Using Mobile Technology for Nutrition Programs

A practical guide for implementers and practitioners

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Key messages

> Over 97% of the world’s population has access to a mobile phone signal.

> However, far too many mHealth initiatives that aim to utilize this mobile network struggle to scale up beyond pilots and sustain impact over time.

> This article offers a conceptual framework that nutrition practitioners can use to harness the potential of mHealth interventions.

> The four-step process aims to put people first in designing a framework to help build, implement, evaluate and scale mHealth innovations.

> As malnutrition continues to overburden many health systems, mHealth offers huge potential for strengthening and improving existing initiatives and outcomes, so long as they can be implemented successfully.

Introduction: The promise of mHealth

Mobile technology has proliferated more rapidly than any other technology in human history. Over 97% of the world’s population today has access to a mobile phone signal, creating unprecedented opportunities to reach remote and disconnected communities. The field of mobile health or mHealth leverages these opportunities, harnessing mobile and wireless technologies such as basic phones, smartphones, tablets and mobile networks to address the coordination and communication challenges of delivering health care to underserved populations around the world.

This new field shows particular promise in low-resource settings, including in strengthening nutrition programs and improving health outcomes. mHealth interventions have the potential to change nutrition-related behaviors, strengthen malnutrition case finding, improve treatment adherence, manage stock of supplements and micronutrients, and increase the efficiency of health workers, facilities and systems providing nutrition services at the last mile.

“mHealth harnesses mobile and wireless technologies to deliver health care to underserved populations around the world”

Despite its promise, however, evidence suggests that far too many mHealth interventions fail to scale up beyond small pilots or sustain impact over time. Bringing human–technology interaction to bear on health systems involves many complexities, and paradoxically can sometimes do more harm than good. This article offers a practical guide for nutrition programs seeking to adopt mHealth innovations. It draws on the experiences of Medic Mobile, a nonprofit organization that uses mobile technology to create connected health systems, as well as those of a growing community of information and communication technology (ICT) practitioners. While neither exhaustive nor prescriptive, this article suggests a conceptual framework within which nutrition practitioners can plan, craft and implement effective mHealth interventions for nutrition programs.

Getting started: Planning for mHealth

The idea of mHealth may seem daunting at first. Many nutrition programs use paper-based information systems, and adopting technology is outside the realm of comfort and expertise of
many health teams. Getting started with mHealth, however, is much like starting any new program, and there are often more questions than answers. The first, especially for practitioners with little or no background in technology, is often “What can mobile technology really do?”

The good news is that with over 500 mHealth pilots implemented globally, the ICT community has gathered insights to help beginners in this process. Drawing on experiences in developing countries, mHealth thought leaders have developed a framework of 12 common mHealth applications for reproductive, maternal, newborn and child health (RMNCH) (Figure 1). These include using mobile technology for behavior change communication, data collection and provider training, and highlight a range of possibilities that practitioners may consider for their programs and context.

Practitioners also have to answer other questions as they plan for mHealth, including: What human resources are needed to support such a project? Do we build a tool in-house or engage the services of a partner organization? How much will an mHealth system cost to implement and manage? How will we implement the project? How will we measure its success?

These questions can help practitioners objectively evaluate the need and value of mHealth for their program, rather than adopting an mHealth intervention because it sounds appealing, because others have done so or because donors wish to fund it. This process also highlights the nuances of implementing and managing an mHealth program, reveals key human-resource, financial and other considerations, and uncovers potential challenges to be addressed. A variety of toolkits have been designed to guide practitioners as they plan for mHealth and other digital health programs. For example, a toolkit from the World Health Organization and PATH lays out an eight-step process that can help practitioners develop their ICT program along with planning tools for each step (Figure 2).

"mHealth toolkits can help practitioners evaluate the need of mHealth for their program and uncover potential challenges to be addressed”

From planning to practice: Medic Mobile’s mHealth process

Toolkits such as these can help practitioners conceptualize their mHealth programs, but even the best-laid plans often go awry once the work of design and implementation actually begins. How then do you get from an mHealth plan to the actual practice of it? In the absence of standardized mHealth processes, we offer our own approach at Medic Mobile, an organization that supports over 16,000 frontline health workers with mobile technology as they provide care to 11 million people in 23 countries. Since 2008, Medic Mobile has worked with clinics, hospitals, non-profit organizations and ministries of

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**FIGURE 1: Twelve common mHealth and ICT applications for reproductive, maternal, newborn and child health (RMNCH)**

1. Client education and behavior change communication (BCC)
2. Sensors and point-of-care diagnostics
3. Registries/vital events tracking
4. Data collection and reporting
5. Electronic health records
6. Electronic decision support
   - Information, protocols, algorithms, checklists
7. Provider-to-provider communication
   - User groups, consultation
8. Provider work planning and scheduling
9. Provider training and education
10. Human resource management
11. Supply chain management
12. Financial transactions and incentives

**Credit:** Labrique AB, Vasudevan L, Kochi E, Fabricant R, & Mehl G.

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**USING MOBILE TECHNOLOGY FOR NUTRITION PROGRAMS**
health to create, implement and scale mHealth interventions to improve the last-mile delivery of health care and save lives. While our implementations vary in their use, scope, context and the challenges they seek to address, we adopt the following framework to conceive, build and implement a wide range of interventions (Figure 3).

We approach mHealth with a four-step, iterative process firmly grounded in human-centered design. It is an approach to problem-solving that puts people first and offers a practical framework for others to replicate as they design, build, implement, evaluate and scale their mHealth innovations. Here, too, guides such as IDEO’s Field Guide to Human-Centered Design can provide practitioners with actionable tools and methods to facilitate this process.7

**Figure 2: An eight-step process to plan for ICT programs**

1. **Define Outcomes**
   - How will a better information system benefit you?
   - How should you define the scope?
   - How will you measure success?

2. **Form your Team**
   - What skills and roles are required to bring your project to a satisfying outcome?

3. **Define what your System needs to do**
   - How can you define your requirements for the system?

4. **Find the right Solution**
   - Should you buy or build your system?
   - Do you select an open-source or proprietary system?
   - How do you evaluate different systems and select the best one?

5. **Select the right Vendors**
   - How do you make sure you select the best providers of technical services?

6. **Estimate Implementation and Operating Costs**
   - How much will your project cost to pilot, scale and maintain?

7. **Create an Implementation Plan**
   - How long will it take to develop, pilot and scale up?

8. **Understand and Manage Project risks**
   - What can go wrong and how can you plan for that?

**Credit:** Grevendonk J, Taliesin B, & Brigden D.6

**Build empathy with end-users**

Our approach to mHealth begins with getting to know the people who will use and benefit from mHealth tools and the resulting improved health system. This means foregoing our familiar perspectives and engaging with stakeholders, particularly end users, to understand their work and home environments, challenges, goals and strengths as they deliver or receive care. In the context of nutrition, this may mean interacting with nutrition health workers, health promoters, mothers, midwives, nurses...
and others as they provide nutrition care for families in their community. Using methods such as interviews, role-playing and sketching, and tools such as visual sketch cards, we define our user personas, understand their contexts and begin to co-design with them, so that they are equal creators of the solutions that will impact their futures.

**Define and ideate with end-users**

Next, we look closely at an existing program and define the most important challenges with users. Several pain points may emerge, with different perceptions of priority among users, practitioners and other stakeholders. You might discover for example, that your foremost challenge as a practitioner is poor breastfeeding practices in the community, but health workers might report that the time taken to maintain paper records each week is their biggest constraint. It may be tempting to solve all of these challenges with technology. However, even straightforward mHealth pilots evolve into complex interventions once underway. A general rule of thumb is to keep things simple, address the most pressing challenge first and later incrementally build on this foundation in future iterations.

Having identified a key challenge, we explore how mobile technology may address it. Technology may not always be the right answer, but if it is, a plethora of decisions need to be made. What technology should the tools harness? For example, should we use text messages, voice communication or multimedia messaging to promote breastfeeding awareness among communities? Should we use basic phones or smartphones, and why? What are the hardware, language and cellular or internet connectivity requirements of our users? How does the tool fit within the existing workflow of service delivery? How will the tool integrate with other existing technology systems at the local and national level?

Many of these decisions involve a trade-off, and while there are no “right” answers, some answers are more context-relevant and user-appropriate than others. Adopting a participatory approach to prototyping the envisioned tool with end users is invaluable. Enabling nutrition workers to test out a concept or role-play a situation with the mHealth tool instead of their current systems can reveal key insights, and the best ideas can be refined into even better solutions with the added perspective of end users.

“Although nutrition programs are well versed in delivering training, mHealth program training can pose unique challenges”

**Deploy and iterate**

Successful implementation requires a skilled and trained workforce to support the use and maintenance of the tools. Although nutrition programs are well versed in delivering training, mHealth program training can pose unique challenges. Users differ in their mobile literacy or baseline knowledge of mobile

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**FIGURE 3: Medic Mobile’s mHealth process**

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<th>Build Empathy</th>
<th>Define &amp; Ideate</th>
<th>Deploy &amp; Iterate</th>
<th>Measure Impact</th>
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<tbody>
<tr>
<td><img src="image1" alt="Build Empathy" /></td>
<td><img src="image2" alt="Define &amp; Ideate" /></td>
<td><img src="image3" alt="Deploy &amp; Iterate" /></td>
<td><img src="image4" alt="Measure Impact" /></td>
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Credit: Lester Ng
technology and may have varying technology learning curves, irrespective of their nutrition expertise. Building capacity and planning for continued end-user training after implementation is a non-negotiable investment of resources for the success of mHealth.

Another crucial aspect is management and supervision of the intervention. Designating an mHealth champion to drive the intervention forward, address any implementation challenges and effectively support and motivate end users is vital for the success of any mHealth program.

Implementation may imply finality, but is in fact the completion of only one iteration of the entire process. Being open to continuous iteration with users even after implementation is crucial for the tool to evolve into a more enhanced and impactful solution over time.

Measure impact
Once implemented, it is important to monitor how the tools are used and whether they influence key activity and impact metrics as we expect. Are nutrition workers using the mHealth tool as consistently as intended? Has the mHealth tool improved reporting time compared to paper-based systems? Has it helped to reinforce breastfeeding counseling given to mothers and are outcomes improving? Has it helped to reduce stock-outs of micronutrients at the community level? Sharing impact data, not only at the program level but also with end users, is key to enhancing motivation, performance and engagement. Moreover, demonstrating impact at pilot level is a prerequisite for future scale-up of the tool more widely with partners at the local and national level.

Overarching principles of digital development
While our framework can help practitioners to design and implement mHealth systems that are responsive to people’s priorities and contextual complexities, mHealth initiatives must address a range of additional factors if they are to be sustained or scaled up. Experience has shown that financing, scaling, sustaining and integrating mHealth interventions as well as building institutional partnerships to support these programs in the long term are crucial components of mHealth success. The international development community has captured best practices for these and other key elements of technology-enabled programs into a set of broader “Principles of Digital Development”.

These nine core principles and accompanying tools and resources can guide practitioners as they create successful digital programs for nutrition (Figure 4).

Concluding thoughts
As malnutrition continues to overburden health systems, mHealth has tremendous potential to strengthen nutrition programs and improve outcomes, particularly in last-mile settings. mHealth interventions are complex, however, and pose multi-dimensional challenges. Practitioners can meet these challenges by systematically planning for mHealth and adopting an iterative, human-centered approach to understanding users, defining
challenges, ideating solutions, implementing and refining prototypes, and measuring impact. Taking the principles for digital development seriously will also help prepare implementers for many of the more common pitfalls. Using these frameworks and principles, practitioners can create innovative and lasting mHealth solutions to transform and save the lives of many suffering from malnutrition around the world.

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References: