Increasing Access to Diagnostic Imaging in Developing Countries: The Asha Jyoti Mobile Clinic

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Introduction
Diagnostic imaging plays an important role not only in identifying pathology and tracking the progression of a disease, but also in preventing disease via early screening. However, many parts of the world lack adequate access to basic imaging technology, such as x ray and ultrasound. This paper reviews evidence from WHO estimates from the late 1970s and early 1980s. It is therefore essential to learn how to measure access in order to best address it.

World Access to Imaging Technology 1978 Survey

<table>
<thead>
<tr>
<th>Region</th>
<th>Access to Imaging Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 billion</td>
<td>Adequate</td>
</tr>
<tr>
<td>1.2 billion</td>
<td>Poor</td>
</tr>
<tr>
<td>1.1 billion</td>
<td>None</td>
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The WHO defines it as an interaction of different factors, which include affordability, availability, accessibility, appropriateness, acceptability, and quality.

The Definition of ‘Access’
Acceptability
Affordability
Quality
Availability

Essential Imaging for the Developing World

Interestingly, 85-90% of the imaging need in developing countries can be met by x ray and ultrasound alone. These modalities not only diagnose disease, but also help to treat and manage health problems via imaging-guided therapies and surgery. However, many developing regions have a profound lack of access to adequate imaging services.

Ultrasound has an established role in obstetric imaging. Additional conditions for which ultrasound is commonly used include internal bleeding, heart and kidney conditions, and imaging guidelines for procedures. Regrettably, barring ultrasound, only x ray can be used to diagnose conditions on imaging or screen for certain diseases like breast cancer. Also, it can identify breast lumps and provide image guidance for needle biopsy.

Background
RAD-AID International has looked at the issue of access through its Radiology Readiness survey, a 16-patent survey that attempts to reflect the medical imaging needs in different parts of the world. In 2010, the survey focused on developing countries and these findings are compared with previous surveys in order to understand the changes. The comprehensive survey helps identify areas of disparity in terms of need, the survey revealed women’s health as the most underserved and highest priority area of need.

Currently, about 70% of women in India reside in rural areas, where patients lack basic health care and need medical treatment. The death of women’s health screening programs is reflected in increased mortality and morbidity from breast and cervical cancer. Breast cancer is the second most common cause of cancer mortality worldwide. There is a need for national screening programs for breast cancer in India. Thus, when women do present to clinic and hospital, a majority of the women diagnosed have locally advanced breast cancer. Cervical cancer, which is second in prevalence to breast cancer, also lacks adequate screening prevalence. Screening is also available for osteoporosis, a condition affecting almost 1/3 of women in India. Through surveys and data on an understanding of the medical needs, the survey found that a majority of the women in India lack basic health care and need medical treatment.

Mission
The Asha-Jyoti Mobile Health Program is a sustainable and available mobile medical clinic that uses advanced technology and community health services to address women’s preventative health issues in the city, peri-urban and rural areas of Chandigarh, Punjab.

The mobile health clinic will focus on providing free preventative screening services for women:

1. Mammography (screening and treatment)
2. Bone densitometry screening (screening and treatment)

Van Staff

| Dr. Nandish Shah, Public Health Radiologist |
| Bianca Nguyen, Graduate Nurse from PGIMER |
| Anna Nordvig, Medical Technologist |
| Dr. Niranjan Khandelwal, Social Worker |

Addressing Challenges through Partnerships

Chandigarh is divided into sectors. Currently, the van goes to an existing primary healthcare center in sector 45 for 3 days/week. Sector 45 in Chandigarh is a unique sector with a combination of urban, rural (Burail village) and urban slum (sector 45) areas. It is thus most affected by the infrastructural, educational, financial, and clinical barriers surrounding access. To date, the program has screened 2394 women.

Understanding Adequate Access

Disparity in access also exists within developing nations, specifically between the private and public sector. While the private sector has the resources to offer needed imaging services, it is inaccessible due to cost and urban location. The public sector, however, aims to provide for all, but is overburdened due to lack of sufficient resources in trained staff and imaging devices. For public sector facilities in more rural areas, the challenge lies in having the resources to house, maintain, and repair needed imaging services as well as trained staff to step in the area to offer services.

At the core, a definition of necessity is to be compared with a definition of adequacy. The WHO uses data on access to basic imaging technology to understand the gaps in care that need to be addressed. The WHO has breaks down the issue of access into four domains:

1. Base
2. Capacity
3. Convenience
4. Cost

In 1979, the WHO conducted a survey to assess radiological services and received responses from 84 countries of varying income levels.

In 2011, the WHO disseminated the Baseline Country Survey in Medical Decision. A web page survey undertaken by the same authors in the 1970s. It took into account the WHO Reference Data and the information contained in the WHO-EM/79.8/C2 report.

Conclusion
The first step in attacking the issue of access is to understand the various factors that affect access, including affordability and technological limitations. It is then possible to identify inefficiencies in the access to medical imaging technology, among all available affordable technologies. In terms of the model described above, with the WHO needs-based assessment in place, the WHO has laid the foundation for overcoming the overall gap in adequate imaging technology. With the information, all parties involved, whether it is radiologists, radiologic technologists, economists, politicians, ministers of health, or developing nations, will be able to join forces to close this gap.