

# Trends in Scholarly Communication Among Biomedical Scientists in Greece

Assimina Vlachaki<sup>†</sup> Christine Urquhart<sup>‡</sup>

<sup>†</sup>Department of Information Studies, Aberystwyth University, Aberystwyth, UK and  
National and Kapodistrian University of Athens, Library of Health Sciences, 11527, Athens, Greece,  
Pate09(at)excite.com

<sup>‡</sup>Department of Information Studies, Aberystwyth University, Aberystwyth, UK

**Abstract:** *The aim and objectives are to examine the main changes in scholarly communication among Greek biomedical scientists (2007-2011). The methods include a bibliographic survey (two phases), and a questionnaire survey (three phases). Results indicate that awareness of open access publishing has increased since 2010, but that biomedical scientists in Greece are not very aware of the operations of open access journals.*

**Keywords:** *Open access, Scholarly communication, Biomedical publishing*

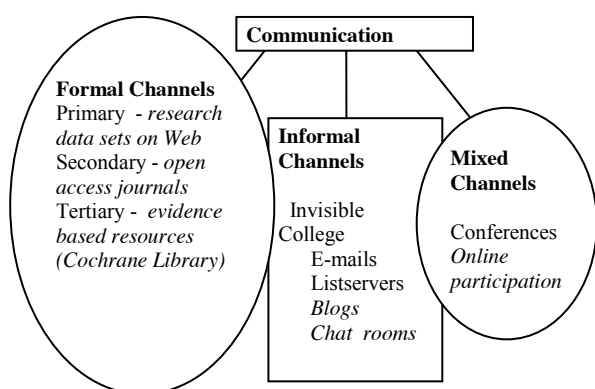
## I. INTRODUCTION

In this paper we discuss the background to the changes in scholarly communication, and investigate the attitudes of Greek biomedical scientists to the support and promotion of the scholarly communication, in particular the factors that may influence in the choice of journal, or the use of other means of information dissemination such as institutional and subject repositories.

## II. FORMS OF SCHOLARLY COMMUNICATION

The diagram (Fig. 1) illustrates some of the recent developments in *italics*.

Figure 1. Scholarly communication



The **formal channels**, are still considered authoritative sources, but a serious disadvantage of the traditional print format for publication is the time required for

publication processes, which may mean that some information in the textbook is not the most current advice. Nowadays, this obstacle is partly overcome through online updates (e.g. for the Oxford Textbook of Medicine, the online version offers updates), but the process of peer review still takes time for the Oxford Textbook or for any journal published (in print or electronically).

The **informal channels** are influenced by some of the Web 2.0 developments and relationships with formal channels are changing. The BMJ group, as well as publishing a range of medical (general and specialist) journals, also hosts some blogs on the BMJ group website. Some journals, such as the leading medical journal *The Lancet* has moved into policy work, for example by commissioning *The Lancet Series* to highlight clinically important, but overlooked areas of health and medicine. *The Lancet* outputs include podcasts, videos, and the journal sponsors conferences.

The **mixed channels** are perhaps therefore increasing. The important part of the conference for many participants is the opportunity to network with others, and learn informally.

There are many challenges to biomedical publishing (Hersh and Rindfleisch, 2000). Open access publishing has been proposed as a solution to the dominance of a few biomedical publishers, and the increase in subscription costs, but there are some intellectual property difficulties (Jacobson, 2000; Markovitz, 2000). In addition the peer review processes (unpaid) still have to be managed, the hosting costs of the journal and the editorial processes need to be considered as well. Some open access journals may rely on the voluntary efforts of editors and reviewers, and support from other organisations. Other open access journals use author charges (or organisational subscription) to pay for the management costs. The standard model of subscription costs still works for many individual (personal or organisational) journal subscriptions, but increasingly publishers (and other aggregators) are offering bundles of journals to institutions, with (possibly) some flexibility to add some additional titles. It is complex (Campbell, Willinsky, and Anderson, 2010) although open access in medicine in Greece may be more advanced than in other disciplines (Georgiou and Papadatou, 2010). For learned societies, dependent on subscription income from journals, the threat may be greater (Armbruster, 2007) although there may be publishing solutions for some of these societies through

the open access publisher Biomed Central (Cooney-McQuat, Busch and Kahn, 2010).

Another recent development is the growth of subject-based and institutional repositories. PubMed Central is the best example of a subject-based repository in the biomedical field. The institutional repositories contain the academic and research output of a specific organisation. Rodríguez – Armentia and Amat (2010) examined how open access worked for Spanish authors among different disciplines, and for clinical medicine, the publishers' website was the most important, followed by the subject-based repositories. Similar surveys mentioned in the above article, conducted by Matsubayashi et al. (2009) and Bjork et al. (2008) showed that homepage posting and institutional repositories are the least used methods. However, for organisations, their institutional repository can demonstrate the extent of their research activity.

### III. BIOMEDICAL JOURNALS IN GREECE

In Greece, the first medical journal was published with the title "Asclepius" by the Medical Company of Athens in 1836. The biomedical journals in Greece (and for Greece) may be divided in four categories: Greek – language journals, English-language journals generally available in Greece, Greek – language journals published simultaneously in English language mostly by Greek scientific companies or universities, and English – language journals published in Greece by international organizations. Several Greek journals are not always included in database collections and so are not easily detected. However some of these (Iatriki, Archives of Hellenic Medicine and Galen) are well known within Greece, and accessible via the Internet (although two of these only for abstracts). Infolibraries.gr provides free access to electronic Greek journals such as Haema, Pneumon, Acta Orthopaedica et Traumatologica Hellenica.

### IV. METHODS

This section outlines the methods used to analyse the trends in scholarly communication in biomedicine in Greece. The first method involved bibliographic surveys, the second, questionnaire surveys of biomedical researchers.

#### IVA. BIBLIOGRAPHIC SURVEYS

We tried to detect Greek biomedical journals in five worldwide sources, PubMed, SCI (Science Citation Index), BioMed Central, DOAJ (Directory of Open Access Journals), Google. The first phase took place during October of 2006 except for SCI where the research was continued at the beginning of January in 2007. The second phase was conducted from April to May of 2011. In both phases there were no year limits. Details for the first phase are given in a previous paper (Vlachaki & Urquhart, 2010). However, it is important to emphasize that in phase two, the procedures had to differ because of changes made by the publisher of PubMed, the National Library of Medicine (NLM) in

the USA, to the structure of their publications. However, we were able to use a subset of the NLM catalog, the "journals referenced in the NCBI databases". So, although the same keywords were used, this time we used limits and specifically the limits "only PubMed Journals".

#### IVB. QUESTIONNAIRE SURVEYS OF BIOMEDICAL RESEARCHERS

A questionnaire survey conducted in three different periods in hospitals in Athens. A convenience sample was used, and the questions were the same as those used in a Spanish survey (Hernandes-Borges et al., 2006), with minor adaptations. The questionnaire (translated into Greek) asked about publishing activity, awareness of open access publishing, attitudes towards open access sources and sources of information about open access. Questionnaire data were entered into SPSS for further analysis. The first phase in early 2007 had a response rate of 59/70, the second phase, with minor modifications to the wording of a few questions, in early 2010, with a different sample, had coincidentally the same response rate (59/70), and the third phase (September 2010 – May 2011) had a response rate of 81/92.

### V. RESULTS

The bibliographic survey shows that the number of NLM currently indexed journals has increased, but also, surprisingly more "historic" non-currently indexed journals, resulting from changes in the inclusion criteria by the NLM catalogue to cover non-biomedical journals (Fig. 2). Seven journals of Greek publishers were listed in the Directory of Open Access Journals (DOAJ) in 2006, increasing to 11 journals in 2011. However, there are more open access Greek biomedical journals not listed. In the 2011 survey of BioMed Central, a large open access publisher (now part of Springer), three journal titles had a Greek editorial board, based in Greece.

The questionnaire surveys showed that awareness of open access publishing had changed only by the third survey phase in 2011, but was still not high (change from 42.4% aware of open access publishing, to 56.8% aware of open access publishing). There is still some lack of awareness around open access journals, as even in the third phase in 2011, around half the respondents were not familiar with open access journals. There is some uncertainty about the prestige of open access journals, but this is possibly changing (Fig. 3). The views on author charges as a deterrent to publishing in some open access journals show some changes, but the "no opinion" category is perhaps as interesting as the "yes" and "no" categories (Fig.4). Most respondents across all three phases either did not know about the existence of an institutional repository for them, or had no opinion on the subject (Fig. 5).

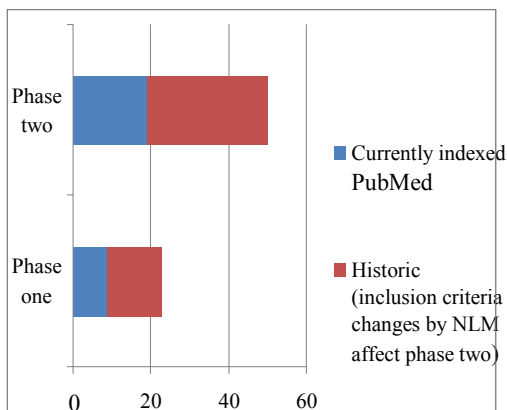


Figure 2. Greek biomedical journal inclusion in PubMed

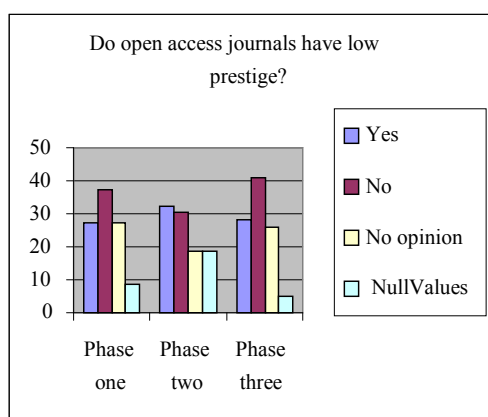


Figure 3. Views on the prestige of open access journals

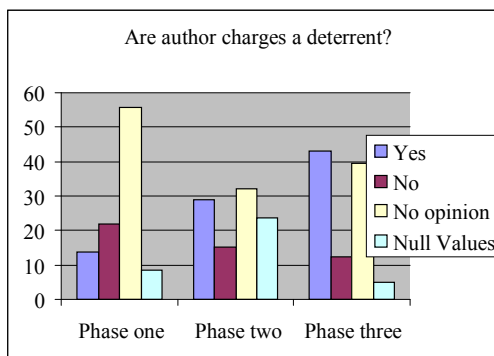


Figure 4. Views on author charges for publishing

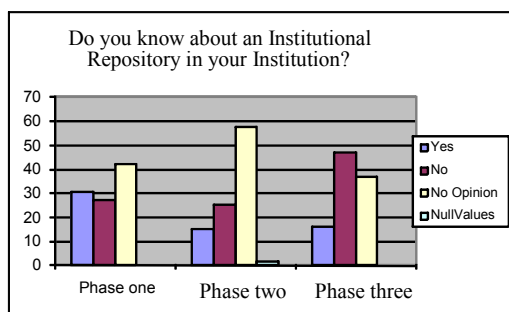


Figure 5. Awareness of an institutional repository

## VI. DISCUSSION

The bibliographic survey indicated that more Greek journals are being indexed by NLM now than in the past. This does not necessarily mean that Greek journals have gained greater recognition as it appears that the NLM are more generous with their coverage. The PubMed Central website states that “PubMed Central will accept material from any life sciences journal that meets NLM's standards for the archive”.

There are other open access Greek biomedical journals that do not appear in PubMed Central, and some of these do not appear in the DOAJ either (a problem noted by Georgiou and Papadatou, 2010). Librarians need to be aware of the changes in the NLM collection policy and the requirements for inclusion in PubMed Central.

Certainly the findings of the questionnaire survey suggest that biomedical scientists in Greece are still confused about some of the differences with open access publishing. The earlier survey of Spanish biomedical researchers, conducted in 2004, found lower levels of awareness (22% aware of open access publishing) and around one third of the Spanish respondents believed the author charges were a barrier (Hernández-Borges et al. 2006). The Greek survey findings suggest that awareness is growing slowly, but the more recent increase could be due to the greater push for open access by the NLM, and the policies to promote open access to the biomedical literature.

There is still some uncertainty among the Greek biomedical researchers, as the survey results indicate, but this is hardly surprising as the situation is complex (Campbell, Willinsky and Anderson, 2010). For relatively new biomedical journals, one route to enhancing the visibility and reach of the journal would be to ensure that the journal met the PubMed Central inclusion criteria. If librarians wish to promote open access, then they could work with the learned societies to ensure that they understand the new criteria, and can explain to their authors what the benefits might be. Research on copyright information to authors supplied by Greek biomedical publishers suggests that the information provided is usually very limited (Vlachaki and Urquhart, 2011). The publishers generally wanted the authors to inform them if they wished to put the article into a repository or post it on a homepage, but the rights for authors were not obvious in the journal instructions to authors.

The views on the prestige of open access journals may be changing, and authors may be more willing to publish in open access journals. The survey of open access in Greece among all disciplines indicated that most open access journals in medicine are peer-reviewed (Georgiou and Papadatou, 2010). The problem of author charges seems to pose a barrier. The survey findings suggest that as awareness has increased, the proportion of researchers who believe author charges are a deterrent has also increased, although a high

proportion of researchers also have no opinion on the subject. Librarians need to explain how author charges work for open access journals and some of the variations in business model used for open access publishing. The survey results also suggest that awareness of institutional repositories is also very low. To some extent, the way PubMed Central works with biomedical publishers, some of the work is done for authors now, as the publishers work with PubMed Central to ensure the articles are available freely after any publication embargo period has expired. Biomedical researchers may be unwilling to put any effort into populating an institutional repository, and the survey of Spanish researchers suggests that publishers' websites were the places that searchers might expect to find open access material (Rodríguez-Armentia and Amat, 2010).

## VII. CONCLUSIONS

Open access biomedical publishing in Greece is developing, but it is hard to track all the developments, particularly when there is no single source of information on Greek open access journals in biomedicine. The changes in NLM inclusion criteria for PubMed Central also complicated analysis of trends.

The survey findings suggest awareness is developing but the sample was a convenience sample, and the confidence limits associated with the sample size are quite large (around plus or minus 10%). The findings also suggest that Greek biomedical researchers seem rather unconcerned by open access with a high proportion of respondents offering 'no opinion' for many questions. Librarians could perhaps provide more of the information that is required, about impact factors, author charges, and PubMed Central inclusion.

## REFERENCES

- [Armbruster, Chris](#), "Moving out of Oldenbourg's long shadow: what is the future for society publishing." *Learned Publishing*, **20**, 259-266 (2007).
- [Björk, Bo-Christer, Annikki Roos and Mari Lauri](#), "Global Annual Volume of Peer reviewed scholarly articles and the share available via different open access options." *Proceedings ELPUB 2008 Conference on Electronic Publishing, Toronto, Canada*, 178-186 (2008).
- [Campbell, Bob, John Willinsky, and Rick Anderson](#), "Scholarly publishing roundtable – three view - points." *Learned Publishing*, **23**, 264-271 (2010).
- [Cooney-McQuat, Sarah, Stefan Busch and Deborah Kahn](#), "Open access publishing: a viable solution for society publishers." *Learned Publishing*, **23**, 101-105 (2010).
- [Georgiou, Panos and Fiori Papadatou](#), "Open access in Greece". In: *Open access in Southern European countries*. Lluís Anglada, Ernest Abadal (eds). Madrid: FECYT, p. 39-62 (2010).
- [Hernández-Borges, A. A., Cabrera;Rodríguez, R., Montesdeoca-Melián, A., Martínez-Pineda, B., Torres-Álvarez de Arcaya, M. L. and Jiménez-Sosa, A.](#), "Awareness and attitude of Spanish medical authors to open access publishing and the "author pays" model." *Journal of the Medical Library Association*, **94**, 449-451 (2006).
- [Hersh, William R. and Thomas C. Rindfleisch](#), "Electronic publishing of scholarly communication in the biomedical sciences." *JAMIA*, **7**, 324-325 (2000).
- [Jacobson, Michael W.](#), "Biomedical publishing and the internet: evolution or revolution?" *JAMIA*, **7**, 230-233 (2000).
- [Markovitz, Barry P.](#), "Biomedicine's electronic publishing paradigm shift: copyright publishing and PubMed Central." *JAMIA*, **7**, 222-229 (2000).
- [Matsubayashi, Mamiko et al.](#), "Status of open access in the biomedical field in 2005." *J Med Libr Assoc.*, **97**, 4-11 (2009).
- [Rodríguez – Armentia, Nerea and Carlos B. Amat](#), "Is it worth establishing institutional repositories? The strategies for open access to Spanish peer-reviewed articles." *Learned Publishing*, **23**, 193-210 (2010).
- [Vlachaki, Assimina and Christine Urquhart](#), "Use of open access journals in biomedicine in Greece." *Library Management*, **31**, 19-26 (2010).
- [Vlachaki, Assimina and Christine Urquhart](#), "Copyright and open access journals in Greece," in Katsirikou, Anthi (ed.), *Open Access STM Information: Trends, Models and Strategies for Libraries*, Berlin, Boston (DE GRUYTER SAUR), 137-144 (2011).