

mHealth

What is the new technology in family planning?

Use mobile wireless technologies, such as cell phones, to provide health information and support to clients, providers, or health systems.

Background

mHealth (mobile health) is an emerging field that uses mobile and wireless technologies to support the achievement of health objectives (WHO 2011). Mobile phones are rapidly becoming one of the most widespread communication channels in the world. mHealth approaches may hold the potential to strengthen family planning programming, including reaching underserved populations and addressing critical health-systems issues in areas such as human resources, health management information systems, and financing (Lemaire, 2011; van Heerden, 2012; Labrique, 2013).

Declining mobile phone costs, growth in subscriptions, and rapid advances in technology have driven an explosion of mHealth pilot projects and programs since 2005. Evidence of the impact of mHealth on health outcomes and systems is limited, but growing (Labrique, 2013). Initial evidence demonstrates promising results of mHealth applications on patients' adherence to medication, health workers' compliance with treatment guidelines, and access to health information among clients and providers (L'Engle, 2012; Lemaire, 2011; Levine, 2008; Deglise, 2012; Pop-Eleches, 2011; Lester, 2010).

mHealth has been identified as a *new technology* by the HIP technical advisory group. While there are some initial experiences implementing mHealth applications to support family planning programs, there is a need for more research to better understand the potential and limitations of these applications (HIP, 2013). For more information about HIPs, see <http://www.fphighimpactpractices.org/overview>.



Photo credit: Text to Change, Uganda, 2012

**“mHealth presents a critical opportunity to re-
envision how health information and services
are consumed and delivered.”**

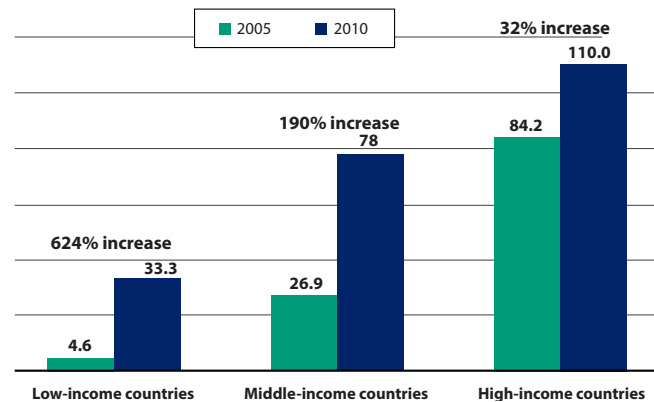
– Patricia Mecheal, Executive Director, mHealth Alliance

Why is this practice important?

A growing number of people in the developing world have access to mobile technologies. Almost 80% of mobile subscribers live in the developing world. From 2005 to 2010, mobile telephone subscriptions grew by 274% in sub-Saharan Africa, while South Asia experienced a staggering 665% increase. The rapid pace of growth worldwide is driven by low-income countries (see Figure 1; World Bank and ITU, 2012).

Notably, women are 21% less likely than men to own a mobile phone (GSMA and Cherie Blair Foundation for Women, 2010). Data from 17 sub-Saharan African countries showed that men were more likely to own a mobile phone, as were people in urban areas and people who had at least nine years of education (Tortora, 2011). Mobile technologies offer innovative opportunities, however, to reach populations underserved by family planning programs, particularly men and younger people (L'Engle, 2012).

Figure 1. Mobile phone telephone subscriptions (per 100 people)



Source: World Bank and ITU, 2012

Many countries are implementing mHealth programs. The second global survey on mobile technologies reported that 83% of the 112 participating World Health Organization Member States had at least one mHealth initiative. Of these, three quarters reported four or more mHealth initiatives (WHO, 2011).

What is the impact?

A review of mHealth evidence related to family planning and published in peer-reviewed journals through February 2013 identified several key points relevant to the potential contribution of mHealth applications to family planning programs, outlined below. Evidence from other health areas provides guidance that may be relevant to mHealth for family planning as well. (See RESOURCES for detailed information on mHealth evidence and key implementation resources.)

mHealth programs for family planning provide a range of mechanisms that make use of all types of mobile phones (i.e., basic, feature, and smart) and can be broadly categorized into two groups of mHealth practice: (1) client-centered and (2) provider and health system-focused.

1. Client-centered programs are designed to provide health information and support directly to clients or the general public, such as CycleTel™ (an SMS or text message automated system that facilitates use of the Standard Days Method®) and m4RH (an opt-in automated SMS system that provides information on family planning methods and clinic locations).

- **Evidence of mHealth as an effective tool for health promotion and behavior change communication is limited.** Numerous systematic reviews have examined the effects of behavior change interventions for disease management and prevention delivered through text-messaging. Cole-Lewis (2010) found evidence to support text-messaging as an effective tool for behavior change. The authors concluded that effects exist across age, minority status, and nationality. Only

one of the studies included in this review, however, was implemented in a developing country. A Cochrane review based on two randomized control trials concluded that “mobile phone text-messaging at weekly intervals is efficacious in enhancing adherence to ART, compared to standard care” (Horvath, 2012; also supported in Free, 2013). Two systematic reviews with significant representation from developing countries concluded that the evidence was insufficient for making recommendations and the authors called for more rigorous evaluation of mHealth interventions (Gurman, 2012; Deglise, 2012).

2. Provider and health system strengthening programs provide training, counseling/job aids, and performance support for health workers, systems, data, and program management. Examples of health system strengthening mHealth programs include the CommCare platform (a mobile phone-based platform for community health workers that provides on-the-job training and helps to manage enrollment and tracking of clients) and ILS Gateway (an integrated logistics system on mobile phones that provides alerts, supply chain management tools, and reporting functions for stock and ordering of medicines and other health products). Although there is limited evidence of these mHealth programs’ direct impact on health, evidence has shown that this type of mHealth application can:

- **Provide a cost-effective approach to improve communication between community health workers and their supervisors.** A program in Malawi supported SMS communication to improve information sharing between community health workers and their district teams. SMS participants (N=95) reported and received feedback from their supervisor at least 5 times per month at an average of USD \$0.61 per communication, compared to USD \$2.70 per contact and 4 times per month among those with cell phones but no access to SMS (N=95), and USD \$4.56 per contact at a frequency of 6 times per month for the control group (N=95) without cell phone access. The most frequent SMS communication was regarding commodity stock-outs, which ultimately resulted in reductions in stock-outs (Lemay, 2012).
 - **Improve supply chain management.** Health facilities (n=129) in three rural districts in Tanzania used mobile phones to facilitate accurate stock counts of anti-malarial medications. At 21 weeks, the proportion of health facilities with no stock of one or more anti-malarial medicines fell from 78% at week 1 to 26% (Barrington, 2010).
 - **Provide health workers with reminders of protocol guidelines for patient care, resulting in better treatment compliance by health care providers** (Florez-Arrango, 2011; Zurovac, 2011).

How to do it: Tips from implementation experience

The mHealth landscape is changing quickly, both in terms of technology and economics. Smart phones are becoming more common in low-income countries and their features are more advanced, expanding the potential application of mHealth technologies. The implementation tips listed below represent a synthesis of lessons learned from published literature, gray literature, and in-depth interviews with 18 mHealth experts. They are divided into five components of mHealth implementation: (1) planning and design, (2) technological considerations, (3) scale-up, (4) sustainability, and (5) evaluation.

Numerous issues must be considered when designing and implementing client-centered mHealth tools, including:

- Mobile phone access (disaggregated by sex, geography, etc.)
- Sharing of phones
- Language and literacy (de Tolly, 2012; Gold, 2010)
- Privacy
- Technological challenges

PLANNING & DESIGN: *Determine if the proposed mHealth solution is appropriate for the problem to be solved.*

Do not start with a solution and try to find a problem that it can address. The problem to be addressed should drive development of the proposed mHealth approach and not the other way around. Meaningful involvement of stakeholders and end-users in design and subsequent implementation is crucial to success. In addition to promoting strategic coordination, convening a knowledge-sharing platform such as an mHealth community of practice facilitates understanding of the local context and agreement on program expectations. Continuous and iterative testing of the tool's content and usability with stakeholders and end-users helps ensure buy-in, program relevance, and success.

Considerations

- Is the problem determining the technology solution?
- Are end-users involved in design and testing? Is your design based on their insights and needs?
- Are stakeholders (Ministries of Health, Non-governmental Organizations, donors, etc.) supportive of your goals and objectives? Is there potential for them to act as a coordinating body to provide oversight, guidance, and leadership?
- Is the technology appropriate for the setting where it will be used?
- Is the design guided by the mHealth evidence base and the larger health systems evidence base?
- Is the content based on appropriate national or international guidelines?
- Does it have the potential to be implemented in a cost-effective way?
- Does it include a monitoring and evaluation plan?
- Are there existing mHealth approaches that can be leveraged and adapted, rather than re-inventing strategies?
- Is there potential for unintended consequences?

TECHNOLOGY: *Determine if and how well your project will interface with existing technology, infrastructure, and capacity.*

A clear understanding of expectations for the technology component of the project will help you choose a technology partner or determine how to implement the project from a technology point of view. This will also help to identify what can be leveraged from the local context. Networking with stakeholders, local officials, and local organizations on the ground can help to evaluate local technology strengths and limitations.

Considerations

- Are there existing technology platforms or tools that can be used or modified? What will need to be developed from scratch and what are the cost implications?
- How will you make sure that your platform or system can work with other existing systems to share and exchange data, or interoperability?
- Is there local capacity to support the development, maintenance, and growth of your tool? Is technology expertise from outside the country or region needed?
- Does your tool comply with existing national regulations and policies on data ownership, storage, confidentiality, etc.?
- How familiar are end-users with your technology? Will your tool present a steep learning curve for them?

SCALE-UP: *Determine the potential for the project to be implemented on a larger scale.*

Scale-up should be considered in initial planning and design phases. Notable barriers to scaling up mHealth include limitations of current funding mechanisms, lack of evaluation, and limited stakeholder support. To justify large-scale implementation, new mHealth projects must not only be grounded in rigorous evidence, but they also must be in line with health priorities, existing local capacities and systems, and cultural challenges.

Considerations

- If your tool is targeting the public, how will you recruit users and provide ongoing support and training for them? How will you do this in a gender-sensitive way that promotes equality?
- To what extent will your tool be accessible to other potential users? To what extent is it adaptable to different contexts? Is it able to share data with other existing platforms and tools?
- What is the cost of your tool? What are the cost implications if the mHealth solution is offered on a larger scale?
- What is the capacity of local technology partners to support the technology requirements of a scaled-up program? Does your system need to be redesigned to accommodate implementation on a larger scale, for example?
- What is the potential of your tool to contribute to other health and/or development issues and national mHealth goals?

SUSTAINABILITY: *Consider the accessibility of resources for the long-term operation of the project.*

Quantifying upfront costs, scale-up costs, and potential cost savings is critical for securing government and private sector investments in mHealth. Nurturing local capacity to develop and maintain mHealth tools will ensure long-term operation. Open source mHealth systems, which promote shared data standards and freedom to modify system functionality, are also viewed as potential future drivers of mHealth's scalability and sustainability. A report commissioned by the mHealth Alliance (Vital Wave, 2013) uses a value-chain analysis framework to evaluate five current mHealth financial models and suggests that sustainable models are contingent on a deep understanding of ecosystem players, market dynamics, and incentives that are specific to each.

Considerations

- What will mobile network operators and/or the telecommunications industry have to gain from working with you? Can your strategy evolve with changes in the industry?
- Is your tool adaptable to rapid or significant technological and economic changes?
- What are the ongoing costs to operate, secure, maintain, and scale the technology?
- Does the project use cost-effective technologies, or open-source systems?
- Does the project have a plan for building local capacity to maintain and develop state-of-the-art solutions?

EVALUATION: *Assess the potential contribution of evidence generated by this project.*

As mHealth continues to grow, it is important to understand the effect of mHealth tools and approaches on both individual health outcomes and health systems. Measuring the costs of mHealth approaches and undertaking cost-benefit analyses will also be critical to inform decisions about future mHealth investments.

Priority research questions

- What is the impact of mHealth approaches on client and provider behavior disaggregated by urban/rural and demographic status?
- What is the cost, including cost effectiveness and cost benefits of mHealth tools?

Tools and Resources

mHealth Evidence brings together the world's literature on mHealth effectiveness, cost-effectiveness and program efficiency, to make it easier to get up to speed on the current state-of-the-art. It includes peer-reviewed and grey literature from high-, middle- and low-resource settings. <http://www.mhealthevidence.org>

mHealth Planning and Implementation Guide: How to Integrate Mobile Technology into Health Programming is intended primarily for global health practitioners and program staff working to implement mHealth solutions in low-resource settings. <http://www.k4health.org/toolkits/mHealth-planning-implementation-guide>

mHealthKnowledge is an online portal links users with a broad range of global information resources and tools for planning, implementing, monitoring, and scaling up mHealth programs in low- and middle-income countries. <http://www.mhealthknowledge.org/>

mHealth Working Group website is an online community of practice with resources and inventory of projects. www.mHealthWorkingGroup.org

National eHealth Strategy Toolkit is a practical guide to help governments, ministries, and other stakeholders develop and implement a national eHealth vision, action plan, and monitoring framework. http://www.itu.int/pub/D-STR-E_HEALTH.05-2012

For more information about HIPs, please contact the HIP team at USAID at: fhip@k4health.org

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