Life Saving Commodities
Improving access, saving lives

Demand Generation for Reproductive, Maternal, Newborn and Child Health Commodities

UTILIZING ICT IN DEMAND GENERATION FOR REPRODUCTIVE, MATERNAL, NEWBORN AND CHILD HEALTH:

Three Case Studies and Recommendations For Future Programming

July 2014

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HEALTH COMMUNICATION CAPACITY COLLABORATIVE

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Acronyms

CHPS	Community-Based Health Planning and Services
CHWs	Community Health Workers
GSM	Global System for Mobile
HCAC	Health Content Advisory Council
ICT	Information and Communication Technology
IVR	Interactive Voice Response
JHU·CCP	Johns Hopkins Bloomberg School of Public Health Center for Communication Programs
MAMA	Mobile Alliance for Maternal Action
MOTECH	Mobile Technology for Community Health
RMNCH	Reproductive, Maternal, Newborn and Child Health
SBCC	Social and Behavior Change Communication
SM	Social Marketing
SMS	Short Message Service
UNCoLSC	United Nations Commission on Life-Saving Commodities for Women's and Children's Health
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
USSD	Unstructured supplementary service data
WHO	World Health Organization
WRHI	Wits Reproductive Health and HIV Institute

About

What is this resource?

This resource provides an in-depth look at three programs that illustrate the use of information and communication technologies (ICTs) and new media – specifically using mobile technologies – as part of an integrated strategy to increase demand for and use of reproductive, maternal, newborn and child health (RMNCH) commodities and services.

The three case studies are:

1. **Mobile Alliance for Maternal Action** (MAMA), which uses technology to improve health and nutrition outcomes among pregnant women and new mothers and their infants in Bangladesh and South Africa

2. **Ananya,** which is a multiplatform program designed to reduce maternal and infant mortality in Bihar, India

3. **Mobile Technology for Community Health** (MOTECH), which aims to increase the quantity and quality of prenatal and neonatal care in rural Ghana

Who should use this resource?

This guide is intended for program managers, planners and other professionals involved in the design, implementation or evaluation of demand generation programs that work to improve the demand for and utilization of RMNCH commodities and services.

How do I use this resource?

The three case studies provide examples on how to use technology as part of a larger, integrated communication strategy for demand generation. They also provide examples on how to apply behavior change theory to demand generation programs. The essence of this resource is captured in the last section highlighting key lessons learned from all three case studies with recommendations for future ICT programs.

This resource serves as an important tool in the Demand generation implementation kit for underutilized commodities in RMNCH (http://sbccimplementationkits.org/demandrmnch), which is designed to support the development of country-specific communication strategies to increase demand for underutilized commodities in RMNCH.

Thirteen Life-Saving Commodities for Women and Children

Reproductive Health

Female Condoms

Prevent HIV and unintended pregnancy: A female condom (FC) is a plastic pouch made of polyurethane that covers the cervix, vagina and part of the external genitals. FCs provide dual protection by preventing STI infection, including HIV, and unintended pregnancies.

Contraceptive Implants

Prevent unintended pregnancy: Contraceptive implants are small, thin, flexible plastic rods inserted into a woman's arm that release a progestin hormone into the body. These safe, highly effective, and quickly reversible contraceptives prevent pregnancy for three to five years.

Emergency Contraception

Prevent unintended pregnancy: The emergency contraceptive pill is the most widely available emergency contraceptive in developing countries. It is optimally taken in one dose of 1.5mg as soon as possible after sexual activity. An alternative product of 0.75mg is also widely available.

Maternal Health

Oxytocin

Post-partum hemorrhage: WHO recommends oxytocin as the uterotonic of choice for prevention and management of postpartum hemorrhage.

Misoprostol

Post-partum hemorrhage: In settings where skilled birth attendants are not present and oxytocin is unavailable, misoprostol (600 micrograms orally) is recommended.

Magnesium Sulfate

Eclampsia and severe pre-eclampsia: WHO recommends MgSO4 as the most effective treatment for women with eclampsia and severe pre-eclampsia.

Child Health

Amoxicillin

Pneumonia: Amoxicillin is an antibiotic that is used to treat pneumonia in children under five. Amoxicillin is prepared in 250mg scored, dispersible tablet (DT) in a blister pack of 10 DTs.

Oral Rehydration Salts

Diarrhea: Oral rehydration salts (ORS) is a glucose-electrolyte solution given orally to prevent dehydration from diarrhea. ORS is packaged in sachets of powder to be diluted in 200 ml, 500 ml or 1 liter of fluid, prepared to an appropriate flavor.

Zinc

Diarrhea: Replenishment with zinc can reduce the duration and severity of diarrheal episodes. Zinc is prepared either in 20mg scored, taste masked, dispersible tablets or oral solutions at concentration of 10mg/5ml.

Newborn Health

Injectable Antibiotics

Prevent newborn sepsis: WHO recommends benzlypenicillin and gentamicin, in separate injections, as first-line therapy for presumptive treatment in newborns at risk of bacterial infection.

Antenatal Corticosteroids

Prevent pre-term RDS: Antenatal corticosteroids are given to pregnant women who are at risk of preterm delivery to prevent respiratory distress syndrome in babies born in pre-term labor.

Chlorhexidine

Prevent umbilical cord infection: Chlorhexidine digluconate is a low-cost antiseptic for care of the umbilical cord stump that is effective against neonatal infections.

Resuscitation Device

Treat asphyxia: Birth asphyxia, or the failure of a newborn to start breathing after birth, can be treated with resuscitation devices.

In 2010, the United Nations (UN) Secretary-General's Global Strategy for Women's and Children's Health (the Global Strategy) highlighted the impact that a lack of access to life-saving commodities has on the health of women and children around the world.

The Global Strategy called on the global community to save 16 million lives by 2015 through increasing access to and appropriate use of essential medicines, medical devices and health supplies that effectively address the leading avoidable causes of death during pregnancy, childbirth and childhood. Under the Every Woman Every Child (EWEC) movement, and in support of the Global Strategy and the Millennium Development Goals (MDGs) 4 and 5, the UN Commission on Life-Saving Commodities (UNCoLSC) for Women's and Children's Health (the Commission) was formed in 2012 to catalyze and accelerate reduction in mortality rates of both women and children.

The Commission identified 13 overlooked life-saving commodities across the RMNCH 'Continuum of Care' that, if more widely accessed and properly used, could save the lives of more than six million[1] women and children. For additional background information on the Commission please refer to: http://www.everywomaneverychild.org/resources/un-commission-on-life-saving-commodities.

[1]For assumptions used to estimate lives saved see UNCoLSC *Commissioner's report* (http://www.everywomaneverychild.org/images/UN_Commission_Report_September_2012_Final.pdf)

An Overview of Demand Generation

Demand generation increases awareness of and demand for health products or services among a particular intended audience through social and behavior change communication (SBCC) and social marketing (SM) techniques. Demand generation can occur in three ways:

- ***Creating new users*** – convincing members of the intended audience to adopt new behaviors, products or services

- ***Increasing demand among existing users*** – convincing current users to increase or sustain the practice of the promoted behavior and/or to increase or sustain the use of promoted products and services

- ***Taking market share from competing behaviors*** (e.g., convincing caregivers to seek health care immediately, instead of not seeking care until their health situation has severely deteriorated or has been compromised), products or services (e.g., convincing caregivers to use oral rehydration solution (ORS) and zinc instead of other anti-diarrheal medicines)

When well designed and implemented, demand generation programs can help countries reach the goal of increased utilization of the commodities by:

- Creating informed and voluntary demand for health commodities and services

- Helping health care providers and clients interact with each other in an effective manner

- Shifting social and cultural norms that can influence individual and collective behavior related to commodity uptake

- Encouraging correct and appropriate use of commodities by individuals and service providers alike

In order to be most effective, demand generation efforts should be matched with efforts to improve logistics and expand services, increase access to commodities, and train and equip providers, in order to meet increased demand for products and/or services.

Without these simultaneous improvements, the intended audience may become discouraged and demand could then decrease. Therefore, it is highly advisable to coordinate and collaborate with appropriate partners when forming demand generation communication strategies and programs.

Who are the audiences of demand generation?

Reducing maternal and child morbidity and mortality through increased demand for and use of RMNCH commodities depends on the collaboration of households, communities and societies, including mothers, fathers and other family members, community and facility-based health workers, leaders, and policy makers.

Some of the commodities are more provider-focused in terms of demand and utilization, but all depend on the care-seeking behavior of women and families.

Provider-focused	Provider and End-user
☐ Oxytocin	☐ Female condoms
☐ Magnesium sulfate	☐ Implants
☐ Injectable antibiotics	☐ Emergency contraception
☐ Antenatal corticosteroids	☐ Misoprostol
☐ Resuscitation equipment	☐ Chlorhexidine
☐ Amoxicillin	☐ ORS
	☐ Zinc

Key Concepts and Definitions in Demand Generation

Social and Behavior Change Communication (SBCC): SBCC promotes and facilitates behavior change and supports broader social change for the purpose of improving health outcomes. SBCC is guided by a comprehensive ecological theory that incorporates change at the individual level and change at the family, community, environmental, and structural levels.

A strategic SBCC approach follows a systematic process to analyze a problem in order to define key barriers and motivators to change, and then design and implement a comprehensive set of interventions to support and encourage positive behaviors.

A communication strategy provides the guiding design for SBCC campaigns and interventions, ensuring communication objectives are set, intended audiences are identified and consistent messages are determined for all materials and activities.

Social Marketing (SM): SM seeks to develop and integrate marketing concepts (product, price, place and promotion) with other approaches to influence behaviors that benefit individuals and communities for the greater social good. (http://socialmarketing.blogs.com/r_craiig_lefebvres_social/2013/10/a-consensus-definition-of-social-marketing.html)

Channels and Approaches

Advocacy: Advocacy processes operate at the political, social and individual levels, and work to mobilize resources and political and social commitment for social and/or policy change. Advocacy aims to create an enabling environment to encourage equitable resource allocation and to remove barriers to policy implementation.

Community Mobilization: Community mobilization is a capacity-building process through which individuals, groups or organizations design, conduct and evaluate activities on a participatory and sustained basis. Successful community mobilization works to solve problems at the community level by increasing the ability of communities to successfully identify and address its needs.

Entertainment Education: Entertainment education is a research-based communication process or strategy of deliberately designing and implementing entertaining educational programs that capture audience attention in order to increase knowledge about a social issue, create favorable attitudes, shift social norms and change behavior.

Information and Communication Technologies (ICTs): ICTs refer to electronic and digital technologies that enable communication and promote the interactive exchange of information. ICTs are a type of media, which include mobile and smart phones, short message service (SMS) and social media such as Facebook and Twitter.

Interpersonal Communication (IPC): IPC is based on one-to-one communication including, for example, parent-child communication, peer-to-peer communication, counselor-client communication or communication with a community or religious leader.

Mass and Traditional Media: Mass media reaches audiences through radio, television and newspaper formats. Traditional media is usually implemented within community settings and includes drama, puppet shows, music and dance. Media campaigns that follow the principles of effective campaign design and are well executed can have a significant effect on health knowledge, beliefs, attitudes and behaviors.

Key Concepts and Definitions in ICT and New Media

Media/Medium. Media/medium refer(s) to the means of communication, such as radio, television, print, web-based tools and face-to-face communication that may reach or influence people widely.

Channel. Channels are the means of transmission of media, such as cable, wire and radio waves.

e-Health. Electronic health, or e-Health, is the use of information and communication technologies (ICT) for health.

m-Health. Mobile Health, or m-Health, is the provision of health services and information via mobile and wireless technologies.

New media. New media is a term for the various forms of electronic, interactive communication that are made possible through the use of computer and web-based technology (e.g., websites, chat rooms, online communities). The term is in relation to "old" media forms, such as print newspapers and magazines, which are static representations of text and graphics.

Social media. Social media refers to interaction among people in which they create, share and/or exchange information and ideas in virtual communities and networks.

Growth of ICT and New Media and Potential to Increase Demand

Given the global proliferation of mobile and wireless technologies, ICTs and new media have the potential to transform health communication and service delivery. As of 2011, there were over five billion wireless subscribers around the globe, over 70 percent of whom resided in low- and middle-income countries. Over 85 percent of the world's population is covered by commercial wireless signals, much more than is covered by a network of roads or by the electrical grid (WHO, 2011). ICTs and new media offer methods for connecting and mobilizing consumers and providers – even those living in hard-to-reach areas – and reaching them with up-to-date health information.

Case Study #1: Mobile Alliance for Maternal Action (MAMA)

Using Mobile Phones To Improve Health

The MAMA Program uses technology to improve health and nutrition outcomes among pregnant women and new mothers, and their infants, in resource-poor settings. MAMA delivers vital and culturally sensitive health messages to expectant and new mothers via mobile phones. The messages reflect the most up-to-date, evidence-based global standards and relate to behaviors that are proven to affect health outcomes, such as attendance at antenatal care, nutrition, vaccination, cord care and use of insecticide-treated bed nets.

Context

MAMA is currently being implemented in two countries with high maternal and infant mortality rates and widespread cellular coverage – Bangladesh and South Africa. MAMA India is expected to launch in 2014.

Bangladesh

In Bangladesh, pregnant women and new mothers do not often have access to timely, reliable and culturally relevant information about how to best care for themselves and their babies. Although there has been some improvement over the past ten years, maternal and infant mortality rates are still very high. In 2010, the lifetime risk of maternal death was 1 in 170 women, and in 2011, the infant mortality rate was 37 in 1000 infants (UNICEF, 2013).

In the last ten years, mobile phone access, use and coverage has expanded exponentially, making mobile phones a viable means by which to reach Bangladeshi women with lifesaving information. In 2000, Bangladesh had one of the lowest tele-density rates in the world – 0.26 telephones per 100 inhabitants. However, since then, Grameenphone has become the leading wireless operator in Bangladesh, with a network covering over 90 percent of the population (IDA, 2007).

In September 2013, Grameenphone announced the opening of its 3G network in Dhaka, which will enable the rollout of a nationwide 3G network with enhanced capacity and instant mobile Internet access for all customers (Xinhuanet News, 2013). Prior to the national launch in December 2012, MAMA Bangladesh conducted formative research in 13 locations in four districts (Dhaka, Chittagong, Sylhet and Gaibandha).

Among approximately 1000 female subscribers, 60 percent had their own phone and 40 percent were enrolled through a gatekeeper's or family member's phone. While the willingness to pay for the service was low overall, low-income subscribers were willing to pay more than high-income subscribers (Mendoza, 2013). Reasons for these findings were not revealed in the literature; however, research suggests that once a subscriber begins receiving the service, his or her threshold for payment increases, thus suggesting that a model using an initial free trial might gain higher retention and eventual willingness to pay.

South Africa

Similar to Bangladesh, maternal and infant mortality rates are very high. In 2010, the lifetime risk of maternal death was 1 in 140 women, and in 2011, 35 out of every 1000 infants died before their first birthday (UNICEF, 2013).

The South African Department of Health has identified maternal and child mortality as one of its four priorities (MAMA South Africa, 2013). More South Africans use a mobile phone than watch television or listen to the radio and there are more SIM cards in use in South Africa than people (MAMA South Africa, 2013).

Implementation

MAMA is implemented in each country based on the availability of financial and technical inputs and the necessary mobile network infrastructure. The first steps of setting up a MAMA program include establishing in-country partnerships, selecting business models and identifying mobile platforms.

OVERVIEW OF THE MAMA PROGRAM

Location: Bangladesh and South Africa

Partners: United States Agency for International Development (USAID), Johnson & Johnson, United Nations Foundation and BabyCenter operate through a secretariat hosted by the mHealth Alliance.

Launch Date: May 2011

Summary: The MAMA partnership has developed adaptable messages that are based on WHO and UNICEF guidelines. The messages have been developed in close collaboration with a group of global health experts who make up MAMA's Health Content Advisory Council (HCAC). MAMA's HCAC members lend their knowledge and expertise to ensure that MAMA's messages reflect the most up-to-date, evidence-based global standards. Messages relate to behaviors that are proven to affect health outcomes, such as attendance at antenatal care, nutrition, vaccination, cord care and use of insecticide-treated bed nets. The messages blend health with child development information so mothers are motivated to get the right care at the right time for themselves and their children. Messages are consistent with national and state behavior change and communication strategies and are aimed to be endorsed by host country governments. The messages include direct reference to consumer-facing life-saving commodities such as oral rehydration salts, zinc, chlorhexidine, contraceptive implants and emergency contraception.

The MAMA partnership has engaged the global community to help mothers and their family members subscribe to these evidence-based messages. MAMA messages and guidelines located on the website are offered free of charge to organizations that register on the website. The organization can adapt and use the messages for their own local programs. Messages are available through www.mobilemamaalliance.org/mobile-messages. The cost of implementing the messages – sending and receiving an SMS – will vary according to country business models and the organization's funding support, including any government subsidies.

Goal: At the local level, MAMA's goal is to use technology to improve health and nutrition outcomes among pregnant women and new mothers and their infants in resource-poor settings by delivering vital and culturally sensitive health messages to new and expectant mothers via their mobile phones. At the global level, MAMA seeks to achieve "scale, sustainability and impact" by creating a replicable model for reaching low-income mothers and household decision makers by increasing the impact of current mHealth programs, providing technical assistance to new mHealth models, and improving methods of applying mobile technology to protect maternal health.

ICT Approach: Use mobile phones to deliver time-sensitive, stage-based information on critical health issues directly to expectant and new mothers.

Depending on the country, business models can take many different shapes and are based on a collection of financial inputs including in-country government contribution, funding sources and availability, subsidies by mobile operators and minimum subscriber charges.

Once the program is set up, the target population(s) and key focus of the messages to be delivered are identified by the various country partners that provide the technical input for the program. MAMA considers multiple services, products and applications to reach all members of the target audience.

Bangladesh
Nationwide SMS/IVR mobile application

Aponjon, the Bangladeshi version of MAMA, utilizes short message service (SMS) and interactive voice response (IVR) – a technology that allows a human caller to interact with a computer through the use of voice and tones based on keypad selections. SMS and IVR can be accessed from any mobile phone handset, no special software is required.

Aponjon ran as a pilot program from September 2011 to June 2012. It was implemented in four districts across Bangladesh and had 1043 subscribers. MAMA Bangladesh was officially launched nationwide in December 2012 (MAMA Bangladesh, 2013). Primary subscribers (pregnant women and new mothers) receive two messages per week, while gatekeepers (husbands and mother-in-laws) receive an additional weekly message, if they opt in, for a total of three messages per week. Information is delivered via text message or short, pre-recorded voice message skits.

The skits feature local actors who play the roles of family member, patient and physician in an entertaining and educational way (MAMA Bangladesh, 2013). Community health workers (CHWs) encourage women to subscribe to MAMA. The service costs two taka (about US 2.5 cents) per message. Subscribers are charged based on their socioeconomic status, with at least 20 percent of the lowest-income subscribers eligible to receive free messages (MAMA Bangladesh, 2013).

South Africa
SMS, online portal and interactive quiz service

The MAMA program is implemented in South Africa by three organizations: Praekelt Foundation, Cell-life and the Wits Reproductive Health and HIV Institute (WRHI). Following a pilot program, MAMA South Africa was launched nationwide in May of 2013.

Currently, the service consists of a free SMS program offered through two inner-city clinics in Hillbrow, Johannesburg; a dynamic community portal or mobisite at www.askmama.mobi; and an interactive quiz service (MAMA South Africa, 2013). MAMA South Africa also plans to expand their services to Mxit, a popular social networking site for youth. These approaches are further described below:

SMS: For subscribers of the MAMA program from the two clinics in Hillbrow, Johannesburg, MAMA SMS service sends two messages per week from the time a woman is in her fifth week of pregnancy until her child is one year old. HIV-positive mothers can receive information specifically tailored to their health needs.

Due to the high costs, MAMA South Africa is unable to offer text messages free of charge nationwide; however, this is a goal for the future. MAMA South Africa will expand to include voice services for mothers with low literacy (MAMA South Africa, 2013).

MAMA Mobi: MAMA mobi is an interactive website that delivers personalized health

information to mothers in English and will add Zula, Xhosa and Afrikaans in the future (Cheers, 2013). By registering with a due date or baby's age, presentation of information on the site is tailored to provide relevant, personalized information based on the stage of pregnancy or age of baby (MAMA South Africa, 2013).

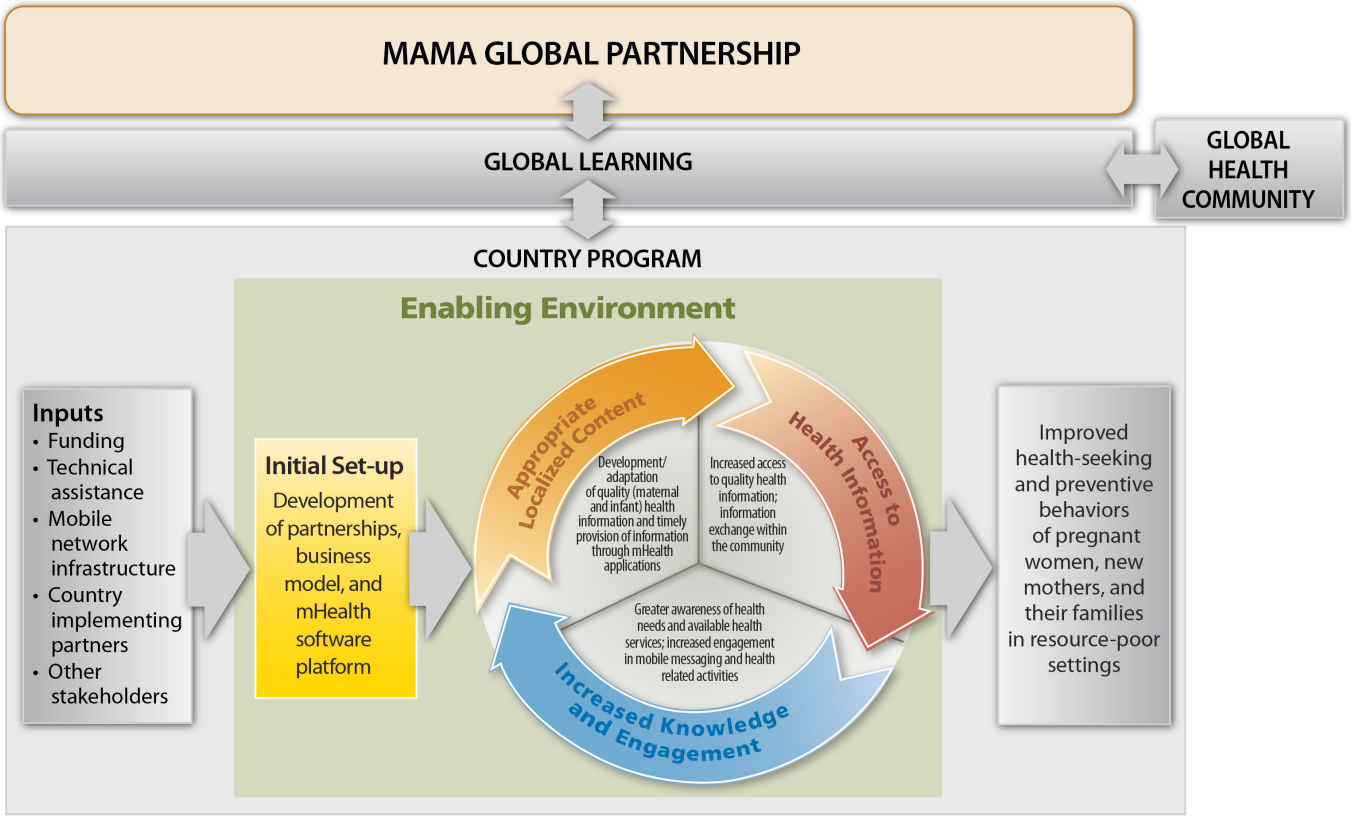
A new partnership with Vodacom will make www.askmama.mobi available free of charge to all Vodacom subscribers in South Africa – an estimated 25 million people. The www.askmama.mobi site launched on Vodacom Live! (Vodacom's mobile homepage) on 26 August 2013 and attracted 170,000 new users in the first six weeks (MAMA South Africa, 2013).

MAMA Quizzes: Quizzes are a personalized and convenient way to learn and test individual knowledge about pregnancy and the first year of a baby's life. Subscribers dial in every "MAMA Monday" for a weekly quiz and tips from MAMA (MAMA South Africa, 2013). The quiz service utilizes unstructured supplementary service data (USSD) which is a protocol used by Global System for Mobile (GSM) cellular telephones. This protocol enables a mobile phone to communicate with a computer run by a service provider in a real-time connection. Unlike SMS messages, a USSD session allows for a two-way exchange of a sequence of data, which makes it more responsive than SMS.

MXit: In the future, MAMA will be expanding to MXit – a popular mobile social network in South Africa – to provide pregnancy, childbirth and parenting information to users between the ages of 18 and 25 (MAMA South Africa, 2013).

Theory of Change Model

MAMA's overall theory of change model is described in Figure 1 below (MAMA, 2011).



This model serves as the program guide for design and implementation of activities. The model proposes a sequence of activities – from inputs to outcomes – that take place within the policy and socio-cultural context of a given geographic location.

After inputs and initial set-up, the model addresses three stages critical for adoption of targeted behaviors: 1) presence of appropriate localized content; 2) increased access to health information; and 3) increased knowledge and engagement.

The theory behind these steps is that, with access to high-quality information, women will be more aware of their health needs, status and recommendations for their particular stage of pregnancy and/or motherhood, and will utilize this information to change their behavior (e.g., seek preventative care; end negative health behaviors such as smoking, drinking, etc.)

This model assumes that women will want to change their behaviors based on pregnancy stage or motherhood, and that effective health communication and appropriate messages will ensure improvements in health-related behavior and overall health status. The process follows the pathways proposed by behavior change and communication theories – namely, the Health Belief Model and Theory of Reasoned Action/ Theory of Planned Behavior.

According to the Health Belief Model, individuals will be more likely to change their behavior if they recognize the existence of a risk, feel susceptible to that risk and if they believe the benefits of change outweigh the barriers to change. According to the Theory of Reasoned Action/Theory of Planned Behavior, an individual's attitude about a specific behavior and what their reference groups think of that behavior influence their intention to change and their ultimate behavior.

Results

MAMA has developed adaptable messages informed by experts in maternal, newborn and child health. The evidence-based, culturally sensitive mobile messages – accompanied by guidelines on how to localize the messages for a specific country context – are being downloaded and used by 250 organizations in 60 countries around the world. MAMA's national programs in Bangladesh and South Africa currently reach over 376,000 mothers and families (MAMA, 2013).

Bangladesh

To date, 1500 CHWs have been trained to register subscribers and over 176,000 individuals have subscribed to the service – 17 percent of whom live below the poverty line. MAMA estimates that approximately two million subscribers will be registered by the end of 2015. Seventy-eight percent of those who registered for MAMA through a CHW opted to receive messages in an IVR format. More highly educated women and women living in urban areas were more likely to receive messages via SMS (Mendoza, 2013).

South Africa

From the launch of the pilot program to October 2013, over 200,000 women have used the MAMA South Africa service. Detailed user testing took place during the pilot program with 22 pregnant women and new mothers over a period of two months. Eighty percent of these women reported that the service gave them new knowledge about pregnancy and how to care for a child (e.g., signs of labor, importance of a facility-based delivery, when to introduce solid food, vaccination schedules, etc.). All mothers reported sharing the information with others in the community. A formal evaluation is forthcoming that will sample more than 2000 women to assess the health impact of the messaging regarding the adoption of health behaviors and uptake of health services.

Case Study #2: The Ananya Program

A Multi-Platform Approach To Reduce Maternal And Infant Mortality In Bihar, India

Targeting providers and consumers, the Ananya Program uses mobile technologies to increase knowledge of health providers and mass media to educate consumers in an effort to generate demand for, and utilization of, maternal, infant and child health services.

Context

Bihar, India is one of the poorest regions in India; 40 percent of its population lives below the poverty line and 80 percent live in rural areas (BBC Media Action, 2012). There are 27 million women of reproductive age and 18.5 million children under the age of six living in Bihar. Although Bihar accounts for only 8 percent of India's population, 12 percent of maternal deaths and 12 percent of infant deaths occur in the state. Moreover, 13 percent of all partially immunized children and 15 percent of all underweight children in India reside in Bihar (Smith, Rangarajan, Borkum, & Dandona, 2011).

Reaching women in Bihar with traditional media is difficult; only 18 percent of women aged 15–45 years watch TV and only 11 percent listen to the radio. However, 90 percent of young mothers have mobile phones (MacPherson & Chamberlain, 2013).

Equally important is the fact that all 200,000 CHWs in rural Bihar either own or have access to a mobile phone. The average CHW in Bihar is a middle-aged woman with a basic education, a high caseload of about 1000 people and with little access to adequate training and materials (MacPherson & Chamberlain, 2013). These health workers are responsible for providing health information and care to thousands of people who might otherwise have limited or no access to care. When used strategically, mobile health applications can support both CHWs and the clients they serve, and reinforce health messages being disseminated through other media channels.

Implementation

The Ananya Program takes a "360-degree approach" to improving maternal, newborn

Photo courtesy of Ananya

OVERVIEW OF THE ANANYA PROGRAM

Ananya: A Sanskrit word meaning "unique" or "unlike others"

Location: Bihar, India
Funder: Bill & Melinda Gates Foundation, with BBC World Service Trust as a partner.
Implementation Dates: 2010–2015

Summary: Previously known as the Family Health Initiative, the Ananya program addresses both supply- and demand-side barriers to increased uptake, coverage and quality of family health interventions through a synergistic set of six complementary grants. This case study focuses on the demand-side grant focused on changing behaviors, social norms, and self-efficacy to support family health through a multi-channel communication strategy. More information on the Ananya program can be found at www.ananya.org.in.

Goal: To reduce maternal, newborn and child mortality by 40 percent by 2015 by addressing critical gaps in care during the most vulnerable time of life – the 1000-day window from conception, pregnancy, and birth of a baby, to the child's second birthday. The emphasis of the program is on family planning, pre-and post-delivery care for mothers and newborns, immediate and exclusive breastfeeding, care and nutrition for children up to two years of age, and routine immunization. Coverage for treatment of diarrhea, pneumonia, some neglected diseases and sanitation are also a part of the program.

ICT Approach: Incorporating the use of mobile technologies into a package utilizing various communication channels, including mass media, radio, television and street theater, as well as uniquely tailored outreach platforms to reach and empower women. The mobile components include Mobile Academy (training course for CHWs), Mobile Kunji (CHW job aide), and Kilkari (message service for families).

and child health. BBC Media Action utilizes a combination of face-to-face communication, ICT, mass media and community work to deliver lifesaving messages to the women of Bihar. The three main program components are to (1) empower CHWs and reach families through mobile applications; (2) deliver critical messages through mass media (TV and radio); and (3) engage and mobilize the community through street theater performance and women's listener clubs.

The program was initially launched in eight priority districts in Bihar: Patna, Begusarai, Khagaria, Samastipur, East Champaran, West Champaran, Gopalganj and Saharsa. According to a news article in June 2013, the Bill & Melinda Gates Foundation announced program expansion to seven additional districts: Siwan, Sheohar, Muzaffarpur, Munger, Jehanabad, Darbhanga and Bhagalpur (The Telegraph, 2013). The overall program plan is to scale-up the program to all thirty-eight districts of Bihar by 2015.

Empower CHWs through mobile applications

Mobile Academy is a training course to expand and refresh CHWs' knowledge of 10 life-saving behaviors and enhance their communication skills. Launched in May 2012, Mobile Academy uses IVR, a technology that allows a human caller to interact with a computer through the use of voice and tones based on keypad selection that can be accessed from any mobile phone handset.

To access Mobile Academy, CHWs make a call that costs less than US $0.01, about 90 percent less than standard IVR rates; however, health workers must cover that cost themselves. Workers complete a 190 minute-training course at their own pace, either during a single phone call or multiple phone calls. Mobile Kunji, which means "guide" or "key" in Hindi, is a job aid that combines IVR-based mobile service and an illustrated deck of cards supporting key maternal and child health messages. When visiting a family, a CHW dials the individual short

code printed on each card and a health message plays for the family. Messages are pre-recorded by "Dr. Anita," an engaging but authoritative female doctor. The messages reinforce the information that a health worker tries to convey to a family (MacPherson & Chamberlain, 2013).

Mobile Kunji and Mobile Academy were rolled out via intensive three-day in-person trainings designed to improve the interpersonal skills of CHWs. Forty thousand CHWs in eight priority districts in Bihar were initially trained. By December 2015, it is expected that an additional 160,000 CHWs in Bihar will be trained on these mobile applications.

During formative research for the project, CHWs said that they could not afford to pay for the ongoing use of Mobile Kunji and felt the government should be required to cover the costs because it is the families who benefit from the mobile service. In response, the Bill & Melinda Gates Foundation covered the cost of calls to Mobile Kunji for the first year of the program to demonstrate the efficacy of the service to the government, particularly within poor communities that might not otherwise be able to afford mobile technology services themselves.

Due to health workers' enthusiastic response to the service and up-take rates that far exceeded projections, the government of Bihar agreed to cover health workers' costs to call Mobile Kunji on an ongoing basis (MacPherson & Chamberlain, 2013).

Reaching families through mHealth

Families with pregnant women and mothers of children under the age of one can also subscribe to a separate mobile service called Kilkari (which means a baby's gurgle in colloquial Hindi). The service focuses on promoting healthy behaviors and generating demand for health services. Subscribers to the Kilkari program receive weekly IVR calls in their local language about maternal and child health.

These calls convey information that is appropriate to either the gestational age during pregnancy or the child's age after birth. The staged messages reinforce the information imparted by the CHW during home visits, remind subscribers of healthy behaviors and encourage them to follow the schedule of care recommended by the Bihar Ministry of Health. This service is accessible to about 90 percent of subscribers in Bihar from any mobile phone for a minimal fee; Kilkari costs 1 rupee per message ($0.02 US).

Mass media and community-based interventions

The mHealth components described above complement the mass media and community-based interventions also being implemented in Bihar as part of the Ananya Program. The mobile applications reinforce the health messages being communicated to families in Bihar as part of seven communication campaigns that will take place through 2015.

Communication campaign topics focus on spacing pregnancies, preparing for the birth of a child and reinforcing messages that CHWs deliver during home visits. A long-format radio program also educates listeners about critical maternal and child health issues, and these issues are discussed in women's listening clubs. Ten thousand performances by local street theatre companies are also planned to engage families through interactive and entertaining performances that communicate critical family health information.

Theory of Change Model

As previously noted, ICTs and new media can be most effective when incorporated into a demand generation program that incorporates

multiple communication channels tailored to audience needs and linked to existing health services.

One of the objectives of Ananya is to develop and implement mass media and mobile messaging strategies at the population level. The activities implemented to achieve this objective are: 1) develop and implement multi-media communication strategy, channels and messages; 2) create mobile-based communication services; and 3) develop private sector partnerships for distribution of behavior change communication messages.

The expected output of these activities is increased reach of family health messages through mass media and mobile-based channels.

The outcomes are numerous and include increased awareness of family health services at the individual/household level, increased number of family health interactions at the community and facility level, and increased adoption of positive family health behaviors at the community/population level. The expected impacts are reduced mortality and improved health outcomes.

Scale-up is also a critical piece of the Ananya initiative. As evidenced in the logic model, a key assumption is that the program can be brought to scale and that delivery at scale of high-impact family health services and interventions will significantly reduce maternal, neonatal and child mortality and morbidity.

After program implementation and scale-up throughout Bihar, Mathematica Policy Research, Inc. will undertake a rigorous process evaluation to measure the extent to which scale-up occurred, to understand and document the scale-up process, and to identify factors that facilitated and inhibited scale-up in Bihar.

Results

Mathematica Policy Research, Inc. is conducting the evaluation of the Ananya program. Although it is too early to report the full health impacts of the program, results so far are promising.

From August 2012 to February 2013, use of Mobile Academy and Mobile Kunji was eight times higher than expected. Although only 40,000 workers were initially trained to use Mobile Kunji, almost 75,000 unique users called Mobile Kunji in that initial seven-month period. Additionally, 1.4 million minutes of messages were played in this period (each message in Mobile Kunji is just over a minute long) (MacPherson & Chamberlain, 2013). As described above, the government pays for the cost of calls to Mobile Kunji.

Despite the fact that CHWs must pay out of their own pocket to call Mobile Academy, 21,500 workers called the service during the initial seven-month period. Those callers accessed more than 1.7 million minutes of content. Of the 21,500 callers to the service, 22 percent (4730 callers) have already completed the Mobile Academy course and are eligible for certificates indicating that they passed the course (MacPherson & Chamberlain, 2013).

Anecdotal evidence is also pointing to the impact of these services on health. A physician and senior supervisor of health workers in the district of Gopalganj reported a spike in women coming to the local health facility after implementation of Mobile Academy and Mobile Kunji. This supervisor attributes the spike to the increased effectiveness of the health workers, almost all of whom have completed the Mobile Academy course. One pregnant woman also reported being convinced by her health worker and Mobile Kunji to register for free government health products and services (MacPherson & Chamberlain, 2013).

Case Study #3:
Mobile Technology for Community Health (MOTECH)

Supporting Providers and Clients in Ghana

The Mobile Technology for Community Health (MOTECH) initiative aims to determine how to use mobile phones to increase the quantity and quality of prenatal and neonatal care in rural Ghana, with a goal of improving health outcomes for mothers and their newborns.

The ICT approach includes mobile applications targeted at both health consumers and health providers.

Context

Ghana has made great strides in providing health care for its 25 million citizens. However, despite dedicated efforts, critical health issues remain, including the number of women who die in childbirth. In 2010, a woman's lifetime risk of maternal death was 1 in 68. In 2011, the infant mortality rate was 52/1000 (UNICEF, 2013).

Although mobile phone penetration has quickly surpassed that of landlines in Ghana, mobile phone ownership is not yet ubiquitous in rural Ghana and, although some pregnant women own their own mobile phone, it is more common for a phone to be shared by a family or even an entire community in some cases.

A common practice is "flashing", which refers to the act of deliberately calling someone for a few seconds so that the phone rings and then hanging up before the recipient answers, indicating that the receiver of the missed call should return – and thus pay for – the call. Some studies estimate that "flashes" comprise 20–30 percent of all calls made in Africa (Grameen Foundation, 2012).

Implementation

The MOTECH system was launched in July 2010 in the Kassena-Nankena and neighboring Kassena-Nankana West districts, which include 27 community-based health planning and

Photo courtesy of MoTeCH

OVERVIEW OF THE MOTECH INITIATIVE

Location: Ghana

Partners: Ghana Health Service, Grameen Foundation and Columbia University's Mailman School of Public Health. Funded by a grant from the Bill & Melinda Gates Foundation

Launch Date: July 2010

Summary: MOTECH is an open source software program that aims to distribute health information to underserved populations. MOTECH provides a set of services encompassing five key functional mHealth areas including behavior change and demand generation, management of patient data, workforce performance, last-mile supply chain and patient adherence. Additional information on the MOTECH initiative can be found at www.ghsmotech.org

Goal: The MOTECH initiative aims to determine how to use mobile phones to increase the quantity and quality of prenatal and neonatal care in rural Ghana, with a goal of improving health outcomes for mothers and their newborns, striving to promote utilization of health information services in order to increase the demand for care.

ICT Approach: The ICT approach includes two mobile applications. Mobile Midwife provides relevant health information to women during pregnancy. The Nurses' Application enables health workers to use mobile phones to maintain electronic records and retrieve patient information.

services (CHPS) facilities and eight health centers. MOTECH has since been launched in the Awutu Senya District in the Central Region and may potentially be launched nationally (Grameen Foundation, 2012).

A unique component of the MOTECH platform is its simplicity; existing programs are able to adapt and integrate the MOTECH platform without having to devote intense resources to design. It is simple for the developers as well as the end user.

MOTECH provides two integrated mobile health services: Mobile Midwife focuses on the client and Nurses' Application focuses on the provider.

Mobile Midwife

The Mobile Midwife service enables pregnant women and their families to receive messages via SMS or IVR – a technology that allows a human caller to interact with a computer through the use of voice and tones based on keypad selections. The Mobile Midwife service is offered free of charge to users (Grameen Foundation, 2012).

Weekly messages provide information specific to the woman's stage of pregnancy and/or newborn's age. The messages combine:

- Alerts and reminders for care seeking (e.g., reminders to go for specific treatments, such as prenatal care or a tetanus vaccination);
- Actionable information and advice to help deal with challenges during pregnancy (e.g., tips for saving money for transportation to deliver at a health facility, what is needed for a birthing kit, nutrition information); and
- Educational information, including milestones in fetal development, promotion of good health practices and songs about breastfeeding.

For each week of pregnancy, the pregnant woman receives one primary message and has the option to listen to two additional messages. The messages are tailored to the individual based on her stage of pregnancy, health care history, location, community values and norms for seeking care and advice.

Given the prevalence of shared phones and the culture of male dominance in Ghana, the majority of messages sent through the Mobile Midwife service are designed to be heard by both the pregnant woman and her family members. MOTECH refers to these users as "pregnant parents." MOTECH has additional tailored messages intended for men only, and some intended to be shared more broadly with the community in order to dispel cultural myths and practices (Grameen Foundation, 2012).

All SMS messages delivered as part of the Mobile Midwife program are delivered in English. IVR messages are delivered in English or in a few select local languages. For example, during MOTECH's first implementation, two languages – Kasem and Nakam – of the Upper East Region were available as IVR messages. Two additional languages – Senya and Fanta – are now supported by the IVR message system in the Awutu Senya District in the Central Region.

A woman registers for the Mobile Midwife service through a community nurse or CHW. The health worker asks relevant information about contact and location information (so the patient can be associated with the nearest health facility), demographics, gestational age, phone access (personal or shared), choice of SMS or voice messages, choice of language if voice messages are chosen, and the day and time during the week that is best to receive messages. The nurse enters all information on a MOTECH registration form available on their phone or by calling and speaking with the MOTECH call center. Upon registration, the patient receives a MOTECH ID number that she uses to retrieve messages (Grameen Foundation, 2012).

The MOTECH system was designed to make its services as widely available and easily accessible to users as possible, and was designed to respond to the common act of "flashing" described above. The MOTECH system calls a subscriber back when it receives a "flash" leading them to the IVR system's main menu.

A toll-free short code was developed to enable any woman who does not have access to her own mobile phone or a shared household phone to retrieve her message(s). Women can call a toll-free short code number from any mobile phone using any telecommunications provider. Once connected to the MOTECH service, she is prompted by the IVR system to enter her MOTECH ID, which identifies the client and retrieves her unique message.

Messages are delivered to the woman on the day and time that she chooses during registration. However, it is not uncommon that a woman may miss a message (e.g., being unavailable, dead phone battery, cellular network down, dropped call, etc.).

The MOTECH system categorizes any message that has been listened to for less than five seconds as not received and immediately calls the woman back. The system makes three attempts to connect and if those attempts fail, the system calls the woman again the next day at the same time (Grameen Foundation, 2012).

Nurses' Application

The Nurses' Application helps community nurses and other community health workers record and track the care being delivered to women and newborns using low-cost GSM mobile phones. Health workers can also use a form in the mobile application to query the database

for specific information, such as patients who are overdue for appointments, those overdue for delivery, and those who have recently given birth; an individual's address; and the care that an individual is due for soon. Patient medical records and data are transferred from the phone to a central patient electronic medical records system stored on the MOTECH server.

Results

Mobile Midwife

In the first 26 months since the July 2010 launch, 11,490 members have enrolled in the Mobile Midwife program, and 57,921 messages have been delivered to subscribers. Ninety-nine percent of the subscribers chose to receive voice messages rather than SMS and the majority of subscribers were women 21–30 years old. On average, 42 percent of subscribers who listen to the primary message listen to the secondary message and 36 percent listen to the tertiary message (Grameen Foundation, 2012).

In July 2011, one year after MOTECH was launched, Grameen Foundation hired an independent consultant to conduct a qualitative research study to help understand how the system was being used and issues that had arisen. Six discussion groups of six to nine participants each were conducted. Not surprisingly, women who owned their own phones reported no problem accessing their messages. Women who shared a phone with others expressed more difficulty obtaining messages due to travel of others or difficulty navigating the phone to enter the MOTECH ID number.

The vast majority of women expressed appreciation for the content of the messages and liked the individualized nature of the messages. The majority of respondents were able to recall specific messages (Grameen Foundation, 2012).

Focus group findings indicated that credibility of the messages was a function of personal experience, rather than where the message came from. Mobile Midwife messages are sent to women explaining what will be happening to their bodies during pregnancy. When the women experience those things, a foundation of credibility is established for future messages. It was not important to the women if the messages came from the Ghana Health Service, MOTECH or a particular clinic.

These messages often provoked behavior change, such as arriving early at the health center for delivery rather than waiting at the house. The discussion groups specifically asked how women changed their behaviors as a result of the messages. The changes mentioned covered the entire span of pregnancy, delivery, and postnatal care. Particularly common were changes in diet for both pregnant women and infants and increased health care seeking during pregnancy, delivery, and for the infant after delivery. The majority of women could mention specific ways in which the messages changed their behavior or their family members' behavior.

While the women reported seeing the value of Mobile Midwife messages, they reported that paying for these messages would be hard, as they depend on their husbands for money. They said that it is often challenging enough to get money to pay for proper food and transportation to the clinic.

From March through May 2012, interviews were conducted with 30 new Mobile Midwife clients each month in the Awutu Senya District in the Central Region, to assess their experience. In total, 90 participants were interviewed through random selection from the database. Results confirmed that within focus groups, listening patterns varied significantly based on mobile phone ownership. Forty-three women interviewed experienced difficulty accessing

the MOTECH system using IVR, with the most common problems being not knowing the phone number to call to access messages, not knowing the MOTECH ID and difficulty navigating the IVR system.

Nurses' Application

As of September 2012, 31 facilities and 175 health workers have been involved in the MOTECH initiative. These workers have uploaded 124,446 patient encounters via mobile phone. One of the goals of the MOTECH system is to have automated reports so that health workers do not have to spend time filling out reports by hand.

An incentive offered by the Ghana Health System was that nurses who had an 80 percent accuracy rate entering data with the mobile phone application over three consecutive months would no longer be required to produce manual reports. Nurses in seven of 15 CHPS facilities in the Upper East Region reached this goal. In the Awutu Senya Region, workers in four of the 12 CHPS facilities reached this goal in just five months.

Recommendations for Utilizing ICT in RMNCH Demand Generation

The three case studies described present examples of different models for utilizing ICT and new media for increased demand of RMNCH commodities and services. A number of recommendations can be drawn from these case studies to apply the lessons learned to future programming in demand generation:

1 **Consider an integrated communication strategy.** ICT and new media are best utilized as part of an integrated strategy for demand generation, one in which mobile applications are complemented by other communication channels such as interpersonal communication, community-based activities and mass media. One of the strengths of the Ananya Program is its "360-degree approach" – in addition to mobile applications targeted at health workers and consumers, the program includes community mobilization and mass media activities. Programs of this nature – comprehensive ones that present an integrated, multi-pronged approach to improve health – are a gold standard for demand generation programming.

2 **Consider multiple ICT and new media services, products and applications to reach intended audience.** Better access to health information can increase demand for health services. The case studies presented here all include the use of mobile technologies through SMS or IVR messaging. However, the use of multiple ICT and new media services, products and applications to reach an intended audience can further enhance a program – as seen in MAMA South Africa. For example, program managers can consider companion products, such as a website and online social networking – e.g., MAMA South Africa's dynamic community portal or mobisite at www.askmama.mobi and MAMA's popular mobile social network, MXit.

3 **Tailor health messages to the individual subscriber.** One of the key benefits of ICT and new media over traditional media is the ability to tailor messaging to meet the specific needs and circumstances of the user. This tailoring was utilized successfully in the case studies to ensure that pregnant women, mothers, and health care workers were accessing the most appropriate content for their needs – e.g., messages in the subscriber's local language and corresponding to the stage of pregnancy or age of child. In MOTECH's Mobile Midwife application, developing and adjusting the content of the messages was possibly the most essential element of the project's overall success.

4 **Involve household decision makers when appropriate.** In locations where women are not household decision makers, other family members (often husbands and/or mothers-in-law) act as gatekeepers for many services, including those related to health and technology. Ensuring that the influence of these gatekeepers is acknowledged and addressed in program plans helps ensure that the target population – new and expectant mothers – is able to utilize the family's mobile phone to receive critical health information. For example, MAMA Bangladesh involved gatekeepers by offering an additional weekly SMS message targeted specifically to husbands and mother-in-laws, if they opt-in. In MOTECH, including influencing audiences in programming helped ensure that important messages reached expectant and new mothers.

5 **Position ICT and new media within a broader system, including service delivery.** Mobile phones are a tool that can facilitate more effective solutions to improve demand for RMNCH commodities and services. However, in order for demand generation programs to succeed, program planners need to ensure that the appropriate clinical interventions are in place and available before the program is launched. For example, while the MOTECH initiative was able to get people to come to a health facility for vaccinations, the facility administration faced difficulties keeping the vaccines in stock and properly refrigerated.

6 **Plan early for scale-up.** Not all programs should scale-up; however, all programs should plan for potential scale-up during the program design phase to avoid or better manage possible obstacles down the road. Planning and thinking ahead helps with the eventual uptake and adoption of the program on a large scale. The Ananya program's project plan was to initially launch in eight focal districts in Bihar in 2012–2013 and scale-up to the rest of Bihar by 2015. The cost of the Ananya program's comprehensive approach to improving family health will influence future replication and scale-up decisions. Acknowledging this fact during program development, the evaluation plans were designed to include a cost analysis to generate estimates of overall program costs, the costs of major program components, replication costs and the key cost drivers. In addition, evaluators – Mathematics Policy Research, Inc. – will attempt to determine the cost-effectiveness of both the program and the value-added solutions, and how cost-effectiveness may have evolved over the course of the Ananya program. Evaluation plans also include a rigorous process evaluation to measure the extent to which scale-up occurred, to understand and document the scale-up process and to identify factors that facilitated and inhibited scale-up in Bihar.

7 **Plan for sustainability, develop sustainable financing.** Program planners should plan for sustainability during program development. One of MOTECH's goals has been to identify a sustainable business model to support the ongoing operating costs of the service, although program partners are finding this difficult. The population of Ghana is relatively small, and therefore there are a small number of pregnant women who have the capacity and willingness to pay for the Mobile Midwife service. Program partners are continually looking for new solutions to making this program accessible and self-sustaining.

Although the Ananya program identified the government as a key stakeholder for the provision of program financing, the government first needed evidence of the program's value and impact as an affordable way to help care for the poor. The external donor agreed to cover the cost of calls to Mobile Kunji for the first year; evaluation of the trial provided the government with evidence of the positive response for the service. Recognizing the positive impact that Mobile Kunji could have on maternal, infant and child health, the government of Bihar agreed to cover health workers' call costs to Mobile Kunji on an ongoing basis.

8 **Form strategic partnerships.** Leverage the expertise of government, non-profits and the technology and mobile industry. Engaging key stakeholders early in the process strengthens local ownership, as well as the quality and sustainability of the program. For example, one suggested strategic partnership would be with the local mobile network operator(s) who would most likely take on much of the ongoing marketing of the project. It is important to note that relationships with partners often require focused attention and time throughout development, implementation, and program evaluation. For example, nurses initially viewed MOTECH as a "project" rather than as a new, critical element of their role as an employee of the Ghana Health Service. By involving the Ghana Health Service more visibly in program activities, nurses began to take the work associated with the MOTECH initiative more seriously, which improved data quality and consistency. For more information about public-private partnerships for demand generation, visit the Demand generation implementation kit for underutilized commodities in RMNCH (http://sbccimplementationkits.org/demandrmnch).

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