How maternal health innovations are closing the digital divide

A MSD for Mothers Report

MSD
for Mothers

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How maternal health innovations are closing the digital divide

A message from MSD for Mothers

MSD for Mothers is MSD's global initiative to help create a world where no woman has to die while giving life. Applying MSD's business expertise, scientific expertise and financial resources, we are working across sectors to improve the health and well-being of women during pregnancy, childbirth and the months after.

Towards this goal, we have invested in the development and enhancement of digital health solutions that are tackling some of the most critical obstacles standing in the way of women receiving quality maternity care and family planning services in low- and middle-income countries (LMICs). The digital innovations we are supporting are designed to improve health care providers' delivery of quality care, women's access to this care and women's experience of care across the maternal health continuum — from family planning and antenatal care to labor and delivery and postpartum care.

> As part of our commitment to health equity, MSD for Mothers seeks to better understand how the digital health platforms we invest in are serving all women, especially low-income women in low- and middle-income countries, where the gender digital divide is most pronounced.

This report describes the findings and recommendations from our collaborators' efforts in LMICs to advance equity in maternal health — and health more broadly — through digital innovations.

The COVID-19 pandemic has demonstrated the immense power of digital tools to facilitate access to health care — in many cases, digital tools have become a necessity. But in LMICs, barriers to digital tools, especially for women in low-income communities, can exacerbate existing health inequities. Many women, particularly those living in under-resourced communities, have limited or no access to technology, hindering their ability to benefit from digital health solutions. These women fall within the gender digital divide.

We are early in our journey to help close the gender digital divide and are committed to working with our collaborators to intensify focus and investment to reach underserved and underrepresented women. We will be providing updates along the way — highlighting challenges and failures and spotlighting successful approaches to advance maternal health and gender equity.

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The problem: the gender digital divide in low- and middle-income countries

The digital divide is the distinction between those who have internet and/or mobile access — and are able to make use of digital communications services — and those who are excluded from using these services.[i] The *gender* digital divide refers to the inequalities between men and women in terms of digital technology access and use.

Societies across the globe are rapidly digitizing: today, more than half of the world's population is connected to mobile internet, with over three quarters of those connected living in low- and middle-income countries.[ii] COVID-19 further accelerated the pace — some believe that the pandemic brought digital transformation forward by more than five years.[iii]
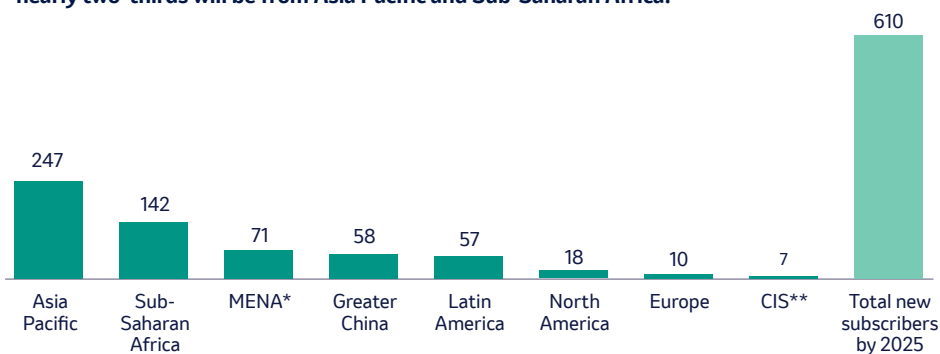
But as internet and mobile phone access and adoption become more widespread, there is growing concern that many women in LMICs are being left behind.

The GSMA Mobile Gender Gap Report 2021 highlights that 234 million *fewer* women than men access mobile internet in low- and middle-income countries, and smartphone ownership, a principal way of accessing the internet, is *15 percent lower* for women than men. Gender gaps in mobile ownership and mobile internet use are widest in South Asia and Sub-Saharan Africa.

Inequities that result from differences in income, age, education, geography and culture often exacerbate the gender digital divide. At the same time, the digital divide may exacerbate gender and other inequities by limiting access to vital information, resources and services.

Regional growth in mobile subscribers by 2025 (in millions)

There will be more than 610 million new subscribers to mobile services by 2025: nearly two-thirds will be from Asia Pacific and Sub-Saharan Africa.

Asia Pacific	Sub-Saharan Africa	MENA*	Greater China	Latin America	North America	Europe	CIS**	Total new subscribers by 2025
247	142	71	58	57	18	10	7	610

* Middle-East/North Africa
** Commonwealth of Independent States

Source: GSMA, 2020
https://www.gsma.com/mobileeconomy/wp-content/uploads/2020/03/GSMA_MobileEconomy2020_Global.pdf

The emergence of a new generation of youthful 'digital natives' — first-time mobile subscribers — across Sub-Saharan Africa will allow Africa to maintain its momentum as one of the fastest growing regions adopting mobile use.

Nigeria will record the fastest growth in new mobile subscribers in Sub-Saharan Africa.

The gender gap in mobile ownership and Internet use is:

51%
in South Asia

37%
in Sub-Saharan Africa

In low- and middle-income countries

234 million
fewer women than men access mobile internet

Smartphone ownership is

15%
lower for women than men

Key barriers to closing the digital divide for women

The United States Agency for International Development (USAID) categorizes the key barriers to closing the gender digital divide in low- and middle-income countries into four broad areas outlined below.[iv, v, vi] MSD for Mothers' collaborators are overcoming these barriers in the following ways:

Affordability

Cost: women, especially in low-resource communities, often do not have the means to pay for devices, fees, taxes, or pricing and data plans. Our collaborators:
- Design health solutions that work with less expensive basic phones
- Partner with telecom providers to subsidize costs to clients for engaging on health-related platforms

Availability

Infrastructure: low levels of network coverage and quality create additional barriers for women. Many low-income areas have limited communications infrastructure, such as fiber-optic cables, cell towers and data centers. Our collaborators:
- Advocate for expansion of mobile Internet access by demonstrating the positive health impact of digital technology on women's daily lives

Ability

Digital literacy & skills: in many countries, gender inequality means that women have lower levels of education than men and, as a result, women often lack the digital skills or confidence needed to use the Internet and digital technologies. Our collaborators:
- Facilitate mobile-based digital literacy for women by using trusted local community and peer networks to deliver digital skills training to women, including in local languages

Social norms and underlying gender inequality: perceived fears and misconceptions about women's technology use prevent women from engaging with and adopting digital technology. Our collaborators:
- Address the negative influence of social norms by challenging restrictions on women's access to mobile technology

Appetite

Safety, security and harassment: women and girls face disproportionate harm associated with online and mobile access, such as cyberbullying, harassment and concerns about data security and privacy

Relevance: digital tools and technologies often do not take women's specific needs and concerns into account, including content, language and ease of use. Our collaborators:
- Design creative women-centric technology by understanding and incorporating the content, features, channels and services that women find useful and relevant

Why MSD for Mothers is committed to greater equity in digital solutions

MSD for Mothers is collaborating with digital health innovators who are committed to helping underserved women in low- and middle-income countries take greater advantage of what digital tools offer. Increasingly, our digital collaborators are demonstrating that with the right approach, it is possible to close the digital divide and connect women to quality maternal and reproductive health services. These efforts help improve maternal health and also address broader inequities in societies and health systems.

Digital solutions have the potential to transform maternal health outcomes. Digital technology creates opportunities for women to access critical health services and information directly on their mobile phones, including life-saving information related to maternal health (e.g., messages related to antenatal care, safe delivery and postnatal care) that they may not be able to access otherwise.

> " As the world continues to move online, the cost of digital exclusion is increasing. Without a concerted effort, the social and economic consequences of the gender digital divide will continue to grow. Women will not be able to take advantage of the benefits of connectivity and online content, including digital development programming."
>
> USAID Gender Digital Divide Primer

Closing the gender digital divide: learnings from our collaborators

This report features five digital solutions and the creative approaches their developers are using to close the digital divide:

1. **Together for Her**: online platform that enables women to learn about the care they should receive throughout their pregnancy

2. **mDoc**: integrated health care management platform that provides personalized virtual care for high-risk pregnant women

3. **Nivi**: mobile phone-based platform that provides education on family planning options and connections to health facilities

4. **MomCare**: digital platform that tracks the maternity care journey and improves the financing and delivery of care

5. **Safe Delivery App**: mobile app that equips providers with tools to deliver safer maternity care to all women

The 5 C's of digital inclusion

Our collaborators' approaches to closing the gender digital divide fall into 5 main categories:

- Capacity building
- Collaboration
- Context-specific content
- Comprehensive approaches
- Capturing disaggregated data

In 2021, MSD for Mothers conducted a review to better understand how the digital solutions we support are addressing the gender digital divide. We asked our collaborators:

- Who is your typical user?
- What proportion of users are of lower socioeconomic status as defined in your markets?[1]
- How do you integrate women's needs and feedback into solutions?
- How do you engage and onboard users — particularly female users — who may be of lower socioeconomic status and, as a result, have lower digital literacy?
- What strategies do you employ to close the digital divide?
- What have you learned from these efforts and what recommendations do you propose for the field?

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1   Our collaborators' methodology to understand who uses their platforms varies based on the data that is available to them, including assessing SES through country-specific scales, and analyzing user demographics through geospatial mapping, user surveys, national surveys and proxy data (e.g., location).

The 5 C's of digital inclusion

Capacity building to help women improve their digital literacy

mDoc is bolstering the digital literacy of women by ensuring that its infographic content is culturally appropriate, creating how-to videos in a number of local Nigerian languages and offering virtual and in-person group demos run by community ambassadors. Nearly three-quarters of women using mDoc reported that they were more comfortable using their phones for health-related activities compared to fewer than 5 percent upon enrollment.

Collaborating with government stakeholders, non-governmental organizations and local community organizations to promote the use of platforms in low-resource settings and engage hard-to-reach populations

MomCare engages community health volunteers to conduct a financial means test when enrolling women to ensure that the platform is serving the lowest income groups. They also reach out to marginalized populations, such as adolescents, who often do not have access to a personal mobile phone.

Maternity Foundation (Safe Delivery App) works through partners in each country — health ministries, international NGOs, UN agencies and midwifery associations and colleges — to reach and support health care workers in different settings, especially public sector facilities serving lower-income women in India and Ethiopia.

> " Digital solutions have the potential to tackle some of the key barriers adolescents in LMICs face when seeking SRHR (sexual and reproductive health and rights) information and services, including provider bias, stigmatization and discrimination, lack of privacy, embarrassment, and high cost of services and transportation."
>
> Going online for sexual and reproductive health – a report prepared by Girl Effect and Women Deliver
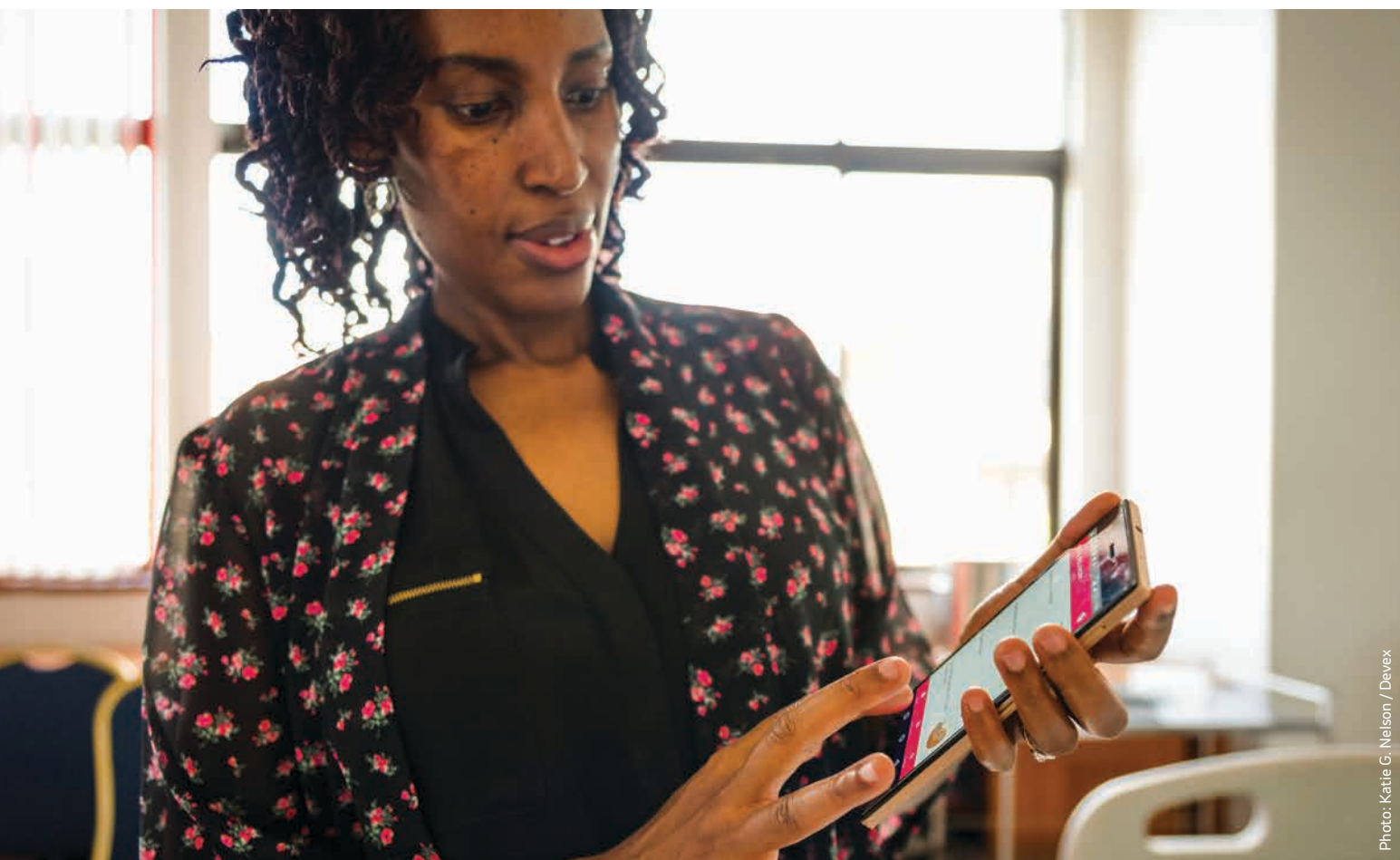

Photo: Katie G. Nelson / Devex

Context-specific content, including content in local languages, to provide women with localized and relevant health information designed to meet their specific needs

In India, Nivi's chatbot feature is available in both Hindi and English, which has helped expand Nivi's user base significantly, including among lower-income women with fewer years of education. A version in Hausa, the popular tongue in many parts of rural Nigeria, is in the works to further broaden reach among marginalized groups.

Safe Delivery App has been adapted for users in more than 20 countries, with language, animations and clinical practices that are appropriate for each context.

Together for Her (TFH) routinely asks women to test various features on the platform and then adapts the interface and other features based on their feedback. For example, TFH added more video content and content related to diet and nutrition after hearing from women about their health needs. As a result of being responsive to what women are seeking, TFH has seen strong growth in the number of users.

Comprehensive approaches to reach women through the digital tools and platforms they are already using

Nivi engages women via WhatsApp and Facebook Messenger, reaching them where they are already active in the digital space in Kenya, India and Nigeria.

MomCare sends surveys via Short Message Service (SMS) or text messages to women at different moments in their pregnancy reminding them to seek timely care. Although SMS messages have limitations, they are an effective way to reach all women, including those without smartphones or with limited data plans.

mDoc utilizes both online and offline methods to reach women, including through in-person community workshops as well as tele-education classes.

Capturing disaggregated data to fully understand the barriers women face in utilizing digital health solutions and leveraging data insights to proactively support those most in need

PharmAccess collects data throughout the MomCare care journey to identify high-risk and low-income women, enabling both health providers and community health workers to bring additional support to those who need it.

Safe Delivery App is utilizing learnings and data insights to lay the foundation for more proactive and personalized learning paths for each health care worker to provide better quality care to women.

Together for Her is developing a machine learning model to approximate the socio-economic status of users based on proxy indicators such as smartphone ownership, device model and geo-location. The team will leverage data insights to develop specific strategies for women in these low-resource settings.

Collaborator case studies

This report focuses on five collaborators and their efforts to improve maternal health and close the gender digital divide through their digital health solutions. Operating in Kenya, India and Nigeria, each has deployed a different strategy for seeking input, expanding reach and designing to meet the specialized needs of women.

1. Together for Her: prioritizing relevant, user-driven content to generate demand for quality maternal care

Despite an increase in the number of women giving birth in health facilities, maternal deaths are not declining as much as they should, largely due to poor quality care.[vii] With support from MSD for Mothers, Avegen — a digital health company — launched Together for Her (TFH) in India.

TFH is a digital pregnancy care program that aims to ensure equitable access to both guidance on quality maternal health care and support for pregnant women. The TFH app offers a scientifically grounded and personalized care journey to pregnant women by empowering them with knowledge, activating them towards healthy behaviors and generating their demand for good quality care. Women access content on antenatal care, including informational videos, modules and nudges related to nutrition, birth preparedness, physical activity, anemia, etc. throughout their entire pregnancy journey on the TFH app.

User demographics

Socioeconomic status of users

3% Lower
24% Upper
24% Lower-Middle
29% Upper-Middle
20% Middle
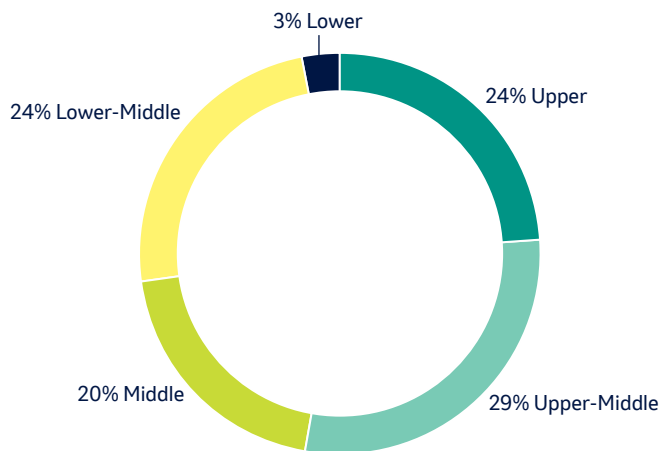
Source: Avegen Together for Her

44%
of users are in the middle and lower-middle socioeconomic status (SES) quintile

27%
of users are in the lower and lower-middle SES quintile. Women in this quintile have the highest need for support, but the lowest access to digital tools

Strategies to close the digital divide

Developing relevant content | TFH incorporates women's perspectives into the design of their platform by asking them to test various platform features and then adapting the interface based on their feedback.

Through in-app feedback as well as phone surveys, TFH learned that women using the app wanted more daily content, more information about pregnancy-related tests and scans, more information on diet and nutrition as well as more video content. In response, TFH has created additional content on the topics of greatest interest. By keeping digital content aligned with women's needs, TFH has seen strong growth in new users on the platform.

Partnering to increase access to technology | TFH is striving to overcome a fundamental challenge: high cost of attracting new users who have lower access to technology but a greater health need. TFH is now partnering with private health facilities and NGOs that work closely with low-income communities to help increase health consumer demand and expand the user base.

Improving the quality and availability of gender-disaggregated data | As TFH expands, the platform aims to reach women from underserved areas. To this end, the team is developing a machine learning model that will enable them to approximate the socio-economic status of the women on the platform based on digital proxies such as smartphone ownership, device model and geo-location of the user mapped to relative wealth indices created by Facebook. The team will then leverage these data to develop specific strategies to reach underserved populations and design digital content relevant to users (e.g., creating content in additional local languages).

> **To achieve true health equity, we need to rethink the fundamentals of integrated health care and technology, and not just resort to digitalizing traditional models of health care delivery. We need to evaluate and understand the needs of underrepresented populations and create tailor-made digital solutions that will deliver precise, focused health interventions that address their immediate problems."**
>
> Shobana Kamineni
> *Executive Vice Chairperson, Apollo Hospitals Enterprise Limited*

Key learnings

- **Identify the ideal "reach: benefit" ratio for the target user.** Strike the balance between who can be reached at the lowest cost and who will benefit the most.

- **Leverage the power of digital and create a product that meets the needs of all women who want to use it.** Supporting women from less-advantaged circumstances does not necessitate excluding women who are better off.

- **Partner with the private health care sector.** Private facilities in low to middle-income communities offer faster in-roads to reaching women than public hospitals. Partnerships with NGOs and government offer great reach and scale but take extensive time to foster.

- **The best route to scale a digital solution is generating demand amongst health care consumers.** Articulate the value proposition of digital health solutions to women directly.

2. mDoc: personalizing virtual care to support high-risk women

Maternal morbidity due to indirect causes — such as diabetes, anemia, hypertension and risk factors for preeclampsia/eclampsia (PE/E) — is increasing in LMICs.

mDoc's women-centered digital platform — CompleteHealth™ — provides virtual support to women diagnosed with PE/E risk factors and related chronic conditions. mDoc is part of the "Reducing Indirect Causes for Maternal Morbidity and Mortality (RICOM3)" consortium operating in Lagos and Abuja, Nigeria. RICOM3 is implementing an integrated quality of care model that combines digital and service delivery innovations — including CompleteHealth™ — designed to reduce risk factors for PE/E.

CompleteHealth™ provides women with self-care support across the maternal and reproductive care continuum through virtual coaches and a multidisciplinary care team that sends health education messages and nudges, answers questions, refers users to primary health providers and develops personalized action plans.

At the time of mDoc enrollment, only

4.6%

of women were able to navigate web-based and mobile platforms such as Telegram, Zoom and CompleteHealth™

User demographics

The majority of CompleteHealth™ users (83%) are female and 79% have smartphones. Typical users live in urban/peri-urban Nigeria and are low-income, making less than 1500 Naira (~$3 USD) a day. They are mainly petty traders who have moved from rural areas to better support themselves and their family members back home.

Strategies to close the digital divide

Improving digital literacy | In spite of high smartphone penetration, mDoc found that digital literacy was low. Many women who own smart phones did not understand how to use these devices to find answers to health questions. At the time of mDoc enrollment, only 4.6% of women were able to navigate web-based and mobile platforms such as Telegram, Zoom and CompleteHealth™. mDoc found that key barriers to digital literacy include limited knowledge about technology, minimal technical support when problems arose, fear of technology and limited internet access.

mDoc aims to close the digital divide by improving the digital literacy of women through videos, infographics and in-person demos. Their strategies include ensuring infographic content is in-depth and culturally appropriate; creating how-to videos in various local languages; offering virtual and in-person group walk-through visits and demos run by community ambassadors; and ensuring mDoc IT support is easily reachable through dial-in numbers.

Photo: mDoc

Strategies to overcome barriers

Barriers	In-depth infographics	How-to-guide videos	Virtual walk-throughs	In-person demos	Dial in to mDoc IT support
Lack of knowledge about technology	✓	✓	✓	✓	
Lack of technical support			✓	✓	✓
Fear of technology			✓	✓	✓

Key learnings

The platform's implementers credit mDoc's success to their thorough onboarding approach, which includes reaching women both online and offline through community 'NudgeHubs' — peer-based workshops and tele-education classes. By proactively addressing women's doubts and concerns — about their own abilities to engage, the value of doing so, the perceived risks around sharing private information and other fears — they were able to build trust. The more confident and comfortable women were in using the technology, the more fruitful the engagement with health services on the platform:

- **73%** of women reported they were more comfortable using their phones for health-related activities than before enrollment with mDoc
- **96%** of women reported feeling confident managing their health, an increase from **62%** at baseline
- **83%** of women reported they knew the risk factors and medical conditions that can lead to serious complications in pregnancy, an increase from **61%** at baseline
- **80%** of women knew that blood pressure above 140/90mmHg is abnormal

mDoc found that access to mobile technology is not a proxy for digital literacy. As smartphones become more accessible to low-income and marginalized populations, it is imperative to invest in strategies that augment women's digital literacy so that these devices meet their expansive potential to enable access to better health for all.

Patient story

Mrs. Ibrahim of northern Nigeria was 26 weeks pregnant with her third child when she was introduced to the mDoc CompleteHealth™ digital platform during a routine antenatal care visit. Ibrahim is a typical mDoc user: she is not wealthy and although she has access to a smart phone, she wasn't using it as a health tool — until mDoc.

She was taught how to navigate the online hub, access health education messages, chat with her assigned health coach and input key health metrics for her personal dashboard.

Ibrahim continued to check in and keep her profile up to date from home — which is why, once her blood pressure became elevated (a symptom of preeclampsia), her condition was quickly detected and managed and danger was averted. Follow-up interactions through the platform, including counseling, provided the extra support that Ibrahim said empowered her to practice self care for the remainder of her pregnancy, such as keeping up with her medications and blood pressure checks. She later delivered a healthy baby boy.

Mrs. Ibrahim, pictured above with her newborn son, had a safe and healthy delivery thanks to timely interventions by her health provider — facilitated by the mDoc CompleteHealth™ digital platform.

3. Nivi: broadening access to family planning services by meeting users where they are

Women are more likely to use family planning if they have knowledge of and access to a full range of options. Yet, too often, women do not know which options are available or how to get the family planning services they need or prefer.

askNivi is a simple, mobile phone-based service that helps people learn about the full range of family planning options, identify the method(s) they want and find local providers who offer quality services and have their preferred options available. Nivi's "smart" chatbot provides women with tailored answers to their questions and directs them to reproductive health services nearby.

User demographics

In Nigeria, in partnership with the Society for Family Health, Nivi has engaged with nearly 25,000 users across five states on family planning related topics. Ten percent of registered users have come from the lowest income quintiles.

25%
of Nivi users in India and Kenya are from rural areas

Strategies to close the digital divide

Meet women where they are | askNivi is now being used in Kenya, India and Nigeria and engages women via WhatsApp and Facebook Messenger, reaching them where they already "live" in the digital space. The interactive platform generates real-time, on-demand insights, including user demographics, contraceptive use and preferences, and obstacles to obtaining contraceptives.

Provide options to encourage women to seek health care | To facilitate access to users' preferred contraceptive method, Nivi launched "Unified Referrals" — a system of mapping product and service offerings to locations that offer them. The chatbot takes users through the contraceptive screening conversation, suggests three methods that might be right based on preferences, then matches those recommendations to up to six nearby service providers, propriety patent medicine vendors (PPMVs), clinics, pharmacies and eCommerce websites where those methods can be found.

In partnership with Pathfinder International, Nivi also developed antenatal care content to help pregnant women access important information and get referrals to antenatal care services. Over 700 new users, registered in the first six months since launch, received reminders about upcoming antenatal care appointments and other alerts.

Speak users' language | Offering different language options is also helping Nivi boost engagement. In India, the platform's chatbot feature is available in both Hindi and English, which has helped expand Nivi's user base significantly, including among lower-income women with fewer years of education. A version in Hausa, the popular tongue in many parts of rural Nigeria, is in the works to further broaden reach among marginalized groups.

Here are a few resources to help you nearby:
1:33 PM

⭐ - Nivi Partner - ⭐
* DRUG POINT
9 UNILAG ROAD
8033467984 (0.9 km)
1:33 PM

⭐ - Nivi Partner - ⭐
* DRUGS CAFÉ PHARMACY
16, ST FINBARRS AKOKA
8082945522 (1 km)
1:33 PM

⭐ - Nivi Partner - ⭐
* BAYO PHARMACY
6, ANIFOWOSE STREET, SHOMOLU
8036375046 (1.2 km)
1:33 PM

Here are some digital resources that might be able to help you:
1:33 PM

Jumia offers the widest assortment at an unbeatable price. Buy condoms now at Jumia:
https://ra.nivi.io/061041acd6e6b
1:33 PM

I know I gave you some different options. Which do you think you'll choose? Reply with the number.
Type 1: DRUG POINT
Type 2: DRUG CAFÉ PHARMACY
Type 3: BAYO PHARMACY
Type 4: Condoms at Jumia
Type 5: I don't know yet
1:33 PM

A sample referral chat from a user in Nigeria showing three physical referrals and a website for buying condoms online

Key learnings

Nivi is built on the core idea of meeting every individual where they are with respect to their health journey. As such, the askNivi platform focuses on engaging its users with relevant health information regardless of their readiness to take up a particular family planning product or service. Awareness-building campaigns on digital platforms, such as Facebook and Instagram, and through traditional settings, such as mass media (billboards on heavily trafficked areas) have been effective in attracting a diverse user base. So far, Nivi has been able to:

- **Enroll 56,000 users** onto askNivi, with nearly half of those users engaging in one or more family planning related conversations
- **Provide referrals** to pharmacies and online contraceptive providers to 13% of those enrolled
- **Prompt a response** from 94% of users who received a positive health information message through askNivi's re-engagement engine

4. MomCare: developing measurement tools to better understand women's access to finances and support the pregnancy journey

Completing the full continuum of maternal health care helps ensure a healthy pregnancy and safe delivery. However, many women pay out of pocket for maternity care services without being sure of the quality, placing families at serious financial and health risk.

PharmAccess Foundation, an organization that utilizes mobile technology and data to strengthen health markets in Sub-Saharan Africa, has developed and is now scaling MomCare, a digital platform that helps women — and their health care provider(s) — track the maternal health journey and makes it easier for women to attend all health care visits across the continuum of care. In Kenya and Nigeria, women use the platform to provide feedback on the care they receive and pay for quality care offered by accredited providers. Their providers use the platform to track patients' care, improve the quality of care they deliver and receive payments faster.

User demographics

The majority of health care facilities where MomCare mothers are being enrolled are in rural areas. Based on questions asked upon enrollment, PharmAccess can assess the poverty level of users and has determined that 13% of all MomCare users in Kenya are below the national poverty line. In Western Kenya, where the vast majority of health care clinics are rural, 26% of enrolled women are below the national poverty line.

For a pregnant woman to enroll on the MomCare app, she must provide a phone number: 83% of women use their own phone number and 17% use their partner's, their parent's or another adult's phone number to enroll.
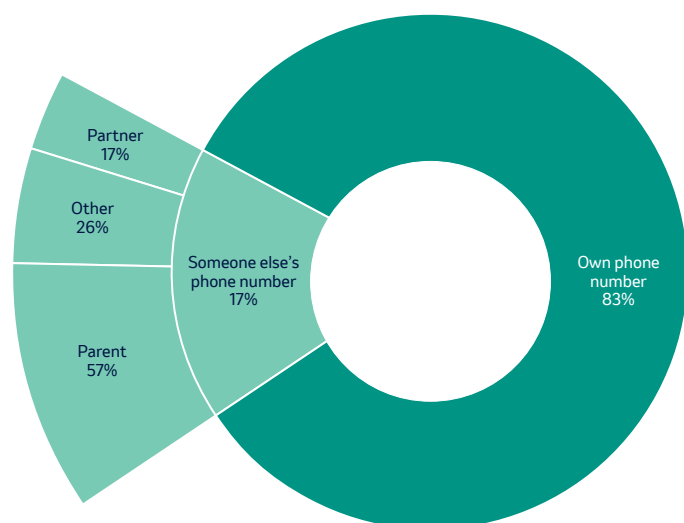
Whose phones are pregnant women using to enroll in MomCare?

Source: PharmAccess Group, based on care analytics data as of Jan 2022

13%
of all MomCare users in Kenya are below the national poverty line

26%
of MomCare users enrolled in western Kenya are below the national poverty line

Teenagers are most likely to register using another person's phone number, with 75% using a parent's phone and 25% using a number from another adult. By comparison, only 4% of pregnant women over 20 years of age who registered without their own number used that of a parent, while 48% used their partner's number. These significant differences highlight the importance of understanding the needs and family relationships of women of different ages and life stages.

Strategies to close the digital divide

Work with local communities | PharmAccess engages community health volunteers to conduct a financial means test when enrolling women in MomCare to ensure that the platform is reaching and serving the lowest income groups. They also reach out directly to underserved populations without connection to a personal mobile phone, such as adolescents.

Use data to proactively support those most at-risk | PharmAccess collects data throughout the care journey to identify high-risk and low-income women, enabling both health providers and community health volunteers to bring additional support to those who need it.

Meet women where they are | MomCare's engine triggers SMS surveys to pregnant women at different moments and reminds them to seek timely care. Although SMS messages have limitations, they are an effective way to reach all women, including those without smartphones or with limited data plans.

"From home I didn't have someone to accompany me to the hospital. nurses took care of me as their own sister i liked it thanks to them"

Example feedback through the SMS surveys from a mother from Western Kenya

Key learnings

It can be challenging to get answers to personal subjects like breastfeeding and mental health, even more so through a 160-character SMS text message. However, through iterative testing with mothers, MomCare has reached an average response rate of 20%. A key learning is that a simple, relevant and comforting question to start with — such as "Have you planned your next visit? Yes/No" — engages mothers more easily than complicated questions specific to health metrics, especially in communities with low digital literacy.

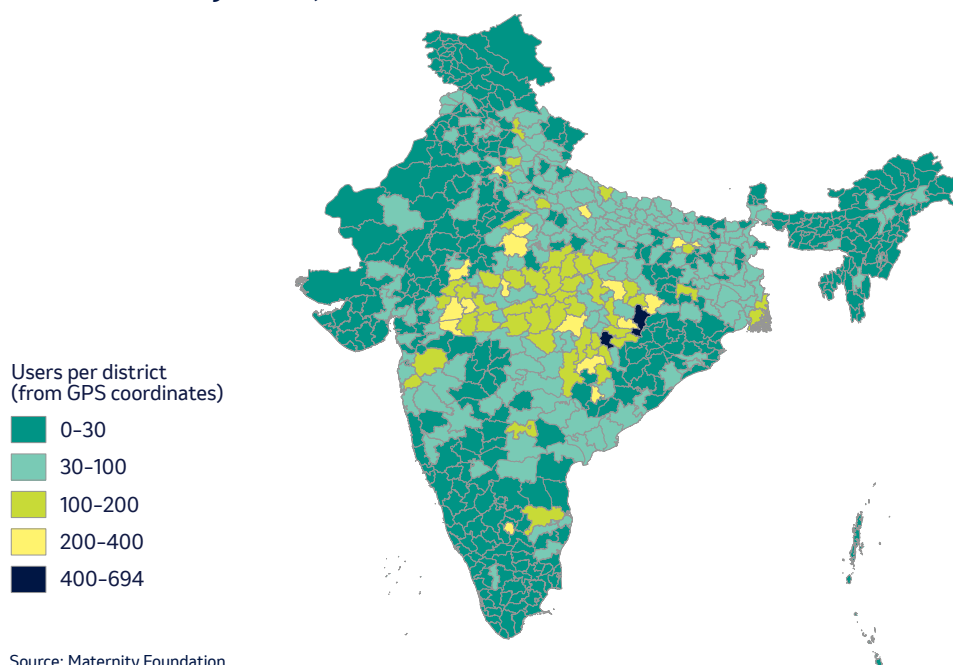# 5. Safe Delivery App: equipping providers with digital tools to help them deliver safer maternity care

The majority of maternal deaths can be prevented if women give birth with a skilled birth attendant equipped to handle potential emergencies. But in many low-resource settings, health care workers lack the information they need to deliver high quality maternal health care services, essential for improved maternal and newborn health.

The Safe Delivery App is a smartphone application that gives maternity care providers instant access to evidence-based and up-to-date clinical guidelines. The app — which is aligned with WHO clinical guidelines — provides resources for basic emergency obstetric and neonatal care, supports pre-service and in-service trainings and can be used as an immediate life-saving reference during complicated deliveries.

User demographics

To date, the Safe Delivery App has had more than 250,000 downloads, 98% by health care workers, primarily in low- and middle-income countries. Maternity Foundation, an organization that aims to reduce maternal and newborn mortality in low-and middle-income countries, monitors users' demographics, patterns and behavior to understand how they are engaging with the app in their work and training.

Distribution of users by district, 2017—2021

Users per district
(from GPS coordinates)

- 0–30
- 30–100
- 100–200
- 200–400
- 400–694

Source: Maternity Foundation

The Safe Delivery App is being used where the need for health care worker capacity building is high. In India, the app is being rolled out in partnership with the Government of India, with special focus on states with a high poverty index. App usage data shows that of the 130,000 users reached nationwide, the app is used most commonly where poverty is high and the need for additional support is greatest.

Strategies to close the digital divide

Work closely with local partners | Maternity Foundation works with partners to ensure that they reach and support skilled birth attendants in the hardest to reach, most remote and underserved areas — from tea gardens in Bihar and Assam India to refugee camps in the Gambella and Somali regions of Ethiopia.

Make sure the solution is relevant and understandable to the target user | The Safe Delivery App has been adapted to meet the language, cultural and clinical practices of more than 20 different countries. There are now global versions in English, French and Arabic, four different versions for Ethiopia, seven different versions for India, and national versions for Bangladesh, Cambodia, Nepal, Myanmar, Rwanda and Tanzania. In all versions, the content is highly visual, taking into account varied levels of literacy among users.

Design the product to work within the limitations users face | The Safe Delivery App is free to download and works offline. It can also be transferred across devices, thus staying available to health care workers in areas where connectivity is not assured. Maternity Foundation and their partners are looking to make the app even more accessible by compressing the size of the app and enabling users to select only certain elements at a time.

To ensure sustainability and scale, integrate the solution with existing systems | Maternity Foundation works through stakeholders in each country – health ministries, international NGOs, UN agencies and midwifery associations and colleges — to effectively reach and support health care workers in different settings. They have a particular focus on public sector facilities serving lower income populations in both India and Ethiopia. The App is always integrated with existing efforts and training programs on the ground, ensuring higher reach, acceptability and impact among users.


Photo: Mulugeta Wolde

Midwives in a remote health facility in the Somali Region of Ethiopia use the offline Somali version of the Safe Delivery App to practice drills and routines related to postpartum hemorrhage (here using this training program and a simulation doll from Laerdal Global Health). This is part of a collaboration with UNFPA and the Ministry of Health to improve quality of care nationwide in Ethiopia.

Key learnings

Through developing and scaling the Safe Delivery App across more than 20 countries, Maternity Foundation highlights four key learnings from using technology to reach and support underserved areas and populations.

- **It's not just about technology |** Technology can be a great driver in closing concrete gaps and overcoming barriers to outreach or democratization of knowledge, but digital solutions must be responsive to everyday needs and constraints in each setting.

- **Ecosystem over solution |** The Safe Delivery App is one component in a much broader ecosystem that is educating and training skilled birth attendants and ultimately building quality care in each country. Focusing on effectively linking with existing efforts on the ground has proven far more important than continuously working to improve the solution itself.

- **80% standardized – 20% customized |** Building a comprehensive digital solution requires time and resources and it is crucial to have a strong backbone so that every adaptation and update can be done effectively. Maternity Foundation works with an 80/20 model: 80% standardized content, 20% customized to specific contexts and use cases.

- **Use data and keep learning |** In terms of access, a digital learning tool does more than close a digital divide. It opens a realm of possibilities of learning through anonymous user data, geographic data points, user feedback and more. Maternity Foundation is working with experts in the field to ethically use learnings and data insights not only for documentation, but to lay the foundation for more proactive and personalized learning paths for each health care worker.
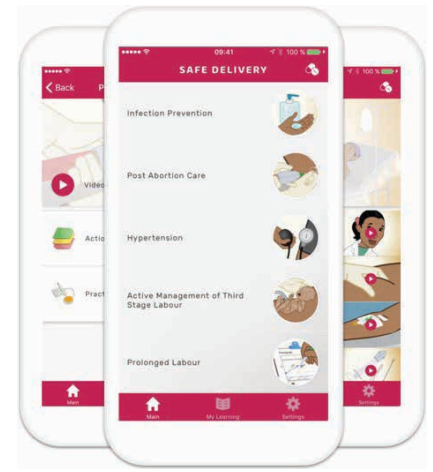
Summary of key learnings

1. **Be intentional about addressing the digital divide.**

   - Gather and improve the quality and availability of gender-disaggregated data. Consult with users about what their specific hesitations or barriers may be and make sure the solution addresses them.

   - Identify the ideal "reach:benefit" ratio for the target user. Strike the balance between who can be reached at the lowest cost and who will benefit the most.

2. **Remember that access to mobile technology is not a proxy for digital engagement.**

   - As smartphones become more accessible to low-income and marginalized populations, it is imperative to invest in strategies that augment the digital literacy of women so that these devices meet their expansive potential to enable access to better health for all.

   - Offer content in multiple local languages to boost engagement and reach lower-income women with fewer years of education.

3. **Design your product to work within the constraints users face.**

   - Digital solutions should be designed to overcome local barriers. If lack of a reliable network is a challenge, check that the application works offline. If low literacy is common among users, make your solution heavily visual.

   - To understand local context, use local data. Consider sources for collecting population demographics such as health records, user information, the Global Positioning System (GPS) and human development measures.

4. **Think about the solution within a broader ecosystem.**

   - Linking with existing efforts on the ground has proven important to achieve sustainability and scale and ensure higher reach, acceptability and impact among users.

   - Generate demand amongst health care consumers as the path to scale. Recognize that partnerships facilitate entry to new markets. Know the value proposition for partners and consumers and engage them in decision-making on the path to scale.

   - Partner with the private health care sector. Private facilities that serve low to middle-income patients can offer a faster entry point to reach these groups than public hospitals. Engagement with NGOs and government may offer reach and scale but takes time to foster.

Conclusion

With digital health technologies becoming more prevalent — and more important, given the COVID-19 pandemic — a critical question must be: "how is this innovation addressing the gender digital divide?" As we continue to invest in the promise of digital health to improve quality maternity care and strengthen health systems, MSD for Mothers is determined to mitigate the risk of digital transformation further exacerbating inequities.

We will continue to work with our collaborators to help close the gender digital divide, including: support their creative ways to promote digital literacy and skills; develop relevant, local content to meet women's needs; design easy to use digital platforms based on women's feedback; collect quality gender and socio-economic data and more.

We are excited by the potential of digital solutions to improve women's health and committed to demonstrating that even women from the most under-resourced communities can also benefit from digital health innovations.

MSD for Mothers is committing to the below. Join us!

Moving forward, MSD for Mothers will be more intentional about closing the gender digital divide by:

- Calling for all the digital health solutions we support to be inclusive as they strive to reach underserved women and achieve specific health and gender equity targets

- Capturing and monitoring qualitative and quantitative data from our collaborators about women's needs and the barriers they face in adopting and using digital technology

- Continuing to work with collaborators to solicit feedback from women and respond to their needs in the design and implementation of digital tools and services, including addressing barriers related to access, affordability, safety and security, knowledge and skills, and the availability of relevant content, products and services

- Collaborate with stakeholders from industry, government, the development community and others to close the gender digital divide and hold ourselves accountable to the women we want to reach

Pursuing health equity — addressing preventable differences in the burden of disease and health outcomes — is deeply embedded in our company's DNA. At MSD, we target areas where we can make meaningful, measurable and lasting impact on societal barriers to health, while also tackling important non-health factors like systemic racism, digital inclusion and climate change, which drive underlying inequities. We continue to challenge ourselves to innovate, make ambitious commitments and form unique collaborations to advance health equity.

Acknowledgments

MSD for Mothers is grateful to our five digital health collaborators for their contributions to this report and we are pleased to highlight their expanding efforts to close the gender digital divide and advance equity in maternal health.

> Avegen (Together for Her)
>
> mDoc (CompleteHealth™)
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> Nivi (askNivi)
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> Maternity Foundation (Safe Delivery App)
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> PharmAccess Foundation (MomCare)

We also thank Rabin Martin for its support in developing *How maternal health innovations are closing the digital divide*.

Endnotes

i   USAID Gender Digital Divide Primer: https://www.usaid.gov/sites/default/files/documents/DAI-1089_GDD_Primer-web_rev1_9.6.21.pdf

ii The State of Mobile Internet Connectivity 2021: https://www.gsma.com/r/wp-content/uploads/2021/09/The-State-of-Mobile-Internet-Connectivity-Report-2021.pdf

iii How COVID-19 has pushed companies over the technology tipping point—and transformed business forever: https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever

iv Gender Digital Divide: https://www.marketlinks.org/sites/default/files/media/file/2021-03/GDD_Desk%20Review_final-with%20links_updated%203.18.21.pdf

v   The Mobile Gender Gap Report 2021: https://www.gsma.com/r/wp-content/uploads/2021/07/The-Mobile-Gender-Gap-Report-2021.pdf

vi USAID Gender Digital Divide Primer: https://www.usaid.gov/sites/default/files/documents/DAI-1089_GDD_Primer-web_rev1_9.6.21.pdf

vii Providing Women with the Quality of Care They Deserve: Together For Her Health: https://www.msdformothers.com/docs/MSDforMothers-Together-For-Her-Health.pdf