Health Services Benefit from Mobile Technology

The advancement of mobile technology is increasingly facilitating disease surveillance besides improving access to health especially in resource-poor settings, writes Zachary Ochieng.

Necessity is the mother of inventions. When it comes to disease surveillance, technology comes in handy. One such technology is Nokia HealthRadar, a mobile based near real time system to track the spread of diseases. The system allows health professionals to easily report disease related data - this data is then analysed on the Health Radar server and later visualised on a mobile device used by the health practitioners/authorities.

In the Kilifi District of Kenya, malaria is an endemic problem. Mobile phones are helping researchers fight the disease more efficiently. For more than 10 years, medical field workers from the Kenya Medical Research Institute (KEMRI) have conducted a survey of the 200,000 people who live in the coastal Kilifi District to monitor malaria rates and develop appropriate responses. Traditionally, the field workers received a print-out of the names and locations of the people to be surveyed on each day. They then travelled to meet the interviewees, conducted the survey and recorded each person's answers on a paper form, and returned to the hospital to transcribe the details onto the main database.

In an effort to improve the efficiency of this process, KEMRI worked with the University of Nairobi and Massachusetts Institute of Technology (MIT) to develop the Mobile Demographic Surveillance System (MDSS).

"This system is based on mobile-phone software developed by students at the University of Nairobi. Field workers can now conduct surveys using mobile phones, inputting data quickly and easily, thanks to their familiarity with SMS messaging. The precise location and time of every visit is recorded using data from the mobile-phone network", says Gerard Brandjes, Nokia's General Manager for East and Southern Africa.

According to Brandjes, the information collected is sent directly to the local hospital's database. This means that the time-consuming (and potentially error-prone) process of transcribing results at the end of each day is eliminated, so field workers can spend more time conducting their surveys.

Brandjes says mobile phones proved more effective than PDAs for several reasons. As well as offering superior connectivity, field workers can use their own mobile phones to collect information, and so require very little training in the technology. With a better understanding of the region's population, KEMRI can plan their anti-malaria strategy more effectively — a critically important issue in a region where the disease is more prevalent than any other part of the world.

Elsewhere, in their quest to promote development in the rural communities, Ericsson, the Swedish telecommunications giant, mobile operator Zain and The Earth Institute, a development organisation based at Columbia University have launched the provision of mobile phone connectivity to the Millennium Villages in Dertu in northern Kenya, Ruhira in Uganda and Mbola in Tanzania.

For the 5000 odd residents of remote Dertu, the launch comes as a big relief given that the area is being connected to the mobile network for the first time. In this remote, pastoral and nomadic society, basic voice and data communication will be enabled over an EDGE network. New mobile phone applications for healthcare and for livestock management are being piloted to help with the collection of household health data as well as tracking recently immunised livestock.

Sony Ericsson has also provided mobile phones to the millennium village health clinics and community health workers. “Patients no longer have to come to my clinic. They simply call for services which I have to take to their doorsteps”, says John Onyango of Siaya’s Bar Sauri Millennium Village. “These days I don’t have to walk for a long distance to reach a veterinary doctor when my cow falls sick. I simply call him and he comes within miutes”, says an enthusiastic Mary Auma, a widow from Bar Sauri. Together with Ericsson, Sony Ericsson has also developed and will provide a new solar village charger capable of recharging at least 30 mobile phone batteries per day and eight phones simultaneously for each village cluster.

In Tanzania and Uganda, Zain and Ericsson have upgraded the existing GSM network to EDGE, thus improving the basic coverage in the area. In combination with its fixed wireless terminals, it will bring mobile Internet to schools and health centres. Ericsson also plans to extend coverage, enabling mobile communication to all the 73,000 people living in both village clusters. Ericsson and Sony Ericsson are also providing mobile phones to community health workers, and have piloted new health applications for mobile learning purposes as well as basic household data collection. Zain has provided SIM cards and established emergency numbers in order to improve access to health care and emergency services. One such initiative is a new toll-free phone service that can be used in medical emergencies to connect patients with on-duty medical personnel. To support economic development, Ericsson plans to focus on identifying and developing telecom services and applications customised to meet the needs of poor, rural communities.

“As the dominant supplier in Africa, Ericsson tapped relationships with African operators, including Zain and its subsidiary Celtel, in order to develop a comprehensive end-to-end communication strategy in the villages”, stated Chris Gabriel, Zain Africa Chief Executive.

In South Africa, Marlon Parker, an IT lecturer at Cape Peninsula University of Technology has started a drug counselling service using the cell phone chat service known as Mxit and the Facebook social networking application.

“The main objective was to meet the youth on a platform that they are comfortable with as a first point of contact, where they can express themselves and receive counselling or advice on the issue of drug and substance abuse”, said Parker.

For the last two years, Parker, who is also a PhD student at the university has been using the technology to interact with youngsters involved in drugs and gangs. Parker’s PhD thesis is on the use of technology to facilitate community change. During his research, he discovered that cell phones were the most commonly used piece of technology in all communities. The MXit cell phone chat technology has managed to rope in 8.6 million users around the country within a period of two years.

The project was born following an increase in gang and drug activity on the Cape Flats in the Western Cape Province , which was causing tension within communities. According to

Parker, these activities have a negative impact on citizens in these communities and contribute to a sense of helplessness. Reconstruction or rehabilitation of ex-drug addicts and ex-gangsters are challenging due to communities with tension not being able to empower these citizens or not willing to be rehabilitated. This presented the opportunity for the use of technology as part of the reconstructing of these citizens. Parker found himself starting this project after his elder brother, now serving a prison term, became a drug addict and pusher. “I had to do something since my mother was heartbroken as a result of my brother’s activities”, Parker confides.

The project was also inspired by a research conducted in 2007 which found that there is an increase in mobile instant messaging (MIM) amongst teenagers in South Africa , many of whom are using MXit, a popular South African (MIM), as their primary tool for messaging. Parker and his team interviewed members of the community and used their findings to formulate ideas on how people living in communities affected by drugs and gangsterism can be empowered and healed through web technologies.

Brent Williams, 31, a reconstructed drug addict and pusher is full of praise for the Impact Project. “I started smoking tik (methamphetamine) at the age of 21 and only stopped last year. I was one of the first tik dealers in Bridgetown . I started drinking when I was 13 and by 21, I was taking tik, Ecstasy, cocaine, heroin and that's when things went wrong. I used to hang out with the gangsters but never became part of them because I knew they wanted to have control of me”, said Williams.

Parker and his team have a Facebook group called Impact where they add friends and engage with people about what they do and monitor addicts' lives closely.

On Facebook they have access to status updates on someone's profile. On the blog, www.reconstructed.org. ex-addicts share their experiences.

John Arudo, Regional Research Co-ordinator, Aga Khan University’s Advanced Nursing Studies Programme, says that with 18 million Kenyans having mobile phones, and with the shortage of nurses, doctors and bed capacity in hospitals, mobile phones can come in handy in the provision of health services.

“Mobile technology is going to fill that gap because we are going to have just a few people providing services to a bigger population using mobile phones”, says Arudo. Citing his own experience, Arudo says that his personal physician is based in Eldoret but he doesn’t have to travel there physically to consult him.

“It only takes me a few seconds to explain my problem and within seconds, i dash to the pharmacy with the prescription”.

Arudo says the university is able to reach the medical students wherever they are, using mobile phones. For students on distance learning programme, the course materials are also sent for them to download from the Internet using their mobile phones. However, Arudo admits that the challenge lies in the fact that only those with Internet-enabled phones can access the service. The low bandwidth also impedes faster download.

Even so, the impact of mobile technology on health services cannot be overstated, if recent studies are anything to go by. A study published in the Journal of the American Medical

Informatics Asscociation in August 2009 finds that the substantial growth in mobile handheld technologies has heralded the opportunity to provide physicians with access to information, resources and people at the right time and place. The study—*The impact of mobile handheld technology on hospital physicians' work practices and patient care*—identified the ability of personal digital assistants (PDAs) to positively impact on areas of rapid response, error prevention, and data management and accessibility. According to the study, PDA use demonstrates the greatest benefits in contexts where time is a critical factor and a rapid response crucial.

In a related development, a report released last year by the UN Foundation and the Vodafone Group Foundation chronicles how the advent of mobile technology has transformed and facilitated the work of a number of NGOs involved in various forms of development work. Titled *Wireless technology for social change: Trends in NGO mobile use*, the report authored by Sheila Kinkade of ShareIdeas.org and Katrine Verclas of MobileActive.org examines 11 case studies of groups active in the areas of public health, humanitarian assistance and environmental conservation.

The management of South Africa's ART (Anti-retroviral Therapy) programme provides a perfect example of how mobile technology can be used in a resource-poor setting. Cell-Life, a non-governmental organization based in Cape Town has created its "Aftercare" programme to work with the public health system and its health workers to provide home-based care for HIV/AIDS patients receiving ART treatments. The mobile technology-based "Aftercare" programme supports the effective treatment of HIV/AIDS patients, and covers other aspects such as voluntary counselling. Each "Aftercare" worker is assigned to monitor 15 to 20 patients. The worker visits the patient in his or her home, and in a one-on- one session discusses the patient's current treatment. Using their mobile phones for data capture, "Aftercare" workers record information about patient medical status, drug adherence and other factors that may affect a patient's ART therapy.

But has mobile technology impacted negatively on health? According to Arudo, studies have never produced conclusive evidence to support this. The little – and inconclusive – research undertaken so far has nonetheless hinted that excessive exposure to electromagnetic fields could cause such undesirable effects as memory loss, Parkinson's and Alzheimer's diseases, and even brain tumours.

Still, according to Arudo, the future looks very exciting. In Namibia, for instance, nurses in the rural areas can use a webcam to capture a patient's wound and relay it to an expert hundreds of kilometres away, who then issues a prescription and instructions on treatment within seconds. Using a phonecam, the same picture can be taken, sent to the specialist as an email attachment. Put simply, patients no longer need to travel long distances to visit their doctors. How times have changed!

Zachary Ochieng,
Managing Editor,
CIO East Africa magazine.
eDevelopment House,
Kenya
URL: http://www.cio.co.ke