

Open Access: Barriers and Opportunities for Lower-income Countries

Dan J Ncayiyana, MD
Editor: *South African Medical Journal*

**International Seminar on Open Access for
Developing Countries**

Salvador, Bahia September 21-22 2005

Introduction

To discuss the challenges and opportunities of open access for low and middle income countries particularly in Africa, it is necessary to begin by describing the meaning of the concept of 'open access', even though this concept will no doubt be described many times over in the course of this seminar. In order to further develop the context, it will then also be necessary to sketch the state of open access in the world today.

The formal definition of open access is contained in the Bethesda Principles formulated in April of 2003, which the *Public Library of Medicine* (PLoS), has described as follows: 'open access to scientific and medical literature allows anyone, anywhere, with a connection to the Internet to find and read published research articles online, and to use their contents in the course of scholarship, teaching, and personal inquiry'. Open access literature must be free of charge to the reader, and free of most copyright and licensing restrictions, in any language and in any science discipline.

Stated differently, open access is the storage of peer reviewed health and medical literature in a public digital repository in such a manner that it can be retrieved or 'mined' using appropriate electronic search tools, totally free of cost to the user. Examples of digital repositories dedicated to open access include PLoS, PubMed Central, BioMed Central, and INIST (a repository for mainly French literature).

There are two primary vehicles for delivering open access to research articles: open access journals, and open access archives and repositories. Archiving is an important source of open access literature, though perhaps not as well used. Many authors deposit articles that have already been processed, published or

accepted for publication by major journals in their departmental or institutional archives.

Therefore, open access refers to access to scientific articles, rather than to scientific journals *per se*. In fact, three times as many articles are accessible on an open access basis through self-archiving than through open access journals, and more than half of the scientific journals published worldwide support self-archiving and allow authors to do so [1].

Traditional paper journals online

A growing number of traditional paper journals publish full-text online versions, but not necessarily on an open access basis. The *BMJ* was a pioneer among major medical journals when it offered free and immediate Internet access to the full text of all research papers and other articles contained in a *BMJ* issue as far back as 1998. This initiative saw an astronomical growth in the number of *BMJ* worldwide readers, and an enhancement of the impact factor, and the move was hailed as revolutionary across the world, particularly in the developing countries.

Unhappily, the *BMJ* has been compelled by commercial imperatives to retreat somewhat in this regard, and now restricts open access to research articles, but places time-limited restrictions on access to the rest of the journal contents as of 2004. This policy change has caused much disappointment and elicited loud protests from readers; and the editor's claim on 2 April 2005 that 'the *BMJ* is the world's only major general medical journal to provide immediate free access to the full text of all research articles' [2] was greeted with sharp disagreements in the 'rapid responses' rubric of the electronic version of the journal.

Most established medical journals in the North are now full text on the web, but with varying levels of accessibility for the reader:

- Most are accessible strictly by subscription only; the reader or researcher must pay to have sight of, or download the full text of the desired paper
- Some allow certain portions of the journal to be accessed without charge, while other sections are by subscription only, at least for a specified period of time, and
- A minority have followed the original lead of the *BMJ* of publishing their contents on the Internet for open access without any restrictions

In addition, new internet-based journals have been established by entities such as PLoS and Biomed Central specifically to enable the publication of high quality open access articles on the web.

Nevertheless, the volume of scientific articles available on an open access basis on the Internet remains relatively small. According to one estimate, there are 24 000 known research journals in circulation today across all disciplines and languages worldwide, publishing about 2.5 million articles per year. Of these, only about 100 000 articles are available on open access [1]. The web-based *Directory of Open Access Journals* (DOAJ) which 'covers free, full text, quality controlled, scientific and scholarly journals' lists only 1761 scientific journals, including health and medical publications.

The open access movement gains momentum

However, the open access movement has gathered momentum in the last few years, fuelled in large part by the increased demand for global exchange of scientific information, and the escalating and unsustainable costs of paper journals for individual readers, and particularly for science libraries around the world. Scientific paper publishing is big business worth \$7 billion a year, with some publishers raking in profits of as much as 40% on journal business. Society-owned science journals have come to be regarded as cash cows by some sponsoring organisations.

With journal prices increasing far faster than the underlying rate of inflation, cash-strapped libraries have been forced to cut back on subscriptions, to which publishers have responded by increasing their prices even further in what would seem to be an unsustainable spiral to self-destruction [3].

The open access movement is also driven by funding agencies, specifically the NIH supported by Congress, the Wellcome Trust and the Howard Hughes Hughes Medical Institute.

Open access challenges for lower-income country research

Conceptually, open access should make it easier for quality research from lower-income countries to be published internationally, and to overcome the barriers that frequently prevent such research being published in traditional paper international journals. Electronic publishing is cheaper, and reaches more people on a global scale. The emerging, web-based open access journals such as those published by Biomed Central are presumably not constrained in time, space, profit or philosophy in the same manner as the traditional paper journals.

Therefore, for quality health and medical journals from lower-income countries, 'going open' on the web should present huge opportunities to broaden their international exposure and readership.

But there can be no quality journals without quality research; and there can be no quality journals and quality research without viable and sustainable material support.

All developing countries are not the same. Some countries in the South, in regions such as in Latin America and Asia, have an excellent research culture and publish journals of outstanding quality.

This is however not true of most of the developing world.

Most publications from lower-income countries have little or no international reach, with only about 5% of the journals originating from developing countries meeting the criteria for indexing in international databases. The rest have limited academic credibility, and have little or no impact on the health status of the local communities they seek to influence [5].

Then there are the language barriers. For example, Latin-American journals represent less than 2% of journals indexed in Medline, and less than 1.7% of the references in Medline come from Latin-America [6]. Language-based indexing systems are emerging as a result, for French and Ibero-American literature.

It is worth looking at some of the problems facing health and medical research and publishing in poor countries, using Africa as an example.

1. Research capacity constraints

The odds against good health and medical research in African countries are formidable, and include

- Inadequate funding from public and private sources
- Lack of interest among international funding entities to support research into the health problems of the developing world
- Impoverished academic and laboratory facilities
- Lack of institutional and political commitment to quality research [4]
- Poor technical human resource support
- Relentless brain drain of experienced researchers to wealthier countries

2. Capacity challenges for journals

In July of 2002, TDR (tropical diseases research) of the WHO conducted a survey of 69 African health and medical journals [7], and found that

- The majority were severely under-funded
- They did not publish regularly
- They lacked high quality articles
- They had no access to reliable standard peer review

- They had huge distribution problems
- They lacked the managerial, marketing, technological and editorial skills
- They operated in environments of poor communications infrastructure, specifically with respect to power, postal service, telephone and Internet connectivity

In the light of these difficulties, the benefits of a broadened and internationalized readership from open access is going to remain limited for research publications and research journals from lower-income countries, unless and until appropriate changes occur domestically, regionally and internationally to promote and support quality research and quality journals from these countries.

Promoting open access for research and research journals from lower-income countries

1. Greater receptiveness to research papers from developing countries

Researchers in the South have traditionally encountered barriers to getting published in print journals in the North, due in part to space and other logistical constraints. Internet publishing overcomes most of such constraints, and Web-based open access journals can and should adopt greater receptiveness to research papers submitted from lower-income countries

2. Greater receptiveness in the open access journals to research dealing with health problems of the South

Internet based open access journals should demonstrate greater receptiveness to research dealing with the health problems of the South, and be a partner in mitigating the 10/90 phenomenon and reversing the prejudice against health and medical research and publishing that has become a hallmark of paper-based Western journals

3. A suitable application of the 'author pays' formula for researchers from the South

While the 'author pays' formula for funding open access publishing is vastly cheaper than the current costs of producing a paper journal, authors from developing countries will in most cases not have the resources to pay in order to publish in open access journals, and special arrangements and exemptions will need to be devised to accommodate them and in order not to stifle research from this part of the world

4. Commitment to health and medical research by governments of developing countries

Governments of lower-income countries must show greater commitment to health and medical research by investing in the appropriate infrastructure and creating appropriate career paths for researchers in the health and medical field, in order for the governments to benefit from evidence-based data in making policy and planning their health services

5. International support for indigenous research and open access research journals in developing countries

World research is largely biased in favor of health problems of the wealthy countries, whereas the greatest burden of disease is to be found in developing countries. Research into Third World health problems can best be conducted in the Third World, and international funding agencies, foundations and governments should reorder their priorities towards funding research in lower income countries, in part to mitigate the brain drain of Third World scientists who migrate overseas to find satisfaction in their research careers.