

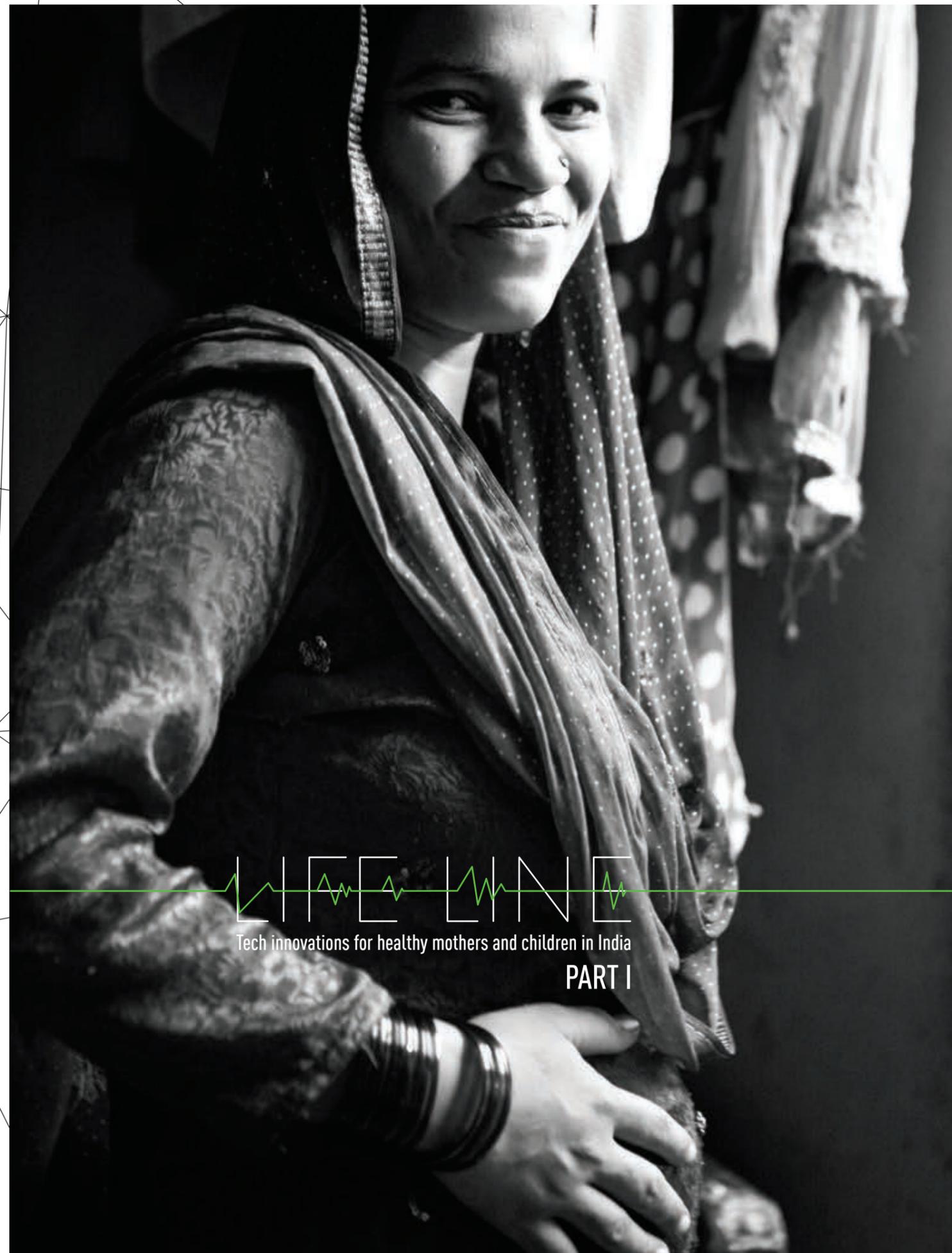
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Tech innovations for healthy mothers and children in India

PART I



Photo Credit - Swasthya Swaraj



USAID

The United States Agency for International Development (USAID) is the United States federal government agency that provides economic development and humanitarian assistance around the world in support of the foreign policy goals of the United States. USAID works in over 100 countries around the world to promote broadly shared economic prosperity, strengthen democracy and good governance, protect human rights, improve global health, further education and provide humanitarian assistance. This report is made possible by the support of the American People through the United States Agency for International Development (USAID). The contents of this report are the sole responsibility of Dasra and do not necessarily reflect the views of USAID or the United States government.

Kiawah Trust

KIAWAH TRUST

The Kiawah Trust is a UK family foundation that is committed to improving the lives of vulnerable and disadvantaged adolescent girls in India. The Kiawah Trust believes that educating adolescent girls from poor communities allows them to thrive, to have greater choice in their life and a louder voice in their community. This leads to healthier, more prosperous and more stable families, communities and nations.



PIRAMAL FOUNDATION

Piramal Foundation strongly believes that there are untapped innovative solutions that can address India's most pressing problems. Each social project that is chosen to be funded and nurtured by the Piramal Foundation lies within one of the four broad areas - healthcare, education, livelihood creation and youth empowerment. The Foundation believes in developing innovative solutions to issues that are critical roadblocks towards unlocking India's economic potential. Leveraging technology, building sustainable and long term partnerships, forming scalable solutions for large impact is a part of our approach.



DASRA

Dasra means 'enlightened giving' in Sanskrit and is India's leading strategic philanthropy foundation.

Dasra recognizes an urgent need for inspired and uncompromising competence to touch and transform the lives of 800 million Indians. Through knowledge creation, capacity building, collaboration and fundraising, we nurture powerful partnerships with funders and social enterprises. Since 1999, Dasra has engaged with over 3,000 corporates, foundations and philanthropists, influenced USD 49 Million towards the social sector and improved the life chances of over 9 million people.

December 2015

FOREWORD

Despite the remarkable growth and innovation in medical technology over the last few decades, poor access to quality healthcare remains one of the greatest global challenges. This is especially true in developing countries like India, which undoubtedly needs large-scale, systemic transformation in the delivery of healthcare services.

Such a long-term overhaul can be effectively complemented by more immediate solutions based on Information and Communication Technologies (ICTs) such as mobile phones, computers and the internet. The last-mile reach of ICTs makes them potential game changers when providing basic health solutions such as access to information, training of community health workers, behavior change communication, monitoring and evaluation of programs, and improvements in health system management and accountability.

Through our work at the Bill & Melinda Gates Foundation, I have observed that innovative ICT solutions can support improvements in public health provision and outcomes in many ways.

To begin with, ICTs make crucial life-saving information accessible to large populations. Besides bridging the information gap, innovative health technology tools placed in the hands of community health workers (CHWs) – in areas of acute shortage of doctors and nurses – can also transform the delivery of health messages and improve rates of behavior change. ICTs, especially mobile technology, have also empowered CHWs, giving them credibility as they take on the role of second-rung care providers.

Second, ICTs offer cost-effective solutions across the healthcare spectrum. At one end, patients save on the cost of travel, and in some cases potentially expensive curative costs, by accessing essential health information without delay. On the other, CHWs can use technology to connect large groups of people by providing them consistently high-quality information. They can collect data, get alerts, and use simple techniques – such as dialing ‘missed calls’ – to overcome challenges in treatment adherence by improved tracking of patient activity. Regular maintenance of records of human resources, patients, supplies and hospital management through ICTs has significantly enhanced efficiency by improving services and saving on operational costs.

Third, the ICT environment in healthcare in India is still evolving, but with rapidly increasing penetration of smartphones even in rural markets, advances in data connectivity, and the government’s Digital India drive, there is massive potential to leverage ICTs for health. ICTs are a powerful medium that can break through geographical and financial barriers, and are enablers that can give everyone in India the opportunity to live a healthy and productive life.

This important report by Dasra highlights the impact that ICTs can have, not only on the provision of healthcare services in their entirety, but more importantly, across the Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) spectrum. That is a critical demographic, because investing in women and children is key to creating a healthier, more prosperous India.

Ajkesh Wadhvani
Deputy Director, Integrated Delivery, India,
Bill & Melinda Gates Foundation

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Part II of this report discusses interventions on the ground and profiles the work of 11 non-profits and social businesses.



EXECUTIVE SUMMARY

This is one of India's many challenges that is both serious and shocking – every year, women and children here die in large numbers. India has the largest share of maternal and child mortality statistics in the world (16% and 27% of all maternal and child deaths globally). These are lives that could be saved, if only women, families and last-mile health workers could access basic health information and services.

Fortunately, innovative technology solutions are making this increasingly possible for the most vulnerable populations in India.

Consider Ahiliya's story – she is 26 and lives in the Khagaria district of Bihar. During her first two years of marriage, she became pregnant twice. She lost the child because she simply did not know about the antenatal vitamins she should have been taking, or the diet she should have followed. The second time, she gave birth to a boy, but he died of malnutrition before his second birthday because women in Ahiliya's community believe that a child should be exclusively breastfed until age 2.

Now, she is pregnant again, but this time she feels confident and is very excited. What has changed?

The Anganwadi worker in Ahiliya's village now uses an audio-visual tool called Mobile Kunji when counseling families during home visits. Using her mobile phone, she plays back messages to the women about life-saving healthy behaviors – in the local Angika dialect and in the voice of a fictional 'Dr Anita', which has given the community a measure of reassurance. Ahiliya now takes her zinc tablets regularly and has decided to give her baby mashed food along with breast milk, from six months onwards.

Elsewhere, in Maharashtra's Raigad district, women can now subscribe to a phone-based voice messaging service called Phone Sakhi, which gives them this information twice a week, tailored to suit the stage of their pregnancy. They now understand the importance of taking their iron pills, feeding the baby the first yellow breast milk as soon as it is born, and immunizing the baby within seven days.

These examples illustrate the transformative benefits of using technology to overcome many challenges that typically prevent women like Ahiliya from getting quality medical guidance. Such services do not need them to leave their home for basic care, so they reduce the often unaffordable burden of time and money spent traveling (many times over long distances) to a health center. Also, the information provided is personalized and verified by doctors, helping dispel harmful myths and practices. Increasingly, technology is also making it possible for women like Ahiliya to visit a nearby health center and consult a qualified doctor in the city via telemedicine.

The health worker in Ahiliya's district was also given additional training through educational videos, on her phone. This gave her not only the latest clinical information, but also valuable insights to improve her interaction with the community and the uptake of health information and services.

An application on her phone also allows her to create health records for all the members in her community and update these on her visits. It helps her schedule regular visits, identify and prioritize high-risk cases, and better track the women she works with. Her supervisor can review the records in real time on her computer. This helps her better manage the performance of health workers



in her village/block and intervene when needed. Eventually, data from all parts of the country can feed into state- and national-level databases, to be analyzed and used for better decision making at the highest levels.

Today, we are at the cusp of enormous opportunity. As of May 2015, India was the world's second largest telecom market, with over 1 billion phone subscriptions (98% of these mobile) and 267 million internet subscriptions. And the government's Digital India campaign, which aims to wire up every village in India with mobile and broadband connectivity by 2020, will only amplify those numbers.

Even if we come close to that ideal, India will be able to provide timely, customized and life-saving medical information to a diverse population at a relatively low cost. And that will only be the first step. The data will allow a more accountable health system to track health outcomes of millions of invisible, unreached women and children, and better meet their needs.

Investing in ICTs for impact

Technology is not an end in itself – on the contrary, when leveraged to find solutions to problems, it can be a game changer, especially in a country like India. Donors and stakeholders looking to harness its potential could scale their impact exponentially if they focus on three action areas:

- **Use ICTs to help health workers:** As a resource, learning tool and means for greater process efficiency and program monitoring, ICTs can help improve the quality of care, by enabling health workers to perform near the top of their potential.
- **Take advantage of open-source technology:** Open-source technology makes software source code freely available to anyone who wants it, and allows users (government, funders, implementers and developers) to freely share and adapt it to local needs. This helps lower technology costs and drives collaboration and continuous user-driven improvements.
- **Build evidence:** While there is general consensus on the potential for ICTs to improve healthcare in India, there is still a significant dearth of strong quantitative evidence linking these programs to real changes in behavioral and health outcomes. Such information is critical to the large-scale mainstreaming of these interventions and their integration into the health system.

Organizations on the ground

By mapping over 100 non-profits and social businesses using ICTs in Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) programs on the ground, Dasra has identified nine key interventions targeted at one or more of the following: end beneficiaries, health providers, and overall health systems. This report has detailed profiles on 11 such organizations, shortlisted by Dasra for their use of ICTs to improve RMNCH+A.

The solutions typically involve the collection, transmission and/or analysis of real-time data, information and communication, using mobile devices and the internet. Examples of organizations are wide-ranging: some train health workers on using mobile applications to counsel and track patients and manage workflows, some send targeted information to pregnant mothers, others offer telemedicine linkages between informal providers in the village and city-based specialists, or use technology for better program monitoring.

ICTs provide a real opportunity to address India's dire need to reduce preventable maternal and child morbidity and mortality, as well as inefficiencies in health services and systems. We are in a position today to save the lives of thousands of women like Ahiliya and their babies, and transform their communities – and that is an outcome that can give the statistics real meaning.

SETTING THE STAGE

Rekha with
her baby
Tara



Photo Credit - Piramal Swasthya

A STAR IS BORN

Rekha is a bubbly 20-year-old who lives in the Sivasagar district of Assam, some 300 km from Guwahati and almost two hours by foot from the nearest health facility. Fortunately, she has a mobile phone at home, as do many of the women in her village.

Three months into her first pregnancy, she got a phone call asking about her health. It was from a call center executive at Piramal Swasthya's Mother and Child Tracking System (MCTS) helpline, which offers services in underserved and unreached parts of Assam, where rates of maternal and infant mortality are extremely high. The executive is typically an Auxiliary Nurse Midwife (ANM) or General Nurse Midwife (GNM) who tracks the health of, and provides lifesaving information to pregnant women and young mothers through the course of their pregnancy, usually over eight phone calls. On every call, a software kit prompts the executives with a set of questions to ask based on the stage of pregnancy, allowing them to give the patient validated information.

When Rekha was six months pregnant, she got another routine call. But this time, with the help of the software-prompted questions, the MCTS associate discovered that she was suffering from a consistent fluid discharge. On further probing, she suspected a tear in the amniotic sac, and it became clear that she had been neglecting her condition and was avoiding seeking medical help. At this point, the associate identified her as high-risk, and the case was immediately transferred to a Medical Officer who confirmed the tear.

She explained to Rekha the importance of amniotic fluid for the baby, and the fatal risks associated with its loss, and convinced her to go to the hospital for a check-up as soon as possible. Rita, the Accredited Social Health Activist (ASHA) of the village, was also intimated and took her to the hospital the next day where she received timely treatment. Piramal Swasthya's helpline continued to track her progress over the next two months. Last December, Rekha gave birth to her daughter Tara (which means 'star' in Hindi). Her family is overjoyed and grateful.

Source: Piramal Swasthya

A TALE OF 2 INDIAS

An ICT revolution and a healthcare crisis

At 16% and 27%, India contributes a higher global share of maternal and newborn deaths than any other country in the world.¹

[Increasing health expenditure by just USD 5 \(INR 305\) per person per year could prevent the deaths of 147 million children, 5 million women, and 32 million stillbirths, and result in economic and social benefits worth up to nine times that investment by 2035.](#)

Source: Stenberg K, et al. 2013. Advancing social and economic development by investing in women's and children's health: a new Global Investment Framework. Lancet.

Over the last few years, we have made undeniable progress on improving health outcomes and survival rates of mothers and children in India, but we still have a long way to go before we achieve our infant and maternal mortality reduction targets as listed in the 2015 Millennium Development Goals. Most maternal and newborn deaths in India can be prevented through simple, proven and low-cost solutions.

For instance, while a child is 15 times more likely to die within the first month of being born, at least half these lives can be saved by scaling up knowledge and implementation of interventions such as neonatal resuscitation and other elements of basic newborn care.^{2,3} Similarly, it is estimated that 55,000 women in India die from preventable pregnancy-related causes such as nutritional deficiencies, lack of birth preparedness, and lack of access to skilled birth attendants.⁴

While there is no denying the need for large-scale systemic change in the delivery of healthcare in India, much can be achieved through less daunting solutions such as timely access to essential life-saving information, better training of health

workers, improved linkages to the health system, behavior change communication, data collection and analysis, and improvement in health system management and accountability.

The good news is that with close to a billion mobile phone connections and over a million broadband connections, the expanding wave of affordable and universally-accessible Information and Communication Technologies (ICTs) in India, especially mobile- and internet-related, offers substantial potential to gear many of these solutions for effective delivery of Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) services across the continuum of care – from pre-pregnancy to postnatal.⁵

With the rapid penetration of ICTs, it is now possible to keep a pregnant woman in a remote village in Bihar informed about the benefits of completing four antenatal visits during pregnancy, or to give a newly married couple in a tribal district of West Bengal information on family planning methods.

[“The adoption of mHealth \(Mobile Health\) in emerging markets like India versus developed markets is ‘a paradox.’ In developed markets, mHealth is perceived as disrupting the status quo, whereas in emerging countries it is seen as creating a new market, full of opportunities and growth potential.”](#)

-Rana Mehta, healthcare lead, PWC India

Source: PwC. (2015). Emerging mHealth: paths for growth.

Mobile applications are being used to build capacity of frontline health workers and to serve as a job

aid to help them deliver relevant information, record patient data, and establish links to the nearest health facility. In some districts, a toll-free number allows patients to give feedback on their experience at a certain health facility, while some mobile applications help doctors remotely check a pregnant woman's vital statistics for complications.

Telemedicine is helping connect patients in remote locations to specialists based in the city without the need to travel long distances. Several case studies from India illustrate the fact that ICTs, and in particular mobile telephony, are being used to improve attendance among pregnant women for routine antenatal care appointments, ensure more newborns and children receive timely immunization, enhance Anti-Retro Viral medication compliance, prevent mother-to-child transmission, and help free up health workers' time so they can provide direct care, among other applications.⁶

ICTs can inform people about, and improve adherence to simple, low-cost, life-saving solutions

- 01 Access to voluntary family planning can reduce maternal deaths by 33%, and child deaths by as much as 20%.ⁱ
- 02 Daily oral iron supplementation reduces the risk of maternal anemia at term by 70%.ⁱⁱ
- 03 88% of child deaths due to diarrhea and its complications are preventable.ⁱⁱⁱ
- 04 Skilled care during labor can prevent 43% of newborn deaths.^{iv}
- 05 Zinc supplementation alone can prevent nearly 75,000 deaths of children under five in India each year.^v
- 06 Strengthening care at the family community level, along with preventive services such as tetanus immunization, can reduce neonatal deaths by 20-40%.^{vi}
- 07 The wider use of four low-cost products such as steroid injections, the antiseptic chlorhexidine, injectable antibiotics and a resuscitation device could save the lives of 1 million babies every year.^{vii}

Sources - Refer Appendix III, Endnotes B

BEYOND CONNECTIVITY

Information Communication Technologies (ICTs)

ICTs refer to electronic and digital technologies that enable communication and promote the interactive exchange of information. ICTs include any communication device including radio, television, cellular phones, computer and network hardware and software, and satellite systems, as well as the various services and applications associated with them, such as videoconferencing, short message service, distance learning and social media such as Facebook and Twitter.

Source: IGI Global.

eHealth (e for "electronic") is defined by the World Health Organization as the use of ICT for health, and includes mHealth (m for "mobile") and telemedicine.

Across the country, from large cities to remote villages, ICT penetration rates are growing:

Close to **1** billion

mobile phone connections and 500 million unique subscribers make India the world's second-largest telecommunications market.⁷

70%

of rural India is expected to be connected by telephones, mostly mobile, by 2017 from ~46% in 2014.⁷

Over **267** million

internet subscriptions make India the second largest internet subscriber base in the world.⁸

300%

growth expected in the Indian smartphone market over the next 6 years.⁹

There is a huge opportunity to leverage these ubiquitous technologies, especially mobile phones, to bridge substantial gaps in access, awareness, quality and delivery of services for Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A).

ICTs as game changers for maternal and child healthcare delivery in India

ICTs have the potential to change the face of healthcare delivery in India by offering crucial benefits.



ACCESS

As Ashish Sinha from ABT Associates explains: "Technology helps address issues of access, both physical and social." In a country where 70% of the population lives in rural areas that face a 60% shortage of doctors, ICTs overcome physical barriers to healthcare delivery by helping anyone with a mobile phone and / or internet connection access essential health information - an important first step - regardless of their proximity to a healthcare professional or health facility.^{10,11}

ICTs also help tackle some psychosocial and gendered barriers to access. For example, research shows that women often lack the agency to take decisions related to their health and well-being, while men are less likely to seek healthcare due to notions of masculinity.^{12,13} A mobile phone obviates part of a woman's need to seek permission to visit a health facility or spend money on healthcare - most advice can be provided to her in her home, and healthy behaviors help reduce curative costs of treatment. Technology also helps reach people who may be the target of stigma or discrimination due to their caste or a 'shameful' condition such as AIDS.¹⁴ ICTs have the potential to help drive increased adoption of health-seeking behaviors and gradually even address some of these underlying social and gender norms that prevent people from seeking timely care.



SCALE

One of the biggest advantages of ICT-based health applications is their ability to simultaneously provide healthcare services and information to an exponentially larger, more geographically remote, and culturally diverse population than is possible through traditional means. Besides the potential for direct outreach made possible by mobile and internet connectivity, by serving as job aids to over-burdened health workers, these applications also enhance their potential to reach out to and effectively service a larger number of people. In India, the Ministry of Health and Family Welfare is in the process of nationally rolling out the mobile messaging, mobile training and audio-visual job aid components of the Ananya program in Bihar to target 10 million families and 1.1 million frontline health workers across India.¹⁵



CUSTOMIZATION

ICT applications can be tailored to meet the specific individual needs of target populations and geographies, increasing their uptake and effectiveness. Several ICT applications provide automated stage-based information to pregnant women and mothers through the course of their pregnancy and post-childbirth. The most effective applications also incorporate relevant socio-cultural aspects of the target groups into their design, such as local dialects, customs and religion, as well as specific gender norms such as women's literacy levels and access to mobile phones.

For instance, Mira channel is an integrated mobile phone channel, that provides information to women around pregnancy and childbirth using games and storytelling techniques. It is available for download on individual mobile phones for self-management of health, as well as by health workers ('Mira workers' or ASHAs) for counseling during household visits. Interestingly, multiple registrations on one application have allowed its use in women's Self Help Group settings using one mobile phone to educate and inform multiple women, who may not personally have access to mobile phones.



QUALITY

Quality of care is a significant predictor of service utilization in maternal health, even more than access.¹⁶ By enabling the provision of standardized text, voice or audio-visual content to patients, ICTs minimize the risk of inaccurate or partial information being disseminated through informal means. Similarly, in addition to essential skill-based and competency-based training, ICTs can be leveraged to deliver standardized training modules on an on-going basis to health workers, building their capacity to deliver quality care. ICT-enabled data collection, analysis and reporting also facilitates supervision of health workers and adherence to standard treatment protocols, as well as data-driven decision-making and more effective policy design. ICTs also increase accountability within the health system by giving patients the power to assess and provide real-time feedback on the quality of care being delivered.



COST

Over 63 million people in India are forced into poverty every year due to healthcare costs alone.¹⁷ Thus, one of the biggest draws of technology applications for the Indian consumer is the cost reduction these solutions offer.¹⁸ Patients save on travel costs because they can access essential information without visiting a health facility. This is key in India, where 31% of the population travels more than 30 km to seek healthcare in rural parts of the country.¹⁹

[The Safe Motherhood Project in Indonesia, Pakistan and the Philippines studied the effectiveness of using Short Messaging Service \(SMS\) messages for behavior change communications, finding that participating health centers saw up to 25% cost savings, a 20% increase in facility-based deliveries, and improvements in breastfeeding practices.](#)

Source: IDRC. 'Connecting ICTs To Development: The IDRC Experience - Home'.

Since several of these applications focus on preventive healthcare, patients also potentially avoid more expensive curative healthcare costs. Likewise, the health system can lower project costs by scaling up these applications relatively faster than some other infrastructure-intensive solutions, by building the capacity of the existing workforce to reach out to more people than previously possible. And by reducing inefficiencies in the system and improving accountability through applications for inventory management, real-time location tracking or biometric attendance of health workers, among others.

A HEALTH SYSTEMS FRAMEWORK

According to the World Health Organization (WHO), India's health system has six building blocks that need to be strengthened simultaneously to tackle the country's child and maternal health crisis.²⁰

The following section offers an analysis of key challenges within each of the building blocks, and the corresponding ICT interventions that hold the potential to address them. These interventions will be discussed in detail in PART II of this report.



01

Health Workforce



CHALLENGES

Health worker shortage

- 19 health workers per 10,000 people, instead of the 25 prescribed by WHO.^a
- 10% shortage of doctors at Primary Health Centers (PHCs).^b
- 23% shortage of nursing staff at PHCs and Community Health Centers (CHCs).^c
- 70% shortage of specialists at CHCs.^d
- Of the 22,000 registered obstetricians in the country, less than 1,300 work in government hospitals in rural areas.^e

Inadequate health worker training

ASHAs only get 23 days of training over four years. Studies show that such condensed training results in low knowledge retention and needs ongoing support to reinforce messages.^f

Overburdening of health workers

ASHAs and ANMs (Auxiliary Nurse Midwives) are tasked with several responsibilities, with limited tools to manage their work, and inadequate incentives to reach everyone in their coverage area.

ICT SOLUTIONS

While ICTs cannot directly impact the supply of health workers, they can help improve health workers' knowledge, skills and ability to service more women and families through:

- Health provider **training** and development via mobile phones / video conferencing.
- Phone-based **job aids** to assist in work flow management through reminders and alerts, improved home-based healthcare delivery through decision support, and triaging and referral services.
- ICT-enabled **data collection** and creation of electronic health records for improved patient monitoring and tracking.
- **Remote and home-based care** through telemedicine and point-of-care diagnostics.

02

Service Delivery



CHALLENGES

Shortage of health facilities

- CHCs: 2,115.^g
- PHCs: 4,252.^h

Low uptake of public healthcare and institutional deliveries

- 70% of households in urban areas and 63% in rural areas rely primarily on private healthcare.ⁱ
- Around 85% of people surveyed nationally were willing to move to public healthcare if its challenges were addressed.^j
- Home deliveries still persist at 25-40% in pockets across states.^k

Lack of adherence to recommended protocols

- In several home deliveries, untrained

ICT SOLUTIONS

ICTs can help reduce, to some extent, dependence on health facilities/workers through:

- **Health education** and behavior change communication for end beneficiaries.
- **Reminders and alerts** to beneficiaries for better adherence to treatment.
- **Remote and home-based care** through telemedicine and point-of-care diagnostics.

And also simultaneously improve services and skills for facility- or home-based care through:

- **Behaviour change communication** for health workers.

and unskilled birth attendants often overlook standard protocols such as hygienic handling of the umbilical cord, administering essential antibiotics and recognizing danger signs.

- Antenatal care-seeking in rural areas is ~50% for more than one visit, and ~10% for more than four visits.^l

Poor emergency response and referral linkages between health facilities

- Several women deliver babies in transit or at home. One study showed that ~50% of maternal deaths occurred at home and ~14% in transit between facilities.^m

- Health provider **training and development** via mobile phones or video conferencing.
- Intimating referral units** about the status of incoming patients, for continuity of services and to enhance preparedness and minimize delays in treatment.
- Supply chain management** (drugs, blood, ambulances, etc).

03

Health Financing



CHALLENGES

Unaffordable healthcare

- Half of the population in rural India belongs to households living on INR 34 (~ US\$ 0.61) per day, while the expenditure per childbirth in India isⁿ:
 - Private facility: INR 8,673.^o
 - Public facility: INR 1,801.^p
 - At home: INR 695.^q
- 25% of women in rural areas have not delivered their last baby in a health facility due to high costs, despite incentives such as the Janani Suraksha Yojana (JSY).^r

Inability to access financial incentives and entitlements

In several cases, families are either unaware of their entitlements or not equipped to take advantage of them.

ICT SOLUTIONS

- Health education and information about entitlements and government schemes such as JSY.
- ICT enabled mobile money/digital payments can be used for a variety of purposes:
 - On the provider side:** salaries, provider reimbursements, and performance-based incentives.
 - On the beneficiary side:** health savings accounts, insurance premium payments, conditional cash transfers, and electronic vouchers.

04

Health Information Systems



CHALLENGES

Inadequate data collection and reporting

- Only 41% of live births were registered over 2005-2012 in India.^s

Inadequate patient tracking and continuity of care

- Lack of integrated systems between health facilities leads to crucial delays during patient referrals.
- Limited monitoring of new mothers and newborns in the absence of updated electronic health records results in poor adherence to recommended protocols such as staying at the facility for 24 hours post-delivery.

ICT SOLUTIONS

- Phone / tablet-based **registration and tracking of vital events** such as births and deaths.
- Creation and real-time updating of **electronic health records**.
- Data portability and sharing between health facilities through integrated **Hospital Management Information Systems**

05

Leadership and Governance



CHALLENGES

Health worker absenteeism

- Doctor absenteeism in public health facilities ranges between 30% and 70%.^t
- National Family Health Survey (NFHS-3) estimated that 70% of births in rural areas took place at women's or parents' homes. Of these deliveries, fewer than one in seven were attended by a health professional.^u

Limited supervision affecting service quality

- Lack of data systems to adequately track and evaluate health workers' output.
- Paper-based systems of work significantly reduce time available to ANMs and Anganwadi workers for supervision of ASHAs and direct provision of healthcare.

06

Essential Drugs & Equipment



CHALLENGES

Absence of essential equipment, drugs and vaccines in facilities

- Newborn care equipment is available in only 28% of PHCs.^v
- Only 12% of First Referral Units (FRUs) have regular blood supply. The lack of functioning blood banks at many facilities often prohibits Cesarean-section procedures.^w
- Stock-outs of essential drugs are common in public health facilities.^x

ICT SOLUTIONS

- ICT-enabled improved **supervision and performance monitoring** of health workers.
- Human resource management** and accountability, including biometric attendance systems.
- Phone-based **patient feedback** and grievance registering mechanisms.

ICT SOLUTIONS

- Supply chain management:** drugs and inventory management information system to prevent stock-outs, Global Positioning System (GPS) tracking of ambulances, medical devices etc.
- Data and GPS-enabled **real-time information** on nearest functional facility.

Sources - Refer Appendix III, Endnotes B

The ICT revolution in India is creating a climate conducive to rethinking health service delivery, and governance within the health system. It is helping overcome aspects that limit access, such as distance and social marginalization, inadequately skilled health personnel, and a lack of financial resources. Importantly, ICTs also facilitate the measurement of performance and progress, improving inclusiveness and transparency, and connecting information systems for reporting and research.

Across the country, sometimes in unlikely corners, innovation is brewing, especially around the ubiquitous mobile phone, to the benefit of better informed, serviced and monitored pregnant women, mothers and children; better trained and better supported health workers; and data-driven health systems. While consensus about the promise of ICTs is unanimous, the applications and manner in which they are used and deployed must be strategic and responsive to current needs. The next chapter discusses priorities that will help stakeholders do this.

KEY TAKEAWAYS

- At 16% and 27% respectively, India has the highest global share of maternal and newborn deaths. Most of these can be prevented through simple, proven and low-cost solutions.
- High rates of penetration and access to affordable Information and Communication Technologies (ICTs) such as mobile phones and the internet have the potential to improve Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) by transforming the delivery of health education, behavior change communication, training and supervision of health workers; improving data collection and analysis, connectivity to and within the health system; and enabling overall health system integration and management.
- ICTs offer important benefits over traditional modes of service delivery:
 - Greater access to hard-to-reach rural and socially marginalized populations.
 - Faster scale-up through simultaneous one-to-many outreach using automated solutions.
 - Increased customization to suit local socio-economic and technological context, and individual and community health needs.
 - Improved quality of care and adherence to health protocols through standardized information and training, decision support software, enhanced patient tracking, and overall data-driven efficiencies. ICTs also enable a greater focus on preventive healthcare.
 - Cost-effectiveness, owing to reduced travel costs and health shocks, and improved awareness of government and other health financing. The health system lowers costs by scaling up faster, enabling existing resources to benefit more people, and using ICT applications to check inefficiencies in the system and improve accountability.

PRIORITIES FOR ACTION

As established in the previous chapter, technology can be a powerful enabler of improved health and survival. Potential applications are multiple and wide-ranging, whether focused on improving access for and empowering people on the ground, or enhancing the capacities of health systems to deliver. Equally diverse are the approaches and means through which applications can be designed. This includes the types of devices and software used and designed for, as well as intended target audiences.

Through secondary research and expert consultations, Dasra has identified areas of focus that deserve the attention of funders and other stakeholders looking to best leverage the potential of technology to improve health outcomes for girls, mothers and children in India. Three of these are explained in some detail in the following pages.

LEVERAGE ICTs TO ENHANCE FRONTLINE HEALTH WORKER PERFORMANCE

“Empowering my community motivates me as a community health volunteer.”

- Caroline Loingoje, community health worker, Samburu Mararal, Kenya ²¹



Photo Credit: SNEHA

The centrality of the community health worker

For most people in rural India and urban slum populations, Community Health Workers (CHWs) provide the first, and sometimes, only point of contact with the health system. They perform multiple functions – home visits, assessment and treatment of disease, data collection, education and counseling, and referrals for further care.²² This has allowed health care to become accessible to millions more than otherwise possible, due to reduced time and cost of travel, as well as the ability to seek out patients who may be the targets of stigma and discrimination.²³

A human resource crisis: When adjusted for qualification, the density of health workers (doctors, nurses and midwives) falls to around one-fourth of the WHO benchmark.

Source: IDFC. (2014) Human Resources for Health in India: Current Challenges and Policy Options.

Urban-rural divide 833 million rural Indians had only 44,000 public sector doctors providing them healthcare in 2013.

Source: Centre for Policy Research. (2015) Physician Shortages In The Indian Public Sector.

To address the chronic shortage of doctors and nurses, task shifting as a strategy has allowed for the transfer of many responsibilities from higher-level care providers to those at lower levels. Frontline Health Workers (FLWs) or CHWs such as ASHAs, ANMs and other informal CHWs are now responsible for the provision of several low-cost, life-saving interventions such as treatment of communicable diseases such as tuberculosis, malaria and HIV/AIDS in areas of high burden. They are also supposed

to ensure skilled birth attendance, immunization, promotion of breast feeding, reduction of child malnutrition, and prevention and treatment of childhood illnesses.²⁴

Systematic reviews of studies comparing CHWs with usual community health practices in their absence, have shown the effectiveness of CHWs in promoting immunization and breastfeeding, improving tuberculosis treatment outcomes and reducing child morbidity and mortality.

Source: Tulenko, K. et al. (2013). Community health workers for universal health-care coverage: from fragmentation to synergy. Bulletin of the WHO

Research has shown that health interventions integrating CHWs can lead to positive behavior changes and lower morbidity and mortality rates, while taking services closer to the communities that need them, and at lower costs.²⁵ Ensuring CHWs have the required tools, training and support structures to do their best is paramount.²⁶ In this context, the use of ICTs by CHWs has intuitive appeal.

Midwives who are educated and regulated to international standards can provide 87% of the essential care needed for women and newborns.

Source: United Nations. 2014. The State of World's MidWifery. A Universal Pathway. A Woman's Right to Health.

Enhancing performance across the value chain

CHWs face several challenges – from the maintenance of skills and knowledge despite limited training and supervision, to balancing multiple priorities given the complexity of tasks performed in the field, and the lack of appropriate tools to provide services and collect data.^{27, 28} While

further research is called for, several studies have shown how the use of ICTs can address many of these challenges and has helped improve effectiveness of CHWs across the value chain of activities – from work planning and efficiency, to data collection, and beneficiary and program monitoring for adherence to health guidelines – to ultimately improve health outcomes in communities.

Most commonly, CHWs use mobile technology to collect field-based health data, receive alerts and reminders, facilitate health education sessions, and conduct person-to-person communication.

Source: Braun, R. et al. (2013). Community Health Workers and Mobile Technology: A Systematic Review of the Literature. PLoS ONE.

Work planning and efficiency

Phone-based reminders, alerts and scheduling assistance help CHWs plan their time more efficiently and free up time for direct service provision. The use of mobile devices instead of paper registers saves CHWs the time and effort it would take to, say, travel to a health facility to transfer patient information, or look up information.²⁹ One study found that sending mobile reminders to CHWs resulted in an 85% reduction in average number of days clients were overdue for a visit.³⁰

At the end of a pilot study in Malawi, using mobile phones with Frontline SMS, an open source software, 75 CHWs over the course of six months saved around 2,048 hours of worker time and \$2,750 (INR 1.4 lakh) in fuel and operational costs, which in turn helped double the number of people served by the CHWs.

Source: Braun, R. et al. (2013). Community Health Workers and Mobile Technology.

USE AND DEVELOP OPEN SOURCE SOLUTIONS FOR HEALTH INFORMATION SYSTEMS

“Certainly there’s a phenomenon around open source. You know free software will be a vibrant area. There will be a lot of neat things that get done there.”

-Bill Gates, Technology Advisor, Microsoft & Co-Chair, Bill & Melinda Gates Foundation

The world is experiencing a significant shift away from the use of technologies and services based on proprietary software – typically under restrictive copyrights and source code usually hidden from users – and towards Free And Open Source Software (FOSS) solutions and services.³⁶ The general idea behind FOSS is to make human-readable source code of software freely accessible to anyone who wants it, and allow users (government, funders, implementers and developers) to freely share, customize and adapt the software to their local needs.

Call to Action: WHO Global Health Information Forum 2010 (excerpt)
 “...investing in appropriate technology – based on open standards – that permits rapid expansion to rural populations, which in turn empowers frontline employees with real-time access to information and permits rapid action in public health emergencies.”

Source: World Health Organization. (2011). Country Health Information Systems.

Low-cost, flexible, collaborative

A key advantage of FOSS in healthcare projects is significantly lower technology acquisition and deployment costs in the absence of proprietary license costs. This is especially appealing to developing countries where resources are limited and financial viability is a challenge. But FOSS technologies also offer important benefits beyond lower costs:

- **Adaptability and customizability to local needs and resource-limited environments**, which is critical in India given its geographically and culturally diverse spread.
- **More innovation and collaboration**

leading to continuous user-driven improvement and greater community ownership,

- **Greater independence and choice** by avoiding vendor lock-in, and critically,
- **Extensibility and interoperability** between technologies and information systems – enabling scale up.

Interoperability between systems allows a country to pick and choose components that best suit its application, and enable integration with solutions that have already gained traction. Such an ‘integrated’ health system with inter-operable databases improves national-level epidemiological data, disease surveillance and response efforts, and better informs policy-making.

A well-known example is Mobile Technology for Community Health (MOTECHE). This integrated open source software platform allows organizations to choose from multiple mHealth solutions serving the same population, to be deployed together – in a way that enables data sharing and a better experience for users of the system. The MOTECHE suite combines MOTECHE with many established open source tools, enabling organizations building mHealth solutions to develop, manage, and monitor those solutions more quickly and cost-effectively with fewer technical resources. Recognizing the array of different user needs, the MOTECHE Suite supports multiple devices (from low-end handsets and smartphones to tablets and personal computers) as well as a range of message formats (SMS, voice, data).

To reduce development and operational costs, and provide a firm foundation of field-proven

applications covering a diverse range of capabilities, the MOTECHE Suite consortium brings together several experienced mHealth implementers, open-source solution providers and funders in an open ecosystem of partners, including Dimagi, Grameen Foundation, InSTEDD, OnMobile, OpenMRS, ThoughtWorks, and University of Southern Maine.

Source: Grameen Foundation, (2012). MOTECHE SUITE.

“It is much easier to put existing resources to better use, than to develop resources where they do not exist.”

- George Soros

Another example of a comprehensive open source ehealth delivery platform is the Millennium Villages Global Network (MVG-Net), developed to support the Millennium Villages Project (MVP) in Africa. While the jury is still out on the overall success of MVP, the large scale technological implementation on MVG-Net is very relevant to the context of the Indian sub-continent.^{37,38,39}

The implementation of MVG-Net using FOSS healthcare applications and common standards allows for widespread interoperability of health information systems within and between countries, regardless of their technological and economic environments. This not only reduces the cost of designing and implementation of systems, but the ability to share data and lessons learned between organizations and countries should allow for more rapid, evidence-based decision-making and program planning.

Source: Kanter, A. S. et al. (2012). The importance of using open source technologies and common standards for interoperability within eHealth.

Photo Credit - Dimagi

In a study in rural India:

- Data collection using mobile phones reduced time – from data collection by CHWs to receipt by a regional coordinator – from 45 days to 8 hours.

- Data completeness improved from 67% of required fields in the paper-based system to 84% in the mobile-based system.

Source: Agarwal, S. et al (2015). Evidence on feasibility and effective use of mHealth strategies by frontline health workers in developing countries: systematic review.

Data collection

Several studies have shown that, when equipped with mobile devices, CHWs become capable collectors of complete, high-quality and timely data from the field.³¹ Data collection with GPRS-enabled phones permits checking for logical flows as well as real-time identification of data falsification, and can help them identify incorrect entries, thereby reducing error rates.³²

A cluster-randomized trial from Kenya showed that health workers who received motivational messages about management of children with malaria demonstrated improvement in correct management by 24% compared to those who did not.

Source: Zurovac, D. et al (2011). The effect of mobile phone text-message reminders on Kenyan health workers’ adherence to malaria treatment guidelines: a cluster randomised trial. The Lancet

Quality and adherence to treatment

ICT tools can enable real-time quality review, analysis and support for decision-making, as well as rapid response to cited health issues.^{33, 34} The use of these tools by CHWs has also meant improved adherence to recommended healthcare practices by beneficiaries.

A cluster-randomized trial in Zanzibar found that pregnant women who were connected to their healthcare provider through two-way mobile phone messaging were more likely to have the presence of Skilled Birth Attendants (SBAs): 60% of births in the intervention group were delivered by an SBA versus 47% in the control group.

Source: Agarwal, S. et al. (2015). Evidence on feasibility and effective use of mHealth strategies by frontline health workers in developing countries.

Going ahead

To enhance the delivery of RMNCH+A services at the last mile, program designers, funders and implementers must recognize the productivity gains to be had from prioritizing ICT interventions tailored to the needs of CHWs. In addition, interventions should account for cultural factors: for instance, who owns the phone and how it is shared among family members, involve health workers in design and implementation, and provide sufficient initial and ongoing training support to transition from paper-based ways of working. These will foster buy-in and the necessary cultural change needed for the uptake of ICTs.³⁵

MVG-Net covers about 500,000 people, connecting resources and people in 14 sites across 10 sub-Saharan African countries. It works across diverse languages and situations – from supporting CHWs using mobile phones, to storing medical records, and creating local knowledge centers. Similar to the MOTECH Suite, MVG-Net includes multiple open source e/mHealth tools that have been integrated to benefit from the functionality of the individual pieces – including OpenMRS (Open Medical Record System) for a database of longitudinal medical records; ChildCount+ for bidirectional links with CHWs in the field; MOTECH for decision support and messaging; District Health Information System (DHIS-2) for data aggregation; Pentaho for data warehousing, among others.

[The Indian government announced a policy which makes it mandatory for all software applications and services of the government to be built using open source software.](#)

[so that projects under Digital India “ensure efficiency, transparency and reliability of such services at affordable costs.” \(March, 2015\)](#)

Source: The Times of India, (2015). Government announces policy on open source software.

Going ahead

The past 10 years have seen much growth in FOSS technologies for health.⁴⁰ Empirical and anecdotal evidence continues to show the potential of FOSS technologies to empower individuals and communities, share knowledge and resources, foster an unprecedented rate of collaboration, and create health information systems that are sustainable in the long term.^{41, 42, 43}

Stakeholders involved in designing the critical back-end for ICT-based RMNCH+A solutions should take advantage of this availability, build on it, and emphasize interoperability to best use the resources and wealth of data that will be generated.

03

GENERATE EVIDENCE OF IMPACT – OR THE LACK OF IT

“To improve health and reduce health inequalities, rigorous evaluation of eHealth is necessary to generate evidence and promote the appropriate integration and use of technologies.”

– Consensus statement of WHO Global eHealth Evaluation Meeting, September 2011

Choosing wisely

Because resources are limited and the need for action urgent, solving global health issues needs careful prioritization of multiple, competing strategies. The logical aim for policymakers, funders and implementers should be to quite simply do what works best, while ensuring that solutions are socially, politically, economically and environmentally appropriate.

Specifically in the area of RMNCH+A, the use of ICTs offers much allure, partly because of the naturally high penetration of these technologies, especially in developing countries like India where problems of

RMNCH+A are most acute.

But what is the basis for choosing one solution over another?

Because governments and other funders must make choices about what constitutes essential health interventions and also be risk-averse, evidence around the absolute and relative value of ICT solutions in terms of cost, performance and health outcomes is critical to their large-scale mainstreaming and integration into the health system. This is especially pertinent in India, where scale is a non-negotiable.

The evidence gap and why it matters



Photo Credit - SNEHA

While there is general enthusiasm and consensus on the potential to leverage ICTs to improve RMNCH+A services, there is still a significant dearth of rigorous, quantitative evidence linking these programs to real changes in behavioral, and more importantly, health outcomes.^{44, 45, 46, 47, 48, 49}

Also missing is an understanding of what this costs. These gaps in measuring and documenting evidence limit identification and replication of successful programs, the ability to learn from mistakes, and the potential for cumulative improvements to programs over time.

For instance, most ICT programs for RMNCH+A, in India and other developing countries, have been small-scale, donor-funded initiatives that have played out without the benefit of an adequate evidence base, and have not themselves been configured with research in mind.⁵⁰ This also makes it harder to move beyond India's case of 'pilotitis' because, for government and policymakers, the challenges inherent in scaling ICT programs are difficult to calculate and address without adequate, well-documented experiences of taking such technologies to scale.⁵¹

"Cost is obviously a barrier. We haven't yet demonstrated convincingly the cost savings that ICTs can produce. Another barrier is "quick fix" solutions, where an application is slapped together because of a political imperative.

- Dick Martin, USAID/EGAT

The quality of research and evidence is also critical. Randomized Control Trials (RCTs) and detailed study protocols are costly and rare, and research methodology in most cases combines less rigorous methods such as focus groups, one-on-one interviews, observational research, and mixed methods 'gap-analysis'.^{52, 53, 54} Further, most research so far has been qualitative, focusing on the user experience or the technical performance of eHealth systems.⁵⁵ Also, most evidence in the area disproportionately revolves around mHealth as compared to telemedicine or other efforts within the overarching milieu of ICTs for Health.^{56, 57} India specific studies are even harder to come by. Finally, the cost-benefit of such strategies is still quite unclear, making it difficult to weed out poor investments.^{58, 59} This is particularly critical given the challenges with financial sustainability when using technology programs to reach the poorest populations.

Stepping up efforts

Encouragingly, the last five years have seen a growing emphasis on program evaluation.

Each of Mobile Alliance for Maternal Action's (MAMA) three current country programs - Bangladesh, South Africa and India - has identified priority intermediate-level health outcomes related to change in knowledge, at-home preventive behaviors, and seeking of health services that are measurable, relevant and within the realm of influence of each MAMA program.

For example, international collaborations such as the mHealth Alliance and development agencies such as USAID are increasingly documenting experiences of mHealth implementation projects in the area of RMNCH+A. One of

the best-known examples is MAMA, a patient messaging system.⁶⁰ In order to provide evidence of change through MAMA's programs, the MAMA Global team has been working with research partners in each country to develop rigorous study designs to evaluate MAMA's impact on priority health and behavior outcomes.⁶¹

RCTs too are becoming more common, such as those undertaken to assess the impact of mobile messaging programs in Malawi and Zanzibar. In Malawi, an external evaluation study of the Chipatala Cha Pa Foni project showed increased uptake of proven home- and facility-based practices among the intervention group, using a sample size of more than 6,000 women.⁶² In Zanzibar, a pilot study conducted on the Wired Mothers intervention found that the mobile service significantly increased the proportion of women receiving recommended antenatal care and delivering with a skilled birth attendant, with more women receiving preventive health services, and more women with antepartum complications identified and referred.⁶³

Going ahead

In order to take impactful ICT programs for RMNCH+A to scale, governments, funders and program implementers must prioritize designing and supporting evidence-based programs as far as possible, and commit the requisite budget and resources for rigorous evaluation to be able to reflect on program successes, and equally, failures. Greater efforts should also be made to disseminate existing evidence, focusing on the numerous studies and projects that exist but are not reflected in research literature or widely shared with the health community.⁶⁴ All this will highlight what works best.

KEY TAKEAWAYS

Based on secondary research and conversations with over 20 experts, Dasra has identified three key themes that deserve the careful attention of funders and other stakeholders looking to leverage the potential of technology to improve health outcomes for mothers and children in India:

- **Leverage ICTs to enhance Frontline Health Worker (FLW) performance.**
FLWs are critical to last-mile RMNCH+A service delivery in India, and have proven effective in influencing positive behavior change and lowering maternal and child morbidity and mortality rates in India and the developing world. ICT tools and applications can address many of the challenges faced by FLWs, helping them improve the quality of care provided, efficiency of services, and capacity for program monitoring, and free up their time for more direct care provision. Applications include data collection and monitoring, counseling decision support, remote training, and reminders and scheduling assistance.
- **Use and develop open source solutions for health information systems.**
Open source solutions make human-readable source code freely accessible to anyone who wants it, allowing users (government, funders, implementers and developers) to freely share, customize and adapt the software to their local needs, whether for inventory management, telemedicine, job aids for health workers or other applications. When the back-end technology for ICT solutions is open source, it:
 - Lowers technology acquisition and deployment costs
 - Offers flexibility, adaptability and customizability to local needs
 - Enables broad-based collaboration leading to continuous user-driven improvement and greater community ownership
 - Avoids vendor lock-in and,
 - Enables easier, faster and more cost-effective scale up due to interoperability of different technologies and information systems.
- **Generate evidence of impact – or the lack of it.**
There is a dearth of rigorous, quantitative evidence around the absolute and relative value of ICT solutions in terms of cost-benefit, performance, behavioral and health outcomes, which is critical to their large-scale mainstreaming and integration into the health system. To move beyond the prevailing state of ‘pilotitis’ in India, programs must, both, be informed by evidence, and also themselves be configured to contribute to and grow the existing research and evidence base.

RECOMMENDATIONS AND CONCLUSIONS



LEVERAGING THE DIVIDEND

India is poised to achieve both economic growth and human development if it can harness the promise of ICTs. The health sector is a prime and urgent candidate, and there are few more pressing after concerns than millions of women and children avoidably dying each year in India. Dasra's research shows that the need of the hour is for governments and funders to view technology as strategic and integral to delivering and strengthening health services in India. Successful adoption and effective implementation of ICT solutions will be propelled by several factors such as design, sustainability and an enabling eco-system. Stakeholders interested in a technology-driven transformation will need to:

01 View ICTs as enablers, not substitutes for people and processes

At least in the foreseeable future, ICT applications cannot replace doctors or frontline health workers, or eliminate the need for antenatal checkups, good nutrition or a stable supply of medicines and vaccines. What they can do effectively is enhance process efficiencies, and enable task-shifting from highly qualified health workers to health workers with shorter training and fewer qualifications, who can be effectively assisted by technology to perform new and more complex tasks.

02 Integrate ICTs into health systems instead of creating standalone solutions

ICT solutions must be integrated into the existing functions, workflows and goals of healthcare systems, providers and patients

to provide the support needed for new behaviors.

A health worker is far more likely to use her mobile phone to capture data during a household visit if her phone replaces her register and the data links automatically to the government/organization database. Patients can immediately improve adherence to medication in chronic conditions such as diabetes and HIV through phone-based alerts and reminders, which do not require the learning of radically new behaviors or technologies to be effective.

Another critical aspect of integration is ensuring interoperability across devices, software platforms and service providers. The benefits of large-scale adoption of ICT applications at the state or national levels will only be realized if they are built on open interfaces and platforms that follow standard guidelines, and can work across different telecom operators and devices. As one of the experts interviewed by Dasra explains, "Typically, the government floats project tenders and selects the lowest bidder in each category -

say technology solution, platform, content, device etc. However, the application that 'wins' the bid may be optimized for a particular platform, while the government may award the project to another bidder. The resultant lack of interoperability often requires redevelopment of the technology solution, driving up costs and even rendering the project unviable."

03 Design solutions for and with end-users

The success of ICT solutions will be determined by their perceived value for users and ease of use.

Localize

While ICT applications can be scaled quickly, a one-size-fits-all approach will not be effective given the diversity of local languages and dialects, literacy levels, varying technology usage patterns, socio-cultural norms, gender norms and differences in access to technology, health-seeking behaviors, and disease prevalence across geographies

and population groups. This would mean, for instance, making choices about using SMS or IVRS, timing the delivery of communication to effectively reach women, and curating relevant content that is engaging and relatable to its audience. Such customization is best achieved by involving end users in designing and testing solutions through a collaborative and participative process.

Make them technology appropriate

Despite the rapid uptake of ICTs in India, feature phones with limited functionality currently greatly outnumber smartphones, and regional limitations persist over availability of power and mobile/broadband connectivity, among others. And while some RMNCH+A funders are keen on investing in high-technology solutions, the real value of ICTs will be derived by designing lowest common denominator applications that can be easily adapted to existing devices and resources, to rapidly achieve scale. At the same time, as far as possible, readiness to changes in technology over time is highly desirable

04 Use the data generated through ICT applications

With the growing acceptability and use of ICTs in health systems, the quantum of real-time patient data is bound to grow exponentially. This kind of 'big data' offers unprecedented opportunity to understand on a huge scale, disease prevalence patterns, health-seeking behaviors, efficacy and uptake of health services, and even health workers' performance and accountability - across individuals and groups, and geographical and cultural lines. Good quality, interoperable data and strong back-end analytics will be key to converting this evidence into meaningful information at the point of care, as well as much further from it, as insights for policy and decision makers. At the program level too, the deployment of ICTs for program delivery should be used in program monitoring and evaluation - to build evidence of impact and enable continuous improvement.

05 Develop viable business models and leverage public-private partnerships

One of the main goals of most ICT pilots is to demonstrate the value-add of an ICT application to the health system and to beneficiaries, and also identify, where possible, optimal price points at which end-users will continue to use an application by paying for it. Given the soft and hard infrastructure and training requirements, technology interventions require funding and/or financially viable business models to be sustainable in the long term. Therefore, the life span of projects is often dictated by the terms of a grant. Identifying government funds or using government financing mechanisms, along with public-private partnerships, is an important and viable option, and one that was emphasized by all of the experts Dasra spoke with.

APPENDICES

Appendix I

Dasra would like to extend its sincere thanks to all the individuals, academics, experts, government officials and non-profit organizations that have made invaluable contributions to its research and this report.

	Expert	Organization
1	Aakash Ganju	Mobile Alliance for Maternal Action (MAMA)
2	Anand Sinha	David and Lucile Packard Foundation
3	Anindya Chatterjee	IDRC
4	Aparajita Gogoi	Centre for Catalyzing Change
5	Aparna Hegde	ARMMAN
6	Ashish Sinha	ABT Associates
7	B. P. Agrawal	Sustainable Innovations
8	Balaji Utlal	Piramal Swasthya
9	Devika Sarin	Dimagi
10	Dipa Nag Chowdhary	MacArthur Foundation
11	Kai-lik Foh	GSMA
12	Lysander Menezes	PATH
13	Phet Sayo	IDRC
14	Poulomi Pal	IDRC
15	Priya Anant	ACCESS Health International
16	Rohini Kalvakuntla	ACCESS Health International
17	Rushika Shekhar	Dimagi
18	Sara Chamberlain	BBC Media Action
19	Sharmila Neogi	USAID
20	Sheena Chhabra	USAID

Appendix II

Glossary

Accredited Social Health Activists are community health workers instituted by India's Ministry of Health and Family Welfare as part of its National Rural Health Mission.

Anganwadi Worker is a health worker chosen from the community and given four months training in health, nutrition and child-care. She is in-charge of an aanganwadi or daycare centre for children which covers a population of 1000.

Auxiliary Nurse Midwife is a trained health care provider who conducts outreach and provides services to women and children in the community.

Community Health Center is the third tier of the network of rural health care institutions, required to act primarily as a referral center for the neighboring PHCs for the patients requiring specialized health care services.

Integrated Child Development Services is an Indian government welfare program, which provides food, preschool education, and primary healthcare to children less than 6 years of age and their mothers. These services are provided through Anganwadi centres established mainly in rural areas and staffed with frontline workers.

Primary Health Center is the first point of contact between individuals and a qualified medical doctor. Each PHC is linked to approximately six sub centers (a population of approximately 30,000) and is typically a single-doctor clinic with about six inpatient beds as well as facilities for delivery, family planning (including sterilizations), minor surgeries, and limited laboratory testing.

Panchayat is a self-government organization at the village or small-town level in India.

Acronymns

ANM	Auxiliary Nurse Midwife
ASHA	Accredited Social Health Activist
AWW	Anganwadi Workers
CHC	Community Health Center
CHW	Community Health Worker
DHIS	District Health Information System
eHealth	Electronic Health
EWR	Elected Woman Representative
FLW	Frontline Worker
FOSS	Free and Open Source Software
GNM	General Nurse Midwife
GPRS	General Packet Radio Service
GPS	Global Positioning System
HW	Health Worker
ICDS	Integrated Child Development Services
ICTs	Information and Communication Technologies
IVRS	Interactive Voice Response System
JSY	Janani Suraksha Yojana
MAMA	Mobile Alliance for Maternal Action
MCTS	Mother and Child Tracking System
mHealth	Mobile Health
MOTECH	Mobile Technology for Community Health
MVG-Net	Millennium Villages Global Network
MVP	Millennium Villages Project
PHC	Primary Health Center
RCT	Randomized Control Trial
RMNCH+A	Reproductive, Maternal, Newborn, Child and Adolescent Health
SC	Sub Center
SHG	Self Help Group
SMS	Short Messaging Service
WHO	World Health Organization

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Tech innovations for healthy mothers and children in India

PART II



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The United States Agency for International Development (USAID) is the United States federal government agency that provides economic development and humanitarian assistance around the world in support of the foreign policy goals of the United States. USAID works in over 100 countries around the world to promote broadly shared economic prosperity, strengthen democracy and good governance, protect human rights, improve global health, further education and provide humanitarian assistance. This report is made possible by the support of the American People through the United States Agency for International Development (USAID). The contents of this report are the sole responsibility of Dasra and do not necessarily reflect the views of USAID or the United States government.

Kiawah Trust

KIAWAH TRUST

The Kiawah Trust is a UK family foundation that is committed to improving the lives of vulnerable and disadvantaged adolescent girls in India. The Kiawah Trust believes that educating adolescent girls from poor communities allows them to thrive, to have greater choice in their life and a louder voice in their community. This leads to healthier, more prosperous and more stable families, communities and nations.



PIRAMAL FOUNDATION

Piramal Foundation strongly believes that there are untapped innovative solutions that can address India's most pressing problems. Each social project that is chosen to be funded and nurtured by the Piramal Foundation lies within one of the four broad areas - healthcare, education, livelihood creation and youth empowerment. The Foundation believes in developing innovative solutions to issues that are critical roadblocks towards unlocking India's economic potential. Leveraging technology, building sustainable and long term partnerships, forming scalable solutions for large impact is a part of our approach.



DASRA

Dasra means 'enlightened giving' in Sanskrit and is India's leading strategic philanthropy foundation.

Dasra recognizes an urgent need for inspired and uncompromising competence to touch and transform the lives of 800 million Indians. Through knowledge creation, capacity building, collaboration and fundraising, we nurture powerful partnerships with funders and social enterprises. Since 1999, Dasra has engaged with over 3,000 corporates, foundations and philanthropists, influenced USD 49 Million towards the social sector and improved the life chances of over 9 million people.



PART II

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ON THE GROUND

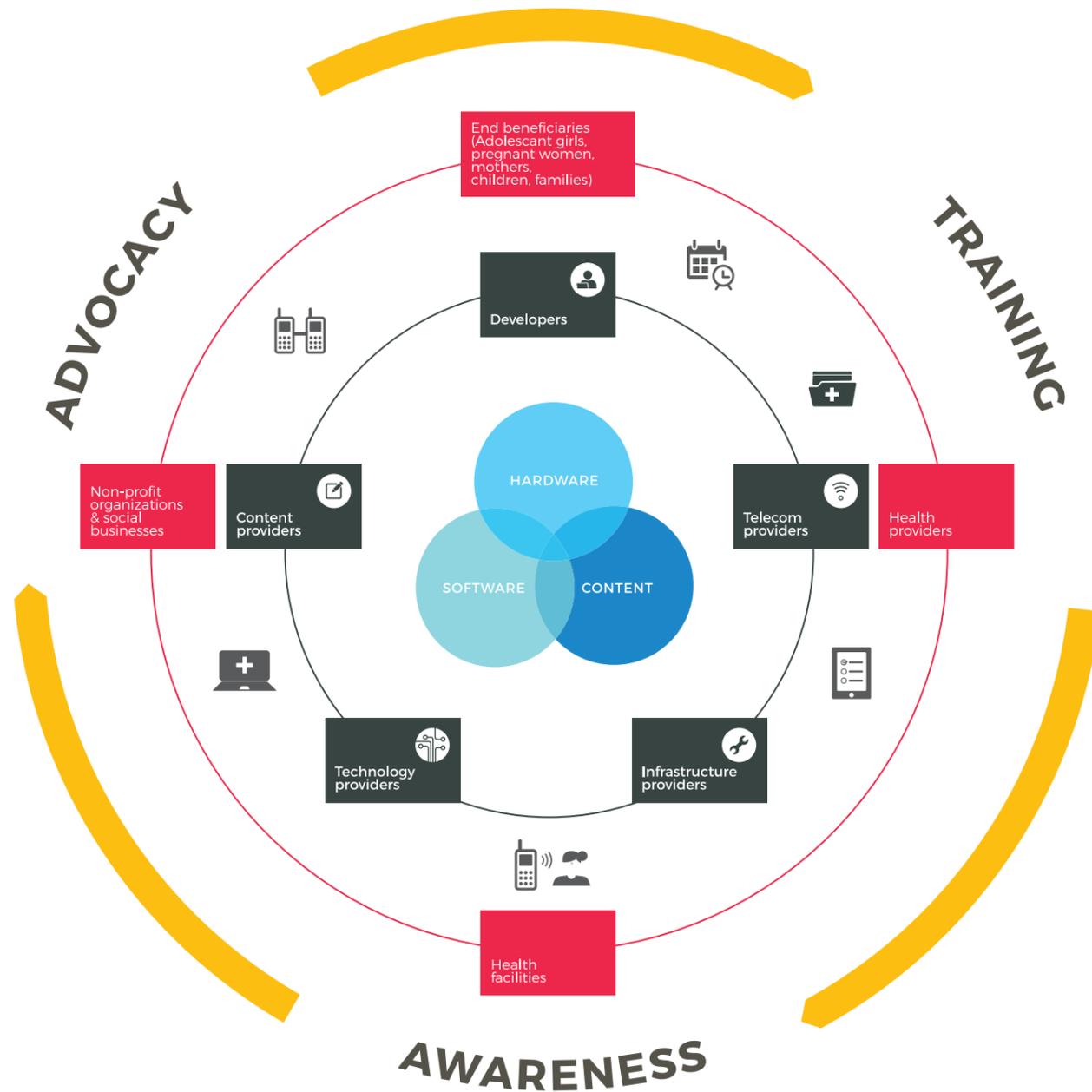
Technology is not an answer in and of itself. But when leveraged to find solutions to real problems, it can be a game changer, specially in a country like India. Recognizing this potential to use ICTs to leapfrog implementation efforts, several social organizations in India are finding innovative and impactful applications for ICTs to move the needle on RMNCH+A.

As a first step, this requires the development of ICT solutions at the back end - including the hardware and devices, software platforms and applications, and content. These serve as the necessary backbone for any ICT-based intervention.

Once an ICT solution is in place, its success and sustainability depends on certain key on-going activities by implementing organizations. These include regular training of technology users; awareness and mobilization of the solution/service among community members and other potential partner organizations; and advocacy for eventual up-take by government through the demonstration of successful pilots.

Cycle of development and sustainability of ICT solutions for RMNCH+A

- ICT Applications for RMNCH+A
- Stakeholders
- Technology back end
- Stakeholders



The following section describes ways in which Information and Communication Technology (ICT) solutions and apps are being deployed by different stakeholders involved in Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A), by differentiating the process and efficiency gains for beneficiaries, health workers and the overall health system.

End-Beneficiaries

- 01** Health education, behavior change and demand generation
- 02** Reminders and alerts for improved adherence to treatment
- 03** Remote and home-based care

Healthcare Providers

- 01** Provider training and development
- 02** Job aids
- 03** Communication and connectedness

Healthcare System

- 01** Data-driven efficiencies
- 02** Governance and accountability
- 03** Supply chain management



Photo Credit - Educate Girls

End-Beneficiaries

(Adolescent girls, pregnant women, mothers, children and their families)



01 Health education, behavior change and demand generation

This involves the use of ICT devices and platforms to deliver actionable, timely and targeted messaging around healthy behaviors for improved maternal, newborn and child health. The content covers themes such as nutrition, hygiene, reproductive health, family planning and birth spacing, ante and postnatal care, birth preparedness, newborn care, immunization and childhood illnesses like pneumonia and diarrhea. Information about government services and schemes is also made available over these channels.

Communication flows in a variety of ways: content delivered directly to the beneficiary's phone via SMS (Short Messaging Service) or IVRS (Interactive Voice Response System); educational videos that can be downloaded or are played to the beneficiary by a health worker on a mobile or tablet at her home (one to one) or in larger beneficiary gatherings (one to many) convened by local Non Governmental Organizations (NGOs); or helplines with a combination of IVRS and paramedics to respond to health queries.

CASE STUDY

mMitra

ARMAN's mMitra program is a timed and targeted voice call service that sends calls to pregnant women and mothers to bridge the information gap and encourage positive practices. mMitra sends twice a week voice calls on preventive care information directly to phones of the enrolled pregnant women and mothers from the first month of pregnancy until the first year of child's life. The mMitra program launched in Nov 2014, focusing on pregnant and new mothers living in the slum and low-income communities of the Greater Mumbai region. The program has to date reached over 200,000 women in the Mumbai Metropolitan region and aims to cater to over 1 million pregnant women and new mothers in Mumbai, Delhi, Pune and other urban slum geographies in the next three years.

CASE STUDY

MOBILE KUNJI

Mobile Kunji is another audio-visual behavior change communication aid used by health workers. It consists of a mobile phone and a deck of laminated cards printed with information relevant to various stages of family planning, pregnancy and postnatal care for children up to two years old. The health worker can look up the card and call the unique short code printed at the bottom. The recorded voices of a "Dr Anita" or her assistant "Nishant Kumar" provide further information during the call. This ensures that all relevant information is accurately covered, instead of relying only on the health worker's memory. The use of Mobile Kunji is expected to scale up from the current 40,000 frontline workers in Bihar to 200,000 by December 2015.

02

Reminders and alerts for improved adherence to treatment

This typically involves phone-based alerts and triggers to aid beneficiaries with self-management of their health, based on individual needs. For pregnant women, for example, this would follow a stage-based approach to ensure regular intake of nutritional supplements, appointment setting and ensuring regular visits to the Primary Health Center or sub-center for ante natal care; for HIV+ women, reminders for Anti-Retro Viral medication to prevent transmission from mother to child; for mothers, reminders for immunization for their children, family planning etc.

03

Remote and home-based care

In India, 70% of the population lives in rural areas, but only 3% of the country's specialist physicians practice in those areas.¹ ICTs are helping reduce geographic constraints on the availability of health providers and resources by bringing higher quality care to remote and underserved populations.

Telemedicine helps connect patients to qualified – and often city-based – doctors who they would otherwise not have access to. Point-of-care diagnostic kits make it possible for a doctor to remotely monitor and track patient health. Where needed, even health workers are being trained to conduct basic diagnosis and treatment with decision support offered by ICT devices through clinically robust algorithms.



CASE STUDY

Remedi™, Swasthya Slate, Dox-in-Box©

World Health Partners, a Delhi-based non-profit, identifies informal health providers at the village level and uses live streaming over the internet to connect them to qualified specialist doctors based in the city. These telemedicine centers, branded as SkyHealth Centers, also offer point-of-care tele-diagnosis using a Remedi™ kit that measures basic indicators such as temperature, blood pressure, heart rate, respiratory rate, and can assess Electrocardiograms and transmit results directly to the specialist physicians.

On the diagnostic side, **Swasthya Slate** is a device that allows health workers to use Android tablets and phones to conduct 33 diagnostic tests on the mobile device using specialized applications. It allows users to deliver fast and accurate care at home, in clinics and just about anywhere. With the Slate, the tests are done in a single location in 45 minutes. For the individuals administering the tests, the time spent recording data and completing forms fell from about 13 hours to two hours. The Slate collects data input by users and communicates this to a central server, creating a reliable record of patients' health as well as enabling download of recommended therapies.

Piramal Swasthya similarly uses its **Dox-in-Box©** diagnostic kit to support its telemedicine offering. Dox-in-Box© digitally captures, stores and transmits eight vital signs. It emphasizes general physician functionality and is easy to use.

¹ Sahni, N. and Myers, M. (2014). What the U.S. Can Learn From India and Brazil About Preventive Health Care. Harvard Business Review. <https://hbr.org/2014/11/what-the-u-s-can-learn-from-india-and-brazil-about-preventive-health-care>.

Healthcare Providers (Doctors, nurses, CHWs, rural medical practitioners)



01

Provider training and development

ICTs provide a cost-effective, scalable and sustained means of enhancing health worker knowledge and capacity through distance learning. Educational videos, informational messages, interactive exercises, and live training via videoconferencing through a mobile phone or web interface allow health workers to get up-to-date clinical training, updates and continuing education. The social benefits of on-going training include increased motivation and retention of health workers.

CASE STUDY

MOBILE ACADEMY

Mobile Academy is a mobile-based training course on family health for Community Health Workers (CHWs). It was developed by BBC Media Action and funded by the Bill and Melinda Gates Foundation for the Ananya program in Bihar. It uses mobile technology that is handset-independent, audio-based and accessed via a simple voice call to train Bihar's 200,000 CHWs – to expand health workers' knowledge of life saving preventive health behaviors, and enhance their communication skills. It consists of nine chapters, 36 lessons and nine quizzes covering nine lifesaving behaviors. If they complete the course with a 50% pass mark, health workers get a printed certificate from the Bihar government. They pay for the 160-minute course themselves. At less than one cent a minute, the total cost is approximately \$1.50 (INR 100).

CASE STUDY

IKURE

IKure, a Kolkata-based provider of rural primary health centers in West Bengal, uses a similar e-learning training methodology for its community health workers using pictorial e-learning content in regional languages. This is delivered over platforms including mobile tablets in offline mode, feature phones and through computers at locations with internet connectivity.

02

Job aids

Health workers are a critical link between people and the health system. They have challenging roles – having to service and keep track of a large number of households, and offer information, counseling, referral and escort services across varied health streams, with limited supervision and training support.

ICT applications can help health workers perform their jobs better by aiding in:

- **Workflow management:** This includes planning and scheduling tools to help keep track of upcoming and pending appointments and visits, prioritization of high-risk patients, digital checklists to ensure compliance to protocols etc.
- **Improved first-contact healthcare** through decision support tools and systems that are automated and algorithm- or rule-based. They help the health provider follow clinical guidelines and provide quality care to patients.
- **Triaging and referral services:** As part of this category of services, healthcare problems are received, assessed and managed through advice or referral to a more appropriate service using ICT applications and decision support.

CASE STUDY

CATHOLIC RELIEF SERVICES

Using **Dimagi's CommCare** open source platform, Catholic Relief Services has co-developed the **ReMiND (Reducing Maternal and Newborn Deaths)** mobile application for Accredited Social Health Activist (ASHAs) in two blocks in Uttar Pradesh. The ReMiND app uses audio-visual prompts to help ASHAs systematically assess and counsel pregnant women during routine home visits. ASHAs use the app to register each new mother, entering patient data into the phone. On each subsequent visit, the application walks ASHAs through checklists, questions and educational prompts to identify current issues, determine if prior treatment was followed, and share new counseling points based on the woman's stage of pregnancy. The application also guides ASHAs in early identification of problems and supports rapid referral of women and newborns with complications to appropriate care.



CASE STUDY

PIRAMAL SWASTHYA

Through Piramal Swasthya's **Health Information Helpline (HIHL)**, qualified and trained paramedics, counselors, and doctors utilize software based on medically validated algorithms and disease summaries to triage callers and reduce the minor ailment load on the health system. Callers can accordingly get health information and advice, avail of counseling services etc. Currently, five HIHLs operate in partnership with state governments across Andhra Pradesh, Assam, Rajasthan, Maharashtra, Karnataka, Chhattisgarh and Jharkhand.

03

Communication and connectedness

ICTs promote peer-to-peer learning through greater connectivity and communication between health workers by way of simple mobile phone connectivity, interactive discussion forums and social networking. Mobile phones in particular also help improve health worker efficacy by making it easy to connect with supervisors and/or Auxillary Nurse Midwife (ANMs), as well as with members in the intervention village.

Health Systems



01

Data-driven efficiencies

ICTs play an important role in recording, collecting and tracking potentially enormous quantities of data around population-level health indicators and outcomes. Such data is now increasingly available in real-time and is more accurate owing to significantly lowered human error risk in reporting.

- Electronic health records allow health workers to make more informed clinical decisions and enable continuity of care for patients/beneficiaries across the health system. These include prenatal records, infant growth monitoring, vaccine records, etc.
- Registration and tracking of vital events such as births and deaths help improve district, local, state and national records for access by supervisors, policymakers and other stakeholders. The focus is on developing an integrated view of health service data that contributes to a national health information system. This in turn helps identify eligible mothers and children from the target population and better understand disparities in health outcomes. It also boosts disease surveillance capabilities and ultimately enables more data-driven policy and decision making by the government.

CASE STUDY

MOTHER AND CHILD TRACKING SYSTEM (MCTS)

Launched by the Indian government in 2009, the MCTS is a Web-based information system to ensure name-based registration and tracking of all pregnant women and newborns. The aim of MCTS is to ensure that every pregnant woman gets complete and quality ante and postnatal care, and every child gets a full range of immunization services. Regular SMSes are sent to pregnant women and parents of children to make them aware of the services that they are entitled to so that they may avail of such services.

MCTS serves two purposes. It facilitates grassroots delivery of targeted services. It also helps health and family welfare managers and policy makers measure and monitor efficiency of maternal and child health services. Over 142.4 million pregnant women and children have been registered in MCTS until January 2015.

02

Governance and accountability

By reducing ambiguity of data and enhancing communication, ICTs help make health workers and the health system more accountable to the people.

- **Feedback:** ICTs enable mechanisms for feedback from patients and beneficiaries, which provides an additional and critical layer of information on service and performance.
- **Supervision:** Real-time data reporting helps supervisors and government authorities monitor and track performance of health workers as well as health

facilities, and in turn drive efficiencies. Interestingly, increased supervision – made possible by technology – also leads to increased motivation levels among health workers, who were previously left largely unsupervised and neither rewarded nor reprimanded for the work they did.

- **Human resource management:** Biometric and GPS tracking of health workers helps improve their distribution across the health system, attendance rates of health providers, as well as frequency of coverage of the beneficiary population.
- **Partially / fully automated incentive-based payments:** ICTs help integrate health system data with payment systems. This includes mobile and online payments to health workers based on their performance, as well as to beneficiaries who are entitled to payouts under government schemes such as Janani Suraksha Yojana. Such a system would reduce issues such as payment delays, non-payment or funds leakage by minimizing avenues for corruption.

CASE STUDY

CENTRE FOR CATALYZING CHANGE

Centre for Catalyzing Change, a Delhi-based non-profit, leverages ICTs in its Pahel program in Bihar, which works on building capacities of Elected Women Representatives (EWRs), especially in the area of RMNCH+A. Using a checklist, EWRs collect information on the status of public health infrastructure and services, and feed this information to the health delivery system as well as the state government for improved accountability and action. Using an IVRS, feedback is now provided over the mobile phone. This ensures real-time and relevant data and enables much faster redressal and action.

CASE STUDY

IMTECHO

In the IMTECHO program working with ASHAs and Primary Health Centers (PHCs) in Gujarat, supervision of ASHAs' performance is a strong component. A Web-based interface has been developed for medical officers and PHC staff, serving as a mechanism to monitor and support ASHAs. It provides real-time information on the work done by ASHAs, and provides alerts on high-risk patients, supply chain management (e.g. low inventory of drugs and supplies with ASHAs) and automates the calculation of performance-based incentives for ASHAs.

CASE STUDY

INTRAEHEALTH

Intrahealth has supported the Jharkhand government to develop a human resources information system named iHRIS that provides systematic and customized information on 1,800 public doctors and specialists by cadre, location and training history. The information is used for deployment and future planning of human resources.



03

Supply chain management

ICTs provide tools to track and manage stocks to allow continued access to medicines and medical technology, both at health facilities and for mobile and home-based care. This includes the use of SMS and other technology for fraud prevention (e.g. due to the sale of counterfeit medication), reporting on commodities such as drugs, vaccines and diagnostic equipment to provide visibility on supplies across facilities, and communication approaches to request new commodities. It also involves tracking healthcare infrastructure such as mobile vans and mobile medical technology.

CASE STUDY

108 EMERGENCY RESPONSE SERVICE

Under the government's toll-free 108 Emergency Response Service, currently operational in 17 Indian states, ambulances are being fitted with GPS devices to track location and movement, and optimize response time to within 15 minutes of an emergency call. Besides timely help, the GPS will also inform ambulance drivers about speed limits, and sound alerts in case of overspeeding which become crucial in cases of pregnancy or traffic accident victims.

CASE STUDY

SWASTH FOUNDATION

Swasth Foundation's primary health clinics are equipped with a cloud-based Hospital Management Information System called Swasth Live, which includes a module on supply chain and inventory management. For example, all drugs are bar-coded upon manufacture, dispatched to the centers and tracked through the system to avoid stock-outs, expiration etc. Lab samples are also tracked from the clinics to the centralized laboratory where they are analyzed, after which the results are automatically uploaded to the system and made available to patients in real time.

KEY TAKEAWAYS

- By mapping over 100 non-profits and social businesses developing and/or deploying ICTs in their RMNCH+A programs on the ground, Dasra has identified nine key interventions targeted primarily at one or more of the following stakeholders: End-beneficiaries, Health providers, and overall Health Systems.
- Solutions typically involve the collection, transmission and/or analysis of real-time data, information and communication, using mobile devices and the internet.
- This requires the development of ICT solutions at the back end – including the hardware and devices, software platforms and applications, and content – that serves as the backbone for any ICT-based intervention.
- Once an ICT solution is in place, its success and sustainability depends on certain on-going activities by implementing organizations. These include regular training of technology users, awareness and mobilization of the solution/service among community members and other potential partner organizations; and advocacy for eventual up-take by government through the demonstration of successful pilots.



Photo Credit - SNEHA

THE CHANGE MAKERS

Non-profit organizations and social businesses.

During the course of this research, Dasra evaluated over 100 non-profits and social businesses that are using ICTs to deliver programs for improved RMNCH+A to analyze their approaches, models and interventions. Following a comprehensive diligence process, 11 of these organizations have been highlighted in this section. The chart below maps these organizations to the interventions discussed in the preceding section.

		ARMMAN	CARE	C3	Dimagi	FRHS	Piramal Swasthya	SEWA Rural	SNEHA	Swasth	WHP	ZMQ
End-Beneficiaries	Health education, behavior change and demand generation	📶		📶		📶	📶	📶		📶	📶	📶
	Reminders and alerts for improved adherence to treatment					📶						
	Remote and home-based care						📶				📶	
Healthcare Providers	Provider training and development		📶		📶	📶	📶	📶		📶	📶	📶
	Job aids	📶	📶		📶	📶			📶			📶
	Communication and connectedness		📶		📶							📶
Healthcare System	Data-driven efficiencies	📶	📶		📶	📶	📶	📶	📶	📶	📶	
	Governance and accountability		📶	📶	📶	📶		📶	📶			
	Supply chain management				📶		📶	📶		📶	📶	

ARMMAN

www.armman.org

**Organization Overview**

Founded: 2008 | **Head Office:** Mumbai | **Coverage:** Maharashtra and Karnataka | **Full Time Staff:** 31
Budget (2014-15): INR 4 Crore

ARMMAN designs and implements sustainable interventions to reduce maternal, neonatal and child mortality and morbidity in underprivileged urban and rural communities in India. It achieves this by identifying and addressing systemic gaps in both health services delivery, and community health care seeking practices, and adopts a multi-sector evidence-based 'community needs assessment' approach.

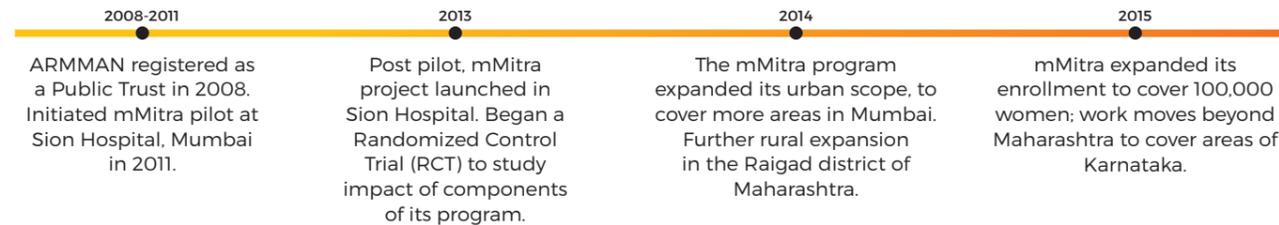
Program Overview: Coverage: Maharashtra | **Full Time Program Staff:** 31
Budget (2014-15): INR 4 Crore

THE PROBLEM

A woman dies in childbirth every ten minutes in India and more than 300,000 children die on the day of their birth. The lack of access to basic information along with lack of timely availability and access to services is a major contributor to India's abysmal maternal and infant mortality and morbidity rate.

ARMMAN'S RESPONSE

ARMMAN leverages the high penetration of mobile telephones in India, and provides pregnant women and new mothers with timed and targeted health related information, equipping them to take informed decisions for themselves and their family's health, which in turn reduces maternal and infant mortality and morbidity.

How did it evolve?**What does it do?**

ARMMAN's four lead projects are targeted at reducing mortality and morbidity of mothers, children and neonates:

- **mMitra**, in urban India, and **Phone Sakhi**, covering rural India: These are timed and targeted call services that send voice messages twice weekly on preventive care information to enrolled pregnant women, and mothers from the first month of pregnancy till the first year of the child's life. Phone Sakhi in rural India also includes one-minute animations on key topics of mother and infant health.
- **Arogya Sakhi Home Based Care** program: An Arogya Sakhi serves as the maternal and child health advocate of a village, assists Accredited Social Health Activists (ASHAs) and the government health system. In addition to enrolling women into Phone Sakhi and showing them animations monthly, the Arogya Sakhi is trained to perform home-based focused preventive, diagnostic and treatment interventions, through which she earns an income.
- **Mother and Child Health Tracking** in Nandurbar: Government health functionaries – Auxiliary Nurse Midwives (ANMs), are provided with an Android phone with encoded antenatal, infancy and childhood forms. The phones provide alerts regarding high risk factors present, treatment to be given, and need for referrals. The data is transferred to the Primary Health Center through GPRS, to take action on identified next steps.

Key Interventions**End-beneficiaries**

- **Health education, behavior change and demand generation**
- Reminders and alerts for improved adherence to treatment
- Remote and home based care

Health providers

- Provider training and development
- **Job aids**
- Communication and connectedness

Health system

- **Data driven efficiencies**
- Governance and accountability
- Supply chain management

What has it achieved?

- ARMMAN has reached out to over 200,000 expectant and young mothers in Mumbai, and over 1,000 women in rural Maharashtra.
- Under the Arogya Sakhi project, 166 women have been trained and empowered to become financially independent Arogya Sakhis.
- A cluster-randomized control trial conducted of ARMMAN's subscriber base, engaging 1500 women, indicates that mMitra service has helped in increasing the knowledge about family planning methods, and has also helped in increasing the consumption of supplements.

What next?

- ARMMAN intends to take mMitra to five million women in the next ten years. Its strategic plan envisages reaching out to urban poor in all states, and in the first phase start with Delhi, Madhya Pradesh and Kolkata.
- In the coming 3-5 years, the organization wants to scale doorstep delivery of health care services through Arogya Sakhis to all districts in Maharashtra and expand to other states in India.



A young couple listening to mMitra calls together.

Quality Indicators**Leadership**

Led by Dr. Aparna Hegde, a uro-gynecologist.

- Co-founder and Director of UPHI, a tertiary, clinical and academic center of excellence in the field of pelvic reconstruction surgery.
- All the projects of ARMMAN are conceptualized by her based on her experience as a resident and Professor at Sion Hospital, Mumbai.

Partnerships

- mMitra has been launched in partnership with Mobile Alliance for Maternal Action (MAMA).
- All messages and animations have been vetted by Federation of Obstetric and Gynaecological Societies of India (FOGSI).
- Funders include Glenmark, Tata Trust, Swadesh Foundation and Deshpande Foundation.

Endorsements

- mMitra won the Viewer's choice award at Saving Lives at birth event in 2011.
- mMitra was featured in DNA's list of exciting developments for women in 2014.

Voices from the Ground

"I love mMitra calls. My baby keeps moving inside me while I listen to mMitra messages. I am sure that my baby is listening too."

- Samruddhi Pawar, Age 26

"I had no idea about pregnancy and care to be taken during pregnancy. mMitra messages are not only helping my wife and my baby but me as well since I am able to understand and look after her better."

- Husband of Sushma Wagh, mMitra subscriber

Voices from the Team

"It was my first-hand observation, during my medical training in Mumbai, how the lack of access to preventive care information can lead to loss of life. It was heart-breaking, particularly because it was preventable. These experiences provided the background for mMitra, which I conceptualized as a scalable solution for this pervasive and systemic problem"

- Dr. Aparna Hegde, Founder

CARE India

www.careindia.org

Organization Overview

Founded: 1946 | **Head Office:** New Delhi | **Coverage:** 15 states

Full Time Staff: 484 | **Budget (2014-15):** INR 240 Crore

CARE India is an organization working for over 60 years to end poverty and social injustice in the country. They work in areas of health, education, livelihoods and disaster preparedness and response, with a large focus on improving health delivery services for the poor and marginalized. CARE sees improvement in structural issues of gender and governance as a key enabler to helping people live with security and dignity.

Program Overview: Coverage: Bihar | **Full Time Program Staff:** 230

Budget (2014-15): INR 186 Crore



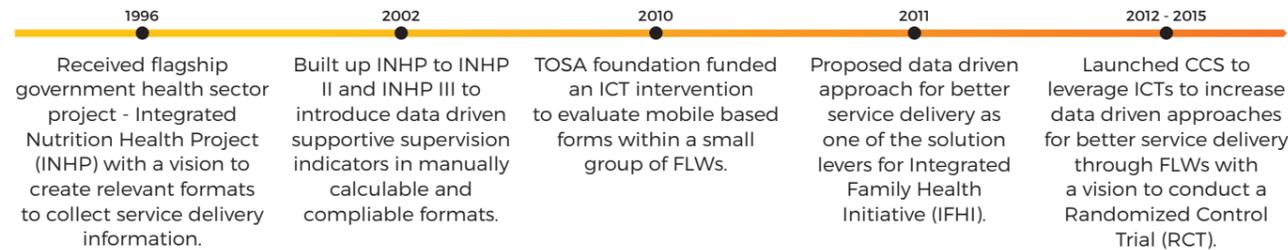
THE PROBLEM

Despite modern improvements in health sciences and delivery systems, name-based beneficiary tracking is a big challenge in public health service delivery, especially for RMNCH. Provision of information and critical decision making at the hour of need is often hard due to time lag or non-availability of data.

CARE'S RESPONSE

Continuum of Care Services (CCS), an mHealth solution to help structure Frontline Worker (FLW) and beneficiary interactions through protocolized counseling, supervision support to FLWs and seamless coordination between FLWs in a catchment area. It also helps collect, collate, track real-time RMNCH data, supporting data-driven decision making.

How did it evolve?



What does it do?

For the past 3 years, Continuum of Care Services (CCS) is being implemented in Saharsa district, Bihar through 512 Community Health Workers, 57 supervisors and 12 managers to deliver health and nutrition services to a population of 350,000. Key features:

- **End to end solution** which includes a suite of applications and multiple modules used for tracking health status of pregnant mothers and children up to 6 years (as per WHO standards).
- Aids in **coordination and integration** of services across two key government health & nutrition departments (MHFW & MWCD)*.
- Services provided include **antenatal/postnatal care** (ANC/PNC), exclusive breastfeeding, initiation of complimentary feeding, immunization and family planning. Besides tracking general health indicators, there is close monitoring in cases of complications/high risk pregnancy. Key events tracked are birth, death and migration. Nutritional components such as Threonine (THR), spot-feeding, and pre-school activities are also captured.
- **Home visit scheduler** feature with guided question prompts for FLWs, asked in a structured manner to cover 19 necessary home visits in the continuum of care, i.e. from -9 to +24 months.
- **Real-time supervisory review** module for Auxillary Nurse Midwife (ANM) and supervisors. Context specific communication aids to reinforce the importance of proper care measures needed for the beneficiary. Audio and visual reminders to FLW for collecting relevant data during house visits through a Due List feature.

Key Interventions

End-beneficiaries

- Health education, behavior change and demand generation
- Reminders and alerts for improved adherence to treatment
- Remote and home based care

Health providers

- **Provider training and development**
- **Job aids**
- **Communication and connectedness**

Health system

- **Data driven efficiencies**
- **Governance and accountability**
- Supply chain management

* MHFW - Ministry of Health and Family Welfare
MWCD - Ministry of Women and Child Development

What has it achieved?

RCTs found improvements in service delivery and significantly large improvements on health outcome indicators: 10% more mothers had at least two FLW house visits during their ANC period with 21.1 % more beneficiaries receiving at least three ANC visits. 13% more mothers received home visits within a week of their delivery. 6.3% more pregnant women consumed 90 Iron Folic Acid tablets with 9.1% more having phone numbers of local transport provider, ambulance, nearest health institution and FLW. 13.7% more mothers breastfed within an hour of delivery with 7.4% more practicing skin-to-skin-care during PNC period. 9.1% more children began eating solid food at six months of age. 10.9% more mothers adopted modern methods of family planning after delivery.

What next?

- Disseminate the results and key learnings to state and national governments and at international fora.
- Adopt further customization to scale-up CCS in priority districts across eight states in India through Ministry of Women and Child Development.



Girja Devi, Anganwadi Worker, Samda block, Saharsa counselling a newly blessed mother during a home visit.

Quality Indicators

Leadership

- Ramkrishnan Balakrishnan (Technology lead)
- Masters in Healthcare and Hospital Management.
- 8 years of experience in ICT and healthcare field.

Sharadprakash Chaturvedi (Field Lead)

- Masters in Human Resource Management.

Partnerships

- Project Partner: Government of Bihar – supported by Bill and Melinda Gates Foundation.
- Technology partner for the platform: Dimagi.

Endorsements

- Received the mHealth Alliance Collaboration Award for the Collaborative effort of the CCS intervention, in December 2013 during the mHealth Summit.

Voices from the Ground

"I feel proud using this with women in my village. It increases my value in their eyes."

– Renu Kumari, Anganwadi Worker, Nado Health Center, Saharsa

"I started complementary feeding of my child because the ASHA visited and gave me relevant information at the right time."

– Salma Khatoun, Mother of six month baby, Nariayar Health Center, Saharsa

Voices from the Team

"If we provide the proper 3Ts (technology, tools and training) to a Community Health Worker, the fourth T (transformation) in her catchment happens automatically."

– Ramkrishnan Balakrishnan, Principal Consultant ICT, CARE India

Centre for Catalyzing Change (C3)

www.c3india.org

**Organization Overview**

Founded: 1987 (as CEDPA) | **Head Office:** New Delhi | **Coverage:** Bihar, Jharkhand and New Delhi

Full Time Staff: 37 | **Budget (2014-15):** INR 7.8 Crore

Centre for Catalyzing Change works with a mission to empower women and girls in all sectors of development. To achieve its target of gender equality, the organization focuses on three major sectors – Girls' Education & Youth Development, Reproductive Health and Rights, and Gender and Governance. Through its efforts, C3 has reached out to two million women and community members.

Program Overview: Coverage: Bihar | **Full Time Program Staff:** 5

Budget (2014-15): INR 1 Crore

THE PROBLEM

Bihar has the sixth highest Infant Mortality Rate across India, i.e. 126,000 infant deaths annually. Most of these deaths are preventable, provided proper infrastructure and manpower for maternal and newborn child care. Bihar is also the most vulnerable Indian state in terms of low status of women on socio-economic indicators.

C3'S RESPONSE

Bihar was the first state to reserve 50% seats for women in local governance (Panchayati Raj). C3 leverages this in its Pahel program that uses technology to empower and support Elected Women Representatives (EWRs) to play an active role in governance. They are also trained to monitor reproductive services at village, block and district levels.

How did it evolve?**What does it do?**

C3's Pahel program trains and empowers EWRs in three districts in Bihar to improve and track reproductive health delivery. It raises their awareness about their expected roles, reproductive health, and provides them tools to track progress and share updates.

- **C3 trains EWRs** on gender equality, local government structures, reproductive health delivery systems, and government schemes.
- **Technology is used to reiterate training** to EWRs who receive detailed information on entitlements and service benchmarks for reproductive health through Interactive Voice Response System (IVRS) on their own/husband's phones.
- **Reproductive health service delivery** is tracked by EWRs using pictorial checklist tools, administered at respective panchayat levels (Village Health Sanitation & Nutrition Day/ Sub Center / Primary Health Centre/ District Hospitals) to check infrastructure, personnel, or other requirements for adequate healthcare provision. C3's workers mentor them through the process.
- **Peer learning** is driven by field workers, through Mahila Sabhas (women's groups) mobilized to discuss training, share best practices and address roadblocks.
- **Monitoring, evaluation and advocacy** is a key component of Pahel. Data is collated real-time, and is shared to assist EWRs in follow-ups with women on a regular basis; this data is also used to inform advocacy with the government.

Key Interventions**End-beneficiaries**

- **Health education, behavior change and demand generation**
- Reminders and alerts for improved adherence to treatment
- Remote and home based care

Health providers

- Provider training and development
- Job aids
- Communication and connectedness

Health system

- Data driven efficiencies
- **Governance and accountability**
- Supply chain management

What has it achieved?

- C3 has reached out to 1,200 EWRs with an indirect outreach of 120,000 people since 2011. Early impact indicators include:
 - Awareness on reproductive health increased from 40% (pre-training) to 70% (post-training).
 - 46% increase in screening of anemia at Anganwadi Centers.
 - 26% increase in availability of child weighing equipment.
- C3 is in the process of compiling evidence for the government towards scaling Pahel to other districts.

What next?

As Bihar goes into elections, C3 is taking a year to compile end-line learnings. Some of the preliminary next steps include:

- Replicating the model and scaling it in other states.
- Expanding the focus of the intervention to also include a full range of RMNCH+A interventions, including girl child education; some EWRs have already taken the initiative of going to schools and checking on sanitation facilities and attendance of girls at schools.



Women Elected Leaders trained in the use of checklists to assess health facilities on 6 key indicators leading to effective maternal, family planning and reproductive health services.

Quality Indicators**Leadership**

Dr. Aparajita Gogoi is Executive Director of Centre for Catalyzing Change.

- Holds a PhD (International Politics) from Jawaharlal Nehru University, New Delhi.

Partnerships

- Long-term funders include Packard Foundation, MacArthur Foundation, Ford Foundation and DFID.
- Strong partnerships with Bihar government, part of the Committee developing Women's Empowerment Policy.
- Partnership with Gram Vaani to help develop IVRS content.

Endorsements

In 2011, the Guardian, UK, named Dr. Gogoi as one of the World's 100 Most Inspiring Women. Dr. Gogoi was awarded 'Women, Inspiration, Empowerment' Champions Award by White Ribbon Alliance in 2011 for innovative advocacy for the women of India.

Voices from the Ground

"I know I have the power to demand improvements in our schools and health centres. I take my community members along with me when I go to the District Headquarters to meet officials."

– Akhbari Khatun, Ward Member, Gaighat village, Muzzafarpur district, speaking about her journey as a widow to becoming a vocal people's representative

Voices from the Team

"We believe that until women are represented more fully in local, national and international decision-making bodies, their priorities will not receive needed resources. Pahel addresses two gaps – one of empowering women and giving them a voice, and second, leveraging that power to make systematic changes in reproductive health."

– Dr. Aparajita Gogoi, Executive Director

Dimagi Software Innovations Pvt. Ltd.

www.dimagi.org



Organization Overview

Founded: 2007 | **Head Office:** New Delhi | **Coverage:** 17 states across India

Full Time Staff: 26 | **Budget (2014-15):** INR 4.1 Crore

Dimagi Software Innovations Pvt. Ltd., based in India, is a fully owned subsidiary of Dimagi Inc. which was created out of Harvard University and Massachusetts Institute of Technology (MIT) Media Lab in 2002. Dimagi develops cloud-based, open source ICT solutions for real-time data and information management. It is designed to support frontline programs to deliver quality services to underserved people across sectors like health and education in over 50 countries.

Program Overview: Coverage: 17 states across India | **Full Time Program Staff:** 26

Budget (2014-15): INR 2.9 Crore

THE PROBLEM

In India, rates of maternal and newborn mortality are high despite the availability of simple lifesaving information and interventions, and a large cadre of frontline health workers to deliver them. Health workers are often overburdened and poorly trained, which affects the quality of services they provide.

DIMAGI'S RESPONSE

Dimagi has created an open source mobile platform called CommCare. It is easily customizable and enhances effectiveness and efficiency of frontline workers and programs through real-time data-driven decision support and monitoring. Dimagi provides hands-on support to partners to design and deploy CommCare.

How did it evolve?



What does it do?

Dimagi's flagship tool, CommCare, is utilized in all its projects in India, of which 70% relate to improving RMNCH+A. It is designed for non-programmers to design, deploy and use the application, and is accessible online to download and customize. It serves as a:

Job aid: CommCare is a tool to support frontline workers and supervisors in collecting patient data during household visits, and improving the quality of their services by providing them real-time guidance through key counseling points and decision support.

Monitoring and supervision tool: CommCare submits visit data in real-time to its central cloud server, CommCareHQ, where it is immediately made accessible to supervisors and program managers who are then able to monitor the progress of health workers and patients and accordingly provide supervision if required. CommCare is currently being used by 2,544 frontline health workers in India, each of whom reaches out to a population of approximately 1000. To date, over 600,000 'cases' have been registered and monitored through CommCare in India. These cases include pregnant women, newborn children, postpartum mothers and adolescents.

Implementation support: To complement the CommCare technology development, using a bottom up 'under the mango tree approach', Dimagi works with partner organizations to support design, implementation and maintenance of its CommCare system. Depending on the needs of the partner organization, Dimagi will assist with program design, technical support and training.

Key Interventions

End-beneficiaries

- Health education, behavior change and demand generation
- Reminders and alerts for improved adherence to treatment
- Remote and home based care

Health providers

- **Provider training and development**
- **Job aids**
- **Communication and connectedness**

Health system

- **Data driven efficiencies**
- **Governance and accountability**
- **Supply chain management**

What has it achieved?

- Using CommCare, health workers increased their knowledge of health danger signs by 22%, completed 20% more visit-protocols, reduced the average time it took them to submit data to a program coordinator from 45 days to less than one day and improved form data completeness from 67% to 84%.
- Dimagi has strong relationships with the government and has worked in close partnership with the Bihar government on the Ananya project (2011-2015), an initiative to improve health and nutrition services in Bihar.
- Since 2008 over 20 peer-reviewed publications have discussed CommCare, making it the most evidence-based mobile platform for front line health workers globally.

What next?

Dimagi would like to focus on the following areas over the next few years:

- Partner with the Ministry of Women and Child Development and Bill and Melinda Gates Foundation to implement CommCare across 8 states, impacting over 90,000 Anganwadi workers reaching a population of 90 million.
- Build online courses called "CommCare Academy" to better enable individuals to become certified in using CommCare on their own, thus easing adoption of CommCare worldwide.
- Continue to have a core focus on health while diversifying mobile applications in other sectors such as agriculture and education. It plans to focus on new revenue streams with emphasis on a Software as a Service (SaaS) model, building on revenue generation from organizations independently deploying CommCare.



A woman viewing CommCare's audio-visual information on maternal and newborn care, Kaushambi, Uttar Pradesh.

Quality Indicators

Leadership

Jonathan Jackson and Vikram Kumar, co-founders:

- Jonathan has a Bachelor's and Master's degree in electrical engineering and computer science from MIT.
- Vikram studied engineering at the Indian Institute of Technology and Columbia University and medicine at the Harvard-MIT Division of Health Sciences and Technology.

Partnerships

- Funders: USAID, World Bank, Public Health Foundation of India, Bill and Melinda Gates Foundation.
- Partnerships: Partnered with over 100 organizations around the world and over 55 in India.

Endorsements

- Dimagi's work was showcased as part of the UN General Assembly to highlight how innovation is helping achieve the Millennium Development Goals (2014).
- Received Vodafone's 'Mobile for Good' Award (2014).

Voices from the Ground

"Now, we're taking more interest in our field work. Before this, we weren't as enthusiastic or interested in it. Now we feel an urgency to meet pregnant woman and speak to them. We used to think, 'We'll meet them when we meet them.' Now, we think, 'We haven't met her yet. We need to meet her. We haven't spoken to her yet!' Now, we want to spend more time in the field!"

– ASHA worker from Kishangarh, Rajasthan.

Voices from the Team

"In building our business, Dimagi seeks a ground-up approach meaning that it is the end user and beneficiaries who drive the design and development of our tools. Our unique global network of field managers and partners constantly feed that innovation as we seek to be more responsive to the end user's needs. By enabling greater access and better visibility than has ever been possible, technology firms like Dimagi are helping development partners to reimagine the challenges of poverty reduction and sustainable development."

– Jonathan Jackson, co-founder

Foundation for Research in Health Systems (FRHS)

www.frhsindia.org



Organization Overview

Founded: 1989 | **Head Office:** New Delhi | **Coverage:** Uttar Pradesh, Karnataka, Maharashtra, Gujarat, Tamil Nadu

Full Time Staff: 44 | **Budget (2014-15):** INR 3.8 Crore

FRHS is a systems development and research organization working to improve public health, emphasizing maternal and child health. It develops solutions towards supporting the government and private health providers develop Information, Communication and Technology (ICT) interventions that facilitate scale. Further, FRHS conducts rigorous evaluations of its programs, and those of third parties, including the government.

Program Overview: Coverage: Karnataka | **Full Time Program Staff:** 20

Budget (2014-15): INR 1.1 Crore

THE PROBLEM

At the grassroots, the public healthcare system in India faces two key challenges: inefficiently managed frontline workers with a low level of healthcare knowledge, and citizens who lack awareness around healthy practices. These challenges contribute to a high incidence of maternal and newborn deaths.

FRHS'S RESPONSE

FRHS trains frontline workers to capture and track public health records using mHealth interventions towards ensuring better quality, efficiency, and equitable access to health service delivery. This in turn increases effective engagement of frontline workers with the community and contributes to improved RMNCH+A outcomes.

How did it evolve?



What does it do?

FRHS' initiatives under Project DRISTHI include the following activities:

- **Building the capacity** of frontline medical workers and Auxiliary Nurse Midwives (ANMs) by providing three weeks of initial training on healthcare provision, and the effective use of an ICT platform followed up with three-hour refresher trainings each month.
- Providing ANMs with tablet **computers preloaded with software** that aggregates vital health data on cloud systems, relating to key phases of maternal and child care.
- **Facilitating** 50 ANMs covering a population of 250,000 in providing **door-to-door consulting** on best RMNCH practices relating to family planning, antenatal and postnatal care, and child care. ANMs monitor previous health history and any complications that can become a risk for mother or child throughout this consultation process.
- **Collecting, storing and tracking** individual and aggregated beneficiary health data to provide timely interventions and monitor outreach.
- **Evaluating the impact** of the intervention on specific RMNCH outcome indicators including prevalence of anemia, timely postpartum care, and conducting a Randomized Control Trial (RCT) with 50 test, and 50 control ANMs.
- Undertaking **baseline and endline surveys**, involving nearly 10,000 households each, towards establishing a robust ICT solution that can be transitioned to government to scale up.

Key Interventions

End-beneficiaries

- **Health education, behavior change and demand generation**
- **Reminders and alerts for improved adherence to treatment**
- Remote and home based care

Health providers

- **Provider training and development**
- **Job aids**
- Communication and connectedness

Health system

- **Data driven efficiencies**
- **Governance and accountability**
- Supply chain management

What has it achieved?

- DRISTHI monitors the health of mothers and infants from 50 ANM areas (Primary Health Centre blocks) with each ANM covering a population of 5,000 people.
- Timely anemia testing of pregnant women increased from 44% to 100% over one year of project implementation; Postnatal women visited by health worker increased from 40% to 54% in one year.
- The DRISTHI application produces real-time performance reports for ANMs, which are streamlined with government reporting formats monitoring health outcomes, for timely action by health-workers.

What next?

FRHS plans to adopt two broad approaches in the coming three years towards sustaining and expanding its work:

- Developing new services and products: The organization plans to invest funds in developing new products and services for research to become self-sustaining.
- Continuing to work with external parties, on research studies being conducted to assess the efficacy of programs and interventions within FRHS' domains of expertise.



ANM visiting beneficiary mother for routine health update to track progress and update data base.

Quality Indicators

Leadership

Dr. Nirmala Murthy is the founder of FRHS.

- Holds a Doctorate of Science (D.Sc) from the Harvard School of Public Health.
- Has served as a consultant to various large scale projects of State and Central Governments in India, the World Bank, DFID, UNICEF, and Ford Foundation.

Partnerships

- Past and current partners include Government, Bill and Melinda Gates foundation, WHO, UNDP, Wellcome Trust, ICICI, Clinton Health Initiative, Harvard University, University of Columbia, University of California San Francisco.

Endorsements

- FRHS won the 1st Runner Up prize out of 27 nominations and 4 finalists in the "Best Practices of Mobile Usage" category at the 3rd eNGO Challenge South Asia 2014. The eNGO Challenge is an annual event held to recognize best NGOs using ICTs.

Voices from the Ground

"I enjoy working using the tablet platform. It has made it easier for me to input and track patient data, but has also helped gain more acceptance of my work in the eye of my patients. They have become more responsive due to the behaviour change communication feature of the platform. All this was not possible earlier with the paper-based data collection and tracking system."

– Parvarti, ANM working on the Drishti Pilot

Voices from the Team

"We strongly believe that in order to achieve improved and strong health indicators, we need a mechanism in place where government workers, medical institutions and other public health service provisions can respond effectively to poor health status. We see DRISTHI as a scalable solution to address this gap."

– Dr. Prakash M, Assistant Executive Director, FRHS

Piramal Swasthya Management and Research Institute

www.piramalswasthya.com



Organization Overview

Founded: 2007 | **Head Office:** Hyderabad | **Coverage:** 12 states including Andhra Pradesh, Assam, Chhattisgarh
Full Time Staff: 1843 | **Budget (2014-15):** INR 52 Crore

Piramal Swasthya, as a part of Piramal Foundation, provides healthcare that is accessible, affordable, and available to underserved populations in India. It endeavors to develop innovative primary healthcare solutions that focus on reproductive, maternal, newborn and child health, and non-communicable diseases.

Program Overview: Coverage: 12 states including Andhra Pradesh, Assam, Chhattisgarh
Full Time Program Staff: 1,726 | **Budget (2014-15):** INR 35.4 Crore

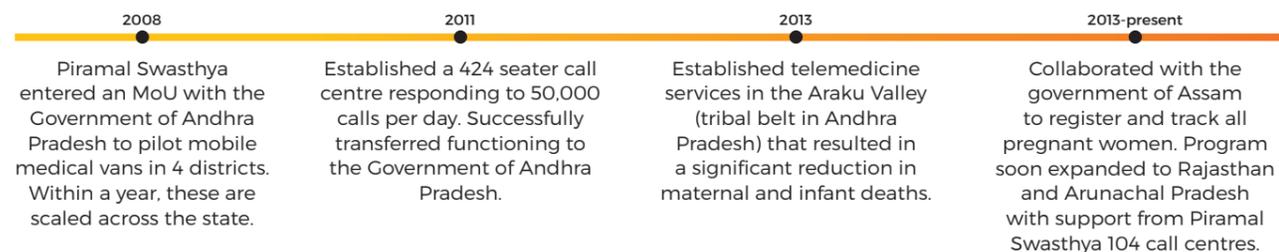
THE PROBLEM

Healthcare needs are not adequately met in remote parts of India where there tends to be poor access to qualified doctors, delays in seeking healthcare and poor service quality in public hospitals. This significantly contributes to maternal and infant deaths that are otherwise preventable.

PIRAMAL SWASTHYA'S RESPONSE

Piramal Swasthya improves access to and timeliness of healthcare through technology platforms across 12 states in India. These services help in meeting the healthcare needs of remote populations by improving access to medical professionals, and reducing cost of care and the burden on an overloaded public healthcare system.

How did it evolve?



What does it do?

Piramal Swasthya works to reduce maternal and infant deaths in under-served rural areas through technology platforms such as:

- **Telemedicine services** that connect women and children in remote areas to specialist doctors with the help of innovative examination devices such as Dox-in-Box – a diagnostic kit that digitally captures, stores and transmits eight vital signs. This device can be used by semi-professional health workers.
- **Health Information Helpline** that offers medically validated advice and information on government health schemes and on institutional deliveries. This is done through qualified medical professionals who use Piramal Swasthya's software to classify callers on the basis of risk and hence direct them to an appropriate healthcare provider.
- **Mobile Health Services** that provide vans with a location tracking system, electronic medical records, medical devices, medication and a health worker. This improves physical access to healthcare by providing pre- and post-natal care to women living over three kilometers from the nearest public health facility.

Key Interventions

End-beneficiaries

- **Health education, behavior change and demand generation**
- Reminders and alerts for improved adherence to treatment
- **Remote and home based care**

Health providers

- **Provider training and development**
- Job aids
- Communication and connectedness

Health system

- **Data driven efficiencies**
- Governance and accountability
- **Supply chain management**

What has it achieved?

- Piramal Swasthya's model has been successful in screening and identifying 69% of high risk pregnancy cases at the early stages in its project areas, thus prompting timely medical intervention.
- The programs were also able to increase the institutional delivery rate to 81% in the Scheduled Tribe (ST) dominated areas.
- Piramal Swasthya has leveraged technology to reach 56,00,000 mothers and children in the last one year.

What next?

Over the next few years, Piramal Swasthya will work to:

- Strengthen the Mother and Child Tracking System (MCTS) services in Arunachal Pradesh while implementing an MCTS pilot in two to three states – potentially in Karnataka, Maharashtra, and Chhattisgarh.
- Integrate and deepen interventions for adolescent girls through a screening and referral program focused on nutritional deficiency, Vitamin A and D deficiency, anemia risk, sanitation and HIV awareness.
- Develop a technology platform to create and track individual electronic health records of beneficiaries.



Piramal Swasthya's outreach team in Assam.

Quality Indicators

Leadership

- Paresh Parasnis, Head, Piramal Foundation, CSR Activities
- Erstwhile Executive Director and COO of HDFC Standard Life Insurance Ltd.
- Board of Trustees, Shoshit Sevi Sangh and Nadathur Trust.
- Fellow of Institute of Chartered Accountants of India.

Partnerships

- Long-term funders include Piramal Foundation and six state governments which contribute to organization's revenue through public private partnerships.
- Uranium Coal Fields of India in Karnataka and Eastern Coal Fields Limited in West Bengal to support the Mobile Health services.

Endorsements

- Times of India Social Impact Awards, Corporate NGO in Healthcare 2015.
- NASSCOM & KPMG Healthcare IT Awards 2011.
- NASSCOM Social Innovation Honors 2010 for 104 Health Information Helpline.

Voices from the Ground

"Before Piramal Swasthya began working in our village, it was very difficult for us to access good quality healthcare. Because of poor road conditions and lack of transportation, we had to walk through a long way to even meet with a doctor. Now, thanks to Piramal Swasthya's Telemedicine center, I can consult a senior gynecologist through video conferencing without having to travel a long distance."

– Sandhya Rani, beneficiary

Voices from the Team

"Piramal Swasthya endeavours to make primary healthcare available and accessible to the vulnerable populations of India. It aims at bridging the last mile healthcare service delivery gap through its mobility solutions and technology enabled delivery initiatives, and by supplementing and complementing existing government infrastructure/initiatives."

– Sridhar Upadhyay, Senior Vice President (HR, Quality and Corporate Responsibility)

SEWA Rural (Society for Education, Welfare and Action Rural)

www.sewarural.org



Organization Overview

Founded: 1980 | **Head Office:** Jhagadia, Gujarat | **Coverage:** Gujarat
Full Time Staff: 216 | **Budget (2014-15):** INR 7.7 Crore

SEWA Rural is a non-profit organization that provides healthcare to under-served, tribal communities in the Bharuch and Narmada districts of Gujarat. It works to address developmental challenges through a 150 bed tertiary care hospital, a community based healthcare project focused on mothers and children, a primary healthcare training center, and activities focused on life skills development for men, women and adolescents.

Program Overview: Coverage: Jhagadia, Gujarat
Full Time Program Staff: 30 | **Budget (2014-15):** INR 92 Lakh

THE PROBLEM

An ASHA's capabilities are not fully utilized because of limited training, lack of performance supervision and inadequate administrative support. This results in poor coverage of basic RMNCH+A services and hence, a neglect of high-risk conditions that contribute to maternal and infant mortality and malnutrition.



SEWA'S RESPONSE

SEWA Rural and Government of Gujarat improve Accredited Social Health Activist (ASHA) performance and supervision through a mobile-based application (ImTeCHO) that provides real-time data, activity scheduling, point of care decision support, and behavior change videos. It also trains ASHAs and supports Primary Health Centers (PHCs) in overseeing ASHAs' activities.

How did it evolve?



What does it do?

SEWA Rural's ImTeCHO (Innovative Mobile Phone Technology for Community Health Operations) program uses a mobile application to improve the performance of ASHAs, overcome performance bottlenecks and improve the coverage of RMNCH+A services. ImTeCHO is currently active in nine PHCs, across three tribal districts of Gujarat - Bharuch, Valsad and Narmada - and engages 280 ASHAs. Its key components are as follows:

A mobile phone application that is used by the ASHA as a job aid for:

- **Daily task scheduling:** Once the ASHA registers a beneficiary (pregnant woman or child), the system generates a schedule of home-visits and tasks that need to be completed.
- **Behavior change communication:** The application contains 11 brief video clips that address critical health issues such as breastfeeding and early newborn care. These are shown to the woman according to the stage that best suits her needs.
- **Diagnosis and risk stratification:** Each beneficiary's form contains checklist to remind the ASHA to perform and record recommended examinations. This information is linked to an algorithm that generates a probable diagnosis. Once diagnosed, the beneficiary is provided with treatment or referred to an appropriate provider. Management of the high risk cases is supported by a 24x7 helpline.

A desktop-based web interface that is used by PHC medical officers to:

- Track high risk cases and obtain information about critical indicators such as maternal and infant deaths.

Key Interventions

End-beneficiaries

- **Health education, behavior change and demand generation**
- Reminders and alerts for improved adherence to treatment
- Remote and home based care

Health providers

- **Provider training and development**
- **Job aids**
- Communication and connectedness

Health system

- **Data driven efficiencies**
- **Governance and accountability**
- **Supply chain management**

What has it achieved?

- The mid-term evaluation of ImTeCHO demonstrated that it has been highly effective in increasing ASHA coverage and improving health-seeking behavior amongst mothers. For example, in ImTeCHO-enabled villages, 92% mothers received at least three pre-natal visits by the ASHA in villages and 61% sought medical assistance from the ASHA for post-natal complications. However, in areas beyond IMTECHO's intervention, 65% mothers received adequate pre-natal care and only 9% mothers sought medical assistance from an ASHA.
- The previous iteration of SEWA Rural's community health project achieved a 74% reduction in maternal mortality and 39% reduction in infant mortality since 2003. It served 33,000 pregnant women and newborns.

What next?

SEWA Rural plans to:

- **Conduct a Randomized Control Trial (RCT)** to examine indicators such as effectiveness, efficiency and quality of care through ImTeCHO. The aim is to develop a focus on building evidence around mHealth solutions.
- **Expand mHealth coverage** through ImTeCHO to an additional 300 villages (population: 300,000) within Bharuch and Narmada districts in Gujarat.
- **Sustain work in existing areas and mainstream efforts in select PHCs.** Through this, it also aims to focus on disseminating results of its pilot study by documenting research findings, intensive advocacy, and development of teaching and learning material for health workers of other NGOs and the government.



Videos from ImTeCHO have significantly improved sharing of healthy practices among new mothers.

Quality Indicators

Leadership

- The leadership team comprises medical doctors with an academic background in community medicine from leading universities such as Johns Hopkins and Emory.
- The team also includes specialists such as surgeons, internists, gynecologists, ophthalmologists, pediatricians and public health experts.

Partnerships

- Partnered with the Gujarat government to share resources such as ASHAs and PHC staff.
- Funders include Government of Gujarat, Jamsetji Tata Trust, MacArthur Foundation, WHO, and Indian Council of Medical Research.

Endorsements

- Recipient of "Public Health Champion Award" by the WHO India office for sustained contribution to public health in India.
- Recipient of the "ICONIC" award for Social Impact by International Data Corporation, India.

Voices from the Ground

"ImTeCHO has enabled me to work more effectively. It reminds me about whom I need to visit and when is the right time to do so. This planner ensures that I don't miss any of my home visits. Also, I now receive my cash incentives on time."

- Nayedaben Vasava, ASHA from Timla, Gujarat

Voices from the Team

"The SEWA Rural team believes that most health workers want to do their best for their community. The ImTeCHO mobile phone application enables them to give their best through better support, motivation and supervision. This belief is based on learnings from over three decades of working at the grassroots."

- Dr. Pankaj Shah, Director, Community Health

Society for Nutrition, Education and Health Action (SNEHA)

www.snehamumbai.org



Organization Overview

Founded: 1999 | **Head Office:** Mumbai | **Coverage:** Greater Mumbai Metropolitan Area
Full Time Staff: 390 | **Budget (2014-15):** INR 16.6 Crore

SNEHA works towards improving the health outcomes of women and children in Mumbai's urban slums, through its maternal and newborn health, child nutrition, sexual and reproductive health, and violence against women interventions. It works with communities to cultivate positive health seeking behaviors while ensuring that local government providers are able to deliver critical health services to the most vulnerable populations.

Program Overview: Coverage: Greater Mumbai Metropolitan Area
Full Time Program Staff: 102 | **Budget (2014-15):** INR 2.8 Crore

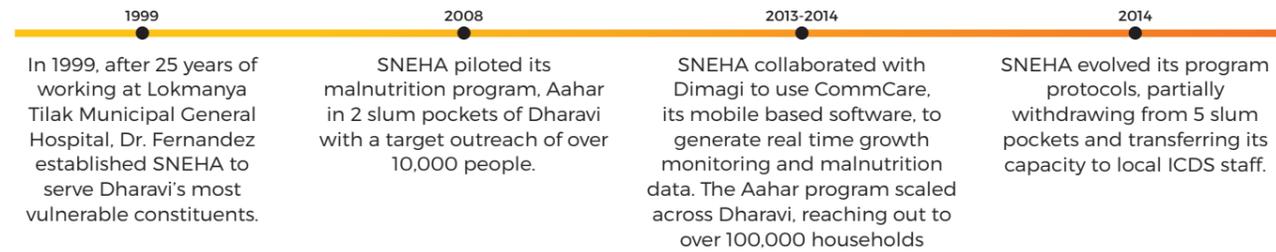
THE PROBLEM

Poor newborn care, lack of access to healthcare and infrastructural problems in Mumbai's urban slums create poor health and nutrition outcomes among children aged under-3 years, as deficient early growth significantly compromises their cognitive development and negatively affects future health.

SNEHA'S RESPONSE

SNEHA's community workers monitor the nutritional status of vulnerable children and provide mothers with health education and door to door counseling to affect health seeking and child feeding practices, while building the capacity of local Integrated Child Development Services (ICDS) staff through trainings, seminars and community events.

How did it evolve?



What does it do?

The Aahar program tackles malnutrition amongst children under-3 years through early screening, treatment and behavior change communication, along with training ICDS workers.

- SNEHA's team of Community Organizers (CO) provide **early identification and tracking** of vulnerable children through early screening and real time growth monitoring to track future nutritional outcomes. The COs provide door-to-door nutrition counseling, refer malnourished children for intensive nutritive care and promote community ownership through community events that promote good new-born care practices. SNEHA employs over 70 Community Organizers with mobile devices, who cover all of Dharavi's 10 slum pockets.
- SNEHA uses an **open source mobile data collection application**, CommCare to reduce lead times in data analysis and calculating real time nutritional grades, track screening information, and scale its anthropomorphic activities to regularly cover over 14,000 children and over 4,400 pregnant women in Dharavi. SNEHA has customized CommCare to suit its predefined impact assessment metrics, developing an inbuilt height for weight calculator.
- SNEHA adopts a **software based approach to its information management** and regularly invests in human capital which brings in specific technological skills to help SNEHA further push the scope of using technology based on ground interventions.

Key Interventions

End-beneficiaries

- Health education, behavior change and demand generation
- Reminders and alerts for improved adherence to treatment
- Remote and home based care

Health providers

- Provider training and development
- Job aids**
- Communication and connectedness

Health system

- Data driven efficiencies**
- Governance and accountability**
- Supply chain management

What has it achieved?

- The Aahar program has reached 100,000 households in Dharavi, screening over 25,000 children under-3 years for malnutrition, and counselling 4,200 pregnant women on antenatal care and young child feeding practices.
- SNEHA has reduced wasting (an indicator of acute malnutrition which compares the weight of a child to his or her relative height) in children under-2 years by 18% in Dharavi between 2011 and 2014.
- Provides continuous training and capacity building to over 500 government health workers, improving uptake of Government 'Take Home Rations' to pregnant women and children by 40%.

What next?

SNEHA plans to:

- Partner and build the capacity of NGOs to sustainably deliver malnutrition programs across geographies.
- Undertake a comprehensive end line study of the Aahar program, to comprehensively track and document program impact and learning, to enable SNEHA to become a thought leader in the sector.
- Transition its intervention to local government actors in a phased manner by progressively building their capacities and imbuing ownership of the community under them, which it is currently in the process of doing.
- Increase the use of tablets as a means of delivering behavior change modules along with creating consolidated case histories for every child with relevant historical health and nutritional information.



SNEHA's CO logging information from a home visit on her device.

Quality Indicators

Leadership

- Dr. Armida Fernandez is the founder trustee of SNEHA.
- Former dean at the Lokmanya Tilak Municipal General Hospital.
- She was honored as an Ashoka Fellow in 2004 and was the president of the National Neonatology Forum.

Partnerships

- Long-term funders include The Wellcome Trust, Ford Foundation, Breadsticks Foundation and the Sir Dorabji Tata Trust among others.
- SNEHA is the official partner of World Bank funded Integrated Child Development Scheme and partners with UNICEF and University College London.

Endorsements

- CNBC TV18 Inclusive India Award 2012 - Primary Health.
- Vodafone mobile for Good Award 2014- Technology.

Voices from the Ground

"We feel happy when SNEHA visits us. We feel a sense of belonging. SNEHA saved our daughter. Her weight gain now is good and for that we are forever grateful to SNEHA."

- Aahar Beneficiary

Voices from the Team

"SNEHA believes in creating evidence based models of health intervention. This is only possible with a strong focus on data collection, analysis and feeding back the findings into our interventions. Strong monitoring and evaluation of all our program interventions is part of the DNA of SNEHA."

- Vanessa D'Souza, Chief Executive Officer

Swasth Foundation

www.swasth.org



Organization Overview

Founded: 2009 | **Head Office:** Mumbai | **Coverage:** Maharashtra, Uttar Pradesh
Full Time Staff: 120 | **Budget (2014-15):** INR 4.4 Crore

Swasth provides affordable and accessible healthcare to urban slum populations through a network of financially sustainable health centers and community health programs. It leverages technology to create efficiencies and lower costs in the management and provision of treatment. It also develops technology solutions for partner organizations to streamline operations and improve maternal and child health outcomes.

Program Overview: Coverage: Maharashtra, Uttar Pradesh
Full Time Program Staff: 120 | **Budget (2014-15):** INR 1.2 Crore

THE PROBLEM

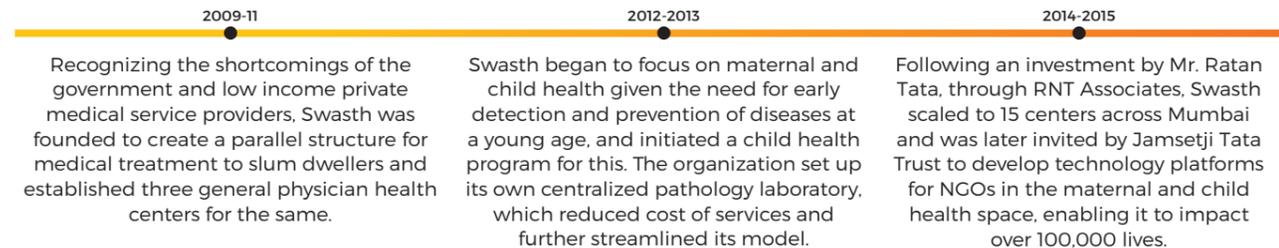
In addition to poverty, slum dwellers suffer due to dismal hygiene conditions, inadequate public health systems which lack a preventive focus, poor disease management, and expensive medical solutions which then lead to poor nutritional practices, disorders and diseases like anaemia with inter-generational effects.



SWASTH'S RESPONSE

Swasth has established 15 health centers to provide high quality, affordable and accessible, preventive and curative treatment to the poor. It has developed robust patient monitoring and management systems to tackle diseases like anaemia and improve nutrition outcomes through centers, community programs and partnerships.

How did it evolve?



What does it do?

Swasth developed a cloud based, healthcare management system known as Swasth Live in-house, which offers the following modules:

- Patient enrolment, identification and electronic medical records
- Supply chain, operations and inventory management
- Customer satisfaction monitoring and management
- Cash management and donor management

Swasth leverages technology to improve healthcare delivery systems for the poor, with a focus on maternal and child health through,

- **Partnerships:** It has developed customized systems for 21 NGOs in the maternal and child health space in Uttar Pradesh, and for government departments tackling malnutrition in Maharashtra, to track over one lakh beneficiaries for service provision and monitoring. Swasth Live is also used by four partners in Rajasthan, Tamil Nadu and Assam for streamlining operations.
- **Programs:** It provides free annual checkups and follow-up treatment through health camps to students from grade one to ten in community schools and centers as part of its child health program, initiated for early detection and prevention of diseases.
- **Health centers:** It operates a network of 15 health centers in the slums of Mumbai with 30% of its clinical diagnosis relating to anaemia, nutritional disorders and gynecology. Each center has a catchment population of 100,000 and provides quality primary health services for ten hours a day at 50% of market rates, resulting in better access and affordability for the poor.

Key Interventions

End-beneficiaries

- **Health education, behavior change and demand generation**
- Reminders and alerts for improved adherence to treatment
- Remote and home based care

Health providers

- **Provider training and development**
- Job aids
- Communication and connectedness

Health system

- **Data driven efficiencies**
- Governance and accountability
- **Supply chain management**

What has it achieved?

- Swasth has successfully used technology to service over 300,000 customer visits since 2009, while maintaining high standards of customer satisfaction and low cost of services provided. It has recorded a satisfaction rate of 92% among beneficiaries, a patient recovery rate of 90% and customer savings of over INR 5 Crore.
- Over 80,000 maternal and child health cases have been treated between 2011 and 2015, in urban slums, but recognizing the need to address similar problems in rural India, Swasth has developed to track and monitor the health status of over 16,000 pregnant women, 65,000 children and 35,000 adolescent girls across 1,200 villages in Uttar Pradesh and over 10,000 children for severe malnutrition in Maharashtra.

What next?

Swasth aims to ensure access to affordable quality health services to 10 million low income individuals by 2018 by refining its model and expanding outreach, for which it will work towards diversifying its sources of funding, building its team and collaborating with other organizations. Key plans can be categorized under the following heads:

- **Scaling of health centers:** Conduct research to enable a health center to break-even in two years so as to facilitate scaling from 15 Swasth health centers across the slums of Mumbai to 52 over the next two years.
- **Child health program:** With a budget of INR 3.6 Crore, expand outreach of the program through community schools and health centers. It will focus on testing for anaemia and nutritional disorders, promoting healthy habits, and providing free medicines, follow up treatment and electronic health reports to 30,000 children by 2018.



A primary health centre established by Swasth in a Mumbai slum with a catchment population of one lakh people.

Quality Indicators

Leadership

Sundeep Kapila, Founder and CEO

- Co-founded Swasth and has been with the organization through its seven year journey from 2008 to 2015.
- Has worked with the India practice of McKinsey and Company for over six years, specializing in the healthcare and development sectors.
- Completed B. Tech, Computer Science from IIT Bombay.
- Selected as a participant, Leadership Program, Dasra Social Impact and Harvard Business Publishing, 2015.

Partnerships:

- Funding: Jamsetji Tata Trust, USAID, Cipla Foundation.
- Implementing: People's Action for National Integration (PANI), Swayam Shikshan Prayog (SSP).

Endorsements:

- Member (selected globally), Social Entrepreneurship Accelerator at Duke (SEAD), 2014.
- Member (selected globally), Learning Collaborative, convened by Results for Development Institute (R4D) through Center for Health Market Innovations (CHMI).

Voices from the Ground

"Now, I have my own identity in the community. I feel confident. I now know how to communicate to our people on healthcare issues and use computers",

says **Afsana Ansari**, who has received a formal education only up to Grade X and was a home maker in a low-income slum community in Mumbai. Swasth aims to recruit its staff locally from the communities it operates in, to empower and build strong bonds with beneficiaries, and hired and trained Afsana to be a Community Health Worker. She has since been promoted and now works as an Area Health Coordinator.

Voices from the Team

"The health of a child is of paramount importance as it impacts their long term well-being, learning abilities as well as future opportunities. Most barriers to health do not show up explicitly and as such proactive and comprehensive health check-ups are the only way to detect and remove such barriers to a healthy and successful life. Hence, this has been chosen as a core focus area at Swasth."

– Sundeep Kapila, Founder and CEO, Swasth Foundation

World Health Partners (WHP)

www.worldhealthpartners.org

**Organization Overview****Founded:** 2008 | **Head Office:** New Delhi | **Coverage:** Bihar, Uttar Pradesh, Kenya**Full Time Staff:** 328 | **Budget (2014-15):** INR 72 Crore

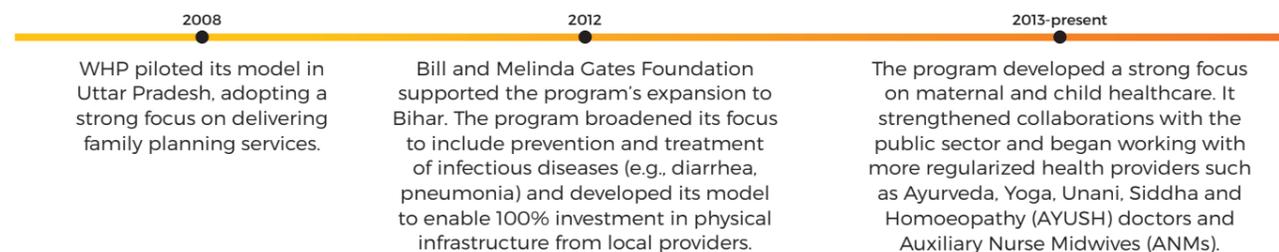
WHP harnesses local market forces to provide rural and vulnerable communities in India and Kenya access to health and reproductive health services. It leverages existing local infrastructure such as informal and formal healthcare providers and supply chains, and utilizes advanced communication and medical technologies to establish comprehensive, large-scale, and cost-effective service delivery networks.

Program Overview: Coverage: Bihar, Uttar Pradesh**Full Time Program Staff:** 311 | **Budget (2014-15):** INR 64 Crore**THE PROBLEM**

Access to quality health services is an enormous challenge for over two-thirds of India's population living in rural areas with weak infrastructure, inadequate material and skilled resources, and extreme poverty. Women and children are disproportionately affected by this lack of access.

WHP'S RESPONSE

WHP brings quality, affordable primary and preventive healthcare to rural communities through a social franchising model, using telemedicine and business relationships to link informal rural health providers to urban specialists, health facilities and a supply of essential medicines.

How did it evolve?**What does it do?**

WHP works with informal rural health providers to create an incentive based, tiered and 'Sky' branded social franchise model with a 70% focus on family planning and RMNCH+A services. Its model involves:

- **Identifying and training local providers:** WHP identifies and trains village-level healthcare providers, rebranded as Sky providers, for three to six days on areas such as diagnostics, treatments, recording medical data, communication with patients, and basic computer skills. WHP has trained 14,318 Sky providers till date.
- **Facilitating medical consultation:** Sky providers offer patients consultations with doctors based at WHP's central medical facilities in Delhi and Patna, either through their mobile phones or via telemedicine provisions at a nearby Sky center which is equipped with a laptop, webcam, Internet connection and a diagnostic kit to measure basic medical parameters. To date, WHP has connected 157,262 rural patients to qualified urban doctors through tele-consultations.
- **Enabling medical referrals:** WHP facilitates formal tie-ups between Sky centers and nearby hospitals and diagnostic centers.
- **Maintaining a supply chain:** WHP supplies its self-branded generic medicines (SkyMeds) to remote villages to ensure affordable access and immediate availability of basic pharmaceuticals.
- **Social marketing:** WHP builds community awareness around areas such as maternal health and family planning, motivates caretakers to seek timely treatment, and promotes Sky providers by using media such as mobile video vans.

Key Interventions**End-beneficiaries**

- **Health education, behavior change and demand generation**
- Reminders and alerts for improved adherence to treatment
- **Remote and home based care**

Health providers

- **Provider training and development**
- Job aids
- Communication and connectedness

Health system

- **Data driven efficiencies**
- Governance and accountability
- **Supply chain management**

What has it achieved?

- Through its Sky network, WHP has provided antenatal care to 155,134 women till date, including 34,852 women last year (2014-15).
- In 2014-15, WHP treated 1,002,647 and 1,785,624 children for pneumonia and diarrhea respectively through its Sky network.
- Through supplying medicines and facilitating access to high quality care, WHP has reduced families' out-of-pocket expenses by 25% and 46% for treating childhood diarrhea and pneumonia respectively.

What next?

- WHP is looking to broaden its geographic reach by covering all districts of Bihar and Uttar Pradesh and expanding its program to Rajasthan, Madhya Pradesh, Chhattisgarh, and Odisha. It also plans to expand to countries in East Africa such as Zambia and South Sudan.
- WHP aims to extend its family planning and RMNCH+A programs in Uttar Pradesh by collaborating with the government of Uttar Pradesh with whom it signed a Memorandum of Understanding in July 2015.
- WHP plans to phase-out the basic mobile-based component of its program and garner a stronger focus on facilitating medical consultation through more advanced technology such as General Packet Radio Service (GPRS) enabled devices.



A Sky provider checking a child's pulse using a device that transmits data to city-based doctors for diagnosis.

Quality Indicators**Leadership**

- Gopi Gopalakrishnan, Founder and President
- Selected to be an Ashoka India Fellow (2015).
 - Received numerous awards including the Schwab Foundation Entrepreneur of the Year award (2013), Skoll Award for Social Entrepreneurship (2013), and Chivas Social Entrepreneur of the Year award (2014).
 - Served as a member of India's Population Commission.
 - Received a civilian honor from the Government of Vietnam while serving as Country Director of DKT International in Hanoi.

Partnerships:

- Funding: Bill and Melinda Gates Foundation, Merck for Mothers.
- Implementing Partners: Pathfinder International, Government of Bihar, Government of Uttar Pradesh.

Endorsements:

- First place, IT @ Networking Awards (2011).
- Covered in several prestigious publications including Harvard Business Review and The Huffington Post.

Voices from the Ground

"My daughter drastically lost weight and was constantly coughing. Being a vegetable vendor and the sole bread earner of a family of six, I am financially broken. WHP's field officer identified Gudiya through the help of a Sky provider. She is now getting regular consultation and tests from WHP's network laboratories, and free anti TB drugs from a network chemist."

– Ram Sagar Poddar, Akhara Gali, Dighaghat, Patna

Voices from the Team

"In the coming years, WHP will be taking more confident steps, enabling us to provide viable solutions to health challenges. WHP is increasingly engaging with the public sector, applying systems and technologies that have been developed to harness private sector market resources. After all, every resource is a national resource and needs to be leveraged to address the basic health needs of the community, wherever they are."

– Gopi Gopalakrishnan, President, WHP

ZMQ Development

www.mirachannel.org



Organization Overview

Founded: 2012 | **Head Office:** New Delhi | **Coverage:** Haryana, New Delhi
Full Time Staff: 49 (non-profit & for profit) | **Budget (2014-15):** INR 87 Lakh

ZMQ is structured as a hybrid model with a for-profit entity, ZMQ Technologies Pvt. Ltd, and a non-profit entity, ZMQ Development. Both entities aim to use Information and Communication Technologies (ICTs), especially mobile technology, to provide information and services to isolated, marginalized and rural communities to address various development and healthcare gaps. In India, ZMQ currently works in New Delhi and Haryana.

Program Overview: Coverage: Haryana

Full Time Program Staff: 26 | **Budget (2014-15):** INR 66 Lakh

THE PROBLEM

Maternal and newborn mortality rates are high in Mewat District, Haryana. This is due to lack of awareness for mothers about life saving behaviors during the pregnancy and postpartum period, and poor quality of services by frontline health workers who are often overburdened and under-trained.

ZMQ'S RESPONSE

ZMQ works with government service providers and community health workers in Mewat District to improve access to healthcare information and services to pregnant women and mothers. It uses mobile technology to increase awareness on essential health practices and to facilitate better healthcare delivery.

How did it evolve?



What does it do?

MIRA Channel is an integrated mobile lifeline channel, which provides comprehensive information to rural women on critical health issues such as prenatal care, immunization and newborn care. The MIRA Channel can be customized in the following ways:

- **MIRA individual application:** The application is set up on the mobile phones of women in SHGs for self-management of health. This has been implemented in partnership with the Mewat Development Agency in six SHG federations. Trainings are given to the SHG group leaders who work with the women within their groups to enhance health awareness. Currently, it has a subscription of 60,000 women and girls.
- **MIRA worker toolkit:** ZMQ has established a chain of health workers, primarily adolescent girls from the community. MIRA workers are trained for six weeks on public health, and using the MIRA channel, each MIRA worker identifies households which have pregnant women in a given village. They visit the women weekly to provide timely advice using the mobile based iconic graphic and audio tools and collect symptomatic data. This data goes to a server and ZMQ's health workers respond via mobile phone if referral services are needed. Currently ZMQ is present in one block in Mewat district with approximately 10 MIRA workers.
- **MIRA-Primary Health Center connect:** This application is in pilot stage and works in the same manner as the MIRA worker toolkit, however it is customized for government health workers (ASHA and ANMs).

Key Interventions

End-beneficiaries

- **Health education, behavior change and demand generation**
- Reminders and alerts for improved adherence to treatment
- Remote and home based care

Health providers

- **Provider training and development**
- **Job aids**
- **Communication and connectedness**

Health system

- Data driven efficiencies
- Governance and accountability
- Supply chain management

What has it achieved?

- Since 2012, the MIRA program has reached out to 266,000 women and girls. In 2014-2015, 177,000 women, adolescent girls and children were reached - 47,000 of these through MIRA workers, and 130,000 women as part of SHGs.
- In 2014-15 in the project intervention area, there has been an increase in antenatal care visits by 55%, institutional deliveries by 49% and immunization rates by 41%.
- ZMQ has extensive experience in technology development through its for-profit arm. As a consulting organization which designs and develops ICTs and technologies, ZMQ has engaged with prominent partners such as UNDP, UNESCO, USAID, Johns Hopkins, FHI360, Sangath, CORE Group Polio Program, and PCI.

What next?

ZMQ aims to focus on the following areas over the next few years:

- **Scaling:** ZMQ plans to scale the program within India in Haryana and other states including Rajasthan. This year, ZMQ also plans to expand the MIRA program to Uganda and Afghanistan through partnering with local non-profits.
- **Organization strategy:** Going forward, the MIRA program will be the core focus for ZMQ. As the MIRA program has several different models, it plans on creating a strategy to enable effective scale up of these models.
- **Diversify the application:** ZMQ aims to diversify the MIRA application so that it caters to other needs of women and adolescent girls, such as access to finance and entrepreneurial skills training.



MIRA Workers, Mewat District, Haryana.

Quality Indicators

Leadership

Hilmi and Subhi Quraishi, co-founders

- Hilmi Quraishi is an Ashoka fellow.
- Subhi Quraishi is a member of the Global Task Force on mHealth in Tuberculosis at the World Health Organization.

Partnerships

- Funders: Millennium Alliance, IKP Knowledge Park.
- Government partnerships: National Health Mission Haryana, National Livelihood Mission Haryana, for implementation of the MIRA program.
- Other linkages: Games for Change, for the creation of behavior change communication games, and Nokia.

Endorsements

- Recipient of the Millennium Alliance Awards by USAID-FICCI in 2013 and 2014.
- Received the Mobile for Good Award by Vodafone Foundation in 2013.

Voices from the Ground

"Neither my mother nor my sister was with me during my pregnancy, or after giving birth. It was the MIRA worker, Savita, who helped me. After giving birth to my baby girl, though my mother was not present, the MIRA mobile application was with me throughout, just like a friend, guiding me with information to keep myself and my newborn baby healthy. I highly suggest that the people of my community use this application for their own benefit."

- Sakina, a beneficiary who used MIRA during her pregnancy

Voices from the Team

"MIRA works with semi-literate rural women using engaging, interactive decision making tools and trackers. Using an RMNCH+A approach, MIRA not only empowers pregnant women and new mothers, but also builds capacities of adolescent girls who will be wives and mothers tomorrow. MIRA is a 'one stop-channel' for all health needs of women and girls in rural areas, making it an ideal platform for donors to support it and see quick impact."

- Hilmi Quraishi, Co-Founder

APPENDICES

Appendix I

Dasra's expertise lies in recognizing and working with non-profits that are most impactful and scalable in their fields. Dasra strongly believes that the strength of any organization comes from its people, and has ingrained this philosophy in its due diligence process whereby an organization is assessed not just on the basis of its program strength but also on the potential of its team, leadership, and management.

In order to identify successful organizations that have the potential to create impact at scale Dasra follows a comprehensive three stage due diligence process.

Phase I – Sector Mapping

- The process involves undertaking an exhaustive sector mapping and compiling a list of all the non-profit organizations working in the sector.
- Based on quantitative and qualitative secondary research, references from previous experience, and inputs from sector experts, the work carried out by the organizations is categorized under specific interventions.
- Organizations having programs with the most scalable and impactful interventions are screened from this universe against criteria such as – program focus, outreach, team, budget, scale and impact, and growth plan.

Through sector mapping for this report, Dasra mapped ~104 non-profits across India.

Phase II – Detailed Assessment of Organizations based on phone calls and site visits

- Dasra conducts a detailed assessment on the screened organizations by making a one-two day site visit to understand the work being done on the ground and spend time with the leadership and management of the organization
- An organization profile is prepared to capture the current work and achievements of each organization and provide a sense of the future growth of the organization as a whole
- Organizations are rated using the Dasra Capacity Assessment Framework (DCAF), a tool that Dasra has developed over the years to evaluate organizations against three key areas – leadership potential, organization strength, and program effectiveness.

Through phone calls, Dasra assessed 59 non-profits using technology to improve RMNCH+A. Seven of these were chosen for site visits.

Phase III – Final Shortlisting

- Dasra Capacity Assessment Framework (DCAF) and organizational profiles are used to discuss the program strength, organization potential, and areas where Dasra can add value through its capacity building support
- Members from Dasra's advisory research and diligence team as well as senior management participate in the shortlisting process to identify 8-12 high impact and scalable non-profits to be profiled in the report.

10 non-profits and one social business were shortlisted for being profiled in this report, based on the strength of their programs to improve RMNCH+A, the potential of their organization and vision of their leadership.

Dasra re-engages with the final shortlisted organizations to create robust growth plans, and works with the organizations to explore funding opportunities. Dasra also offers peer learning and capacity building opportunities to these organizations through Dasra's two-three day, residential workshops.

Appendix II

Dasra would like to extend its sincere thanks to the following organizations for their participation during the Dasra Capacity Building Workshop in October, 2015 or their engagement with the Dasra time during the diligence process.

	Organization	Website
1	ARMMAN	www.armman.org
2	CARE	www.careindia.org
3	Catholic Relief Services	www.crs.org
4	Centre for Catalyzing Change	www.c3india.org
5	Dimagi	www.dimagi.com
6	Foundation for Research in Health Systems (FRHS)	www.frhsindia.org
7	Medic Mobile	www.medicmobile.org
8	Operation ASHA	www.opasha.org
9	Piramal Swasthya	www.piramalswasthya.com
10	Real Medicine Foundation	www.realmedicinefoundation.org
11	Sarathi	www.sarathidevfo.org
12	SEWA Rural	www.sewarural.org
13	Society for Nutrition, Education and Health Action (SNEHA)	www.snehamumbai.org
14	Swasth	www.swasthindia.in
15	Swasti	www.swasti.org
16	Swayam Shikshan Prayog (SSP)	www.sspindia.org
17	Vatsalya	www.vatsalya.org.in
18	World Health Partners	www.worldhealthpartners.org
19	ZMQ Development	www.zmqsoft.com