The Journal of Global Radiology
Ensuring Medical Imaging Access for All

EDITORIAL

The Logistics of Bringing Imaging to the World

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THERE are many unanswered questions about access to diagnostic radiology in the developing world. World Health Organization (WHO) is one good source of information about the health needs and income status of member countries, but there is a dearth of solid data on imaging needs relative to demography and disease profiles at the community level. In an effort to benefit the maximum number of people, health dollars in the developing world tend to be steered away from public hospitals to primary and preventive care. As a result, patients requiring secondary and tertiary care in the hospitals receive far less than optimal care. Subpar diagnostic services are a major contributing factor. This observation is supported by reports on the status of radiology in Liberia and Cambodia in the current issue of this journal. Both papers highlight the unsatisfactory state of medical imaging in teaching hospitals and major trauma centers, which lack basic imaging resources from the standpoint of developed nations. In the absence of model radiology facilities in many countries, there is little understanding of the benefits that investment in diagnostic imaging may bring at the public or private level. Organizations such as the WHO, the Consortium of Universities for Global Health, non-governmental organizations, and charitable entities should assist government agencies and local entrepreneurs in investing in such model imaging centers. With concomitant educational programs, the goal for these centers would be to enable local talent to take over the operations of these facilities. An age-old proverb that fits well here is, "Give a man a fish, and you feed him for a day. Teach a man to fish, and you feed him for a lifetime." Helping to establish these centers as profitable businesses can be a route to sustainable imaging services. Both consumer service and quality improve in a competitive business environment.

In the last three decades there has been accelerated urbanization of populations worldwide. In 1980, there were 143 cities with populations of 1-2 million people, 61 cities with 2-4 million people, 19 cities with 4-6 million, and 14 cities with 8-10 million (1). By 2010, these figures had increased to 257 (1-2 million), 130 (2-4 million) 49 (4-6 million) and 20 (8-10 million), respectively (1). Amid this backdrop of urbanization, economic globalization and improved job opportunities have led to steady growth of the middle class in sub-Saharan Africa, Asia and South America. While these demographic shifts pose a burden on public services, they also provide opportunities for entrepreneurs and multinationals to profit from establishing imaging services in these virgin markets. Equipment manufacturers have begun to create imaging machines that are customized for the developing world. One such low-cost digital X-ray unit is expected to go into production within two years. This X-ray machine would be able to operate on an intermittent fluctuating power supply and have few parts subject to breakdown. This machine would include a built-in mini-PACS, as well as a ten-year warranty. Researchers have indicated that the possibility exists for a single digital processor to support image reconstruction of both X-ray and ultrasound images. Provided the equipment lives up to its promise, this innovation would go a long way toward solving the problem of global access to medical imaging (2).

The current issue of the Journal of Global Radiology (JGR) covers a range of topics that fall within the sub-specialty of global radiology. Original articles, country reports, and a conference report have attempted to paint an informative picture of the practice, research, and educational opportunities for voluntary contributions and profitable business. These papers contribute, in one way or another, to the vision of the Journal of Global Radiology: Ensuring medical imaging access for all.

A country report is a category of content in JGR that depicts overall medical imaging services in the politico-economic context of developing countries. Specific data on the available services and resource shortfalls by region and by imaging modality create a realistic blueprint for planning and developing solutions. This information is available as a planning support tool to governments, non-governmental organizations, charitable bodies, entrepreneurs, and international bodies.

In this issue, country reports by Ali et al. and Harrington & Makris discuss the status of diagnostic imaging in Liberia and Cambodia respectively. In both countries, large sections of the population lack access to medical imaging services. While the overall picture of diagnostic imaging services is dismal, both authors are able to identify system shortcomings in an objective manner by

tabulating data such as the numbers of various types of imaging equipment, the volume of exams, the cost to patients, and the supply of skilled workers, such as radiologists, technologists and medical physicists. This information is available to anyone attempting to improve the current status of medical imaging in any country. Some salient points worth noting in these reports are the absence of systematic local efforts to remedy the situation, and the fact that radiologists perform few interventional procedures. Notes on climate, economy, culture and tourism are helpful to those wishing to volunteer, explore, provide services, conduct research or get involved in business ventures.

The supply chain of film, chemicals and the after-sale service of automatic processors is generally expensive and hard to maintain in the developing world. While digital radiography eliminates the need for processing, it adds the complexity of a Picture Archiving and Communication System (PACS) to the equation. In "PACS for the Developing World," Mendel and Schweitzer have created a foundation document for choosing and assembling PACS for resource-constrained environments.

Reports on regional scientific meetings inform us about the regional level research productivity in radiology. A report by Rana on the annual meeting of the Pan Arab Interventional Radiological Society provides an introduction to the leading interventional radiologists in the Middle East and South Asia. It seems clear that cutting-edge clinical work, research and training programs are emerging in the developing world. In their report, Ali et al. describe the global efforts by Imaging the World (ITW). ITW is a non-profit charitable academic radiology organization based at the University of Vermont. They have educated Village Health Team members and nurses in ultrasound scanning in rural Uganda, with encouraging results. Their simple and effective methods are well worth adoption by others.

An original research paper by Tsu et al. explores an important contemporary subject in both the developed and the developing world: ultrasound of the breast. This article confirms findings of other leaders on the subject that the breast ultrasound is a valuable tool in finding potential cancer in patients with positive clinical breast examination. Moreover, this paper is a good example for researchers to emulate in manuscript preparation. ❐

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