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Access to electronic healthcare information resources in developing countries: experiences from the Medical Library, College of Medicine, University of Nigeria

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Abstract

This paper presents results from a preliminary investigation into the situation regarding access to electronic healthcare information in developing countries, focusing on the circumstances in the Medical Library, College of Medicine, University of Nigeria. A review of current literature examines broader issues around access to electronic information in developing countries, and specific issues regarding electronic healthcare information. Studies that particularly focus on the situation in Nigeria are identified. Information gathered from a series of interviews with the librarian at the Medical Library identify a number of issues,

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including the lack of an adequate ICT infrastructure and affordable online access, and a need for library staff and library users to gain ICT skills and information seeking skills.

Introduction

The expansion in the availability of electronic healthcare information in recent years has given access to a wealth of resources. However, there remains a discrepancy between those who do and do not have access to the appropriate technologies or necessary monies to retrieve these resources. There are also issues arising concerning the appropriateness of much of the available information to the needs of healthcare professionals in developing countries.

The study presented here looks at the availability and uptake of electronic healthcare information resources in the Medical Library, College of Medicine, University of Nigeria, and examines some of the barriers to providing these resources. The principal author was a researcher on a previous study into the provision of electronic information resources in Nigerian libraries based at Liverpool John Moores University (Ashcroft and Watts, 2005), and has a particular interest in electronic healthcare information resources in developing countries. A preliminary review of the literature into this area revealed only a small amount of existing research. Communication with a contact from the previous study of Nigerian libraries established contact for the principal author with the librarian in the Medical Library, College of Medicine, University of Nigeria, who has co-authored this paper.

This paper presents results from a preliminary investigation of the situation regarding access to electronic healthcare information in developing countries, and focuses on the circumstances in the Medical Library, College of Medicine, University of Nigeria. An extensive literature review was carried out into both the broader issues around access to electronic information in developing countries, as well as specific issues regarding electronic healthcare information. Studies that particularly focused on the situation in Nigeria were identified. Information was then gathered from a series of interviews with the librarian at the Medical Library and the results of those interviews, and the issues raised therein, are presented here.

The "Digital Divide" and the "Know-do Gap"

The term "Digital Divide" has become well established in describing the division between those people who do or do not have access to information and communication technologies (ICTs). (bridges.org, 2002) Norris (2001) provides an interesting analysis of this division, describing a multi-dimensional digital divide that exists globally, socially and democratically. The global digital divide is the difference in access to ICTs between countries; the social digital divide is the difference in access to ICTs between the citizens of a country; the democratic digital divide is the difference between those who are or are not able to use ICTs to participate in public life.

The multi-dimensional digital divide that Norris describes has a clear impact on the provision of electronic healthcare information in the developing world, both between countries and within them. Electronic healthcare information resources emerging from the developed world may not necessarily be relevant or appropriate to the needs of those living in developing countries. It may be that knowledge no longer functions accurately when disconnected from its environment (Jimba, 2000), that information is perceived as having little local relevance (Carter, 2005), or there is a lack of evidence-based research that is applicable for healthcare practitioners in developing countries. (Chinnock et al, 2005) Although there is continuing

evidence for increased access to ICTs and online facilities in the developing world, physical access to suitable ICTs and reliable connections to the Internet remains challenging and costly for many. In Nigeria – where this study has taken place – 0.5% of the population are Internet users: the same statistic in the United States is 54%. (Central Intelligence Agency, 2004) Results from a previous study of Nigerian libraries suggested that the high cost of hardware, software and – particularly - ISPs were a significant barrier to provision of electronic information resources. (Ashcroft and Watts, 2005)

Of late, a new expression has emerged that refers to some of the issues previously covered by the term digital divide. The "know-do gap" describes the discrepancy between having access to knowledge, and translating that knowledge into practice. In the World Health Organization report *World Report on Knowledge for Better Health: Strengthening Health Systems*, LEE Jong-Wook, the Director General of the World Health Organization states that 'There is a gap between today's scientific advances and their application: between what we know and what is actually being done.' (World Health Organization, 2004, p.XI) Godlee et al (2004) refer to the "know-do gap" being as great in developed countries as it is in developing countries.

This is an interesting shift in rhetoric, suggesting a possible consensus that knowledge is both more freely available and increasingly accessible to all; the difficulty now is how to transform that knowledge into effective practice.

Policy and strategy

Issues arising from the digital divide or know-do gap have been acknowledged by the international community and, as a result, there are a number of initiatives that are attempting to understand and address these issues.

The *World Summit on the Information Society* is taking place in two phases, with the first held in Geneva in December 2001, and the second phase to be held in Tunis in November 2005. An introduction to the purpose of the summit states that

> Paradoxically, while the digital revolution has extended the frontiers of the global village, the vast majority of the world remains unhooked from this unfolding phenomenon. (World Summit on the Information Society, 2004)

The summit has produced both a *Plan of Action* and a *Declaration of Principles*. (World Summit on the Information Society, 2003) In terms of e-Health, the *Plan of Action* discusses facilitating access to medical knowledge and locally-relevant content, promoting international standards for data exchange and encouraging the expansion of ICTs to remote and underserved areas, and vulnerable populations. The second phase of the summit will measure and evaluate the success of the *Plan of Action*.

The G8 Summit taking place at Gleneagles in Scotland in July 2005 is building on a history of addressing ICT issues from previous annual summits. In Okinawa in 2000 a *Digital Opportunities Task Force* was developed to tackle issues around the digital divide. (G8 Kyushu-Okinawa Summit, 2000) This was developed in Evian in 2003, where G8 leaders approved the action plan, *Science and Technology for Sustainable Development*. (G8 Evian Summit, 2003) For the Gleneagles Summit, there has been a Joint Science Academies Statement on *Science and Technology for African Development* (Joint Science Academies, 2005), which sets out a series of recommendations. The document suggests that there must be

a recognition of the role of science, technology and innovation in the success of development in Africa, including solutions appropriate to local needs. African countries require the methods and infrastructure to exploit their knowledge, and African universities need to be supported and developed as centres of excellence in this field.

The World Health Organization report *World Report on Knowledge for Better Health: Strengthening Health Systems* (World Health Organization, 2004) calls for health research systems to promote mutual learning, problem solving and innovation. The report advocates robust national health research systems providing equitable access to research information. These should be open to all countries and include all stakeholders, including health service providers, policy makers and civil society.

An ongoing *Global Review on Access to Health Information in Developing Countries* was launched in 2004 and includes a large range of relevant participating organisations such as the British Medical Journal, the Global Forum for Health Research and the World Health Organization. The initiative is a review of lessons learned, progress and ways forward in providing access to information for health professionals in developing countries. (International Network for the Availability of Scientific Publications, 2004)

The launch of this review was accompanied by a discussion paper published in The Lancet entitled *Can we achieve health information for all by 2015?* (Godlee et al, 2004a) This paper presents an excellent overview of the progress to date, such as access to health information becoming a key international development issue. It is important that information flows take into account user needs, rather than simply "pushing" information upon them. Key to the sustainability of many development projects is working to build local capacity; this belief is shared by many other organisations, such as bridges.org (http://www.bridges.org/) and SATELLIFE (http://www.healthnet.org/whoweare.php).

Godlee et al conclude by suggesting four broad areas for future activity: improved access to essential information for health professionals; improved connectivity; identification and understanding of barriers to using information in different locations (partially the know-do gap); and improving quality of healthcare information in terms of reliability, relevance and usability.

Existing research

There is some existing research into the provision of electronic information in developing countries; there is a lack of research specifically into electronic healthcare resources. Commentators continue to call for an increase into research in this area. (Godlee et al, 2004b; World Health Organisation, 2004; World Summit on the Information Society, 2003) The literature presented here is drawn both from general studies in this area, and also from literature that specifically discusses the situation in Nigeria: the focus of this study.

Chisenga (2004) carried out a survey of the use of ICTs in ten African Public Library Services. The survey found that, although most libraries had Internet connectivity, almost none were offering Web-based information services to their users. Lack of funding remains problematic in developing ICT services, with many libraries relying on donor assistance, or choosing to establish cyber cafes as a means of providing Internet access and generate revenue. Few libraries had ICT strategies for development. Chisenga identifies four principle barriers to the effective provision of ICTs in the surveyed libraries: a lack of adequate or

reliable funding; a lack of strategic planning; a lack of use of Internet to provide information services to users; and a lack of consistent training for library users in new ICT services.

There is evidence that access to ICTs themselves remains a problem. Ondari-Okemwa (2004) carried out a survey of 46 sub-Saharan countries to discover the impediments to providing access to "global knowledge" in sub-Saharan Africa. Respondents suggested that unreliable electricity supply and high cost of ICTs were significant barriers to accessing online information. Similarly, in a study of access to electronic information resources in Nigerian libraries, Ashcroft and Watts (2005) found that unreliable electricity supplies and prohibitively high costs of Internet Service Providers (ISPs), hardware and software were barriers to ICT provision. In a discussion about ICTs in African universities, Karbo (2002) also identifies the problem of the cost of providing ICTs as well as a suitable infrastructure to house them. A study of use of electronic information resources at the University of Agriculture Library in Abeokuta, Nigeria, also found that constraints to accessing resources were principally infrastructural; specifically, a lack of computer terminals and power supply outages. (Oduwole, 2003)

Lack of adequate ICT skills and training causes difficulties, both amongst staff providing access to ICTs and their users. (Ashcroft and Watts, 2005; Idiodi, 2005; Karbo, 2002) This may be compounded in some countries by low basic literacy levels amongst the population. (Ondari-Okemwa, 2004)

Funding itself may be poor. Okiy (2005) describes the situation in Nigerian libraries, which receive poor allocations from Government, and therefore look elsewhere for income. Costs may be passed on to users themselves. For example, the University of Jos introduced library fees for its students. Akporhonor (2005) reports a similar situation at Ambrose Alli University and Delta State University.

There is some evidence that many ICT users in developing countries gain access to Internet facilities through cybercafés, again passing costs on to users. Jagboro (2003) conducted a study of Internet usage in Nigerian universities and found that 45.2% of respondents accessed the Internet in cybercafés. Jagboro suggests that this high score may be due to the proximity of cybercafés to user facilities, such as hostels and lecture halls. However, access to cybercafés may also be problematic. Adomi (2005) reports on a price increase in cybercafé services in Abraka, Nigeria. This was brought about after cybercafé owners invested in generators in order to provide a reliable electricity supply, as well as meeting high costs of ISPs. The price increase was reversed as it led to a decrease in customer patronage.

Some research exists about the use of electronic healthcare resources in Nigeria. Ajuwon (2003) carried out a study of uptake of ICTs by health science students at the University College Hospital, Ibadan. This study found that 57.4% of students sampled could not use a computer, that there was a need for ICT literacy to be added to the curriculum and that there was a need for adequate computer laboratories to be established. Ogunyade (2003) examined the use of Medline - the database of life sciences and biomedical bibliographic information – by medical students at the University of Lagos. The study found that use of the database was poor, due to lack of awareness, lack of access to computers, insufficient training and the high cost of provision.

Medical Library, College of Medicine, University of Nigeria

This study was carried out in the Medical Library, College of Medicine, University of Nigeria. The library, which was established in 1967, is located within the University Teaching Hospital on the Enugu Campus of the University of Nigeria. The library is currently one of the four largest medical libraries in Nigeria, with a stock of more than 30,000 books, monographs and journals. The library has private study rooms and a reading area that seats 350 users. Users include College of Medicine staff, hospital staff, medical students and other health professionals. (Iroka, 2004)

Access to electronic information resources

The library is not currently automated, and has one computer that is used for secretarial purposes. This computer does not provide access to online facilities. However, within the same building as the library, there is a cybercafé that provides library users with broadband access to the Internet and email. The library signposts users to the cybercafé if they wish to use online facilities. The library also distributes circulars to its community of users in the various departments of the College of Medicine giving details of the facilities available in the cybercafé.

The library provides users with access to a range of CD-ROMS. The College of Medicine purchased Medline (1990-2000) CD-ROM for library users. This database provides users with many thousands of references in the field of life sciences and biomedical bibliographic information, although the version purchased will not now provide references to the most recent developments in this field. Free access to the complete version of Medline is available online in the cybercafé, and some users are able to make use of this for conducting literature searches.

The library provides users with the e-TALC CD-ROM, which is distributed free-of-charge by the UK-based charity Teaching-aids at Low Cost (TALC). e-TALC provides users with access to large amounts of high-quality, copyright free, health education and training material. CD-ROM disks are provided free to developing countries, and TALC have distributed over 50,000 disks as of November 2004. Organisations that contribute to e-TALC include the World Health Organization, the British Medical Journal, the Cochrane Library, and the Wellcome Trust. The CD-ROM is designed for ease of use and accessibility, through a thorough in-house testing programme. Materials are presented in HTML and PDF format, and the software to use the resources is supplied on the CD-ROM, including a search engine. Some examples of the variety of types of materials provided on the latest edition of the CD-ROM include:
- Latest full-text issues of the *British Medical Journal*
- *A Parrot on Your Shoulder* – a guide for those working with children with HIV/AIDS
- Evidence-based abstracts from the *Cochrane Library*
- Full text of the open-access medical journal *PloS Medicine*
- A radio script of *Health considerations for refugees*
- *International Network for the Availability of Scientific Publications* (INASP) latest newsletter
- A slide set and script from *HIV/AIDS – Clinical Manifestations in Adults (Africa)* (Teaching-aids at Low Cost, 2005)

The library also provides CD-ROMs from the World Health Organization and from the UNAIDS Library (UNAIDS is the Joint United Nations Programme on HIV/AIDS).

In the cybercafé, as well as accessing Medline, users also access Medscape. This is a free online resource for healthcare professionals, which offers a variety of information, including continuing medical education, journal articles, medical news, conference coverage and drug information. Medscape is designed to make the process of gathering information for health professionals simpler, less time-consuming and more productive. (Medscape, 2005)

The College of Medicine and medical library are also supported by the Health InterNetwork Access to Research Initiative (HINARI), with users gaining access to this resource online through the cybercafé. HINARI provides free or very low cost online access to over 2,000 full-text journals in bio-medical and associated social sciences. The initiative began in July 2001, with six major publishers – Blackwell, Elsevier Science, Harcourt Worldwide STM Group, Wolters Kluwer International Health and Science, Springer Verlag and John Wiley - signing up to a statement of intent. (Health InterNetwork Access to Research Initiative, 2001) Twenty-two further publishers joined the initiative in May 2002, and the list of publishers and access to their journals, continues to grow. Eligibility is based on GNP per capita according to World Bank figures, and non-profit organisations in Nigeria are entitled to free-access to HINARI resources. (Health InterNetwork Access to Research Initiative, 2005)

Strategies and Policy

Although no written strategies or policies have been produced as yet, the organisation is sensitive to the issue of providing ICTs and Internet access. Departments across the University have been tasked with developing their own strategies, and the intention is that these will inform a University-wide policy on ICT provision.

The College of Medicine is planning to equip every department with access to at least one computer. The College has begun acquiring computers, and this has been carried out mostly through donations. When this is completed, the intention is to link all departments to the cybercafé for access to the Internet.

Constraints

Use of the cybercafé is not unproblematic. The facility was a contract awarded by Nigeria's Educational Trust Fund in 2002. Although the project is completed, there are continuing problems providing consistent connections to the Internet. As a result, the University is unhappy with the project, and will not fund the cybercafé until these problems are resolved. As a result, the cost of using the cybercafé is prohibitively expensive (120 Naira per hour), with most users only being able to afford to spend up to thirty minutes online each week. In this short period of time, many users only make use of the Internet to send and receive emails.

There are skills and training needs amongst both library staff and library users. The University has arranged some training for staff in computer applications in libraries and library work. Most staff still require basic ICT training, including information finding skills and troubleshooting skills. Likewise, most users have ICT skills and training needs. Some training may be available by arrangement with the cybercafé, although this is arranged between individuals and cybercafé staff, and is incurs a cost to the individual.

Initiatives that may help improve access to electronic healthcare information resources are still in their infancy and are yet to impact on the medical library presented in this study. The National Virtual Library of Nigeria is being administered by the Federal Ministry of Education. This is currently focused on equipping libraries with computers and Internet access, rather than establishing a digital library resource. (National Virtual Library of Nigeria, 2005) The Nigerian Universities Network (NUNet) project is run by the Nigerian National Universities Commission, and is intended to encourage Universities to share knowledge and information. However, this project has not fully taken off, so information sharing is yet to take place between libraries, as libraries and universities are not fully networked. (National Universities Commission, 2005)

Discussion

There are two strands that emerge from the available literature into electronic healthcare information resources in developing countries: making relevant information available to health care professionals; and providing reliable and affordable physical access to that information.

The scope of this study clearly cannot be seen to be demonstrative of the situation that information providers face globally. Further research may indicate how indicative the situation at the medical library in the University of Nigeria Teaching Hospital is of other medical libraries and information resources in similar situations.

There is a lot of work being carried out internationally to make healthcare information freely available online. As this study has indicated, the library has access to a variety of information through initiatives such as HINARI, Medline and Medscape. An inspection of INASP Health Links – a gateway to selected websites of relevance to healthcare professionals and other associated people in developing countries – demonstrates the broad variety of healthcare information resources that are being made freely available online. (International Network for the Availability of Scientific Publications, 2005) Whether that information is relevant to the needs of library users is, again, a subject for further research: a user needs analysis would address this.

In order to take up the opportunities offered by electronic healthcare information resources, both library staff and users need sufficient ICT skills. The amount of healthcare information being made available, together with the issues arising around how appropriate available information is to user needs, means that library staff and users need the necessary skills to search for the information that meets their requirements. Providing library staff with these ICT and information seeking skills will give them the opportunity to provide their users with relevant information, as well as being able to pass on those skills to users.

Conclusion

In the case of the medical library examined here, the lack of an adequate ICT infrastructure appears to be the principal reason for hindering access to online health information resources, and is clearly a more pressing problem than a lack of available information.

In addition, both library staff and users need to be provided with ICT skills and information seeking skills in order to take full advantage of the electronic healthcare information resources that are currently accessible.

Further research

This study presents the situation in one medical library, and more exploratory work is needed to determine the situation both nationally and internationally.

As Godlee et al (2004a) suggest, there is a need for a greater and more detailed understanding of healthcare professionals' information needs. Research into this area also needs to understand and contextualise its subjects' access to information - in particular, electronic information - in order fully to understand both information needs and potential and existing barriers to those needs.

Research would also be useful into awareness of current electronic healthcare information resources. This need not be confined to healthcare professionals themselves, but also to those information professionals who are providing a service to them.

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