

Remote Monitoring

Project 21: The Cell-Life Project

Country: South Africa

Sponsoring Organization and Partners: The University of Cape Town, the Cape Peninsula University of Technology and Cell-Life

Application Area: Remote Monitoring

Providing home-based care for HIV/AIDS is critical in the African context, where the stigma attached to the disease often discourages patients from visiting health facilities. Cell-Life, a social enterprise based in South Africa, is developing innovative approaches to home care with their 'Aftercare' program. In this program, Aftercare health workers monitor patients whom they visit at home. Workers use data-enabled mobile phones to record information about the patients' medical status, medication adherence, and other relevant factors. The data are then transmitted via SMS to the central Cell-Life database, where care managers use a web-based system to access and monitor incoming patient information. Initial program results were encouraging, but significant challenges remain. Although South Africa's mobile penetration rate is high, the system is currently used on only one network using prepaid accounts, and the software is not yet available in any of South Africa's national languages other than English. Cell-Life is currently working to address these issues so the program can be adopted on a national scale.

Reference sources:

<http://update.cell-life.org/accolades/Commonwealth%20Health%20Ministers%20Handbook%20-%20June%202006.pdf>

<http://www.wired.com/medtech/health/news/2004/11/65585>

http://mobileactive.org/files/MobilizingSocialChange_full.pdf



Credit: Mobiles in Malawi/Josh Nesbit



Credit: WFP Paulette Jones

Project 22: Chinese Aged Diabetic Assistant (CADA)

Country: China

Sponsoring Organization and Partners: Microsoft Research, researchers from St Louis University, Old Dominion University, Beijing Medical University and Peking University First Hospital

Application Area: Remote Monitoring

Economic development and the resultant lifestyle changes are contributing to rapidly rising diabetes rates in fast-growing nations such as China. To counter this trend, Microsoft Research and a group of researchers from several universities and Chinese medical centers are developing a smartphone-based self-management and support system for elderly diabetics in China. The project will use smartphones to send elderly diabetics recommendations and guidelines related to physical activity, glucose and blood pressure monitoring, weight measurement, and diet. Patients will be trained to enter and send data on glucose levels, and doctors will be able to track patient data and graphically display data for patients. The system designers will use a user-centered design approach to develop software that reflects the preferences and capabilities of the targeted population to achieve maximum usability. The project's software will be available free of charge and will work on PDAs and smartphones that run the Windows Mobile operating system.

Reference sources:

<http://www.cadaproject.com/>

<http://www.cadaproject.com/data/poster.pdf>

http://research.microsoft.com/enus/um/redmond/about/collaboration/awards/cellphone-healthcare_awards.aspx#ECE

http://www.cadaproject.com/data/Smart_Phones_for_Older_Chinese_with_Diabetes.pdf

Project 23: Colecta-PALM

Country: Peru

Sponsoring Organization and Partners: The University of Washington, the Peruvian University of Cayetano Heredia and two Peruvian health clinics (Via Libre and Impacta)

Application Area: Education and Awareness, Remote Monitoring

Patient-based mHealth strategies must have patient buy-in to succeed. Colecta-PALM, an open source, secure web-based application that delivers Spanish-language surveys via audio on PDAs, was designed to ensure patient buy-in. A pilot test of this technology was conducted with HIV/AIDS patients in Peru. The patients used PDAs to enter and submit information regarding their ART adherence and behaviors that could potentially lead to additional HIV transmission. Patients' medicine compliance and behaviors were assessed and different types of feedback were provided depending on the user's risk profile. Of the 31 patients tested, 27 (74%) reported openness to using PDAs for HIV treatment support. The researchers in this study believe that these results "suggest that PDAs may be a culturally appropriate way to support ART adherence and safer sex for PLWHA [people living with HIV/AIDS]. Use of tools such as PDAs among PLWHA in some resource-constrained settings may be acceptable and can build on existing use patterns."

Reference sources:

<http://colectapalm.org/>

http://faculty.washington.edu/wcurioso/emulator/e/Poster_Colecta_Palm_07.pdf

http://faculty.washington.edu/wcurioso/kurth_amia_2007.pdf



Credit: DataDyne

Project 24: Mashavu: Networked Health Solutions for the Developing World

Country: Tanzania

Sponsoring Organization and Partners: Pennsylvania State University and Ideablob.com

Application Area: Remote Monitoring

Lack of sustained, regular care for children is often responsible for the spread of preventable diseases in the developing world. The ‘Mashavu: Networked Health Solutions for the Developing World’ project was initiated by students at Pennsylvania State University to tackle this challenge through mobile solutions. Mashavu (which means ‘chubby-cheeked’ in Swahili) is a computer-based system that enables doctors to connect with children in developing countries via mobile phones. Essential medical data (e.g., height, weight, blood pressure, and lung capacity) are collected at Mashavu stations in developing communities and sent by mobile phone to a remote server. Medical professionals can then ‘electronically adopt’ children by logging on to a web portal to monitor the children’s health, provide feedback or advice to the child’s caregivers, and collect health statistics. The student team from Pennsylvania State University is working with the Mount Meru Peak School and Good Hope orphanage in northern Tanzania to pilot test the system.

Reference sources:

<http://live.psu.edu/story/29485>

<http://www.ideablob.com/ideas/1528-Mashavu-Networked-Health-Solu>

Project 25: MediNet Healthcare Management System

Country: Trinidad and Tobago

Sponsoring Organization and Partners: Microsoft Research and University of the West Indies

Application Area: Remote Monitoring

The Caribbean is a region with very poor healthcare facilities, but a comparatively strong cellular phone infrastructure. Microsoft Research has provided a grant to professors at the University of the West Indies to create a mobile phone-based healthcare management system, to be deployed first in Trinidad and Tobago, followed by a broader regional rollout. The long-term goal is to build a network that integrates medical resources and promotes the sharing of medical information and expertise. The healthcare management system, ‘MediNet,’ will target diabetes and cardiovascular disease. The system is designed to relay information from patient monitoring devices to a central server via a cellular network. At the server, a data reasoning engine extracts all relevant information and alerts medical officers about severe cases. It also recommends appropriate responses such as a follow-up visit or phone call. The system can also send suggestions directly to patients via SMS message or pre-recorded voicemail.

Reference source:

http://research.microsoft.com/enus/um/redmond/about/collaboration/awards/cellphone-healthcare_awards.aspx#EAD

Project 26: Mobile Care, Support and Treatment Manager (MCST)

Country: India

Sponsoring Organization and Partners: ZMQ Software Systems

Application Area: Remote Monitoring

Keeping HIV/AIDS patients informed of their health status is one of the most basic ways of empowering them. With that in mind, the Mobile Care, Support and Treatment Manager (MCST) is being created by ZMQ Software Systems as an attempt to use technology to improve the logistical challenges of HIV/AIDS management in developing countries. The solution is conceived as a global model, but ZMQ admits that localization and adaptation to rural, urban, and peri-urban contexts will be a challenge. MCST will enable HIV/AIDS patients to use their mobile phones to access their lab tests and medical history reports. They can also use the system for nutritional planning, create alerts to remind them to take their medication, and connect with a help line. In addition, the solution can be used in 'Group Management' mode for organizations that work with HIV/AIDS patients. ZMQ is currently seeking partners for this project.

Reference sources:

<http://www.freedomhivaids.in/mCST.htm>

<http://www.zmqsoft.com/>

Project 27: Mobile Phones for Health Monitoring

Country: India and the United Kingdom

Sponsoring Organization and Partners: The UK – India Education and Research Initiative (UKIERI), Loughborough University, Indian Institute of Technology, All India Institute of Medical Sciences, Aligarh Muslim University and London's Kingston University

Application Area: Remote Monitoring

Long considered a 'rich country disease,' diabetes is spreading rapidly in the developing world as affluence changes traditional dietary habits. In 2005, engineers at Loughborough University developed a mobile phone health monitoring system to monitor diabetes and other diseases. The system allows doctors to use mobile phone networks to monitor up to four key medical signals (electrocardiogram heart signal, blood pressure, levels of blood glucose, and oxygen saturation levels) from patients who are on the move. Engineers from the UK and India are working to 'miniaturize the system' so that sensors are small enough to be carried by patients while procuring the necessary biomedical data. In Britain, the solution will be used to improve healthcare delivery, while in India it will connect 'centers of excellence' to hospitals and clinics in more remote areas. Over the next three years, clinical trials will occur in both the United Kingdom and India.

Reference sources:

http://www.lboro.ac.uk/service/publicity/newsreleases/2007/09_health_monitor.html

<http://www.ukieri.org/docs/ukieri-awards-details-2007.doc>

Project 28: Phoned Pill Reminders for TB Treatment

Country: Thailand

Sponsoring Organization and Partners: The Chiang Mai Public Health Department

Application Area: Remote Monitoring

The province of Chiang Mai in northern Thailand has a high number of patients with TB—a major cause of death in much of the developing world. A prime reason for high TB mortality rates is the failure of patients to take their medications on a regular basis. To combat this trend, the Chiang Mai Public Health Department piloted a program involving 60 TB patients who were provided with mobile phones that could only receive incoming calls. Patients then received daily reminder calls to take their medication. Dr. Surasing Visrutarana, Chief Provincial Health Officer, noted that during a three-month pilot in 2007 the drug-taking consistency rate for the patients was over 90%, a significantly higher rate of successful treatment than that observed in the province's standard TB treatment program. The project was not only effective but inexpensive, with a cost of just 100 baht (\$3) per person.

Reference sources:

<http://listmanager.bps-lmit.com/read/messages?id=49295>

http://nationmultimedia.com/2007/01/28/national/national_30025286.php



Project 29: SIMpill Solution for TB

Country: South Africa

Sponsoring Organization and Partners: SIMpill and Tellumat

Application Area: Remote Monitoring

Reminders to take daily medication are an effective means to ensure drug regime adherence, which is critical for diseases like TB, where 99% of those infected can be cured with proper medication compliance. The SIMpill solution is designed to help ensure compliance. SIMpill works by equipping a pill bottle with a SIM card and transmitter. When the pill bottle is opened, an SMS message is sent to a designated healthcare worker. If the pill bottle is not opened when expected, the patient gets a text message reminder to take the medication. If the patient then fails to comply, the health worker is prompted to call or visit to encourage the taking of medication. A 2007 pilot in South Africa to test the system's efficacy yielded impressive results. The pilot showed that with SIMpill, 90% of patients complied with their medication regime, compared to the typical 22 to 60% compliance rate without the system. The solution is now available worldwide.

Reference sources:

Paton, C. Thinking in the box. Financial Mail. 19 September 2008. Retrieved via Factiva.

<http://www.SIMpill.co.uk>

<http://free.financialmail.co.za/innovations/07/0302/minn.htm>

<http://www.itweb.co.za/sections/computing/2005/0501241215.asp?S=IT%20in%20Healthcare&A=ITH&O=TE>

Project 30: Virtual Health Pet

Country: Brazil

Sponsoring Organization and Partners: VIDATIS and the Atech Foundation

Application Area: Remote Monitoring

Virtual Health Pet has taken advantage of the popularity of the Japanese Tamagotchi virtual pets to improve medication compliance and patient health in Brazil. The virtual health pet, a J2ME software application running on the patient's mobile phone and linked to an electronic health records system, interacts with the patient to remind them to take their medications on time and to monitor their overall health. Alerts are sent out to caregivers or emergency services if the patient does not respond to its pet's messages in a timely manner. Because the software is linked to an electronic health records system, the Virtual Health Pet is able to both collect patient data and to provide the patient with near real-time information from their medical team. The Virtual Health Pet won a Special Jury Award at Simagine 2006, but it is uncertain whether the application is currently being deployed in the field.

Reference sources:

<http://developers.sun.com/champions/nardon.html>

<http://www.tridedalo.com.br/fabiane/index.htm>