Telemedicine Project in Ghana

Access to healthcare and medicines is a challenge for the majority of people living in developing countries. In an effort to strengthen human resources in rural areas and to improve the quality of primary healthcare, the Novartis Foundation for Sustainable Development (NFSD), in cooperation with the Millennium Villages Project (MVP), the Ministry of Health and the Ministry of Communications in Ghana, National Health Insurance Agency Ghana, Ghana Health Service, and Ghana Medical Association, initiated a Telemedicine Project in Bonsaaso cluster in Ghana. The objective of the project is to improve access to primary healthcare by using information and communication technologies (ICTs) to overcome geographical barriers. The experience and success of this pilot will help expand the provision of a scalable and sustainable service at the national level.

The Telemedicine Project covers six Millennium Villages and thirty communities in the Bonsaaso cluster, home to 32,000 people. The communities are separated by stretches of unpaved roads, often requiring four-wheel-drive vehicles to enable access. There are only seven health centers, therefore in order to access healthcare, residents in many of the communities have to travel lengthy distances. By extending mobile and ICT networks, telemedicine has the potential to reduce the need for perilous distances to be traversed when patients and community health extension workers (CHEWs) need medical advice from a specialist, or in emergencies.

Operations are being monitored in order to extract and evaluate lessons learned. Best practices from the project aspire to inform future Ghana health strategies, particularly as the Ministry of Health looks to scale up telemedicine services across the country.
The potential of e-health for development

E-health, or electronic health, is defined as the use information and communication technology (ICT) in the health sector. It can involve technologies such as computers, mobile phones or satellite communication aimed at treating patients, pursuing research, educating students, tracking diseases or monitoring public health. E-health is one of the most rapidly growing areas in health today, offering enormous potential for developing countries.

Applications in the area of e-health include data management systems to store patient data, computerized learning tools for health training or diagnosis and treatment at distance. Telemedicine, which is defined as the use of ICTs for the exchange of medical information for prevention, diagnosis and treatment, has the potential to bridge the distance between the patient or local health worker and a specialized medical professional physically sitting anywhere else in the world.

Novartis Foundation and the Millennium Villages Project

Ghana demonstrated a national eagerness to engage ICTs to develop e-health strategies. Furthermore, the decision to help initiate the Telemedicine Project in the Bonsaaso cluster, and specifically derive benefit from an established cluster of six Millennium Villages in Ghana, stems from an established partnership between the Novartis Foundation and the Millennium Village Project (MVP). Since 2007, the Novartis Foundation has supported the Ilolangulu Millennium Village in Tanzania, helping the village achieve the Millennium Development Goals. The foundation invests in the transformation of Ilolangulu village from subsistence farming to self-sustaining commercial activity. In addition to financing one of the village clusters, the Novartis Foundation collaborates with MVP in health-related research and donates Coartem®, the artemisinin-based combination therapy produced by Novartis, to all Millennium Villages for the treatment of malaria.

Healthcare challenges in the Bonsaaso cluster

The Bonsaaso cluster is situated in the Amansie-West District of the Ashanti Region of Ghana, an area characterized by tropical climate conditions. The cluster is home to 32,000 inhabitants spread over six villages and thirty communities. The communities in the cluster are scattered over a diverse and challenging terrain, where thick rainforest means communities are often isolated from one another. Ghana’s second largest urban center, Kumasi, is located a few hours drive away from the cluster. In the dry season, total transport time from distant villages to the nearest district hospital can be up to five hours. This journey is considerably longer in the rainy season when roads have been washed away.

The limited health facilities and health workers in the Bonsaaso cluster have to address conditions, such as malaria, anemia, malnutrition, tuberculosis (TB) and HIV/AIDS, which affect many members of the community. The delivery of healthcare is often difficult and community members regularly travel up to 40km to access medical advice or attention. Similarly, the movement of sick people to health facilities is complex. For example, women are particularly at risk during pregnancy and delivery. There is increasing demand for point-of-care support for health workers, so to minimize the number of unnecessary referrals to the District Hospital in Agroyesum, which is often overwhelmed by cases that could be treated from a distance using ICTs. Furthermore, health-related emergencies need to be tended to in the villages when transport is not possible.

Teleconsultation: reducing time and distance when seeking healthcare

One approach proposed to overcome transportation challenges is teleconsultation practice (training sessions and consultations via mobile phones), which helps improve access to quality healthcare services at the primary level for patients in remote areas. Teleconsultation practice aims to reduce transportation time and
costs for patients and their families, to increase medical knowledge and safety in primary healthcare facilities, and to strengthen local capacities in e-health. The Telemedicine Project draws inspiration from protocols developed by Medgate in Switzerland, which have been adapted to local needs, allowing for structured teleconsultation in Ghana. This new telemedicine approach is being trialed in a development context and lessons from this pilot project will provide valuable learning about the potential telemedicine has to address healthcare service delivery challenges in rural areas.

During the initial phase of the project, healthcare personnel such as nurses, midwives and CHEWs, were inducted in the use of mobile technologies. This training enabled personnel to communicate via mobile phones within their peer group for coordination and informal telecounselling. In 2010, key stakeholders, including doctors and ministerial representatives, attended a workshop run by Medgate in Basel, Switzerland, which introduced telemedicine concepts and protocol systems in preparation for the early implementation of the Telemedicine Project.

With the help of Ericsson, Airtel and Ghana Ministry of Communications, additional telecommunication masts and antennae were installed across the Bonsaaso cluster, thus increasing mobile communication coverage. As a result, mobile network accessibility was expanded to 21 communities and all seven health facilities. These activities were complemented by the procurement of necessary equipment, including mobile phones, the creation of a toll-free emergency number, as well as the creation of closed user groups to allow for group phone calls, supported by Airtel, free of charge. The set-up of technical systems to ready the new teleconsultation center at the District Hospital in Agroyesum was funded through a grant from the Novartis Foundation for Sustainable Development. The district hospital is being used by the Millennium Village Project team to anchor all telemedicine activities for the cluster.

In addition to the successful set-up of the teleconsultation center, associated technology and strengthened capacity building, the future potential of the project has seen the building of relationships with important stakeholders and the drafting of key documents. For example, a research protocol to guide monitoring and evaluation activities throughout the project was established. Furthermore, telemedicine guidelines were drafted, and have since been approved by the Ministry of Health, Ghana. The Novartis Foundation helped support the development of an e-health strategy for Ghana, which will create the enabling environment needed for telemedicine activities to succeed and be adopted by regional and national public health institutions.

Medical advice via mobile phone

In November 2011, Medgate facilitated a four-day workshop for CHEWs, nurses, midwives and physicians in Kumasi, Ghana. The workshop included training in formalized teleconsultation via mobile phones, and computer-based decision support systems, thus directly connecting CHEWs and practitioners with physicians working at District Hospital in Agroyesum. This prompted the scale-up from unstructured, or informal, consultations to structured consultations, whereby protocols are followed to ensure a structured conversation flow between the physician and the counterpart. Structured consultation ensures that the most important questions are answered for a rapid and accurate triaging and diagnosis, which ultimately helps decide whether or not a patient requires referral to the hospital. Now, health workers, nurses and
other personnel are able to engage in structured consultation with doctors at the district hospital, as a result reducing unnecessary referrals and allowing for immediate support in the event of medical emergencies.

**Outlook**

Future focus will ensure the smooth implementation and running of structured teleconsultation, and guidance through interview protocols. Additional trainings with Medgate are planned, with a follow-up session scheduled for June 2012. Furthermore, 24-hour staffing of the teleconsultation center is envisioned to provide seamless, round-the-clock support. Capacity development in human resources, logistics and institutions will continue toward strengthening the implementation of the project. The impact of the project will be routinely measured, with the aim of expanding teleconsultation services to the regional level, providing support to health workers beyond the Millennium Village cluster.

The Telemedicine Project is one of many examples that demonstrate the value of e-health in improving healthcare systems in developing countries. ICTs have the potential to address several of the health challenges facing developing countries by providing cost-effective solutions. **E-health solutions help to better connect people around the world – be they health workers in remote areas that need to consult with their peers and doctors, or if patients need to connect with medical specialists for advice.** If all stakeholders continue to collaborate in a meaningful way, then the Telemedicine Project has genuine potential to improve access and quality of healthcare, particularly for use in rural areas and in other challenging contexts.

**Further information and videos of our projects**

www.novartisfoundation.org/projects