mHEALTH ALLIANCE

mHealth Support Tools for Improving the Performance of Frontline Health Workers:

An Inventory and Analytical Review

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We hope this report provides a foundation for further investigation into the use of mobile health tools to support the performance and accountability of Front-line Health Workers in low- and middle-income countries.

List Of Acronyms And Abbreviations

ART	Anti-retroviral Treatment
ASHA	Accredited Social Health Activists
CAMCAP	Central America Capacity Project
CBA	Community Birth Attendant
CHW	Community Health Worker
CIDA	Canadian International Development Agency
DFID	Department for International Development
d-IMCI	Distance IMCI
DOT	Directly Observed Therapy
eHealth	Electronic Health
EWEC	Every Woman, Every Child
FMOH	Federal Ministry of Health [Ethiopia]
FLHW	Frontline Health Worker
HBC	Home-based care
HIS	Health Information System
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HSDP IV	Health Sector Development Plan IV [Ethiopia]
ICT	Information and Communication Technology
IMCI	Integrated Management of Childhood Illnesses
IVR	Interactive Voice Response
LEAD	Local Partners Excel in Comprehensive HIV/AIDS Service Delivery
LHW	Lady Health Workers
LMICs	Low- and Middle-Income Countries
LMIS	Logistic Management Information System
mHealth	Mobile Health
mLearning	Mobile Learning
mMoney	Mobile Money
MNH	Maternal and Newborn Health
MOH	Ministry of Health
MOHP	Ministry of Health and Prevention [Senegal]
MOHSW	Ministry of Health and Social Welfare [Tanzania]
MVP	Millennium Villages Project
OpenLMIS	Open Logistic Management Information System
OpenMRS	Open Medical Record System
PDA	Personal Device Assistant
QoC	Quality of Care
RMNCH	Reproductive, maternal, neonatal & child health
SMS	Short Message Service
STD	Sexually Transmitted Disease
TB	Tuberculosis
TBA	Traditional Birth Attendant
UN	United Nations
USAID	United States Agency for International Development
WHO	World Health Organization

Executive Summary

The United Nations (UN) Commission on Life-Saving Commodities for Women and Children (hereafter referred to as the "Commission) was established in 2012 to increase access to and expand the use of 13 life-saving health commodities for women and children in low- and middle-income countries (LMICs) by 2015.

To achieve this goal, the Commission made 10 recommendations, based on research into the barriers impacting the accessibility and adoption of the 13 commodities. Specifically, Recommendation 9 focuses on improving the performance and accountability of Frontline Health Workers (FLHWs), who are often the first point of care in public health systems in LMICs and play an important role in recommending, and sometimes dispensing, life-saving health commodities.

In parallel, the increase in mobile technology penetration in LMICs has catalyzed the development of mobile health (mHealth) tools to strengthen health systems. As a result, the Commission is interested in exploring how mHealth can support the achievement of Recommendation 9, by surveying the existing landscape, identifying gaps and opportunities, and establishing a framework to guide focused development.

This report outlines the findings from a three-pronged approach that includes:

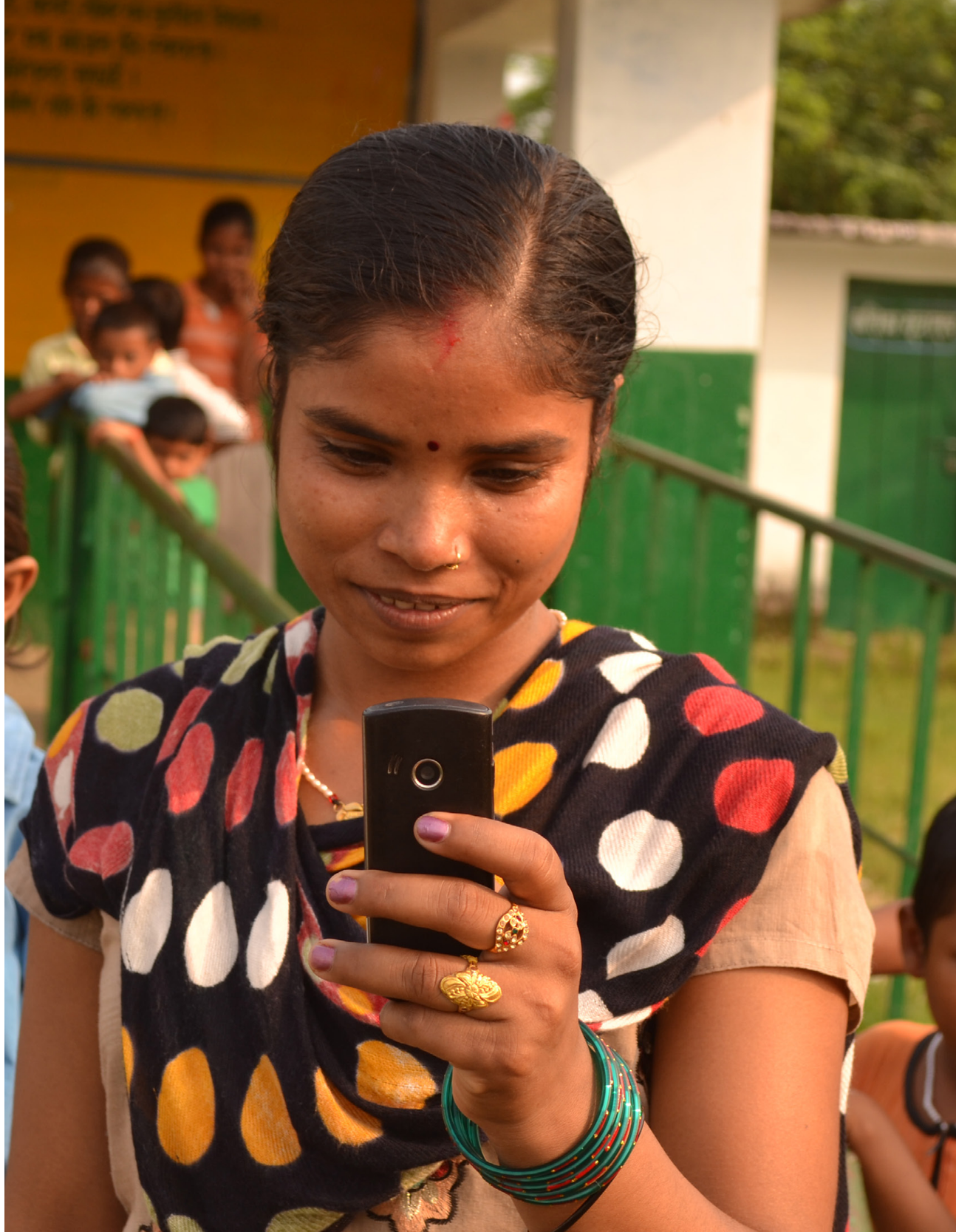
1. Establishing a database of existing mHealth tools related to FLHW performance and accountability
2. Conducting a literature review on the evidence base of using mHealth tools to improve FLHW performance and accountability
3. Developing a framework to guide the adaptation of paper-based content into mobile-friendly content.

The database research yielded 223 entries of approximately 100 unique mHealth tools globally, and the literature review found 66 articles that matched the inclusion criteria for further analysis. In general, the majority of mHealth tools identified were being implemented in India and East Africa and focused on supporting patient monitoring, reinforcing learning, and strengthening counselling efforts during home visits, through pre-loaded java-based applications. Overall, the mHealth tools related to human resource management, including work planning and scheduling, performance management and compensation, were the least commonly identified.

The research found a notable shift from "single-function" and "single-disease" mHealth tools, to more integrated solutions that cut across the roles and responsibilities of a FLHW, and content related to multiple diseases and commodities. In cases where single-disease mHealth tools were identified, they most commonly focused on HIV, reproductive health and child survival.

The scale of mHealth tools is still limited to pilots and, in some cases, regional growth (state-level); however, there are increasing examples of multi-country mHealth pilot implementations. This continued fragmentation is largely being driven by the scale-up of platforms, such as CommCare and FrontlineSMS, that provide the infrastructure and tools necessary to reduce the cost and technical expertise required to develop an mHealth tool.

As a next step, the Commission should consider conducting content evaluations of a short-list of mHealth tools to understand how and which commodities are represented, followed by establishing a committee to drive the development of identified content gaps using the content adaptation framework. Further, as mHealth tools continue to mature into integrated solutions, the Commission should consider new evaluation methodologies and taxonomy to better align future research, strategy and policy development with rapidly advancing technology.



1 Background

The United Nations Commission on Life-Saving Commodities

In 2012, the United Nations (UN) Commission on Life-Saving Commodities for Women and Children (hereafter referred to as the "Commission") was established to address the deaths of millions of women and children that occur each year in low- and middle-income countries (LMICs) from diseases, due to the lack of widespread access to life-saving health commodities (hereafter referred to as "commodities").

Since the Commission was established, it has undertaken a process of identifying a list of essential, but overlooked, commodities. These commodities, if readily available at the right time, right place, and right cost, could help prevent the unnecessary deaths of many women and children in LMICs. This effort was combined with in-depth research on the current barriers impacting the accessibility and adoption of each commodity identified.

The result of this work is a focused list of 13 commodities and 10 recommendations to address the barriers preventing access to and expanded use of the commodities. The next step will be establishing a strategy to implement each of the 10 recommendations in the 50 countries under the UN Secretary General's *Every Woman Every Child (EWEC)* initiative over a five-year period.

Recognizing the potential for mobile technologies to support the implementation of these recommendations, the Commission is collaborating with the mHealth Alliance to lead research efforts to further explore this opportunity.

This report outlines the initial research findings on how mobile technology (mHealth) can be used to support the achievement of Recommendation 9, namely, improving the performance and accountability of FLHWs in LMICs through increased access to relevant information and tools to accurately understand, recommend and/or prescribe the 13 commodities.

Methodology

The mHealth Alliance led a three-pronged approach between October 2013 and February 2014 to inform the Commission on the potential of mobile phones to support the achievement of Recommendation 9. This process included:

1. Establishing a database of existing mHealth tools related to FLHW performance and accountability
2. Conducting a literature review on the evidence base of using mHealth tools to improve FLHW performance and accountability
3. Developing a framework to guide the adaptation of paper-based content into mobile-friendly content.

The literature review was focused on surveying the evidence base for mHealth tools that support the performance and accountability of FLHWs to identify

United Nations Commission on Life Saving Commodities for Women and Children: *Recommendations*

1. Shaping global markets: By 2013, effective global mechanisms such as pooled procurement and aggregated demand are in place to increase the availability of quality, life-saving commodities at an optimal price and volume.
2. Shaping local delivery markets: By 2014, local health providers and private sector actors in all EWEC countries are incentivized to increase production, distribution and appropriate promotion of the 13 commodities.
3. Innovative financing: By the end of 2013, innovative, results-based financing is in place to rapidly increase access to the 13 commodities by those most in need and foster innovations.
4. Quality strengthening: By 2015, at least three manufacturers per commodity are manufacturing and marketing quality-certified and affordable products.
5. Regulatory efficiency: By 2015, all EWEC countries have standardized and streamlined their registration requirements and assessment processes for the 13 live-saving commodities with support from stringent regulatory authorities, the World Health Organization and regional collaboration.
6. Supply and awareness: By 2015, all EWEC countries have improved the supply of life-saving commodities and build on information and communication technology (ICT) best practices for making these improvements.
7. Demand and utilization: By 2014, all EWEC countries in conjunction with the private sector and civil society have developed plans to implement at scale appropriate interventions to increase demand for and utilization of health services and products, particularly among under-served populations.
8. Reaching women and children: By 2014, all EWEC countries are addressing financial barriers to ensure the poorest members of society have access to the life-saving commodities.
9. **Performance and accountability: By end 2013, all EWEC countries have proven mechanisms such as checklists in place to ensure that health-care providers are knowledgeable about the latest national guidelines.**
10. Product innovation: By 2014, research and development for improved life-saving commodities has been prioritized, funded and commenced.

Source: http://www.unicef.org/media/files/UN_Commission_Report_September_2012_Final.pdf

trends, gaps and opportunities. An initial search of the literature was conducted to identify high yield search terms in select academic databases. The Boolean search terms generated included "mobile phone" AND "community health worker", "mobile phone" AND "protocol adherence", "mobile technology" AND "community health worker", and "mLearning" AND "community health worker". The following five databases were used: PubMed, Ovid MEDLINE, Google Scholar, CHW Central and Lifesaving Commodities. The CHW Central and Lifesaving Commodities databases included grey literature. Additional literature was identified using the references of articles that met the inclusion criteria. Of the 8,981 articles identified, 84 were selected for a more in-depth review. If an article was concerned with a Pathfinder country[1], it was automatically flagged for further review. Articles that focused on mobile phone-based support tools for FLHWs met the inclusion criteria, and articles, such as literature reviews, that had general lessons learned from pilots and implementations were also included. Excluded articles included technology feasibility studies and mHealth solutions not focused on FLHWs. Of the 84 articles that underwent further review, 66 met the inclusion criteria.

The database of existing mHealth tools for FLHWs was developed by establishing criteria and a taxonomy that outline the type of mHealth tools aligned with the goals of Recommendation 9 and are reflective of the 13 commodities. The development of the criteria and taxonomy was followed by applying the resulting rules while searching through eight databases housing health innovations and mHealth tools in LMICs. These databases included: GSMA mHealth tracker, Health Unbound, mHealth Working Group, Center for Health Market Innovations and mHealth Info. The database outlined 12 types of mHealth tools related to Recommendation 9, and included: patient registration, patient assessment, patient monitoring, work planning, counseling, social networking, clinical decision-making, checklists, mobile learning, care coordination, compensation and performance tracking (see Figure 1 for definitions). The database captures 12 categories of information for each mHealth tool identified, including: name of product, vendor/developer, description of mHealth tool, type of tool, related commodity(s), country, predominant technology, mobile phone compatibility, open source (yes/no), multi-language support (yes/no), platform, source data, business model, level of scale and contact information. Mobile health tools with multiple functions and/or multi-country implementations were entered as unique entries. Any tools that related to multiple commodities (more than two) were categorized as "all" under "related commodity(s)". Overall 223 entries were entered into the database, of which approximately 100 are unique mHealth tools.

The framework was established by reviewing the content adaptation process of four non-profit organizations (NGOs) involved in developing mHealth tools for LMICs, in addition to drawing from behavioural change communication guidelines and frameworks.[2] A draft of the framework was reviewed at the Commission's Working Group meeting in November 2013 in New York City, New York.

FIGURE 1: Definitions of types of mHealth tools used for database research

Type of mHealth Tool	Definition
Patient registration	Registering patients into a project specific or centralized database over the mobile phone; this often includes creating or using unique identifier numbers
Patient assessment	Data collection and/or survey administration for patient identification of a disease using a mobile phone
Patient monitoring entry of ongoing	Supporting the entry of ongoing patient medical data on a mobile phone for monitoring and data analysis
Work planning	Mobile tool supporting frontline health workers to prioritize daily, weekly and/or monthly patient load, in addition to the messages emphasized during an appointment, based on data from patient registration and assessment
Counselling	Supporting frontline health workers to deliver messages on health practices using mobile phone features
Social Networking	Mobile-based platform to facilitate collaboration and/or communication amongst frontline health workers
Clinical Decision Making	Intelligent step-by-step guide for frontline health workers to assess a patient's condition and/or inform treatment decisions; this often includes questions for a frontline health worker to ask a patient, data inputs based on the patients answers to the questions and automated recommendations based on the data inputs
Checklists	Mobile-based lists to guide sub-activities to be performed by frontline health workers to ensure optimal quality (e.g., list for sub-activities during a home visit)
Mobile Learning	Mobile-based platform to enable frontline health workers to learn health concepts, treatment guidelines, role expectations etc.; this may also include options for assessment and certification
Care Coordination	Coordination between frontline health workers and patients, frontline health workers and other health professionals, and for referrals, using the features of a mobile phone
Compensation	Mobile-platform to enable faster delivery of frontline health worker salary, performance incentives and/or resources for transportation or supplies
Performance Tracking	Mobile-based data input of completed activities by frontline health workers to monitor performance and/or calculate salary/incentive pay

2 Mobile Health for Frontline Health Workers

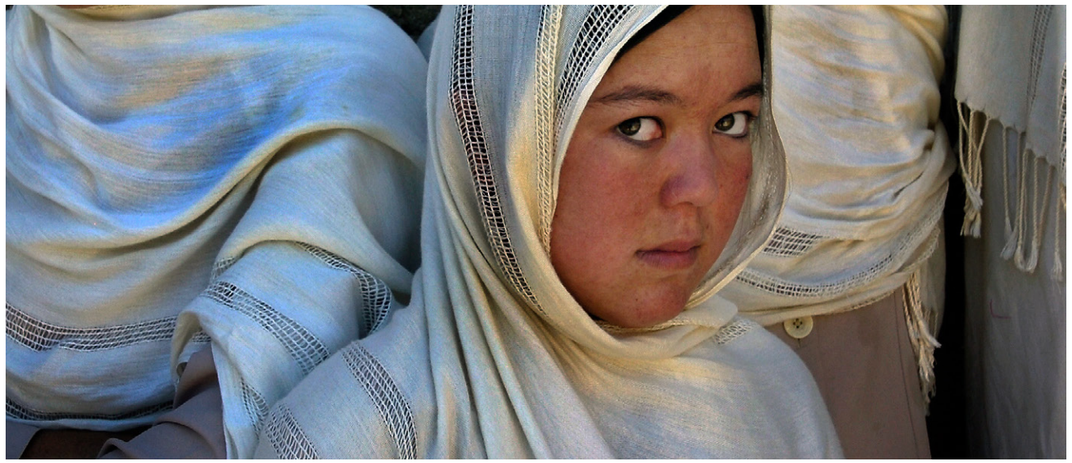
FLHWs are often the first point of contact that a community has with the health system in LMICs. They play an important role in persuading families to adopt life-saving health practices and linking the community to the broader health system.[3]

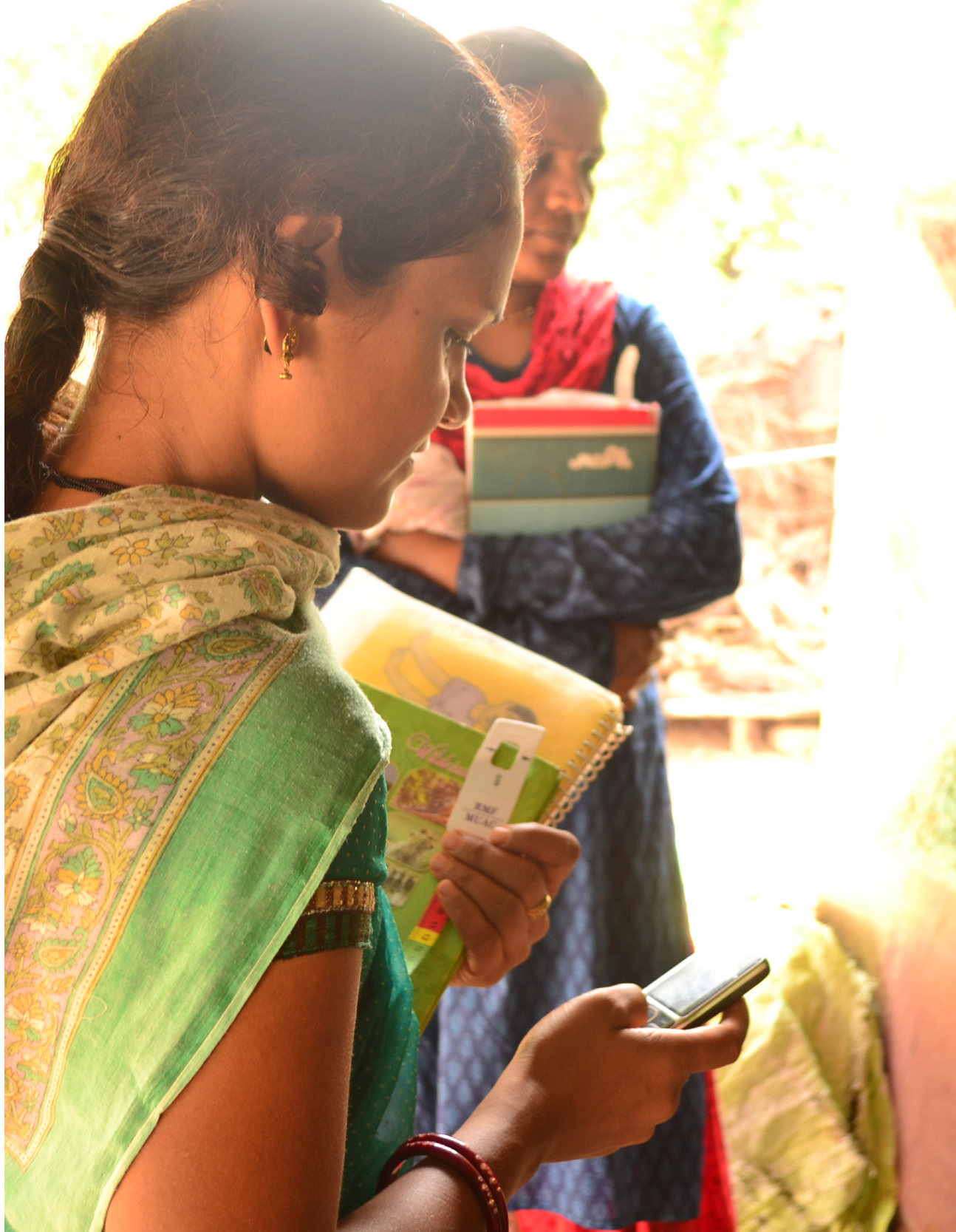
Despite the integral role that FLHWs tend to play in rural health systems in LMICs, they often receive limited training[4] and supervision, inadequate pay and few opportunities for professional development.[5] As a result, an FLHW's ability to support the adoption of life-saving health commodities to improve health outcomes for women and children is often compromised.

> "Governments and private organizations are exploring how mobile technology and connectivity can be used to support and achieve improved health outcomes for women and children."

With rapidly increasing mobile phone penetration rates in LMICs, governments and private organizations are exploring how mobile technology and connectivity can be used to support and achieve improved health outcomes for women and children. One such application is the use of mobile technology to support the performance and accountability of FLHWs in delivering high-quality care by improving access to information and tools across the continuum of care for women and children. This includes the use of mobile technology to: support end-to-end patient management, including registration, assessment and monitoring; improve productivity using tools to organize daily work plans; reinforce training and health behaviour messages for FLHWs and patients through learning modules; provide more standardized and quality care through checklists and clinical decision support; and reduce the time to distribute compensation, performance incentives and/or travel reimbursements to FLHWs.

As part of the Commission's work to identify strategies to increase access to and expanded use of the 13 short-listed life-saving health commodities, the mHealth Alliance led a three-month research project to assess the current state of mHealth tools to support the performance and accountability of FLHWs in LMICs.



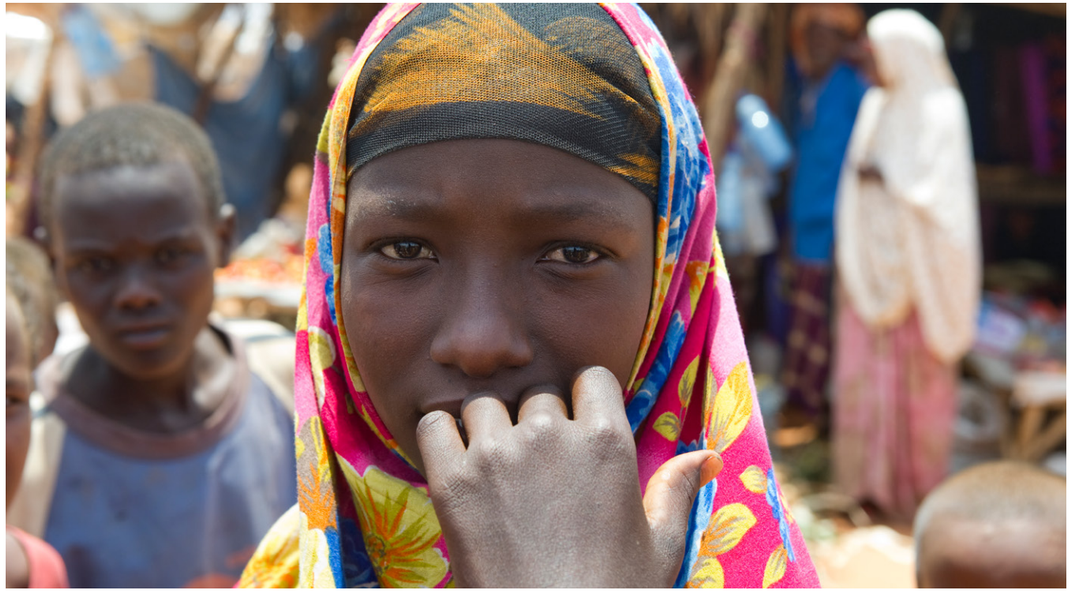


3 Overall Findings

Our database research into the current state of mHealth tools for FLHWs found approximately 100 unique mHealth projects (223 in total) being deployed mostly in India and East Africa as pilot or regional programs.[6] Our literature review results yielded limited relevant articles, suggesting that organizations are perhaps more focused on implementation of mHealth tools for FLHWs, and are opting to publish open-source grey literature and white papers, rather than peer-reviewed papers. Further research is required to verify that projects in the database and those represented in the literature are mutually exclusive and still in operation.

Though the research was organized and conducted to identify mHealth tools for specific functions and responsibilities of FLHWs across the continuum of care for women and children (e.g., patient registration), it was found that most tools were "integrated solutions" that reflected an FLHW's workflow more holistically.

We define an integrated solution as a mobile tool that supports multiple FLHW functions, health practices, patient needs and/or commodities. For example, eCompliance, an mHealth tool developed by non-governmental organization (NGO) Operation ASHA in India, Vietnam and Cambodia, is an example of a single function mobile tool, since it was designed specifically to support FLHWs to improve patient adherence to tuberculosis (TB) treatment through a biometric data collection system. Whereas, in contrast, the Ethiopian Ministry of Health, in collaboration with PATH, Columbia University, and Vital Wave Consulting, are designing an integrated mHealth solution to strengthen the FLHW program. The solution is classified as integrated since it focuses on five functional areas, including referrals, data exchange, supply chain management, training and counselling.



Based on our research, we infer that the trend towards integrated solutions is largely driven by the scale-up of cloud-based mobile platforms that provide the infrastructure to easily develop, manage and monitor unique mobile tools for FLHWs. This trend is combined with increased mobile phone ownership, and improved technical literacy of FLHWs in LMICs, providing the infrastructure required to deploy an mHealth solution. For instance, BBC Media Action found that over 90% of a cadre of FLHWs in India, called Accredited Social Health Activists (ASHAs), owned a basic mobile phone.[7]

> "Over 90% of a cadre of FLHWs in India, called Accredited Social Health Activists (ASHAs), owned a basic mobile phone."

The most common platforms supporting the development of mHealth tools found in our research included CommCare, MOTECH, Open Medical Record System (OpenMRS), Open Logistic Management Information System (Open-LMIS), INSTEDD, FrontlineSMS, IQSMS and IQGEO. Mobile health tools are built on top of these platforms, each providing access to various types of mobile features, such as Short Messaging Service (SMS), Interactive Voice Response (IVR), forms for data collection, and application architecture, to create custom solutions using different content. In 2013, with the support of the Grameen Foundation and the Bill and Melinda Gates Foundation, a consortium of platform partners, called MOTECH Suite, which includes CommCare, MOTECH and OpenMRS amongst others, was established to provide developers, NGOs, governments and/or private companies with a comprehensive set of services under a single umbrella, in the form of an integrated information system. The MOTECH Suite supports five key functional mHealth areas including: behaviour change and demand generation, managing patient data, improving worker performance, last mile supply chain and patient adherence.

Since development of mHealth tools has become increasingly cost-effective and accessible, even amongst organizations with minimal technical expertise, the wider adoption of these platforms has meant an increase in the quantity of mHealth tools that exist to support FLHWs in LMICs. However, this trend also has meant an increase in the fragmentation of mHealth tools, with limited scale-up of any individual solution. For example, in India, the CommCare platform is used by over 30 organizations to develop mHealth tools for ASHAs and other FLHWs across the country. Each organization develops a unique mHealth tool on the CommCare platform for a targeted group of ASHAs, usually in a specific district of a state, and deploys the solution independently. As a result, there are similar mHealth tools being developed and implemented by multiple organizations, rather than a single mHealth tool being implemented by multiple organizations.

This trend is also seen in Sub-Saharan Africa. For instance, CommCare has been used to adapt the Integrated Management of Childhood Illnesses (IMCI) guidelines into a clinical decision support tool for FLHWs in Tanzania and Malawi.[8] Similarly, the Malaria Consortium and its partners have used CommCare to create an integrated solution for FLHWs to support malaria diagnosis, treatment and care with a decision support tool, an interactive counselling guide, a patient registry and a mechanism for monitoring FLHW performance in Uganda and Mozambique.[9] On the one hand, the trend towards fragmentation indicates that there are multiple organizations invested in deploying mHealth tools for FLHWs. Yet this fragmentation can contribute to confusion at the national and state government level when evaluating mHealth solutions for scale-up.

The prevalence of integrated solutions in our research made it challenging to deconstruct the types of content included in an mHealth tool to evaluate which commodities were represented. In cases where an mHealth tool was focused

on a single commodity, it was typically concerned with HIV/AIDS, reproductive health, pregnancy complications, malaria or child survival. Antenatal corticosteroids, chlorhexidine, resuscitation devices and amoxicillin were not addressed by specific mHealth tools, but were included in integrated solutions.

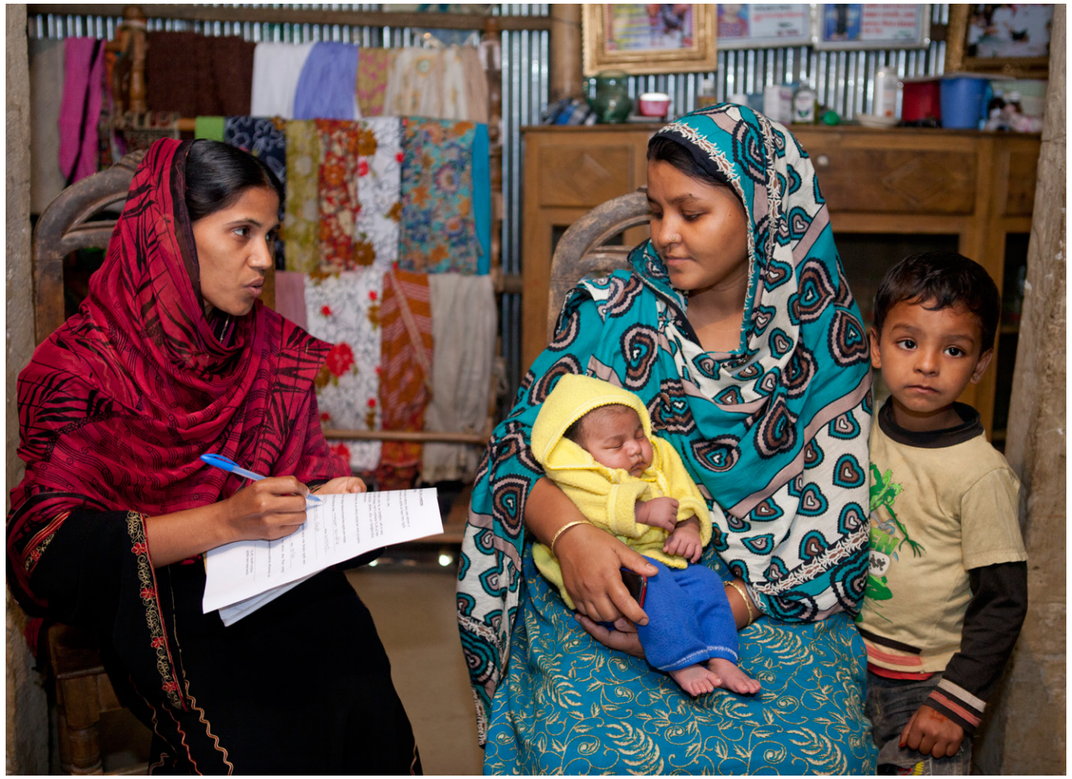
> “Preloaded applications on mobile phones most commonly supported FLHWs to deliver counseling messages to pregnant mothers and their families or access refresher learning modules for their own education.”

In cases where mHealth tools focused on a single function, the most common solutions were those that supported FLHWs with patient management, counseling and learning tools. The least represented single function mHealth tools were related to work planning, compensation and performance tracking. These findings suggest a trend towards developing mHealth tools that support FLHW responsibilities in comparison to FLHW professional development and productivity. The Ananya program in Bihar, India, supported by the Bill and Melinda Gates Foundation and implemented by CARE, Dimagi and BBC Media Action, is an example of an integrated mHealth tool for FLHWs that focuses on professional development and productivity. The mHealth tool supports ASHA's with work planning to prioritize her daily patient load, combined with performance tracking features that aggregates data on tasks completed to inform performance feedback sessions between an ASHA (the FLHW in Bihar) and her supervisors, and mobile learning tools to refresh knowledge and prepare for community events.

In terms of technology, preloaded applications on smartphones and java-based mobile phones were the most common format for mHealth tools for FLHWs. This was followed by the use of SMS and IVR on basic mobile phones. Specifically, preloaded applications on mobile phones most commonly supported FLHWs to deliver counseling messages to pregnant mothers and their families or access refresher learning modules for their own education.

While pre-loaded applications on smartphones and java-based phones were the most common format for mHealth tools for FLHWs, mHealth tools that have predominantly achieved scale are those that use low-cost basic technology such as interactive voice response (IVR). For instance, in Ghana, Liberia and Tanzania, a social enterprise called Switchboard has implemented a national peer-to-peer mobile network, MDNet, for FLHWs and physicians to share information with each other by offering free calls within the network.[10] Additionally, Ethiopia's Fitun Warmline is a national toll-free hotline for FLHWs, through which FLHWs are able to obtain advice on supporting HIV/AIDS patients.[11] Mobile Academy and Mobile Kunji are IVR solutions that support FLHWs in India with home-based counselling and refresher training on key health practices (mobile learning or mLearning). Both solutions have been adopted by more than four state governments in India. The challenges with achieving scale of pre-loaded applications on smartphones and java-based phones are still predominately related to the costs of hardware and data transmission, availability of power charging solutions, and the difficulty in managing the logistics of training and long-term support.

While our database was designed to capture information on whether an mHealth tool supported multiple languages, was open-source and had a business model, in addition to the source guidelines adapted for the mHealth tool, the methodology used did not yield substantial results. This finding indicates the need for deep-dives into select mHealth tools for more comprehensive data. Only 16% of entries included data on multi-language support; of those 16%, most supported multiple languages. Further, the results were similar for the 30% of entries that included data on the open-source status of an mHealth tool. The latter finding is driven by CommCare and FrontlineSMS, both of which encourage organizations to share content and source code on an online network. The business models of



the majority of mHealth tools in the database were categorized under non-profit, with no information on plans to achieve sustainability.

Overall, the research findings illustrate advancement from single function mHealth tools to complex integrated solutions that more accurately represent an FLHW's workflow and broad scope of tasks and responsibilities. This finding suggests that a single integrated solution has the capacity to support increased access to and expanded use of multiple commodities prioritized by the Commission. Further, as mHealth tools for FLHWs continue to advance in features and functionality, the next stage of integration will be with national health information systems and electronic medical records, of which the research shows early signs on in India and Tanzania.

> “The next stage of integration will be with national health information systems and electronic medical records.”

For this landscape, it was challenging to specifically identify which commodity was covered by a specific tool. Rather, it more broadly assessed coverage by the area of focus: family planning, maternal, newborn, and/or child health. As a next step, the Commission should consider conducting an evaluation of the content included in a shortlist of broadly used mHealth tools, to verify which commodities are included and how they are represented and supported to better achieve the goals of Recommendation 9. Further, the scale-up of integrated mHealth solutions calls for new evaluation methodologies and taxonomy to better support organizations, align research with the advancement in technology, and ultimately better inform national and state governments in their planning and strategy processes.

Types of mHealth Tools

This section provides a high-level overview of the types of mHealth tools used to support FLHWs across the continuum of care for women and children, and the current state of availability and traction. We have organized the 12 types of mobile tools in the database into six categories:

1. Patient Management
2. Work Planning and Scheduling
3. Education and Awareness
4. Clinical Support and Quality Care
5. Performance Management and Compensation
6. Information Systems

Figure 2 visually maps the types of mHealth tools used across the continuum of care for women and children.

Patient Management

Patient management includes mHealth tools that support FLHWs in registering, assessing and monitoring patients on treatment to alleviate a disease, those at risk of a disease, and/or women during a pregnancy cycle. In our research, patient assessment differs from clinical decision making in that the former focuses predominantly on tools that screen for disease risk, whereas the latter focuses on diagnosis and treatment decisions. Further, patient-monitoring tools can also support national and international disease surveillance activities.

While patient registration and patient assessment tools can be mutually exclusive, patient-monitoring tools almost always implicitly include the former function. For example, UNICEF created an SMS tool for FLHWs in Nigeria specifically to register new births to collect national population data.[12] Further, organizations such as D-Tree and Pathfinder International have created patient assessment tools to support FLHWs screen and refer HIV and TB patients in Tanzania.[13]

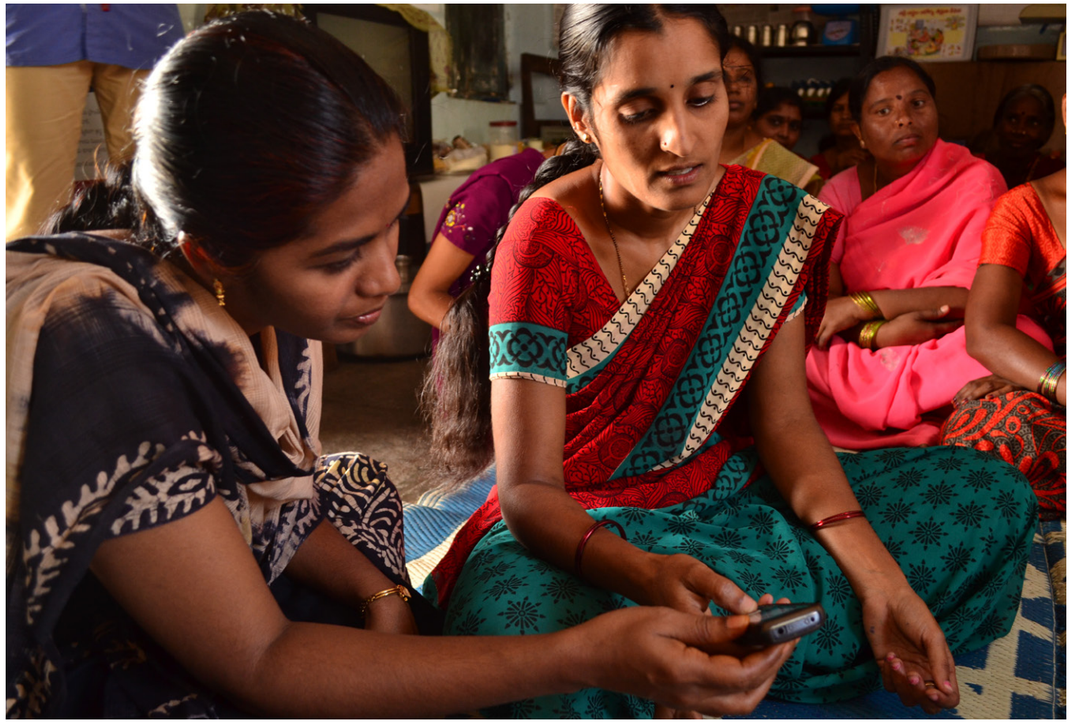
Patient management mHealth tools were the most common type of tool in the database research. This trend may suggest that organizations are inclined to begin mHealth programming by establishing a patient database, which can then serve as the foundation for additional mHealth support tools.

Most patient management mHealth tools were found in Uganda, India and Nigeria, and supported multiple commodities. In cases where patient management tools were created for specific disease areas, they mostly focused on HIV, Child Survival and Reproductive Health. For example, the Local Partners Excel in Comprehensive HIV/AIDS Service Delivery (LEAD) Project, being implemented in seven countries across sub-Saharan Africa, is using IQSMS, an SMS-based system, to monitor and report data of HIV/AIDS patients.[14] In Tanzania alone, since inception in 2011, nearly 500 sites and 600 FLHWs are using the system, sending over 90,000 SMS messages of patient data, which is then being integrated into

FIGURE 2: Types of mHealth tools mapped across the continuum of care for women and children

CONTINUUM OF CARE FOR WOMEN & CHILDREN

	MONITOR	REGISTER PREGNANCY	MONITOR PREGNANCY	REGISTER BIRTH	MONITOR MOTHER & CHILD HEALTH
CERTIFIED HEALTH WORKER ACTIVITIES					
PREGNANT MOTHER HEALTH CYCLE	PRE-PREGNANCY	PREGNANCY		BIRTH & POST-PARTUM	MOTHERHOOD
NEWBORN CHILD HEALTH CYCLE				BIRTH & POST-NATAL	INFANCY & CHILDHOOD
mHEALTH TOOLS THAT SUPPORT CERTIFIED HEALTH WORKERS' ACTIVITIES	Patient Registration Workplan & Patient Monitoring Counseling Clinical Decision Support Refresher Training & mLearning Performance Feedback & Compensation	Pregnancy Registration	Workplan & Pregnancy Monitoring Pregnancy Counseling Clinical Decision Support (e.g. complications) Care Coordination & Social Network Refresher Training & mLearning Performance Feedback & Compensation	Newborn Birth Registration	Workplan & Newborn Child Monitoring Newborn Child Counseling Clinical Decision Support (e.g. complications) Care Coordination & Social Network Refresher Training & mLearning Performance Feedback & Compensation



the country's national electronic medical record system.[15] Though magnesium sulfate, a medication used in the management of eclampsia to prevent seizures, is not a highly represented commodity within single-function mHealth tools, a consortium of academic and non-academic organisations has been established in four countries. The consortium is piloting an mHealth tool aimed at supporting FLHWs to monitor antenatal care and easily coordinate with other health professionals in the case of an emergency, in order to reduce the overall burden of pre-eclampsia and eclampsia.[16]

The literature found examples of organizations testing the feasibility and cost-effectiveness of replacing paper-based tools with mHealth tools to manage patient case registration, monitoring and follow-up and achieving favorable results.[17] For example, Thailand's malaria program scaled-up the use of mHealth tools for patient case registration and follow-up, following a pilot project testing the feasibility with FLHWs.[18] Another study in Kenya illustrated the feasibility of using mobile video to support FLHWs monitor TB patients remotely. This worked by partnering with a patient's treatment partner (as part of the Directly Observed Therapy (DOT) model) to take and send videos to FLHWs of patients taking their medication.[19]

IVR was the least used technology to support patient management mHealth tools, in comparison to pre-loaded applications, data-supported applications, and SMS, which were all highly represented.

The Commission can benefit from conducting further research to evaluate whether disease and/or commodity specific patient management mHealth tools are more effective in comparison to integrated solutions that cut across diseases and commodities.

Work Planning and Scheduling

The work planning and scheduling category includes mHealth tools that support FLHWs to organize and prioritize daily patient load and provide guidance on specific content that should be delivered to a patient depending on factors such as pregnancy semester, existing health conditions or age of child. This type of mHealth tool can be especially important in supporting FLHWs to ensure that patients are adhering to treatment regimens with commodities such as TB fixed-dose combination, vitamin A, and contraceptives.

In some cases, work planning and scheduling mHealth tools overlap with patient registration and monitoring mHealth tools. For example, a patient management mobile tool for a malaria program in Thailand also alerted FLHWs when to follow-up with a specific patient, thereby supporting work planning and scheduling activities.[20] However, programs, such as CARE's Integrated Family Health Initiative and Intrahealth's mSakhi application in India, have developed comprehensive work planning and scheduling functions as part of integrated solutions that use back-end algorithms to identify which patients a FLHW needs to visit on a given day and which messages should be communicated to that patient based on their medical history.[21]

In Bangladesh, workload scheduling has also been identified as a priority by USAID and the John Hopkins Center for Communication Programs. Together, they have developed an mHealth tool called mRegister to support the Government of Bangladesh FLHWs with an integrated solution that includes work planning and scheduling functions.[22]

An open source human resources information system called iHRIS is being used in 19 countries to help track, manage and plan health workforces. In addition to the three main components of the iHRIS suite, iHRIS Plan and iHRIS Retain are designated for workforce planning.[23]

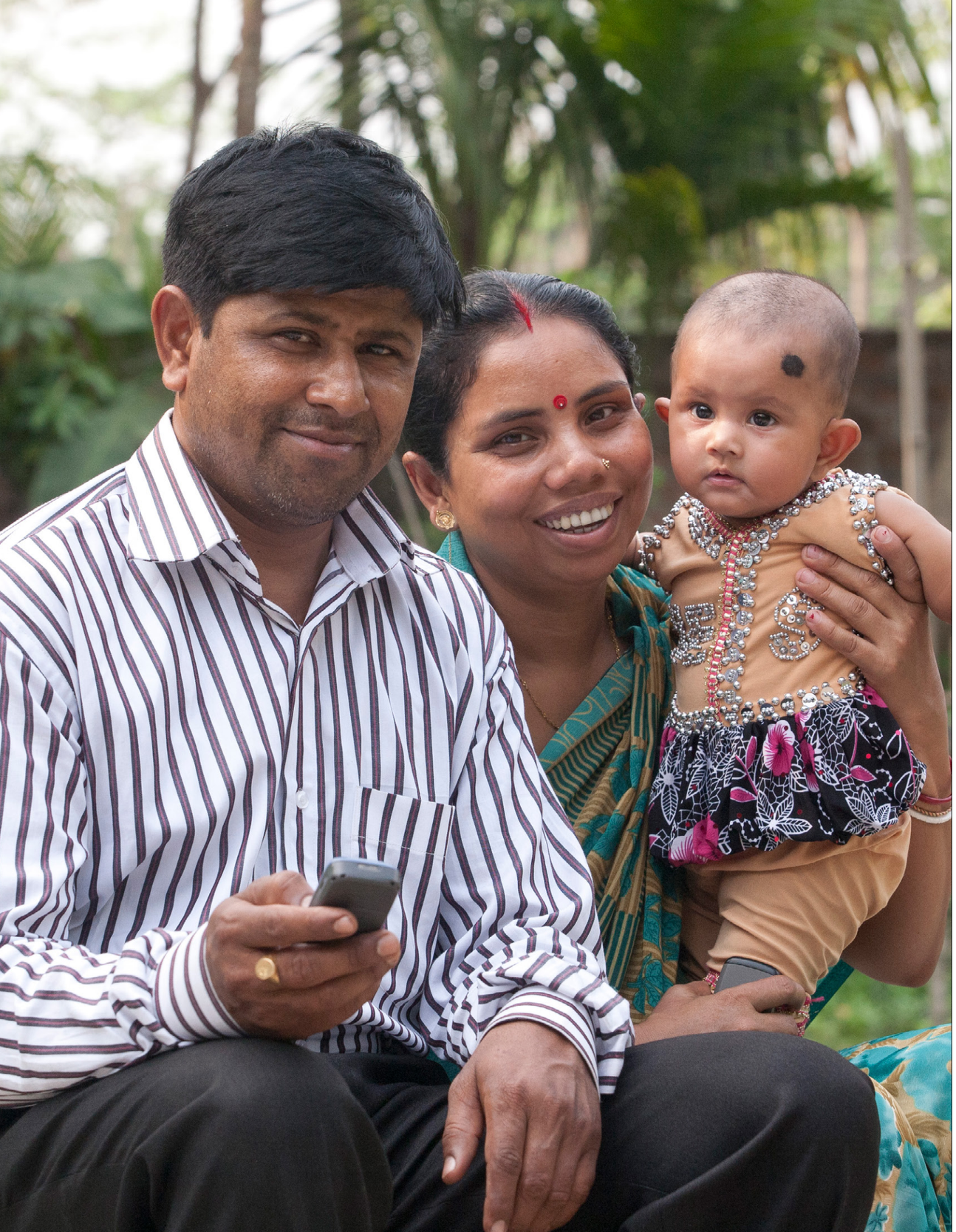
In general, this category of mHealth tools was the least represented in both the database research and literature, and no commodity specific examples were identified. The Commission should continue to monitor the impact of these mHealth tools on FLHW performance and accountability.

Education and Awareness

The education and awareness category includes mHealth tools that support FLHWs to refresh their knowledge on health practices ("mLearning"), and/or support FLHWs communications and influence the adoption of health practices during counseling sessions with patients and their families. This was the second most common category of mHealth tools in our database research, and the most common identified in the literature, suggesting a strong inclination by organizations to focus on using mHealth tools for FLHW capacity building. There was a concentration of mHealth tools to support FLHW counseling activities in India, Tanzania and Kenya, and support FLHW learning in Kenya, India and Uganda.

The literature found that mobile phones were being used by FLHWs as a tool to disseminate and gain knowledge through peer-to-peer networks,[24] and that mobile job aids not only reduced workload, but also improved adherence to national treatment guidelines, leading to decreased error rates.[25]

The database research found that most counseling mHealth tools cut across all commodities, and were mostly built on the CommCare platform and delivered



through pre-loaded applications on java-based mobile phones. To illustrate, a 16-country program, supported by World Vision, the Bill and Melinda Gates Foundation, Grameen Foundation, Australia Aid and others, is utilizing the CommCare platform to strengthen FLHW home-based primary healthcare counseling.[26]

In contrast, mLearning tools either focused on one of nine commodities on the Commission's shortlist, with HIV and reproductive health being the most common, or multiple commodities. Further, learning content was delivered across mobile technologies, including preloaded applications, text SMS, data applications, and preloaded videos. FrontlineSMS was a common platform for mobile learning tools, driven by a five-country program, called the Central America Capacity Project (CAMCAP), which is led by Intrahealth International and USAID. CAMCAP reinforces HIV lessons for FLHWs through SMS.[27]

These trends suggest that mHealth learning tools are well positioned for commodity-specific content to strengthen the knowledge of FLHWs on health practices that may be new, lagging, or required to respond to a critical event or emergency. In comparison, counseling mHealth tools may be better developed with access to health information across commodities to provide FLHWs with the flexibility and necessary resources to provide high quality patient care.

Clinical Support and Quality Care

A suite of mHealth tools are used to support FLHWs delivery of quality patient care, including those that utilize algorithms to assist in clinical decision making, provide checklists to support standardized and recommended care and provide directories to coordinate with other health professionals for referrals and advice. While clinical decision support mHealth tools were concentrated in Malawi and Tanzania, and social networking mHealth tools in Tanzania, there were no country trends for checklist and care coordination mHealth tools.

The literature found examples of mHealth clinical decision support tools for FLHWs in Columbia, Kenya and Papua New Guinea, two of which focused on malaria and helped reduce clinical errors and improve compliance to standard protocols.[28] In the database research, mHealth clinical decision support tools were the most common under this category, and generally cut across multiple commodities, or focused on HIV or reproductive health. D-Tree, a non-profit organization, has led the development of mHealth clinical decision making tools for FLHWs in Malawi and Tanzania that mostly focus on adapting protocols such as the Integrated Management for Childhood Illness (IMCI) for mobile and developing clinical algorithms on mobile for triaging HIV/AIDS patients and supporting pregnant women.[29]

Adapting checklists for the mobile platform, to support FLHWs in improving the standard of care in LMICs, was the second most common type of tool in this category in the database research. The majority of the checklist tools identified focused specifically on post-partum hemorrhage and severe pre-eclampsia and eclampsia, diseases both related to maternal health. This trend is driven by the five-country program being led by MCHIP, called the Maternal and Newborn Health Quality Care Facility Assessment (MNH QoC), which focuses on providing obstetricians and nurse midwives with mobile phone-based checklists to capture the quality of care for pregnant women at hospitals and health facilities[30]. Since mHealth clinical decision support tools can overlap with mHealth checklist tools, further research is required to deconstruct the two functions within a single mHealth tool to evaluate the scope of its content.

Using mobile phones for care coordination was as common as using them for checklists in our database research, each tool supporting multiple commodities through text SMS or preloaded applications. This trend is driven by the implementation of the MOTECH Suite, an alliance of mobile platforms to ease the development of mHealth tools for FLHWs, in five countries[31]. Other care coordination mHealth tools identified in the database research focused on supporting FLHWs to make referrals for post-partum hemorrhage cases in Indonesia, multiple diseases in Philippines,[32] and HIV in Malawi.[33] In the literature, a study was found that used SMS, on the RapidSMS platform, to support FLHWs in Rwanda connect to nearby ambulances and receive guidance on stabilizing critical care patients. While successful, the project identified maintenance costs as a challenge, but found that the Rwandan government's pledge to equip all FLHWs with mobile phones could help offset initial capital costs.[34]

Finally, FLHWs using mobile phones for peer-to-peer knowledge transfer and advice through social networks was the least common tool in this category. The limited number of social networking mHealth tools found in our database research was largely concentrated in Tanzania, and predominately used the voice feature. This trend suggests that using mobile phones for social networking may still be an informal or uncommon activity amongst FLHWs. Switchboard has formalized this activity in Ghana, Liberia and Tanzania, by establishing a nationwide network of all FLHWs, and negotiating free "in-network" calling with telecom operators for FLHWs.[35] Further, Mobilized, an application identified in the literature, was designed to support FLHWs in South Africa manage MDR-TB treatment. Results from the Mobilized pilot reported that FLHWs found the social networking feature of the application the most useful, since it led to better care coordination by improving communication, integration and cohesiveness amongst care teams.[36]

These findings suggest that clinical decision support and checklists are well positioned for commodity specific mHealth tools. Further research is required to understand if and how commodity specific mHealth tools should be developed to support care coordination and social networking activities amongst FLHWs and the broader health system in an LMIC.

Performance Management and Compensation

Managing the performance of FLHWs through a supervisory structure that offers feedback and coaching, in addition to providing FLHWs with timely and consistent compensation, incentives and/or subsides are important functions that mHealth tools can enable.

This category of mHealth tools is still nascent. In the database research, there were six examples of performance management related mHealth tools, and five examples of compensation related mHealth tools. Since these tools fall under human resource management and capacity building of FLHWs, the majority cut across multiple commodities. However, D-Tree International is an example of an organization that has developed an integrated solution that uses mHealth and mobile money (mMoney) tools to improve safer deliveries for pregnant women in Zanzibar, Tanzania. The mHealth tools support Community Birth Attendants (CBAs) with patient registration, risk assessment, counseling for birth planning, and care coordination, while the mMoney tools enable D-Tree to transfer funds to CBAs to help coordinate and cover transportation for pregnant women to a facility for delivery. The CBAs also use the tool to receive their performance incentives following a successful and safe birth. The program has seen dramatic increases in facility delivery rates, from 30% to 72%, in the two districts where the pilot was implemented, and is now being scaled up across Zanzibar through 2014.[37]

Similarly, iHRIS, an open source human resources information system, is able to help governments track, manage and plan for their health workforces through their suite of tools. The iHRIS suite includes three main components—iHRIS Manage, iHRIS Qualify and iHRIS Train—and two workforce planning tools (iHRIS Plan and iHRIS Retain).[38]

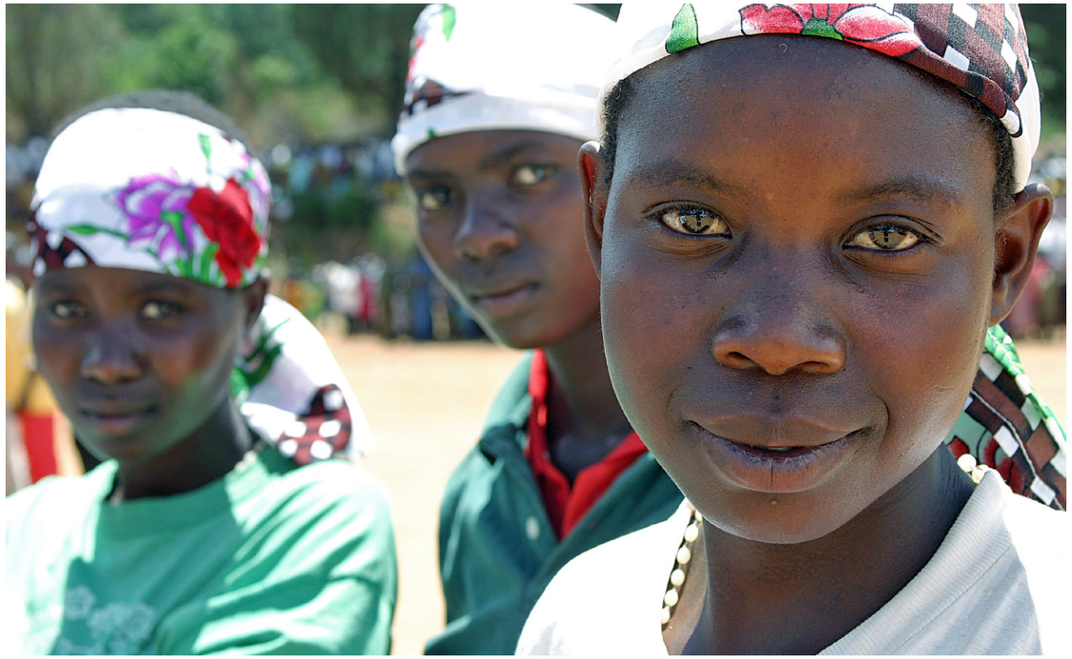
In general, compensation related mobile tools are growing in countries such as Kenya, India and the Philippines where the mMoney infrastructure exists and is broadly used across the population.

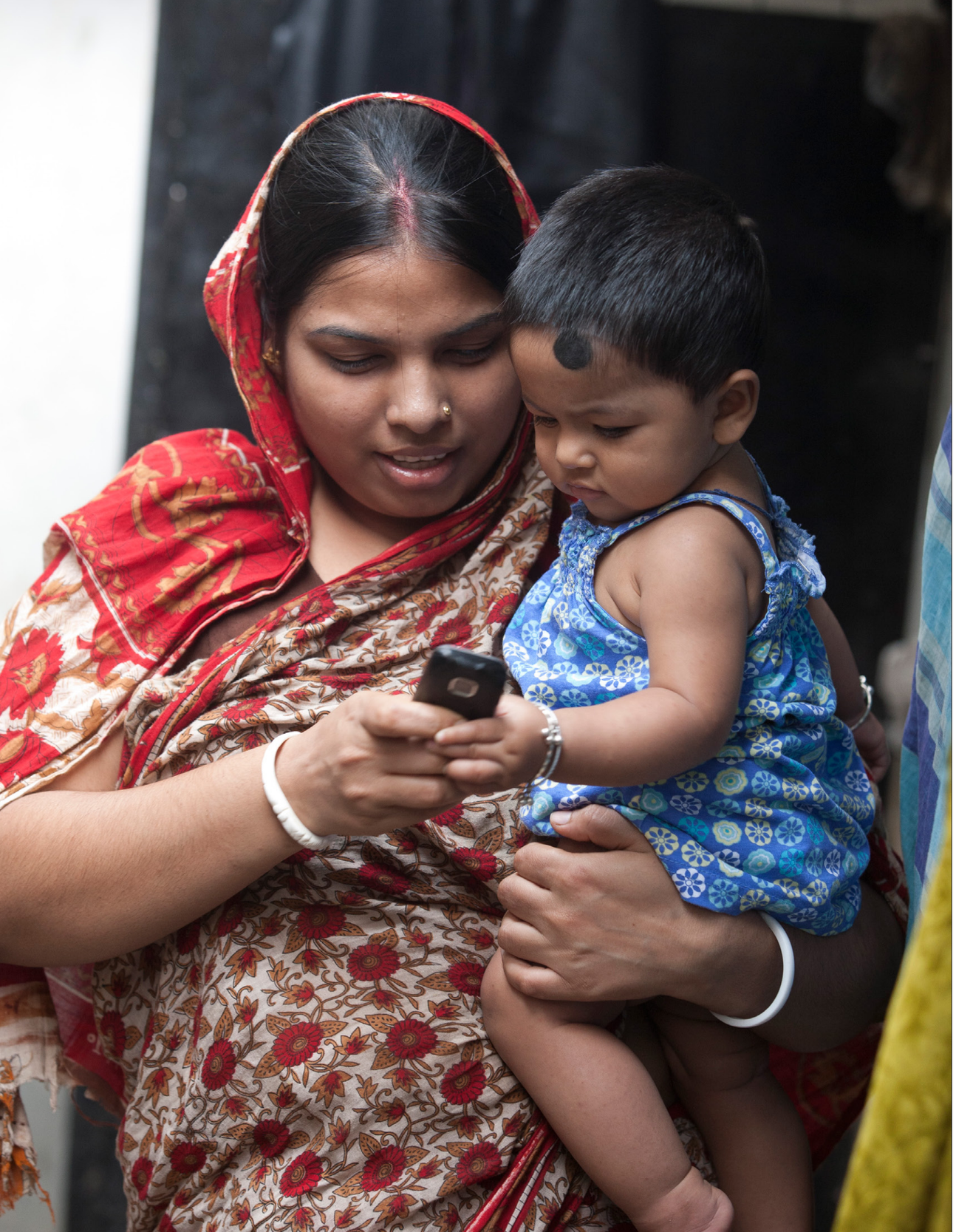
> "The program has seen dramatic increases in facility delivery rates, from 30% to 72%."

Information Systems

Information systems are concerned with the linkages across data collection, storage, processing and use. Information systems include the mHealth tool and complementary components (e.g., data warehouse). For example, data collected using an mHealth tool can be used to populate and maintain individual health records. Furthermore, the data can be linked to a national health information system and used to support disease surveillance, management and distribution of health services and products, and policy development.

In our research, we primarily found that tools being used for patient registration, assessment and monitoring by FLHWs were typically part of or linked to an information system. For example, the MOTECH suite of tools are used in conjunction with OpenMRS, an open-source electronic medical record system. In Ghana, the integration has allowed midwives to record and track care provided to women, newborns and children under 5 years of age. An enhanced integration of the





MOTECH suites, in India, Sierra Leone, Tanzania, Uganda, and Zambia, have the mHealth tool connected to data repositories not only for medical records (OpenMRS), but also for logistics (through OpenLMIS). The integration of the MOTECH suite with OpenMRS and other databases has been documented in the literature.[39] Programs in Kenya, Albania, Bangladesh and Uganda have allowed providers to link care across the community, local facilities and government. Such linkages have supported activities including disease surveillance and reporting and supply chain management, ultimately leading to improved health services management and patient care.[40-47]

The iHRIS suite of tools was the only information system tool that was not related to patient registration, assessment and monitoring. Rather, iHRIS is a work planning and scheduling and performance monitoring information system.[48]

The literature also included use cases on setting up and using an mHealth tool in the context of an information system. Similarly, the use cases from the literature were concerned with patient registration, assessment and monitoring. A RapidSMS system was adapted for integration with a national database in Rwanda. The information system capitalized on bi-directional data flow, allowing for notifications to be sent to the care provider for appropriate patient follow-up. Furthermore, data generated using the tool could be accessed and filtered using a web-based interface. However, the system was not able to address redundancies and some important statistics could not be generated.[49] Cell-PREVEN in Peru used an online database to allow for rapid access to the data for 'real-time' surveillance.[50] In Thailand, a mobile phone-based data collection tool for monitoring malaria cases sent information to a central database that could be accessed by key personnel for action.[51] Such applications underline the importance and utility of information flows across the different levels of the health system. Again, illustrating how information systems can help improve health services management and provide more timely patient care.

Overall, mHealth tools involving patient registration and monitoring are typically part of an information system. The findings may be due to the intrinsic need for patient monitoring data to be readily accessible at points outside of individual encounters. This necessitates having a system that allows for the bi-directional flow of data, data that can be accessed by different users and/or a robust data repository for long-term data storage. While programs have developed central databases or web interfaces for data access, it is not clear how well the components of the information systems integrate with national health information systems or meet national reporting requirements.

4 The Role of mHealth in Pathfinder Countries

The Commission has initially focused on implementing Recommendation 9 in eight of the EWEC countries, which have been designated as 'Pathfinder' countries. These countries are Malawi, Senegal, Uganda, the Democratic Republic of Congo, Ethiopia, Nigeria, Sierra Leone and Tanzania. Currently, national policies are being put in place in Pathfinder countries to formally integrate mHealth into national health systems. A review of the policies featured on the Commission's website, including job aids, national health plans, health worker performance standards and procurement plans was conducted in combination with a literature review. The following are the high-level findings on the state of mHealth to support FLHW performance and accountability from each Pathfinder country, except the Democratic Republic of Congo and Nigeria, for which there was no data available on the website at the time of our research.

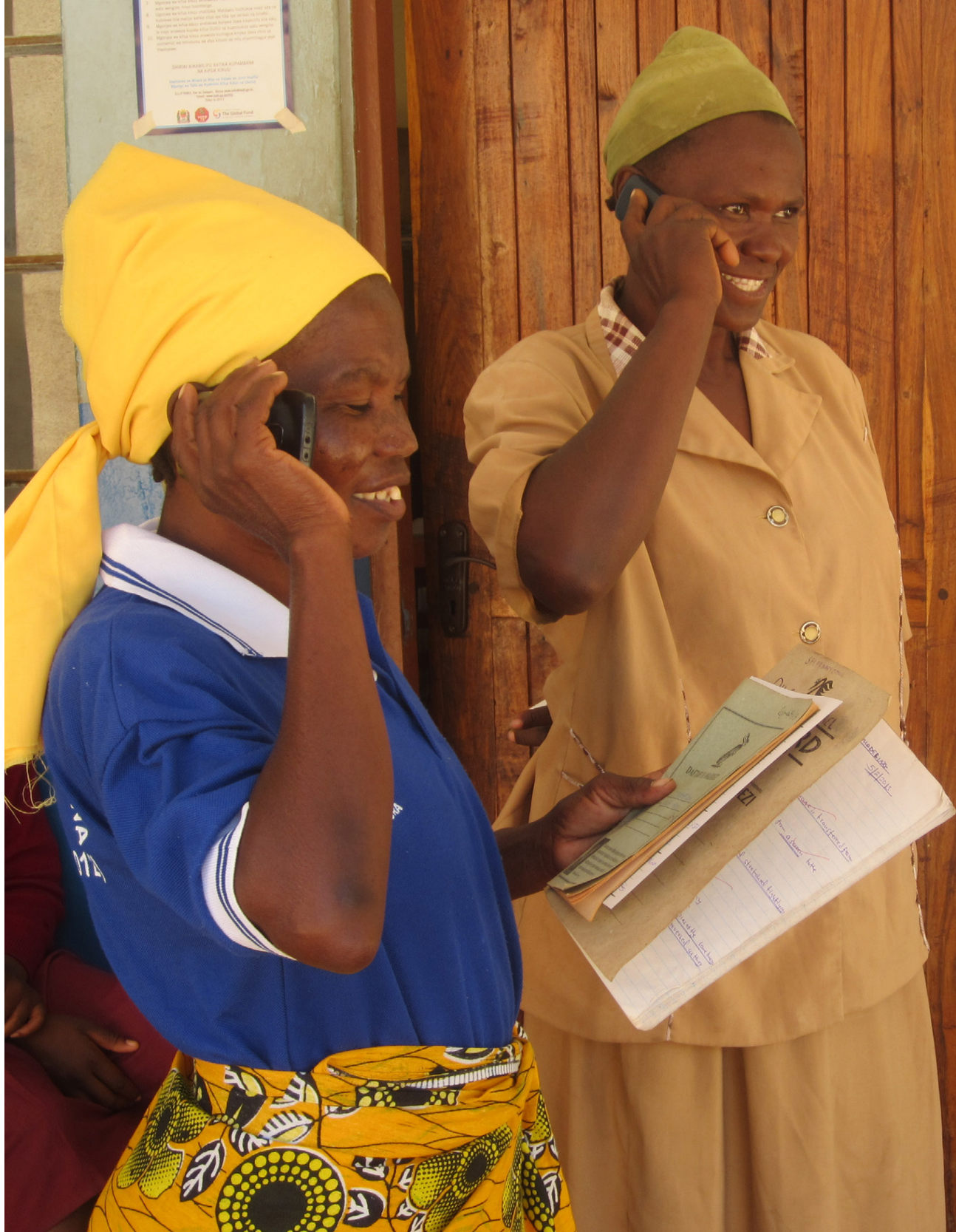
Malawi

In Malawi, one of the key bottlenecks impacting access to and expanded use of commodities related to RMNCH is the lack of alignment between national health guidelines, the essential medicines list, and the WHO guidelines. The discord across regulatory documents has had negative implications on the procurement, availability and service delivery of commodities.[52] Harmonization across guidelines is critical to ensure that when guidelines are adapted for the mobile platform and disseminated to FLHWs that recommended commodities are available for patients to use. Ensuring that the supply of commodities meets the demand generated through mHealth tools is important to sustain the credibility of FLHWs, and the use of mHealth tools. The Malawi Ministry of Health (MoH) is currently in the process of establishing an eHealth strategy, which may address some of the current regulatory challenges.[53] The eHealth strategy will draw from the evidence generated by the K4Health pilot projects led in Malawi that focused on using mHealth tools to improve maternal health outcomes by addressing HIV, reproductive health and family planning.[54] The pilot found high rates of mobile phone usage amongst FLHWs[55] and identified SMS as an effective medium for reinforcing health messages and treatment guidelines to FLHWs.[56]

The Malawi MoH is currently focused on three areas of improvement that should be considered when prioritizing content to adapt into mHealth tools for FLHWs. The three priorities are antenatal care visits, nutrition and malaria treatment.[57] Further, FLHWs are increasingly being assigned additional responsibilities through task-shifting efforts, especially as it relates to ART treatment initiation and management. However, training and supervising FLHWs on the additional tasks has been poor, indicating an opportunity to leverage mobile technology to address the learning gaps.

Senegal

In Senegal there are signs of an increased focus on utilizing mHealth to improve FLHW performance and accountability in the country. First, the Ministry of Health and Prevention (MoHP) has established a national FLHW plan that



states that all FLHWs will be equipped with a mobile phone, thereby providing the hardware and infrastructure required to scale mHealth support tools.[58] Further, disease specific programs like PMTCT, is exploring sending SMS reminders to patients and FLHWs to close referral loops, as part of its three-year program.[59]

These developments are accompanied by the opportunity to expand the country's modest health information system into a comprehensive mobile phone-based system that leverages the increase in mobile phone usage.[60] The Malaria Control Program is an example of a health department that is currently lacking basic inventory management and training tools for FLHWs and other health cadres, and could benefit from exploring mobile phone-based solutions.[61]

Uganda

In 2011, the government of Uganda placed a moratorium on new mHealth and eHealth implementations to reduce the fragmentation of projects in the country, and ensure that those in existence are in alignment with government priorities and polices. However, it is clear that the government considers mHealth a priority, as it has established a national eHealth policy, lists mobile phones as essential medical equipment[62] for FLHWs and other health cadres, and has begun integrating data collection on mobile phones with its national health information management system.[63] For example, mTrac is being used to report stock-outs of essential commodities and facilitate the re-stocking process.[64]

Further, mHealth pilots and studies in Uganda are yielding positive results. A situational analysis of newborn care in Uganda identified mobile phones as an opportunity to improve the referral system through better communication amongst FLHWs and other health cadres. Similarly, a study that explored the use of voice and SMS to facilitate communication between FLHWs and other health workers found that patients and health workers felt that the quality of care had improved,[65] despite no significant changes in patient outcomes. Lastly, findings from another study underlined the typically overlooked importance of the calling features on mobile phones to support clinical decision-support.[66]

Ethiopia

Ethiopia has made great strides in addressing gaps within its health system. The essential medicines list is in alignment with the WHO guidelines and revisions are made on a regular basis, and task-shifting responsibilities related to reproductive and maternal health to FLHWs have been implemented successfully. Through the Health Sector Development Plan (HSDP IV), the Ethiopia Federal Ministry of Health (FMOH) is looking to improve health care management, especially as it relates to RMNCH and ICTs, which it has identified as a key priority in achieving the plan's goals.[67] Mobile health is included in the final implementation phase of the HSDP IV, and a separate eHealth strategy has been established, which will also bolster mHealth efforts.[68] Currently, the FMOH is collaborating with Columbia University, PATH and Vital Wave Consulting to develop a comprehensive integrated mHealth solution for FLHWs that will focus on providing support for referrals, data exchange, supply chain management, training, education and consultation.[69] In general, the FMOH is highly committed to ensuring that all routine health information systems and new technologies are interoperable and plugged into the country's enterprise architecture.[70]

Sierra Leone

In Sierra Leone, discord between regulatory guidelines, including the national essential commodities list and the WHO's recommended commodities, has led to discord on job aids and training materials provided to FLHWs. As the Commission considers adapting content for mHealth tools for FLHWs, enabling harmonization between guidelines will be critical to ensure the right commodities are recommended by FLHWs and used by patients.

Nevertheless, mobile phones are considered basic equipment for FLHWs in Sierra Leone, as stated by the "Policy for Community Health Workers in Sierra Leone," which also outlines that mobile phones and airtime will be used to facilitate referrals across the health system.[71, 72] Furthermore, a health sector performance report from 2010 recommended that a mobile phone-based social network could be used to facilitate mentoring for FLHWs and other health cadres.[73]

This commitment to mHealth by the Ministry of Health and Sanitation has led to pilot projects in Sierra Leone that includes training FLHWs in 13 districts on mHealth tools that provide logistics support.[74]

Tanzania

Tanzania is challenged by a weak commodity procurement system, combined with discord between the country's essential medicines list and international guidelines.[75] These drawbacks significantly impact the performance and accountability of FLHWs to increase access to and expand use of life-saving health commodities. To overcome these challenges, the government of Tanzania recently completed a successful pilot of a new laboratory management information system (LMIS) called ILS Gateway, which is built on the RapidSMS platform and integrates mobile phone-based data collection into the national HMIS,[76] to improve commodity availability. While the pilot has been successful in improving commodity availability, high human resource turnover, network coverage issues, late reporting and data quality issues have adversely impacted scale-up of the program.[77]

The government is also using mobile phones to improve FLHW adherence to national guidelines, including IMCI. A distance-learning program for IMCI (d-IMCI) has been set up, which delivers content and mentorship, where mentors communicate with mentees using mobile phones, in addition to conducting monthly visits[78]. Additionally, a successful regional program in Tanzania already uses SMS notifications to inform supervisors if FLHWs miss routine household visits,[79] in an effort to improve supervision, performance management and service delivery.[80]

Both the government of Tanzania and Zanzibar are investing in communication equipment for all health facilities and leveraging high mobile phone ownership amongst FLHWs by establishing social networks to improve communication and supervision amongst FLHWs and other health cadres.[81]

5 Framework for Mobile Content Adaptation

FIGURE 3: Recommended mHealth projects for further research

Recommended tools for content evaluation
MOTECH Suite
LEAD Project
CARE Integrated Family Health Initiative
Mobile Kunji (BBC Media Action)
Mobile Academy (BBC Media Action)
Ethiopia mHealth program
CAMCAP (Intra-health International)
CCM Application (D-Tree International)
Millennium Villages Project
Health eVillage
Job Aid Mobile Tool (World Vision)
MNH QoC (MCHIP)
mRegister

To ensure that content and learning on the 13 commodities prioritized by the Commission are included in integrated and single-function mHealth solutions for FLHWs, two key activities must occur: 1) reviewing the existing availability of digitized content on the 13 commodities to identify gaps and 2) adapting paper-based content on the 13 commodities to mobile phone-friendly content to address the gaps.

The first activity requires shortlisting a select number of mHealth tools across categories to conduct an evaluation of each tool's content to understand if and how the 13 commodities are represented. The working group and/or an independent panel of reviewers should be established to lead the evaluation. According to our database research, we have included a list of potential mHealth tools to consider for the evaluation (see Figure 3). In addition, the mPowering Frontline Health Workers Partnership just completed a survey with ~80 organizations to understand the availability of digitized health content, including formats and willingness to share, to identify gaps. The results of this survey will be released by March 2014, and should be referenced and leveraged as part of this process.

To guide the second part of the process — adapting paper-based content into mobile phone-friendly content — we have established a framework that outlines the three phases of content development and key related activities (See Figures 4, 5 and 6). There are two routes that the Commission can consider when developing mobile-friendly content to support increased access to and expanded use of the 13 commodities. The first is an open-source platform that houses mobile-friendly content across formats (i.e., basic mobile phones, Android), technologies (i.e., SMS, voice), and select languages. The second is the development of open-source mHealth tools across categories and technologies that include the appropriate content for organizations to use as a base, and then repurpose as required. In both cases, the framework outlines the process for adapting paper-based content into mobile phone-friendly content in a way that takes the end-user's needs, literacy, technological feasibility and human resource capacity into account.

Phase 1 outlines the research required to understand the end-user to select the most appropriate mobile communication medium to deliver the content (e.g., SMS, IVR) and to craft the language of the content in a way that aligns with the workflow, beliefs, knowledge gaps, and terminology of the end-user. The challenge for the Commission will be to identify common ground and differences amongst FLHWs and health systems globally or in select countries, in order to develop content that is both clinically accurate and adaptable according to a country's social, cultural and political landscape.

Phase 2 is a guide to select the communication medium in a way that aligns the technology with the needs and preferences of the end-user, and the capacity and resources of the implementing organization. The "difficulty" of implementing a certain mobile phone communication medium is broadly categorized as high, medium or low; this is a general assessment, and may differ across countries depending on the availability and robustness of a technologies infrastructure and support eco-system.

Lastly, Phase 3 outlines the content creation process, which includes using a reference guideline as the foundation for development, supported by a multi-stakeholder review committee, and multiple rounds of pre-testing and iteration with the end-user. The Commission may want to consider establishing a multi-country stakeholder review committee, starting with the Pathfinder countries, and developing guidelines or toolkits for implementing organizations to conduct pre-testing exercises with end-users.

FIGURE 4: Phase 1 of framework to adapt paper-based content to mobile-friendly content

PHASE 1: UNDERSTANDING THE END USER

GOAL	TARGET AUDIENCE	INFRASTRUCTURE	CAPACITY	RESOURCES
What are the goals of disseminating the content? Do they reflect the desired action of the end-user and beneficiary health outcome?	Describe the profile of the end-user who will use this content (demographic, literacy, employment status, work schedule, performance levels, hobbies, frustrations, family structure, community status, living conditions, dreams)	Evaluate the existing availability of mobile phones amongst the end-users, noting type of mobile phone, ownership arrangements, charging solutions, average spend per month, and average shelf life	Evaluate the implementing organization's capacity for training and support (e.g. number of days/hours per target user)	Evaluate existing digitized content, if available
What is the timeline to achieve this goal?	Map the workflow of the end-user(s), noting the order and timing of activities, and scope of interactions with other individuals and peers.	Evaluate how end-users use the mobile phone, and overall technical literacy (i.e. which features, for how long, how often, ask users to describe the utility of features in own words)	Evaluate the implementing organization's capacity to update the content, if at all	Evaluate financial and human resources available to support the delivery of content to mobile phones (i.e. purchasing mobile phones vs. using existing infrastructure)
What learning style will be applied and/or tested (e.g. personalized/adaptive, individual learning vs. group learning, blended learning, group work)	Evaluate the end user(s) current practices, knowledge gaps, myths, terminology and sensitivity, as it relates to the content topic	Evaluate the security needs and/or implications of the disseminated content for the end-use and beneficiary	Evaluate the implementing organization's capacity to set up and maintain a fleet of mobile phones	Evaluate technical resources and skillset to adapt content for the mobile platform
	Understand all decision makers and influencers within the end user(s) life, personally, and professionally	Evaluate the network infrastructure and reliability of various types of data transmission (i.e. GPRS, SMS)		Evaluate target users willingness and ability to pay; if yes, than identify how much
	Test hypotheses on preferred and not preferred communication mediums (i.e. SMS, multimedia content)	Evaluate existing policies that outline end-user responsibilities and accountability and support structures		

FIGURE 5: Phase 2 of framework to adapt paper-based content to mobile-friendly content

	PHASE 2: SELECT THE COMMUNICATION METHOD				
COMMUNICATION METHOD	**SMS**	**IVR/AUDIO**	**VIDEO**	**REFERENCE GUIDE**	**INTERACTIVE APPLICATION**
TECHNICAL LITERACY OF TARGET AUDIENCE	MEDIUM	LOW	MEDIUM	MEDIUM	HIGH
READING/WRITING LITERACY OF TARGET AUDIENCE	HIGH	LOW	LOW	HIGH	MEDIUM
TWO-WAY INTERACTION	MEDIUM	LOW	LOW	LOW	HIGH
INFRASTRUCTURE REQUIRED	LOW	MEDIUM	MEDIUM	MEDIUM	HIGH
COMMUNICATING COMPLEX CONTENT	LOW	MEDIUM	MEDIUM	HIGH	HIGH
DIFFICULTY OF IMPLEMENTATION	MEDIUM	LOW	MEDIUM	MEDIUM	HIGH

FIGURE 6: Phase 3 of framework to adapt paper-based content to mobile-friendly content

PHASE 3: CREATE AND TEST CONTENT

REFERENCE GUIDELINES	DESIGN	PRE-TESTING	ITERATION	MONITORING
Identify reference guidelines to utilize (e.g. Global vs. National)	Adapt a short-list of key messages into appropriate format for chosen communication medium, keeping the following in mind: text length to maximize attentiveness, tone to establish trust and credibility, local terminology and context (e.g. where to obtain care) to be relevant, time available for content consumption for end-user(s)	Introduce a small group of end-users to the content, and how to access the material	Synthesize pre-testing findings, and short-list priorities for changes to content	Establish mechanisms to monitor usage and recall of content by end-user(s) (i.e. back-end systems for real-time monitoring)
Establish a review committee of stakeholders from NGOs, civil society, and government to verify medical and clinical soundness of content	Consider the order the content is delivered to align with the end-user(s) learning needs and capacity, workflow, and setting for consumption	Conduct weekly meetings to test how the content resonates with the target user(s).	Integrate changes into content and pre-test again if required	Establish a process for end user(s) to report technical issues to be addressed
Triangulate research of end-user knowledge gaps and myths with key messages identified by review committee to establish a short-list of messages		Consider testing the following at regular intervals: tone of content voice, perception by end-user, use of local words and phrases, ability of end-user to act on content, end-user able to reiterate content accurately, usability, usage, challenges and benefits of access to content, trustworthiness, logical ordering	Revisit feedback from end-users during fixed intervals to update content	Monitor related performance and/or health outcome related to content
Segment messaging in alignment with end-user workflow				

6 Lessons Learned and Recommendations

Lessons Learned

1. High mobile phone ownership amongst FLHWs has created the infrastructure and foundation required to scale mHealth support tools.

2. The most common type of mHealth tools developed to support the performance and accountability of FLHWs are those focused on patient monitoring, mobile learning and counseling. The least common were those related to human resource management functions, including work planning and scheduling and compensation and performance management.

3. The majority of mHealth tools are designed to support increased access to and expanded use of multiple commodities. In cases where mHealth tools are created for specific commodities, they usually focus on HIV, reproductive health and child survival.

4. Preloaded applications on java-based phones were the most common method of building and delivering mobile tools for FLHWs.

5. Patient registration and patient monitoring programs are typically part of an information system that allows for remote data access, enhanced case management and more timely provision of health services.

6. Ministries of Health in Pathfinder countries are increasingly considering mHealth as a priority, illustrated by the establishment of enabling national policies and inclusion of mobile phones on equipment lists.

7. Overall, mHealth tools are most commonly being developed and implemented in India, Tanzania, Uganda and Kenya. According to our research on Pathfinder countries, Ethiopia appears poised for implementation and growth of mHealth tools for FLHWs.

8. Adapting and developing content for mHealth tools for FLHWs must align with strengthened commodity procurement management and harmonization across regulatory guidelines at the country level, to ensure that commodities recommended within mHealth tools are available for patients.

9. The process of adapting paper-based content to mobile phone-friendly content is a three-step process that requires understanding the end-user, choosing the appropriate communication medium, and consistently testing the content with the end-user for feedback.

Recommendations

1. The Commission can benefit from conducting content deep dives into a shortlist of scaled mHealth tools for FLHWs to evaluate which of the 13 commodities are being represented and how. The mPowering Frontline Health Workers program has conducted a similar exercise, which the Commission can leverage as part of its process.

2. Since mHealth tools for FLHWs have advanced from single function tools to integrated solutions, a need for new evaluation methodologies and taxonomy is required to better align research, decision-making and policy development with rapidly advancing technology.

3. The scale-up of platforms that enable the development of mobile tools for FLHWs has led to an increase in the number of small-scale solutions, calling for a re-evaluation on how “scale” is defined and measured.

4. The Commission should consider one of two routes to support the development of mHealth tools for FLHWs to increase access to and expand use of the 13 commodities: 1) establishing an open-source platform that houses mobile-friendly content across commodities, formats, technologies and languages or 2) developing open-source integrated mHealth solutions across categories and commodities that can be implemented and adapted as necessary at the country level. Either way, the Commission should factor in the heterogeneity of FLHWs globally, and ensure that the content and/or mHealth tools developed support country-level adaptation.

5. Further research is required to understand the time and resources required to implement the content adaptation framework. Other organizations working on similar efforts include AMREF, Digital Campus, Hesperian, mPowering Frontline Health Workers, and Text to Change.

Endnotes

1. Pathfinder Countries include: Malawi, Senegal, Uganda, the Democratic Republic of Congo, Ethiopia, Nigeria, Sierra Leone and Tanzania.

2. These NGOs include: Dimagi, BBC Media Action, Hesperian Health Guides, D-Tree International and Intrahealth International.

3. http://1millionhealthworkers.org/files/2013/01/1mCHW_Technical TaskForceReport.pdf

4. http://iheed.org/reports/iheedreport_2012.pdf

5. http://iheed.org/reports/iheedreport_2011.pdf

6. Pilot is defined as a mobile tool being tested for feasibility or academic research in a time-limited, defined environment. Regional is defined as the scale of a mobile tool within select states in a country, with the goal of longevity and sustainability. Scale is defined as implementation at the nationally in one country or multiple countries.

7. Reference from BBC Media Action Policy Brief: http://g3ict.org/download/p/fileId_959/productId_269

8. (Tanzania) http://www.biomedcentral.com/1472-6947/13/95, (Malawi) http://www.d-tree.org/malawi/ovc-and-community-imci-malawi-2/

9. www.malariaconsortium.org/inscale

10. http://www.switchboard.org

11. http://fitun.etharc.org

12. https://www.rapidsms.org/projects/nigeria-birth-registration

13. http://www.pathfinder.org/our-work/projects/mhealth-in-tanzania.html

14. http://futuresgroup.com/projects/local_partners_excel_in_comprehensive_hiv_aids_service_delivery_lead

15. http://futuresgroup.com/projects/local_partners_excel_in_comprehensive_hiv_aids_service_delivery_lead

16. https://mobiledevelopmentintelligence.com/products/3184-clip-community-level-interventions-for-pre-eclampsia

17. http://jamia.bmj.com/content/19/4/655.long/ http://www.malariajournal.com/content/9/1/237

18. http://www.malariajournal.com/content/9/1/237

19. http://www.ajpmonline.org/article/S0749-3797(10)00259-X/abstract

20. http://www.malariajournal.com/content/9/1/237

21. http://www.intrahealth.org/page/msakhi-an-interactive-mobile-phone-based-job-aid-for-accredited-social-health-activists

22. http://www.mhealthworkinggroup.org/project

23. http://www.ihris.org/ihris-suite/

24. http://www.tandfonline.com/doi/full/10.1080/10810730.2011.571344#.UqAJ1mRDt2s

25. http://iospress.metapress.com/content/9t83393414644065/?genre=article&issn=0928-7329&volume=21&issue=2&spage=113

26. http://www.wvi.org/mhealth

27. http://www.intrahealth.org/blog/tags/central-america-capacity-project#.Ut8-q2Qo6fU

28. (Colombia) http://jamia.bmj.com/cgi/pmidlookup?view=long&pmid=21292702;(Kenya) http://jamia.bmj.com/cgi/pmidlookup?view=long&pmid=21292702;(Papua New Guinea) http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0076578

29. (Tanzania) http://www.d-tree.org/tanzania/hivaids-tanzania/; (Malawi) http://www.d-tree.org/malawi/maternal-health-facility/

30. http://www.mchip.net/sites/default/files/mHealth_MCHIP_final.pdf

31. http://www.motechsuite.org/

32. http://one.telehealth.ph/beta/

33. http://www.d-tree.org/malawi/maternal-health-community/

34. http://www.panafrican-med-journal.com/content/article/13/31/full/

35. http://www.switchboard.org

36. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0064662

37. http://sustainabledevelopment.un.org/index.php?page=view&type=1006&menu=1348&nr=1167

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40. http://futuresgroup.com/projects/local_partners_excel_in_comprehensive_hiv_aids_service_delivery_lead

41. http://www.iqstrategy.net/products/iqsms/

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44. http://www.kiwanja.net/database/project/Project_PATH_AESSIMS.pdf

45. http://www.polioeradication.org/Research/PolioPipeline/No7Winter2011/Mobilephoneshelpassessqualityofpoliocampaig.aspx

46. http://www.jhumhealth.org/projects/mregister

47. http://www.healthnet.org/uhin

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53. https://lifesavingcommodities.org/?1z0lb52f

54. https://lifesavingcommodities.org/?ld7654rx

55. https://lifesavingcommodities.org/?1j65nncf https://lifesavingcommodities.org/?pbwzzq92

56. http://www.search4dev.nl/download/434663/464168.pdf http://www.tandfonline.com/doi/full/10.1080/10810730.2011.649106#.Uqz67mRDt2s

57. https://lifesavingcommodities.org/?7m7mxhkl

58. https://lifesavingcommodities.org/?svtx7tzr https://lifesavingcommodities.org/?7c3c3010

59. https://lifesavingcommodities.org/?p8qtdhn9

60. https://lifesavingcommodities.org/?t82dqakt https://lifesavingcommodities.org/?kzdfttb3 https://lifesavingcommodities.org/?jv03an9t

61. https://lifesavingcommodities.org/?jwxq4q6s

62. https://lifesavingcommodities.org/?k11xv63q

63. https://lifesavingcommodities.org/?wl2xncdq

64. https://lifesavingcommodities.org/?v8k23va1

65. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3265752/

66. http://www.tandfonline.com/doi/full/10.1080/09540121.2013.774315#.UqCOa2RDt2s

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69. http://www.vitalwaveconsulting.com/pdf/2011/mHealth%20Framework%20for%20Ethiopia%202011.pdf

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73. https://lifesavingcommodities.org/?mh437w45

74. https://lifesavingcommodities.org/?kd6hwpq4

75. https://lifesavingcommodities.org/?2zs882sh

76. https://lifesavingcommodities.org/?g8w7v8ds

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Appendix A

Definitions used to build the database on mHealth tools to improve the performance and accountability of FLWs

CATEGORY	VALUES	DEFINITION
1. Name of product	Free form	The most common name used to refer to the product
2. Vendor/Developer	Company/ Organization name	The company(s) or organization(s) that you would contact if you wanted to use the tool
3. Description of mHealth tool	Free form	Describe the mobile tool. 100 words maximum
4. Type of tool	Patient registration	Registering patients into a project specific or centralized database over the mobile phone. This often includes creating or using unique identifier numbers
	Patient assessment	Data collection and/or survey administration for patient identification of disease using a mobile phone
	Patient monitoring	Supporting the entry of patient medical data on a mobile phone for monitoring and data analysis
	Workplan	Mobile tool supporting frontline health workers prioritize daily, weekly and/or monthly patient load, in addition to the messages emphasized during an appointment, based on data from patient registration and assessment
	Counseling	Supporting frontline health workers deliver messages on health practices using mobile phone features
	Performance tracking	Mobile based data input of completed activities by frontline health workers to monitor performance and/or calculate salary/incentive pay
	Social networking	Mobile-based platform to facilitate collaboration and/or communication amongst frontline health workers
	Clinical decision making	Intelligent step-by-step guides on mobile phones for frontline health workers to assess a patient's condition and/or inform treatment decisions. This often includes questions for a frontline health worker to ask a patient, data inputs based on the patients answers to the questions and automated recommendations based on the data inputs
4. Type of tool continued	Checklists	Mobile-based lists to guide sub-activities to be performed by frontline health workers to ensure optimal quality (e.g. list for sub-activities during a home visit)
	Mobile Learning	Mobile-based platform to enable frontline health workers to learn health concepts, treatment guidelines, role expectations etc. This may also include options for assessment and certification
	Care Coordination	Coordination between frontline health workers and patients, frontline health workers and other health professionals, and for referrals, using the features of a mobile phone
	Compensation	Platform to enable faster delivery of frontline health worker salary, performance incentives and/or resources for transportation or supplies
5. Related commodity	Pneumonia	Amoxicillin, Injectable Gentamicin, Injectable Ampicillin, Injectable Procaine benzylpenicillin, Injectable Ceftriaxone, ARI Timer, Oxygen
	Diarrhea	ORS, Zinc
	Neonatal care	Caffeine citrate, Chlorhexidine solution, Antenatal Steroids, Vitamin K
	Newborn sepsis	Injectable Gentamicin
	Newborn asphyxia	Ambu bags, suction material
	Post-partum hemorrhage	Oxytocin, Misoprostol
	Severe pre-eclampsia and eclampsia	Magnesium sulfate
	Reproductive Health	Contraceptives: implants, depo-provera, emergency contraception, oral contraceptives, female condoms, male condoms
	Malaria	Artemisin Combination therapy (ACT), Artesunate: rectal and injection dosage
	HIV	Fixed-dose combination therapy, Nevirapine, Zidovudine, Isoniazid/Co-trimoxazole, Paracetamol, Morphine
	TB	TB Fixed-dose combination

5. Related commodity continued	Child Survival	Vitamin A
	All	Two or more of the related commodities
6. Country	Any country in the world	Country where a mobile tool is being piloted or implemented at scale
7. Predominant Technology	Pre-loaded application	Software application that is either downloaded and stored on a mobile phone's memory storage or used through a memory card. Does not require data connectivity to use the application
	Data application	Software application that requires data connectivity (i.e. WAP, 2G, 3G) to run on a mobile phone
	IVR	Information delivered or accessed through an interactive voice response system (IVR)
	Text SMS	Information delivered or accessed through text-based SMS messages on the mobile phone
	Rich-media SMS	Information delivered or accessed through audio-visual based SMS messages on the mobile phone
	Pre-loaded video	Videos that are either downloaded and stored on a mobile phone's storage memory or used through a memory card. Does not require data connectivity to access the videos
	Data video	Videos that requires data connectivity (i.e. WAP, 2G, 3G) to run on a mobile phone
	Voice	Utilizing voice to support the performance of CHWs
	Pre-loaded audio	Audio that is either downloaded and stored on a mobile phone's storage memory or used through a memory card. Does not require data connectivity to access the videos
8. Mobile phone compatibility	Basic	Mobile phone limited to SMS and Voice
	Java-based	Mobile phone with WAP browser, SMS, Voice and a Memory Card
	Android Smartphone	Mobile phone with data connectivity and audio-visual capabilities, operating on the Android platform
	PDA	Mobile phone with data connectivity and audio-visual capabilities
	Blackberry	Mobile phone with data connectivity and audio-visual capabilities, operating on the blackberry platform
8. Mobile phone compatibility continued	iPhone	Mobile phone with data connectivity and audio-visual capabilities, operating on the iOS platform
	Windows Smartphone	Mobile phone with data connectivity and audio-visual capabilities, operating on the Windows platform
	Smartphone	Use in cases where type of smartphone is not indicated
	All	Compatible with two or more mobile platforms
9. Open Source	Yes	The mobile tool and/or parts of the mobile tool are available open-source
	No	The mobile tool is not available open-source
10. Multi-language support	Yes	The mobile tool support for more than one language
	No	The mobile tool only supports one language
11. Platform	Freeform	Infrastructure used to build, store and/or deliver informed within a mobile tool
12. Source data	Freeform	International or national guidelines use to inform mobile tool
13. Business Model	Non-profit	The product is dependent on grant funding
	Government	The product is funded through government budgets
	Public-Private	The product is funded through a mix of grant and private capital
	Social Enterprise	The product is paid for by the community health worker, but profits are minimized to remain affordable
	Consumer	The product is paid for by the community health worker to maximize profits
14. Level of scale	Pilot	The mobile tool is being tested for feasibility or academic research in a time-limited, defined environment
	Regional	The mobile tool is being scaled within select state(s) in a country
	National	The mobile tool is being scaled across the entire country
15. Website	Freeform	Website of vendor/developer

Appendix B

Quantity of mHealth Tools by Target Population and Health Focus, Percentage of Tool Types, and Life-Saving Commodities Utilized

TARGET POPULATION:
GENERAL POPULATION
QUANTITY OF TOOLS:
77

TARGET POPULATION:
WOMEN
QUANTITY OF TOOLS:
26

TARGET POPULATION:
CHILDREN
QUANTITY OF TOOLS:
15

TOOL TYPES:	PATIENT REGISTRATION	PATIENT ASSESSMENT	PATIENT MONITORING	WORKPLAN	COUNSELING	PERFORMANCE TRACKING	SOCIAL NETWORKING	CLINICAL DECISION MAKING	CHECKLISTS	MOBILE LEARNING	COMPENSATION	CARE COORDINATION
HEALTH FOCUS: **COMMUNITY HEALTH** QTY OF TOOLS: **52**	3%		24%	5%	15%	6%	8%	8%		18%	8%	6%
HEALTH FOCUS: **HIV** QTY OF TOOLS: **15**		12%	24%		29%			12%		24%		
HEALTH FOCUS: **OTHER** QTY OF TOOLS: **4**		75%						25%				
HEALTH FOCUS: **MALARIA** QTY OF TOOLS: **3**			33%							33%	33%	
HEALTH FOCUS: **TB** QTY OF TOOLS: **3**		33%	33%						33%			
HEALTH FOCUS: **PREGNANCY** QTY OF TOOLS: **20**	5%	5%	30%		10%			20%	5%	15%	5%	5%
HEALTH FOCUS: **FAMILY PLANNING** QTY OF TOOLS: **6**	22%		11%		33%	11%				22%		
HEALTH FOCUS: **CHILD HEALTH** QTY OF TOOLS: **8**			38%		13%	13%		25%		13%		
HEALTH FOCUS: **NUTRITION** QTY OF TOOLS: **3**			33%					33%		33%		
HEALTH FOCUS: **IMMUNIZATION** QTY OF TOOLS: **1**			100%									
HEALTH FOCUS: **NEWBORN HEALTH** QTY OF TOOLS: **3**	33%				67%							

LIFE-SAVING COMMODITITES UTILIZED BY mHEALTH TOOLS

In 2012, the United Nations (UN) Commission on Life-Saving Commodities for Women and Children was established to address the millions of deaths of women and children that occur each year in low- and middle-income countries (LMICs) from diseases due to the lack of widespread access to 13 prioritized life-saving health commodities and operationalized a set of 10 recommendations to overcome critical barriers to access and use of the commodities. Recognizing the potential for mobile technologies to support the implementation of these recommendations, the Commission is collaborating with the mHealth Alliance to lead research efforts to further explore this opportunity. This infographic maps an inventory of mobile technologies that can be used to support the achievement of Recommendation 9, namely, improving the performance and accountability of FHW in LMICs through increased access to relevant information and tools to accurately understand, recommend and/or prescribe the 13 commodities.

MATERNAL HEALTH COMMODITIES

OXYTOCIN: Used for treatment of Post-partum Hemorrhage

MISOPROSTOL: Used for treatment of Post-partum Hemorrhage

MAGNESIUM SULFATE: Used for treatment of Eclampsia & Severe Pre-Eclampsia/Toxemia of Pregnancy

REPRODUCTIVE HEALTH COMMODITIES

FEMALE CONDOMS: Used for Family Planning & Contraception

IMPLANTS: Used for Family Planning & Contraception

EMERGENCY CONTRACEPTION: Used for Family Planning & Contraception

CHILD HEALTH COMMODITIES

AMOXICILLIN: Used for treatment of Pneumonia

ORAL REHYDRATION SALTS (ORS): Used for treatment of Diarrhea

ZINC: Used for treatment of Diarrhea

NEWBORN HEALTH COMMODITIES

INJECTABLE ANTIBIOTICS: Used for treatment of Newborn Sepsis

ANTENATAL CORTICOSTEROIDS (ANCS): Used for treatment of Respiratory Distress Syndrome for preterm babies

CHLORHEXIDINE: Used for Newborn Cord Care

RESUSCITATION EQUIPMENT: Used for treatment of Newborn Asphxia

Appendix C

Inventory of mHealth Tools

Global

Hesperian Health Guides
VENDOR/DEVELOPER: Hesperian, UnaMesa Association
DESCRIPTION: The Safe Pregnancy and Birth App is the only comprehensive app on pregnancy and birth developed specifically for low-resource settings. Life-saving information is presented in clear, accessible language rich with illustrations, and an intuitive and friendly navigation—perfect for working with community health workers or midwives with varied literacy levels.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: Post-partum hemorrhage, Severe pre-eclampsia and eclampsia
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: No
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: Hesperian Health Guides
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: hesperian.org/books-and-resources/safe-pregnancy-and-birth-mobile-app/

Newborn Care Series
VENDOR/DEVELOPER: Global Health Media Project
DESCRIPTION: Providing access to clinical health information through videos delivered on mobile phones.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: Newborn sepsis
TECHNOLOGY: Pre-loaded video
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: YouTube
SOURCE DATA: Care of the Newborn Reference Manual, Save the Children, 2004; Managing Newborn Problems, WHO, 2003; and Integrated Management of Childhood Illnesses Chart Booklet, WHO, 2011
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: globalhealthmedia.org

Multi-country

Anthrowatch
VENDOR/DEVELOPER: UNICEF
DESCRIPTION: Anthrowatch is being used for nutritional surveys and as an ongoing nutritional monitoring tool in food insecure countries.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: RapidSMS
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: unicefstories.org/tools/nutritionmonitoring/

CAMCAP
Belize, Costa Rica, El Salvador, Guatemala, Panama
VENDOR/DEVELOPER: Intrahealth International, USAID
DESCRIPTION: mLearning Reinforcement for HIV eCourse- mLearning for HIV community workers/activists, reinforcing content of eLearning course.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: HIV
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: FrontlineSMS:Learn
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.mhealthworkinggroup.org/project

CLIP (Community Level Interventions for Pre-eclampsia)
India, Mozambique, Nigeria, Pakistan
VENDOR/DEVELOPER: University of British Columbia, Olabisi Onabanjo University Teaching Hospital, Eduardo Mondlane University; Aga Khan University; KLE University - Jawaharlal Nehru Medical College; WHO; Pre-eclampsia Foundation
DESCRIPTION: CLIP aims to reduce pre-eclampsia burden via community mobilization and empowerment of community health workers to provide antenatal monitoring, appropriate referral, immediate intervention, and to arrange transport to the nearest equipped in-patient facility.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Severe pre-eclampsia and eclampsia
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.mhealthworkinggroup.org/project

CommCare in MVP
Ethiopia, Ghana, Kenya, Malawi, Mali, Nigeria, Rwanda, Senegal, Tanzania, Uganda
VENDOR/DEVELOPER: Millennium Villages Project (MVP)
DESCRIPTION: Supports data collection, patient monitoring for referrals and follow-up and enhanced service delivery (i.e., clinical algorithms, job aids).
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Android Smartphone
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: CommCare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: millenniumvillages.org/innovation/

Djobi
Mali, Senegal
VENDOR/DEVELOPER: Fond Francophone des Inforoutes; Sonatel Orange; PAMAS; Gaston Berger University; iicd; RAES
DESCRIPTION: Supporting community health workers collect data to prevent malaria and childhood mortality
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Malaria
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Emerginov
SOURCE DATA: N/A
BUSINESS MODEL: Public-Private
LEVEL OF SCALE: Pilot
WEBSITE: www.djobi.org/

eCompliance
Cambodia, India, Vietnam
VENDOR/DEVELOPER: Operation ASHA
DESCRIPTION: Improving patient adherence of TB treatment through biometric data collection and providing information to community health workers on patients that require follow-up
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: TB
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Frontline SMS
SOURCE DATA: World Health Organization (WHO) Directly Observed Treatment Short course (DOTS)
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: www.opasha.org/our-work/ecompliance-innovation-and-health/

Health eVillage
China, Haiti, Uganda, USA, Kenya
VENDOR/DEVELOPER: Skyscape
DESCRIPTION: Provides medical reference material and clinical decision support to health care workers.
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application (Data Application in Kenya)
MOBILE PHONE COMPATIBILITY: iPhone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Skyscape
SOURCE DATA: www.healthevillages.org/wp-content/themes/foundation/images/HeV_Brochure.pdf
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.healthevillages.org/

iHRIS
Botswana, Chad, Democratic Republic of the Congo, Ghana, Guatemala, India, Kenya, Lesotho, Liberia, Malawi, Mali, Namibia, Nigeria, Rwanda, Senegal, Sierra Leone, Tanzania, Togo, Uganda,
VENDOR/DEVELOPER: USAID, Capacity-Plus, IntraHealth
DESCRIPTION: iHRIS is an open source human resources information system used in 19 countries to track, manage and plan for their health workforces. There are three components of the iHRIS system: iHRIS Manage, for human resources; iHRIS Qualify, a health license and certification database; iHRIS Train to help manage health worker training information. There are also two workforce planning tools (iHRIS Plan and iHRIS Retain).
TYPE OF TOOL: Performance tracking, Workplan
TARGETED COMMODITIES: All
TECHNOLOGY: N/A
MOBILE PHONE COMPATIBILITY:
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT:
PLATFORM: iHRIS
SOURCE DATA:
BUSINESS MODEL:
LEVEL OF SCALE:
WEBSITE: www.ihris.org/ihris-suite/

Job Aid
Afghanistan, Ghana, Kenya, Malawi, Mozambique, Rwanda, Sierra Leone, Tanzania, Uganda, Zambia, Zimbabwe
VENDOR/DEVELOPER: World Vision, The Gates Foundation, Dimagi, Grameen Foundation, Australian Aid (AusAid), USAID, DFID/IrishAID, WV Canada, CIDA
DESCRIPTION: All projects are implementing the Community Health workers approach for the delivery of high impact community health interventions. The major focus being the extension of primary healthcare counselling from health facilities to the household. Envisioned to create a simple, affordable, transferable mobile solution for patient management, data collection and interface to MOH and community clinics
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Compare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.mhealthworkinggroup.org/project

LEAD Project, Local Partners Excel in Comprehensive HIV & AIDS Service Delivery
Ethiopia, Guyana, Kenya, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia
VENDOR/DEVELOPER: CRS, Futures Group, University of Maryland Institute of Human Virology, Catholic Medical Mission Board, Inter Church Medical Mission board
DESCRIPTION: Linking care across community services, healthcare workers, local facilities, and government to improve the lives of people living with HIV/AIDS
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: HIV
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: IQSMS; IQGEO
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: www.mhealthworkinggroup.org/project
www.futuresgroup.com/projects/local_partners_excel_in_comprehensive_hiv_aids_service_delivery_lead

Maternal and Newborn Health Quality Care Facility Assessment (MNH QoC)
Ethiopia, Kenya, Madagascar, Rwanda, Tanzania
VENDOR/DEVELOPER: MCHIP
DESCRIPTION: Obstetricians and nurse-midwives using mobile phones for capturing observational health worker performance data at hospitals and health facilities
TYPE OF TOOL: Checklists
TARGETED COMMODITIES: Post-partum hemorrhage, Severe pre-eclampsia and eclampsia
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Windows Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: No
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: National in Ethiopia, and Rwanda; Regional in Kenya, Madagascar, and Tanzania
WEBSITE: www.mchip.net/sites/default/files/mHealth_MCHIP_final.pdf

MOTECH Suite
India, Sierra Leone, Tanzania, Uganda, Zambia
VENDOR/DEVELOPER: Grameen Foundation, Dimagi, Inc, ThoughtWorks, InSTEDD, University of Southern Maine, VillageReach
DESCRIPTION: MOTECH Suite provides a set of services encompassing five key functional mHealth areas: Behavior Change & Demand Generation, Managing Patient Data, Improving Worker Performance, Last-Mile Supply Chain, and Patient Adherence.
TYPE OF TOOL: Care Coordination, Counseling, Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: MOTECH; OpenMRS; OpenLMIS; INSTEDD; CommCare (India, Sierra Leone, Tanzania); Compare (Uganda, Zambia)
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: motechsuite.org/

Project Mwana / Results 160
Malawi, Zambia
VENDOR/DEVELOPER: UNICEF
DESCRIPTION: Community Health Workers register births and trace patients via SMS to ensure that they receive key childhood interventions.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: RapidSMS
SOURCE DATA: N/A
Non-profit
N/A
http://unicefstories.org/tools/patienttracing/

Project Optimize
Albania, Vietnam
VENDOR/DEVELOPER: PATH, WHO
DESCRIPTION: Digital immunization registry that would allow better tracking of children in need of vaccinations through an electronic registry and vaccine tracking.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Data application

MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Government
LEVEL OF SCALE: National
WEBSITE: www.path.org/projects/project-optimize-albania.php
www.path.org/projects/project-optimize-vietnam.php

RemindMi
VENDOR/DEVELOPER: UNICEF
DESCRIPTION: CHWs register births over their phone and then receive timed reminders to go follow up with specific mothers to ensure that mothers are getting essential health services for their infants, such as HIV testing and immunization.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: HIV
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: RapidSMS
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: unicefstories.org/tools/healthreminder/

Switchboard
Ghana, Liberia, Tanzania
VENDOR/DEVELOPER: Switchboard
DESCRIPTION: Nationwide network and phone registry for community health workers
TYPE OF TOOL: Social networking
TARGETED COMMODITIES: All
TECHNOLOGY: Voice
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: No
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: USSD Registration Platform; Bulk SMS Platform
SOURCE DATA: N/A
BUSINESS MODEL: Social Enterprise
LEVEL OF SCALE: National
WEBSITE: www.switchboard.org

Afghanistan

Better Health for Afghan Mothers and Children (BHAMC)
VENDOR/DEVELOPER: World Vision
DESCRIPTION: Reinforces CHW training on the American College of Nurse-Midwives Home-Based Life Saving Skills for births and post-partum care.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: Neonatal care, Post-partum hemorrhage
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Android Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: CommCare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: wvi.org/afghanistan-mHealth

HIV Screening of Sex Workers
VENDOR/DEVELOPER: Bloomberg School of Public Health
DESCRIPTION: CHWs collecting information from female sex workers to identify individuals at risk for HIV
TYPE OF TOOL: Patient Assessment
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Android Smartphone
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: eMocha Platform
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: main.ccghe.net/content/emocha-projects

Bangladesh

BRAC Manoshi
VENDOR/DEVELOPER: mPower, BRAC, ClickDiagnostics
DESCRIPTION: Application automatically used vital signs and other data that health workers enter to triage patients. Medical responses were then based off of risk categorization and assessment of data.
TYPE OF TOOL: Patient Assessment
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: mTikka, mCare platforms
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mpower-social.com/blog/2011/10/launching-of-mcare-joint-initiative-by-johns-hopkins-ministry-of-health-and-mpower/#!health-model/ci0o

BRAC Manoshi
VENDOR/DEVELOPER: mPower, BRAC, ClickDiagnostics
DESCRIPTION: Mobile phone-based data collection tool and automates scheduler.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Neonatal care
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: http://health.brac.net/manoshi

mCARE
VENDOR/DEVELOPER: Government of Bangladesh, Ministry of Health and Family Welfare, MIS (Stewardship); Johns Hopkins Bloomberg School of Public Health (Research Partner); mPower Health / Click Diagnostics (Technical Development and Implementation); JiVitA / Johns Hopkins, Bangladesh (Field Implementation)
DESCRIPTION: mCARE is an integrated mobile phone health information system which: a) facilitates pregnancy surveillance and registration, b) optimizes scheduling and delivery of antenatal and postnatal care to pregnant women and newborns, and c) facilitates timely referrals and response for emergency pregnancy and neonatal crises in rural Bangladesh.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Click Diagnostics
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.jhumhealth.org/projects/mcare
www.mhealthinfo.org/project/mcare-maternal-neonatal-and-postpartum-care"

mRegister
VENDOR/DEVELOPER: USAID, Johns Hopkins Center for Communication Programs
DESCRIPTION: mRegister will allow current Government of Bangladesh field level workers greater mobility and efficiency while carrying out their daily tasks. Key functions for the application include: workload scheduling, performance monitoring, real-time workforce supervision, client registration and record keeping, and immediate access to key health indicators as recorded by the Family Welfare Assistant and Family Welfare Visitor.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application, Patient registration, Performance tracking, Workplan
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: mPower Health
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mhealthworkinggroup.org/project

Benin

CORE Group CommCare mHealth Collaborative
VENDOR/DEVELOPER: Center for Human Services, Norwegian Agency for Development Cooperation
DESCRIPTION: This project will pilot test the use of mobile technology by Community Health Workers in the Commune of Toffo and Ze, Benin. Specifically, the pilot test will consist of developing a family planning module that includes the use of images, audio and video clips that will be used by CHWs during their routine family planning counseling with mothers of children 0-59 months.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Compare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.mhealthworkinggroup.org/project

Botswana

Integrated Healthcare Information Service Through Mobile Telephony (IHISM)
VENDOR/DEVELOPER: University of Botswana
DESCRIPTION: Uses text messaging to provide means for health care workers to monitor patients with HIV for their care.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: HIV
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: research.microsoft.com/en-us/collaboration/papers/botswana.pdf
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: N/A

Ethiopia

Ethiopia mHealth project
VENDOR/DEVELOPER: Ethiopia Federal Ministry of Health, Columbia University, PATH, Vital Wave Consulting
DESCRIPTION: Using mHealth to strengthen the implementation of the Health Extension Worker Program in Ethiopia. There are five priority areas for mHealth integration within the health system: referrals, data exchange, supply chain management, training and education and consultation.
TYPE OF TOOL: Counseling, Mobile Learning, Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: CommCare; MOTECH
SOURCE DATA: Ministry of Health, Government of Ethiopia
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: National
WEBSITE: www.vitalwaveconsulting.com/pdf/2011/mHealth%20Framework%20for%20Ethiopia%202011.pdf

eVoucher
VENDOR/DEVELOPER: Marie Stopes Ethiopia, Embassy of the Netherlands
DESCRIPTION: MSIE developed a eVoucher system that has enabled the distribution and tracking of vouchers for family planning services to young people using mobile phones.
TYPE OF TOOL: Patient registration
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: bestpractice.mariestopes.org/BPG/Home/DownloadAsset/1181

Fitun Warmline
VENDOR/DEVELOPER: Fitun; John Hopkins Bloomberg School of Public Health
DESCRIPTION: A toll free call-in center, devoted to answering questions about HIV/AIDS from health care workers in Ethiopia.
Mobile Learning
TYPE OF TOOL: HIV
TARGETED COMMODITIES: Voice
TECHNOLOGY: All
MOBILE PHONE COMPATIBILITY: No
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: Non-profit
BUSINESS MODEL: National
WEBSITE: fitun.etharc.org

Health Systems 20/20
VENDOR/DEVELOPER: USAID
DESCRIPTION: Mobile checklists to improve supportive supervision of TB by assessing diagnostic services and delivery of DOTS services
TYPE OF TOOL: Checklists
TARGETED COMMODITIES: TB
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: Checklists developed by WHO, National TB and Leprosy Training Center and Health Systems 20/20; harmonized existing checklists from four pilot states
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.healthsystems2020.org/content/resource/detail/92730/

SMS Tech for Health
VENDOR/DEVELOPER: Technology for Change International
DESCRIPTION: Health care workers collect data on expectant women and system provides feedback on possible courses of action for care.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: smsinaction.crowdmap.com/reports/view/162

Ghana

mCoaching
VENDOR/DEVELOPER: JHPIEGO, USAID (MCHIP)
DESCRIPTION: Post-training reinforcement, follow-up and mentoring/supportive supervision
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: All
TECHNOLOGY: IVR
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: FrontlineSMS:Learn
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mhealthworkinggroup.org/project

Mobile Midwife Program
VENDOR/DEVELOPER: Grameen Foundation
DESCRIPTION: Mobile application to record and track the care delivered to women, newborns and children under 5
TYPE OF TOOL: Patient monitoring, Patient registration
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: MOTECH; OpenMRS
SOURCE DATA: BabyCenter.com

BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.motechsuite.org

Guatemala

Kawok
VENDOR/DEVELOPER: Tula Foundation
DESCRIPTION: Kawok is a suite of applications, maps and reports designed to support community health workers (CHWs) in their daily work in our community health program.
TYPE OF TOOL: Counseling, Patient monitoring, Patient registration, Performance tracking
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: CommCare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: tula.org/tulasalud/technology/

Librarians & Doctors Teaming Up
VENDOR/DEVELOPER: University of Pennsylvania Libraries, University of Pennsylvania School of Medicine, Hospitalito Atitlan & partner hospitals, Elsevier Foundation
DESCRIPTION: Physicians in Guatemala will be able to hold teleconsultations with physicians at the University of Pennsylvania.
TYPE OF TOOL: Clinical decision making, Mobile Learning
TARGETED COMMODITIES: All
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.healthcanal.com/public-health-safety/15514-Penn-Librarians-and-Doctors-Team-Help-Guatemalan-Patients.html

India

AESSIMS
VENDOR/DEVELOPER: Voxiva, PATH, Government of Andhra Pradesh
DESCRIPTION: Frontline health workers used the application to report outbreaks of Japanese Encephalitis.
TYPE OF TOOL: Patient Assessment
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: www.kiwanja.net/database/project/Project_PATH_AESSIMS.pdf
BUSINESS MODEL: Government
LEVEL OF SCALE: Regional
WEBSITE: N/A

eSwasthya
VENDOR/DEVELOPER: Piramal Foundation
DESCRIPTION: Female health workers use a mobile phone to connect with providers who triage the call then run remote consultation.
TYPE OF TOOL: Care Coordination
TARGETED COMMODITIES: All
TECHNOLOGY: Voice
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Consumer
LEVEL OF SCALE: Regional
WEBSITE: piramal.com/piramal-foundation

Handhelds for Health
VENDOR/DEVELOPER: Handhelds for Health
DESCRIPTION: Provides health care workers with mobile phone-based tools for data collection and disease surveillance.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: handheldsforhealth.org/index.htm

HealthPhone
VENDOR/DEVELOPER: The Mother and Child Health and Education Trust, Content Partners: UNICEF India, Global Health Media Project, Medical Aid Films, Alive & Thrive, Grampari, TeachAIDS, The Three Amigos, Buzz & Bite, No Excuses, iheedCrowd, Translators Without Borders, dotSUB, Videum, MobileRoadie Riddhi
DESCRIPTION: Provide a free personal video, audio and image reference library and guide to better health practices, on a microSD card, directly to health workers, families and communities, especially those who live in villages and slums, to use in their mobile phones, when they need it, where they are, and as they are.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded video
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: healthphone.org

Improving Frontline Worker Client Interaction through a Client Booking and Behaviour Change Communication Application for FP/SRH in Rajasthan
VENDOR/DEVELOPER: Marie Stopes, USAID, Dimagi
DESCRIPTION: Improve the effectiveness and accuracy of BCC and counselling by Interpersonal Communicators (IPC, MSI's frontline workers) by using prompts to ensure IPCs provide accurate information as well as by including pictorial tools which IPCs can show directly to clients in these low-literacy settings.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Compare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.mhealthworkinggroup.org/project

Integrated Family Health Initiative
VENDOR/DEVELOPER: CARE
DESCRIPTION: Supporting community health workers with managing patient load
TYPE OF TOOL: Patient monitoring, Patient registration, Workplan
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: CommCare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: www.ananya.org.in

Maternal Health Platform
VENDOR/DEVELOPER: Global Health Bridge
DESCRIPTION: Supports health care workers with data collection and follow-up, including reminders to the health care worker.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.globalhealthbridge.org/projects/maternal-health-platform/

mNewborn
VENDOR/DEVELOPER: IntraHealth International, Inc., Pop Council
DESCRIPTION: mNewbornCare- Mobile phone-based multimedia application to support ASHAs and ANMs in improving quality/number of postpartum home visits. 3 components: (a) self-learning and counseling tool, (b) decision support tool, and (c) real time monitoring and management tool.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.mhealthworkinggroup.org/project

Mobile Academy
VENDOR/DEVELOPER: BBC Media Action
DESCRIPTION: Mobile Academy is a training course, delivered via mobile phone, intended to expand and refresh community health workers' knowledge of life saving health behavior, and to enhance their interpersonal communication skills
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: All
TECHNOLOGY: IVR
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: No
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: MOTECH
SOURCE DATA: N/A
BUSINESS MODEL: Social Enterprise
LEVEL OF SCALE: Regional
WEBSITE: www.ananya.org.in/index.php/tools/106-mobile-academy

Mobile Kunji
VENDOR/DEVELOPER: BBC Media Action
DESCRIPTION: IVR tool designed to support community health workers with multimedia messages during counseling sessions and home visits
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: All
TECHNOLOGY: IVR
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: No
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: MOTECH
SOURCE DATA: N/A
BUSINESS MODEL: Public-Private
LEVEL OF SCALE: Regional
WEBSITE: www.ananya.org.in/index.php/tools/96-mobile-kunji

mSakhi
VENDOR/DEVELOPER: IntraHealth
DESCRIPTION: Interactive tutorial that provides ASHAs with educational content on various health care topics.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: Neonatal care, Post-partum hemorrhage, Reproductive Health, Severe pre-eclampsia and eclampsia
TECHNOLOGY: Pre-loaded video
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: mSakhi
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.intrahealth.org/page/mobile-application-reinforces-frontline-health-workers-knowledge-confidence-and-credibility-

ReMiND Project – Reducing Maternal and Newborn Deaths
VENDOR/DEVELOPER: CRS, Dimagi, Vatsalya with Hesperian and J-PAL
DESCRIPTION: Phone-based job aids
TYPE OF TOOL: Counseling, Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: CommCare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: www.commcarehq.org/exchange/325775003aa58cfcefbc75cfdf132e4d/info/

Sheikpura District Health Society
VENDOR/DEVELOPER: National Rural Health Mission, Norway India Partnership Initiative, Sheikpura District Health Society, State Bank of India, Eko Financial Services
DESCRIPTION: The National Rural Health Mission of India pays performance based incentives to India's community health workers in rural communities via mobile money. The program was piloted in January 2011 in the Shiekpura district of Bihar State, India.
TYPE OF TOOL: Compensation
TARGETED COMMODITIES: All
TECHNOLOGY: N/A
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Social Enterprise
LEVEL OF SCALE: Pilot
WEBSITE: www.in.undp.org/content/dam/india/docs/NIPI/Resources_Other-Publications_BrochureMMTForASHA.pdf

TeleDoc
VENDOR/DEVELOPER: Jiva Health
DESCRIPTION: Health care workers used mobile phones to connect with doctors to help guide treatment and diagnosis.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: All
TECHNOLOGY: Voice
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Consumer
LEVEL OF SCALE: Regional
WEBSITE: www.comminit.com/global/node/116145

Indonesia

Care Coordination
VENDOR/DEVELOPER: JHPIEGO, USAID (EMAS)
DESCRIPTION: Toll-free SMS system for managing referral for obstetric emergencies
TYPE OF TOOL: Care Coordination
TARGETED COMMODITIES: Post-partum hemorrhage
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: SMSLIB
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mhealthworkinggroup.org/project

Info Bidan
VENDOR/DEVELOPER: UNICEF; Indonesian Ministry of Health; Nokia and XL Axiata
DESCRIPTION: Capacity building amongst midwives
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Frontline SMS
SOURCE DATA: N/A
BUSINESS MODEL: Public-Private
LEVEL OF SCALE: Regional
WEBSITE: smsinaction.crowdmap.com/reports/view/257

SMS reinforcement
VENDOR/DEVELOPER: JHPIEGO, USAID (EMAS)
DESCRIPTION: SMS reinforcement and assessment of health provider knowledge
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: All
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A

PLATFORM: SMSLIB
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mhealthworkinggroup.org/project

Kenya

Baby Monitor: Connecting Women and infants to Care

VENDOR/DEVELOPER: Saving Lives at Birth partners: the US Agency for International Development (USAID), the Government of Norway, the Bill & Melinda Gates Foundation, Grand Challenges Canada, and The World Bank. InSTEDD and Jacaranda Health
DESCRIPTION: Baby Monitor takes clinical screening directly to women in the critical period before and after birth. This mobile phone application, developed by the Population Council and InSTEDD, uses interactive voice response technology to detect complications and take action. Women listen to screening questions in their local language and respond by pressing a key. Baby Monitor assesses responses and, if necessary, sends information, makes referrals, and dispatches community health workers.
TYPE OF TOOL: Patient Assessment
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: IVR
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.popcouncil.org/projects/349_BabyMonitor.asp
facebook.com/babymonitorapp

Capacity Kenya

VENDOR/DEVELOPER: IntraHealth
DESCRIPTION: Ensures regular communication with health care workers, especially regarding human resources information.
TYPE OF TOOL: Social networking
TARGETED COMMODITIES: All
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: BulkSMS
SOURCE DATA: N/A
BUSINESS MODEL: Public-Private
LEVEL OF SCALE: Pilot
WEBSITE: www.intrahealth.org/blog/text-messages-essential-tool-reaching-remote-health-workers-kenyan-health-system#.Uo9HZ2RgZb4

KEMSA e-mobile application

VENDOR/DEVELOPER: CDC Foundation mHealth Kenya
DESCRIPTION: Mobile phone-based ordering tool for commodities for health care workers that also allows for drug tracking.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.cdcfoundation.org/blog-entry/kemsa-e-mobile-launch-kenya

Kenya Polio Campaign

VENDOR/DEVELOPER: Global Polio Eradication Initiative
DESCRIPTION: Allowed 'real-time' data collection and transmission of polio campaign for faster stock turn around time, problem solving and dispatching of other resources (i.e., supervisors).
TYPE OF TOOL: Patient Assessment
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: EpiSurveyor
SOURCE DATA: N/A
BUSINESS MODEL: Government
LEVEL OF SCALE: Regional
WEBSITE: www.polioeradication.org/Research/PolioPipeline/No7Winter2011/Mobilephoneshelpassessqualityofpolio-campaig.aspx

Map of Medicine

VENDOR/DEVELOPER: Kijabe Hospital, Map of Medicine, Cisco
DESCRIPTION: Provides access to the medical information data base, Map of Medicine.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: Diarrhea, HIV, Malaria, TB
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: PDA
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Map of Medicine
SOURCE DATA: www.cisco.com/web/about/ac79/docs/wp/Kijabe_Hospital_CS_1009a.pdf
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: N/A

mHMtanni

VENDOR/DEVELOPER: Pathfinder International, USAID
DESCRIPTION: Community Health workers in Nairobi province use CommCare to support home visits related to MNCH and OVC care.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Compare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.pathfinder.org

Mobile Payroll

VENDOR/DEVELOPER: Pathfinder International, Visa, Nethope
DESCRIPTION: The project will implement a pay-for-performance scheme, whereby data collected through the mobile phone application will be linked to mPesa, a mobile money service, to deliver performance-based payments to community health workers via their mobile phone. The project aims to improve the transparency and the quality of services delivered, while recognizing worker performance.
TYPE OF TOOL: Compensation
TARGETED COMMODITIES: All
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: No
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: mPesa
SOURCE DATA: N/A
BUSINESS MODEL: N/A
LEVEL OF SCALE: Pilot
WEBSITE: frontlinehealthworkers.org/mhmtaani-us-supported-program-empowers-community-health-workers-through-mobile-technology/

Pambazuko-PALM

VENDOR/DEVELOPER: University of Washington, Universidad Peruana Cayetano Heredia, University of Nairobi, Asociacion Civil Impacta Salud y Educacion, Asociacion Via Libre
DESCRIPTION: Provides tailored messaging and an evidence-based counseling protocol in English and Kiswahili that nurses can use when interacting with patients.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: PDA
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: Distributed Health Assessment & Intervention Research
SOURCE DATA: faculty.washington.edu/wcurioso/emulator/e/Poster_Colecta_Palm_07.pdf
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.pambazuko.org/

Pamoja Project

VENDOR/DEVELOPER: UNICEF
DESCRIPTION: Health care workers receive SMS messages and emails twice a week to encourage optimal HIV service delivery.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: HIV
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: RapidSMS
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.rapidsms.org/projects/the-pamoja-project/

SMS Reminders for Malaria Treatment Guidelines

VENDOR/DEVELOPER: Wellcome Trust
DESCRIPTION: Health care workers received SMS messages on malaria case-management for 6 months and adherence to malaria treatment guidelines was assessed.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: Malaria
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Computer-generated SMS platform
SOURCE DATA: www.thelancet.com/journals/lancet/article/PIIS0140-6736%2811%2960783-6/abstract
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: N/A

TUPANGE

VENDOR/DEVELOPER: JHU·CCP, Jhpiego, Marie Stopes Int'l, MOH Kenya, Tupange
DESCRIPTION: TUPANGE will be using mobile phone technology and Facebook for FP messages and information for youth and health workers.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Rich-media SMS
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mhealthworkinggroup.org/project

Uliza!

VENDOR/DEVELOPER: FACES
DESCRIPTION: Hotline for health workers seeking advice and information on HIV care.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: HIV
TECHNOLOGY: Voice
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: www.faces-kenya.org/?s=uliz&Submit.x=-1023&Submit.y=-507&Submit=Go

Lesotho

Vista mHealth EMP

VENDOR/DEVELOPER: Vista LifeSciences
DESCRIPTION: Enabling CHWs to manage health workers in clinics and remote areas of HIV/AIDS patients
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Windows Smartphone
OPEN SOURCE: No
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Vista mHealth Electronic Medical Pathways
SOURCE DATA: N/A
BUSINESS MODEL: Public-Private
LEVEL OF SCALE: Regional
WEBSITE: www.vistalifesciences.com/index.php/emp-systems/hivaids-care.html

Malawi

Action Meningitis

VENDOR/DEVELOPER: D-Tree
DESCRIPTION: Mobile phone-based application that has adapted the emergency triage assessment and treatment (ETAT) protocol.
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Android Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.d-tree.org/malawi/etat/

CCM Application

VENDOR/DEVELOPER: D-Tree; Catholic Relief Services; USAID
DESCRIPTION: The mobile application implements the C-IMCI protocol as defined by the Government of Malawi and in that way offers decision support to the Health Surveillance Assistants who are working in their communities to promote good health.
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: N/A
SOURCE DATA: Government of Malawi C-IMCI Protocol
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.d-tree.org

CCM Application

VENDOR/DEVELOPER: D-Tree; Barr Foundation
DESCRIPTION: To support HSAs in Malawi to improve the delivery of maternal and child health services
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.d-tree.org/malawi/ovc-and-community-imci-malawi-2/

CCM Application

VENDOR/DEVELOPER: D-Tree; Barr Foundation
DESCRIPTION: A supervisory tool to manage the performance of HSAs
TYPE OF TOOL: Performance tracking
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.d-tree.org/malawi/ovc-and-community-imci-malawi-2/

IMPACT Project

VENDOR/DEVELOPER: D-Tree, Malawi Ministry of Health
DESCRIPTION: The IMPACT project supports the continuum of care for mothers and children diagnosed with HIV. The application covers a total of 18 required visits, ranging from 3 antenatal visits, 3 postpartum visits and 12 postnatal visits every two months, until the child reaches the age of two.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.d-tree.org/malawi/maternal-health-community/

Management Sciences for Health
VENDOR/DEVELOPER: Management Sciences for Health, K4Health, MOH Malawi
DESCRIPTION: Information sharing between CHWs and district health facilities
TYPE OF TOOL: Care Coordination
TARGETED COMMODITIES: HIV
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Frontline SMS
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.k4health.org/malawi

Maternal Health Facility
VENDOR/DEVELOPER: D-Tree, Jhpiego
DESCRIPTION: Provides clinical algorithms for maternal health care.
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Android Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.d-tree.org/malawi/maternal-health-facility/

RapidSMS
VENDOR/DEVELOPER: UNICEF
DESCRIPTION: Interactive clinical decision support system for child health as it relates to nutrition.
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: RapidSMS
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.unicef.org/infobycountry/usa_51097.html

Mali

Association Pesinet
VENDOR/DEVELOPER: Pesinet, Ashoka Sanofi Espoir Foundation, BNP Paribas Foundation, Orange Mali foundation, Médicaments Export, Malian Ministry of Health
DESCRIPTION: Delivered in partnership with the local primary health centers, the service combines regular health follow-up, micro-insurance and education for prevention. It is based on technologies and on the work of agents in the communities.
TYPE OF TOOL: Counseling, Patient monitoring
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Pesinet
SOURCE DATA: N/A
BUSINESS MODEL: Social Enterprise
LEVEL OF SCALE: Pilot
WEBSITE: www.mhealthworkinggroup.org/project

Mozambique

inSCALE mobile phone support system
VENDOR/DEVELOPER: Malaria Consortium, London School of Hygiene and Tropical Medicine, University College London, Dimagi, ScyFy technologies, Ministries of Health of Mozambique
DESCRIPTION: In Mozambique, CHWs are provided with smart phones programmed with a tool for decision support, immediate feedback and multimedia, audio and images to improve adherence to protocols. The tool also allows CHWs to send key indicators to a server and to keep a register of patients who can be tracked over time. The indicators submitted can be used to monitor the performance of CHWs by providing automated, timely, digestible reports with targeted follow-up actions for CHW supervisors.
TYPE OF TOOL: Clinical decision making, Counseling
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Android Smartphone
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Compare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.malariaconsortium.org/inscale

Mozambique Health Information Network (MHIN)
VENDOR/DEVELOPER: FHI-360 SATELLIFE, MISAU, Ministry of Science and Technology (Mozambique)
DESCRIPTION: Supports data collection and transmission from rural health care workers to district health offices, including data on monitoring drug usage and stocks for supply management.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Government
LEVEL OF SCALE: Regional
WEBSITE: www.healthnet.org/mhin

Nigeria

Health Systems 20/20
VENDOR/DEVELOPER: Datadyne; Abt Associates
DESCRIPTION: Improved supportive supervision by use of data-driven quality assessment tools with PDAs
TYPE OF TOOL: Performance tracking
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Datadyne
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mhealthworkinggroup.org/project

m4Change
VENDOR/DEVELOPER: Pathfinder International, Dimagi
DESCRIPTION: Health workers use the mobile phone application to track antenatal care clients over time, provide interactive counseling and schedule SMS appointment reminders for their clients.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Java-based, Android Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: CommCare
SOURCE DATA: www.commcarehq.org/exchange/05f2a3bc4a7211c2c3535b8b-392babbc/info/
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: www.pathfinder.org/our-work/projects/m4change.html

Mobile Community Based Surveillance Project (mCBS)
VENDOR/DEVELOPER: eHealth Nigeria
DESCRIPTION: TBAs are able to notify health officials and other health care providers about maternal and child health events for follow-up/action.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: RapidSMS
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: ehealthafrica.org/projects/mobile-community-based-surveillance-mcbs/

NURHI Project
VENDOR/DEVELOPER: MOH Nigeria, CCPN, JSI, JHU-CCP
DESCRIPTION: Using mobile phone technology and Facebook for FP messages, appointment reminders and information for youth and health workers.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Rich-media SMS
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mhealthworkinggroup.org/project

SMS Birth Reporting
VENDOR/DEVELOPER: UNICEF
DESCRIPTION: Community health workers report every birth using text messages and the data is gathered at a national level.
TYPE OF TOOL: Patient registration
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: RapidSMS
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: National
WEBSITE: unicefstories.org/tools/smsbirthreporting/

Pakistan

HealthLine
VENDOR/DEVELOPER: Carnegie Mellon University, Aga Khan University
DESCRIPTION: Toll-free health information line for [rural] health care workers.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: All
TECHNOLOGY: Voice
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: N/A
SOURCE DATA:
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: www.cs.cmu.edu/-healthline/

Jaroka Tele-HealthCare
VENDOR/DEVELOPER: Tele-HealthCare
DESCRIPTION: Mobile phone-based tele-healthcare for Lady Health Workers (LHWs) in rural areas, allowing them to connect with experts for medical advice in the field.
TYPE OF TOOL: Social networking
TARGETED COMMODITIES: All
TECHNOLOGY: Voice, Rich-media SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: tele-health-care.org/implementation/jaroka-tele-healthcare-in-rural-mardan/

Micro Health Franchise System (UmeedSey)
VENDOR/DEVELOPER: FINCON Services, Poverty Eradication Initiative, Saving Lives at Birth
DESCRIPTION: SMS-based clinical decision support tool that links health workers with specialists who help determine the plan of action.
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: umeedsey.org/

Peru

Cell-PREVEN
VENDOR/DEVELOPER: Universidad Peruana Cayetano Heredia (Peru), Imperial College (London) and the University of Washington (Seattle), Peru's Ministry of Health
DESCRIPTION: System allows for real-time data collection and transmission of adverse events related to antibiotic administration for STDs.
TYPE OF TOOL: Patient Assessment
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: PDA
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Cell-PREVEN
SOURCE DATA: N/A
BUSINESS MODEL: Government
LEVEL OF SCALE: Pilot
WEBSITE: www.prevenperu.org/preven/

Colecta-PALM
VENDOR/DEVELOPER: University of Washington, Universidad Peruana Cayetano Heredia, University of Nairobi, Asociacion Civil Impacta Salud y Educacion, Asociacion Via Libre
DESCRIPTION: Provides tailored behavioral messaging, in Spanish, that the health worker can use to help patients adhere to ARTs and practice safer sex.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: PDA
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Distributed Health Assessment & Intervention Research
SOURCE DATA: faculty.washington.edu/wcurioso/emulator/e/Poster_Colecta_Palm_07.pdf
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: N/A

mLearning for HIV/AIDS
VENDOR/DEVELOPER: Institute of Tropical Medicine and Institute of Medicine Alexander von Humboldt eLearning Teams
DESCRIPTION: Health care workers were provided with guidelines on HIV/AIDS treatment. Visual content was used.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: iPhone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: iClone and Moviestorm
SOURCE DATA: www.aidsrestherapy.com/content/7/1/35
BUSINESS MODEL: N/A
LEVEL OF SCALE: Pilot
WEBSITE: www.aidsrestherapy.com/content/7/1/35

mLearning for HIV/AIDS
VENDOR/DEVELOPER: Institute of Tropical Medicine and Institute of Medicine Alexander von Humboldt eLearning Teams
DESCRIPTION: Health care workers were provided with guidelines on HIV/AIDS treatment with access to feedback, readings, and peer-to-peer sharing.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: iPhone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: MLE Moodle
SOURCE DATA: www.aidsrestherapy.com/content/7/1/35
BUSINESS MODEL: N/A
LEVEL OF SCALE: Pilot
WEBSITE: www.aidsrestherapy.com/content/7/1/35

Philippines

Community Health Information Tracking System (CHITS)
VENDOR/DEVELOPER: Dr Herman Tolentino
DESCRIPTION: An SMS-based electronic health record system for government health centers.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: Yes

MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: CHITS
SOURCE DATA: N/A
BUSINESS MODEL: Government
LEVEL OF SCALE: Regional
WEBSITE: www.chits.ph/web/?page_id=2

National Telehealth Service Program

VENDOR/DEVELOPER: University of the Philippines Manila - National Telehealth Center (NTHC), Philippines Department of Health
DESCRIPTION: Allows telereferrals and responses to be sent via SMS with a strong focus on patient care.
TYPE OF TOOL: Care Coordination
TARGETED COMMODITIES: All
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Government
LEVEL OF SCALE: National
WEBSITE: one.telehealth.ph/beta/

PhilHealth Remittance-By-Air (RBA)

VENDOR/DEVELOPER: PhilHealth
DESCRIPTION: Provides mobile phone-based payments to informal health care workers.
TYPE OF TOOL: Compensation
TARGETED COMMODITIES: N/A
TECHNOLOGY: Rich-media SMS
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Government
LEVEL OF SCALE: National
WEBSITE: www.philhealth.gov.ph/

Rwanda

IHSSP (Integrated Health systems Strengthening)

VENDOR/DEVELOPER: Management Sciences for Health, USAID
DESCRIPTION: SMS text-based, data reporting and recording, CHWs communicating with health facilities
TYPE OF TOOL: Care Coordination
TARGETED COMMODITIES: All
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mhealthworkinggroup.org/project

RapidSMS Rwanda

VENDOR/DEVELOPER: UNICEF; WHO;UNFPA; Government of Rwanda
DESCRIPTION: Track pregnancies, report on danger signs during pregnancy, subscribe to emergency alerts to ensure that women can access emergency obstetric care, and provides a real-time national surveillance mechanism for maternal health.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Post-partum hemorrhage
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: RapidSMS
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: National
WEBSITE: www.rapidsms.moh.gov.rw/#intro

TRACnet

VENDOR/DEVELOPER: Rwanda Ministry of Health, Voxiva
DESCRIPTION: Comprehensive program that allows health care workers to send and receive information, including stock supply monitoring and test results on patients.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: HIV
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: N/A
SOURCE DATA: www.un.org/esa/sustdev/publications/africa_casestudies/tracnet.pdf
BUSINESS MODEL: Government
LEVEL OF SCALE: Regional
WEBSITE: www.tracnet.rw/tracnet/core/modules/pagelayout/web/showpage.aspx?menukey=1

Senegal

Capacity Plus

VENDOR/DEVELOPER: Intrahealth International
DESCRIPTION: IVR Family Planning Course- FP refresher training for nurses in Senegal to be delivered via mobile phone interactive voice response (IVR) system
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: IVR
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.mhealthworkinggroup.org/project

Mobile Technology to Reduce Maternal Death

VENDOR/DEVELOPER: WAHA International, Ministry of Health Senegal, The Fistula Foundation
DESCRIPTION: Provide means for transmitting referrals from the community to a facility for critical obstetric care.
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: Post-partum hemorrhage, Severe pre-eclampsia and eclampsia
TECHNOLOGY: Voice
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: www.waha-international.org/?what-we-do=1614
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.waha-international.org/?projects&id=37

Vitamin A supplementation at 6 months contact

VENDOR/DEVELOPER: Canadian International Développement Agency (CIDA), HKI
DESCRIPTION: The purpose of deploying SMS monitoring and evaluation is to introduce real time feedback into project management. The SMS strategies designed for this project can result in the development of both quantitative and qualitative data. SMS communications provide data that is as reliable as paper data entry, while introducing time and cost efficiencies. SMS strategies can be used to improve: the targeting of mothers, the engagement of the community health worker with local beneficiaries, provide data-driven performance feedback, and enhance the accountability in stock management and service provision.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: ReminderSMS
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.mhealthworkinggroup.org/project

South Africa

Mobile Health Information System (MHIS)

VENDOR/DEVELOPER: Eastern Cape Department of Health, FHI 360, MTN-South Africa, Nelson Mandela Metropolitan University/School of Clinical Care Sciences, South Africa Partners, Qualcomm Wireless Reach
DESCRIPTION: Smartphone outfitted with a locally relevant clinical library that health care workers can use for continuing education and professional development.
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Android Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: MHIS
SOURCE DATA: www.qualcomm.com/media/documents/files/wireless-reach-case-study-south-africa-mobile-health-info-system-english-.pdf
BUSINESS MODEL: Government
LEVEL OF SCALE: Pilot
WEBSITE: www.qualcomm.com/media/documents/wireless-reach-case-study-south-africa-mobile-health-info-system-english

PIERS on the Move

VENDOR/DEVELOPER: University of British Columbia; Lions Gate Technologies; Stellenbosch University
DESCRIPTION: The PIERS on the Move project combines two previously successful innovations: 1) the miniPIERS model - a clinical risk assessment model for women with pre-eclampsia based on only demographics, symptoms and signs; and 2) the Phone Oximetry - a mobile phone based pulse oximetry. The objective of the project is to develop and test a low-cost and simple device that will allow community health workers to rapidly and reliably identify women and babies at increased risk of complications from pre-eclampsia, before these complications arise. This allows preventative treatment to occur.
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: Severe pre-eclampsia and eclampsia
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: savinglivesatbirth.net/summaries/37

The North West Department of Health project

VENDOR/DEVELOPER: Mobenzi Researcher; Medical Research Council; University of the Western Cape in partnership with the North West Department of Health
DESCRIPTION: CHWs utilize their mobile phones to complete a contextual form each time they make a patient visit and record information about each patient's health, adherence to prescribed treatment and any pregnancies or births.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Mobenzi Researcher
SOURCE DATA: N/A
BUSINESS MODEL: Private
LEVEL OF SCALE: Pilot
WEBSITE: www.mobenzi.com/researcher/Case-Studies/View/NWDoH

Tanzania

AfyaMtandao

VENDOR/DEVELOPER: IICD, Christian Social Services Commission
DESCRIPTION: Focuses on health knowledge sharing and support amongst health care workers through ICTs.
TYPE OF TOOL: Mobile Learning, Social networking
TARGETED COMMODITIES: All
TECHNOLOGY: N/A
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: afyamtandaonetwork.ning.com/page/about

eIMCI

VENDOR/DEVELOPER: D-Tree
DESCRIPTION: Converted paper-based IMCI protocol into an electronic protocol that health care workers could use for point-of-care support.
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: PDA
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: CommCare
SOURCE DATA: www.biomedcentral.com/1472-6947/13/95
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.dimagi.com/mobile-e-imci/

HIV/AIDS Care

VENDOR/DEVELOPER: D-Tree
DESCRIPTION: Clinical protocols for triaging HIV/AIDS patients receiving ARTs.
TYPE OF TOOL: Patient Assessment
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.d-tree.org/tanzania/hivaids-tanzania/

mHealth Tanzania

VENDOR/DEVELOPER: Phones for Health, PEPFAR
DESCRIPTION: Provides an easy way for health care workers to supply data on on infection rates for malaria, cholera, measles, typhoid, etc.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: All
TECHNOLOGY: IVR
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: IVR
SOURCE DATA: N/A
BUSINESS MODEL: Public-Private
LEVEL OF SCALE: Pilot
WEBSITE: www.cdcfoundation.org/PEPFAR

Mobile Money

VENDOR/DEVELOPER: Pathfinder, mPesa
DESCRIPTION: Pathfinder Tanzania pioneered the use of mPesa for office operational costs, as well as delivery of payments for Pathfinder-supported community health workers in Tanzania. From November 2010 to May 2013, Pathfinder Tanzania became the second largest corporate user of Vodacom mPesa services and has sent $1.8 million through the mPesa platform to over 20,000 recipients. Now, more than 95 percent of all its office transactions are initiated through mobile money. All community health workers supported in Pathfinder's projects are paid monthly via mPesa and all training recipients receive stipends via mPesa.
TYPE OF TOOL: Compensation
TARGETED COMMODITIES: All
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: No
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: mPesa
SOURCE DATA: N/A
BUSINESS MODEL: N/A
LEVEL OF SCALE: Pilot
WEBSITE: www.pathfinder.org/our-work/projects/mhealth-in-tanzania.html

Mobile Money

VENDOR/DEVELOPER: D-Tree, Zantel, Etisalat, Jhipiego
DESCRIPTION: D-tree established a program in Zanzibar, Tanzania to help frontline community health workers provide high quality maternal health care and adequately refer women with high-risk conditions and obstetric emergencies to health facilities. Mobile money is used to transfer funds from D-Tree to Community Birth Attendant (CBA) accounts to pay for transportation and withdraw their incentives. Saw a dramatic increase in facility delivery rates
TYPE OF TOOL: Compensation
TARGETED COMMODITIES: Severe

pre-eclampsia and eclampsia
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.mhealthworkinggroup.org

Tanzania Telemedicine

VENDOR/DEVELOPER: IICD, iPATH
DESCRIPTION: Health care workers are able to access iPATH teleconsultation platform using their mobile phones to transmit case data for consultations.
TYPE OF TOOL: Social networking
TARGETED COMMODITIES: All
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: iPATH
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
http://www.iicd.org/projects/tanzania-telemedicine

TB Engage

VENDOR/DEVELOPER: Pathfinder International
DESCRIPTION: In order to promote screening for tuberculosis and improve health seeking behavior to improve the uptake of tuberculosis screening and treatment, Pathfinder is building the capacity of community health workers to identify and refer possible tuberculosis suspects for further examination. As part of this project, Pathfinder will implement a two way self-screening SMS project that will allow clients to self-screen for tuberculosis based on the National TB/HIV screening tool from the National Tuberculosis and Leprosy program in Tanzania. Once identified as a possible suspect, the SMS system will encourage clients to go to the facility for further screening and receive follow up by community health workers at the community level.
TYPE OF TOOL: Patient Assessment
TARGETED COMMODITIES: TB
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: National TB/HIV Screening Tool from the National Tuberculosis and Leprosy program
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.pathfinder.org/our-work/projects/mhealth-in-tanzania.html

Clinical Decision Making

VENDOR/DEVELOPER: JHPIEGO, USAID (ACCESS-FP)
DESCRIPTION: Clinical guideline and decision-making application used by Community Health Workers
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Compare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mhealthworkinggroup.org/project

Clinical Decision Support for HIV/AIDS and FP Home Based Care Providers

VENDOR/DEVELOPER: Pathfinder International, CDC/PEPFAR, FHI360 for the FP portion; D-Tree
DESCRIPTION: Over 300 community health workers are using CommCare software to guide home visits related to HIV/AIDS. HBC providers receive SMS messages for improved follow up of clients. Select HBC providers also have an app to guide Family Planning Counseling.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: HIV, Reproductive Health
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Compare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: www.pathfinder.org

COMMIT Project

VENDOR/DEVELOPER: JHU·CCP, USAID, COMMIT Project, NMCP, Population Services International/Tanzania
DESCRIPTION: A coordination system involving CHWs concerned with community based malaria control activities. Maps of malaria prevalence and incidence would be made available to help guide intervention and vector control strategies with BCC and monitoring.
TYPE OF TOOL: Care Coordination
TARGETED COMMODITIES: Malaria
TECHNOLOGY: Rich-media SMS
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mhealthworkinggroup.org/project

Family Planning

VENDOR/DEVELOPER: D-Tree
DESCRIPTION: The project fosters use of evidence-based practices during family planning service provision via mobile phone-based applications by community based health workers
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.d-tree.org

HIV/AIDS Care

VENDOR/DEVELOPER: D-Tree
DESCRIPTION: D-tree International has developed a set of clinical protocols for the purpose of triaging HIV/AIDS patients receiving ART.
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: Yes
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.d-tree.org

PROGRESS Project

VENDOR/DEVELOPER: FHI360, USAID, PROGRESS Project, MOHSW Tanzania, D-Tree International, Pathfinder
DESCRIPTION: Adaptation of an evidence-based FP counseling and screening job aid for use on mobile phones by community health workers as part of an existing HIV home-based care program. The intervention will also focus on the use of mobile phones to expedite routine data collection and reporting among levels of the health system.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Smartphone
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: CommCare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: www.mhealthworkinggroup.org/project

Uganda

inSCALE mobile phone support system

VENDOR/DEVELOPER: Malaria Consortium, London School of Hygiene and Tropical Medicine, University College London, Dimagi, ScyFy technologies, Ministries of Health of Uganda
DESCRIPTION: In Uganda, CHWs are given a Java enabled mobile phone through which they can send their weekly reports on patients seen and drug stocks, receive immediate performance related feedback based on data submission and monthly motivational messages to reinforce topics that need reminder and refresher training
TYPE OF TOOL: Patient monitoring, Performance tracking
TARGETED COMMODITIES: All
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Java-based
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: Compare
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.malariaconsortium.org/inscale

Mobiles for Quality Improvement (m4QI)

VENDOR/DEVELOPER: JHPIEGO, USAID (SHOPS), Abt Associates, Marie Stopes/Uganda, Appfrica, Marie Stopes International, FrontlineSMS
DESCRIPTION: SMS reinforcement and assessment of health provider knowledge; free and open source software development
TYPE OF TOOL: Mobile Learning
TARGETED COMMODITIES: Reproductive Health
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: Basic
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: FrontlineSMS:Learn
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: www.shopsproject.org/sites/default/files/resources/SHOPS%20m4QI%20Uganda%20Pilot%20Report.pdf

PreventionRX Study

VENDOR/DEVELOPER: University of Washington; New York University; Integrated Community Based Initiatives
DESCRIPTION: Individualized HIV "prevention prescription" counselling messages based on HIV serostatus, risk factors, and risk behaviors.
TYPE OF TOOL: Counseling
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Android Smartphone
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: eMocha Platform
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: main.ccghe.net/CCG/country/uganda#RxeMOCHA

PreventionRX Study

VENDOR/DEVELOPER: University of Washington; New York University; Integrated Community Based Initiatives
DESCRIPTION: A questionnaire administered to identify patients at high-risk for HIV
TYPE OF TOOL: Clinical decision making
TARGETED COMMODITIES: HIV
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: Android Smartphone
OPEN SOURCE: Yes
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: eMocha Platform
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Pilot
WEBSITE: main.ccghe.net/CCG/country/uganda#RxeMOCHA

Uganda Health Information Network (UHIN)

VENDOR/DEVELOPER: FHI-360 SATELLIFE
DESCRIPTION: Supports data collection and transmission on a daily basis, in addition to offering continued education.
TYPE OF TOOL: Mobile Learning, Patient Assessment, Patient monitoring
TARGETED COMMODITIES: HIV, Malaria, TB
TECHNOLOGY: Pre-loaded application
MOBILE PHONE COMPATIBILITY: PDA
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: Regional
WEBSITE: www.healthnet.org/uhin

Vietnam

Project Optimize

VENDOR/DEVELOPER: PATH, WHO
DESCRIPTION: Digital immunization registry that would allow better tracking of children in need of vaccinations through an electronic registry and vaccine tracking.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Data application
MOBILE PHONE COMPATIBILITY: N/A
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: N/A
SOURCE DATA: N/A
BUSINESS MODEL: Government
LEVEL OF SCALE: National
WEBSITE: www.path.org/projects/project-optimize-vietnam.php

Zambia

Project Mwana / Results 160

VENDOR/DEVELOPER: UNICEF; FHI360
DESCRIPTION: Community Health Workers register births and trace patients via SMS to ensure that they receive key childhood interventions.
TYPE OF TOOL: Patient monitoring
TARGETED COMMODITIES: Child Survival
TECHNOLOGY: Text SMS
MOBILE PHONE COMPATIBILITY: All
OPEN SOURCE: N/A
MULTI-LANGUAGE SUPPORT: N/A
PLATFORM: RapidSMS
SOURCE DATA: N/A
BUSINESS MODEL: Non-profit
LEVEL OF SCALE: N/A
WEBSITE: unicefstories.org/tools/patienttracing/

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