



Credit: Vital Wave Consulting

Project 5: Project Masiluleke

Country: South Africa

Sponsoring Organization and Partners: Praekelt Foundation, iTeach, National Geographic, Nokia Siemens Networks, MTN, Ghetto Ruff, Children of South African Legacies, Aricent and frog design

Application Area: Education and Awareness

See case study on page 22.

Reference sources:

<http://newsvote.bbc.co.uk/2/hi/technology/7688268.stm>

http://www.poptech.org/project_m/

<http://opensourcepbx.tmcnet.com/news/2008/10/24/3730564.htm>

<http://www.frogdesign.com/press-release/poptech-unveils-project-masiluleke.html>

Project 6: Text to Change (TTC) - HIV Prevention Through SMS Quiz

Country: Uganda

Sponsoring Organization and Partners: Text to Change (TTC), Zain (previously Celtel), the local NGO AIDS Information Centre (AIC), the Dutch Ministry of Foreign Affairs and Merck

Application Area: Education and Awareness

See case study on page 25.

Reference sources:

<http://www.texttochange.com>

Interviews with the Text To Change team

Remote Data Collection

Project 7: Cell-PREVEN

Country: Peru

Sponsoring Organization and Partners: Universidad Peruana Cayetano Heredia (Peru), Imperial College (London), University of Washington (Seattle) and Peru's Ministry of Health

Application Area: Remote Data Collection

When it comes to effective data collection in remote areas of the developing world, less is often more. Cell-PREVEN was created to allow access to real-time data to members of the healthcare ecosystem in Peru. This interactive voice response system enables health workers in the field to collect and transmit data via basic mobile phones. The data is aggregated in a centralized database and made available to medical professionals, and the system is designed to send SMS or e-mail alerts if certain symptoms are recorded. During a three-month pilot test, 797 reports were collected and 374 adverse events were recorded—30 severe enough to trigger an SMS alert to a team leader. The pilot researchers believe that Cell-PREVEN demonstrates that “cell phones are a feasible means of collecting and reporting data in real-time in remote communities...it’s not necessary to have the latest Palm Pilot or Tablet PC to create a sophisticated public health surveillance system.”

Reference sources:

<http://www.prevenperu.org/preven/>

http://www.prevenperu.org/preven/presentation_curioso.pdf

<http://faculty.washington.edu/wcurioso/cellpreven.pdf>

Project 8: Community Accessible and Sustainable Health System (Ca:sh)

Country: India

Sponsoring Organization and Partners: Media Lab Asia (part of the Ministry of ICT India), Dimagi, Inc. (privately-held software company) and All India Institute of Medical Sciences

Application Area: Remote Data Collection

Large, rural areas in developing countries often lack comprehensive collection of health and population data. In Ballabgarh, India, Media Lab Asia community health workers used an open source software application on PDAs called Ca:sh—the Community Accessible and Sustainable Health system—to collect medical and demographic data. The pilot aimed to improve maternal and child health, and used Compaq iPAQs, which could run a MySQL database capable of storing up to 7,000 records. An evaluation of the five-month pilot “indicated high acceptance of the technology and reduction in total time for entry of data...the [health workers] were satisfied with the user interface and were able to depend entirely on the handheld, replacing their existing paper-based records.” Media Lab Asia now is exploring future applications, such as mobile surveys and disease-case management, and has ported the software to less expensive Palm OS-based devices.

Reference sources:

<http://www.dimagi.com/content/cash.html>

<http://www.medialabasia.in/healthcare.html>

<http://kaash.sourceforge.net/doc/dyd02.pdf>

Project 9: Community Health Information Tracking System (CHITS)

Country: Philippines

Sponsoring Organization and Partners: United Nations Development Program (UNDP) and Asia-Pacific Development Program (APDP)

Application Area: Remote Data Collection

Patient education is not the only challenge to improving health in the developing world—often health workers are not equipped with the information they need to best serve patients. The Community Health Information Tracking System, or CHITS, is an open source program that helps to ‘train the trainers’ by facilitating data collection and transmission in rural areas. The system allows community health workers to send SMS messages to report injuries and receive training on health surveillance via their mobile phones. The CHITS open source community believes they should teach local health workers “how to use the information system, [and] allow them to gain insight into their condition...so that they can decide to take action and be proactive in empowering others to do the same.” Like many mHealth projects, CHITS had found that empowering local communities with information and enabling two-way data flows is an effective strategy.

Reference sources:

http://www.stockholmchallenge.se/datacommunity_health_informat

<http://www.apdip.net/resources/case/rnd48/view>

<http://www.chits.ph/wiki/index.php?title=WhatisCHITS>

http://chits.ph/wiki/index.php?title=CHITS_Manifesto



Credit: UN UNHCR



Credit: Vital Wave Consulting

Project 10: The Dokoza System

Country: South Africa

Sponsoring Organization and Partners: Dokoza, State Information Technology Agency (SITA), Centre for Public Service Innovation (CPSI), Centre for Scientific and Industrial Research (CSIR) and the Meraka Institute, with the cooperation of South Africa's National Department of Health

Application Area: Remote Data Collection

Integrating mobile data collection solutions with existing health information systems is essential to advancing patient care. The Dokoza system in South Africa seeks to meet this need. It is an SMS-based mobile system designed to fast-track and improve critical services to HIV/AIDS and TB patients. Dokoza relies on SIM cards that can be used across networks, which interact with a more complex back-end system that integrates with existing hospital information systems. The integration with existing infrastructure offers the possibility of dramatic improvements to existing patient health information records, and in the 2004 pilot, both doctors and patients found the system to be user-friendly. Challenges encountered during the pilot include the duplication of data entry in instances where paper-based systems already existed, and staff shortages that hampered information collection. Despite the promise of this technology, little new data exists on its impact since the end of the pilot.

Reference sources:

<http://www.changemakers.net/node/1014>

<http://www.dokoza.co.za/content/patent.asp>

http://www.ehealth-connection.org/files/conf-materials/mHealth_%20A%20Developing%20Country%20Perspective_0.pdf

Project 11: EpiHandy

Country: Uganda, Zambia, Burkina Faso

Sponsoring Organization and Partners: Center for International Health, Norway

Application Area: Remote Data Collection

Health data collection in the developing world is often hampered by the high costs and inefficiencies of traditional large-scale paper-based surveys. The EpiHandy tool, a mobile health data collection and record access program enabled by PDAs, helps to mitigate these issues. EpiHandy has been deployed in many countries and by many different organizations since its first release in 2003, and has been used in multi-year studies in Uganda, Zambia, and Burkina Faso. In the Uganda study, mobile phones were deployed to participating clinics and Ministry of Health experts trained the local staff on using the open source JavaRosa software to fill and submit medical forms. The data from the forms was transmitted across the standard services available on the local mobile network. EpiHandy has yielded positive results during a five-year assessment in which 14 interviewers collected information on breastfeeding habits and child anthropometry in rural areas of eastern Uganda. Outcomes include greatly reduced data entry errors and broad user acceptance, as well as cost effectiveness relative to traditional paper-based surveys, increasing the potential for this already successful solution to scale further.

Reference sources:

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

<http://www.cih.uib.no/>



Project 12: EpiSurveyor

Country: Kenya, Uganda, Zambia (and 20 countries in sub-Saharan Africa by end of 2008)

Sponsoring Organization and Partners: The United Nations Foundation and Vodafone Foundation Technology Partnership, the World Health Organization and DataDyne

Application Area: Remote Data Collection

A lack of health data is among the greatest obstacles facing health decision makers. One of the largest and most heralded mHealth projects, EpiSurveyor, developed by non-profit software provider DataDyne, enables public health and development professionals to create, share, and deploy health surveys and other forms on mobile devices. The program runs on free and open software, is easy to use, and can be downloaded to handheld devices to be used by workers in the field. Successful pilot programs in two countries resulted in more timely and accessible healthcare data, making it easier to strengthen district level healthcare programs like immunizations and responses to disease outbreaks. An added benefit is that country health workers become fully self-sufficient in programming, designing, and deploying health surveys, eliminating the need to contract outside consultants. Building upon the success of the initial programs, in fall 2008 the partners announced that with the financial backing of the United Nations Foundation and Vodafone Foundation, and the scaling and expertise of the WHO and participating ministries of health, the EpiSurveyor-based mHealth program would be rolled out in a further 20 countries in sub-Saharan Africa.

Reference sources:

<http://www.datadyne.org/?q=episurveyor/home>

<http://siteresources.worldbank.org/DEVMARKETPLACE/Resources/205097-1099409088482/Brief-DataDyneEpiSurveyor.pdf>

<http://www.unfoundation.org/global-issues/technology/mobile-health-for-development.html>

Project 13: Integrated Healthcare Information Service Through Mobile Telephony (IHISM)

Country: Botswana

Sponsoring Organization and Partners: Microsoft Research Digital Inclusion Program and the University of Botswana

Application Area: Remote Data Collection

In those developing countries boasting near-saturation of mobile phones, the potential benefits of mHealth strategies are the greatest. Microsoft and the University of Botswana are taking advantage of mobile telephony's broad reach in the country to develop an Integrated Healthcare Information Service (IHISM). The system serves both health workers and the general public. It uses a mobile phone-based software application to allow health workers to capture, store, process, transmit, and access patient records. This results in lower costs and greater efficiency by eliminating redundancy and reducing the amount of time devoted to data input. The public can also turn to IHISM for information: individuals pose frequently asked questions about HIV/AIDS via SMS messages and receive a reply straight to their mobile phones. The project partners have identified several challenges, including localization and customization for illiterate users, but overall feel that the system has the potential to become a valuable tool and take on increased scope.

Reference sources:

<http://research.microsoft.com/enus/collaboration/papers/botswana.pdf>

<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=04195350>

http://research.microsoft.com/enus/um/redmond/about/collaboration/awards/digitalinclusion_awards.aspx

http://research.microsoft.com/enus/um/redmond/events/fs2006/presentations/40_Nyongesa_071806.ppt

Project 14: Media Lab Asia - Shared Resource for Rural Health Management and Information Infrastructure

Country: India

Sponsoring Organization and Partners: Media Lab Asia (part of the Ministry of ICT, India)

Application Area: Remote Data Collection

The immense size of India, coupled with the fact that approximately 70% of its one billion citizens live in rural areas, makes affordable and flexible health data collection techniques a necessity. India's Media Lab Asia is working on a project—Shared Resource for Rural Health Management and Information Infrastructure—to improve health data collection and analysis to better serve the needs of its citizens. The mHealth component of this project is focused on data collection. Health workers will use handheld devices to collect a wide array of data in the field—medical history, demographics, immunizations, and instances of disease. This data will be transmitted from the devices to the health information system database, where it can be accessed on a real-time basis. The solution will be implemented initially in the Mallapuram District of Kerala in India. No exact dates for project implementation have been published.

Reference source:

<http://www.medialabasia.in/healthcare.html>

Project 15: Mobile-Based Primary Healthcare Management System

Country: India

Sponsoring Organization and Partners: Center for Development of Advanced Computing (CDAC)

Application Area: Remote Data Collection

Primary Health Centers are critical in rural India as they provide direct patient care and link patients to the national health system via referrals. The Center for Development of Advanced Computing (CDAC) is developing a 'Mobile-Based Primary Healthcare Management System' to strengthen primary health centers in both rural areas and urban slums in India. The CDAC was created in 1988 and is a research and development society overseen by India's Department of Information and Ministry of Communications and Information Technology. A key component of the Mobile-Based Primary Healthcare Management System will be an SMS-based interface, which will allow patients to transmit information to or receive information from a central database via a basic mobile phone. Medical staff and health officials will be able to access this database from more sophisticated, web-enabled mobile phones. The project is in the development stage, but is expected to have a broad geographic scope.

Reference sources:

http://www.w3.org/2008/02/MS4D_WS/papers/cdac-mobile-healthcare-paper.pdf

<http://www.cdacbangalore.in>



Credit: DataDyne

Project 16: Map of Medicine for Kijabe Hospital

Country: Kenya

Sponsoring Organization and Partners: UK National Health Service (NHS), Cisco's Internet Business Solutions Group (IBSG)

Application Area: Remote Data Collection

Doctors in rural areas are often forced to treat individual patients with little or no information about resources in neighboring areas, impeding them from providing optimum care. A joint project was launched in Kenya in 2006 to address this problem. The project gives Kenyan health workers at Kijabe Hospital access to the Map of Medicine, a medical information database. The Map of Medicine is a web-based tool that provides comprehensive, up-to-date information on diagnosis and treatment, presented in easy-to-use flowcharts or 'care pathways.' Doctors participating in the pilot study were given PDAs and access to data on HIV/AIDS, TB, malaria, abdominal pain, diarrhea, and typhoid fever. Results were promising: hospital staff reported that the data access and entry via the PDAs has led to greater efficiency, more time with patients, and reduced administrative costs.

Reference sources:

http://www.cisco.com/web/about/ac79/docs/wp/Kijabe_Hospital_CS_1009a.pdf

<http://www.medic-to-medic.com/>

Project 17: Nokia Data Gathering

Country: Brazil

Sponsoring Organization and Partners: Nokia, Amazonas State Health Ministry

Application Area: Remote Data Collection

Please see case study write up on page 28.

Reference source:

<http://www.nokia.com/nokiadatagathering>

Project 18: PDAs for Malaria Monitoring

Country: Mozambique

Sponsoring Organization and Partners: AED-SATELLIFE

Application Area: Remote Data Collection

Malaria is the prime cause of morbidity and mortality in much of sub-Saharan Africa. Prevention and treatment of the disease are essential to reducing its effects on the population, and the rapid capture of accurate information is a key part of these efforts. The PDAs for Malaria Monitoring project, based in Mozambique, deploys PDAs and GPS devices to increase the ability of health workers implementing malaria programs to make informed decisions. The workers use the devices to collect data and transmit it via the GPRS network to a central database. A technical team then maps the geographic data to public health and resource information. Despite some technical challenges, the results of the project have been positive. Users are able to use the PDAs without difficulty, new data tools and training programs have been created, and information gathered has helped the Health Ministry to influence and shift the allocation of resources.

Reference sources:

http://www.crdi.ca/iicr/ev-118198-201_102534-1-IDRC_ADM_INFO.html

http://www.idrc.ca/uploads/user-S/12053478761102534_Final_technical_Report--_PDAs_for_Malaria_Monitoring.pdf



Credit: Vital Wave Consulting



Credit: UN Martine Perret

Project 19: Phones for Health

Country: Rwanda

Sponsoring Organization and Partners: The GSMA Development Fund, the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), Accenture Development Partnerships, Motorola, MTN and Voxiva

Application Area: Remote Data Collection

Most mHealth programs strive to leverage the growth and penetration of mobile phones in developing countries to strengthen health systems and improve health outcomes. Phones for Health, a large public-private partnership, is pursuing this goal using a system developed and deployed by Voxiva at health ministries in Peru, India, and Rwanda. The program enables health workers in local communities to use a standard handset equipped with a downloadable application to collect and enter health data. Once the data is entered and transmitted, it can be integrated into health information systems and accessed by health officials in real time at all levels using the Internet. The system also allows workers to order medicines, send public health alerts, and download treatment guidelines. The Rwanda pilot follows the successful deployment of a related system—TRACnet—that manages the country's HIV/AIDS program. Rollouts are planned for other areas of the health sector in Rwanda and other African countries.

Reference source:

http://gsmworld.com/documents/gsma_case_study_mhealth.pdf

Project 20: TRACnet

Country: Rwanda

Sponsoring Organization and Partners: TRAC (Treatment and Research AIDS Center)—an institution of the Ministry of Health of Rwanda, Voxiva and the US Center for Disease Control and Prevention (CDC)

Application Area: Remote Data Collection

TRACnet is a comprehensive data entry, storage, access, and sharing system created in Rwanda in 2005 by the Treatment and Research AIDS Center (TRAC), part of the Rwandan Ministry of Health. The system is used to manage critical information on HIV/AIDS patients and monitor anti-retroviral treatment (ART) programs nationwide. Medical personnel can use TRACnet to monitor drug distribution, create and submit reports electronically, and access the most up-to-date information on HIV/AIDS care and treatment. TRACnet was designed for use with all types of technology and information systems, but today, 90% of the system's users access it via mobile phones, rather than more expensive and less reliable computers and Internet connections. Results of the gradual deployment and development of TRACnet have been promising. By the end of 2005, 21 medical centers had switched from inefficient paper-based systems to TRACnet's electronic records system. By 2007, TRACnet covered all 168 health facilities that provide ART treatment, and there were plans to extend the system to 400 more health facilities. Rwanda's Ministry of Health also hopes to expand the system to cover other chronic illnesses.

Reference sources:

http://www.un.org/esa/sustdev/publications/africa_casestudies/tracnet.pdf

<http://www.tracrwanda.org.rw/index1.htm>

<http://www.voxiva.com/casestudies.php?caseid=22>

Excerpts from "Local Case Studies from Africa" prepared by the Department of Economic and Social Affairs, Division for Sustainable Development, United Nations