mHealth Implementation Opportunities, Issues and Challenges

December 5, 2012, affiliate session at the mHealth Summit, Washington, DC
Sponsored by the mHealth Working Group

Summary:
Hosted by the mHealth Working Group, this interactive session focused on the opportunities and challenges related to mHealth implementation and scale up issues in the global health arena. The event leveraged the expertise of members of the mHealth Working Group and the broader mHealth community to help move forward the existing dialogue on implementation opportunities, issues and challenges.

Agenda

- Introduction by Adam Slote, USAID
- Welcome exercise: Write down one thing you have heard about, or that you would like to know about, that would help you with your work in mHealth.
- Presentation by Kelly L'Engle, FHI 360 "mHealth Implementation Opportunities, Issues, and Challenges Related to Family Planning and Reproductive Health," outlining the FHI 360/K4Health and PROGRESS mHealth Implementation Guide
- Vote with your feet: Phones: Do you give or not give mobile phones to health workers?
- Results of welcome exercise
- Small group discussion with participants self-selecting into one of the five groups:
    - Planning and design – facilitated by James BonTempo, JHUCCP
    - Technological considerations– facilitated by Heather Vahdat, FHI 360
    - Scale-up – facilitated by Kelly Keisling, NetHope
    - Sustainability– facilitated by Pamela Riley, Abt Associates
    - Evaluation– facilitated by Kelly L'Engle, FHI 360

  Each group discussed experience with the topic as well as identified barriers or obstacles, and ways to address challenges. Notes for each group include key take aways, including challenges, promising practices, approaches, gaps in tools and resources and recommendations for future discussion.
- Small group report out and discussion
- Distribution of draft mHealth brief, "mHealth: Emerging High-Impact Practices for Family Planning," by FHI 360/K4Health and PROGRESS.

Annexes:

1. Agenda
2. Results of welcome exercise
3. Planning and design – facilitated by James BonTempo, JHUCCP
4. Technological considerations– facilitated by Heather Vahdat, FHI 360
5. Scale-up – facilitated by Kelly Keisling, NetHope
6. Sustainability– facilitated by Pamela Riley, Abt Associates
7. Evaluation– facilitated by Kelly L'Engle, FHI 360

Agenda

Introduction by Adam Slote, USAID, then Kelly Keisling, NetHope and Laura Raney, FHI 360, co-founders and co-chairs of the mHealth Working Group

Welcome exercise: If there were one topic within mHealth you could learn about that would help you do your job better, what would it be? Top score = 25. Those that received 20-23 out of 25:

- Sharing results of what worked and what didn't with regards to using mHealth content in the field (23 out of 25)
- How can I design my mHealth intervention so that it answers the question "does this mHealth intervention provide added value to this program?" (23)
- Logic models or theories of change for M&E of mHealth interventions (22)
- What are the top 10 most common issues that come up in the early stages of mHealth program implementation and basic trouble shooting tips for dealing with them? (22)
- Some examples of successfully scaled –up and sustainable PPP in mHealth. (21)
- One place that I can find mHealth initiatives that have already been piloted and that could be scaled up. (21)
- How to get mHealth & ICT for Health viewed internally as strategic and not just an add-on tool? (21)
- How to effectively evaluate an mHealth project? (21)
- How do we promote integration into health systems and across health areas for mHealth? (20.5)
- How do we bring mHealth technology to scale in resource-limited settings? Who pays for the maintenance of the technology, i.e., SMSs, smart phones, etc.? (20)
- Better tools for testing & quality assurance.(20)
- Health Impact of mBCC (20)

Presentation of FHI 360/K4Health and PROGRESS mHealth Implementation Guide outline, "mHealth Implementation Opportunities, Issues, and Challenges Related to Family Planning and Reproductive Health" by Kelly L'Engle, FHI 360

Dr. L'Engle's slides are available on the mHealth Working Group website under Resources (see: http://www.mhealthworkinggroup.org/resources/mhealth-implementation-opportunities-issues-and-challenges-related-family-planning-and)

The presentation addressed why mHealth is important, noting the sharp growth of mobile phones subscriptions over time. She also showed that first generation mHealth projects – those between 2000 and 2010 - established usability, while second generation programs have much more to address: voice, text, e-mail, GPS, music, video, internet and apps. Two categories of mHealth programs are 1) client-centered, such as m4RH and CycleTel; and 2) health system strengthening, including CommCare platform and ILS Gateway. Addressing the question of the impact of mHealth, evidence on client-centered programs shows that text message programs have high acceptability and may be effective for behavior change. Evidence on health system strengthening programs is sparse and still emerging, though there are three areas of evidence: 1) improved treatment compliance by health workers; 2) supply chain management; and 3) more efficient delivery of community health services. Dr. L'Engle's presentation included peer reviewed evidence on mHealth for family planning (Knowledge for Health (Malawi), Mobile for Reproductive Health (Tanzania)) as well as for other topics (SEXINFO (USA); Mobile technologies improve adherence to ART in Africa (Kenya, WelTel Kenya), Mobile rich media job aids for CHWs (Columbia), SMS for life (Tanzania)). She then presented priories for mHealth research moving forward, which include: impact of mHealth on clinical and behavioral outcomes; cost effectiveness and cost benefits of mHealth

tools; influence of mHealth on the wider healthcare system, particularly at scale; and conditions for and enablers of successful scale-up of mHealth.

The second part of the presentation focused on considerations for implementing mHealth, drawing from published and gray literature along with interviews with 18 mHealth experts. She outlined guidance for five components of mHealth implementation: planning and design, technological considerations, scale-up, sustainability and evaluation. Family planning is the focus, but information is applicable across health and development areas. Highlights from the findings include (see slides for full information):

1. mHealth Planning and Design – Determine if the proposed mHealth solution is appropriate for the context: Is the health issue driving the solution (rather than the technology itself)? Are end-users involved in design and testing?

2. mHealth Technology Considerations – Determine how the proposed project will work with existing technology, infrastructure and capacity: Clear communication between program staff and the technology partner is critical. What tools need to be developed and what existing open-source tools can be used?

3. Scaling-Up mHealth – Determine the project's potential for scale-up: Barriers to scale-up include limitations of funding, lack of evaluation and absence of standardized indicators. To what extent is the solution accessible to a wider audience and adaptable to other socio-cultural contexts?

4. Sustainability of mHealth – Consider the accessibility of resources for the long-term operation of the project. What is the potential value added for private sector support? Will the evidence generated by the project justify continued funding?

5. Evaluation of mHealth – Assess the potential contribution of evidence generated by this project. How does the project incorporate M&E indicators to meet stakeholder requirements? Are project data leveraged for evaluation and reporting?

The participants moved into round table discussions on each of these five topics, facilitated by a member of the mHealth Working Group and with a note taker at each table. The round table discussion questions covered three areas:

A. Experience and Challenges
   1. What is your experience with this topic?
   2. What barriers or obstacles have you faced in this area?

B. Addressing Challenges
   1. How have you seen these barriers successfully addressed?
   2. What other ideas do you have about removing or overcoming these barriers?

C. Help and Resources
   1. Are there specific tools or resources that would be helpful?
   2. What needs to happen next to implement these ideas?

Summaries of group discussions (see full notes in the Annex)

Planning and design – facilitated by James BonTempo, JHUCCP

- Projects that were successful did research and used a business plan.
- Need to engage all stakeholders from the beginning
- mHealth is one solution and not an approach
- When you are talking technology, you have to engage stakeholders that may be outside the health sphere
- Necessary to be aware of interoperability – remember it is a piece of a bigger system
- Never design without involving the end-user

- Have a modular or phased approach
- Be agile and continue to learn throughout
- Start with the evidence
- Include the network operators in the planning to address the accessibility issues

Technological considerations – facilitated by Heather Vahdat, FHI 360

- It is important to consider the environment: is electricity or other means of charging hardware available? Is there mobile network accessibility? What are the regulatory considerations? What are the potential donor or partner constraints?
- Examine equipment needs – simple might be better
- Consider technological literacy of end users
- For the mobile delivery platform, consider several options and pros and cons of each
- Identify staffing needs, particularly with regard to software development
- Pay attention to accessibility

Scale-up – facilitated by Kelly Keisling, NetHope

- Plan for scale from the beginning
- Share strategies and approaches to mHealth
- Conceive of programs holistically at systems level
- Need for better communication and coordination
- Build modules that can be applied across health areas
- Must collaborate so as not to replicate work and create inefficiencies
- Work with ministries of health and stakeholders from the beginning to get buy-in
- Build buy-in at all levels to combat high turnover
- Even if a pilot is effective it may be financially prohibitive, so there must be an added carrot that can promote longevity
- Technology is constantly changing. Let's not think of project "pilots" but instead as adapting to new things.

Sustainability– facilitated by Pamela Riley, Abt Associates

- Sustainability needs to be considered from the beginning, yet challenges prevent this from happening, including donor timelines and different risk-tolerance levels and data needs for stakeholder decision-makers.
- It is essential to learn from what doesn't work as well as to maintain flexibility to adapt to changing circumstances.
- Need for strategies to address the lack of qualified IT staff in the public sector and non-profit entities.
- Creativity is needed to create value across stakeholders.
- Cost data is essential but is difficult to obtain.
- Working towards an entire system can encourage sustainability.

Evaluation– facilitated by Kelly L'Engle, FHI 360

- mHealth interventions are not stand-alone projects, rather components and tools of larger programs. Thus some of the challenges relating to evaluating mHealth projects are challenges public health implementers have always been grappling with.

- Randomized control trials vs. something else. New innovative research methods: how do you make sure that your results are valid, that you can provide high quality information at the speed you need it, that you can evaluate programs that are already running, and that you aren't ignoring the potential for contamination through human factors?
- Evaluating the mHealth component vs. evaluating the health impact.
- mHealth interventions grow and change at a different speed than other interventions, and we have to accept and embrace that in developing evaluation systems.
- We need up-to-date information on the evident that is available and where the gaps are.
- We need a guide for public health implementers to assist them in planning for mHealth evaluations (indicators, methods)

Active discussion/Vote with your feet: Phones: Do you give or not give mobile phones to health workers?

Wrap up

Kelly distributed copies of the draft brief on the use of mobile technologies in support of family planning and reproductive health, "mHealth: Emerging High-Impact Practices for Family Planning." The draft brief was prepared by the FHI/360PROGRESS project and the Johns Hopkins Bloomberg School of Public Health/Knowledge for Health project. Comments are welcome. You can find the draft brief here: http://www.mhealthworkinggroup.org/sites/mhealthwg.org/files/draft_mhealth_fp_hip.pdf
The draft brief defines mHealth, provides background on the growth in the use of mobile phones and explains why mHealth applications have the potential to be important. It then reviews the evidence to date in family planning programs as well as other topics, and includes implementation tips.

Annexes:

1. Agenda
2. Results of welcome exercise
3. Planning and design – facilitated by James BonTempo, JHUCCP
4. Technological considerations– facilitated by Heather Vahdat, FHI 360
5. Scale-up – facilitated by Kelly Keisling, NetHope
6. Sustainability– facilitated by Pamela Riley, Abt Associates
7. Evaluation– facilitated by Kelly L'Engle, FHI 360

Annex 1: Agenda

mHealth Working Group Session
Wednesday, December 5, 1:30 – 5:30 PM, National Harbor 2

mHealth Implementation Opportunities, Issues and Challenges

This interactive session will focus on opportunities and challenges related to mHealth implementation and scale up issues in the global health arena. This event will leverage the expertise of members of the mHealth Working Group and the broader mHealth community to help to move forward the existing dialogue on implementation opportunities, issues and challenges. Preliminary findings from the FHI 360/K4Health Implementation Guide will be shared. Five issues that have been identified will be the topic of focused discussion at round tables. These in-depth discussions will focus on key challenges, promising practices, approaches, gaps in tools and resources, and recommendations for future discussion, within each focal area. Topics include: (1) planning and design; (2) technological considerations; (3) scale-up; (4) sustainability; and (5) evaluation.

Agenda

1:30 – 2:00 Welcome – Adam Slote, USAID, followed by welcome exercise

2:00 – 2:30 Presentation of the preliminary findings from the FHI360/K4Health mHealth Implementation Guide - Kelly L'Engle, FHI 360

2:40 – 3:25 Round table discussion (self-select topics for small groups)

3:30 – 3:45 Coffee break with snacks

3:45 – 4:15 Report out (5 min per table)

4:15 – 4:30 Group Discussion

4:30 – 4:40 Interactive Discussion 1 (vote with your feet)

4:45 – 4:55 Interactive Discussion 2

5:00 – 5:30 Discussion/Next steps

Annex 2: Results of the Welcome Exercise

Welcome Exercise: "25 will get you 10." Each person has an index card or half a sheet of paper and is asked to write down an idea, such as, "If there was one topic within mHealth you could learn about that would help you do your job better, what would it be?" Once people have their topics, the group moves to an open space (no chairs) and pairs up, shares the ideas, exchanges them and writes down a score on the back of the idea (1-5, 1 being a "good" idea and 5 being the "best" idea). Then, you share the idea of your former partner with a new partner and repeat. Keep switching until each card has five numbers on the back. The moderator is keeping tabs on the interactions and stops the group. If there are more than five, cross out the last ones. Add up the remaining five. The moderator then asks for any 25s and participants read them out. And so on (24, 23, and 22, down to 18 or so). This exercise allows groups to maximize their face-to-face time, finds a way to gather their thoughts and to actually talk. It also provides a quick gauge for how the group is thinking, giving you the top 10 or so topics with which the group resonates.

Top results of exercise (n=41):

- Sharing results of what worked and what didn't with regards to using mHealth content in the field (23 out of 25)
- How can I design my mHealth intervention so that it answers the question "does this mHealth intervention provide added value to this program?" (23)
- Logic models or theories of change for M&E of mHealth interventions (22)
- What are the top 10 most common issues that come up in the early stages of mHealth program implementation and basic trouble shooting tips for dealing with them? (22)
- Some examples of successfully scaled –up and sustainable PPP in mHealth. (21)
- One place that I can find mHealth initiatives that have already been piloted and that could be scaled up. (21)
- How to get mHealth & ICT for Health viewed internally as strategic and not just an add-on tool? (21)
- How to effectively evaluate an mHealth project? (21)
- How do we promote integration into health systems and across health areas for mHealth? (20.5)
- How do we bring mHealth technology to scale in resource-limited settings? Who pays for the maintenance of the technology, i.e., SMSs, smart phones, etc.? (20)
- Better tools for testing & quality assurance.(20)
- Health Impact of mBCC (20)
- Which mHealth learning tools and approaches work best in low-resource settings? (19)
- Examples/ideas for sustainable financing mechanisms for mHealth programs that involve the private sector (18)
- Commercialization of/around your product/program, i.e. commercial sustainability (18)
- Business model for sustainability (18)
- How can pilot mHealth projects go to scale AND be linked with health education and training (17)
- Study design issues in evaluation (17)
- Mobile money (17)
- How to achieve better communication among donors in order to avoid replication/recreation of solutions (17)
- How to engage telco's successfully (17)
- How to improve data quality and completeness (17)
- How do you engage consumers and physicians to use remote health monitor tools? (16)
- How do I convince my donor client that mHealth is not about the "m" but about the health? (16)

- A vision of what is possible for mHealth – examples of coming innovations in technology (16)
- To mainstream more rigor into projects and lower the hype (16)
- A better knowledge of technology standards (15)
- Using cellular technology as a data collection tool to monitor treatment adherence, patient knowledge, etc. for research studies. (14)
- Cloud computing/storage/retrieval for clinical and educational enhancement/efficiency (14)
- How to advocate for digital literacy in standard organizational capacity-building agendas (14)
- Strategies and approaches (14)
- Status report of mHealth policy initiatives by country as implemented by MOH – a standard for evaluation maturity of mHealth by country – contact info of MOH mHealth implementers included in the report (14)
- How can mobile technology help me to identify "unique" individuals? Is the John Doe in my mHealth application the same person in your mHealth application? (13)
- Health hotlines (13)
- Who is in charge of message and text? Doctor? Nurse? There is a legal framework? (13)
- Fingerprint-based software per frontline health workers to use in registering/monitoring/collecting data on patients. Currently used by Project Asha in India (12)
- Open source platforms (12)
- Use of mHealth to transmit patient information between providers (CHW, Facility) and to coordinate care across time or place (12)
- An mHealth application that people can use to self-diagnose and receive a treatment plan (12)
- How can GPS/GIS/Mapping help me in my mHealth solutions? (11)
- Technological limitations (11)

Annex 3: Notes from the Planning and Design Group

Facilitator – James BonTempo, JHU CCP
Note taker – Angela Nash-Mercado, JHU CCP, K4Health
Participants
Marco Ambrosio - Sapient
Amy Cannon - Save the Children
Magnus Conteh - World Vision
Judy Chen - University of Southern California
Peggy D'Adamo - USAID
Anne Marie Dinaro - Manoff Group
Jacqueline Dubow - World Bank
Gladys Faba - National Institute of Public Health, Mexico
Bernice Figueroa - Currie & Brown
Joy Kamunyori - JSI
Laura O'Brien - MSH
Yuen Ouelet - Carre Tech
Marion McNabb - Pathfinder
Adrian Pacheco - Secretaria de Salud, Mexico
Sharon Parcchiana - DOD
Esteban Perla - URC
Lucia Ruggario - PAHO/WHO
Lianna Sarkisian - World Vision
Shaun Truelove - JHSPH
Olivia Velez - Columbia University

A. Experience and Challenges
What is your experience with this topic?
Projects that were successful did research and used a business plan, (InfoDev Project, World Bank) had a model/template, the elements included sustainability, costs, outcomes, etc. and a good understanding of the market. Overall, projects need to focus on the health impact and ask what's the gap and is the solution appropriate for the audience and what is the opposition? Also, include a contingency plan.
Landscape analysis – look at what others have done – what works and what doesn't. This can help you identify good ideas as well. Build on things that have worked.

Need to engage all your stakeholders from the very beginning.

What barriers or obstacles have you faced in this area?
Systems and policies set the context in which you can work.
Transforming health service delivery
Narrow thinking
mHealth as an approach to achieve a health priority - mHealth is one solution and not an approach.
When you are talking technology, you have to engage stakeholders that may be outside the health sphere

Capacity gap….integration is larger as well
need to speak multiple languages
multidisciplinary coordination

need to manage expectations….

Diversity of audiences – need language that is universal and this is a big challenge
Therefore, we need a shared language for mHealth for people working in various systems
Tendency for people to think of mHealth as a silver bullet (inflated expectations)

Sometimes new processes are created so some **change management or planning is needed** – because you're modifying existing processes and workflows…so you need to be prepared to help facilitate this and thus need a long-term strategy.

Changes happen fast so being aware of **interoperability** – remember it's a piece of a bigger system – interoperability at multiple levels

Look at the example of Kaiser example or time it took to integrate systems

Consider ALL stakeholders- ensure that the end users are involved in the design and that they are comfortable with the end product.

Integration into the health model.

Donor expectations and flexibility

Issue of **accessibility and capacity gaps**

B. Addressing the Challenges
Never design without **involving the end-user**, looking at acceptability
Models for process improvement – stratify users – use early adoptors to assist
Have landscape mentality or total ecosystem approach
Have a **modular** or phased approach
Be agile and continue to **learn throughout**
Start with the **evidence**

Regarding donors and other stakeholders, need to educate them – find out what motivates them then target your solution to address those issues as well as the donor issue

Include the network operators in the planning to address the accessibility issues.

C. Help and Resources

PAHO – has toolkit on how to develop mHealth policies and how to create collaborative groups (at the policy level) online (Ana Lucia Ruggiero)

World Bank has some templates to share

Annex 4. Notes from the Technological Considerations Group

Facilitator & Note taker: Heather Vahdat – FHI 360

Participants:

Daniel Cothran – JSI
Chris Rogers – UN Foundation
Mike McKay – RTI
Matthias Wiklund – JSI

The focus of the discussion was on what technological and technology-related considerations are important when planning for a mHealth intervention.

1. Environmental Considerations:
    - Electricity or other means of charging hardware available?
        - Small-scale enterprise opportunities (e.g. small-scale hydro-electric; wind)
        - Car batteries
        - Solar panels
    - Mobile network accessibility
        - Do users have access to mobile networks, mobile phones?
    - Regulatory considerations
        - Customs and other regulatory requirements; particularly for international organizations working in developing countries
        - May be more feasible if work can complement another organization bringing more business to the area (e.g. larger mobile company moving into new market – gather data re: access/towers, etc. that can support their larger goals – also tied to bullet below)
    - Potential donor/partner constraints
        - Particularly in cases with corporate partners who may have specific interests in the implementation area (e.g. expansion of 3G)

2. Equipment needs:
- Large-scale equipment is not necessary in most cases.
- Programs with large volume needs are better served working with technology partners who have the appropriate servers and relationships with mobile operators.
- For small-scale, "in-house" operations, often more cost-effective hardware can be employed (e.g. laptops, recycled desktop computers)

3. Technological literacy
- Important to assess the needs of the users
- Literacy is often mentioned but not always a barrier – individuals are skilled at getting assistance if needed
- Assess the type of technology best suited for the program (e.g. mobile phones, in-facility touch screens, etc.)

4. **Accessibility**

For mobile SMS-based projects, how will users connect with the system

- Basic phone number
    - Inexpensive
    - Easy set-up
    - Not as easy to memorize/promote
- Short-code
    - More marketable (easy to remember, etc.)
    - Recognizable as an SMS-based system
    - May take more time to establish
        - Obtain short code lease through regulatory authority
        - Generally requires third-party aggregator support to register short-code across multiple network providers

5. Mobile Delivery Platform

- Web-based platforms (e.g. clickatell)
    - Basic survey – simple question-response interactions
- "off-the-shelf" platform (e.g. FrontlineSMS, RapidSMS, etc.)
    - Small-scale programs, also with relatively basic functionality but support more complex or longer periods of interaction (e.g. collecting data from cadre of CHWs)
    - Small- to Medium-scale, more advanced or tailored functionality, known users (e.g. not general public; lower-SMS traffic).
        - Usually requires programming staff
- Technological platform providers
    - Able to support large-scale, high-volume, and complex programs (e.g. ping-pong or tailored user interactions)
    - Some organizations capable of providing end-to-end support with established mobile operator relationships
        - Potentially expensive; however many small, low-cost , and non-profit organizations available
    - Other specialized organizations that handle specific aspects of system needs
        - Aggregators provide access to mobile operators; ability to quickly provide short codes
        - Platform developers who can program tailored systems
        - Often such organizations start small, then expand to provide a wider range of services over time; can impact cost

6. Staffing Needs
    - Software development?
        - Necessary if developing/managing a mHealth platform in-house
        - Can often identified cost-effective, sufficiently qualified individuals with programming skills
            - Community networks (e.g. Ruby on Rails)

- Expertise is growing quickly so many smaller, local organizations also available to provide cost-efficient support through consultancy
    - Often issues with growing pains with organizations getting their business legs
    - One challenge is that the expertise is growing quickly so often the “grass-roots” level organizations quickly transition into organizations seeking larger, more lucrative projects
- Also consider investing in training for less educated staff; however similar risk for retention as increased skill set allows staff to seek higher-paying positions

---

Annex 5: Notes from the Scale-up Group

Facilitator: Kelly Keisling, NetHope
Note taker: Heidi Good Boncana, JHU/CCP
Participants:

Willow Gerber - MSH
Abeba Taddes - Results for Development
Lesley-Anne Long - Open University
Thu Dirch - FHI 360
Sladego Torgberu - FHI 360
Reid Miller
Yuri Ostrovsky - MIT
Pamela Marks – URC

Kelly Keisling: To what extent are mHealth solutions are available to a wide audience (within country) and to what extent are these adapted to social contexts? Cost efficiencies? Capacity of local technology partners and capacity to support these projects? Potential for an mHealth program to contribute nationally (as opposed to as a pilot)?

Some challenges mentioned by Kelly: lack of evidence for national level adoption, replication of practice, streamlining high-resource projects to low-resource environments, software catch-up, project management needs, scale up may work better on a gradual growth track as opposed to a gradual growth appropriate which may be more appropriate, partnerships, logistics, supplies, capacity building, quality considerations.

Group discussion:
Lack of government buy-in. Government systems do not yet support mHealth projects so obtaining support can be difficult.
How do you have a management structures that consider new technologies? It's often difficult to choose the right answer from the beginning, however once you take a path and pilot a project and then have data (which may take 2 years+) technology has already changed.

Deterrence to scale: Replication of processes lessen efficiency, for example, inputting data by phone in addition to paper based registers. Often, multiple project require different types of data collection, and/or CHWs are used to doing things one way and are reluctant to use the newer technology, and/or there is cache in carrying paper registers as a means of status.

When talking about scale, it must be more than project based. Must be programmatically integrated with Government buy in so that health system has support for programs, otherwise mHealth programs may run in **parallel** to more traditional programs. mHealth programs are usually initiated by outside / international partners.

How do we engage the government and grassroots agencies, communities of practice and working groups within the government so that government can support the work. (i.e.: working with representatives from agencies that government already supports for specific health areas)? So when it comes to scale up, it can be smooth, but only with community and government engagement early on. There should be a national policy on mHealth to support scale up.

Example: Distance education program for health extension workers (for example) in partnership with UNICEF. Constructed as print learning courses, now updating refresher courses with audio, multimedia, etc. Supervision is a hindrance to scale up, Even though the MoH in Ethiopia invited them to roll out this project.

Confusion within and between ministries about mHealth programs. Governments will not get involved if they feel they don't have the capacity to manage it. Must look at issues of digital literacy. Being able to have people at Ministry level to even procure the services appropriately is a challenge. Management issues must be considered!

Working with local experts is key, then making content easily available.

Kelly: Has anyone worked on a project that has gone to scale? What were the challenges during scale up?

At pilot level, focusing on MSM. During scale up level, the program opened up to female sex workers, people living with HIV/AIDS, sugar daddy relationships. But then we had to be careful about **context** due to stigma. Challenge was working with clients who had socially less acceptable connections (sex workers) because a risk of exposure/need to retain privacy.

Donors are more interested in new innovations rather than *funding new innovation*. Need to have different approaches for pilots versus scale up when addressing donors. Partnering with government is a critical first stage.

Cost is a challenge to scale up, not only in increasing scale but in training.

There is often a lack of trust in data and a need for validation of numbers/need for supervision.

It's easy to acquire mobile phones, but how do we ensure that a message we send to our clients are received? People often change phones/sim cards, or share phones, so there is a challenge of receiving message and monitoring.

Is it possible to scale a project that relies solely on funding? It may need to be part of something else that has a market solution. Look at the Grameen phone model, where phones proliferated in some other way, then medical solutions were added to the phones. Even if a pilot is effective, it may be financially prohibitive, so there must be an added incentive to promote longevity.

Important to build a project based on a business model. However, there is a distinction to be made between working from a business model versus working towards a health goal.

Uniqueness to mHealth: individual audience, important to demonstrate mHealth as a complimentary tool to an eHealth system

Technology is changing regularly. Solution: don't think of pilots, but as how to adopt/adapt to new things. Some issues of scale is solving itself through carriers creating new bandwidth and people buying new phones. Projects must be flexible.

Lack of government buy in. We forget key people (advocacy to decision makers). Government support and systems.

Projects often have high turnover. Solution: build buy-in among a base of health workers, and make sure that people at all levels are highly invested.
Phones are very personal. They have the ability to be customized at almost the level of the individual. We must designing programs to reach a broad swath of the population.

Use champions to show how to apply information into practice/practical training.

We have such a singular approach to mHealth (mAg, mMoney, etc.) The agriculture sector does a great job of knowledge exchange because they think of it at **systems** level. We need to reframe discussions in health to be at systems level to go to scale.

There also needs to be better communication and coordination among mHealth community/experts, including a clear vision of what we want to see.

Must be a focusing on multimedia, practical skills training, professional partners, and motivation/incentives.

Key takeaways

- Plan for scale from the beginning!
- Share strategies and approaches to mHealth
- Conceive of programs holistically, at systems level
- Need for better communication and coordination
- Build models that can be applied across health areas
- Must collaborate so as not to replicate work/create inefficiencies
- Work with Ministries of Health and stakeholders from early on to get buy-in
- Build buy-in at all levels to combat high turnover
- Even if a pilot is effective, it may be financially prohibitive, so there must be an added carrot that can promote longevity.
- Technology is constantly changing. Let's not think of project "pilots" but instead as adapting to new things

---

Annex 6: Notes from the Sustainability Group

Facilitator: Pamela Riley, Abt Associates
Note Taker: Carrie Miller, Catholic Relief Services
Participants:
Christine Lasway – FHI 360
Paul Fontelo - NIH
Benedict Hoefnagels – Sight Savers
Anna Gerrard –Emerging ICT Group
Alice Liu - Jhpiego
William Lester - Npoki
Mike Smith - JHSPH

Summary

Problem statement: The sustainability group included about ten participants from the non-profit, academic and for-profit sectors with a range of mHealth experience from just getting started to in-depth involvement with a large-scale initiative (MAMA). There was consensus that sustainability needs to be considered from the beginning, yet there are numerous challenges preventing this from happening. These challenges include donor timelines for both proposal submission and project duration. A push by donors for innovation has led to a proliferation of pilots and non-interoperable systems. And while the purpose of a pilot is to generate proof of concept information to determine if scaling is appropriate, too often funds run out and the intervention is not scaled – even if it could be worthwhile.

Country ownership: Another challenge discussed was the different risk-tolerance levels and data needs for stakeholder decision-makers within the mHealth ecosystem. For example, before buying into a solution a Ministry of Health (MOH) may want cost-effectiveness, health outcome or impact data (i.e., does the intervention actually change behavior?); yet the timeline for gathering these data may exceed available financial resources which are often time-bound by the grant mechanism. Other stakeholders, for example, telecoms may only need a convincing value proposition or business case to gain buy-in – yet gathering the cost data to make a convincing case can be a challenge. And finally, it isn't always clear where staffing to develop and maintain the system/solution will come from once seed/grant funding runs out.

Revenue options: To address these challenges, group members with experience in this area suggested that it is important to develop at least ten sustainability strategies as only a few may work. Often what works is only discovered through trial and error and may not be the same across contexts. Therefore learning from what doesn't work and flexibility to adapt to changing circumstances is essential. For example, in Bangladesh under MAMA, they are exploring a bundling strategy. Farmers, who are mainly men, paid for market price information, and this service could subsidize the cost of sending information about pregnancy for their wives. In Ghana, when this concept was floated, the idea was not deemed feasible. Other strategies include corporate underwriting, advertising messages, user fees, and personal philanthropy "buy a mother a gift".

Technology cost containment: In many low-resource settings, qualified IT staff is few and far between. Those with the most experience are hired by private sector companies with salaries that the public or non-profit sectors cannot match. As a result, public sector/non-profit entities are often grossly understaffed. Strategies to address this include using propriety software, which means that the vendor is responsible for providing technical IT support, and can be held accountable. While the costs of the licenses may be high, technical support may be more available and less expensive. The downside is that new licensees may be too expensive for countries to purchase and technical support may only be available outside of the country and not available when needed. On

the other hand, open-source solutions can be innovative and can be updated without the cost of new licenses. Using open source creates demand for IT staff and can stimulate the IT sector in countries and contribute to capacity strengthening of the country and employment. Yet, it can be difficult to find IT staff with the ability to manipulate the software – so while there is less is spent on licenses more money may be spent on technical support. It is essential to examine *total costs of ownership* for the product. Other strategies proposed to address staffing issues included "in-sourcing" or identifying y pools of qualified IT staff across Ministries e.g., Ministry of Telecommunication and share these resources with MOH or developing a rotating internship with IT schools where placement is in the public sector for 1 or 2 years before moving onto the private sector.

Promising business models: In terms of resources for sustainability – looking at examples was recommended. Switchboard in Ghana was a partnership among MOH, Vodafone and others who got all doctors and nurses in the country to sign up for their services. In network calls among the doctors and nurses are free in order to facilitate referrals. At the same time, calls outside of this group were charged. This created a win-win scenario – Ghana Health Services improved referrals, which benefited patients while Vodafone generated lots of clients with the ability to pay for their services.

Experiences and Challenges

What are your sustainability challenges and questions?

- Pilots are implemented, but it is unclear who provides support once the pilot is complete.
    - What resources are available to provide support and capacity?
    - Who supports the technology and the tools to sustain and use the program going forward?
    - What are best practices from other areas of IT? Can we learn from this?
- Donor funding isn't sustainable. MOH's are asked to make decisions about areas where they may not be well placed. How can we bring in others, e.g., Ministry of ICT to assist with the entire ecosystem?
- In the case of disease elimination where a solution only is needed for about 10 years, what options are available to get MOH buy-in into a top to bottom digitized solution – particularly if the drugs are donated, volunteers distribute it for free…there aren't any obvious commercial aspects. When it is reasonable to solicited donor funding v. using an organizations own resources?
- Why doesn't the sustainability question get asked in the beginning? If a model isn't available, why bother starting? Given interest in mHealth by the private sector, are there more examples of where collaboration has worked?
- Sustainability must be part of planning – particularly in the developing country context. If there is no sustainability plan – then it is just a pilot.
- Financial and institutional sustainability are critical? Where is the leadership behind this? Will they adhere to highest level of technical quality?
- How do you generate the data to make the value proposition to the various stakeholders?
- What evidence is needed to get all the partners to the table?

Other themes

Risk tolerance and Information Needs of Stakeholders

- Identify appetite for risk among stakeholders. There is a level of risk tolerance among certain partners and come back to impact later. Others might be less risk tolerate.
- Need to play to the interest in each partner e.g., figure out ways to get commercial brands in front of consumers; how much eyeball time do people get?
- Stakeholders are interested in different pieces of information which informs information needs e.g., government may want to know if get more people to clinic;

Create Value across Stakeholders

- Creativity is needed.
    - Bundling of services may create value e.g., combine information that farmers needs such as market prices and allow this payment to subsidize cost of sending mothers messages. In Ghana this didn't work.
    - Trial and error is required. Therefore having about 10 ideas with the knowledge that maybe one of those ideas will work.
    - E.g., EpiSurveyor – 1% of customers pay; the rest of customers get it for free.
- Look to the private sector for ideas. When a system is implemented throughout an enterprise they are "in it all the way". A phased approach is developed – Phase I, II, and III. A similar approach could be built into a grant. The private sector also plans for IT support, etc. over time and so should non-profits.
- Engage all stakeholders from the beginning. Often this step is skipped in donor-funded programs. If people see the investment as strategic and part of *their* overall strategy, this increases the likelihood it will be budgeted for.

The Government and Sustainability

- Often sustainability plans assume government will take over the solution. E.g., In Tanzania IntraHealth has a good HR system; but the MOH will not assume the cost. Therefore a local champion is necessary for local ownership.
- There are different challenges with government systems due to challenges in general with gov't systems. Health sector budgeting is a systemic challenge, and ministries of health need assistance in advocating for mHealth investments.
- Taxation systems may be required to support the system.

Innovation & Staffing

- A push for "innovation" by donors often leads to starting over; perhaps the innovation should be to go to scale.
- To address staffing needs for smaller programs, consider partnerships with universities to create work/study programs similar to MIT's Innovation lab where students compete for the opportunity. Over time the interns become developers and help to build a system.
- Competition from the private sector e.g., Oracle in countries like Lebanon and Jordan is high; this resulted in a high turnover rate in the government with staff staying only 1 to 2 years. Need to design staffing plans that recognize this turnover.
- Companies may sponsor them as a sabbatical for staff e.g., Intel.
- Encourage more people to be trained in public health bio-informatics.
- Young techies are interested in doing mHealth abroad could be used to build in country capacity as long as there was a manager and a way to help them understand the country.
- Local Champions are essential. In Abt's case they worked with a local NGO with deep knowledge about communications and rural/poor women in Bangladesh.
- "In-sourcing" may be a strategy to address IT staffing needs. E.g., one country had strong IT staff located in the Ministry of Telecommunication, which they considered sharing with the Ministry for Taxation. All Ministries were competing for the best IT staff. By creating a pool of talent that can be shared across Ministry needs are met and cost could be kept down.
- Mobile technology is a mechanism to reach the right people for training. Training attendees are often determined politically as opposed to making sure the right person is there.
- Some application may facilitate access for women.

Cost, Return on Investment and Total Cost of Ownership

- Cost data is essential – but the reality is, it is hard to get
  - E.g., CommCare – we believe it will be beneficial
  - When CommCare analyzed the cost of supporting them - $110/CHW. This includes the significant management costs and formative research that can be amortized overtime as interventions scale.
  - Is this really cost-effective?
- What is the time spectrum on return on investment?
  - Need to look at the long term investment
- A potential resources for return on investment could be available through Int'l Planned Parenthood

Barriers to Sustainability Planning

- Traditional or donor funded models impose certain constraints:
  - A focus on innovation means always starting over
  - Insufficient resources to invest in an entire system
  - Projects are short –term – so encourages short term thinking
  - Proposals need to be cost competitive and sustainability may have associated costs so costs get cut
  - No incentives for sustainability – no post-project evaluations
  - There may be disincentives to create something that is financially sustainable within the grant period as funds could be cut
  - Organizational culture of NGOs different than the commercial sector
- Problem definition and process are critical
  - Technology does not replace methodology
  - Process oriented thinking is needed
  - Specifications need to be right first
  - Yet, this is easier said than done especially since mHealth is new to the health community and everyone is learning. We are coming to the table with health objectives so and we don't always know what the "best" solution is
  - Mission creep is a risk when health people begin to listen to IT people who can often drive the agenda
- Working towards an entire system can encourage sustainability
  - If there is a solid system that is interconnected with other systems e.g., ag system is linked with a financial system changing an element of that system becomes more difficult, especially if it has been in place for some time
  - This is even the case if there is a regime change which often encourages new systems to be put in place
  - Interoperability is critical
- Devices
  - Technology e.g., laptop or mobile phone has the potential to change society
  - Smart phones can be donated and cost covered for a certain amount of time; then users can assume cost and maintenance costs. Generally once users start using a smart phone it creates a willingness to pay

Knowledge Management and other Resources

- Many institutions, e.g., JHSPH have no long-term record of what works and what doesn't

- Outside of periodic Fail Fairs there are few industry wide forums for this type of exchange
- There are an increasing number of tools available e.g., the Hub, HingX that perform a library function, but they depend on crowd sourcing to be populated and many of us don't have time to insert our information
- World Bank held a meeting on mHealth two weeks ago
- The mHealth Working Group is a forum for discussion; FHI360 has a mHealth guide and today's discussion will contribute to making it more useful
- A wiki may be another way of sharing information
- Mobileactive.org – good for information exchange and peer learning; lots of resources that are in the field.
- Certain individuals such as Katrin Verclas are very knowledgeable about the field

Examples of Sustainable Programs & Approaches

- Switchboard in Ghana developed a commercial product that created a network of doctors and nurses on a single mobile provider – Vodafone. They have free in network calls to facilitate referrals and Vodafone generates paying customers and charges them to make calls to others. They are using a similar approach in Tanzania.
- Request data from telecoms, but in return provide the analyzed data back to the telecoms to inform them about their customers e.g., Abt in Pakistan is trying to use SMS texting to create incident reports.
- Mobile operators want to expand their market share. Therefore if they can generate revenue from their data this is of interest. For example, mobile transactions including mobile money and flashback calls can be used by credit bureaus as a proxy for income.
- Mobile operators are wary of speaking with NGOs. To make these interactions more effective, there needs to be a way to help them improve their services and expand market share.
- Marriage of mobile health and mobile money is unexplored sustainability model. Mobile money helps may create an avenue for more cash transactions around health.

Open Source v. Proprietary Software

- The decision to go open source or with priority software should be based on total cost of ownership – which needs to include the staffing necessary to run and maintain open source materials
- Alice has tools for calculating TCO – perhaps check GESSCI
- Calculating TOC is a challenge. At times proprietary software works better than open source. The relationship with the vendor can be valuable as technical support becomes available
- With open source – strong developers are needed and they are not necessarily readily available. There may be a pool of talent, but as they get "real jobs" they often drop out of the open source community.
- Models like Datadyne are appealing. They believe what is appealing about open source is its low cost. In their "Gmail" model, an easy to use platform is available for free with paying customers providing the subsidy.
- Interoperability – is essential;
- Open source can be a way to stimulate the IT sectors. Open source is really an advantage for the developers, not necessarily the consumer

Next Steps

- The mHealth Implementation Guide outline covers each topic discussed in today's meeting and the best ideas will be incorporated. This will be a web-based tool.

Annex 7: Notes from the Evaluation Group

Facilitator: Kelly L'Engle, FHI 360
Note taker: Leona Rosenblum, JSI

Participants: Frederique Vallieres, Trinity College Dublin; Trevor Lewis, R4D; Sarah Hiller, JSI; Leona Rosenblum, JSI; Courtney Roberts, International Finance Corporation; Kathleen Hill, University Research Co.; Cornelia Lee, FHI 360; Emily Crawford, Johns Hopkins School of Public Health; Lavanya Vashdevan, WHO; Lily Wei, GWU.

Why are we interested in evaluation, and what questions are we hoping to discuss in this session?

- How are people evaluating their mHealth programs? Are they?
- Can we develop a replicable mHealth evaluation?
- What kinds of innovations are right for mHealth? Is it randomized control trials? Or are there other options?
- Focusing on evaluating the program in its use of the technology vs. a program that doesn't use the technology, not simply evaluating the program at the whole.
- mHealth as a standalone intervention? Ways mHealth can strengthen health systems strengthening programs?
- What are the key guidelines for evaluating the impact of the technology, the health outcomes, and how the technology is contributing to the health outcomes?
- What is the approach for evaluation when you are working in resource poor settings?
- Use of different study designs in evaluation. RCTs the way to go, given the pace of technology? Generally, there is an emphasis on evaluating health outcomes, but mHealth provides novel ways of providing access to already validated interventions (i.e. we already know that if you access this intervention, it improves health outcomes). Here, we want to know if the mHealth piece really does allow for improved access.

Relevant Take-Aways from the Research Session, Linking them Back to Evaluation

- Interrupted time series. Modular research (take pieces out, put them back in as you want to speed things up).
- RCTs can be very difficult in the field. Operational research is different than in the lab.
- This is not a new conversation for the development/public health field.
- Those who are implementing don't have time to do these large rigorous evaluations and funding for it, how can we make it easier for people to come up with real data.
- (In the case of mHealth for BCC), is all we need to do is evaluate that we are providing the health information? Because we already know that people who get more health information actually follow-up and perform these actions that you're looking for.
- Maybe we do have to take it to the step where we find out whether or not people uptake the new behavior, but we don't have to see if that behavior improves health (this is already proven elsewhere).
- We already know that just giving people information isn't enough, so does providing info via mHealth provide motivation?

- Logic frameworks for different uses of mHealth, and then indicators for those different logic frameworks.
- RCTs have high internal validity but low generalizability. So what are the alternatives!
- An example: A cluster randomized trial of CHWs using mobile phones to provide care to pregnant women, designed to be very carefully controlled. The women were contaminating the trial data because they go home to their mother's house when they are 6 months pregnant….changing who is control, who is intervention. Very hard to do RCTs, very hard to keep it truly random, keep the data clean.
- What kind of evaluation model can we offer to people who are just jumping on board to implement and then they want to evaluate it later?
- What happens when indicators shift, implementation changes over time.
- M4RH program: piloting new ways of collecting data. SMS based opt-in program, promoting information about family planning. Anytime someone accesses the system we can see where they are, what kind of family planning info they are interested in. But then we send other questions, age, gender, what kinds of family planning information did you get? About 50% of people respond to each question. Look up Kelly's article in Contraception for more information.
- Brings us back around a bit to look at when and how you isolate the evaluation of the technology from the evaluation of the whole program (for health impacts).
- Radical shift: when you use mHealth, the intervention will change grow, different iterations. Can't keep an intervention fixed in its first version.
- Keep in mind that you're also in the process of changing the health system, so how does that change in the system affect your intervention?
- Need to give time for the initial iterations, work out the kinks, and need to be testing the usability for the mHealth intervention. Then you can start testing it in real use.
- What tools do we need?
    - Category break down between health systems interventions and client-centered interventions is really helpful, would be great to know exactly what we do know.
    - Evidence listed broken down by category
- WHO is convening an mHealth technical advisory group next week, designed to create that evidence list.
- Evidence working group at mHealth Alliance is working with the WHO group

Report Out

Generally: kept coming back to the fact that mHealth interventions are not stand-alone projects, they are components and tools of larger programs. This means that some of the challenges relating to evaluating mHealth projects are challenges public health implementers have always been grappling with.

1. Randomized Control trials vs. something else. New, innovative research methods, how do you make sure that your results are valid, that you can provide high quality information at the speed you need it, that you can evaluate programs that are already running, and that you aren't ignoring the potential for contamination through human factors.
2. Evaluating the mHealth component vs. evaluating the health impact.

3. mHealth Interventions grow and change at a different speed than other interventions, and we have to accept and embrace that in developing evaluation systems.
4. We need up to date information on the evidence that is available and where the gaps are.
5. We need a guide for public health implementers to assist them in planning for mHealth evaluations (indicators, methods).