Telehealth and Telebiology Making Healthcare Accessible in Emerging Countries.

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Telehealth today has been largely non-internet based, and has been characterized by point-to-point and dial-up information exchange. E-health, on the other hand, is more accessible due to its increasingly affordable ability to communicate through a common set of standards and across operating system. As can be seen in the number of e-health websites, this increase in access has also led to an increase in the number of uses of the internet for healthcare and led to greater concerns of privacy, confidentiality, security and data integrity. Although e-health is an outgrowth of telehealth, it is differentiated in several important ways; language is also changing as a result of the Internet and e-health. To the dismay of many professionals, those practitioners working for "dot companies" are referred to as "providers" and patients or clients are called "customers". E-health language will most likely be ruled by economics, as has been witnessed by the impact of managed care. We must be clear that e-health refers to all forms of electronic healthcare delivered over the internet, ranging from informational, educational and commercial "products" to direct services offered by professionals, non-professionals, businesses or consumers themselves. It is impossible that this be ruled by economics, as has been witnessed by the impact of managed care. Also, e-health includes a wide variety of the clinical activities that have traditionally characterized telehealth, but are delivered through the Internet.

In order to develop telehealth networks that interface together and create an open environment that can share the national information infrastructure, one should strongly consider the purchase of technologies that meet the recommended guidelines. Not only should the technologies be compatible in terms of inter-operability, but newer versions of these technologies must also be compatible with earlier versions of similar technologies. Whenever possible, the purchasers of telehealth equipment must insure, to the best of their ability, that the vendors they select will provide some commitment to planning and developing new technologies. This type of commitment decreases the likelihood of rapid product obsolescence.

Technology purchased for telehealth should be capable of migrating into expanded capabilities without total replacement. For example, if there is high probability that a purchaser would eventually need to move from 128k to 384k of bandwidth for their telehealth network, then it would be useful to purchase a unit that would work at both 128k and 384k. The level of the vendor's accessibility in terms of sales, timely delivery, and equipment maintenance should be a purchase-evaluator factor. In addition, telehealth programs should consider that the end user can consistently use the equipment for its intended purpose without operational error, and that the technologies can be reliably serviced with minimum downtime. It is important to work with various telecommunications carriers in your proposed network to ensure that the type of equipment you desire will integrate with the communication service available. When buying equipment components separately (e.g. monitors, video-conferencing equipment, cameras, etc.) the video and audio inputs/outputs from CODEC must match the peripheral device to which it will connect and vice versa. It is strongly recommended that each telehealth room, in which the patient will be seen, has access to a secure fax machine and that each telehealth room used by the care provider (e.g. typically the specialist's site) be equipped with a Fax machine so that information (e.g. treatment scripts, test results, etc.) can be faxed to the patient's location.

It is also important to evaluate the process, and to identify the factors that are associated with successful or unsuccessful programs. Evaluation encompasses a range of activities including monitoring, review, and specific program or service evaluation. The relationship between individual telehealth programs and services and the achievement of national telehealth program objectives is central to a national evaluation framework. Some examples of ongoing annual cost are: -

- professional services (such as licensing, maintenance and warranty of the equipment estimated individually);

- estimated telecommunications cost for each service (e.g. ISDN/AW56 port change, dial-up services, line-leasing cost, long-distance phone charges, communications network, bridging costs);

- estimated changes in management cost (e.g. marketing costs, education and training, cost management tools, and costs associated with the help desk services);
- costs of program management and administration of telehealth programs (e.g. regional telehealth project managers, site coordinators) that must be incorporated
- costs associated with the production or monthly delivery of telelearning materials and equipment.

Traditionally, telehealth has followed the classic model of top-down healthcare delivery, from authority to patient. Patients with Internet access, increasingly have immediate access to worldwide medical databases, libraries, conference proceedings, and medical records. They can logon to Medline for original journal articles, access textbook collections, drug databases, diagnostic cookbooks, and disease-specific sites. As a result, patients are taking more responsibility for their healthcare decisions and relying less upon individual practitioners.

E-health empowers individuals by allowing them to make their own informed decisions regarding personal healthcare. Spheres of expertise traditionally held exclusively by professionals are now open to the public at large. Patients are presenting themselves for treatment, often armed with information that they found on the Internet, and are seeking answers to questions based upon that information. They are also helping themselves and each other, with or without the help of professionals. Therefore, internet-based technologies will soon "converge" with satellites and cable television for full interactive broadcast capabilities delivered through one, seamless technology.

Psychologists and their patients will be able to interact over the Internet in a secure environment sooner than legal and ethical adaptations can be made. Estimates for the wide-scale deployment of these services range from 24-48 months. With continued improvement in security and quality of healthcare websites, consumers and practitioners will be able to rely increasingly upon e-health to provide accurate clinical data and support. In the future, e-health will include more interactive services and the virtual office will be an integral part of the psychology practice.

The World Health Organization (WHO) is playing a growing role in helping developing nations use telehealth in rural and underserved areas. WHO is currently assessing projects in Thailand and South Africa, and is overseeing successful programs in several Latin American countries. The projects are owned and managed at the country level, with WHO largely playing an advisory and facilitation role. As an example, in Mexico the project "Educating Chiapas" is one of the most successful projects today. It is a telehealth satellite link between 10 hospitals in the mountainous, underdeveloped region of Chiapas in southeastern Mexico with the modern "20 November" Hospital in Mexico City. The network is used for radiology and pathology consultations with specialists at 20 November Hospital, and in preventing expensive trips for patients and their families to the capital. Hospital 20 November has reported a drop of 60 percent to 70 percent in unnecessary referrals to the hospital since the program began roughly one year ago. WHO refers to this as

a "quiet built-in training process" that is also helping justify the cost of the network. Physicians in Chiapas learn from each consultation and, over time, can handle diagnosis and treatment for specialized cases on their own. While WHO does not fund the projects, it provides free consultation services, and helps to coordinate funding and implementation with non-governmental organizations, local government and the commercial vendor community.

Another example is a Canadian company contracted to provide a telemedicine network for the Benemerita Universidad Autonoma de Puebla in Mexico. International Data Casting's SuperFlex satellite system allowed the university to provide remote diagnostic services and health-related training to under-served communities in Mexico and throughout the region to Central America and the Southwestern United States.

SatelLife, a Boston based nonprofit company is working also in Ethiopia, helping healthcare workers in Africa communicate electronically. SatelLife has developed a service called HealthNet, currently installed in a medical school library in Ethiopia. The Ethiopians are sending some 500 e-mail messages a day; the messages are routed to SatelLife, which provides the Internet gateway. SatelLife's technology can also embed text from web pages requested by users into a reply message. HealthNet is provided free to users, and is an important tool in Africa where Internet access is still too expensive for most people. SatelLife is working in approximately 20 sub-Saharan African nations.

One of the leading telecommunications providers in South Korea, Korean Information & Communications Company, Seoul, has signed a tentative agreement with Smartmeds.com, a subsidiary of Infu-Tech, Inc., Carlstadt, N.J. The partnership will allow Smartmeds.com to establish an e-health maker place and trading portal with access for South Korea customers to the latest American pharmaceutical products. In terms of users, South Korea was the seventh largest Internet market in the world in 2001, according to a study from the South Korea government's Information and communications ministry.

On the other hand, after serving more than 1,000 hospitals in China, Imation Corporation's wholly owned subsidiary, Imation Hong Kong Ltd., announced that it would market and support the Howtek MultiRad radiological film digitizer in China, Hong Kong and Taiwan.

The New Zealand health strategy (NZHS), which was launched in December 2000, provided the framework for making the public health service meet the needs of New Zealanders. This strategy provided the overall context within which the health sector should operate, including the Ministry of Health and the newly formed district health boards (DHBs). It contains principles to guide the sector, as well as goals and objectives for priority health issues.

But what is the future role of the e-technology in emerging countries?

- It is expected that this technology will improve the quality of the healthcare service,

- It will facilitate education of the patient and the healthcare worker,

- It will enable the creation of networks, including a worldwide use in the healthcare system

Useful websites:

- www.telemedicine.com
- www.admtelemedicine.com
- www.telehealth.com
- www.globaltelemedicine.com
- www.biohealthmatics.com
- www.cst-sct.org
- www.who.org
- www.ssa.gob.mx