

What is already known on this topic

Selective reporting of some measured outcomes but not others within published trials has been shown in cohorts restricted by geography and funding source

Outcome reporting bias limits the critical interpretation of individual trials as well as the conclusions of literature reviews

What this study adds

Outcome reporting bias exists in published trials indexed on PubMed

Contacting authors for a list of unreported outcomes has the potential to identify important omissions from publications, although responses are often unreliable

Clinically important trial outcomes are often inadequately reported

Trials should be registered, and protocols should be made publicly available

could lead to the use of harmful interventions. Perhaps more commonly, a treatment may be considered to be of more value than it merits.

To limit outcome reporting bias, researchers and journal editors should ensure that complete data are provided for all pre-specified trial outcomes, independent of their results. Discrepancies between outcomes in the methods and results sections of publications can also be addressed during peer review.

Journal internet sites will help to alleviate concerns over space restrictions.

Trials should be registered and protocols should be made available in the public domain before trial completion. At the least, they should be submitted with manuscripts and reviewed when being considered for publication by journals.

Contributors: See bmj.com

Funding: AWC was funded by the Rhodes Trust; DGA is funded by Cancer Research UK. The funding sources had no role in any aspect of the study.

Competing interests: None declared.

Ethical approval: None required.

- 1 Chan AW, Hróbjartsson A, Haahr MT, Gøtzsche PC, Altman DG. Empirical evidence for selective reporting of outcomes in randomized trials: comparison of protocols to published articles. *JAMA* 2004;291:2457-65.
- 2 Chan AW, Križan-Jerič K, Schmid I, Altman DG. Outcome reporting bias in randomized trials funded by the Canadian Institutes of Health Research. *CMAJ* 2004;171:735-40.
- 3 Chan AW, Altman DG. Epidemiology and reporting of randomised trials published in PubMed journals. *Lancet* (in press).
- 4 West RR, Jones DA. Publication bias in statistical overview of trials: example of psychological rehabilitation following myocardial infarction [abstract]. In: Proceedings of the 2nd International Conference on the Scientific Basis of Health Services and 5th Annual Cochrane Colloquium; 1997 October 8-12, Amsterdam: 82.
- 5 McCormack K, Scott NW, Grant AM. Outcome reporting bias and individual patient data meta-analysis: a case study in surgery [abstract]. In: Abstracts for workshops and scientific sessions, 9th International Cochrane Colloquium; 2001 October 9-13, Lyons: 34-5.
- 6 Felson DT. Bias in meta-analytic research. *J Clin Epidemiol* 1992;45: 885-92.
- 7 Moher D, Schulz KF, Altman DG. The CONSORT statement: revised recommendations for improving the quality of reports of parallel-group randomised trials. *Lancet* 2001;357:1191-4.
- 8 Ioannidis JP, Evans SJ, Gøtzsche PC, O'Neill RT, Altman DG, Schulz K, et al. Better reporting of harms in randomized trials: an extension of the CONSORT statement. *Ann Intern Med* 2004;141:781-8.
- 9 Song F, Eastwood AJ, Gilbody S, Duley L, Sutton AJ. Publication and related biases. *Health Technol Assess* 2000;4(10):1-115.

(Accepted 20 December 2004)

doi 10.1136/bmj.38356.424606.8F1

Perceptions of open access publishing: interviews with journal authors

Sara Schroter, Leanne Tite, Richard Smith

BMJ Editorial Office, BMA House, London WC1 9JR
Sara Schroter
senior researcher
Leanne Tite
research assistant
Richard Smith
former editor

Correspondence to:
S Schroter
sschroter@bmj.com

BMJ 2005;330:756-9

Abstract

Objective To explore authors' attitudes towards open access publishing and author charges, their perceptions of journals that charge authors, and whether they would be willing to submit to these journals.

Design Semistructured telephone interviews.

Participants 28 randomly selected international authors who submitted to the *BMJ* in 2003.

Results Authors were more aware of the concepts of open access publishing and author pays models than previously reported. Almost all authors supported the concept of open access, but few had submitted to an open access journal, other than *BMJ*. Reasons for not submitting included lack of awareness of which journals publish with open access, and journal quality taking a higher priority in decision making than the availability of open access. Authors disliked the idea

of author charges without institutional support and were concerned about implications for authors from developing countries and those without research funding. However, many said they would probably continue to submit to journals they perceived as being of high quality even if they charged authors.

Conclusions Authors consider perceived journal quality as more important than open access when deciding where to submit papers. New journals with open access may need to do more to reassure authors of the quality of their journals.



Fives more boxes of sample quotes and the interview schedule are on bmj.com



This paper was posted on bmj.com on 26 January 2005: <http://bmj.com/cgi/doi/10.1136/bmj.38359.695220.82>

Introduction

An emerging model in scientific journal publishing is open access publishing, with several models for its financing, including an author pays model (box 1). The author's contribution might be paid by research funders or the author's institution. Some journals currently charging authors, such as BioMed Central journals, have institutional membership that means individual authors are not charged. Currently, several biomedical publishers, including the BMJ Publishing Group, are considering moving towards open access publishing funded through author charges, but we know little about authors' attitudes to this. The evidence so far is limited to experiments with heavily subsidised author charges and surveys of authors with limited sampling,¹ low response rates,^{2,3} and polls of authors from speciality journals.^{4,5}

To determine what motivates authors to publish in specific journals, whether they support open access publishing, and their perceptions of journals that charge authors fees, we carried out a series of interviews with authors.

Methods

Sampling

We divided the list of corresponding authors who submitted to the *BMJ* in 2003 into regions from which the *BMJ* receives most submissions: United Kingdom; North America; Australasia; and Europe (excluding United Kingdom). Ten authors from each region were randomly sampled, and a further 10 in the European sample for use in case of language difficulties.

Data collection

We conducted semistructured telephone interviews (see bmj.com). Authors were asked if they were familiar with the terms "open access publishing" and "author pays models" and what they understood these terms to mean; whether they were in support of open access publishing; how they felt about the idea of author charges replacing subscription costs; whether they would consider submitting papers to author pays journals; and whether they would submit to the *BMJ* if it introduced publication charges.

We provided definitions to participants where necessary (box 1).

We independently collated responses and grouped the data according to emerging themes. Both interviewers (SS and LT) verified subsequent themes.

Results

We attempted to contact 50 authors. After exclusions, 28 (72%) took part. They were aged 31-60, lived in the United Kingdom (seven), United States (five), Canada (two), Australia (four), New Zealand (three), the Netherlands (two), Denmark (three), Germany (one), and Finland (one). Twenty one were men. Respondents had been active researchers for between two and 30 years; 18 had been active researchers for at least 10 years. Authors had published between zero and 305 articles, and 18 had published at least 25 papers. Over half (15) had published in at least 15 different journals. Most had received research grants. Participants had a wide range of research interests.

Box 1: Definitions

Open access: "the provision of lawful free access to journal content online with its production funded by means other than subscription charges."

Author pays model: "an alternative method of funding journals whereby subscription charges are replaced with author charges for publication."

Familiarity, support, and reservations

All except four authors were familiar with the term "open access publishing" and defined it accurately. Some assumed open access meant publishing without peer review or printed journals. Half (14) reported that they had not previously submitted to an open access journal or were uncertain if they had. Only two had submitted a paper to an open access journal other than the *BMJ*. Several said that it can be difficult to discern editorial policies for specific journals because libraries subscribe to e-journals which appear to be open access, while some journals have temporary open access to selected content.

Almost all authors supported the concept of open access publishing. Authors reported benefits for themselves and other researchers, including easier and faster literature searching; reduced costs in terms of time savings, photocopying, interlibrary loans, and subscriptions; faster dissemination of results to a wider audience; more equitable access; and the potential for medicine to improve globally.

Respondents were concerned that open access publishing might lead to vanity publishing (poor quality research being published for a fee) and a flood of non-peer reviewed papers on the internet. Peer review, they said, is extremely important and resources might be directed away from this to fund open access.

Willingness to submit to open access journals

Most authors were willing to submit to open access journals. Many said open access was not a relevant factor when they were selecting a journal. Some questioned the quality and reputation of existing open access journals.

Familiarity with author pays model

Twelve authors were not at all familiar with the term "author pays model." However, another 12 were either familiar with the term or had heard of the concept. Several had not made the connection between author charges and open access publishing. A further four authors reported being familiar with the term but failed to describe it accurately. Only nine authors could name some existing author pays journals.

Box 2: Additional barriers to researchers (sample quotes from authors)

Might restrict publications

I have some concerns... It is hard enough finding published literature for Cochrane as it is. It is even harder to find unpublished stuff. If the model was costly enough to drive publications underground that would make Cochrane's work even more difficult

Research process is hard enough

I would hate that. It's awkward as a scientist to go through writing your manuscript, it's time consuming. Having to find the money would make it worse

What is already known on this topic

Several publishers are considering the viability of adopting open access publishing models funded through "author charges," but little is known about how authors will respond to publication fees

What this study adds

Authors support the concept of open access, though few questioned had submitted to an open access journal

Authors did not know which journals publish with open access, and perceived journal quality was more important than open access when selecting journals to submit to

Authors disliked the idea of author charges without institutional support and concerns were expressed about implications for authors from developing countries and those working on non-funded research

Attitudes towards author charges

Authors were mostly against author charges. Some thought charges might be acceptable if grant agencies and universities agreed to support authors. Some were concerned by the idea of paying to publish in non-peer reviewed journals and that the standard of publishing might decline. A few commented on the difficulty of implementing the model and the need for author charges to become standard so that the quality of journals could still be evaluated.

Several authors were concerned for those who could not afford to pay. Unfunded research, including methodological work, research done by junior doctors and PhD students, and researchers in developing countries, might not be published (box 2).

Willingness to submit to author pays journals

Overall, authors were not keen on the author pays model and would hesitate to submit to journals operating under such models.

Box 3: Other factors are important when selecting a journal (sample quotes from authors)

Charging policy would not influence choice of journal

... If one journal came up ... of good quality ... or if a journal changed to this status ... it wouldn't at all influence my choice ... even if there was a payment to be made

Quality and reputation of journal

I would be willing to consider it. But what I am more concerned about is the quality of the publication. I have access to funds through which I could pay to publish ... as long as the fee isn't too outrageous

I would be quite unhappy about it. I guess if it was a really top journal [I would submit] ... but I would be really unhappy about it. Basically for quite a long time I would not be able to afford to do this

Depends on impact factor

Yes ... but again it depends on impact factor because the university I work for has guidelines. We are discouraged from submitting to low impact journals ... there is a list of journals we can use. I think this is widespread, at least in top universities, particularly in the UK with the focus on the RAE [research assessment exercise]

Factors of importance when selecting a journal included impact factor, reputation, readership, speed of publication, and the quality of peer review systems (box 3). They would continue to submit papers to journals regarded as "high quality" even if they charged. Mediating factors, however, were how much journals would charge and whether research funders would pay on the author's behalf.

Reasons cited for not previously submitting to author pays journals included lack of familiarity and perceptions that they are not widely read, that they don't have impact factors, have inferior peer review, and are not of high calibre.

Discussion

Authors were aware of the concepts of open access publishing and author pays journals. While nearly all authors supported the idea of open access publishing, few had knowingly submitted to an open access journal. Concern was expressed about implications of author charges for those who may not be able to pay. Many said they would probably continue to submit to journals they considered as high quality if they charged authors, but this would depend on price and whether they received financial support.

We achieved a good response rate and were able to assess understanding of both the terminology and the concepts behind open access and author pays publishing. Previous surveys were methodologically weak and found limited understanding of open access models.¹⁻³ The *BMJ* is an open access (but not author pays) journal, which might also explain some differences. One survey found respondents associated open access with good quality, well indexed electronic material, and half the authors would not pay author charges under any circumstances.³

Our sample was limited to authors submitting to the *BMJ*. However, we took a random sample of international authors, many of whom had published in many other journals so their opinions are probably representative.

Several publishers are considering moving to open access and author charges. We found authors cared more about journal quality than open access, and journals may need to make special arrangements for dealing with unfunded research and submissions from developing countries. Finally, a comprehensive economic analysis of various charging models and their acceptability to stakeholders is now needed.

Contributors: See bmj.com

Funding: BMJ Publishing Group's research budget.

Competing interests: All authors are or were employed by the BMJ Publishing Group. RS has now left the group and is employed by the British subsidiary of the UnitedHealth Group, a large US health and wellbeing company. He is also on the board of the Public Library of Science, an open access publisher. The *BMJ* is currently an open access journal and is considering whether to adopt author charges to fund the publication process. The researchers who conducted the interviews and analysed the data (SS and LT) do not have a financial interest in what the *BMJ* decides to do. Because members of the *BMJ* staff were involved in the conduct of this research and writing the paper, assessment and peer review have been carried out entirely by external advisors. No member of the *BMJ* staff has been involved in making the decision on the paper.

Ethical approval: This study was approved by the *BMJ* ethics committee.

- 1 Pelizzari E. *Academic staff use, perception and expectations about open-access archives. A survey of social science sector at Brescia University*. http://eprints.rclis.org/archive/00000737/01/Academic_staff_perception_about_Open_archives.htm (accessed 7 July 2004).
- 2 JISC/OSI. *Journal authors survey report*. www.jisc.ac.uk/uploaded_documents/JISCOAreport1.pdf (accessed 7 July 2004).
- 3 Rowlands I, Nicholas D, Huntingdon P. *Scholarly communication in the digital environment: what do authors want? Findings of an international survey of author opinion: project report*. London: Centre for Information Behaviour and Evaluation of Research, Department of Information Science, City University, 2004. <http://ciber.soi.city.ac.uk/ciber-pa-report.pdf> (accessed 7 July 2004).
- 4 Richardson M, Saxby C. Experimenting with open access publishing. *Nature* 2004. www.nature.com/nature/focus/accessdebate/12.html (accessed 7 July 2004).
- 5 Cozzarelli NR, Fulton KR, Sullenberger DM. Results of a PNAS author survey on an open access option for publication. *Proc Natl Acad Sci* 2004;101:1111. www.pnas.org/cgi/doi/10.1073/pnas.0307315101 (accessed 7 July 2004).
(Accepted 19 October 2004)
doi 10.1136/bmj.38359.695220.82

Commentary: Open access publishing: too much oxygen?

Jeffrey K Aronson

"We hold these truths to be self-evident . . ." This assertion of the US founding fathers betokened their zeal for human equality and rights. But such an attitude can betoken intellectual arrogance. It was, for example, self evident to paediatricians in the 1950s that it would be beneficial to give premature babies 100% oxygen without proper trial. But 100% oxygen caused blindness, and the balance of benefit to harm was unfavourable.

In their survey of the attitudes of a small sample of scientists to open access¹ Schroter and colleagues don't actually trumpet its self evident benefits, but their call for evidence refers to the author pays model, not open access publishing itself, although open access will not be possible without an author pays scheme or something comparable. But scientists' opinions should not frame policy without supporting evidence. We need to ask whether immediate free access to readers, with whatever method of payment is used, would benefit science (not the scientists or the grant giving bodies, who are also zealous about this idea) and hence society. To zealots ("the dream is now achievable"²) the benefits of this 100% oxygen may be self evident. But we have little evidence about the balance of benefits and harms. I believe that the potential advantages are few and the disadvantages many; I have summarised them on bmj.com.

Why should we uncritically adopt this system? We already have a better one, operated by many journals currently and in increasing numbers, in which readers pay for immediate access and access becomes universally free after a delay, for example 12 months, as required by the National Library of Medicine and the Wellcome Trust in their current initiative to digitise back issues of journals. Schemes such as HINARI (Health InterNetwork Access to Research Initiative) and AGORA (Access to Global Online Research in Agriculture) will maximise opportunities to access material that is published in this way.³

In any system the burden of cost should be spread across those who are advantaged. A mixed model might be appropriate, maintaining subscriptions while allowing authors who want or are forced to pay for immediate free access to pay for it, and those who do not want it or cannot afford it, not to. Currently, some journals adopt author pays access, others do not. But there are many more readers than authors, which any balance in funding should reflect.

The uncritical application of basic values is a major source of unforeseen undesirable consequences of social actions.⁴ Who doesn't instinctively feel that free

access on day one is basically desirable? But we need to be completely sure that if we open the tap on the cylinder of this 100% oxygen the benefit to harm balance will be favourable, for we will not be able to turn the tap off—there will be no way back to subscription based journal publishing. As the third author of the above paper¹ has written elsewhere, "think harm always."⁵

Competing interests: JKA is a fellow of the British Pharmacological Society and chairman of the editorial board of the British Journal of Clinical Pharmacology, which is published on the society's behalf by Blackwell Publishing, as a subscription journal with free access after 12 months; the complete archives of the journal are about to be digitised for free access.

- 1 Schroter S, Tite L, Smith R. Perceptions of open access publishing: interviews with journal authors. *BMJ* 2005;330:756-9.
- 2 Delamothe T, Smith R. Open access publishing takes off. The dream is now achievable. *BMJ* 2004;328:1-3.
- 3 Katikireddi SV. HINARI: bridging the global information divide. *BMJ* 2004;328:1190-3.
- 4 Merton RK. The unanticipated consequences of purposive social action. *Am Sociol Rev* 1936;1:894-904.
- 5 Smith R. Think harm always [editor's choice]. *BMJ* 2004;329. (3 July)



A summary of advantages and disadvantages of the author pays model is on bmj.com.

Corrections and clarifications

Acute treatment of moderate to severe depression with hypericum extract WS 5570 (St John's wort): randomised controlled double blind non-inferiority trial versus paroxetine

An editing error may have caused confusion in the abstract of this paper by A Szegedi and colleagues (*BMJ* 2005;330:503-6, 5 Mar). The initial daily dose of hypericum WS 5570 was 900 mg split into three doses of 300 mg—that is, 300 mg three times a day.

NICE proposes to withdraw Alzheimer's drugs from NHS

In this News article by Zosia Kmietowicz we mistakenly referred to donepezil, rivastigmine, and galantamine as anticholinesterase inhibitors (*BMJ* 2005;330:495, 5 Mar). They are not; they are acetylcholinesterase inhibitors.

Children may die when left in overheated cars

In this item in the "BMJ family highlights" section by Harvey Marcovitch, we wrongly said: "A few children were deliberately restrained in a safety belt so that adults could sleep, work, use drugs, or gamble" (*BMJ* 2005;330:564, 12 Mar). In fact, according to the original study, the children were restrained in a safety seat, not a belt.

Department of Clinical Pharmacology, Radcliffe Infirmary, Oxford OX2 6HE
Jeffrey K Aronson
reader in clinical pharmacology

Jeffrey.aronson@clinpharm.ox.ac.uk