INCLUSIVE INNOVATIONS

Using Telemedicine to Treat Patients in Underserved Areas

HIGHLIGHTS
- Telemedicine is the remote delivery of healthcare services via information and communication technologies for the purpose of diagnosing, treating, and preventing disease and injury.
- Without leaving their village, patients can receive diagnoses and treatment plans from specialists, obviating the need to spend days and hundreds of dollars traveling to a clinic of hospital.
- Telemedicine also provides opportunities for distance learning by local healthcare providers.

Development Challenge

In low-income countries access to good-quality diagnostic healthcare and treatment are limited because of high costs and a shortage of doctors and specialists in rural or remote areas. In parts of sub-Saharan Africa, for instance, there may be only a single doctor for up to 50,000 patients. Such a ratio demonstrates, on the one hand, lack of access to health services by the poor, and on the other hand, it implies the higher cost of accessing health services given that the urban and rural poor have to often travel further (and forgo additional income) to get medical treatment and advice.
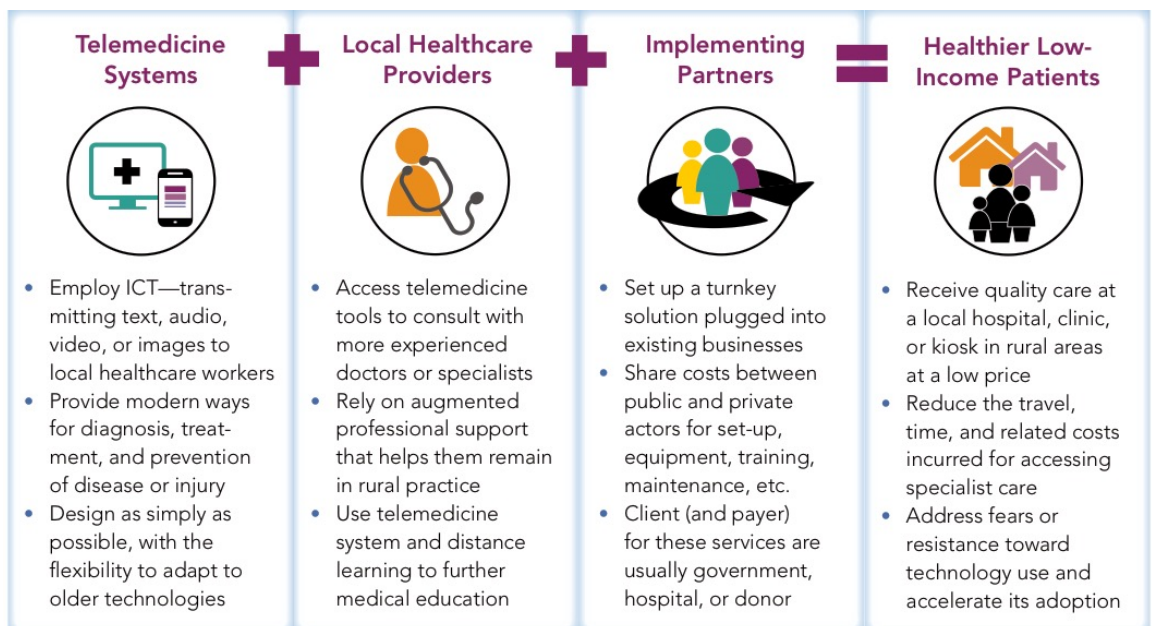
Business Model

Telemedicine is the remote delivery of healthcare services via information and communications technology (ICT) for the purpose of diagnosing, treating, and preventing disease and injury. It can extend healthcare to people who lack access because they live too far from a health facility, or the local facility lacks the necessary equipment and/or trained personnel. Telemedicine can also be used to train local healthcare workers and provide them with professional support.

It is rarely a stand-alone business model. Especially in low-income settings, telemedicine tends to be a turnkey solution that is plugged into the existing infrastructure, such as chain clinics or hospitals, leveraging existing providers and structures and extending services to new areas. The services include tele-consultations, video-conferencing, and remote patient monitoring. Patients usually access tele-medicine at a local hospital, clinic, pharmacy, or kiosk, where healthcare workers consult with doctors or specialists on diagnosis and treatment options.

Features of the Telemedicine Business Model

Telemedicine Systems	**+**	**Local Healthcare Providers**	**+**	**Implementing Partners**	**=**	**Healthier Low-Income Patients**
• Employ ICT—transmitting text, audio, video, or images to local healthcare workers • Provide modern ways for diagnosis, treatment, and prevention of disease or injury • Design as simply as possible, with the flexibility to adapt to older technologies		• Access telemedicine tools to consult with more experienced doctors or specialists • Rely on augmented professional support that helps them remain in rural practice • Use telemedicine system and distance learning to further medical education		• Set up a turnkey solution plugged into existing businesses • Share costs between public and private actors for set-up, equipment, training, maintenance, etc. • Client (and payer) for these services are usually government, hospital, or donor		• Receive quality care at a local hospital, clinic, or kiosk in rural areas at a low price • Reduce the travel, time, and related costs incurred for accessing specialist care • Address fears or resistance toward technology use and accelerate its adoption

Implementation: Delivering Value to the Poor

Awareness

Patients and local healthcare workers may be more familiar with traditional face-to-face consultations and unaware of potential benefits of ICT. Local healthcare workers may further be unable to use ICT, or the local hospital may not be able to afford them. Hence, telemedicine programs are designed to be as simple and flexible as possible. For example, Sanjeevani, a telemedicine solution implemented in India, uses integrated video-conferencing for real-time telemedicine consultations, but also relies on older technologies such as telephones or simple document scanners.

Acceptance

For telemedicine to succeed, both the beneficiaries and the service providers must accept it and understand its benefits. Local healthcare workers who are expected to use telemedicine for patient consultations may fear that the technology will lead to job loss or to a decrease in valuable bedside care for patients. These fears should be clearly addressed by the service provider at the outset. Concerted advocacy on the benefits and best uses of telemedicine help reduce resistance to the technology, accelerating its adoption among health professionals and patients alike.

Accessibility

Given the scarcity of licensed doctors and specialists in many developing countries, telemedicine gives low-income patients access to highly professional care while reducing costs such as travel expenses for medical specialists and for patient transfers. For example, since 2001, the Indian Space Research Organization has established a network connecting 22 "super-specialty" hospitals with 78 rural and remote hospitals across the country through its geo-stationary satellites. By 2005, more than 25,000 patients had been provided tele-consultation and treatment.

Affordability

Telemedicine creates value for a healthcare system by providing greater access to specialists at a minimal cost, introducing up-to-date methods of working with patients, and collecting data. It also allows healthcare workers to continue education at low cost through distance learning. The main client (and payer) is usually a government or a hospital. The end-user (patient) will rarely pay for the telemedicine services but will most likely be asked to cover the cost of a normal consultation. Telemedicine is a business-to-business rather than a business-to-consumer model.
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Telemedicine facilitates access to expert healthcare for patients and local healthcare workers in several ways:
- It provides healthcare workers at local hospitals, clinics, or pharmacies access to expert help from more experienced physicians or specialists.
- It offers reassurance to both local healthcare workers and patients.
- It reduces the travel time expense and stress associated with seeking specialist care.
- It encourages local healthcare workers to remain in rural areas, by augmenting professional support and allowing them to continue their professional development.

Telemedicine transmits information via text, audio, video, and still images to a range of specialists. Photographs of simple skin tumors can be transmitted to large hospitals for interpretation and consultation; X-rays can be sent off for a specialist opinion. Where a stable Internet connection exists, patients can video-conference with a healthcare professional or email information for analysis. Doctors can monitor blood pressure or glucose levels of a clinic's patients by looking at a computer screen.

Results and Effectiveness

Narayana's hospital and healthcare network in India connects 850 centers from around the world to its premier facility in Bangalore, including 53 in Sub-Saharan Africa. It has treated more than 54,000 patients through its electrocardiogram (ECG) networks, examining about 450–500 ECGs a day. MeraDoctor, a remote consultation service in India that uses WhatsApp and telephones, has provided more than 55,000 consultations on more than 400 ailments to its estimated 500,000 customers in rural India. By avoiding overmedication, MeraDoctor also saves patients money on medicine.

Telemedicine facilitates cross-site and inter-country collaboration, providing healthcare professionals with access to otherwise unavailable specialist advice. It is also an effective way to train local healthcare workers remotely. World Health Partners, an Indian NGO, has expanded its telemedicine network in the state of Uttar Pradesh to include about 1,200 "Sky Care Workers" and 120 entrepreneur-run centers (known as "Sky Health Centers"). Sky Care Workers are trained to diagnose patients, perform symptom-based treatments, use teleconsultations, and make referrals to the Sky Health Centers.