

A review on barriers to implementing health informatics in developing countries

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Abstract

Health information systems are spreading globally which promote health and human prosperity. Globalization of health informatics infrastructures is needed to have significant growth in improving quality and capacity of healthcare sector in developing countries. At present the health information infrastructure remains inadequate to meet the needs of rising population. Poverty and technological implementations are major barriers in the lesser-developed countries. Health care can be transformed and health status of population improved by eliminating barriers and implementing health informatics in developing countries.

Background

Health informatics has importance in the management of health care services delivery in both developed and less developed countries for assessing the health needs of populations and evaluation of effectiveness and coverage of health programs. Stronger health information infrastructure is needed in planning and implementation of health care interventions and to improve health systems and attain better health (2,10).

Health-care personnel in developing countries have poor access to information, because the books are out of date and journals and Internet access are lacking, and the information that is available is not appropriate for the local situation (15). Only in large hospitals and institutes is the problem of access to information solved by Internet. Access to Internet is an important aspect for implementation of health informatics (15).

Methodical exploration of advances in information and communication technologies in developing countries is necessary to broaden information and to improve health. Availability of access to revolutionary technology, specifically the World Wide Web and issues of accuracy and the relevance of content enable relevant information to be made available to multiple users instantly. It highlights freedom of expression and access to information. Right of universal access to information and communication services is new a component of the UN's principles and human rights and development (16).

Installation and restructuring of computerized information systems aimed at improving the quality and relevance of data and ensuring their better use in planning and managing applications of geographic information systems is essential in developing countries.

Knowledge, evidence and the timely, appropriate quality information is required to make decisions about resource allocation, policy-making, better planning and particularly to reduce disparity in health between countries and populations (3).

Establishing e-Health and health information systems in developing countries faces different health and socio-economic challenges. There are major obstacles to the introduction of effective health information systems in developing countries.

Barriers

Major problem is of financial constraints (4,7,13). Income disparities, exorbitant costs of usage fees and telephone time, even a rudimentary health information system costs excessively (9,12). Inadequate resources will affect the delivery of treatment and follow-up (4).

An even bigger constraint on implementing effective healthcare practices is politics (7,10). There will always be people with vested interests keen to influence the distribution of funds (7).

Conflicts of interest with medical profession also value the freedom to practice medicine (7). Some strategies designed to implement research findings will be perceived as a threat to this freedom. Levels of compliance with changes in traditional setup are also much lower (19).

Culture and socio-ecological factors play important roles (6). Some cultures restrict access to the World Wide Web and in particular to certain medical illustrations of the human body, in some, information flow is more restricted for political purposes (6,16). Inequalities in health among

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Referencing this article

Oak, M. R. (2007). A review on barriers to implementing health informatics in developing countries [Electronic Version]. *Journal of Health Informatics in Developing Countries*, 1(1), 19-22 from <http://www.jhdc.org/index.php/jhdc/article/view/3>.

socioeconomic groups and by gender, race or ethnicity, geographical area and other measures associated with social advantage are obstacles (14,16).

Population inflation and social crises in large proportion in the developing and underdeveloped world are creating fundamental barriers such as poverty and illiteracy (13,16). Enforcing the legislation is usually harder in developing countries as acceptance of transformation in any system is delayed in community development (19).

Complementary approaches of workforce capacity to human resource development work in the context of systems and long-term perspective are not taken into consideration most of the times (10,13,19). More challenging is the problem of convincing individuals to new technologies. Migration of content of health information from paper-based to a digital format is complicated for health workers (16).

Availability and visibility of health research from developing countries is insufficient (16). There are difficulties in publishing the research in retrievable media and it is seldom indexed (4). Large obstacles impede the implementation of evidence based practices (7).

Among the main reasons of constraints factors related to communication infrastructure, information sharing, and continuous training of health professionals are also important (11). Lack of infrastructures, untrained personnel, and other conditions, impose strong limits to the introduction of new technologies (11,13). State-owned telecommunications systems inhibit the rate of infrastructure distribution and reduce variation, innovation and technology adoption (12,13).

Wireless connectivity provision within and between health facilities that supports the transmission of health knowledge and management information particularly in rural areas in developing countries is lacking (6).

Quality of the processes used to select the information is not consistent (14). Modest attention to data management contributes frequently to face challenges in cleaning, analyzing and interpreting data (7,14,16). A proper working environment and training or guidance in constructing a reliable database is rarely available as data is managed by temporary and unskilled persons (16). Improper practice of data management may create an unreliable database which consequently gives spurious outcomes (1).

Solutions

Addressing the special needs of the undeveloped countries would be the first step. Available indicators based on national poverty lines can be used for monitoring country poverty trends. Health informatics can be progressed due to an open, rule-based, predictable, non-discriminatory trading and financial system in developing countries. Commitment to good governance, development and poverty reduction, comprehensive dealing with the debt

problems, program of debt relief and cancellation of official bilateral debt can enhance the progress (12). Resources should be invested primarily in safe, effective interventions and should not rely on older, cheaper, lower-tech approaches. Relatively inexpensive implementations of intelligent networks of human and machine systems can improve the quality of healthcare and functionality of informatics systems (13).

Population-based health interventions can facilitate informatics enhanced health services. Developing human infrastructure would be determining step in health informatics (13). Establishment of well coordinated information collection systems, using appropriate staff, can improve health care delivery (2). Strong communication infrastructure, information sharing, and continuous training of health professionals are pillars of health informatics (11). Thus familiarize people with technology through repeated exposure and guidance should be provided when needed. Opportunities for interaction with users should be exploited by health policymakers and researchers with help of Internet (8,13,16). Vital statistics systems and the basic information on health systems should be in the focus (3).

Local scientific societies or authors can post their research directly on their own websites due to Internet facilities (8,13,16). The editorial boards of professional journals could make a contribution by facilitating the publication of relevant research (15). With the help of healthcare policy and management research findings should be disseminated to a variety of audiences, including other health professionals, lay readers, and journalists using multilevel approach. Encourage practitioners and policymakers to assess and implement research evidence (7). Health systems research needs to be seen as an integral function of each national health system and needs to exert more leverage on policies and practice (17). After constructing essential research capacity issues related to leadership, career structure, critical mass, infrastructure, information access and interfaces between research producers and users should be addressed (10).

Empirical documentation and monitoring of health disproportions and use of this information for effective planning and monitoring can progress towards health equity through organized intervention of health information systems supporting a culture of equity-oriented decision-making and policy development (14). For implementation of healthcare interventions, only evidence based activities should be considered. Approach to guidelines development methodology should be identified and developed. Health ministries can fund projects to develop evidence based guidelines (7). Standards will play a major role in the diffusion and interoperability of systems. Ensure standards of behavior through generating guidelines and introducing essential policies based on effective and efficient evidence (7). Monitoring and evaluating the implementation of health policies is essential (9). Implementation strategies of standards for vocabulary, contents, images, objects and communication tasks can be imperative to have constructive effect during accomplishment of the different systems and in improving monitoring.

Relevant and effective surveillance systems should be created for data release and generation of useful, relevant and accessible information. Design and implementation of surveillance systems should consider technical issues and aspects of sustainability, utility for resource allocation, planning of health programs and interventions, political will, community involvement, decision-making processes and accountability in surveillance outcomes. Technical, management and political approaches involving new and different stakeholders, new methods and tools in the process, ways to overcome resource restrictions and improve surveillance effectiveness have to be achieved (5).

To reduce the time and resources required in IT utilization important examples from developed countries can be followed (18).

The benefits of information and communications technology can be made available in cooperation with the private sector (12). Space technology-enabled telecommunications, with new high powered satellites and extensive satellite-based applications, can provide medical information anywhere on demand (1,13). Technology of wireless devices such as Internet enabled mobile phones can increase the mobility. Quality of the processes used to select the information, quality and accuracy of information on health oriented websites should be judged and inconsistencies should be removed from the data (1). Search sites run by government agencies, medical journals, or evidence based groups; can be legitimately claimed that the information has passed through a quality filter. Easily accessible, appropriate, up-to-date and accurate information can be made available by increasing the visibility of health research from developing countries. Wider global access to the Internet will be facilitated by the development of less expensive technology. Modern databases of information sources should be created and speed to download information should be increased. Offer to host other organizations on their websites can absorb the costs of developing and maintaining the sites. Establish resource centers that provide additional access to health information and technologies increasing their use in specific areas like health and agriculture (8,13,16).

Robust and affordable connectivity, particularly to rural areas in developing countries should be provided which can fully exploit the potential of handheld computers and wireless connectivity. Novel execution of building capacity, both locally and globally, can be supported by good quality infrastructure (6).

Although telemedicine systems have some advantages, the lack of infrastructure, low income levels and other conditions impose strong limits on the introduction of new technologies. Relevant and sustainable proposals in telemedicine can be promoted for the rural regions of developing countries (11).

Management and administrative issues such as team building, budgeting, mapping, transport and communications also should be taken care of. Local ownership of the process and control of the resources, with annual plans and priorities can give a greater incentive. There is need for a longer time

frame and incremental change despite initial capital investments on infrastructure (17).

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