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On:Innovation,Strategy,Global business

A Telemedicine Innovation for the Poor That Should Open Eyes

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The U.S. government will spend more than $25 billion on health-care-related IT as part of the health care reform bill passed by Congress in March of 2010. The goal is to help make the extraordinarily complicated, fragmented U.S. health care system more interconnected and efficient.

Where should they look for ideas? Poor countries, surprisingly enough. Driven by extreme need, emerging-market countries are inventing new ways to use information technology to improve health care delivery — and they're doing it quickly.

You may think immediately of electronic medical records when you hear "IT" and "health care." Those are certainly important. But IT can be more radically disruptive than digital record keeping — and it has more potential to cut costs and improve health care outcomes. The developing world is the best place to search for those disruptions.

Here's one example: In India, which has the dubious distinction of having the largest concentration of blind people in the world, the ratio of inhabitants to ophthalmologist is around 100,000:1. There's no way the number of qualified physicians will grow to match the need anytime soon. So someone needs to dream up a way to address the problem differently — and someone has.

Before we explore that solution, let's back up and look at what makes it possible. Several technology drivers are making telemedicine a huge disruptive force in un-served or under-served regions of India; together they have the potential to provide access to good medical care without geographical constraints. This is happening because of:

- The widespread availability of mobile networks, and the steady growth of broadband penetration, in the remotest parts of the world. Having a cell phone does not necessarily provide access to healthcare, but the viral spread of cell towers in rural landscapes is paving the way for wireless exchange of medical images and data. In India, for instance, cellular penetration is at a record level of nearly half a billion subscribers, and rising.
- Rapid growth in the availability of low-power, hand-held medical monitoring devices, some with built-in wireless capability. These devices will play a pivotal role in telemedicine. The recently introduced handheld ultrasound machine (yes, handheld!) VSCAN from GE uses the same chip architecture that powers most smart phones.
- The shift away from the proprietary local-area-network-based medical Picture Archiving and Communication Systems (PACS) (which are used in most large hospitals for sharing and archiving of medical data and images) to a networked, tele-enabled (TelePACS) systems that allow inter-hospital, collaborative workflows between specialists anytime, anywhere. Telemedicine requires medical images and data to be available on-line for access by authorized doctors.
- The fact that telemedicine enables greater throughput of medical transactions with existing resources, thereby yielding a cost advantage which can benefit both patient and doctors. Reduction in travel costs by both parties for consultation, diagnosis, and follow up (especially in rural India, where patient travel can be directly equated with daily livelihood) is the largest benefit.

Now, back to the blindness problem. Retinopathy of prematurity (ROP) is the leading cause of preventable infant blindness. In India, over 8% of nearly 30 million births each year are at risk of this potentially blinding condition. This requires a fast, efficient way to screen infants, especially in rural areas. The telemedicine challenge is the retinal screening of nearly 250,000 premature babies a month in some of the remotest parts of the country. Experts qualified to diagnose and treat ROP are located mainly in the cities.

A potential solution has emerged. It begins with the availability of a portable (albeit in a van) retinal camera with a unique image capture design ideally suited for newborns. This camera allows trained technicians, not medical experts, to capture images and upload them (sometimes while traveling between remote locations) via a data card using telePACS software developed by i2i TeleSolutions in Bangalore. The images and data are uploaded to a remote server, in this case located in a bomb shelter in Houston, Texas. This shelter provides a cost effective, scalable, secure way to store the data with no worries about back-up, interruptions in power and air conditioning, etc., which are major considerations in India.

Once uploaded, these images are accessed either on the iPhone, the iPAD, or the PC. Feedback and corrective measures can then be provided back to the technician via the secure server. The window of opportunity for treatment is only a few days (72 hours). This scale of screening in such large numbers can only be possible through telemedicine. This model has now been adopted as part of the National Rural Health Mission (NRHM) in the state of Karnataka in India and is being deployed across eighteen health centers across six rural districts.

Innovations in telemedicine will accelerate in poor countries where access and cost are critical issues. Such innovations can transform health delivery in rich countries. This is a classic reverse innovation story.

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Imtiaz AHMAD 11 hours ago

Dear Prof. Vijay,

Thanks for this fascinating post and bringing this glaring example into notice. We are living in a global village. Rapid advancements in the communication technology has given all of us an opportunity to think differently to the problems facing the humanity and also to serve. The model that has been set by the state of