



CASE STUDY

Continuum of Care Services: A Holistic Approach to Using MOTECH Suite for Community Workers

Providing coordinated care across the continuum of maternal and child health in Bihar, India

PROJECT OVERVIEW

CARE India, Dimagi and Grameen Foundation deployed the MOTECH Suite to improve delivery of family health interventions and quality of health services in rural India. The system, called the Continuum of Care Services (CCS), offers a comprehensive tool for mobile workers, providing coordinated care for one million people in Bihar, India. Its aim is to cover the 1000-day window of pregnancy through the child's second year of age, to deliver 'the right messages at the right time' to pregnant women and newborn children within the community.

At a Glance

Implemented: India, 2012

Partners: Bill & Melinda Gates Foundation, Government of Bihar, CARE India, BBC Media Action, Grameen Foundation, Dimagi

Sectors: Maternal, Newborn & Child Health including Nutrition (MNCHN)

Features: Decision support, client management, data collection & sharing, mobile reports, home visit scheduler, call center, referral system, EDD & BMI calculators, multimedia, & performance dashboards

Impact: Over 50% increase in number of women visited by a FLW within 24 hours after delivery

BACKGROUND

Located in northern India, Bihar's population of 104 million faces some of the poorest health indicators and highest levels of poverty in the country. Over 42% of the state's children under the age of five are underweight. Maternal health is at risk from steep maternal mortality rates, India's highest fertility rate, and limited access to antenatal care. Currently, only 1 out of 3 pregnant women receive appropriate care at a clinic. To address challenges related to MNCHN, the Bill & Melinda Gates Foundation and the Government of Bihar entered into a five-year partnership in 2010 centered on achieving Millennium Development Goals 4 and 5. The resulting Ananya Partnership currently reaches 30 million people and works with 46,000 health workers. With support from CARE India, these efforts have been successfully integrated into the government's overarching MNCHN intervention in Bihar, under the Integrated Family Health Initiative (IFHI). IFHI, specifically, seeks to improve the health of pregnant women, infants and children less than two years of age, across the continuum of care, by enhancing essential health and nutrition services.

In support of IFHI, CARE India is working to identify, test, and scale up multiple innovative solutions for improving delivery of impactful family health interventions. One such innovation is the Continuum of Care Services (CCS), where mobile technology has been leveraged to increase the number of

client-provider contacts and quality of service to improve MNCHN care. It covers a population of over 400,000 through 35 health sub-centres in four blocks of Bihar with a vast network of Frontline Workers (FLWs) and supervisors. Before CCS, their impact was challenged by a lack of coordination of FLWs in these catchment area; limitations of paper-based tools for planning their work; poor job-aids for counseling; a lack of supportive supervision from supervisors currently unable to monitor FLWs' services and patient care; and the unavailability of real-time data for program management.

As a result, CCS was created through a collaborative effort of CARE India, Dimagi, and Grameen Foundation, designed to increase the capacity of over 500 frontline workers (FLWs) to deliver essential health and nutrition services to underserved women and children.

CCS was launched in 2012 in Saharsa district of Bihar, and includes a two-year randomized control trial (RCT) that will directly measure the effect of mHealth tools' impact on health indicators.

CONTINUUM OF CARE SERVICES

The CCS mHealth solution aims to provide holistic care to women and children based on unique needs in respective stages of pregnancy, delivery, post-delivery, and newborn care. It includes a suite of mobile applications with multiple modules that have been built upon the IFHI



framework for MNCHN service provision, extending care at critical junctures for both mother and child. **For 1000 days, FLWs monitor patients throughout three stages of care:**

1. birth & emergency preparedness, skilled birth attendance, post-partum care, essential newborn care, and identification and special care for weak newborns;
2. exclusive breastfeeding for the first six months and childhood immunizations;
3. continued breastfeeding, initiation of complementary feeding, and final coverage of childhood immunization up to the child's second year.

Five primary mobile forms are linked with each stage of care:

- Birth preparedness
- Delivery
- Post-natal care
- Exclusive breastfeeding
- Complementary feeding

These forms incorporate checklists, diagnostic assessments, record keeping, and counselling support to help FLWs deliver targeted care in their communities.



A SOPHISTICATED NETWORK OF FRONTLINE WORKERS

CCS works with multiple cadres of workers across the Government of Bihar's Ministry of Health and Family Welfare and the Ministry of Women and Child Development. Each worker uses a unique mobile application specific to their different responsibilities, designed to reflect where they lie within the frontline health management structure. Starting from the field level, this system of care incorporates:

1. Accredited Social Health Workers (ASHA)
2. Anganwadi Workers (AWW)
3. Auxiliary Nurse Midwives (ANM)
4. Block Health Managers (BHM)
5. Lady Supervisors (LS)
6. Child Development Program Officer (CDPO)

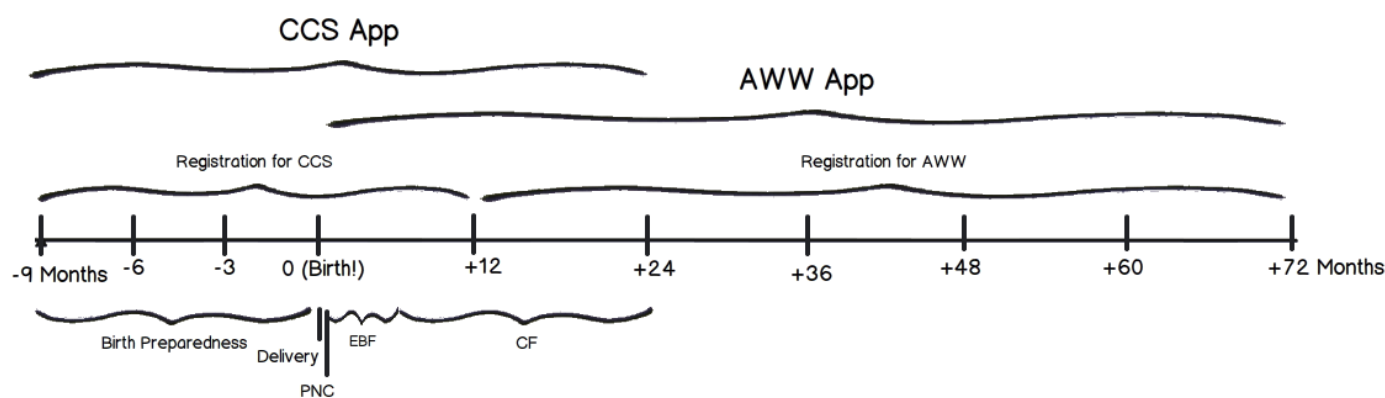
The ASHA is a volunteer frontline health worker, which among other

tasks, has the mandate of tracking all pregnancies in their catchment area (roughly 1 per 1000 people) and recruiting people in the community to come to monthly vaccination days. These ASHAs are a diverse group of women in terms of age, education, literacy, and previous experience with mobile technology. ASHAs team with the AWW in her catchment area, who is primarily responsible for comprehensive early childhood development, feeding, and educating children. Together, they form a team to provide care for a given area within a health sub-centre. Each health sub-centre covers a catchment area of 5,000-15,000 individuals, which is covered by 5 to 15 different teams of ASHAs and AWWs. The AWWs are supervised by Lady Supervisors (LS), under the broader supervision of a Child Development Project Officer, from the Ministry of Women and Child Welfare. Similarly, the ASHA is supervised by

an ANM, under the broader supervision of the Medical Officer In Charge (MOIC) and Block Health Manager (BHM), of the Ministry of Health.

DIVERSE ROLES, UNIQUE TOOLS

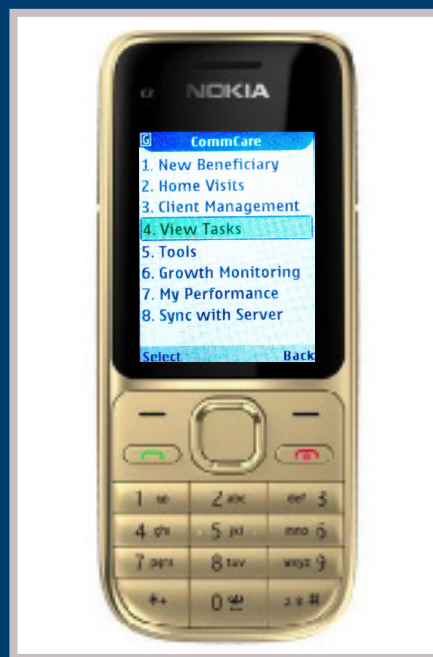
- **ASHA Application:** A specific app to track pregnancies and children up to 2 years of age that is used by both ASHAs and AWWs.
- **AWW Application:** An additional app on AWWs' phones to track specific tasks, such as daily attendance, tracking rations delivered, monitoring growth charts, and registering & tracking children from birth to age six.*
- **Supervisor Application:** Used by ANMs and LSs, this app tracks FLWs' performance via custom reports that are easily viewable on a mobile phone.
- **Manager Application:** Used by BHMs and CDPOs to track overall health sub-centre performance.



Sharing Cases Between FLWs

Care sharing allows AWWs and ASHAs to share the same case list, in order to coordinate care for each case within their catchment area. All FLWs use the same application, but a client registered or tracked with one team member's application is shared with the others. This feature enables coordination of home visits, and allows advanced users to support less-advanced users. Furthermore, this data is aggregated and shared with the ANM, who supervises the overall care team.

This sharing is illustrated by the integration between the CCS and AWW applications, which follows the timeline shown above. The CCS application covers pregnant cases, and mothers and children until the end of the continuum of care (age 2), after which the mother and child cases are transferred to the AWW application to be tracked until 6 years of age*. Data is synced on both FLWs' devices until the 2-year mark, when the case becomes the sole responsibility of the AWW.





THE TECHNOLOGY

CCS supports case management across the continuum of care, and adapts the type of care due at each stage based on patient history from previous visits, decisions on future family planning, and how many children are delivered. CCS includes several elements of the MOTECH Suite including CommCare and the MOTECH HUB server.

CCS is designed to do more than provide counselling, protocol adherence, and data entry. It also provides tools that meet the needs of the FLWs' daily jobs; including, **a home visit scheduler** which prioritizes which cases need to be seen and when, as well as what type of visit needs to be conducted by the FLW; **form filtering** to only show FLWs the forms that need to be filled out at a specific time; **referral and emergency contact information** specific to each FLW and catchment zone, which is displayed if any danger signs are reported; **color coded icons** in the case list to display an individual child's growth and nutrition over time based on weight for age z-scores; and **a 'due list'** that acts to alert the FLW which patient is due for different types of vaccinations at upcoming monthly vaccination days; and allows immunizations to be tracked and recorded quickly during these sessions.

TASK SCHEDULING

The vaccination and task scheduling functionality is enabled by the integration between CommCare and MOTECH HUB server. This integration creates small cases of care due for a specific patient which are then synchronized with the CommCare handset application. These cases leverage the scheduling flexibility and power of the MOTECH HUB, which applies an immunization schedule to know when immunizations are due for each child based on the case history and the national immunization protocols.

The MOTECH HUB serves multiple functions, including the storing of all master patient information, providing the capability to interface with existing government databases, and provides a reporting engine based on all data submissions. Data is collected in such a way as to easily integrate with the Mother and Child Tracking System (MCTS), India's national database to track pregnancies and newborns.

PERFORMANCE MONITORING

The CCS aims to use mobile technologies to reinforce, and improve, the existing health infrastructure in India. FLW Supervisors, including Auxiliary Nurse Midwives (ANMs), Lady Supervisors, and Block Health Managers (BHM)s are given mobile

applications designed specifically for higher level care providers with one primary component: to easily view information about how the workers they supervise are performing via quantitative, up to date information.

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

-FLW

The ANM accesses health indicator-based performance data via her mobile app, including deliveries due in the next 30 days, the number of visits performed on time, and which clients require more follow-up. The Manager app, similar to the Supervisor app, displays the same performance data aggregated for each health sub-centre. The reports appear in real-time along with graphs indicating good or bad performance. A subset of these indicators is fed back to the FLW app, so they, too, can view their personal performance.

TECHNICAL SUPPORT

Dimagi, Grameen and CARE India together created a series of applications aimed specifically at technical support. Starting with a call center, an agent is available for support to FLWs, providing initial technical troubleshooting support and attempts to solve the issue. If unsolvable via the phone, the issue then is escalated to ICT support staff on the ground, and a description of the issue and next steps appear on their phone. A third tier of administrative support is available for issues that have yet to be solved, provided via a web interface to view and update issues. This system has been critical to providing adequate support for the existing deployment, and tests out support methods for future scale.

IMPLEMENTING CCS IN SAHARSA

Launched in July 2012, the CCS was implemented in Saharsa, Bihar. It was deployed alongside a 2-year RCT assessing the impact of FLWs using CommCare to improve health outcomes in maternal and child health in the area. The site currently has over 550 FLWs using the system, supported by 58 supervisors and 12 managers, aiming to deliver health and nutrition services to a population of 400,000.

The applications' content was developed by CARE India, to support the creation of content and protocols, and

BBC Media Action, who developed multimedia to match the style of their Mobile Kunji and Kilkari programs.

The ongoing RCT is designed to compare 35 health sub-centres of FLWs (including ASHAS and AWWs) that are using CCS against 35 health sub-centres of FLWs using paper-based tools with the same protocols. To facilitate technology adoption and ensure CommCare-using ASHAs do not systematically receive more supervision and support than non-CommCare using ASHAs, both groups of ASHAs have received content training from qualified and experienced CARE staff. Thus, the RCT can strive to determine whether any differences in visit quality and experience can be attributed to use of the mHealth system.

FLWs, supervisors, and managers have been equipped with mobile phones, along with field support and training, after an initial pilot field-tested and informed the final applications' design. The system was implemented in 35 health sub-centres after 10 days of training over the course of three months.



"My ability to convince mothers has improved greatly with the mobile phone."

-Barasher, AWW

Feature Spotlight

The Due List

The Due List provides a case list of mothers and children due for care at monthly Vaccination, Health and Nutrition Days (VHND). It fills two roles, 1. creates a list of clients to mobilize for upcoming VHNDs and 2. provides a quick form to update the immunization record of each patient during VHND. FLWs can filter the list by upcoming VHNDs, such as 'tomorrow' or 'in 5 days', and share the list between teams to coordinate mobilizing cases in their respective catchment area.

This feature is enabled by the system's integration with MOTECH Hub. CommCareHQ and the MOTECH Hub servers share information to update cases and create a reporting engine based on data collected. The MOTECH Hub then applies an immunization schedule to know when immunizations are due for each child or mother based on the case history and the national immunization protocols. Multiple immunizations can be displayed for each case, as well as the number of days until the end of the vaccination window.

1.

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EVALUATION & RESULTS

A comprehensive evaluation of CCS is being conducted in 2014, by a third party company, Mathematica. Preliminary analysis of the CommCare data illustrate the mobile tool's positive effects, including an increased number of pregnant women registered at the early stage of pregnancy, correctly receiving 90 IFA tablets, and accessing skilled care at birth. These early results also demonstrate a substantial leap in the percentage of women visited by a FLW within the first 24 hours of delivery from **6.7%** to **59.5%** in less than one year.

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Alongside Mathematica's current evaluation, Dimagi and CARE India conducted a short study to explore the impact of CCS on the quality and experience of care via observing a small number of ASHAs with their clients. The study also focused on whether different ASHA characteristics, such as literacy and education, affect ASHA adoption of the tool and the quality and experience of

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care directly. Among many findings, results show that higher levels of CommCare adoption are significantly associated with higher quality and experience of care. For instance, the ASHAs who used CommCare most frequently scored **33.4%** higher on visit quality and **24.7%** higher on visit experience, compared to ASHAs who used CommCare least frequently.

Amongst other factors, the effect depended on how much ASHAs utilize audio, video, and images in CommCare during home visits. It also found that non-CommCare users often had short and incomplete visits, targeting care to the immediate state of mother and child, rather than the full continuum of care. From these visits, CCS appears to increase the comprehensiveness of home visits and instances of accurate counselling. As RCT results are finalized, CARE India is proposing to scale the system within Bihar, while continuing to pursue integration with the state's MCTS.

MOTECH SUITE 2014
motechsuite.org

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MOTECH SUITE is a set of Open Source technologies from a consortium of partners who have recognized that their complementary software efforts can address core needs of mobile health.

