

# The Cost of Gold Open Access: A Case Study of the UK

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# New Report

Jubb, M., et al. (2015). *Monitoring the transition to open access: A report for the Universities UK Open Access Co-ordination Group.*

London: Research Information Network.

Available at:

<http://www.researchinfonet.org/OAmonitoring>

Monitoring the Transition to Open Access

A report for the Universities UK  
Open Access Co-ordination Group

August 2015



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# Research: Overview

- Research took place January to June 2015
- Aim: to establish an authoritative baseline from which trends can be ascertained in subsequent studies
- Strands and report sections:
  1. OA options available to authors – *led by RIN*
  2. Authors' take-up of OA options – *led by Elsevier*
  3. Usage of OA and non-OA articles – *led by RIN*
  4. Financial sustainability: universities – *led by Sheffield*
  5. Financial sustainability: learned societies – *led by Research Consulting*
- All partners involved in research design and interpretation



# Overall Project: Headline Results

- Strong growth in availability of OA options for authors
- Strong growth in take-up of OA:
  - UK authors ahead of world averages, particularly in
    - take-up of the OA option in hybrid journals, and
    - posting of articles on websites, repositories etc
- Universities' expenditure on article processing charges (APCs) has increased
  - now represents a significant proportion of their total expenditure on journals
- It is too early to assess the extent of any impact of OA on learned societies' finances

## Authors' Take-up of OA Options

At a global level:

19% of articles OA immediately:  
23% OA by 6 months,  
29% OA by 12 months  
34% OA by 24 months

For articles published by UK authors, the proportions were higher:

22% OA immediately  
28% OA by 6 months  
38% OA by 12 months  
43% OA by 24 months

For articles published in the last two years

# Objectives

- To analyse expenditure on APCs during 2014 by a sample of UK HEIs
- To compare 2014 with previous APC expenditure\*
- To analyse APC expenditure and new administration costs plus subscription expenditure (‘total cost of publication’\*)
- To make recommendations about ongoing data collection approaches

\* Pinfield, S., Salter, J., & Bath, P. A. (2015). The “total cost of publication” in a hybrid open-access environment: Institutional approaches to funding journal article-processing charges in combination with subscriptions. *Journal of the Association for Information Science and Technology*, (Early view). doi:10.1002/asi.23446



# Method: APC Data

- Data on 2014 APCs submitted by volunteer institutions to Jisc, January-March 2015
- Compiled by Jisc in a standard template
- APC data received:
  - From 24 HEIs usable for detailed analysis of 2014 APCs in non-anonymised form:
    - Bangor, Bath, Birmingham, Bristol, Cranfield, Durham, Glasgow, Imperial, Lancaster, Leicester, Liverpool, Loughborough, LSHTM, Newcastle, Plymouth, Portsmouth, Queen Mary, Royal Holloway, Salford, Sheffield, Sussex, Swansea, UCL, Warwick
  - From 23 HEIs usable for longitudinal analysis:
    - For HEIs corresponding to those included in previous work and reported anonymously



# APC Data Processing

- The 2014 data were in a much better shape than that collected for previous studies
- However, it still needed considerable checking/ augmenting, including:
  - Adding missing publication dates
  - Disambiguating journal titles
  - Carrying out currency conversions
  - Adding missing APC prices
  - De-duplicating records
  - Checking apparently anomalous figures
- This has involved liaison with institutions and Jisc
- The data still come with caveats



# APC Data: Issues (1)

- Very low APC prices for some items
  - Normally explained by discounts and pre-payment deals, e.g.
    - One institution recorded 40 payments averaging less than £40 as a result of a one-off deal with a publisher
    - Widespread use of schemes such as RSC Gold4Gold resulting in some £0 APCs as part of wider deals with publishers
  - These have been checked wherever possible and corrected (where there was an error) or accepted (where the low or zero APC was verified)
- Splitting of APC payments, normally between two funders
  - These have been merged into single APC payments where identified



# APC Data: Issues (2)

- Amalgamation of colour and page charges by some institutions with APCs – often indicated by apparently high APCs
  - These have been excluded from APC figures where possible
  - Several institutions confirmed this was rare
- Inconsistency in the definition of ‘publication date’ (even *within* some institutions’ data)
  - The two most definitions appear to be
    - Date the VoR (version of record) was made public on the journal web site
    - Date the VoR was made part of a volume and issue of a journal
  - These have had to be accepted

# Subscription and Admin Data

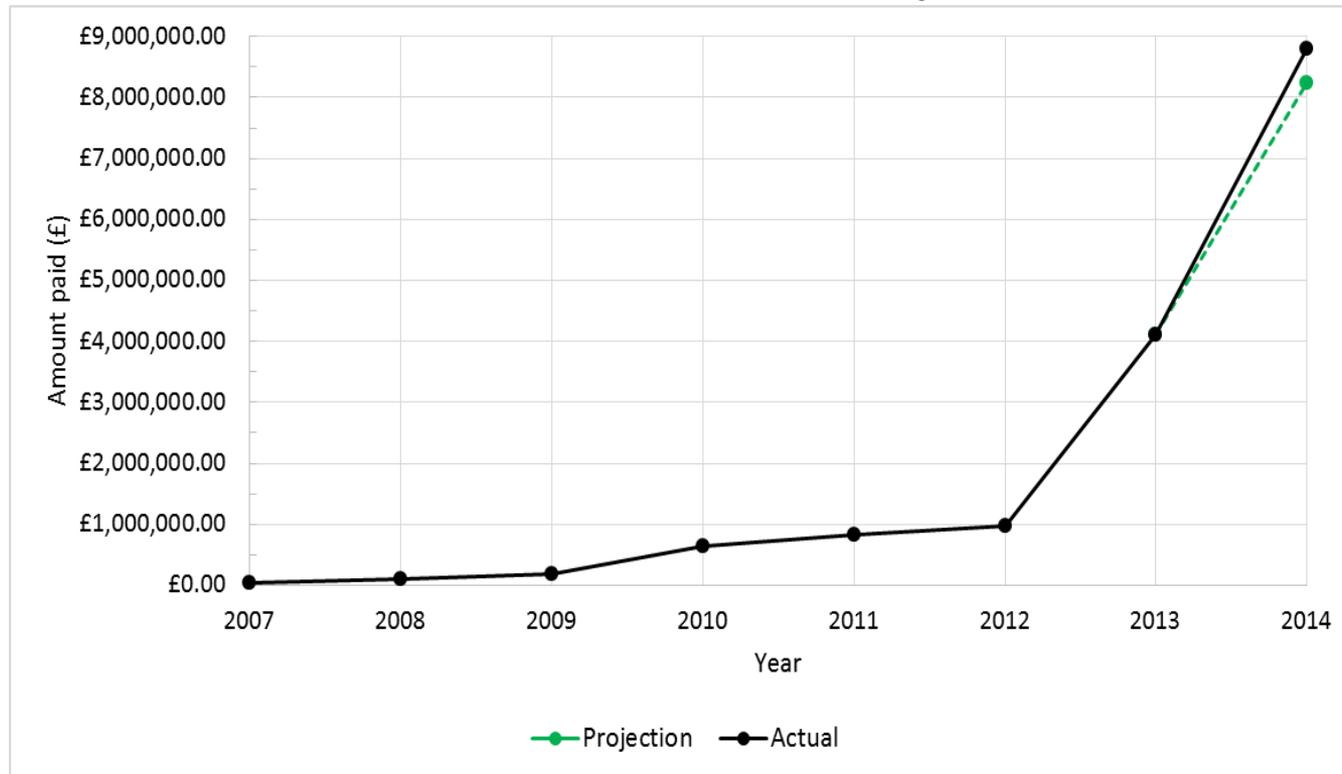
- Subscription data for 2014 in the public domain already\*
  - Covers 7 large publishers only:  
CUP, Elsevier, OUP, Sage, Springer, Taylor & Francis, and Wiley
- Administration cost data to be based on averages from a previous study\*\*
  - £88 per APC for admin. (excl. advocacy, policy and reporting costs)

\* Lawson, S., & Meghreblian, B. (2014). Journal subscription expenditure of UK higher education institutions. *F1000Research*, 3. doi:10.12688/f1000research.5706.1

\*\* Johnson, R., Pinfield, S., & Fosci, M. (2015). Business process costs of implementing “gold” and “green” open access in institutional and national contexts. *Journal of the Association for Information Science and Technology*, (Early view). doi:10.1002/asi.23545



# APC Expenditure: Longitudinal Analysis



- Centrally-managed APC expenditure from the 23 sample HEIs has grown by 555% since 2012
- Our previous study projected growth of expenditure on APCs for the 23 sample HEIs based on 3 months of 2014 data
- The 2014 data for the same HEIs has confirmed the level of growth



# Overview of 2014 APC Data

Mean	N	Sum	Minimum	Maximum	Median
£1,586 (€2,126)	4,853	£7,695,341 (€10,324,410)	£0	£4,536 (€6,087)	£1,502 (€2,015)

- Summary of data for 2014 for the 24 HEIs who provided detailed data
- APC mean lower than previous study: 2013 £1,676 (€2,249) cf 2014 £1,586 (€2,126)
- Minimum: some verified £0 payments
- Mean excluding £0 payments: £1,599 (N=4,813)

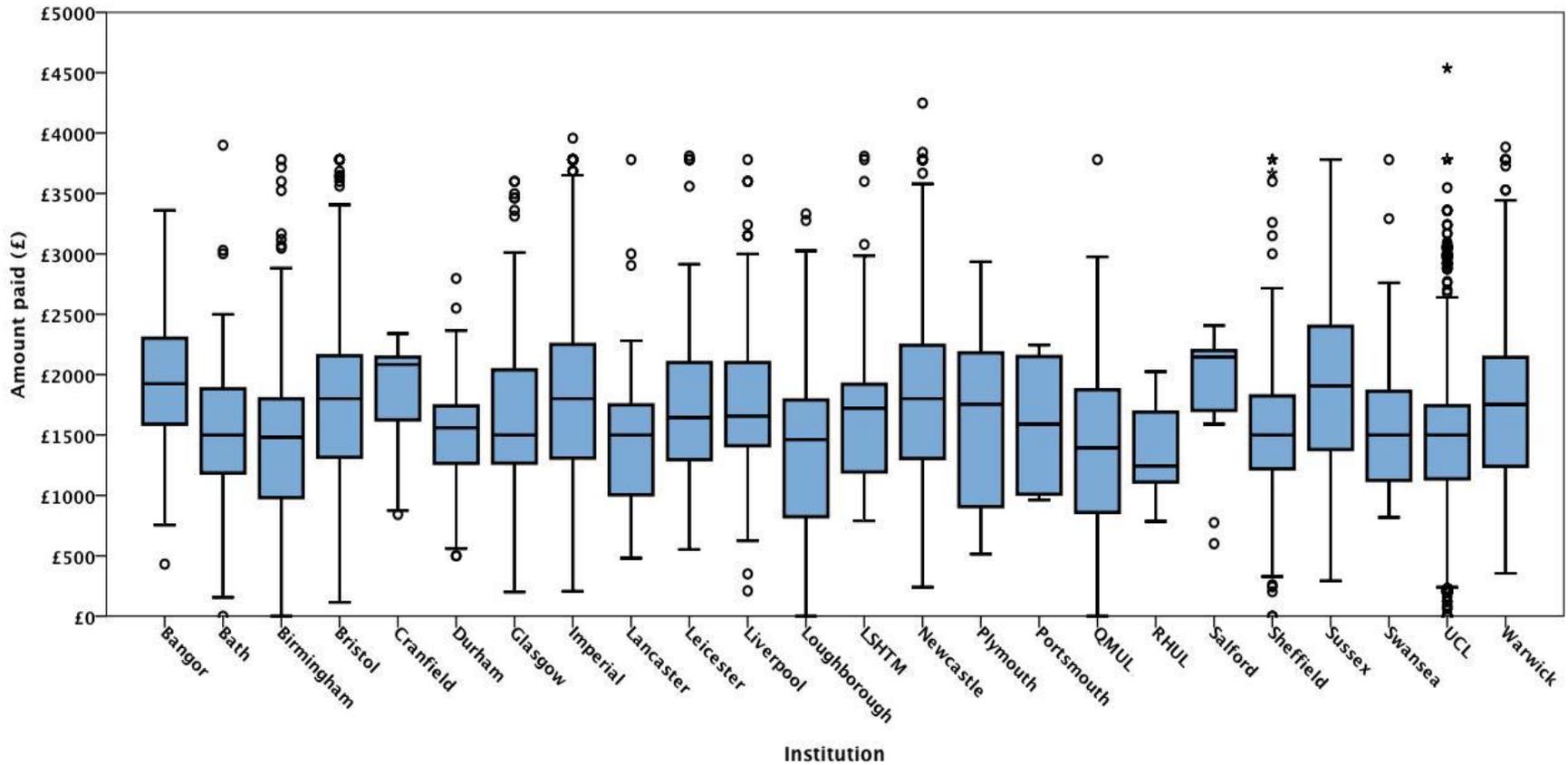
# APC Payments by HEI

Illustrates the variation in the mean, total number of payments, and sum of payments, 2014

Group	Institution	Mean	N	Minimum	Maximum	Sum	Median
Russell Group	Birmingham	£1,387	334	£0	£3,780	£463,221	£1,481
	Bristol	£1,792	277	£115	£3,780	£496,467	£1,800
	Durham	£1,492	99	£500	£2,797	£147,660	£1,560
	Glasgow	£1,638	237	£200	£3,600	£388,180	£1,500
	Imperial	£1,844	495	£205	£3,958	£913,017	£1,800
	Liverpool	£1,783	145	£210	£3,780	£258,466	£1,656
	Newcastle	£1,892	236	£240	£4,248	£446,503	£1,800
	QMUL	£1,322	70	£0	£3,780	£92,549	£1,394
	Sheffield	£1,556	243	£0	£3,780	£378,153	£1,500
	UCL	£1,451	1995	£0	£4,536	£2,893,864	£1,500
	Warwick	£1,823	127	£356	£3,884	£231,461	£1,753
'Pre-92' Universities	Bangor	£1,939	42	£431	£3,360	£81,424	£1,924
	Bath	£1,529	112	£0	£3,900	£171,243	£1,500
	Cranfield	£1,857	19	£842	£2,340	£35,274	£2,084
	Lancaster	£1,465	45	£480	£3,780	£65,945	£1,500
	Leicester	£1,743	70	£552	£3,810	£122,030	£1,644
	Loughborough	£1,413	57	£0	£3,331	£80,567	£1,462
	RHUL	£1,379	7	£785	£2,026	£9,654	£1,243
	Salford	£1,894	18	£600	£2,407	£34,088	£2,146
	Sussex	£1,926	41	£293	£3,780	£78,952	£1,907
	Swansea	£1,647	45	£817	£3,780	£74,129	£1,500
'Post-92' Universities	Plymouth	£1,641	8	£514	£2,934	£13,131	£1,754
	Portsmouth	£1,599	9	£962	£2,245	£14,390	£1,590
Specialist HEI	LSHTM	£1,680	122	£789	£3,808	£204,972	£1,721
	Overall	£1,586	4853	£0	£4,536	£7,695,341	£1,502



# APC Payments Ranges



- Box plot illustrates the range of payments by HEI for 2014

# APC Payments by Subject

<b>Data for the 24 UK HEIs</b>	<b>Panel A: Health and Life Sciences</b>	<b>Panel B: Physical Sciences and Engineering</b>	<b>Panel C: Social Sciences</b>	<b>Panel D: Arts and Humanities</b>	<b>Total (de-duplicated)</b>
Total spend*	£5,526,217	£2,757,244	£620,368	£115,216	£7,596,649
No of articles*	3337	1701	428	88	4710
Mean	£1,656	£1,621	£1,449	£1,309	£1,611
Min	£0	£0	£71	£71	£0
% spend	61.3%	30.6%	6.9%	1.3%	100%
% articles	60.1%	30.6%	7.7%	1.6%	100%

- Journals to which APC payments made mapped against REF (Research Excellence Framework) panels based on Scopus subject classifications for journals (4,710 of the 4,853 papers could be matched)
- Shows a preponderance of payments in the Health and Life Sciences area

\* sum of the panels add up to more than the total as some journals are classified into more than one REF panel



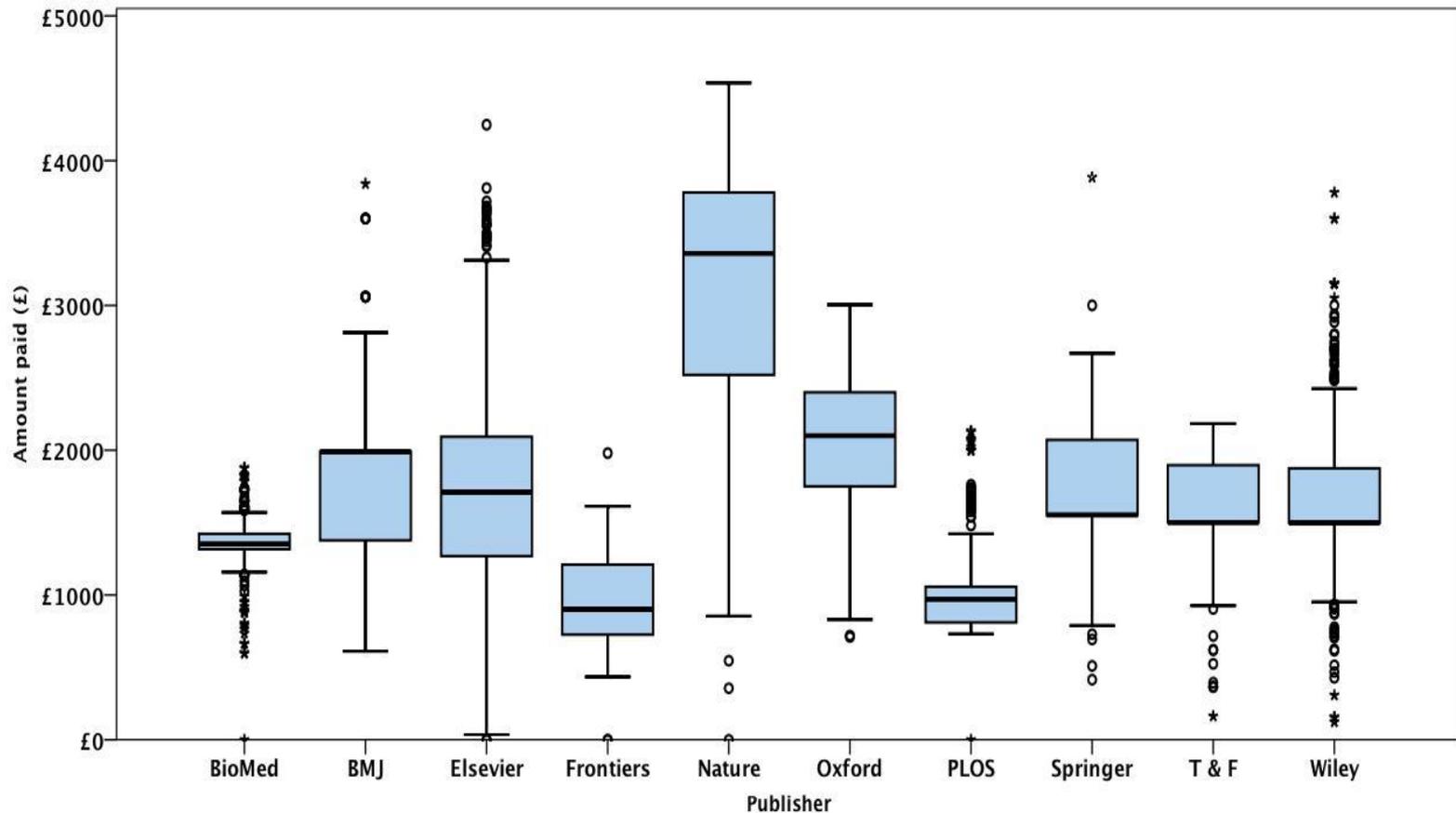
# Top-10 Publishers by APC payments

<b>Publisher</b>	<b>Articles in Fully-OA Journals</b>	<b>Articles in Hybrid Journals</b>	<b>Total (%)</b>
Elsevier	20	906	926 <b>(19.1)</b>
Wiley	25	709	734 <b>(15.1)</b>
Springer	8	329	337 <b>(6.9)</b>
PLOS	322	-	322 <b>(6.6)</b>
BioMed Central	290	-	290 <b>(6)</b>
Oxford University Press	28	202	230 <b>(4.7)</b>
BMJ	80	138	218 <b>(4.5)</b>
Taylor & Francis	1	167	168 <b>(3.5)</b>
Frontiers	140	-	140 <b>(2.9)</b>
Nature Publishing Group	34	106	140 <b>(2.9)</b>
Others	232	1116	1348 <b>(27.8)</b>
<b>Total</b>	<b>1180</b>	<b>3673</b>	<b>4853</b>

- Top-10 publishers by numbers of APC payments
- 3 OA publishers in the top 10; the majority are commercial publishers who also dominate subscription publishing



# APC Range by Publisher



- APC ranges charged by the top-10 publishers based on APC payments

# Journal Types

Publisher Type	Mean	Number of journals	Number of articles	Sum	Min	Max	Median	Average FWCI*
Hybrid journals – published by ‘subscription publishers’	£1,725	1613	3673	£6,337,723	£0	£4,536	£1,680	1.78
Fully-OA journals – published by ‘subscription publishers’	£1,311	74	306	£401,149	£0	£3,810	£1,229	1.49
Fully-OA journals – published by ‘non-subscription publishers’	£1,094	181	874	£956,469	£0	£2,960	£1,071	1.29

- 3 journal types identified by Bjork & Solomon (2014)\*\*
- Marked differences between of APCs paid by type, with hybrids substantially more expensive (the hybrid mean is 58% higher than the mean of fully-OA journals from OA publishers)
- Correlation between average APC and average \*Field-Weighted Citation Impact (FWCI) score

\*\* Björk, B.-C., & Solomon, D. (2014). *Developing an effective market for open access article processing charges*.

London: Jisc, etc. Retrieved from

[http://www.wellcome.ac.uk/stellent/groups/corporatesite/@policy\\_communications/documents/web\\_document/wtp055910.pdf](http://www.wellcome.ac.uk/stellent/groups/corporatesite/@policy_communications/documents/web_document/wtp055910.pdf)



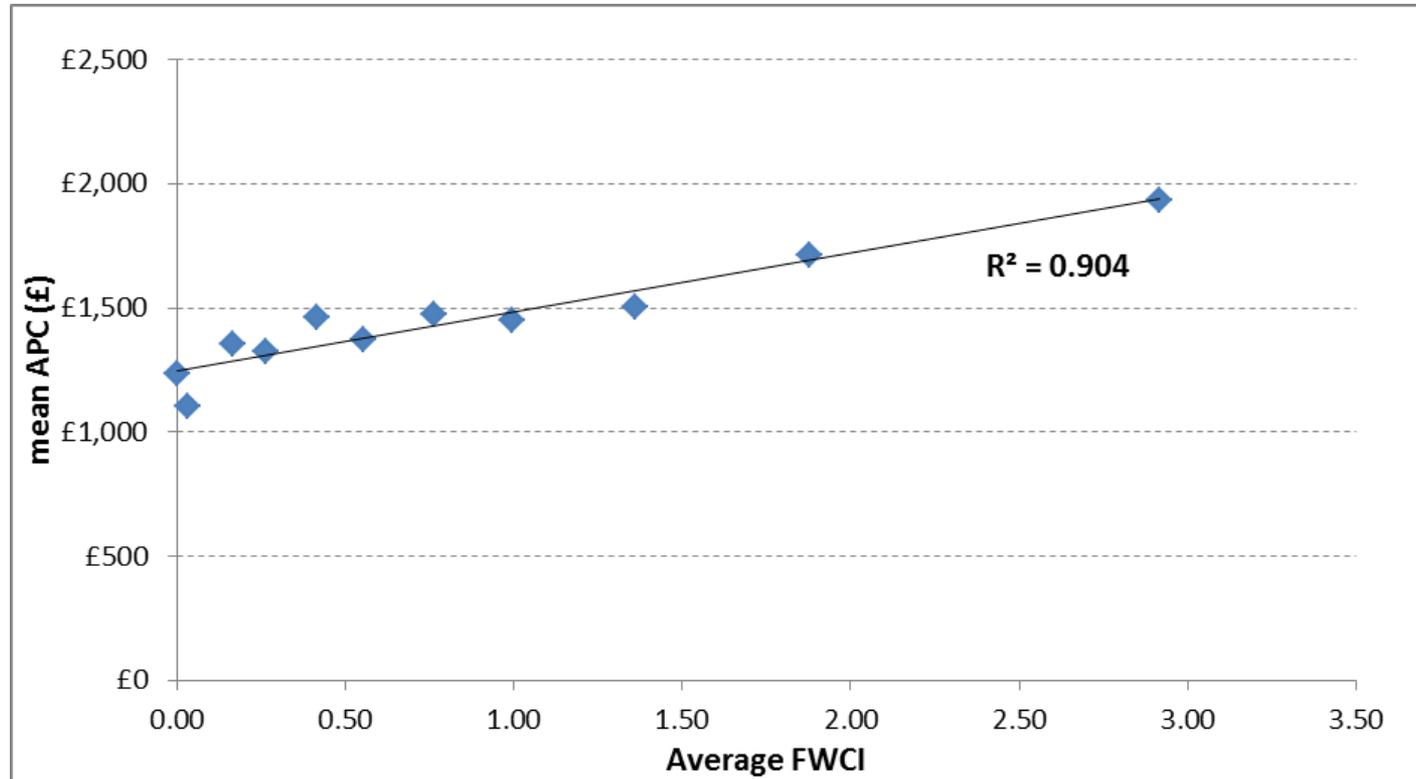
# APC Price and Quality

Based on all journals		Based on journals in which 24 UK universities published APC articles in 2014						
Distribution of all journals	Quality Tier (by FWCI)	No of journals with APC articles (from 24 UK HEIs)	No of articles with APCs (from 24 UK HEIs)	Proportion of journals	Proportion of articles	Weighted Ave FWCI	Ave FWCI	Ave APC paid (£) including VAT if charged
5%	1.0	266	954	15%	20%	2.92	3.11	£1,936
5%	1.5	288	864	16%	18%	1.88	1.90	£1,713
10%	2.0	475	1603	27%	34%	1.36	1.37	£1,503
10%	3.0	321	663	18%	14%	0.99	0.99	£1,449
10%	4.0	182	322	10%	7%	0.76	0.76	£1,472
10%	5.0	125	169	7%	4%	0.55	0.56	£1,371
10%	6.0	47	68	3%	1%	0.41	0.40	£1,459
10%	7.0	24	34	1%	1%	0.26	0.25	£1,325
10%	8.0	14	17	1%	0%	0.16	0.15	£1,352
10%	9.0	12	13	1%	0%	0.03	0.04	£1,102
10%	10.0	3	3	0%	0%	0.00	0.00	£1,237

- APC data matched to Field Weighted Citation Impact (FWCI) scores in Scopus to test if there was a correlation between APC price and citation impact (as a proxy of quality)
- Journals were grouped in 10 different FWCI categories for analysis (each of 10% of the journals with the top two tiers 5%)



# APC Price and Quality



- APC price against FWCI for the sample of 2014 APCs
- Shows a strong correlation between price and quality (as measured by citation)

## ‘Total Cost of Publication’ by HEI

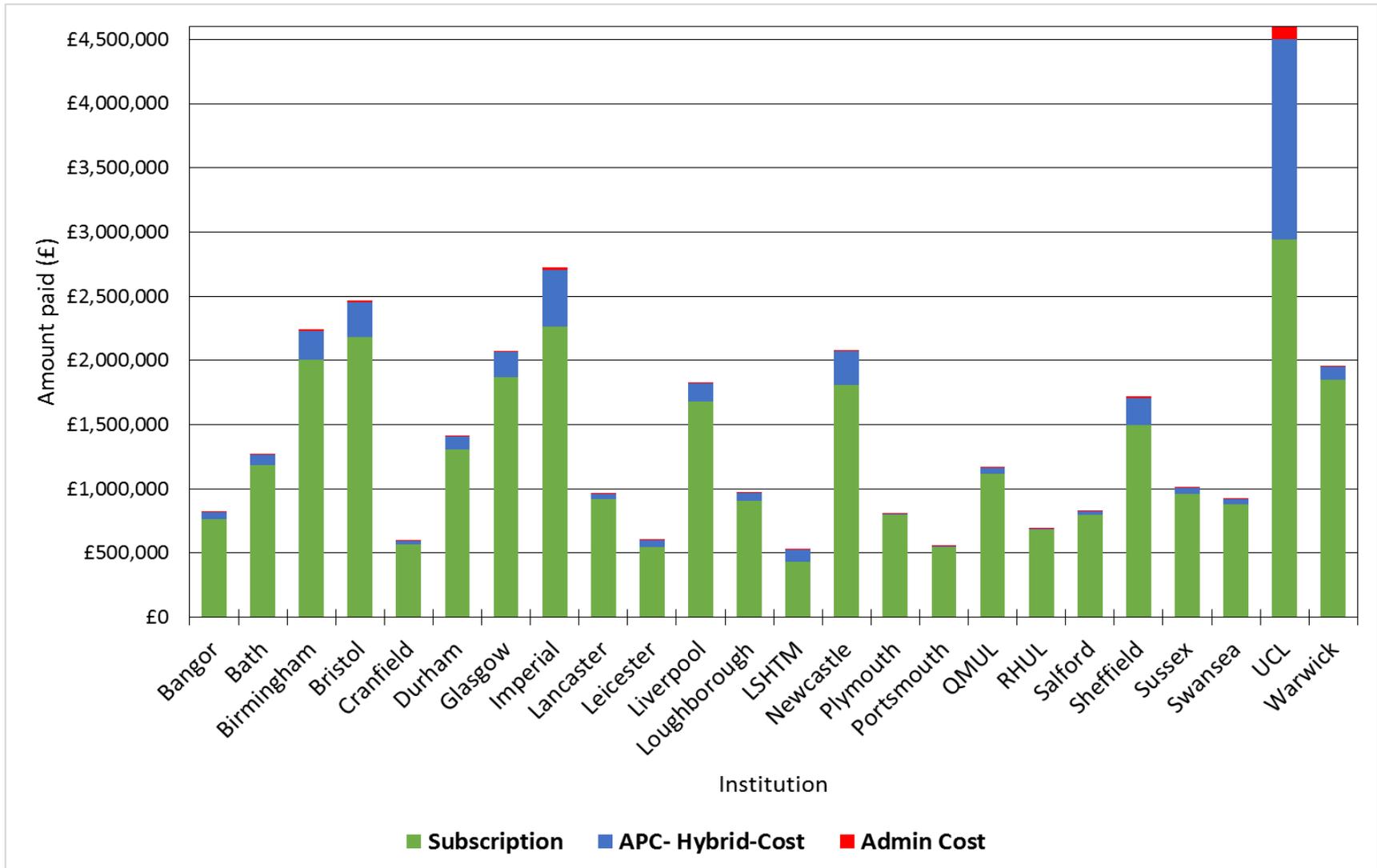
- TCP for the sample of 7 publishers\* using 2014 APC and subscription data and administration costs of £88 per article
- Includes hybrid titles only in order to address issue of additionality of payments

\* CUP, Elsevier, OUP, Sage, Springer, Taylor & Francis, and Wiley

Institution	Subscriptions (%)		APC (%)		Admin cost (%)		Total
	£	%	£	%	£	%	
Bangor	£765,872	<b>93.2%</b>	£53,607	<b>6.5%</b>	£2,200	<b>0.3%</b>	£821,679
Bath	£1,186,086	<b>93.4%</b>	£78,992	<b>6.2%</b>	£4,488	<b>0.4%</b>	£1,269,566
Birmingham	£2,004,295	<b>89.5%</b>	£222,069	<b>9.9%</b>	£14,168	<b>0.6%</b>	£2,240,532
Bristol	£2,181,422	<b>88.5%</b>	£271,226	<b>11.0%</b>	£12,408	<b>0.5%</b>	£2,465,056
Cranfield	£567,832	<b>94.9%</b>	£29,467	<b>4.9%</b>	£1,320	<b>0.2%</b>	£598,620
Durham	£1,308,700	<b>92.7%</b>	£97,268	<b>6.9%</b>	£5,456	<b>0.4%</b>	£1,411,424
Glasgow	£1,871,363	<b>90.3%</b>	£192,080	<b>9.3%</b>	£10,032	<b>0.5%</b>	£2,073,474
Imperial	£2,262,852	<b>83.0%</b>	£443,124	<b>16.3%</b>	£18,744	<b>0.7%</b>	£2,724,720
Lancaster	£919,913	<b>95.6%</b>	£40,053	<b>4.2%</b>	£2,200	<b>0.2%</b>	£962,166
Leicester	£545,000	<b>90.4%</b>	£55,058	<b>9.1%</b>	£2,552	<b>0.4%</b>	£602,610
Liverpool	£1,678,451	<b>91.6%</b>	£146,634	<b>8.0%</b>	£6,864	<b>0.4%</b>	£1,831,950
Loughborough	£903,882	<b>92.9%</b>	£66,003	<b>6.8%</b>	£3,432	<b>0.4%</b>	£973,317
LSHTM	£431,170	<b>80.8%</b>	£98,051	<b>18.4%</b>	£4,576	<b>0.9%</b>	£533,798
Newcastle	£1,806,955	<b>86.7%</b>	£264,885	<b>12.7%</b>	£11,616	<b>0.6%</b>	£2,083,456
Plymouth	£797,744	<b>98.8%</b>	£9,076	<b>1.1%</b>	£352	<b>0.0%</b>	£807,172
Portsmouth	£547,687	<b>98.4%</b>	£8,763	<b>1.6%</b>	£352	<b>0.1%</b>	£556,802
QMUL	£1,117,813	<b>95.8%</b>	£47,055	<b>4.0%</b>	£2,200	<b>0.2%</b>	£1,167,068
RHUL	£683,004	<b>99.0%</b>	£6,425	<b>0.9%</b>	£352	<b>0.1%</b>	£689,782
Salford	£798,763	<b>96.5%</b>	£27,583	<b>3.3%</b>	£1,144	<b>0.1%</b>	£827,490
Sheffield	£1,498,839	<b>87.1%</b>	£211,113	<b>12.3%</b>	£10,208	<b>0.6%</b>	£1,720,160
Sussex	£958,613	<b>94.7%</b>	£51,844	<b>5.1%</b>	£2,288	<b>0.2%</b>	£1,012,745
Swansea	£879,687	<b>95.3%</b>	£41,167	<b>4.5%</b>	£2,200	<b>0.2%</b>	£923,055
UCL	£2,940,492	<b>64.0%</b>	£1,565,022	<b>34.0%</b>	£91,080	<b>2.0%</b>	£4,596,594
Warwick	£1,849,466	<b>94.6%</b>	£100,762	<b>5.2%</b>	£4,312	<b>0.2%</b>	£1,954,540
<b>Total</b>	<b>£30,505,902</b>	<b>87.5%</b>	<b>£4,127,329</b>	<b>11.8%</b>	<b>£214,544</b>	<b>0.6%</b>	<b>£34,847,775</b>



# Total Cost of Publication by HEI



- TCP (subscriptions + APCs + APC admin costs) for the sample of 7 publishers\*, 2014  
 \* CUP, Elsevier, OUP, Sage, Springer, Taylor & Francis, and Wiley



# 'Hidden' Costs

- APCs paid outside the Centre of HEIs
  - Work by Pinfield & Middleton (forthcoming); and Pinfield, Salter & Bath (2015)
- Colour and page charges – also not usually centrally coordinated



# Summary (1)

- The APC market is currently complex (e.g. variable pricing, discounts, other additional charges etc.) and institutional data reflect this
- Centrally-managed APC expenditure has continued to rise steeply (555% since 2012 for the original sample of 23 HEIs)
- APC payments in 2014 varied from £0 to £4,536 with the mean £1,586 (from the sample of 24 HEIs)
- There was considerable variation in the levels of payments across different institutions, reflecting research activity and policy differences
- The largest number of institutional APC payments were made for articles in the Health and Life Sciences



# Summary (2)

- Commercial subscription publishers are responsible for the largest proportion of the APC market
- Hybrid journal APCs are considerably more expensive than fully-open access titles
- There is a correlation between APC price and the citation rates of journals
- For the sample of seven publishers, APCs now constitute 12% of the 'total cost of publication' and 1% APC administration and 87% subscriptions



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# Questions and Comments

# Recommendations for Data Collection

- Data on expenditure in institutions of subscriptions, APCs and administration costs needs to continue to be collected and made public on an ongoing basis
- Reporting of APC expenditure data needs to be further standardised, preferably using the Jisc reporting template, including standardisation in the reporting of:
  - ‘Publication date’
  - APCs distinguished from many additional charges (e.g. colouring page charges)
  - Any splitting of single payments between different funders
  - Consistent inclusion of VAT (if paid)
- Subscription expenditure should also be reported and made publically-available for as wide a range of publishers as possible
- Further work should be done on clarifying administrative costs, particularly those associated with new activities such as APC payments
- Approaches need to be agreed for estimating and where possible recording payment of non-centrally-managed payment of APCs in institutions

# Box Plot Definition for this Study

- The bold line in each box represents the median (second quartile) value
- The bottom and top of each box represents the first and third quartiles respectively
- The distance between these represents the inter-quartile range
- Whiskers represent the lowest datum still within 1.5 IQR of the lower quartile, and the highest datum still within 1.5 IQR of the upper quartile (Tukey boxplot)
- Small circles (○) representing outliers and asterisks (\*) extreme values