

# Exchange

ON HIV AND AIDS, SEXUALITY AND GENDER



## Hype or hope? Using mobile technology to advance sexual and reproductive health

By Hermen Ormel and Hajo van Beijma

Mobile phones have rapidly become the most important way of communication worldwide. This article explores the extent to which mobile technology for health (mHealth) can improve public health services in low- and middle-income countries. Current interventions in the field of sexual and reproductive health are used to illustrate the variety of available mHealth applications. Challenging choices regarding mHealth strategies are identified, as they relate to issues of equity.

### Sex and cell phones

The first time I heard about the link between sexual behaviour and cell phones was in Namibia, some eight years ago during a Ministry of Health HIV programme visit of stakeholders in a remote town. Discussions focused on the drivers of the epidemic that was devastating the nation and on what priority responses should be.

A female staff dropped the notion of '3 Cs' – but not in the context of Consent, Confidentiality and Counselling – the basic principles of HIV testing. In fact, she was referring to one of the causes of HIV: cars, cash and cell phones, as it relates to transactional sex between men and (younger) women, a common phenomenon in southern Africa (see Evans 2010).

Then, mobile phones were relatively new and still hot in that remote area. They were (and still are) among the gadgets co-defining an individual's social status. Mobile phones filled this communication gap with easy pre-paid airtime systems making them affordable for many. Beeping or flashing urges the receiver to call back. Texting (sms) added a different way of communication between people.

For years, due to poor infrastructure, high costs and cumbersome paperwork, having a fixed-line phone was a distant dream for many people in low-income countries. Those who had access to and could afford internet-enabled smart phones could now use email, download and send data and link up with social media like Facebook.

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The number of mobile subscribers has grown exponentially with 70 per cent of the world's five billion wireless phone subscribers living in low- and middle-income countries; 85 per cent of the world's population is now covered by wireless phone networks (WHO, 2011). Many once remote villages are now connected with the rest of the world through this communication life-line.

In the past decade, mobile phones rapidly became hot in a different way than the transactional sex referred to in Namibia. Besides the mobile network operators who

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## Editorial



Eliezer F. Wangulu  
Managing Editor



Hermen Ormel  
Guest Editor

### Mobile text messaging to a global alliance for health

The phenomenal growth of mobile telephony in the least developed countries has overlapped with the global healthcare crisis, especially the HIV and AIDS pandemic. With a reach greater than any other technology or health-related infrastructure, it presents a potentially powerful and important health management tool.

Besides its personal and business use, increasing mobile phone use has the potential to improve healthcare for the world's poor. With more than 5.6 million people living with HIV, South Africa has one of the highest HIV rates in the world. Over 80 per cent of South Africans have mobile phones. Those with smart phones can easily access the Internet with its wealth of health information.

Cell-Life, a non-profit organisation based in Cape Town, works to determine the impact of mobile phones in various health contexts, including mass-messaging for prevention; positive living; linking patients and clinics; and peer-to-peer support and counselling.

Also, Project Masiluleke in South Africa uses a free text message service to encourage HIV testing and counselling. Given that mobile phone usage is highest in the age groups most likely to be infected and undiagnosed, they hope to make a significant impact on reducing the numbers unaware of their HIV status.

Text to Change (TTC), an NGO that uses SMS to provide HIV education in Uganda, has partnered with the AIDS Information Centre and Celtel in a pilot project in western Uganda to provide information on HIV and to encourage subscribers to volunteer for testing.

Six million Ugandans own mobile phones with 90 per cent usage in urban areas and 10 per cent in rural areas. The pilot project ran for six weeks. Fifteen thousand Celtel subscribers were sent an introductory SMS and invited to participate in an anonymous free interactive quiz about HIV, with handsets and airtime as incentives for correct answers. One question was sent each week. A correct answer was confirmed with a text message and an incorrect one received a corrected response. Some 2,500 responses were received each week. A final text was sent encouraging participants to go for free counselling and testing. The initiative realised a 40 per cent increase in the number of people getting tested over the six-week period.

In Malawi, an SMS-based communications network was set up for a rural hospital, St. Gabriel's, to help overcome barriers created by distance for clients and health workers. Many of the CHWs were recruited through the hospital's ART programme to act as CHWs in their respective villages. St. Gabriel's serves 250,000 Malawians in 700 villages within a 100 mile radius. Access to the hospital for many, including CHWs, involves walking or riding a bicycle. The programme began with 100 recycled mobile phones and a donated laptop running FrontlineSMS:Medic – a free application that enables analysis of vast amounts of text messages. CHWs were trained in text messaging.

The SMS network has enabled the hospital to respond to requests for remote clients care; clients can be tracked; drug dosage and usage can be checked. Also, CHWs are able to provide regular clients updates including deaths. Upon testing positive, a client is linked to a CHW with a phone.

Overall, mHealth has stimulated creative and innovative partnerships among disparate groups. This has led to establishment of the UNF-VF Partnership, a unified global body to promote best practices and commonly agreed standards for eHealth, known as the mHealth Alliance.

Rockefeller Foundation's Karl Brown describes the partnership as 'smart globalisation' where "people with different skills, speaking different languages, and reporting to different hierarchies, now enjoy new ways of working together on shared information communication technology platforms". The above case studies can be replicated to improve delivery of health services. ■

make huge profits even among the customer segment that lives on less than two US dollars a day, petty traders run stalls where they recharge phone batteries and sell airtime, farmers can access strategic market information regarding crop prices and, by using the phone, entrepreneurs save travel time to order goods.

Then, public-benefit and development-oriented organisations were not far behind and launched mobile applications in various fields. The Ghana Cocoa Board communicates with farmers via sms and voice mail on farming practices, diseases and marketing of cocoa. In Asia and elsewhere, the Grameen Foundation combines mobile information technology and micro-credit for the socio-economic development of rural communities. During the 2010 earthquake in Haiti, mobile networks and geographical information system technologies were combined to locate and communicate with survivors.

**Using mobile technology for health**

Access to health remains a challenge in many low- and middle-income countries. Moreover, once the client has reached a basic health facility, referral to a better-equipped and staffed facility may be difficult due to poor communication between healthcare providers in (rural) health clinics and health facilities at a higher (urban) level. Communication shortcomings can lead to inequities in access and quality of care and to missed opportunities in terms of health education and disease prevention.

The growing mobile phone coverage among health workers and their clients provides new opportunities for addressing problems of access, quality, effectiveness, efficiency and cost for healthcare. The technology can help reduce inequity and improve access to and quality of health services.

‘mHealth’ is defined as “medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants and other wireless devices” (WHO 2011). In recent years, mHealth has rapidly gained momentum in high, low- and middle-income countries and represents the partnership between mobile technology and public health. It is a subset of the broader concept of eHealth, which refers widely to using (mobile and other) information and communication technologies for health (Al-Shorbaji and Geissbuhler, 2012).

**Communication shortcomings can lead to inequities in access to and quality of care and to missed opportunities in terms of health education and disease prevention**

The newly available communication options provide an important chance to improve health, especially among rural and other traditionally-disadvantaged populations. With the UN Foundation, Vodafone and others’ launch of the mHealth Alliance (www.mhealthalliance.org), the attention to and expectations of mHealth have come to the fore.

WHO’s efforts to capture the progress and challenges of mHealth interventions through its Global eHealth Observatory (WHO 2011); the recent issue of its journal, World Health Bulletin (WHO 2012) dedicated to mHealth; the proliferation of mHealth-related conferences, and the increasing donor funding for a large

number of small and large interventions and research projects testify to the strides mHealth interventions have made.

The mHealth strategy seeks to improve access to services, diagnosis and treatment, quality of care and cost-effectiveness in health outcomes. However, until only recently, most initiatives were pilots and few scientific studies had been undertaken to evaluate their health outcomes (Mechael et al., 2010). More recently, however, a growing number of peer-reviewed scientific papers and research articles have emerged on the topic. mHealth-related approaches can be categorised according to the domains presented in Table 1.

**Table 1: mHealth domains framework**  
(Source: adapted from Magbity, Ormel et al., 2011)

Domain	Description
<b>Health service domains (provider-client interaction)</b>	
1. Education and awareness	For health promotion, community mobilisation; sometimes with links to online platforms, social media
2. Point-of-care support	Supporting diagnosis, screening, clinical care and referral
3. Client monitoring	Supporting treatment adherence support, appointment reminders/tracking
4. Emergency medical response system	Responding to accidents, emergency obstetric care; supporting natural disaster management
5. Health financing	Supporting financial access to services through smart cards, vouchers, insurance and other mobile payments
<b>Health system domains</b>	
6. Disease and epidemic outbreak surveillance	Real-time tracking of diseases
7. Health management information system (HMIS)	Including programme monitoring, supply chain management
8. Human resources for health (HRH) management	For staff management and distance continuous education (‘mLearning’)
9. General coordination	Improving communication among health managers and service providers

Available literature identifies a number of areas where mobile technology, usually as part of a broader set of interventions, can make a difference. In India, Bangladesh and South Africa, the Mobile Alliance for Maternal Action (MAMA) was set up as one of the largest mHealth interventions addressing maternal and newborn health. In Bangladesh, using audio and text messages in local languages, MAMA is working to reach over 500,000 of the poorest women, as well as their partners, mothers and mothers-in-law (who are ‘gatekeepers’ in accessing services) with health information. Women who would like to subscribe to the service register through their community health worker. Those able to pay a small amount subsidise those who cannot, thus contributing to programme sustainability.

Message contents are synchronised with a woman’s pregnancy cycle and cater to information needs on healthcare, misconceptions, pregnancy danger signs, breastfeeding practices, immunisation and referral to local health services. Results are measured in terms of improved coverage of a minimum of four ante-natal care visits, skilled attendance at birth and contraceptive use, among others. (Riley, 2011)

De Tolly and Alexander (2009) noted that “[t]he opportunities in South Africa for using mobile technologies to support initiatives in the HIV and AIDS sector are enormous. Many people have cell phone access, and there is a range of innovative ways in which cell phones can be used to support treatment, disseminate information, provide anonymous counselling, gather data,

and link patients to services.” The LoveLife-Youth Network in South Africa (www.lovelife.org.za) links more than 6,000 peer educators and over 5,000 schools, 100-plus community-based organisations and hundreds of clinics with half a million young people. This is done both face-to-face but also through chat rooms, online quizzes, and the cell phone-based social network, MYMsta, which has 45,000 registered users who, apart from HIV information, also gain access to workplace skills, bursary information and employment and volunteer opportunities. (De Tolly and Alexander, 2009).

**Continuous education for health workers**

As countries in the Global South continue facing an acute shortage of professional health workers, community health workers are often the first and only point of contact with the health system. Although they often deliver basic health education and family planning services, essential maternal and newborn services, provide referrals and administer vaccinations, many of them lack adequate and continuous training. Many capacity building initiatives are under way to improve the quality and effectiveness of community health workers. Increasingly, mobile phones are used as a tool to enhance classroom-based training (blended learning) or for distance continuous education.

In a large-scale programme in Bihar State, India, the State’s Government and BBC Media Action deliver a 160-minute training module to



*A Uganda Woman displays her mobile phone after winning it in an mhealth quiz. (Photo courtesy of Text to Change).*

200,000 community health workers. They pay a marginal fee that serves to cover running costs and allows them to access the interactive voice-response certificate course on maternal and child health, which they can take anytime anywhere. It combines with a practical job-aid in the form of a set of 40 cards that can be used to counsel families and which carries a code the community health workers can use to play phone-based audio messages to their audience.

This Mobile Academy programme aims to reduce maternal and infant mortality of Bihar by 40 per cent by 2015, by increasing knowledge, and changing attitudes and behaviour towards maternal and child health. The Government will take over the programme and related costs in 2013.

### Prospects and challenges

Many mHealth pilots have emerged in recent years, and more research has been done to expand the evidence-base. This has led to the start of several scaled-up programmes that promise to make a difference in health worker continuous education, health education impact, service access and quality, and health information system efficiency. However, there are issues and challenges that need to be addressed when assessing and selecting specific mobile communication strategies and designing and implementing mHealth programmes.

The following are some of the more strategic technical and logistical issues:

**Hype versus reality:** mHealth in the end is not about phones; it is about health. Yet the hype of the past years sometimes focused on the gadgets, the design of stand-alone devices and the technology behind the applications, with too little attention on the complexities of health systems realities (cf. Van Gemert-Pijnen et al., 2012). This sometimes obscured the real goal of improving health. Sometimes mHealth is presented as a magic bullet, when it is only an innovative tool – part of broader strategies to improve health services and systems. Maybe it is time to drop the ‘m’ in mHealth and focus on ‘health’ (cf. Labrique 2012).

**The mobile divide:** While mobile phone ownership is high in all socio-economic spheres, this is not the case everywhere. Some geographical regions may be left behind in terms of mobile network coverage; the poorest people may not be able to access even the simplest of phones; while women and illiterate community members have less access to mobile phones than men and literates. While bridging a gap for certain disadvantaged groups, the mobile revolution also could create a new divide, if the most disadvantaged with no resources to access a phone are excluded from new services. The current emphasis on smart phone technology linked to broadband internet could deepen this divide due to access and cost restrictions – there is a need to keep things simple if the aim is to improve the health of the poorest and if governments are expected to pay.

**Public health benefits versus consumer market products:** The mHealth field naturally brings together public and not-for-profit stakeholders and for-profit businesses. This presents exciting opportunities that the public health sector was unfamiliar with, for example when governments negotiate lower rates in exchange for the prospect of mobile network providers getting increased numbers of clients. But such opportunities are not always there and

it demands awareness that public and private interests do not necessarily coincide: a Ministry of Health may want to use mHealth applications for efficiency reasons, to ‘do more with less’ and offer better services to the public, while private businesses must, ultimately, generate returns on investment.

**Scaling up and governance:** While there is need to try out new strategies to prove they can make a difference and are cost-effective, many feel there have been enough mHealth pilots and funding should no longer aim to ‘let a thousand flowers bloom’ but ensure that proper evidence is generated and then scale-up those ‘flowers’ that were found to be cost-effective to benefit the wider public or specific disadvantaged groups. The Government of Uganda recently imposed a moratorium on new eHealth activities in view of the dozens of largely uncoordinated ongoing pilot projects in the country. This points to the need for stronger eHealth and mHealth stewardship and regulatory frameworks, to ensure public and donor funds are used for maximum benefit. (cf. Labrique, 2012)

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**Health systems going mobile?** All WHO-identified building blocks of health systems (services, workforce, information, technology, finance and governance) potentially stand to benefit from mobile technologies. But there are also potential threats, such as increasing the workload of already overloaded health workers. The evidence for mHealth efficiencies may ultimately be tested here: health workers can take on new (mHealth) activities only if these actually save time and energy (Magbity et al., 2011).

### Conclusion

Mobile phones and related technologies are available to many in the Global South, including health workers and health service clients. Given the fast-growing number of potential applications, they could soon play an

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Sharing health information via a mobile phone. (Photo courtesy of Text to Change).

important role in improving health and health services such as delivering health education messages to pregnant women, motivating people to seek HIV testing, and providing training to community health workers. While exploring mHealth frontiers and generating more evidence for what works for whom and how, it is imperative to recognise more strategic challenges and choices that come with such opportunities. This has implications on whether the most needy will benefit or be left behind. ■

**Hermen Ormel**  
Senior Advisor

### Correspondence:

Royal Tropical Institute (KIT)  
P.O. Box 95001, 1090 HA Amsterdam,  
The Netherlands  
Tel: +31 (0)20 568 8578  
E-mail: h.ormel@kit.nl

**Hajo van Beijma**

Partnership Director, Text to Change

### Correspondence:

‘s-Gravenheke 1 A, 1011 TG  
Amsterdam, The Netherlands  
Tel: +31 20 820 2058  
E-mail: hvanbeijma@texttochange.com

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