

Improving access to scholarly research in Africa: open access initiatives

For many scientists and medics, especially those in lower-income countries such as sub-Saharan Africa, access to the latest research can be limited and restricted. In this age of technology should anyone have to pay to access research published online?

To aid both the economic development of developing countries and to ensure a complete scientific record, scholarly research must be made freely accessible – open access (OA) publishing provides free, immediate and permanent online access to the full text of an article, presenting researchers with easily accessible high-quality scientific resources essential to the rapid and efficient global communication of research findings.

Various projects and initiatives aimed at improving the situation for the developing world are described in this article, including BioMed Central's 'Open Access Africa' initiative.



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For scientists and medics, especially those in lower-income countries, access to the latest scholarly research can frequently be highly limited. Economic, political and societal issues are often compounded by both technological restrictions and journal subscription barriers, creating serious global inequalities in both access to and visibility of published research. Researchers from Africa and other developing countries are the least able to pay to access information, resulting in 'lost science' in the form of information which is either not published or simply not made accessible to all. In some circumstances, access to the latest research findings can mean the difference between morbidity and mortality. Added to this, research from developing countries often lacks the global visibility that western research obtains.

Research from Africa has a very low international reach, and as a result, is not readily available to other researchers in the region, or, indeed to the international scientific community. Despite increased access to technology and the rise of internet communications and online journals, the visibility of African science to researchers and policy-makers still needs to be greatly raised.

Publishers such as BioMed Central often support research output from developing countries by providing automatic waivers for article processing charges (APCs) for published research. BioMed Central offers waivers for all research published from low-income or lower-middle-income countries (as determined by the World Bank) within its journal portfolio. Virtually all African countries currently qualify for BioMed Central's 'Open Access Waiver Fund'*¹. All articles submitted still go through a full and rigorous peer-review process and must be original and scientifically sound. The waiver fund assists researchers in developing countries to publish their research in a BioMed Central journal without incurring any fees and has grown substantially over the past three years, demonstrating both the increasing scientific output from developing countries and also the gradual improvement in understanding of open access (OA) publishing by researchers from developing countries.

* It should be noted that any author, regardless of whether they reside in a country which appears on the World Bank list, can claim for insufficient funding and request consideration of a waiver.

Despite the vast population, just 0.7% of all research findings come from Sub-Saharan Africa². As a whole, the continent's domestic scientific research is under-represented in the International Indexes of Scientific Output³. Science, technology and innovation (STI) are a crucial foundation of economic development and now, African countries are finally recognizing the need to invest in these areas to catalyze economic change. The Addis Ababa Declaration on Science, Technology and Scientific Research for Development from the African Union Summit in January 2007 stated:

*"We, the Heads of States and Government of the African Union, ...recalling our millennium commitments to achieve sustainable development for our Continent, ...realizing that the achievement of these goals depends on our countries' abilities to harness science and technology for development and also an increased and sustained investment in science, technology and innovation, ...commit ourselves to promote and support research and innovation activities and the requisite human and institutional capacities."*⁴

Subsequent to this announcement, a range of initiatives examining the landscape of African research have been launched. One such initiative is the African Innovation Outlook from the African Union (AU). Presented in June 2011, the initiative provides a detailed overview of African research, development and innovation activity. The report, which contains research and development figures for 13 of Africa's 54 countries, highlights the current poor state of scientific development in Africa. Only 72 of Kenya's nearly 7,000 research and development personnel have PhDs⁵ and few countries featured in the report spent more than 1% of their GDP on research and development in 2007.

Another, highly successful initiative is Research4Life, which collectively covers three milestone programmes (HINARI, AGORA and OARE)⁶ and has been providing developing countries with free or very low-cost access to scholarly materials from across healthcare, agriculture and environmental studies. Libraries based in developing countries benefit from the programme through access to over 8,000 peer-reviewed journals, books and databases, which are available in multiple languages, as well as additional literacy and promotional support.

The European Union (EU) has committed substantial funding to AfricaConnect⁷, a project that will enable a high-speed computer link

connecting national research and education networks in Africa to Europe's multi-gigabit research and education network, GÉANT. The Malaria Atlas⁸ Project (MAP), founded in 2005 has collected and analyzed nearly 25,000 parasite rate surveys from 85 different countries as well as malaria vector occurrence, allele frequency and newborns estimates for inherited blood disorders. These comprehensive data sets are being made open access and thus freely available via the internet.

Computer Aid International, BioMed Central's partner charity which aims to reduce poverty through information and communications technology, has created the ZubaBox⁹ which allows internet connectivity in the vast areas of Africa that do not have a constant electricity source. It has enabled Computer Aid International to reach the most rural, isolated and poor communities to provide low-power computing solutions. This technology is vital to the development of scientific research in these regions, as free access to open access research is now available in otherwise unconnected areas. So far, Computer Aid International has sent two 'Boxes' to Zambia and one to Kenya. In Zambia, one ZubaBox is 50 miles from the nearest surfaced road. The ZubaBox is used by medical professionals who want to communicate with specialists in the city, buy medicine online ready for collection and document patient's medical history.

Open access and Africa

Science in Africa clearly still has great scope for growth. However, along with reducing the barriers to publication, additional measures need to be taken to increase the global visibility for science published by African institutes. Currently, several encouraging steps are being taken and efforts are being made beyond Africa to help the region and its scientific output. Leading science publisher BioMed Central, who pioneered the open access publishing model, has recently announced 'Open Access Africa', a series of initiatives designed to increase the visibility and output of scientific research from across Africa and the wider developing world.

The rapid growth and worldwide adoption of the internet has radically expanded access to knowledge. Recent improvements in undersea cabling providing dramatically improved internet capabilities for Africa, and the growth of the OA publishing model presents African researchers and

educational institutions in low-income countries with new methods of communicating with their peers worldwide, and increasing exposure of and access to scholarly literature.

Over the past decade, open access has grown from a niche concept into a globally accepted and widely adopted mode of publishing. Open access publishing provides free, immediate and permanent online access to the full text of an article, presenting researchers with easily accessible, high-quality scientific resources essential to the rapid and efficient global communication of research findings.

In an African context, the open access model arms researchers working on public health issues such as malaria, cholera or HIV/AIDS, for example, with the latest findings from both developed countries and from local/regional researchers on the ground. Thus, rapid access to this information can actively help with treatments and diagnoses in remote locales which lack sufficient funding to obtain licences to subscription journals. Publishing in OA journals also facilitates crucial knowledge exchange by field researchers, ensuring that subsequent medical interventions are based on the most up-to-date research available and are contextually correct on a local/regional basis. Open publication can greatly increase the visibility and accessibility of research worldwide, therefore this model of publishing can help African institutes ensure their research is both available and highlighted well beyond the confines of their institute and even their region.

However, whilst open access publishing has great potential to benefit African nations economically and increase their visibility on a global stage, currently there is a lack of awareness and some confusion as to the best routes to OA within government, institutes and at researcher level. OA publishing, whilst growing across Africa, still only represents a small percentage of the overall national output. A lack of awareness of what 'open access' is, and its benefits is also compounded by a commonplace deficiency in funding for research. To this end, whilst open access is increasing in popularity, there is still great scope for wider adoption and for researchers based in sub-Saharan locations to gain the benefits which OA can provide.

Open Access Africa initiatives

Open access publishing was founded on the tenet that the facilitation of scientific and medical

information flow plays an important role in future international social and scientific development. Scholarly materials within open access journals cover the latest research across child health, childcare, disease identification and eradication and global environmental initiatives, to name but a few topics. By removing journal subscription fees, open access challenges geographic, economical and social inequalities regarding access to and use of high-quality scientific resources. OA publishing also ensures the rapid and efficient communication of research findings. High visibility and citation rates of open access articles mean that this publishing method also aids those looking to communicate their own research results to the global scientific community.

New initiatives being launched by the publisher in 2011 look to increase the visibility and output of scientific research from across Africa and the wider developing world as well as raise awareness of OA publishing as a catalyst for economic improvement in developing countries. Along with the continuation and expansion of the Open Access Waiver Fund, described above, BioMed Central has launched a new type of institutional Membership designed specifically for institutes located in developing countries such as sub-Saharan Africa. 'Foundation' Membership¹⁰ is a free service that enables institutions in developing countries to demonstrate their commitment and support for OA publishing and offers a range of benefits such as: web pages designed to showcase institutions' latest research on an international stage; toolkits and advocacy materials to assist in spreading the word about the benefits of open access and the waiver fund throughout institutes; and complimentary subscriptions to additional scholarly materials which would normally be a stretch for many developing countries library budgets.

Kwame Nkrumah University Of Science And Technology (KNUST) in Kumasi, Ghana, has already joined as the first 'Foundation Member' within the new scheme. KNUST is the only university in Ghana with an open access repository to deposit scholarly resources, and currently sits in 13th position among African universities on the Webometrics World University Ranking¹¹.

Speaking of joining the new Foundation Membership scheme, Prof William O Ellis, Vice Chancellor of KNUST, commented:

"As the premier science and technology university in Ghana, we believe that research is more valuable

when it is shared. The effective communication of research results is an integral part of the research process."

At time of writing, KNUST are also set to host the 2nd annual BioMed Central Open Access Africa conference¹² in October 2011. The first Open Access Africa conference was held 10-11 November 2010 at Kenyatta University, Nairobi, Kenya, where over 200 key opinion leaders and researchers from across the region attended to discuss the issues surrounding access to scientific and medical research, and the role that open access journals can play. Now in its second year, the event has both moved to Ghana and also doubled in size to nearly 300 attendees. Open Access Africa 2011 will discuss the benefits of open access publishing in an African context. Hosted and organized by BioMed Central, in association with Computer Aid International, the event will be led from the perspective of researchers seeking access to information, and authors seeking to communicate the results of their work globally, in an effort to increase visibility and output of African research.

As well as economic and geographic barriers to publishing, researchers in developing countries also often have to overcome a substantial language barrier. To that end, BioMed Central has partnered with international translation and publication specialists, Edanz. Running a series of workshops in Africa together, BioMed Central and Edanz plan to both educate researchers on how to author scholarly articles for inclusion in journals, and to raise awareness of translation services which are available to help researchers communicate their scholarly output on an international level.

Summary

The Open Access Africa programme is viewed as part of the long-term strategy of BioMed Central to promote free and unrestricted access to scientific research, and to aid publications and international visibility of research from within developing countries. Through the development of its Waiver Fund, new Foundation Membership and Open Access Africa event, along with the initiatives of other leading organizations, BioMed Central has set

in motion a wide-ranging campaign designed to help Africa and other developing countries significantly improve the value of their research activities.

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