



## CASE STUDY

# World Vision: Deploying MOTECH Suite to Support Global MNCH & Nutrition Programs

*In partnership with Dimagi and Grameen Foundation, World Vision has developed customizable mobile health applications for scale across their global programs.*

## PROJECT OVERVIEW

In an effort to supplement their global health and nutrition programs with mobile technology, World Vision has partnered with Dimagi and Grameen Foundation to deploy MOTECH Suite. To date, World Vision has adapted and contextualized five standardized mobile health (mHealth) applications in ten countries in Africa, India, South and Southeast Asia, with plans to start deployment to six more in 2014. These programs utilize the applications for maternal, neonatal, and child health and nutrition, which are designed to support Frontline Health Workers (FHWs) to deliver these services more efficiently. The solution serves as a job aid and monitoring tool, and includes components to reinforce intervention protocols. The applications leverage standardized content and collaborative design, enabling support for FHWs and potential for stronger service delivery at a global scale.

## At a Glance

**Implemented:** 2008 - ongoing

**Countries:** Afghanistan, Burundi, India, Indonesia, Mozambique, Niger, Sierra Leone, Sri Lanka, Uganda, Zambia

**Future Countries:** Mali & Chad

**Sector:** Maternal, Neonatal, and Child Health (MNCH) and Nutrition

**Features:** Global application templates & content; Z-score calculations for Weight-for-Age, Weight-for-Height, Height-for-Age, MUAC; Growth charts; Advanced referral system; Excel dashboard & custom reports; & SMS reminders



## BACKGROUND

World Vision is a leading humanitarian organization committed to improving and sustaining the wellbeing of children and mothers around the world. In addition to leading community development and emergency relief programs, World Vision aims to contribute to the global reduction of maternal and under-five mortality and improve the health and nutrition of women and children in over 100 countries. With a 63-year history of implementing relief, development and advocacy programs globally, World Vision brings more than 25 years of technical leadership in the international development and public health fields and currently invests more than US\$400 million annually in maternal and child health, in contribution toward attainment of Millennium Development Goals 4 (reducing child mortality), 5 (improve maternal health) and 6 (combat HIV/AIDS, malaria and other diseases).

The organization's Global Health strategy is founded on evidence-based and cost-effective preventive practices. World Vision is working to scale up a minimum of 18 contextualized interventions in all of their programs, including seven for pregnant women and 11 for children aged 0-24 months. World Vision applies a "Continuum of Care"

approach both in time - by ensuring appropriate healthcare is integrated throughout the lifecycle, and also in space - by building linkages from the household to health systems level, recognizing that interventions are often weakest at the household and community level, especially in the hardest to reach places.

World Vision's MOTECH Suite deployments are supported through a number of public and private partners, including software implementers (Grameen Foundation and Dimagi), foundations (The Bill & Melinda Gates Foundation), government agencies (USAID, DFID, IrishAid, AusAid, CIDA), and inter-governmental agencies (WHO, African Development Bank). World Vision has strategically aligned its mHealth deployments across its global implementation offices, each focused around a central vision statement for their mHealth work:

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*"Empower the most vulnerable households and community health workers and volunteers through the use of common, shared, multi-functional and collaboratively designed mobile health solutions to deliver community-based health interventions."*

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(World Vision)

In following this philosophy, the World Vision team worked with the MOTECH Suite technology partners to design applications to enhance key intervention elements of five different programs the organization standardly deploys in the communities where it works. In this manner, World Vision developed a rich body of informational content that was incorporated into the software solution designs. Once a "standard" version of the software was developed, the MOTECH Suite technology partners worked directly with World Vision health and technology specialists in each country context to adapt these versions to their program needs.

As part of their global mHealth portfolio, World Vision also worked with Dimagi to field-test a CommCare application in Afghanistan's Herat Province. World Vision helped develop the features by providing content to form the basis of this well-received technology tool. Results of this deployment have spurred ongoing interest in this version of the software and elements of this initial application have been rolled out into other countries' austere environments through common, customizable applications using MOTECH Suite.

World Vision has deployed the MOTECH Suite for MNCH and nutrition mobile applications in ten countries with 13 unique deployments.



## THE MOBILE SOLUTION

World Vision's MOTECH Suite tool supports community-based case management across five care provision programs. The organization's use of MOTECH Suite is unique because their mobile applications are designed for reuse, thus lowering the barrier of entry for new countries to adopt the applications. The applications also leverage Z-score calculations to help FHWs easily classify levels of malnutrition by calculating weight-for-age, weight-for-height, height-for-age, and middle upper arm circumference (MUAC), and displays WHO simplified growth charts directly on the mobile device. FHWs are able to refer and track clients between different programs in one application, and can process referrals among the multiple applications. This system helps FHWs easily manage client cases by eliminating the need to track them in two separate places. It also automatically sends SMS messages to FHWs, as well as their clients.

World Vision's applications have been designed to work modularly. Each app can be a standalone

application, but they can also be combined into integrated modules and thereby work in tandem.

## GLOBAL TEMPLATE APPLICATIONS

World Vision partnered with Dimagi and Grameen Foundation to create five template applications for MNCH and nutrition. All template applications were designed so that they can be deployed by any of World Vision's National Offices with reduced design effort. Each application is part of a larger programmatic design that helps ensure commonality across global deployments.

These applications and their corresponding programs include:

### 1 TIMED AND TARGETED COUNSELING (TTC)

TTC is World Vision's Maternal & Child Health program that provides an individual-level behavior change counselling method aimed at pregnant women and caretakers of children under two around the 7-11 life-saving interventions for maternal and child health and nutrition. The TTC mobile

app registers pregnant mothers, tracks their care from pregnancy through birth, and also tracks their children from birth through two years of age.

### 2 POSITIVE DEVIANCE HEARTH (PDH)

PDH (or PDH Hearth) is a model that identifies well-nourished children in communities with high levels of malnutrition and then learns from their families' local 'positive deviant' behaviors that contribute to good nutrition. These positive practices are then shared with the families of malnourished children aged 6-36 months within that community. The families are supported to adopt these practices through hands-on sessions conducted in the home ('hearth') of a community volunteer. During PDH sessions, FHWs identify malnourished children and teach mothers to cook nutritious meals using locally available ingredients. This application covers an array of activities from mother and child registration, to assessments of a child's Weight-For-Height, Weight-For-Age, Height-For-Age, or MUAC, presence of oedema, appetite, and active feeding.

## Feature Spotlight: *Designing Global Content*

World Vision developed standardized content for World Vision's five template applications based on global standards and World Vision's evidenced-based programming.

An initial standard template was built from program specifications and iterated on at the global level. Once the standard template was defined, the World Vision team published the specifications to make them available for individual country offices to review. A critical aspect of the process was identifying which data and protocols were vital to the standard template and which could be altered based on country-specific processes. For instance, some countries may not measure height each month, but when they do, they use the same Z-score calculations.

In practice, adapting the standard template to a country-specific context was challenging, as it took real-time coordination with World Vision global health and nutritionist experts, in-country staff, and Dimagi Field Managers to iterate on the solution. Effort was taken to ensure that small changes to the application based on unique country contexts were accommodated, while ensuring that the core application remained consistent. Changes made by individual countries are incorporated into the global template, as they are useful for all country projects.







### **3 COMMUNITY MANAGEMENT OF ACUTE MALNUTRITION (CMAM)**

CMAM is a decentralized community-based approach for treating acute malnutrition that allows the majority of children to be rehabilitated in their homes using ready-to-use therapeutic foods (RUTF). The model consists of four components – community mobilization for the identification and referral of malnourished children for treatment; supplementary feeding for the moderately malnourished; out-patient therapeutic feeding for uncomplicated cases of severe acute malnutrition; and stabilization care providing in-patient treatment for complicated cases of acute malnutrition. Children attend weekly growth and health monitoring sessions to monitor their recovery and receive a weekly supply of RUTF.

World Vision's CMAM mobile application consists of mother and child-screening forms. The mother form registers a mother's case and, if necessary, a mother subcase for supplementary feeding. The nutrition assessment form creates child subcases which are filtered into supplementary feeding or Outpatient therapeutic food based on the child's MUAC, Weight-for-Height Z-score, the presence of Oedema, and absence of clinical complications.

### **4 GROWTH MONITORING PROGRAM (GMP)**

GMP is a prevention activity comprised of tracking child growth, and promotion in the form of counseling, which increases awareness about child growth; improves caring practices; increases demand for other services, as needed; and serves as the core activity in an integrated child health and nutrition program. As an intervention it is designed to affect family-level decisions and individual child nutritional outcomes. The GMP application identifies malnourished children under five, refers them to treatment, and counsels caregivers on appropriate feeding and care techniques. During monthly GMP sessions, children are weighed and measured by health workers who are guided by CommCare to determine if children are malnourished based on their weight, height, and MUAC. If a child is malnourished, the application includes detailed feeding and illness assessments and provides counseling to the caregiver, and processes the child's referral to a clinic, CMAM program, or a PDH program depending upon program availability and their level of malnutrition. It includes forms for registration, child screening, and counseling, with a strong emphasis on proper feeding and hygiene.

### **5 INTEGRATED COMMUNITY CASE MANAGEMENT (ICCM)**

Through iCCM, FHWs treat diarrhea, malaria, and pneumonia during initial patient visits and follow-up care. FHWs use CommCare's decision support to treat children (including provision of medicine). Based on a child's symptoms entered into the application, the system guides FHWs' treatment based on engrained protocols for care. The iCCM application can also refer children with a severity of illness to nearby clinics, based on program availability.

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## FRONTLINE HEALTH WORKERS ACROSS THE GLOBE

FHWs' profiles vary widely among countries and individual programs. For facility-based programs like CMAM, more highly educated medical professionals typically use the mobile applications. For community-level programs such as GMP and PD Hearth, FHWs are often community volunteers that have varying mobile phone and literacy proficiency. For this reason, all of World Vision's applications include built-in multimedia, including audio recordings, videos, and images. To support different local contexts' needs, the applications are built to include more or fewer multimedia options.

### PROJECT IMPLEMENTATION

World Vision's implementation of MOTECH Suite comprises both a general implementation plan and specific country-level implementations that are ongoing as more of their programs adopt the tool. World Vision and Dimagi first worked to define the template applications based off of their global programmatic standards, which are specific to each of the five applications. These templates were then implemented as pilot applications for each country-deployment during a four-week implementation period,

where staff from Dimagi and World Vision worked directly with FHWs to test the usability of the application and iterate upon its design and content. The team updated the templates based on feedback learned from the initial in-country implementations, and began to roll out the applications to more countries where World Vision works.

Utilizing a common standard was essential in discussing the scope of introducing mHealth interventions to new countries. This standard enabled rapid adoption and scale-up of MOTECH Suite, as illustrated by World Vision's ability to deploy the tool in a series of countries in a very short time frame. As of October 2014, MOTECH Suite was deployed in ten countries throughout Asia and Africa, with plans to expand the deployment to new regions.

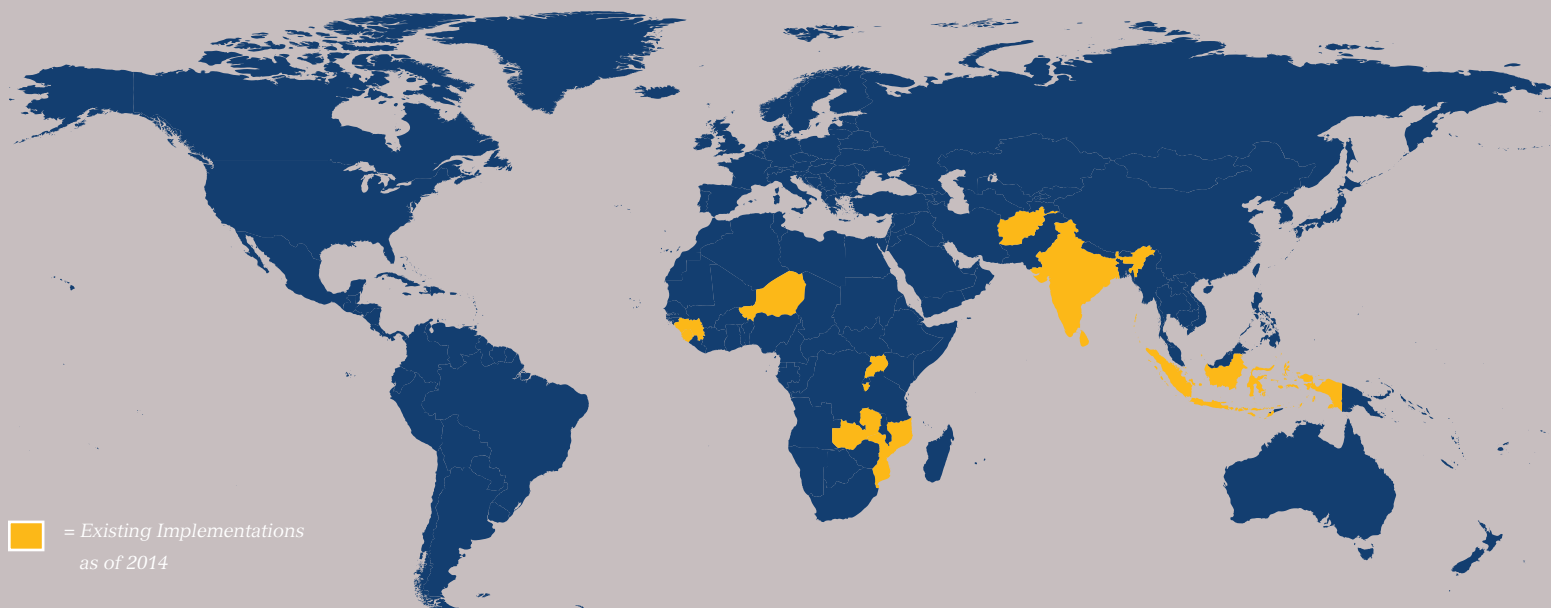
**Four of these ten current implementations are introduced below,** to illustrate 1. World Vision's very first deployment of CommCare (a key component of MOTECH Suite) in Afghanistan, as well as the deployment's future integration of template applications; and 2. standard implementations of the template applications, deployed as both stand-alone applications (such as in Niger and Sierra Leone) and as



a combined tool (in Burundi). There are also applications in Sri Lanka (GMP & PDH), Uganda (TTC), Zambia (TTC), Indonesia (GMP & PDH), Mozambique (PDH), and India (TTC, GMP & PDH). While implementing at the individual country level, World Vision and Dimagi followed the same four-week implementation schedule.

## Designing for Global Scale

*World Vision's MOTECH Suite deployments*







## AFGHANISTAN

In 2008, World Vision partnered with the NGO, Bakhtar Development Network, (BDN) and Dimagi to pilot an MNH CommCare application in 70 villages in Afghanistan's Herat Province, later used to inform the development of the five template applications. To reflect Herat's local context, the application was developed in Dari language with extensive multimedia support for low-literate users.

The overarching aim of the pilot was to test the effect of World Vision's Home-based Life Saving Skills (HBLSS) Program on health outcomes in a post-conflict setting. World Vision incorporated HBLSS and Community Integrated Management of Childhood Illness (C-IMCI) protocols into the application, and designed it to act as a mobile job aid, communication tool, and monitoring system. The application had two modules (antenatal care and postnatal care) to increase and improve MNCH service demand and provision. Afghanistan has engrained social

barriers, including heavy restrictions on women's ability to walk outdoors without a male relative. Because of this, FHWs in Afghanistan primarily operate as 'couples' that include one male and one female, such as a wife and husband or brother and sister. Men typically have higher literacy levels and familiarity with mobile phones, while women bring greater experience performing FHW tasks and delivering pregnancy and newborn care. Given this cultural practice, World Vision conducted separate mobile application trainings for men and women who often shared the phones during their patient visits.

After initial project success, World Vision has plans to scale the template MOTECH Suite applications in Afghanistan in the near term. The first template deployment is tentatively scheduled for 2014, to implement the GMP and CMAM application for community management of acute malnutrition.

*A World Vision-led study in Herat, Afghanistan attributed CommCare with a **20%** increase in the number of women who received antenatal care and a **22.3%** increase in skilled deliveries*







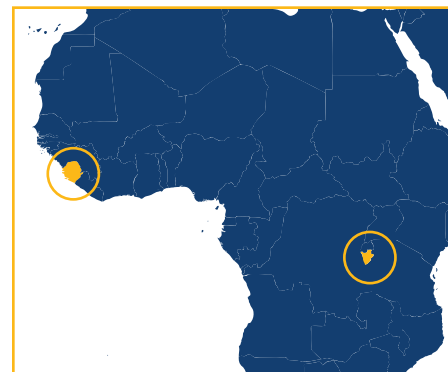
## SIERRA LEONE

**In January 2013**, a MOTECH Suite TTC application was deployed in Sierra Leone to over 30 FHWs. The application is used on a Nokia feature phone and runs in English and Mende.

In this particular training, there was a marked difference between literate and illiterate FHWs. Because the majority of literate FHWs owned their own personal phones, only a small amount of time was needed for phone usage training. However, illiterate

FHWs struggled with understanding how to use a phone. Beyond understanding the application itself, it was necessary to spend time devoted to familiarization with these phones, which has been incorporated into the FHW training plan.

All FHWs spent time providing feedback on the application. Over three days, FHWs collectively made 50 observations about how to make the application easier to use.



**In May 2014**, MOTECH Suite was implemented in Burundi's Bugenyuzi district with a combination of the GMP and PDH applications (shown on the left), aiming to improve child nutrition and the status of underweight children in two health facilities. 18 FHWs (including 16 FHWs and two facility staff) adopted the mobile applications to target all children

under the age of five in Bugenyuzi. By combining GMP and PDH template applications, World Vision created a comprehensive mobile program for FHWs to both register and weigh children during GMP sessions, as well as follow up with them through both GMP and PDH programs.

## BURUNDI



## NIGER

In May 2014, World Vision deployed two MOTECH Suite applications, iCCM and CMAM, representing the first initial deployment of the CMAM template.

iCCM was deployed in Dosso, Niger to 25 RComs (Relais communitaires) who are equivalents to FHWs. As the first point of care for children in villages, RComs prescribe medicine, provide treatment counseling, and refer children to health centers. RComs first assess the child for danger signs, and if one is present, the child must be immediately referred to a health center. If the child does not exhibit health dangers, he is then assessed for: diarrhea, cough, fever, malaria, malnutrition, proper breastfeeding and other signs. The primary purpose of the mobile application was to support decision-making for RComs in screening children under five years old.

The second application, CMAM, is a complementary deployment in Maradi, Niger for a different group

of health workers with a differing set of responsibilities. Contrast to RCOMs, these health workers are often trained medical professionals who receive patients in health centers rather than make individual home visits. The CMAM application screens acutely malnourished children on their visits to the health center and helps guide health workers through clinical examination of the child, supports adherence to treatment protocols, as well as counseling for the mother on proper adherence and positive health and nutrition behaviors. This application also aids in prescribing medicines and processes hospital referrals, based on symptoms presented by the child. As the deployment matures, World Vision is contemplating adding a stock-monitoring component to the application in the future.

*The application screens acutely malnourished children on their visits to the health center and helps guide health workers through clinical examination of the child*





## EVALUATION & RESULTS

A key component of MOTECH Suite, CommCare, has been evaluated through a number of World Vision projects in Afghanistan and Mozambique. These results have informed World Vision's 'mHealth Theory of Change' to support an evolving systematic framework for evaluating mHealth program results.

A World Vision-led study in Herat, Afghanistan compared five intervention and five comparison sites over a two-year period. World Vision evaluated baseline and end line household surveys to examine trends and improvements in behavior change. Results from the surveys show that CommCare is attributed with increasing the number of women who received antenatal care (20%), had skilled deliveries (22.3%), the number of pregnant women who took iron supplements (14.4%), and FHWs who had increased knowledge of pregnancy danger signs (12.9%). The study also found an increase of 12.6% of families with both a birth plan and improved coordination with health facilities for their birth. The study also noted that equipping non-literate FHWs with mobile phones allowed them to have "better access and deliver medical supplies during the winter months, in addition to making referrals to health facilities" [World Vision, 2012 a].

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*Results demonstrated that pregnant women that used CommCare had a higher likelihood of accessing antenatal care and have their births assisted by a skilled provider...*

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*Pregnant women that had access to CommCare were also more likely to be prepared for birth (64%) than in five similar studies, where rates varied between 7% and 48%.*

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An evaluation of World Vision's Mozambique mHealth project also provided encouraging results, suggesting the mobile solution's potential impact on delivery of care. This study sought to determine if mobile phones could impact the quality of service delivery by FHWs using the pregnancy and postpartum modules to manage routine care for mothers and children. It was conducted in Nicosia District from June 2011 to October 2012 and selected FHWs from the project intervention areas who provided coverage for 750 pregnant women, including 393 in the postpartum period.

Results demonstrated that pregnant women that used CommCare had a higher likelihood of accessing antenatal care and have their births assisted by a skilled provider. Women in the intervention were also able to recognize danger signs during pregnancy by a rate higher than the World Health Organization's global average. Pregnant women that had access to CommCare were also more likely to be prepared for birth (64%) than in five similar studies, where rates varied between 7% and 48%. This increased birth preparedness also demonstrated a relationship to increased referral completion rates, for a 91% rate of referral completion in the prenatal period, and 47% during postpartum periods. [World Vision, 2012 b].

MOTECH Suite 2014  
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World Vision. (2012,a). Afghanistan: Application of mobile technology to improve maternal and newborn health outcomes.

World Vision. (2012,b). Grand Challenges Explorations (GCE) Phase I Scientific Report: Use of Mobile Phones for Improvement of MNCH Care.

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