

Cancer and mHealth

Current Opportunities and Barriers to
Application in Low Income Countries



Of the 5 billion wireless subscribers in the world, 70% live in low to middle income countries. Scientists and healthcare providers are realizing the potential of this technology to improve medical care by connecting the expertise in developed nations to the need in developing nations. This article summarizes a number of efforts to use mobile technology (mHealth) to improve outcomes, and discusses the challenges of implementing this approach. These technologies will be important for combating the global cancer rise in the developing world in the coming decades.



By Uduak Thomas, M.A.

The World Health Organization (WHO) defines mobile health, or mHealth, as a subset electronic health that is concerned with the “use of mobile and wireless technologies to support the achievement of health objectives.” It covers things such as health call centers, emergency toll-free telephone services, mobile telemedicine, mobile patient records, decision support systems, and other services [1].

It is clear that mobile technologies, particularly cellular phones, are becoming cheaper and gaining in popularity globally, including in poorer countries. One statistic from the International Telecommunication Union (ITU) estimates the number of wireless subscribers at around 5 billion with over 70 percent living in low and middle income countries. And, the international healthcare community is finding ways to use these technologies to its benefit. According to the WHO, in a survey completed by 114 member states, 83 percent of respondents offered at least one type of mHealth service with many offering four to six programs [1].

Some examples of mHealth projects in low resource areas include a program in South Africa dubbed CellPhones4HIV, which is focused on developing solutions for managing and monitoring patients living with HIV/AIDS. ChildCount in Kenya uses a mobile application based on RapidSMS to monitor over 9,500 children under five to manage malnutrition and provide treatments for conditions like diarrheal illness. A project in Mexico focuses on developing a

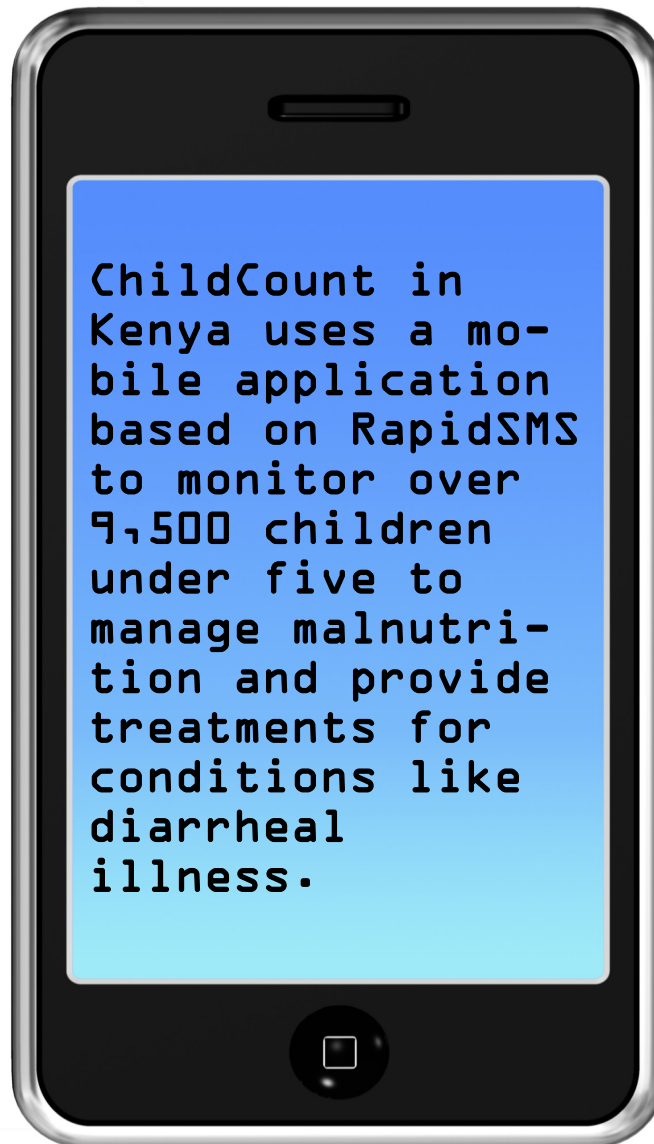
mHealth platform to help researchers monitor mosquito-borne diseases, such as malaria and dengue fever [2].

There are also efforts to apply these technologies specifically to oncology. For example, the Communication in Oncologist-Patient Encounters project (COPE) being conducted by the University of Wisconsin-Madison’s Center for Health Enhancement Systems Studies aims to improve interactions between advanced cancer patients and oncologists by providing patients with internet tools to communicate their emotional concerns to their oncologists. The investigators will compare the COPE approach with their Comprehensive Health Enhancement Support System, or CHEAD, a computer-based system of integrated services that is designed to help individuals cope with a health crisis or medical concern [3].

Other US-based efforts include one by a team at the University of Michigan Health System, which has developed an app for cancer screening called UMSkinCheck. This app lets users to perform skin self-exams by creating a photographic baseline of their skin and photographing suspicious moles or other skin lesions. The app also sends automatic reminders so that patients can monitor changes to their skin lesion over time and provides pictures of various

types of skin cancers for comparison [4].

Meanwhile, a smart phone app from the National Cancer Institute called NCITrials@NIH links oncologists, patients, and families to cancer clinical trial information in the NCI’s Center for Cancer Research database. It also



provides details about studies being conducted at the NIH Clinical Center in Bethesda, Maryland [5].

Currently, while the bulk of mHealth activity related to oncology is concentrated in higher income nations, the cancer burden in developing countries is growing and will demand increased attention from the global community in the years to come. One statistic reported on the Africa Oxford Cancer Foundation's (AfrOx) website — a group that seeks to improve cancer care in Africa — states that according to data provided by the WHO, by 2020, there are expected to be 16 million new cases of cancer every year. 70 percent of these will occur in developing countries, where many patients have little or no access to cancer screening, early diagnosis, treatment or palliative care [6].

In addition, there are some international cancer-focused mHealth initiatives. One example is a partnership that began two years ago between India's Narayana Hrudaya Hospital and Harvard/MIT. This project uses the latter's Sana — a software system that can be loaded on mobile phones and supports audio, images, location-based data, and text — to screen at-risk individuals for oral cancer in rural and semi-urban regions in India [7].

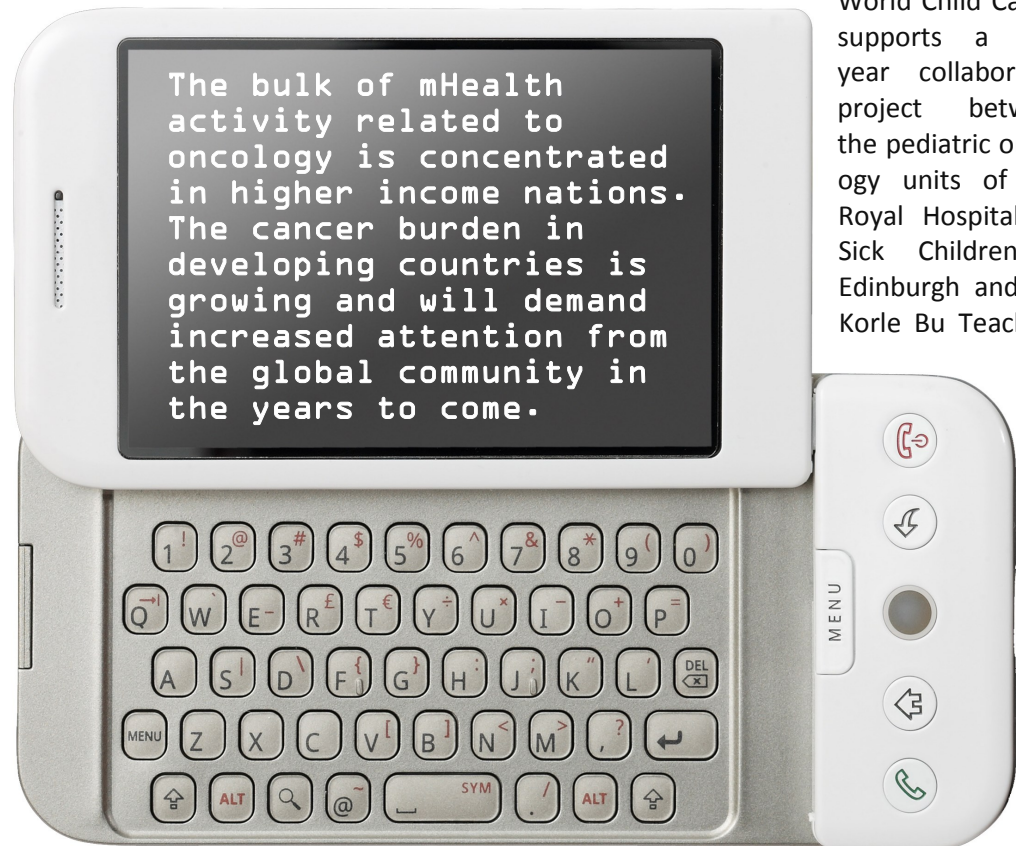
As of last summer, the partners had used the tool to screen up to 6,000 patients and they planned to scale that number up to 1.5 million people this year. In addition to screening individuals, the project investigators are training health workers and general physicians to use Sana to screen and manage oral cancer and other focus diseases. They are also studying the cost-effectiveness, scalability, and sustainability of their program.

In a similar vein, a research team from Stanford Uni-

versity has developed Oscan, device that can be mounted on a camera phone and used to transmit images. This device can be used to screen for oral cancer and connect early stage patient to dentists and oral surgeons. The tool, which won two financial awards earlier this year, has been tested on patient populations in India [8].

Meanwhile, Af-

rOx along with World Child Cancer supports a five-year collaborative project between the pediatric oncology units of The Royal Hospital for Sick Children in Edinburgh and the Korle Bu Teach-



ing Hospital in Accra, Ghana. They use the MedicineAfrica web-based platform to improve childhood cancer survival rates. The project team has used the system to provide e-training to childhood cancer nurses in Ghana [9].

The Challenges to Implementing mHealth Programs

Even though lower income countries are reaping the benefits of mobile technologies, they still lag far behind nations with greater income, as pointed out by WHO's 2009 survey [1]. This affects cancer treatment and access in these nations.

In spite of the differences in resource availability,


some of the same problems plague mHealth efforts in both high- and low-income countries. Participants in the WHO survey reported that conflicting health system priorities competing for finite resources, cost effectiveness, lack of knowledge, and policy were the greatest barriers to mHealth adoption. Specifically, 52 percent of respondents said having to make a decision between competing priorities coupled with the lack of a strong evidence base to verify its impact on health outcomes, and systems, resulted in reduced funding.

Furthermore, 47 percent of the respondents cited insufficient knowledge about possible mHealth applications and public health outcomes as one of the reasons for its limited adoption. Finally, more than 40 percent of participants reported that their country's or region's eHealth policies did not recognize mHealth as an approach to health-related issues [1].

Still on the policy note, a white paper [10] published by the mHealth Alliance and Columbia University's Earth Institute looked at policy-related barriers to mHealth with respect to treatment compliance; data collection and disease surveillance; health information systems; and point-of-care support, among other factors, and identified "clinician resistance to new technology." They also found that unknown costs and infrastructure implications for nationwide community- and facility-based data collection to be road blocks. Other considerations include concerns about the liability and accuracy of health information, data rights and usage guidelines, and the security challenges associated with shared mobile phones.

To tackle these and other obstacles to mHealth, research from the WHO and the joint mHealth Alliance/Columbia University suggest that public awareness campaigns that highlight the need and potential benefits can help. Research also suggests that promoting research and development efforts, strengthening health systems, as well as performing and evaluating trials, will lend credence to arguments for the effectiveness of mHealth tools [1].

Furthermore, a separate document from the mHealth Alliance suggests some ways that the multiple players involved in providing health care technologies can achieve their varying objectives. These include capitalizing on the popularity of other mobile services such as mBanking and mCommerce to build support for mHealth solutions, and establishing public-private partnerships between operators of these services, governments, and non-



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governmental organizations [11]. One such partnership is between the ITU and WHO, which launched the mHealth Initiative. This is a program which uses text messaging and apps to help combat non-communicable diseases (NCD) such as cancer, diabetes, cardiovascular diseases, and chronic respiratory diseases. These diseases are estimated to cause 36 million deaths globally per an-

num. The ITU-WHO partnership will build on current projects, existing health systems, and platforms, and will involve partnerships between governments, NGOs, and the private sector. It aims to provide evidence-based and operational guidance to encourage partners worldwide, especially governments, to implement mHealth interventions to address prevention and treatment of NCDs and their common risk factors [12].

Also, according to the mHealth Alliance, policy makers would do well to have defined mHealth policies and provide incentives such as tax rebates to telecom providers while funders need to come up with solutions. For example, one policy is to ensure that mHealth projects are integrated into government health programs to require project sustainability, as well as to provide resources for measuring program success [11].

Although the field is still in its infancy, addressing the challenges as well as making improvements to and investments in mHealth should ultimately benefit medical care in resource-poor regions of the globe.

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