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Editorial

Open access publication in biomedical research : implications for developing countries

During July this year, the U.S. House Appropriations Committee adopted a set of recommendations, one of which will mandate the National Institutes of Health (NIH) put a condition that all publications supported by NIH grants would be deposited in PubMed Central (PMC), its open-access digital library. If NIH paid any part of their publication costs- page charges, charge for printing colour pictures *etc.*, they would become Open Access (OA) immediately. In other cases where no publication costs have been paid to publisher, the articles would become OA through PMC six months after publication in a journal. The UK House of Commons Science and Technology Committee has just brought out a report [1] on pricing issues and their impact on the availability of scientific literature. Support OA from 34 OECD countries [1], the NIH and Inter-Academy Panel, among others, in rapid succession has brought into centre-stage this debate on the need for unfettered access to scientific information for the progress of humankind.

What is Open access publishing?

What is Open access? For the uninitiated, Open-access (OA) literature is digital, online, free of charge and free of most copyright and licensing restrictions [2]. Here's how the Budapest Open Access Initiative [3] put it: "There are many degrees and kinds of wider and easier access to this literature. By 'open access' to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited."

This Statement issued in 2002 by group of researchers and others representing universities, laboratories, libraries, foundations, journals, publishers and learned societies for free access to scholarly journal literature through deposit of refereed journal archives in open electronic archives and through the development of open access journals that will disseminate their contents without subscription or access fees. The Budapest initiative was further developed and extended in June 2003 in Bethesda. The Bethesda Statement [4] defines open access publication as meeting the same two conditions—free access to published works and immediate deposit of the work and supplementary material in an online repository like PMC for long term archiving. This was soon followed by the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities in October 2003 [5]. OA initiative has received wide support from several countries.

Why is 'open access' to scientific literature so important? At the very heart is the premise that research ideas, information and data generated with public money invested in scientific research is translated into outputs that benefit the public. This will be possible only when there is free and unrestricted access to published literature to all users wherever they are located. This is not possible now due to the ever increasing subscription costs of journals and the copyright policies of journal publishers. Even a country like the US that has stringent intellectual property laws is concerned about the restrictions on access to research data. A report submitted by the NLM (NIH) to the Committee on Appropriations states [6]: "These trends (increase in the prices of learned journals) have adversely affected the ability of academic and health sciences libraries to continue to support the needs of the research and health care provider communities for access to biomedical literature". The NIH has been thinking about OA ever since Harold Varmus became its director in 1993. Varmus, a strong advocate of this cause, is a major force

behind PubMed Central and Public Library of Science (PLoS).

Subscription costs of biomedical journals

Scientists are quite annoyed with commercial publishers as journals continue to be prohibitively expensive. Between 1991 and 2000, library subscriptions to scientific, technical, and medical (STM) journals in North America are quoted to have increased by 158 per cent, which is over 6 times the inflation rate during this period[6]. According to another estimate from the United Kingdom, from 1990 to 2000, medical journal prices have increased by 184 per cent and science and technology journals 178 per cent [7] This study by SQW, independent economic consultants for the Wellcome Trust [7], confirming these trends, underscored the fact that the demand for STM journals is price-inelastic simply because there are a few journals that all researchers would like to read because of their 'quality', and impact factor. And more importantly, publish in *these* journals. With such a patronization, publishers can price such journals at will, and still sell them. Ironically, neither those who foot the bill for research (funding agencies) nor the institutes, which pay the mounting journal subscription charges, have little say in this issue.

Who will bear the cost?

It costs a lot of money to publish journals, claim publishers but do not give out reliable data. On an average, publishers make about 35 per cent profit on their investments with subscriptions, contributing to about 85 per cent of revenue [7]. The OA journals propose to switch over from the subscriber-pays to author-pays model with the cost of publishing picked up by the author or their funder (rather than the subscriber, of a journal). OA publishing is still new with only about 5 per cent of the total scientific journal output in biomedical sciences. The main publishers are the BioMed Central (BMC), established in 2001 and PLoS that started, *PLoS Biology,* in October 2003. OA journals currently charge an article-processing fee of US$ 500 to 1500 per paper from authors to cover the costs of peer review and publication. But, as the money is payable on acceptance, the costs of publishing a high quality journal with high rejection rate will be higher. In future, the fee could vary on the nature of the paper with those with pictures paying more. BMC is aiming to establish as a viable OA publisher and generates revenue from several sources besides subscription. The PLoS is a not-for-profit organisation run for and by scientists. Both receive financial subsidy - BMC by UK public funds and PLoS, a US$7 million from the Moore Foundation. The SQW study on costs and business models in scientific research publishing[7] concludes that author-pays publishing is more sustainable than subscriber-pays model and that it costs up to 30 per cent less overall. Journal publishing is complex and in the absence of adequate data it is too early to comment on the long term viability of this model. Many learned societies are in fact seeking the help of professional publishers for bringing out their journals.

OA journals have been able to compete with traditional publications. BioMed Central has reported higher usage rate for its articles than that for articles published in subscriber-pays journals.[1] A study by Thomson ISI (publisher of SCI), claims that papers in author-pays journals "are cited at a level that indicates they compete favourably with similar journals in their field" and that "the wide distribution of these OA journals has not yet been shown to have any appreciable effect on their appearance in lists of cited references in other journals".[1]

New developments

It appears that commercial publishers are beginning to feel the impact of OA movement. Last year, when two events – inquiry by the UK Parliamentary Committee and the Open access plan by the House Appropriation Committee of the US were in progress, some publishers have quietly initiated the author-friendly steps. Few publishers were willing to accept articles after they had already been archived. *Nature* changed its policy recently. On 3 June 2004, when the UK report was being prepared, Reed Elsevier (the largest publisher with 28.2% global market share in 2003) permitted authors to post the final text of their articles on a personal or institutional web site. Despite some riders, such steps should be welcomed.

The developing world

What is the impact of these initiatives for the developing countries already largely deprived of

access to current information? Many libraries are struggling to purchase access to even the most important journals due to cost. Impact of schemes like the Health Inter-Network Access to Research Initiative (HINARI) designed to give free access to some journals to public institutions in developing countries, (GNP per capita below US$1000) largely Africa, needs to be evaluated.

Will the technology-intensive OA further marginalise science and scientists in poorer countries? Even the minimal ICT infrastructure essential to receive OA journals and databases is lacking in many developing countries. The PC availability is limited. According to NASSCOM, there are about 6.4 million computers in India (2002) as compared to 30 million in the UK and over 190 million in the US. Internet use is equally limited. Of the 605 million global users, Africa's share is 6.31 million while the US and Canada have 183 million users. India has about 7 million connections. In Africa, the per cent population with access varies between 0.2 to just about 7.0 as compared to 59.1 in US. What is more, the Internet speed is a critical factor. Proponents of OA argue that enhancing ICT capacity may, in fact, be more suited to the needs of developing countries because it is cheaper, more immediate and will help researchers to fully exploit the potential of digital technologies via the internet. Payment for publication is the other issue even though the proportion of published articles from poor countries is currently very small. PLoS editors are currently "blind" to the author's payment capacity while making editorial decisions and if the author cannot pay, the fee is waived. As most OA publication charges are likely to be borne by governments (like the UK and US), would they reimburse payment for papers from poor countries? Experience of developing countries shows that such 'charity' often comes with strings. A more viable option would be, set aside a small fund from NGOs exclusively for this purpose. And this is the right time to think of such a system. Publishers like Elsevier aggressively expanding their market in India should consider making their journals (print and online) affordable, especially since their CEO appears to be quite concerned about information access in developed countries [1].

Indian scenario

It is early days for India to be an important part of the OA movement. Few Indian biomedical journals have web sites and those that do have e-versions face serious technology issues, cash crunch besides other problems [8]. The Indian Council of Medical Research, New Delhi has taken a lead in establishing IndMED (www.indmed.nic.in) that provides web access to abstracts of 78 Indian biomedical journals. Several Indian journals including the IJMR are also available full text free on the web. As of now, the Government of India is not associated with the global OA initiative although, the Indian National Science Academy, New Delhi has organised some discussions. Most research and library budget in India comes from the public exchequer. It is time the Govt. talks to all stake holders on OA publishing and take appropriate policy initiatives.

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