APPENDIX C: RESEARCH AND OPEN ACCESS PUBLISHING

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Introduction
Open Access (OA) publishing is undoubtedly one of the most significant and far-reaching developments to have taken place in academic research in the last 50 years. It has stirred up controversy, debate and change in both the research community and the scholarly publishing industry, and become an inescapable part of research publication. Many academic institutions and research funding bodies require consent to OA publishing by their researchers, while many others (including the HSE) strongly encourage it. So what is OA?

The term ‘Open Access’ seems to have been first used in the Budapest Open Access Initiative (BOAI) in 2002. The initiative was the work of a group of academics, researchers and publishers, and its mission statement was bold:

‘An old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge. The new technology is the internet. The public good they make possible is the world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds. Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge’ (BOAI, 2002).

This was followed a year later by a more detailed statement issued at Bethesda, Maryland, following a meeting which featured many of the same participants. The Bethesda Statement went into considerably more detail about what the advocates of OA had in mind for their emerging model, specifying that in an OA publication ‘the author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a licence to copy, use, transmit and display the work publicly...subject to proper attribution of authorship’. Furthermore, ‘a complete version of the work...is deposited immediately upon initial publication in at least one online repository...that seeks to enable open access’ (Bethesda, 2003).

While the Budapest and Bethesda statements crystallised and clarified the underlying concepts, OA had in fact already been around in various forms for a number of years. Cornell University’s ArXiv repository was established in 1991 to store pre-prints in the fields of physics, astronomy and computer science. These were made available without charge or restriction.
Two main factors may be said to have driven Open Access publishing – technological developments (specifically the internet), and subscription journal prices. The transformative effects of the internet have of course been witnessed in many fields, but we are dealing here with its capacity to digitise and distribute, rapidly and at little cost, information which could previously only be made available slowly and at considerable expense.

The seemingly inexorable rise of subscription journal prices has long been a source of friction between researchers, publishers and librarians. According to BOAI signatory Peter Suber, ‘for four decades, subscription prices have risen significantly faster than inflation and significantly faster than library budgets. Subscription prices have risen about twice as fast as the price of healthcare, for most people the very index of skyrocketing, unsustainable prices. We’re long past the era of damage control and into the era of damage’ (Suber, 2012). Suber was not alone in his view. ‘Subscription rates to scholarly journals continue to increase annually by 8-10%, far exceeding inflation rates as measured by the Consumer Price Index’ (Ahmed, Tran, Langdorf, Lessick & Lolfipour, 2008, p. 240). Another study calculated that ‘journal prices increased 215% between 1986 and 2003, while the consumer price index rose just 68%’ (Albert, 2006). This is in striking contrast to one publisher’s claim that between 1998 and 2003 ‘the unit price of journals increased by an average of just under 1%’ (Robinson, 2006), but even allowing for discrepancies involved in measuring different samples using different methodologies over different periods, it seems that subscription price rises have been steady, significant and perhaps unsustainable, forcing libraries to cut back on their subscriptions.

According to Stevan Harnad, another of the BOAI signatories, ‘here is a simple but extremely important consequence of this state of affairs: most research findings are only accessible to a fraction of their potential users’ (Harnad, 2011). Since research is largely (though by no means exclusively) funded from the public purse, an ethical issue also arises: should the public have to pay twice for publicly-funded research?

As these factors have coalesced, the pressure for a new research publishing paradigm has increased. That paradigm is Open Access publishing which allows for free, unrestricted, immediate and online availability of high-quality scientific research results (Laakso et al., 2011).
Green OA
‘Green Open Access means self-archiving of the author’s work, be it a manuscript, a pre-print version of a manuscript accepted to be published in a scientific journal, or the actual published paper itself’ (Laakso et al., 2011). Many subscription journals allow authors to archive these ‘author-accepted’ manuscripts, that is, the version of an article which has been peer-reviewed but not undergone final type-setting and formatting for publication.

The archiving can be via a personal website or an institutional or subject repository. Repositories are increasingly common in educational or research institutions (these are known as institutional repositories), while others are subject-based. The HSE has its own repository, called Lenus, which operates in conjunction with a number of other Irish health organisations. The advantages of this are summarised by Peter Suber: ‘For scholars, repositories are better at making work OA than personal web sites because repositories provide persistent URLs, take steps for long-term preservation, and don’t disappear when the author changes jobs or dies’ (Suber, 2012).

Against this, Martin Hall has cautioned that ‘While access to the green version of a research paper is very useful in scanning a field for new work, only the version of record has research results corrected after review, final forms of diagrams, tables and photographs, and the final pagination for the purposes of citation’ (Hall, 2012), adding that technical limitations might pose problems for text and data mining, thereby hindering the discoverability of researchers’ work. Nevertheless, Green OA (also known as self-archiving) of a postprint can provide significant early access advantages to research (Gargouri et al., 2010). Researchers should also be aware that most journal publishers allow for this (Suber, 2012), and that in most cases Green OA availability does not preclude taking the Gold OA route (if in any doubt, researchers can check a journal’s terms and conditions – see Figure 1. The development of open access publishing 1993-2009 (Laakso et al., 2011).
below). Finally, it is important to remember that a ‘postprint’ or ‘author-accepted’ manuscript is a peer-reviewed piece of research.

**Gold OA**

In Gold OA, an author submitting research for publication pays what is known as an Article Processing Charge (APC) to the journal in which they wish to publish. This is intended to cover the editorial and peer-review costs traditionally funded by subscriptions. Upon payment of the APC, the author’s research immediately becomes freely available to all. The Gold OA route has proven popular with both authors and publishers, and in 2012 the British government’s Finch report (2012) recommended that higher education institutions and research bodies in the UK should adopt this approach.

Under the Gold OA model, the ‘burden of payment’ shifts from reader to author, and many commentators and researchers have noted that Gold OA, with its requirement to pay an APC of between US$500-US$5000 (Elsevier’s rates at the time of writing) discriminates against unfunded researchers.

The economic sustainability of the OA model has been hotly disputed. Publishers (Morris, 2005; Robinson, 2006; Seaman & Stewart, 2013) have been at pains to emphasise the material importance of their contributions to the research process, and have questioned how OA publishers will provide equivalent services in the absence of subscription income. For true OA journals - that is, those that offer full and free access to readers, running costs have to be met somehow. Technological advances may have eliminated paper, printing and postage costs, but repositories, servers, maintenance and staff still cost money.

As seen above, Gold OA is currently the most widely-applied funding model, where authors, or more commonly, their funding institutions – one study found that just 12% of authors personally paid (Dallmeier-Tiessen et al., 2011, p. 9) - pay Article Processing Charges (APCs) to cover the cost of publication. The often high cost of these (see above) has led to their enthusiastic adoption by both OA and subscription-based (so-called ‘hybrid’ journals) publishers. As Suber observed of the latter, “the publisher has subscription revenue for the conventional articles, publication fees for the OA articles, and sometimes both at once for the OA articles” (Suber, 2012).

The sometimes high costs of the Gold OA model have come in for considerable criticism, not least from Stevan Harnad, who accused the publishing lobby of influencing the British government’s decision to support Gold OA (Harnad, 2012) and maintained (2011) that moving to full Green OA would render the subscription model unsustainable and obsolete, leading to Gold OA by default. Suber (2012) on the other hand suggests that this stance may be unrealistic and that Green and Gold OA can be seen as complementary, each having certain strengths and weaknesses.

A number of authors have proposed mechanisms to address the funding issue, arguing that ‘some countries might transfer parts of current subscription budgets to the research sector, earmarked for publication
costs’ (Vigen, 2007), although Harnad noted that institutions would not have the money to pay their authors’ gold OA publishing costs while those funds were still tied up in paying for journal subscriptions (Harnad, 2011). The Gold OA model is still evolving, as are mechanisms to sustain it.

**Scientific impact in OA**

Since Open Access journals began to appear around 15 years ago, many researchers have attempted to measure their scientific (or citation) impact. This after all is one of the key drivers behind researchers making their work freely available – to increase citation and recognition of their work (Antelman, 2004, p. 373). Many of the early studies into citation impact demonstrated an advantage to publishing in OA journals, although these findings were challenged on a number of grounds, notably self-selection bias, where authors make available only those papers which have already achieved some degree of recognition. In other words, one could argue that the articles are online because they are highly cited, rather than being highly cited because they are online – effectively as ‘trophies’ (Eysenbach, 2006, p. 0697). Other studies supported this ‘self-selection bias’ argument, using statistical analysis to demonstrate that OA-published articles enjoyed no discernible advantage in citation impact (as cited in Xia & Nakanishi, 2012, p. 41).

The claim by OA proponents that OA offers impact and citation advantages has been contested by some researchers (Davis, Lewenstein, Simon, Booth & Connolly, 2008), while others – though admitting that moving to an OA model can increase usage figures – contend that spiders, bots and other automated web-crawling mechanisms actually account for much of the increase in ‘readership’ (Nicholas, Huntington & Jamali, 2007, p. 13-14). However, more recent studies do appear to indicate a definite citation advantage for papers published in OA journals (Bjork & Solomon, 2012; Gargouri et al., 2010), and the weight of evidence now strongly supports the OA citation advantage. It also appears that one fear of traditional journal publishers – that OA publishing will result in increased citation of low-quality, otherwise unusable papers – has not so far come to pass (Gargouri et al., 2010). Interestingly, a 2013 study by Archambault et al. confirmed a citation advantage of 19% - 34% (for health sciences and clinical medicine respectively) but found that the advantage was concentrated in the Green and hybrid journals (Archambault et al., 2013, p.16); the authors attributed this in part to the relative newness of Gold OA journals, which take time to establish themselves.
Quality control
Open Access is a new, dramatic and disruptive paradigm in scholarly publishing, and it has not been without its critics and opponents – nor without resistance from established interests. The publishing industry’s response to OA has been predictably unenthusiastic, if not hostile. Objections to Open Access publishing have tended to focus on either economic sustainability or quality control. From quite early on, publishers have been concerned at what they saw as a potential loss of income and influence. They argued that the Open Access model made insufficient provision for expert publishing tasks as proof-reading, reference checking, managing the peer-review process and archiving (Morris, 2005). Seaman and Stewart (2013) pointed out that ‘...copy-editors and proofreaders do much more than correct grammatical and spelling mistakes – detailed quality control is by far the greatest expenditure’. And they noted (with a perhaps understandable note of frustration) that ‘Green OA repositories may be ethically desirable, but they undermine the subscription-based system by taking a value-added service provided by the publisher (e.g., organisation of the peer review process) and then dodging the bill for it’.

Coherent and transparent editorial policy and ensuring rigorous peer review – quality control, in other words – are the basis of any serious scholarly journal (Driscoll, 2010), and subscription journal publishers have made this point repeatedly. Andrew Robinson, Director of Medical Publishing at Blackwell suggested a scenario where ‘the end result [of Open Access] will be an undifferentiated pool of unreviewed research which will, because of its lack of structure, not only halt the diffusion of innovation to the same vital research organs, but also challenge the viability of the whole body by affecting other systems such as peer review’, and arguing that under the traditional paradigm, ‘researchers have never had it so good’ (Robinson, 2006 p. 1454-5). Robinson rejected the ethical and economic arguments made by Open Access proponents, and issued a dire warning about the potential damage that Open Access might wreak upon research publishing: ‘if you think that mass extinction of journals is an overstatement, then think again’ (p. 1458).
Although publishers often overstate their contribution to the peer review process (the bulk of which is carried out by external reviewers and referees who receive no payment for their work), they are responsible for coordinating a complex and time-consuming process. This requires dedicated staff. Open Access publishers have been accused of downgrading peer review, or even omitting it entirely. Seaman and Stewart (2013) expressed particular concern, asking ‘Will publishers that invest heavily in quality control be able to compete with ‘cheap’ OA providers that forego strict peer review, as well as copy editing and typesetting, i.e. producing what is almost ‘grey’ literature, and providing no more service than any ‘green’ OA repository?’ While this arguably misrepresents the services provided by repositories (which have nothing to do with peer review or editorial practices), it raises a fair point about the challenges faced by OA publishers – to maintain quality control and overcome accusations of low standards.

**Copyright**

A brief point needs to be made regarding authors’ copyright. While policies vary from one publisher to another (and from one journal to another), standard practice in subscription publishing has been for the author to sign over copyright to the publisher, who exercises exclusive rights to its re-use. Robinson (2006, p. 1455) saw no problem in this, claiming that authors attached little importance to copyright issues. There is a degree of truth in this, but in a world accustomed to online information sharing it can lead to awkward (to say the least) situations. In December 2013, Elsevier issued thousands of takedown notices to researchers who had posted copies of their articles (to which Elsevier owned the copyright) on the U.S. academic social network Academia.edu (Swoger, 2013). Elsevier’s action was entirely legal – which is precisely the point. The authors had signed away their right to share their work with others, in exchange for the prestige of publishing in a high-ranking journal, but had not realised the implications of doing so. Given Irish researchers’ practice of sharing their published work on similar sites like ResearchGate, there is every likelihood of a comparable occurrence here. When publishing in an OA journal researchers retain full rights to their work, which they can then licence to one or more journals under a Creative Commons type agreement (see below).

**Predatory journals and dubious publishing practices**

Jeffrey Beall, a librarian in the University of Colorado, is a noted critic of Open Access publishing, and the complier of ‘Beall’s List’ (http://scholarlyoa.com/2014/01/02/list-of-predatory-publishers-2014/) of predatory journals, a website devoted to challenging the standards and ethics of Open Access journals. As Beall (2012) notes, many self-proclaimed ‘Open Access’ publishers do not identify an editorial board or provide information about review board members, they lack transparency about their operations and they make unsolicited ‘spam’ requests for submissions. They exist to make money from APCs, despite providing little in the way of peer review or quality control. Beall’s charge is that such publishers are effectively running scams, targeting gullible or
unscrupulous researchers and operating as vanity presses.

Admittedly, Beall’s opposition to OA goes beyond concerns over sustainability or quality. His rather vociferous assertion that ‘the open-access movement is a Euro-dominant one, a neo-colonial attempt to cast scholarly communication policy according to the aspirations of a cliquish minority of European collectivists’. Early funding for the open-access movement, specifically the Budapest Open Access Initiative, came from George Soros, known for his extreme left-wing views and the financing of their enactment as laws’ (Beall, 2013) is both intemperate and inaccurate, (as well as somewhat ironically being published in an Open Access journal) and was equally forcefully rejected by OA advocate (and signatory to the BOAI) Michael Eisen (2013). Nevertheless, his criteria for determining quality in OA journals are valid, and he has played a key role in highlighting the threat of predatory journals and in holding OA journals to the same rigorous standards as their subscription-based counterparts.

The phenomenon of predatory OA publishing is a salutary reminder of the potential pitfalls of online life. From dating sites to phishing to the ever-present ‘419’ banking scams and offers for prescription drugs, internet users always need to be vigilant about the bona fides of those they deal with in cyberspace. This is as true for researchers and journal publishers as it is for anyone else, and Beall’s List is an excellent guide to the frauds and charlatans who seek to make easy profits from the work of researchers. It is worth remembering, though, that fraud and lapses in quality control are not the sole preserve of the OA model. Seaman and Stewart (2013), while staunchly defending the editorial services provided by publishers, acknowledge that peer review ‘does not guarantee a scientifically accurate report’. The now-notorious 1998 study by Andrew Wakefield, suggesting a link between autism and the MMR (measles, mumps and rubella) vaccine was published in the Lancet, a traditional, peer-reviewed subscription journal. More recently it was discovered that the medical publishing giant Elsevier had effectively published a fake ‘journal’ of articles selected to emphasise positive findings about drugs manufactured by Merck (Masnick, 2009a). While Elsevier protested that its publication was not a journal as such, it went to great lengths to create just that impression in the minds of its readers. Elsevier also conceded that the publication was not a one-off; six such ‘journals’ had been published (Masnick, 2009b). As it is, while attention has naturally focused on the problems encountered in the new and still-evolving OA model, the existence of the same problems in the subscription model has tended to receive less attention.

**OA Resources**

While scholarly publishing continues to develop in both its subscription and Open Access forms, and while the latter is still maturing as a platform, it now seems clear that Open Access is here to stay, and that it offers considerable advantages to researchers. The following are some of the OA resources they should be aware of.
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<th>Creative Commons</th>
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<td>Creative Commons (CC) is a U.S.-based non-profit organization dedicated to facilitating the sharing of content on the internet, while permitting the creators of that content to retain full copyright and intellectual property rights. CC does this by providing a suite of standardised licences which content creators can attach to their work, and which allow for varying degrees of sharing and re-use. As CC emphasises, these licences do not replace existing copyright. Rather, CC 'work[s] with copyright experts around the world to make sure our licenses are legally solid, globally applicable, and responsive to our users’ needs' (<a href="http://www.creativecommons.org/about">www.creativecommons.org/about</a>). By using a CC licence, researchers can stipulate the degree of access and re-use which they are willing to grant.</td>
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<th>Sherpa/RoMEO</th>
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<td>Maintained by the University of Nottingham, SHERPA / RoMEO (<a href="http://www.sherpa.ac.uk/romeo/">http://www.sherpa.ac.uk/romeo/</a>) is an invaluable database detailing the self-archiving (Green OA) policies of journal publishers. If you wish to make your pre-print available in a repository but are unsure whether your agreement with a publisher allows this, RoMEO is an easy way to find out.</td>
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<th>Open Access Scholarly Publishers’ Association (OASPA)</th>
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<td>OASPA (<a href="http://www.oaspa.org">www.oaspa.org</a>) is an alliance of OA journal publishers. It sets quality standards for OA journals, advocates for Gold OA and engages in awareness-raising activities.</td>
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<th>Beall’s List</th>
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<td>As noted above, Beall’s list of predatory journals) is a vital tool for those wishing to publish in an OA journal. Beall provides a list (updated periodically) of publishers who fail to meet the ethical or scholarly criteria which would safeguard publishing quality.</td>
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<th>Directory of Open Access Journals (DOAJ)</th>
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<td>The DOAJ (<a href="http://www.doaj.org">www.doaj.org</a>) is a comprehensive list of OA journals (at the time of writing it has indexed an impressive 10,228 journals in 136 countries) that should be an essential part of any researcher’s toolkit. Importantly, given the ongoing controversies and misconceptions surrounding OA and scholarly quality, the DOAJ has a strict set of criteria to be met by any journal seeking inclusion in the list – notably, that the journal should be scholarly, peer-reviewed and fully OA (i.e. there should be no embargo period for articles). The DOAJ also has an article-level search facility, allowing for searching within and across journals.</td>
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<td>Lenus (<a href="http://www.lenus.ie">www.lenus.ie</a>) is a multi-institution health repository, established and maintained by the HSE since 2009. It indexes grey literature and academic / clinical research relating to health in Ireland. Researchers can deposit their published work quickly and easily, making it immediately accessible to a wide audience. Lenus is Ireland’s largest health repository, containing more than 20,000 items as of February 2015. Health and Social Care Professionals have a dedicated collection within Lenus to house, preserve and disseminate their research. Research deposited in Lenus is also made available in RIAN (<a href="http://www.rian.ie">www.rian.ie</a>), which gathers together the research output of the main Irish third level education institutions. RIAN is a portal for Irish Open Access research.</td>
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<th>Open Access and the Irish health services</th>
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<td>A coalition of 20 Irish organisations – the National Steering Committee on Open Access Policy - backed the National Principles for Open Access Statement launched in October 2012 by Minister of State Sean Sherlock (National Steering Committee, 2012). This reaffirmed the principles espoused in the Budapest Open Access Initiative back in 2002 and was swiftly followed by the HSE’s Open Access publishing statement in 2013 (Lawton, Morrissey &amp; Sayers, 2013), which gave real impetus to Open Access publishing within the Irish health services and provided strong encouragement for making Irish health research available via OA.</td>
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Conclusion
With the increasing success of OA publishers like BioMed Central and PLoS, high-quality OA peer review is an established reality according to the study by Archambault et al. (2013 p. 18). Ireland is one of eight EU countries to have reached the ‘tipping point’ where 50% of its published research is OA. OA publishing has demonstrated impact and citation increases over non-OA research. It is a viable professional and ethical alternative to traditional subscription-based publishing. It is not flawless, “but the larger picture is clear: we are headed for an open access world that will replace traditional subscription publishing with systems of distributing new knowledge that are far more appropriate to the immense opportunities of new digital technologies’ (Hall, 2012, p. 239). As such, Irish researchers should not hesitate to embrace it.
References


access initiatives) on use and users of digital scholarly journals. *Learned Publishing*, 20 (1), 11-5. DOI: http://dx.doi.org/10.1087/09531510779490599.


