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Maternal and Child  
Survival Program



# HelloMama

## End of Project Report

October 2015–December 2018

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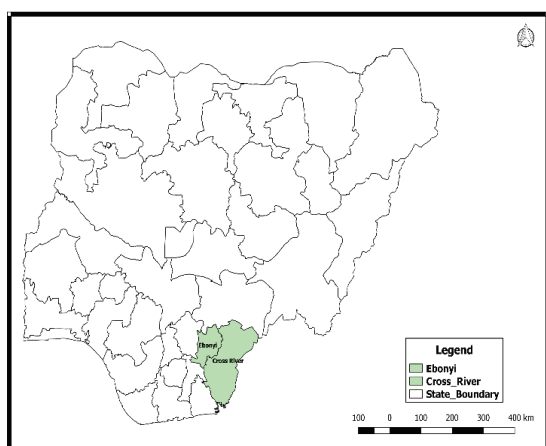
The Maternal and Child Survival Program (MCSP) is a global, \$560 million, 5-year cooperative agreement funded by the United States Agency for International Development (USAID) to introduce and support scale-up of high-impact health interventions among USAID's 25 maternal and child health priority countries, as well as other countries.

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Cover Photo: Karen Kasmauski/MCSP. A Nigerian father reads a message about maternal and newborn health on the family's mobile phone.

May 2019

# Country Summary




Selected Health and Demographic Data for Nigeria	
Population growth rate <sup>2</sup>	2.6%
Mobile phone penetration <sup>3</sup>	84%
MMR (per 100,000 live births) <sup>1</sup>	576
IMR (per 1,000 live births) <sup>1</sup>	69
Total fertility <sup>1</sup>	5.5%
Contraceptive use <sup>1</sup>	15%
Birth with skilled provider <sup>1</sup>	38%
1. Nigeria Demographic and Health Survey, 2013 2. World Bank 2016 3. Nigerian Mobile Report, June 2018	

## Strategic Objectives

- To establish an operational, nationally scalable platform of adequate coverage that makes age- and stage-based mobile messages available to the target population and links to existing health information systems.
- To complement supply-side maternal, newborn, and child health (MNCH) interventions by improving knowledge and adoption of healthy and safe MNCH practices.

## Major Accomplishments :

- Reached over 88,424 subscribers with HelloMama messages.
- Supported 14,420 pregnant women from pregnancy through 1 year of child life who graduated from the HelloMama platform.
- Scaled out HelloMama services from 47 to 142 health facilities.
- Achieved government adoption and influenced Federal Ministry of Health (FMOH) and State Ministry of Health (SMOH) budget for e-health. Cross River State is committing \$110,000 to sustain the cost of HelloMama short message service (SMS) and interactive voice response (IVR) messages.
- Attained status as a recognizable brand tailored to local needs, context, and languages. HelloMama is known as “the phone doctor” in the two supported states of Nigeria.
- Developed a detailed implementation road map that will act as a guide for future programs implementing IVR and SMS messaging systems similar to HelloMama.

<b>Program Dates</b>	October 1, 2015–December 30, 2018		
<b>Funding</b>	<b>Total Mission Funding to Date</b>	<b>Total Core Funding to Date by Area</b>	
	\$5,320,00.00	N/A	
<b>Geographic Coverage</b>	<b>No. (%) of provinces</b>	<b>No. (%) of districts</b>	<b>No. (%) of facilities or communities</b>
	2 of 36 states (5.5% of total states)	31 local government areas (3.9% of 774 total local government areas in Nigeria)	142 (65.7% of 216 total health facilities in Cross River and Ebonyi)
<b>Country and HQ Contacts</b>	Emmanuel Atuma, Project Director ; Marcus Joy Hadiza, Sr. Program Manager ; Alishea Galvin, Sr. Program Officer ; Geoff Prall, Sr. Program Coordinator ; Paul Tuthill, Technical Advisor		
<b>Technical Interventions</b>	 PRIMARY: Maternal Health, Newborn Health, Child Health, Digital Health		

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# Acknowledgments

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We thank the Federal Ministry of Health, Federal Ministry of Communication, National Primary Health Care Development Agency, and the Ebonyi and Cross River states' ministries of health and primary health care development agencies for playing a big role in the implementation of HelloMama in Nigeria. We appreciate their active collaborative and leadership in project implementation and ensuring project ownership, which contributed to the success of HelloMama.

Special thanks to the staff of the HelloMama team of Jhpiego (lead partner), Pathfinder International, and Praekelt Foundation, who managed the implementation of HelloMama in Nigeria. Their technical expertise and complementary roles in project implementation made possible the achievements described in this report.

Lastly, a big thank-you for the immense contributions of all staff and consultants, past and present, technology partners (network operators, aggregators, and hosting firms), and other active players within the Nigeria digital health realm, from whom we learned as much as we shared.

# Abbreviations

ANC	antenatal care
FMOH	Federal Ministry of Health
FY	fiscal year
HCW	health care worker
IVR	interactive voice response
MAMA	Mobile Alliance for Maternal Action
MCSP	Maternal and Child Survival Program
MNCH	maternal, newborn, and child health
MNO	mobile network operator
PY	program year
SMOH	State Ministry of Health
SMS	short message service
SOML	Saving One Million Lives
USAID	US Agency for International Development



# Executive Summary

The Maternal and Child Survival Program (MCSP)'s HelloMama project operated in Nigeria with the goal of improving the health outcomes for pregnant women, newborns, children, and families in Nigeria through age- and stage-based mobile messaging that complemented the efforts of frontline health care workers (HCWs). Over a period of three years, the project coordinated with a consortium of international partners, Pathfinder International and Praekelt Foundation, and several key Nigerian stakeholders to plan and implement a digital health messaging service designed to facilitate behavior change and improve access to maternal and child health services within Ebonyi and Cross River states.

The project set out to build a resilient operational and nationally scalable technology platform that makes age- and stage-based mobile messaging available to the target population, as well as improve knowledge and adoption of healthy and safe maternal, newborn, and child health practices. The platform was initially piloted in 47 supported health facilities across both states, reaching 4,473 subscribers. Based on lessons learned, related to technology and client adoption, the project made adjustments and scaled up to an additional 95 facilities. At the end of the project, over 88,424 pregnant women, new mothers, and their family members were subscribers and 5.9 million messages had been sent to subscribers via interactive voice response (IVR) and short message service (SMS) text. Of the 88,424 subscribers, there were 61,672 pregnant women enrolled in the service. Twenty-one percent (12,862) of pregnant women subscribed for voice calls while 79% (48,810) subscribed for SMS. All the other 26,752 subscribers (i.e. new mothers and family members) opted for interactive voice response (IVR). Additionally, 37,385 subscribers graduated from receiving pregnancy messages to child health and welfare messages.

While there were inconsistencies and incomplete service data from the national DHIS2 for most of the supported facilities, a sample of the 47 pilot facilities from the MCSP and Saving Mothers Giving Lives (SMGL) database showed an increase in the trend for deliveries by skilled birth attendants (SBAs). In March 2017, there were 478 skill deliveries from both states. This increased to 1,378 in both States by September 2018. Other service indicators showed marginal improvements over this time.

Through the support of the honorable Minister of Health, HelloMama secured a four-digit toll-free telephone number: 1444. This short code was integrated with the four major mobile network operators in the country. The project further developed a fully functional real-time dashboard of key indicators for project, technical, and executive views, fostering effective project management decisions at project, federal, and state levels. A control interface was also built, providing an overview of registration data and overall health systems monitoring.

HelloMama supported the government at national and state levels to develop and implement digital health policies and strategies. This included support to the national e-health policy technical working group to finalize the national e-health policy. Both Cross River and Ebonyi state ministries of health (SMOHs) were further supported to develop their state-specific e-health strategic plans for 2018–2023. In addition, the project built management and technical capacities for 40 FMOH and SMOH managers to implement, advocate for, and sustain digital health interventions.

From a programmatic perspective, HelloMama was a learning curve for digital health implementation in Nigeria, which grappled with several challenges ranging from telecoms infrastructure and network coverage in the country, to business culture within the ecosystems, to strategies that promoted digital health adoption by HCWs and the target beneficiaries. The continuity and sustainability of this partnership was achieved via the government embracing the technology through inclusion of digital health in the budget. Cross River State committed \$110,000 to sustain the cost of HelloMama SMS and IVR messages. The Ebonyi state MOH commitment is currently underway.

A detailed implementation road map that will act as a guide for future project implementation has been developed and is ready for adoption. It outlines the process for implementing IVR and SMS messaging systems similar to HelloMama and the HelloMama Bot, an application that uses a telegram bot<sup>1</sup> application programming interface to connect to clients (end users) to deliver age- and stage-based

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<sup>1</sup> Telegram messenger is a messaging app that works over the Internet, similar to WhatsApp or Facebook Messenger. The app can be downloaded through Google Play or the App Store.

messaging without depending on traditional telecommunications channels (text and voice), which is more cost prohibitive.

Despite challenges implementing HelloMama as a new partnership in Nigeria, many stakeholders agreed the project made a significant difference in improving health outcomes for Nigerian women and children, and contributed to efficiency of service delivery. HelloMama messages provided information to pregnant women, making counseling easier for the provider who could reinforce the messages received. HelloMama is now a recognizable “brand” tailored to local needs, context, and languages in the two supported states.

# Introduction

The Mobile Alliance for Maternal Action (MAMA), a global consortium with public-private funding, has delivered vital health information over the past 5 years to pregnant women, new mothers, and their families through their mobile phones with messages specifically designed for behavior change. Through an age- and stage-based model, the messages correspond to what a woman is experiencing in her pregnancy or in her child's development, creating a trusting relationship between the end user and the MAMA service. With an intentional focus on countries where high maternal and newborn mortality rates intersect with an increasing proliferation of mobile phones, MAMA directly supported country programs in Bangladesh, India, and South Africa. In 2015, MAMA Nigeria was launched as a 3-year project (October 2015–September 2018) branded in program year 1 (PY1) as HelloMama under the Maternal and Child Survival Program (MCSP).

The HelloMama project operated in Nigeria with the goal of improving health outcomes for pregnant women, newborns, children, and families in Nigeria through age- and stage-based mobile messaging that complements the efforts of frontline health care workers (HCWs). HelloMama is locally led, planned for scale, and complements the national health care system by aligning with health priorities, policies, and systems.

In PY1, the seven core partners of HelloMama were the Subsidy Reinvestment and Empowerment Program (SURE-P), Pathfinder International, Praekelt Foundation, Johnson & Johnson, the US Agency for International Development (USAID), MAMA Global, and the Federal Ministry of Health (FMOH). In PY2, the key MAMA partners were Pathfinder International and Praekelt Foundation with funding from USAID and Johnson & Johnson via the United Nations Foundation. The project drew upon key lessons learned and best practices from the other MAMA country projects.

The core partners had the following responsibilities:

- **MCSP:** MCSP played a coordination role in leading HelloMama across all states for implementation (including Ebonyi and Cross River) and had staffed the HelloMama project director and other support staff in-country. MCSP also provided headquarters-level programmatic and technical support to HelloMama implementation and the platform for implementation of the pilot in Ebonyi State. MCSP's maternal, newborn, and child health (MNCH) program working in Kogi and Ebonyi provided a platform for HelloMama to generate demand for MNCH services in overlapping states by leveraging their objectives of improving the quality of facility-based MNCH services and community-based child health services. MCSP's approach included implementation of proven interventions, active leadership, effective implementation at state level, and strengthening capacity of health professionals in both public and private/faith-based services, which created an enabling environment for the HelloMama project to thrive.
- **Pathfinder International:** Pathfinder, as one of HelloMama's in-country partners, received direct funding through USAID's Evidence to Action project. Pathfinder was responsible for content development, localization, monitoring, evaluation, and research. HelloMama leveraged Pathfinder's existing maternal and newborn health project in Cross River State and Evidence to Action project for implementation.
- **Praekelt Foundation:** Praekelt led specific activities related to the development of personas and user journeys, wireframes, prototyping, dashboards, platforms for delivering mobile messages via interactive voice response (IVR) and short message service (SMS) text, training materials for HCWs to register women, and a marketing plan to raise awareness of the HelloMama brand. Praekelt also managed the relationships with relevant contractors that were needed to host and aggregate services across mobile network operators (MNOs) in Nigeria, and managed the purchase of the telecommunications "inventory" (airtime and messaging costs) needed to operate the HelloMama platform.

## Goal

To improve the health outcomes for pregnant women, newborns, children, and families in Nigeria through age- and stage-based mobile messaging that complements the efforts of frontline HCWs.

## Objectives

**Objective 1:** To establish an operational, nationally scalable platform of adequate coverage that makes age- and stage-based mobile messages available to the target population and links to existing health information systems.

**Objective 2:** To complement supply-side MNCH interventions by improving knowledge and adoption of healthy and safe MNCH practices.

## Major Accomplishments

### **Objective 1: To establish an operational, nationally scalable platform of adequate coverage that makes age- and stage-based mobile messages available to the target population and links to existing health information systems.**

Pregnant women and new mothers were enrolled in HelloMama at the health facility level during routine antenatal care (ANC) visits and deliveries. During enrollment, HCWs obtained consent and other vital data relating to a woman's pregnancy, such as last menstrual period. Each HCW used a mobile phone with a unique code for facility identification to register the woman's preference for timing of messages, days to receive messages, and language. The woman could also enroll a person who she found influential, such as a male partner, mother-in-law, or friend.

The minimally viable product was the backbone of the technology platform and was built upon a systematic service design process that included all partners for IVR, SMS, and unstructured supplementary service data message delivery (Junebug). Below are the major technology accomplishments HelloMama achieved over the life of the project:

### **Pilot Implementation**

The project pilot phase commenced in September 2016 in 47 sites in Ebonyi and Cross River states of Nigeria with the aim of testing the technology and enrolling 15,000 beneficiaries by the end of December 2016. However, by the end of the pilot, only one MNO (MTN) had integrated into the HelloMama platform to deliver messages. At this time, 4,473 beneficiaries were registered for the service and 9,281 IVR calls made, but only 20% calls being received by intended audience. Network failure accounted for 30% of the unanswered calls, with 50% of subscribers were also rejecting and not answering their calls. 19,383 SMS messages were sent to HelloMama subscribers achieving only a 73% delivery success rate.

A review of the pilot phase indicated several reasons for the low delivery rate of the IVR and SMS messages. A lack of subscriber awareness regarding the borrowed enrollment short-code (55500) may have contributed to the significant amount of rejected and missed calls. Some subscribers may have considered the calls spam and did not answer due to high incidences of spam calls in the country. The high failed calls could also be attributed to beneficiary phones being turned off due to irregular power or lack of network coverage. Health worker enrollment error could have also contributed to some failed message deliveries. Ongoing technical challenges with the platform and only having a single network provider (MTN) delivering messages were also hinderances to the success of the messages during the pilot phase. The registration was done using the phone, however due to challenges with the network availability and user frustration, some health care workers used a paper-based registration system. This required HCWs to upload the subscriber information at another time when the network was available.

Based on these implementation challenges and lessons learned, an extended pilot phase from March 2017 to June 2017 was approved by USAID. During this period, a service signal mapping assessed the level of signal strength and preferred network for the scaled up implementation sites. This mapping helped target sensitization and promotional material development to promote HelloMama services within the select facilities. Promotional materials and supportive supervision helped mentor HCWs to integrate HelloMama enrollment during routine ANC counseling at the facility. The promotional materials also created awareness of the HelloMama approved dedicated 1444 short code.

At conceptualization, a community and self-enrollment mechanism was intended for the HelloMama platform. However, based on the pilot experience, the partnership found that pregnant women were not able to remember an accurate last menstrual period, which was essential for the age- and stage-based messages, without the assistance of a HCW, so the self-enrollment portal was disabled. A community enrollment portal designed for trained volunteers was built, which would allow the volunteers to identify and enroll pregnant women from the community. The subscribers would receive a series of messages prompting them to register for ANC and complete their HelloMama registration at the facility. The partnership however did not proceed in rolling out enrollment at the community and decided to focus on scaling up facility enrollment.

## Content Development

The content development, translation, and testing was conducted from March – July 2016. The message content for HelloMama was developed using an internationally recognized set of age- and staged-based messages developed by Baby Center<sup>2</sup> that was contextualized by a local expert content committee. The partnership conducted a landscape assessment to determine barriers and enablers of health behaviors amongst low-income men and women of reproductive age in Ebonyi and Cross River states. The findings served to develop a topical map for the messages including topics such as ANC attendance, nutrition, hygiene, family planning, labor and delivery, danger signs in pregnancy, breastfeeding, cord care, and skilled birth attendance. A team of experts from the Pediatric Association of Nigeria, Association of Neonatal Medicine, and individual experts from partner organizations and the national teaching hospitals (i.e. SURE-P, Aminu Kano Teaching Hospital, National Hospital, Specialist Hospital, and Ondo Hospital) reviewed these messages to align with local policies and guidance. The Reproductive Health Unit of Family Health Department of FMOH spearheaded the review process and validated the messages.

Messages for pregnant women were able via IVR and SMS. Partner and family member messages were only available via SMS. A total of 136 voice messages (pregnancy and newborn) were developed for women, while 86 voice messages (pregnancy and newborn) were developed for partners and family members. A total of 130 text messages for pregnancy and 116 text messages for newborn care were developed for women. The messages were adapted to the local context, pre-tested, and translated into two languages (Igbo and Pidgin English). From July – September 2016, the content was programmed into the HelloMama technology platform, HCWs were trained to enroll the women, and the system was pilot tested for technical accuracy in delivering messages as well as acceptance by women, their partners and gatekeepers.

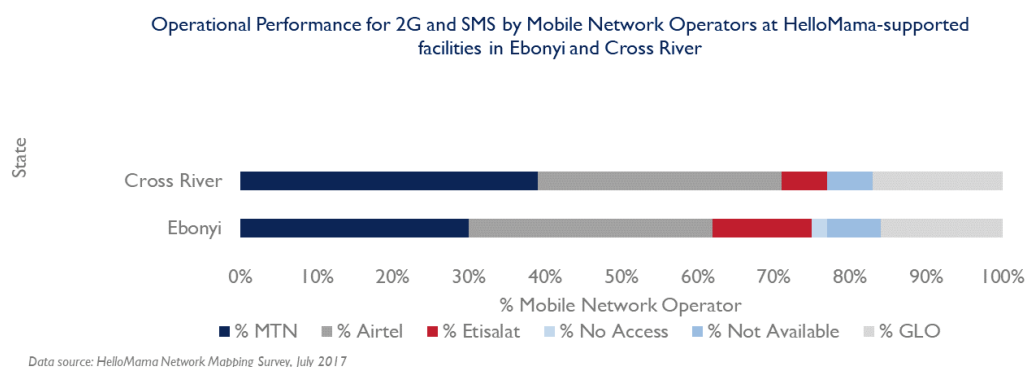
## Network Mapping and Survey Assessment

Between the initial pilot and the extended pilot phase, HelloMama conducted a network signal and strength study in 192 facilities across Ebonyi and Cross River states. The objectives of the study were primarily to test the network strength within and around the designated facilities, and review the performance of the MNOs in the facilities for full optimization of the deployed HelloMama services. Main findings from the study showed the preferred MNOs (i.e. MTN, GLO, Etisalat, Airtel) functioning in the project catchment areas, which HelloMama used to target text and voice messages delivery. The network mapping revealed that 50 facilities had no or limited network coverage available. Based on these findings, 50 facilities were removed from the HelloMama catchment area. HelloMama used these findings to target SMS and IVR message delivery. This resulted in an increased delivery via SMS from 62% to 73%

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<sup>2</sup> <https://www.babycenter.com/>

and via IVR messages from 13% to 20%. These findings remain useful lessons in targeting health messaging in Nigeria.



## Zero-Rated Short Code Obtained from Nigerian Communications Commission

HelloMama secured a four-digit, toll-free telephone number (short code) of 1444 that was used by the project to deliver vital health information to new and expectant mothers in Ebonyi and Cross River states, with the aim of improving health outcomes for these women, their newborns, and their children. This is the first time that a dedicated short code was approved by the Nigerian Communications Commission and endorsed by the FMOH for health messaging in Nigeria. Nigeria's four major MNOs fully integrated the short code into their platforms, increasing the opportunities to scale up the intervention and reach more targets nationwide.

## Integration with Mobile Networks Operators

HelloMama's messages delivered using the Junebug messaging platform were designed to be free for the pregnant women and mothers. As a result, four-digit, toll-free telephone numbers (short codes) was obtained through the aggregator company<sup>3</sup> for the pilot and implementation period. The pilot short codes to initiate the service for clients were \*366\*6# for SMS and 55500 for IVR. However, would later change to 1444 across for both SMS and IVR when approved by the Nigerian Communications Commission and FMOH. The short codes were intended to work across all four main MNOs (MTN, Etisalat, Airtel, and Glo) in Nigeria. The project faced different implementation issues with each MNO. MTN had some issues at the onset with delivering calls outside their network. Initially, Etisalat was not able to have reverse billing, which allowed free messaging to subscribers. Airtel had delays with full integration in the HelloMama service as they were waiting for new software infrastructure to become available. Lastly, full integration with Glo did not occur until close to the end of the project.

The challenging business landscape in Nigeria made integration and getting the desired quality of services from the telecommunications and other technology collaborators a prolonged task. Each of the MNOs had different operational cultures, procedures and capacities for integration into an external platform. Accountability was also a major challenge especially for obtaining detailed call delivery status reports. This was requested from each MNO as it allowed the partnership to have a better understanding of call failures (i.e. the subscribers phone was switched off or there was network outages).

## CommCare Integrations

The plan to integrate the HelloMama platform with third-party registration systems was initiated via integration with CommCare, an open-source mobile platform that provides case management, data collection, and data management for HCWs offline. HelloMama registrations commence offline and are offloaded with Internet availability to increase rate of client registration. This integration was completed and tested. The project was unable to commence the process of integration with DHIS2 due to re-

<sup>3</sup> VAS2NET is the value added service and aggregator company selected for HelloMama pilot integration.



engineering of DHIS2 at the FMOH. This would have ensured that digital health indicators were being reported into the national health information system. The project did not proceed with the DHIS2 integration based on recommendations from USAID.

## HelloMama Dashboard

The project developed a fully functional real-time dashboard of key indicators for project, technical, and executive views, fostering effective project management decisions at project, federal, and state levels. A control interface was built to provide an overview of registration data and overall health systems data monitoring. The control interface fostered decision-making for project management driven by data from the project implementation.

To foster government ownership and usage of the dashboard and control interface, the partnership has engaged in ongoing discussions with the FMOH and SMOHs for designing and reassessing the control interface. This collaboration culminated in a final redash assessment held in Lagos, Nigeria in April 2018. The objectives of the workshop were to analyze current monitoring and reporting functionalities and agree on additional requirements for the HelloMama service. This workshop also providing a mentoring opportunity for the digital health national and state teams on generation and use of the monitoring and reporting tools.

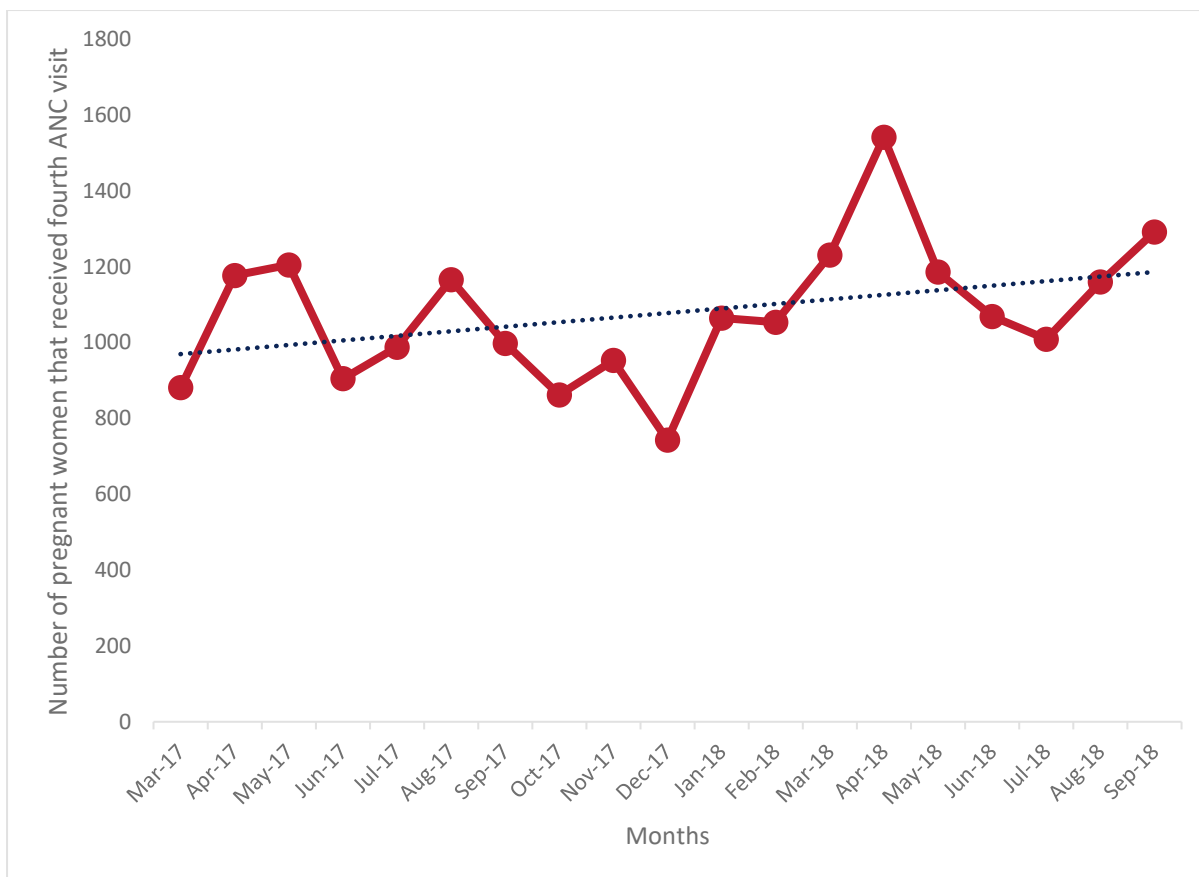
## Callback Features

HelloMama introduced a feature that allowed registered users to trigger a callback with their last scheduled message in the event that they missed their call or the call was interrupted. This resulted in mothers and influencers receiving more vital HelloMama messages and messages at times that were convenient for them.

## Uptake of Subscribers through Brand Recognition

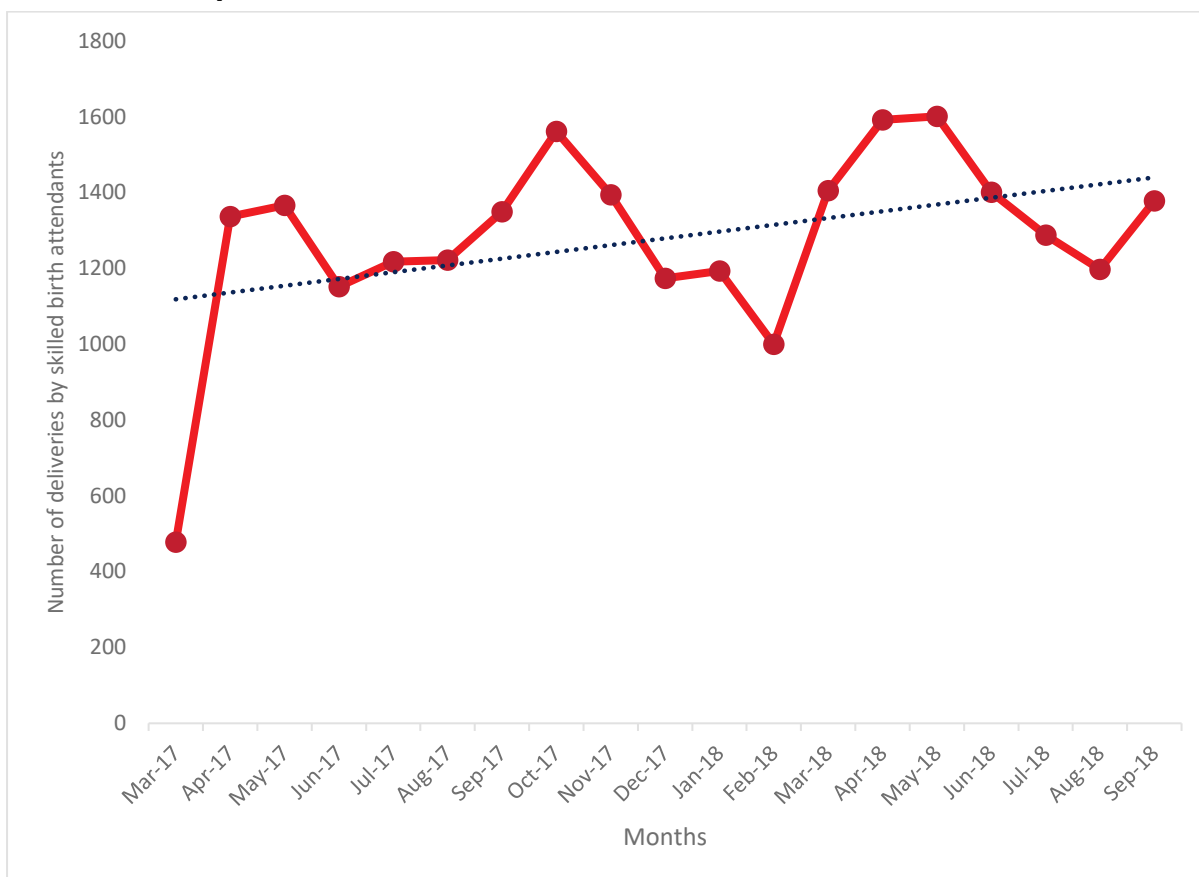
HelloMama attained status as a recognizable brand tailored to local needs, context, and languages. Also known in the two supported states in Nigeria as “the phone doctor,” HelloMama registered over 88,424 pregnant women, new mothers, and their influencers, who received health information on pregnancy care through the HelloMama messages delivered via IVR (12,862 women) and SMS (48,810 women) messages. These women received mobile phone-based health information encouraging attending ANC and giving birth at one of 142 HelloMama and Saving Mothers Giving Life (SMGL)-supported facilities in Ebonyi and Cross River states. Of the 61,672 mothers who delivered and transitioned to childcare messages, 37,385 women graduated from the platform, having received messages from pregnancy to 1 year of child life. Twenty-six subscribers opted out, and 1,264 invalid numbers were removed from the platform. Many mothers are now asking how they too can receive health messages from “the phone doctor.” See Appendix C for success stories.

**Figure 1. Increasing trend in antenatal care (ANC) attendance fourth or more visits in selected facilities in Cross River and Ebonyi states**



Data Source: MCSP/SMGL database, n = 47 facilities. Dotted line indicates average number of women attending ANC over the life of the program.

**Figure 2. Deliveries by skilled birth attendants (SBAs) in selected facilities in Cross River and Ebonyi states**





## **Objective 2: To complement supply-side MNCH interventions by improving knowledge and adoption of healthy and safe MNCH practices.**

From the beginning of the project, HelloMama strived to foster partnerships to serve as a strong unifying force to tackle the complex social and technology changes needed to improve knowledge and adoption of healthy and safe MNCH practices in Ebonyi and Cross River. The project believed a single organization or project could not achieve much without the collaboration and partnership with others within the local digital health environment.

### **Support to National and State Governments**

- As a key digital health actor in Nigeria, HelloMama has been a member of the national e-health technical committee. The project supported the government at national and state levels to develop and implement digital health policies and strategies. This included supporting the national e-health policy technical working group to finalize the national e-health policy. Both Cross River and Ebonyi state ministries of health (SMOHs) were supported to develop their state-specific e-health strategic plans for 2018–2023.
- The project, working with the Cross River State Primary Health Care Development Agency, influenced the inclusion of activities to deliver SMS messages to pregnant women in the State Primary Health Care Development Agency 2017–2022 strategic plan.
- HelloMama expanded to 142 facilities over the life of the project. It supported key stakeholders' understanding of project goals and buy-in, and strategic partnerships in resolving bottlenecks during the life of the intervention. The project built management and technical capacities for 40 FMOH and SMOH management teams for sustainability and management of subsequent digital health interventions. Some key products included an activity plan and budget for age- and stage-based IVR and SMS messages for pregnant women, mothers, and influencers, which was developed in the third quarter of 2018 for Cross River and in the fourth quarter of 2018 for Ebonyi.

### **Capacity Building of HCWs**

HelloMama trained 319 HCWs in HelloMama and Saving Mothers Giving Life-supported facilities on registering women for HelloMama using a mobile device, collecting data, and reporting data. HelloMama also supported the trained HCWs to further cascade the training to other HCWs through direct supportive supervision and mentoring. A monthly meeting to improve uptake of services fostered peer mentoring reviews and healthy competition among the HCWs, with memorabilia for performance as incentives.

### **Supportive Supervision**

HelloMama empowered the Family Health and Information and Communications Technology departments of the FMOH as well as SMOH to understand their role in leading routine integrated supportive supervision for facilities, identifying and resolving issues affecting uptake and delivery of HelloMama messages through onsite joint supportive visits and trainings. HelloMama developed dashboards to foster project management for decision-making at project and state levels. The dashboards support government ownership of digital health programming through training and mentorship to help decision-makers implement informed, impactful programs. The project built interpersonal and business relationships in addition to technical solutions to address project challenges, and developed the capacity of states to ensure sustainability of services.

### **Marketing and Outreach**

The FMOH and consortium management committee approved the branding for HelloMama messages and materials. This allowed HelloMama to have a trustworthy reputation that was approved by the

national government, meaning the project had memorable and consistent branding throughout, so subscribers and HCWs recognized the messages they received.

HelloMama produced and provided information, education, and communication materials (e.g., posters, leaflets, and job aids) to 142 facilities across Ebonyi and Cross River to sensitize beneficiaries to HelloMama services and aid HCWs in the registration process.

## Health-Seeking Behavior Practices

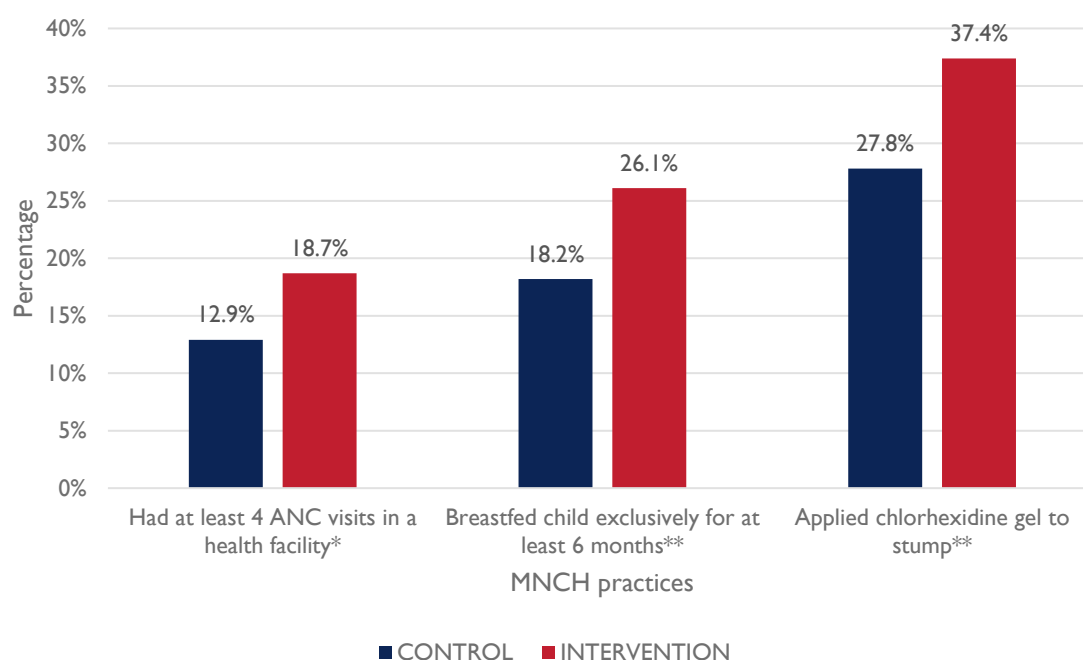
HelloMama messages provided information to pregnant women making counseling by the HCWs easier. HCWs were able to reinforce the messages, saving time spent with each client. Clients also reminded HCWs about the supplements needed at the health facility (e.g., intermittent preventive treatment of malaria in pregnancy with sulfadoxine-pyrimethamine and iron supplementation). Changes in health-seeking behaviors were observed during the HelloMama endline assessment<sup>4</sup>. The study had three objectives: to assess the effect of the HelloMama services on increasing client uptake of ANC, skilled delivery, post-natal care visits and immunization; assess the effect of the HelloMama services on increasing MNCH knowledge and practice, and assess HelloMama subscribers' satisfaction with the quality, relevance and interest in HelloMama messages.

The assessment revealed that there was significant improvement in the percentage of pregnant women who had completed at least four ANC visits in the intervention group (19%) compared to the control group (13%) from baseline to endline,  $p < 0.05$  (see Appendix B). There was also a significant improvement in breastfeeding practices: The percentage of women who exclusively breastfed their babies for at least 6 months increased from 43% at baseline to 69% at endline in the intervention group. However, there was an increase in both intervention and control groups, the intervention group had a higher percentage-point change (26%), compared to 18% in the control group. Application of chlorhexidine to the stump of the umbilical cord also increased from 6% to 43% between baseline and endline overall, with a more significant percentage increase in the intervention group. The women who received HelloMama messages were also significantly more likely to be using a family planning method after delivery ( $p < 0.001$ ) than those in the control group.

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<sup>4</sup> The study design is a non-randomized controlled study with mixed methods where both qualitative and quantitative data were collected. The quantitative study included an intervention group of 30 health facilities, who offered HelloMama services, while the control group are 30 health facilities, who do not offer HelloMama services. A total 2,359 women were enrolled and interviewed in the study at baseline and 2117 (90%) of these women were interviewed at end line. The qualitative data used focus group discussions collected from a subset of the participants recruited from the intervention facilities and their husband/partners. A total of 30 focus groups (15 per state) and 30 facility staff (15 per state) were interviewed. Participant data was obtained through self-reported interviews. The study participants were women recruited at a facility while accessing maternal and child health services and may not be representative of the general population in the state.

**Figure 3. Difference in percentage in maternal, newborn, and child health (MNCH) practices between baseline and endline as a result of HelloMama messages**



P-value <0.05

P-value <0.001

## Performance Monitoring Plan

Nineteen of HelloMama's 24 performance indicators (as stated in the approved performance-monitoring plan) were incorporated with USAID standard indicators in USAID's Performance Reporting System. All are custom indicators. See Appendix A for the list of the indicators and targets.

## Sustainability and Ownership

The goal of HelloMama was to develop a model to demonstrate the feasibility, both in terms of technology and behavior change, to improve MNCH outcomes that could be considered by the government and other donors.

Partnership and collaboration aligned under a government strategic digital health goal are critical to broadening the horizon for sustainable digital health and improved reproductive, maternal, newborn, and child health outcomes. Government buy-in and a national coordination mechanism to allocate and manage resources across partners are key to the sustainability of HelloMama and future digital health partnerships. An example was seen in supported states. The Cross River state government leveraged \$110,000 as a fixed line item in its budget from the state Saving One Million Lives (SOML) partnership to sustain and scale up HelloMama messages. As a result, health messages will be sent to an additional 10,000 pregnant women and their spouses/families with further commitment from the government for full-scale inclusion of a digital health budget line in the 2019 budget and subsequent years. Ebonyi State commitment is currently working to leverage funds from the state SOML to sustain the project.

## Government and Stakeholder Engagement

MCSP strategically engaged both federal and state governments toward state ownership of the intervention. MCSP also influenced policies and resource mobilization through the adoption of the digital health policy and co-creation of a strategy for each state. The project continued to involve state actors in the transition plans to reinforce the principles behind the interventions so that state stakeholders will have management and technical knowledge and the capacity to implement, advocate for, and sustain digital health interventions in Nigeria.

# Cross-Cutting and Global Learning Themes

## Increased Male Involvement in Maternal and Child Care

Gender was integrated as a cross-cutting theme under the larger MCSP umbrella in Nigeria to address gender-related barriers to seeking quality care in a health facility. Although engaging men in health-seeking, reproductive health care and child childcare was not a direct objective under the HelloMama project approach, the project did see a shift in the traditional norms around masculinity that often prevent men from supporting their female partners' health needs. Fifty-seven percent of pregnant women who registered for HelloMama in Cross River State also registered their male partners. This meant that male partners were also receiving the age- and stage-based messages, and could better support their wives to improve their health practices. Ninety percent of women agreed that their partner or husband was more supportive of them during their pregnancy as a result of the HelloMama messages. Male partners provided emotional and financial support to women during ANC and labor. The project did find one incident where local traditional leaders in Ekoli, Ebonyi State, encouraged men to ensure that their wives all had mobile phones so they could receive the HelloMama messages.

# Recommendations and Way Forward

The following recommendations are made in light of the overall HelloMama Nigeria experience:

- A proper assessment of the information and communication technology infrastructures within the localities intended for digital health deployment is fundamental before initialization of a digital health project in sub-Saharan Africa. The infrastructure and coverage are usually stronger in urban centers compared to rural areas.
- Specific legislation and policies are needed that provide rebates for information and communication technologies for health deployment within a free market economy to motivate investments and scale-up of digital health interventions.
- Those investing in digital health should consider plans for field support and continuous engagement of HCWs, technology partners, and beneficiaries. This is required to increase and sustain adoption and positive user experience for the desired outcomes.
- Local ownership and partnership embedded in a comprehensive systems strengthening approach are necessary to achieve sustainable results in digital health. Projects should always aim to strengthen existing systems by aligning their interventions with national and state digital health strategies, even when implementing over a short term or piloting a new approach.
- The national and SMOH state governments should be supported by implementing health program partners and the private sector that have the capacity to plan, budget, and implement digital health as a cross-cutting intervention in the health sector.
- Integrating project activities into existing state-led institutions and projects (e.g., SOML) or routine health services will ensure sustainability.
- Most digital health interventions rely on customized indicators for systems performance and results tracking, so there is currently no way to track digital health program within the national HMIS. Programs need to agree on standard indicators. Once indicators are standardized, they need to be added to the existing national HMIS so they are routinely captured.
- MNOs in Nigeria have in-house foundations as part of their social corporate responsibilities. There is a need to explore ways of integrating these projects with those carried out by the MNOs' foundations.

## Going Forward

Many stakeholders, including HCWs, beneficiaries, and government officials, have attested to and applauded the contributions of MCSP's HelloMama project in improving health outcome for mothers, newborns, and children in Ebonyi and Cross River states. Cross River State has gone ahead to provide funds for continuity, attesting to the project's impact, while Ebonyi State's commitment is being discussed by the state government. Going forward, as MCSP's HelloMama project ends its activities in Nigeria, it leaves behind a re-engineered platform telegram bot that makes the existing age- and stage-based messaging accessible on Android and iOS stores for download directly to smartphones. Additionally, the program has developed a detailed implementation road map that will act as a guide for future programs implementing IVR and SMS messaging systems similar to HelloMama in Nigeria. This document includes the content within the age- and stage-based messages, an outline of the management structure to support a project of this size, and the technology specs of the platform needed to easily replicate the system. Moving forward, the onus is now on national and state actors to ensure that the gains and legacies of the project are sustained and scaled up as much as possible across all Nigerian states.

# Appendix A. Performance Monitoring Plan

Performance Indicator		State	FY 2016			FY 2017						FY 2018						Notes
			FY 2016		Quarterly Status: FY 2016	FY 2017		Quarterly Status: FY 2017				FY 2018		Quarterly Status: FY 2018				
			Annual Planned Target	Annual Actual	Q4—Sept only	Annual Planned Target	Annual Actual	Q1	Q2	Q3	Q4	Annual Planned Target	Annual Actual	Q1	Q2	Q3	Q4	
1	Number of subscribers newly enrolled for HelloMama messages		15,000	1,414	1,414	33,405	29,361	5,291	3,618	11,165	9,287	36,121	55,905	29,361	9,487	9,008	8,049	
	Pregnant women	Cross River	3,765	375	375	8,385	8,295	1,474	944	3,428	2,449	9,065	15,194	8,295	2,265	2,490	2,144	
		Ebonyi	7,005	507	507	15,601	11,994	2,100	1,497	4,418	3,979	16,865	24,108	11,994	4,372	3,966	3,776	
	Influencers	Cross River	1,875	321	321	4,175	4,604	992	475	1,798	1,339	4,532	8,153	4,604	1,346	1,211	992	
		Ebonyi	2,355	211	211	5,244	4,468	725	702	1,521	1,520	5,659	8,450	4,468	1,504	1,341	1,137	
2	Number of subscribers who opted out of the HelloMama services			1	0		212	0	25	84	103		716	92	18	215	391	
		Cross River		0	0		81	0	9	32	40		166	47	6	73	40	
		Ebonyi		1	0		131	0	16	52	63		550	45	12	142	351	
3	Outcome of outbound dialing messages sent out			NA	NA													
	Network failure			NA	NA		45%	31%	50%	42%	46%		38%	48%	48%	26%	19%	
	Rejected			NA	NA		24%	31%	24%	26%	21%		37%	33%	34%	41%	61%	

Performance Indicator		State	FY 2016			FY 2017						FY 2018						Notes
			FY 2016		Quarterly Status: FY 2016	FY 2017		Quarterly Status: FY 2017				FY 2018		Quarterly Status: FY 2018				
			Annual Planned Target	Annual Actual	Q4—Sept only	Annual Planned Target	Annual Actual	Q1	Q2	Q3	Q4	Annual Planned Target	Annual Actual	Q1	Q2	Q3	Q4	
	Successful			NA	NA		12%	19%	12%	13%	12%		15%	9%	9%	23%	8%	
	No answer			NA	NA		19%	19%	15%	19%	22%		9%	9%	9%	10%	13%	
4	Outbound dialing call completion rate (for successful calls)																	
	1–25% call completion rate			NA	NA		27%	33%	33%	25%	25%		30%	32%	31%	30%	28%	
	26–50% call completion rate			NA	NA		7%	10%	7%	7%	7%		9%	11%	14%	8%	7%	
	51–75% call completion rate			NA	NA		10%	6%	9%	10%	12%		13%	14%	14%	13%	11%	
	76–100% call completion rate			NA	NA		55%	51%	51%	59%	56%		48%	44%	40%	48%	54%	
5	Outcome of short message service messages sent out																	
	Not sent			NA	NA		17%	20%	14%	14%	18%		3%	11%	1%	0%	0%	
	Delivered			NA	NA		57%	63%	73%	73%	44%		54%	57%	51%	55%	42%	

Performance Indicator		State	FY 2016			FY 2017						FY 2018						Notes
			FY 2016		Quarterly Status: FY 2016	FY 2017		Quarterly Status: FY 2017				FY 2018		Quarterly Status: FY 2018				
			Annual Planned Target	Annual Actual	Q4—Sept only	Annual Planned Target	Annual Actual	Q1	Q2	Q3	Q4	Annual Planned Target	Annual Actual	Q1	Q2	Q3	Q4	
	Sent			NA	NA		17%	7%	4%	4%	27%		27%	14%	28%	34%	38%	
	Undelivered			NA	NA		10%	10%	10%	9%	10%		15%	18%	20%	11%	20%	
6	Percentage of failed short message service deliveries			NA	NA		43%	37%	27%	27%	56%		46%	43%	49%	45%	42%	
7	Number of health care workers trained to enroll women for HelloMama services	Total	94	85	85	170	50	22	28	0	0	172	184	0	184	0	0	
		Cross River	40	40	40	58	10	0	10	0	0	58	94	0	94	0	0	
		Ebonyi	54	45	45	112	40	22	18	0	0	114	90	0	90	0	0	Transfer of trainable HCW in some facilities resulted in us not meeting our targets as these facilities only had supported staff.



Performance Indicator		State	FY 2016			FY 2017						FY 2018						Notes
			FY 2016		Quarterly Status: FY 2016	FY 2017		Quarterly Status: FY 2017				FY 2018		Quarterly Status: FY 2018				
			Annual Planned Target	Annual Actual	Q4—Sept only	Annual Planned Target	Annual Actual	Q1	Q2	Q3	Q4	Annual Planned Target	Annual Actual	Q1	Q2	Q3	Q4	
8	Number of health care workers who registered women during the reporting period	Total	94	51	51	136	81	66	59	81	68	269	200	59	139	189	186	Transfer of trainable HCW in some facilities resulted in us not meeting our targets as these facilities only had supported staff.
		Cross River	40	25	25	55	32	25	23	32	30	132	92	28	86	92	78	
		Ebonyi	54	26	26	81	49	41	36	49	38	137	108	31	53	97	108	
9	Number of health facilities enrolling subscribers in the HelloMama service	Total	47	34	34	132	46	39	40	46	45	135	128	44	89	128	120	
		Cross River	20	18	18	64	20	18	17	20	20	66	62	20	58	62	56	
		Ebonyi	27	16	16	68	26	21	23	26	25	69	66	24	31	66	64	

# Appendix B. Summary of Baseline and Endline Outcomes

**Table 1. Uptake of maternal, newborn, and child health services and practices by participants at baseline and endline**

Outcomes	Baseline			Endline			Difference In % Between Endline And Baseline	
	CONTROL	INTERVENTION	P-Value	CONTROL	INTERVENTION	P-Value	CONTROL	INTERVENTION
	n = 720	n = 714		n = 1,017	n = 984			
Had at least four antenatal care visits in a health facility*	500 (69.4%)	487 (68.21%)	0.613	837 (82.3%)	855 (86.9%)	0.005*	+12.9%	+18.7%
Delivered in a health facility	542 (75.3%)	527 (73.8%)	0.523	857 (84.3%)	857 (87.1%)	0.071	+9.0%	+13.3%
Had postnatal care visit within 6 weeks in a health facility*	488 (67.8%)	467 (65.4%)	0.341	483 (47.5%)	521 (52.9%)	0.015*	-20.3%	-12.5%
Breastfed child exclusively for at least 6 months*	312 (43.3%)	305 (42.8%)	0.814	625 (61.5%)	678 (68.9%)	0.000*	+18.2%	+26.1%
Applied chlorhexidine gel to stump*	37 (5.2%)	42 (5.9%)	0.537	336 (33.0%)	426 (43.3%)	0.000*	+27.8%	+37.4%
Child received any immunization	707 (98.1%)	697 (97.6%)	0.447	1009 (99.2%)	980 (99.6%)	0.271	+1.1%	+2.0%
Child received first immunization in the first week of birth	438 (60.8%)	427 (59.8%)	0.69	790 (77.7%)	770 (78.3%)	0.757	+16.9%	+18.5%
Currently using any family planning method**				355 (34.9%)	422 (42.9%)	0.000*		
Currently using long-acting reversible contraceptives**				103 (10.1%)	132 (13.4%)	0.022*		

\*Statistically significant at p-value <0.05

\*\*Data were only collected at endline

## Appendix C. Success Stories

### Knowledge is power . . .



As with their previous pregnancies, Monica and Israel became anxious when they knew their third child was on the way.

But things changed after they started receiving HelloMama messages.

*"I knew his birth would be different. We learnt a lot of things we didn't know before.*

*And we did everything they said we should do. It was like they knew everything we needed."*

**Monica and Israel Nwafor** of Ezza LGA in Ebonyi State were among over 40,000 women and gatekeepers enrolled by HelloMama and sent vital health information for behavior change and demand for quality services.

When she brought home her newborn son, Michael, Monica Nwafor's work tripled. The 31-year-old Nigerian woman juggles three jobs. Now, she not only cares for her newborn son, but she is also raising her 5-year-old daughter Miriam and her 3-year-old son Sylva, and earning money trading clothes.

However, a busy schedule is not her biggest concern. She is preoccupied with the threats to her health and the health of her children. According to UNICEF, more than 2,000 children under age 5 and over 100 women of childbearing age die every day in Nigeria. This makes the country the second largest contributor to under-5 and maternal mortality in the world, after India.

Eager to better her family's chances of staying healthy and safe, Monica signed up for HelloMama during her third pregnancy. With two small children to care for and another one on the way, she was determined not to be one of the one of 13 women who die during pregnancy and childbirth in Nigeria.

Via the US Agency for International Development (USAID)'s flagship Maternal and Child Survival Program (MCSP), USAID funded the HelloMama partnership, which originally began in 2014 with help from public and private partners, including Johnson & Johnson. MCSP heads this consortium of partners—which includes Pathfinder International and the Praekelt Foundation—and works with the Federal Ministry of Health and the National Primary Health Care Development Agency to get vital information to parents via mobile phones and at zero financial cost to them.

See full photo story of Monica and Israel Nwafor on the MCSP website here:

<https://www.mcsp.org/hellomama-messaging-service-delivers-vital-health-messages-in-nigeria/>

## HelloMama Subscribers Tell Their Stories

“I used to have leg cramps. Anytime it happened I would scream and my husband would rub my legs but it would not really ease off.

“Then I got a message from HelloMama that if I had cramps I should stretch my legs, walk around, or put my legs on a cold material. I started doing all these, and they are all working for me.”

**Lilian Clement**

**Abakaliki, Ebonyi State**

*(Photo: Tolase Olatinwo/MCSP)*



“HelloMama messages have been very educative, and it has greatly increased my knowledge. I now know how to properly take care of my baby and how to keep her warm. I also know how to take care of the cord.

“Since I registered for HelloMama in the hospital, I have been receiving messages every week, and it feels as if I am being followed, especially when I got the messages that says if my family members are not close by, I should get a trustworthy person that would take me to the hospital.

“My baby is special because I got the right information when I needed it and did not go through any stress. I will advise every pregnant woman to register for HelloMama so they too can benefit.”

**Joy Enegi**

**Police Clinic Calabar, Cross River State**

*(Photo: Ayomipo Edinger/Pathfinder International)*



“During ANC, a pregnant woman asked me ‘Nurse, can you tell me the signs of labor?’ I went ahead to tell her the signs.

“She smiled, brought her phone, and showed me the same signs as messages she got from HelloMama. I smiled too.

“Another woman requested for insecticide-treated net because she got a message from HelloMama that she should always sleep in it. Though we did not have the nets in stock, I directed her to where she can get one.

“Honestly, HelloMama is making our work easy. HelloMama is midwifery through the phone.”

**Blessing Umozurike**  
**Antenatal Care Matron In-Charge, Mater Hospital, Afikpo North Local Government Area, Ebonyi State**  
(Photo: Tolase Olatinwo/MCSP)



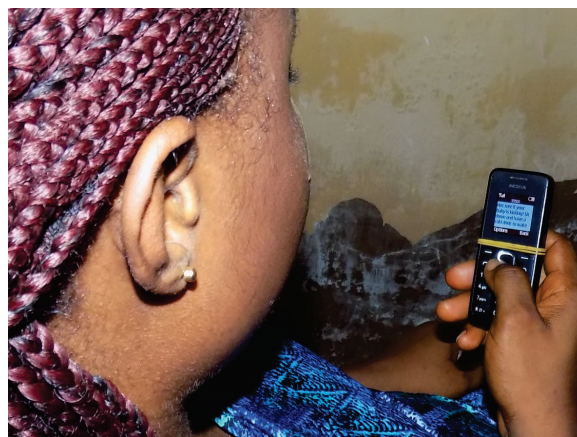
“HelloMama saved my life. During my last pregnancy, I was critically ill all through the 9 months. I thought it was just the pregnancy but did not know that it because of the native medicine I was taking, until I got pregnant again and registered in the hospital. Then, I started receiving the HelloMama messages. I got calls telling me about the type of food to eat and to take only drugs given to me by my nurse. I adhered to that and am perfectly healthy. I would love to continue to receive these messages on how to take care of my baby after birth.”

**Augustine Iyom**  
**Lutheran Hospital Yale, Cross River**  
(Photo: Ayomipo Edinger/Pathfinder International)

Federal Medical Centre, Abakaliki, Ebonyi State:  
Itumo Nkechi was 6 months pregnant, her baby was not kicking, and she was worried. She planned to go to the health facility when she received a message that says, “If you are not sure the baby is kicking, sit up and take a cold drink.” As soon as she carried out the instruction, the baby started kicking immediately.

On February 14, 2017, Nkechi gave birth to a baby boy named Valentine. One month after birth, Nkechi started bleeding. Her husband said they should go to the hospital, but her HelloMama message for that day said you can bleed for 4 to 6 weeks after delivery. She told her husband there was no need for the hospital. She said HelloMama is her mobile doctor, giving her messages on cord care, care for herself, and the baby. In her words, “HelloMama is awesome and has been my guide.”

(Photo: Tolase Olatinwo/MCSP)



## Appendix D. List of Presentations at International Conferences and Publications

- Use of short codes as short message service/caller identification to deliver age- and stage-based messaging to pregnant women and new mothers: “Lessons from HelloMama Nigeria Pilot Implementation.” Presenter: Emmanuel Atuma. Global Digital Health Forum, Washington, DC, December 6–10, 2016.
- “Developing Content for Preventive mHealth Programs: MAMA Experience.” ICT4D conference, Hyderabad, India, May 16, 2017.
- “The HelloMama Nigeria Experience: Lessons Learned from Using Short Codes and Adapting to Network Quality to Deliver Age- and Stage-based Messaging to Pregnant Women and New Mothers.” Presenters: Hadiza Joy Marcus, Emmanuel Atuma, Olayemi O. Sotomi, and Kayode Afolabi. Global Digital Health Forum, Washington, DC, December 11–14, 2017.

## Appendix E. List of Materials and Tools Developed or Adapted by the Project

- *HelloMama: Using Digital Health Platforms to Improve Health Outcomes for Pregnant Women and New Mothers in Nigeria, program brief*
- *Implementation Road Map for Future Programs Implementing IVR and SMS Messaging Systems Similar to HelloMama*
- Mapping and Network Survey Report for Ebonyi and Cross River States
- Ebonyi State e-Health Strategic Plan 2018–2023
- Cross River State e-Health Strategic Plan 2018–2023
- HelloMama Bot guidelines



## Appendix F. Learning Matrix

Learning Agenda	Status Update	Final Products and Dissemination
The research study protocol on “Evaluating the effectiveness and acceptability of using age- and stage-based interactive SMS and voice messaging to improve maternal, newborn, and child health knowledge, uptake of services, and satisfaction in Cross River and Ebonyi states of Nigeria”	Completed	Pathfinder has completed an endline report and submitted it to the USAID Mission for review and approval. The team is currently revising the report. The results will be showcased during the Saving Mothers Giving Life closeout in June 2019.