybrid open access journals, questions about whether and to what extent science policy interventions, as well as the availability of institutional support, influence how researchers publish are of particular concern.

Using self-reported data and gathering publisher and journal information from Crossref, our study extends methods and improves data collection activities for researchers and practitioners alike, as well as contribute to a better understanding of factors affecting the analysis of publication fees in open access publishing. In this regard, our research highlights large variation in the distribution of spending that needs to be taken into consideration when studying payment on publication at the institutional level. We have also confirmed previous studies showing large price variations across publishers and open access journals that need to be better understood in future.

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