



# Mobile for Development mHealth

The Use of Mobile to Drive  
Improved Nutrition Outcomes:  
Successes and Best Practices  
from the mHealth Industry

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April 2015



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The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with more than 250 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and Internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces industry-leading events such as Mobile World Congress, Mobile World Congress Shanghai and the Mobile 360 Series conferences.

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## Mobile for Development

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GSMA Mobile for Development brings together our mobile operator members, the wider mobile industry and the development community to drive commercial mobile services for underserved people in emerging markets. We identify opportunities for social, economic and environmental impact and stimulate the development of scalable, life-enhancing mobile services.

Mobile is the predominant infrastructure in emerging markets. We believe it is the transformative technology that enables us to put relevant, impactful services into the hands of underserved people. Since the creation of GSMA Mobile for Development we have partnered with 50 mobile operators, rolling out 104 initiatives, impacting tens of millions of people across 49 countries.

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The GSMA Mobile for Development mHealth programme brings together the mobile industry and health stakeholders to improve health outcomes in emerging markets, with initial focus on Millennium Development Goals 4, 5 and 6 across Africa. The programme convenes key stakeholders using many forums including working groups and workshops, as well as providing resources and support to identify partnership opportunities to bring mHealth solutions to scale.

For more information on the GSMA's Mobile for Development mHealth programme, please visit [www.gsma.com/mobilefordevelopment/programmes/mhealth](http://www.gsma.com/mobilefordevelopment/programmes/mhealth) or contact [mhealth@gsma.com](mailto:mhealth@gsma.com)



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# Introduction

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This report is intended to showcase a selection of mNutrition activities being implemented in the GSMA mHealth programme's priority countries in Sub-Saharan Africa. Additionally, the report investigates the best practices which have contributed to the success of these interventions. Within the context of this publication, an mNutrition service is defined as any service which is intended to have a positive impact on nutrition outcomes and is supported by the use of mobile technologies. There are a number of ways in which mobile technology can be used to facilitate such nutrition interventions.

The following non-exhaustive list of mHealth strategies are used by the mNutrition services profiled in this report:

- 1 Client education & behaviour change communication (BCC)
- 2 Data collection and reporting
- 3 Supply chain management
- 4 Electronic decision support
- 5 Financial transactions and incentives



This publication elaborates on each of these mHealth strategies, drawing on data from the GSMA mHealth Tracker and interviews held with various organisations implementing mNutrition services within the priority countries.

### **Based on analysis of the findings in this report, the following best practices were defined:**

- **Robust, multi-sectorial partnerships**
- **Quality control measures throughout service design and delivery**
- **High quality evidence of efficacy and user adoption**
- **Sustainable business models which create value for all stakeholders**
- **User-centric and data-driven design**
- **Multiple marketing channels that drive customer acquisition of service**
- **Incorporation of key activities to support the mobile component of the service**

The criteria for selection of mNutrition services in this report was based on their exhibition of best practice. It is envisaged that users of this report will absorb this best practice and adapt and implement it into their own mHealth services. The report concludes with a summary of selected best practices and highlights the following essential gaps within the GSMA priority markets:

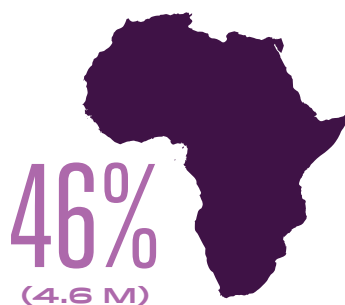
- **Lack of high quality evidence of safety, health system impact and cost**
- **Lack of interoperability and integration of mHealth services**

# Background

The GSMA Mobile for Development mHealth programme connects the mobile and health industries, with the aim of developing commercially sustainable mHealth services which meet public health needs. In September 2013, the GSMA mHealth programme partnered with UK aid from the Department for International Development (DFID) and the Norwegian Agency for Development Cooperation (Norad), to support the scale-up of mobile nutrition (mNutrition) services targeting maternal and child health, in alignment to the Millennium Development Goals 4, 5 and 6. The mNutrition initiative is closely aligned to the UN’s Every Woman Every Child Initiative, Scaling Up Nutrition (SUN) and the Global Nutrition for Growth Compact.

The GSMA mNutrition initiative has prioritised 10 countries in Sub-Saharan Africa: Côte d’Ivoire, Ghana, Kenya, Malawi, Mozambique, Nigeria, Rwanda, Tanzania, Uganda and Zambia.

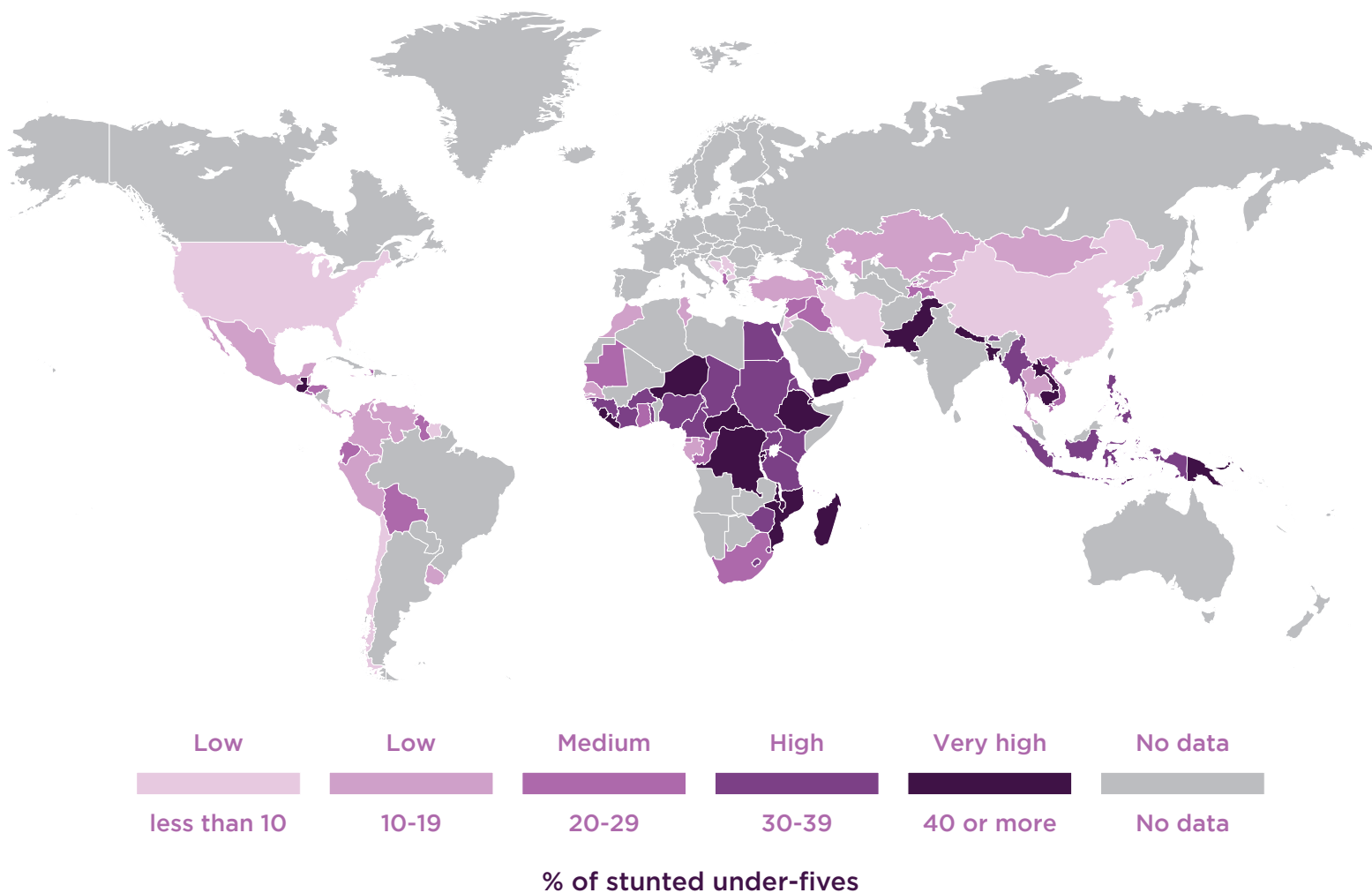
The GSMA mHealth Tracker is a customised tool which captures and presents mHealth products and services around the globe. The GSMA mHealth Tracker has been a valuable tool in helping us understand the various applications of mobile within the nutrition sector of the 10 GSMA priority countries, where we are currently tracking 336 mHealth services. Only 8% (27) of these are mNutrition services.



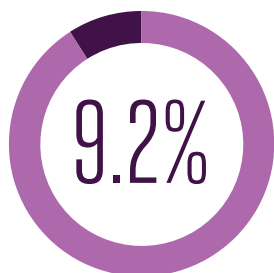
This is surprising as, according to the World Health Organization (WHO), an estimated 10.6 million children under the age of 5 die each year, 46% (4.6 million) of whom die in the African region.

Furthermore, the WHO indicates that malnutrition accounts for one third of all deaths in children under the age of five in Africa - a total of 1.5 million deaths each year. More specifically, the 10 mNutrition countries all have high or very high prevalence of stunting in children under-five, as indicated in Figure 1.

**Figure 1:** Percentage of children under-five who are stunted<sup>1</sup>



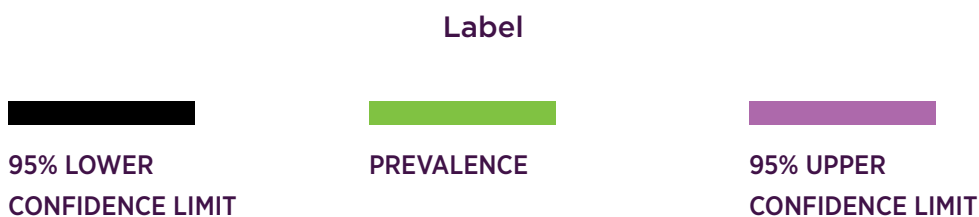
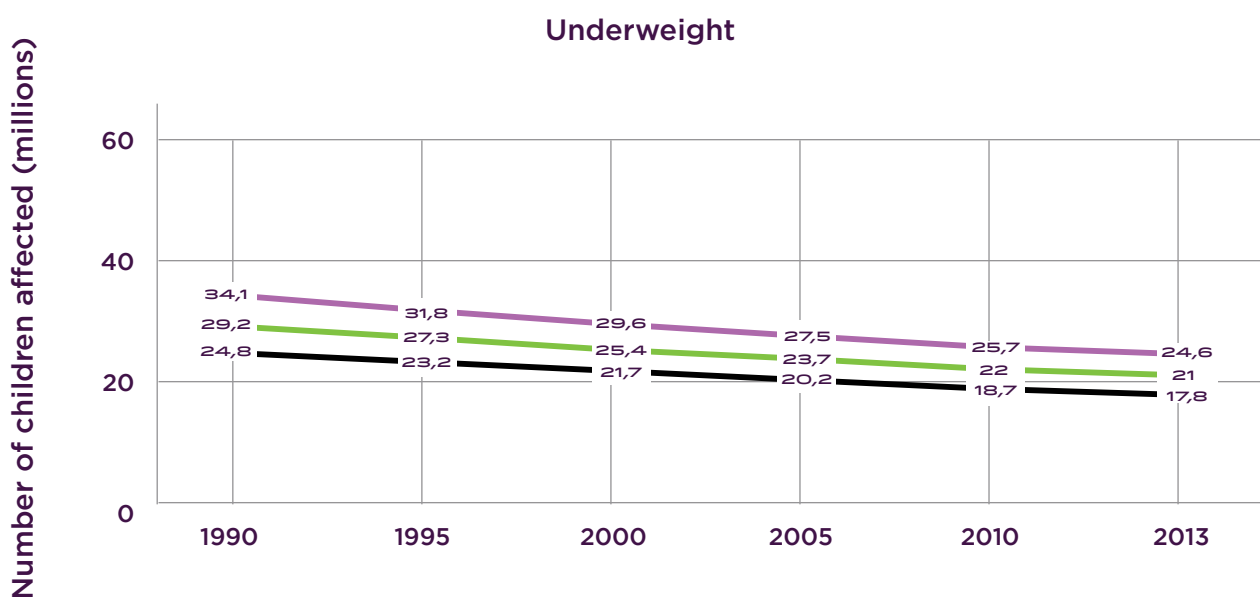
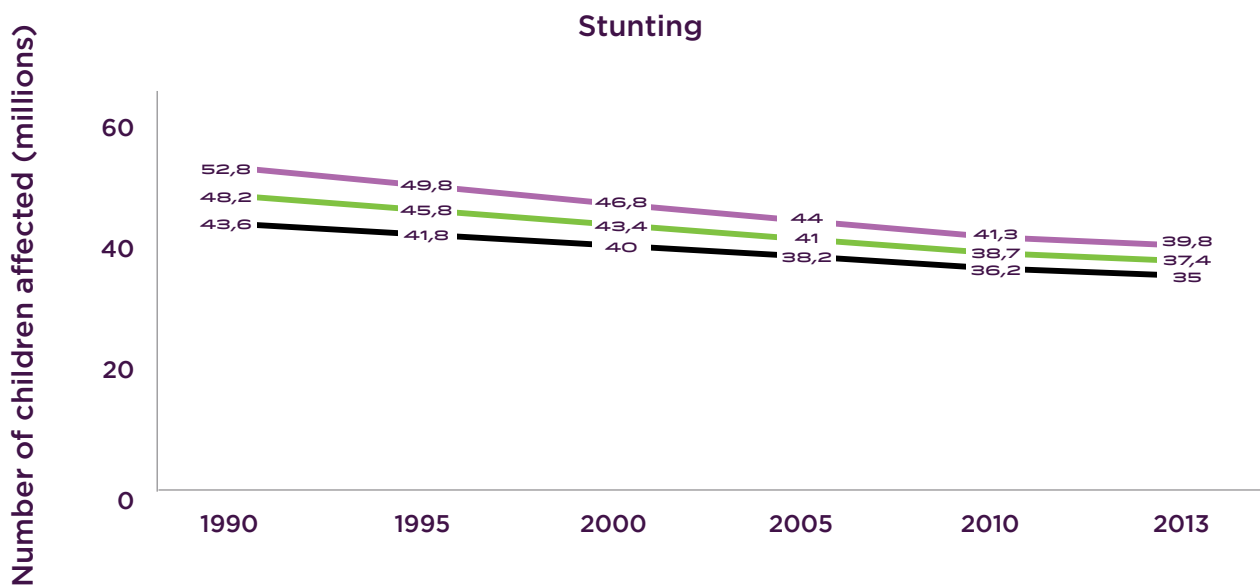
When comparing regional trends in numbers of children affected by malnutrition it can be seen that the prevalence of both stunting and underweight children is on the rise in Sub-Saharan Africa (Figure 2), whilst both these indicators are declining for all other World Bank (WB) regions (Figure 3).



Additionally, 9.2% of children (14.2 million) in Sub-Saharan Africa are wasted, which is the second highest prevalence of wasting amongst this demographic, after South Asia.

<sup>1</sup> Source: <http://data.unicef.org/nutrition/malnutrition>

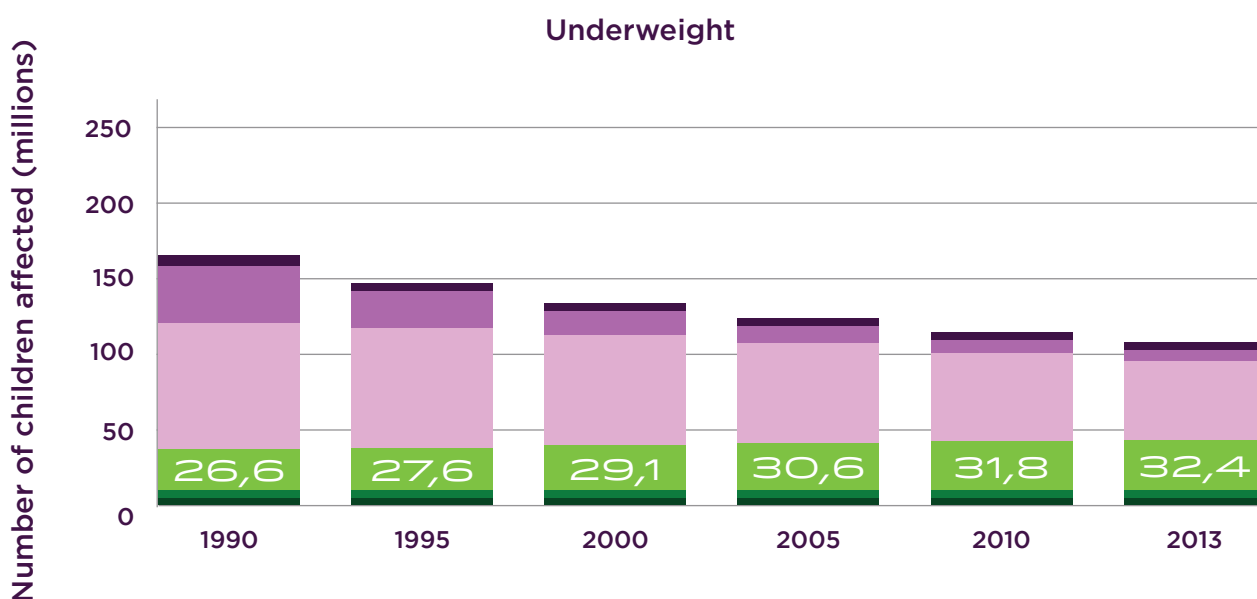
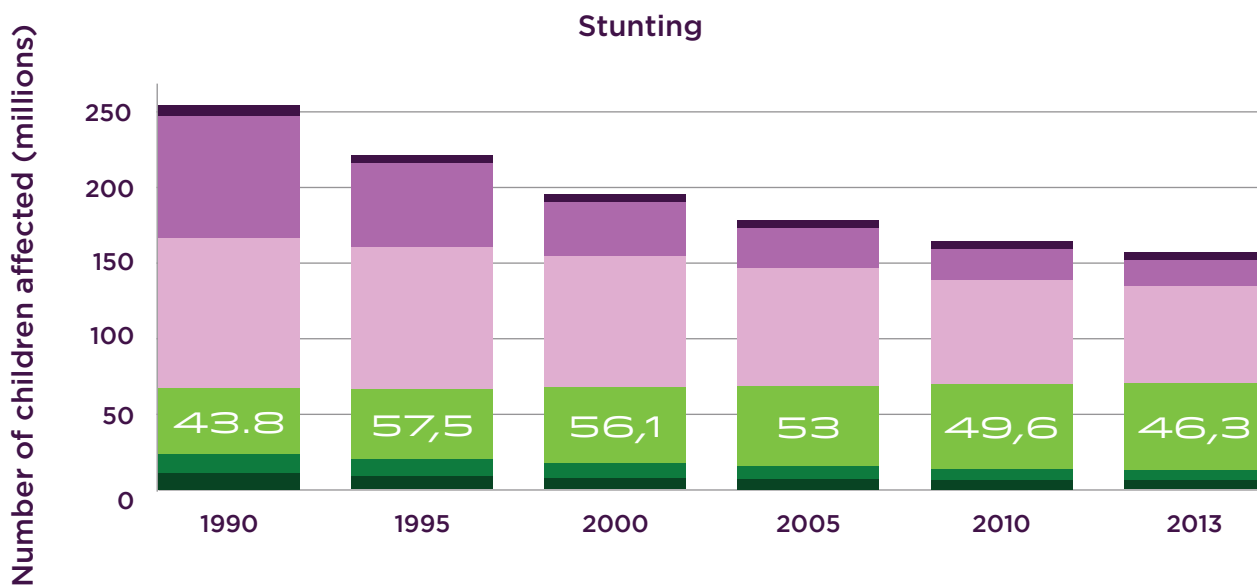
**Figure 2:** Trends in numbers of children affected by malnutrition in Sub-Saharan Africa <sup>2</sup>



<sup>2</sup> Source: <http://data.unicef.org/resources/2013/webapps/nutrition#>



**Figure 3:** Regional trends in numbers of children affected by malnutrition and share of Total Number <sup>3</sup>



### Region



<sup>3</sup> Source: <http://data.unicef.org/resources/2013/webapps/nutrition#>



# 1) Client education & behaviour change communication (BCC)

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Given the high morbidity and mortality throughout Sub-Saharan Africa, client education and BCC focuses largely on the client, offering a novel channel to deliver content intended to improve people's knowledge, modify their attitudes, and change their behaviour <sup>4</sup>.

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<sup>4</sup> Source: <http://www.ghspjournal.org/content/1/2/160.full>

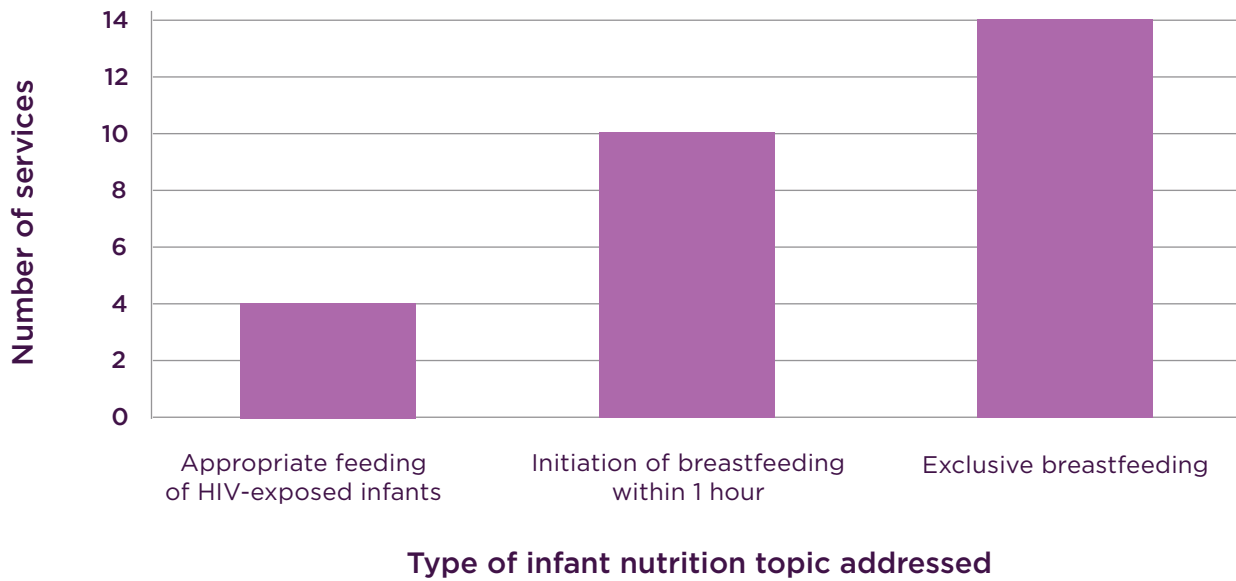
Within nutrition, this is typically centred around the delivery of educational content for improved nutrition practices such as promoting balanced diets and the improved use of locally available foods to ensure increased intake of important nutrients, promoting the intake of micronutrients and fortified foods, and even addressing topics like exclusive breastfeeding of infants, and safe and appropriate complementary feeding of infants and young children. Of the 27 mNutrition services that are captured in the GSMA mHealth Tracker, 67% (18) include a BCC component within their service. 15 of these 18 services have BCC interventions targeted at improving maternal nutrition and 16 have BCC interventions targeted at improving infant and young child nutrition. A breakdown of the various nutrition topics addressed by these BCC services is given in the figures below.

**Figure 4: Maternal nutrition topics addressed in behaviour change communication interventions<sup>5</sup>**

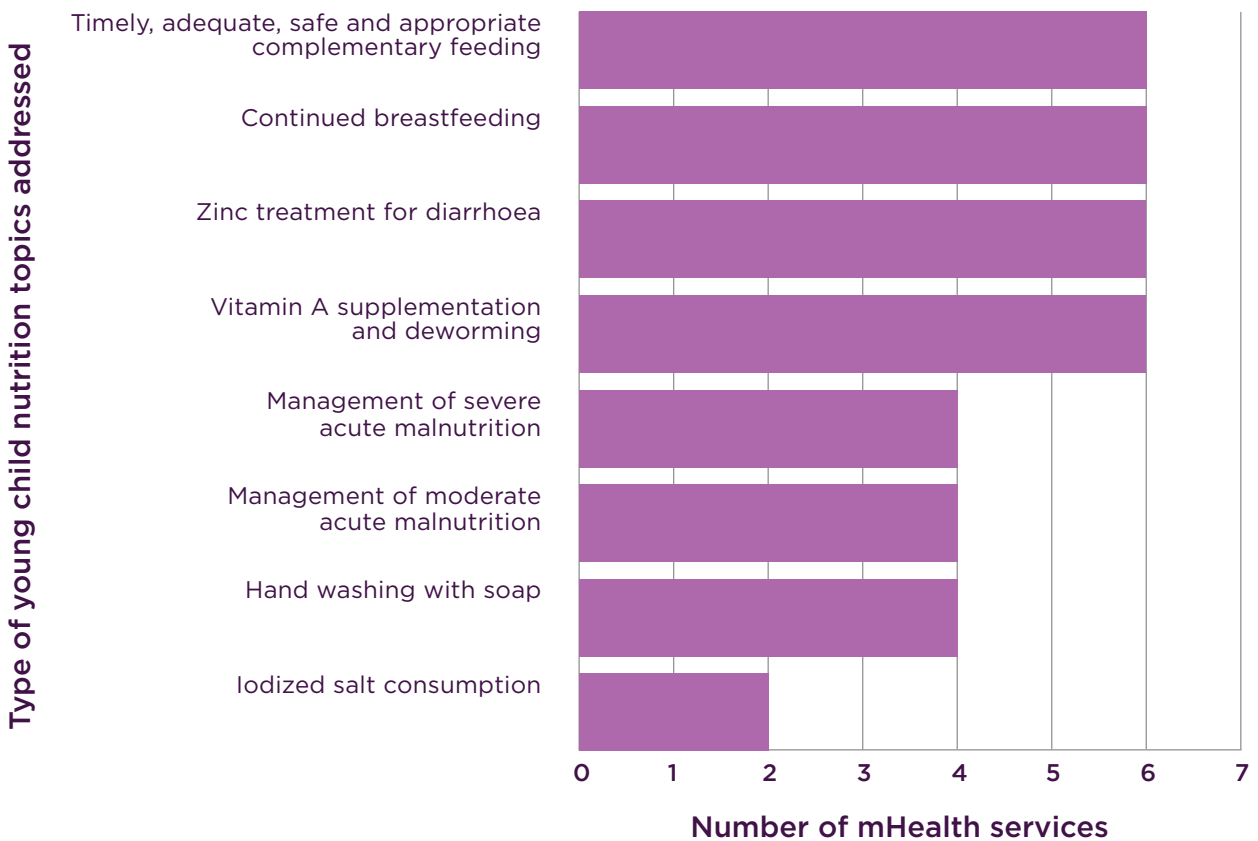


<sup>5</sup> Source: GSMA mHealth Tracker

**Figure 5:** Infant nutrition topics addressed in behaviour change communication interventions<sup>6</sup>



**Figure 6:** Young child nutrition topics addressed in behaviour change communication interventions<sup>7</sup>



<sup>6</sup> Source: GSMA mHealth Tracker

<sup>7</sup> Source: GSMA mHealth Tracker

# Case Study:

## Wazazi Nipendeni - Tanzania

### mHealth use case

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The Healthy Pregnancy, Healthy Baby (HPHB) Text Messaging Service, also called Wazazi Nipendeni, offers maternal and early childcare health information to subscribers of all networks on their phone, for free.

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The service offers reminders and informative text messages in Swahili to pregnant women, mothers with newborn babies up to 16 weeks old (continuing through to age 5) and supporters/caregivers of these women. The objective is to promote healthy pregnancy and early childhood care behaviours. In addition, the service seeks to assist health professionals in the dissemination of information typically shared during antenatal care (ANC) visits. The content promotes improved nutrition practices. For instance, nutritional messages range from information on timely iron and folic acid intake to maintaining a healthy, well balanced diet and drinking clean water, as well as breast feeding instructions. These messages can include simple instructions on how to treat early pregnancy nausea, to information on the importance of the first breast milk and how to observe and monitor the milk intake by babies.

## Icons

### Delivery channels



SMS

### Target audience



Pregnant women

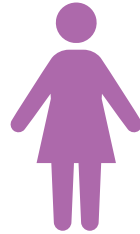


Pregnancy support network

### Tech device



Basic phone



Women of reproductive age



General information seekers

### Target actors



Facility-based healthcare workers

### Geographical areas of focus



Nationwide through self-registration



Facilitated at the clinic

### Mobile operators



Vodacom Foundation



part of etisalat

# Best practices and successes

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## Robust, multi-sectorial partnerships

**The success story of Wazazi Nipendeni lies in its partnerships.**

From the outside, it seems that these partnerships have developed in much the same way as any mHealth service. The difference with this consortium of partners, now coordinated by the mHealth Tanzania Public Private Partnership program, is that it is formally led by the Centers for Disease Control and Prevention (CDC) Foundation in partnership with the Ministry of Health and Social Welfare (MoHSW), with financial support from the US Government Centers for Disease Control and Prevention (CDC). This means that there are specific human and financial resources allocated to managing and growing this consortium of partners. This ensures that the interests of, and negotiations with particular stakeholders are managed on a continuous basis. In the case where more time, effort and energy are required to broker a particular partnership, someone is formally mandated to meet this need. This is particularly valuable for fostering healthy partnerships with Ministries of Health and mobile operators. Securing these partnerships typically requires a considerable and consistent investment from the mHealth service

and in most circumstances mHealth services are resource constrained and cannot effectively manage these partnerships.

The mHealth Tanzania PPP manages the implementation of the text messaging service in collaboration with the MoHSW. Wazazi Nipendeni has benefited greatly from the early establishment of strategic and multi-sectorial partnerships which have strengthened over time to support efforts to develop the business model and scale of implementation. A diverse array of partnerships was ensured early on due to the diversity of funding partners, each financing a particular part of the project (content development and technical assistance, multi-media campaign and marketing, implementation and management of the service, facility and community based registration assistance). Both implementation and operation of the service have thrived through this cross-sectorial collaboration: for example, sharing resources with NGOs and local partners, as well as the zero rating of messages by all mobile network operators, results in a cost saving for the donor and other stakeholders.

The service also benefits from the support of several other on-the-ground partners working at the health facility and community levels. These partners contribute to service implementation by encouraging adoption of the messaging service as well as providing support to users.

The value of these partnerships is perceived by all the partners. So much so that partners, such as mobile operators, are starting to drive the growth of the mHealth Tanzania PPP by bringing new organisations to the table. They understand that the addition of new partners increases the value of the service for each of the partners, and more importantly, the value of the service to the end users.

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*“Building partnerships within the mHealth PPP has been all about leveraging synergies - understanding, pitching to, and delivering on value drivers for all the stakeholders. We are building a spider web of connections, where the links are important for the achievement of the common goals. The commitment from each partner moves beyond CSR and it becomes hard to remove a tool such as the Healthy Pregnancy, Healthy Baby Text Messaging Service because it adds value to and receives value from all links. It’s important to sell the heart and the vision to each partner - you need an ambassador within each partner organisation. Partnerships take time, patience, and championing - There needs to be someone who gently knocks on all the doors, over and over again until the value proposition is defined, understood and adopted by all. Someone who is solely responsible for developing and maintaining these relationships. We were lucky that our funders realised and understood the value and the need for this.”*

- Janita Ferentinos, mHealth Tanzania PPP

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The mHealth Tanzania PPP successfully secured partnerships with all four leading mobile operators in Tanzania - Airtel, Tigo, Vodafone and Zantel - through working on a combination of Corporate Social Responsibility (CSR) and commercial principles. All four mobile operators offer zero-rating of the service and thus take up the cost of the text messages. The partnership is mutually beneficial, as mobile operators have access to MoH-approved and validated content, in addition to the basic set of free messages, which can be used for commercial activities that further support the basic safe motherhood initiative. While CSR is the primary reason for supporting the service, several mobile operators are taking steps to work with the mHealth Tanzania PPP and the MoHSW on innovative ways (USSD and voice) to expand Wazazi Nipendeni content dissemination. The uniquely strong partnership between the mHealth Tanzania PPP and the Tanzanian mobile industry improves consumer access to the service in ways other services might not, as well as presenting opportunities for sustainable business models.



*“The tricky thing about negotiating partnerships with mobile operators is the need for differentiation between the service offerings within each mobile operator. It’s important to do your homework and stay updated on what are sometimes continually changing mHealth strategies within the mobile operators. When negotiating with mobile operators, it’s essential to shift the discussion from a public health focus to a conversation around mutual benefits.*

*Another challenge is the high turnover of staff within mobile operators. One way to work around this is to drive the conversation as far up as securing buy-in from the CEO, including as many employees in conversations along the way. That way you don’t need to start from scratch when an employee leaves the company or moves to another department. We’ve seen real success when there is an employee sitting within the mobile operator who has understood the vision and is actively transferring this to other employees & decision makers within the organisation. We’ve also found that when we invest more energy and effort into these relationships, it’s more likely to be reciprocated by the mobile operator - for example, we spend a lot of time thinking about new business strategies for the mobile operators - how can we grow their offering? We take these ideas to the mobile operators and work with them to bring this idea to fruition. The relationship becomes less of an ask from us for commitment from the mobile operator, and more of a team effort to grow our mutual investment. At this time and age it is essential that an NGO should be looking at their business as a business and where possible to move from donor funding to sustainable solutions.”*

- Janita Ferentinos, mHealth Tanzania PPP

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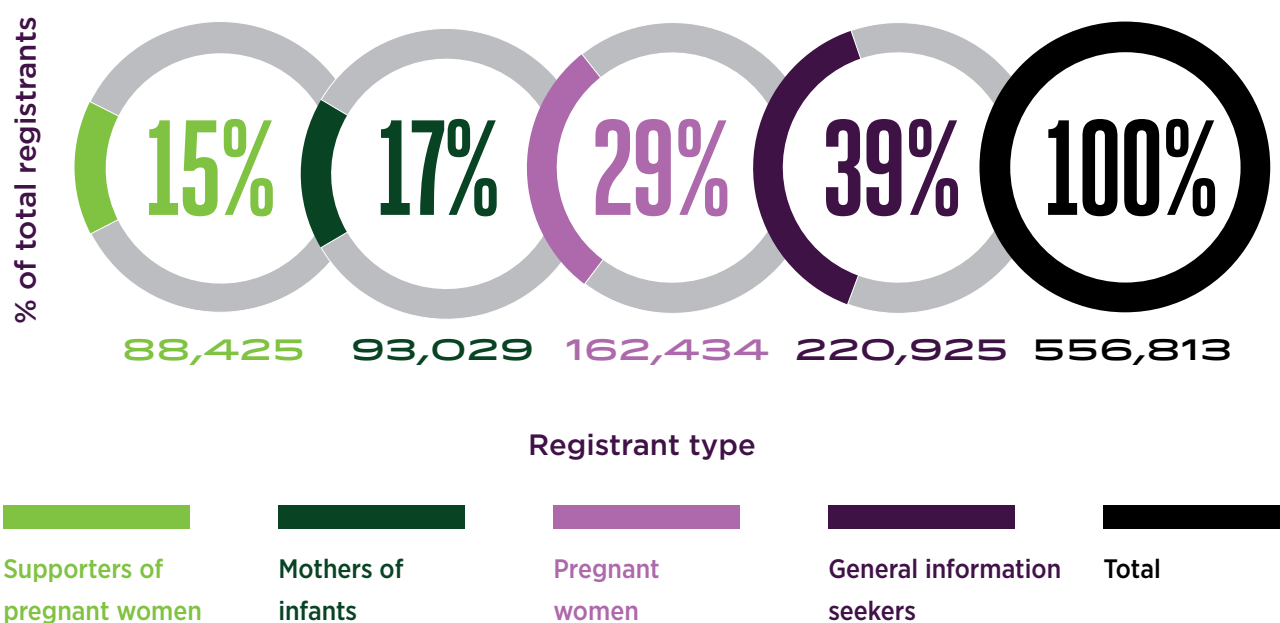
## **Sustainable business models which create value for all stakeholders**

Wazazi Nipendeni SMS Service is a good example of an mHealth service that is successfully making the transition from being exclusively donor-funded to adopting sustainable revenue-generating business models. In collaboration with the MoHSW and mobile operator partners, the mHealth Tanzania PPP has worked to create a sustainable business model which appeals to the diverse network of stakeholders. The mHealth Tanzania PPP is making premium content available to mobile operators in exchange for delivering the basic set of Wazazi Nipendeni text messages for free. Mobile operators are able to offer this premium content at limited costs for the subscribers, in addition to the continuous (contextually expanded) Wazazi Nipendeni text messages. Mobile operators also facilitate periodical promotion to subscribers. Paid-for premium content will not only satisfy the growing needs of the end user to be able to access more extensive information on some of the topics that are briefly addressed within the free text messages, but this paid-for component will also sustain the zero-rating of the existing text messaging service.

## High quality evidence of user adoption

Wazazi Nipendeni has scaled up significantly since its birth and is continuing to expand. Since the launch of the service in November 2012, the HPHB system has sent out over 44 million healthy pregnancy and early childhood care messages to its 556,813 total registrants (Q1 2015). Of this total, 408,000 registrants enrolled in the service themselves. The breakdown of this group of registrants is shown in Figure 7.

**Figure 7:** Wazazi Nipendeni: breakdown of registrant demographics to date <sup>8</sup>



<sup>8</sup> Source: mHealth Tanzania PPP

**1,300**

Almost 1,300 health workers are actively registering mothers during antenatal care visits

**1,000**

in over 1,000 health facilities in 35 districts across 10 regions.

**18,433**

pregnant women and new mothers have been signed up through facility and community based registration efforts



The HPHB network of **on-the-ground** partners collectively support more than

**2,000** of the total estimated **7,000** facilities within Tanzania.

**2,000**

they work with over **2,000** community healthcare workers (CHWs) across the country.

Due to the successful uptake of the service, the Wazazi Nipendeni SMS Service can become a valuable tool of the Big Results Now Initiative to support the aim to reach significant reductions in maternal and infant deaths<sup>9</sup>.

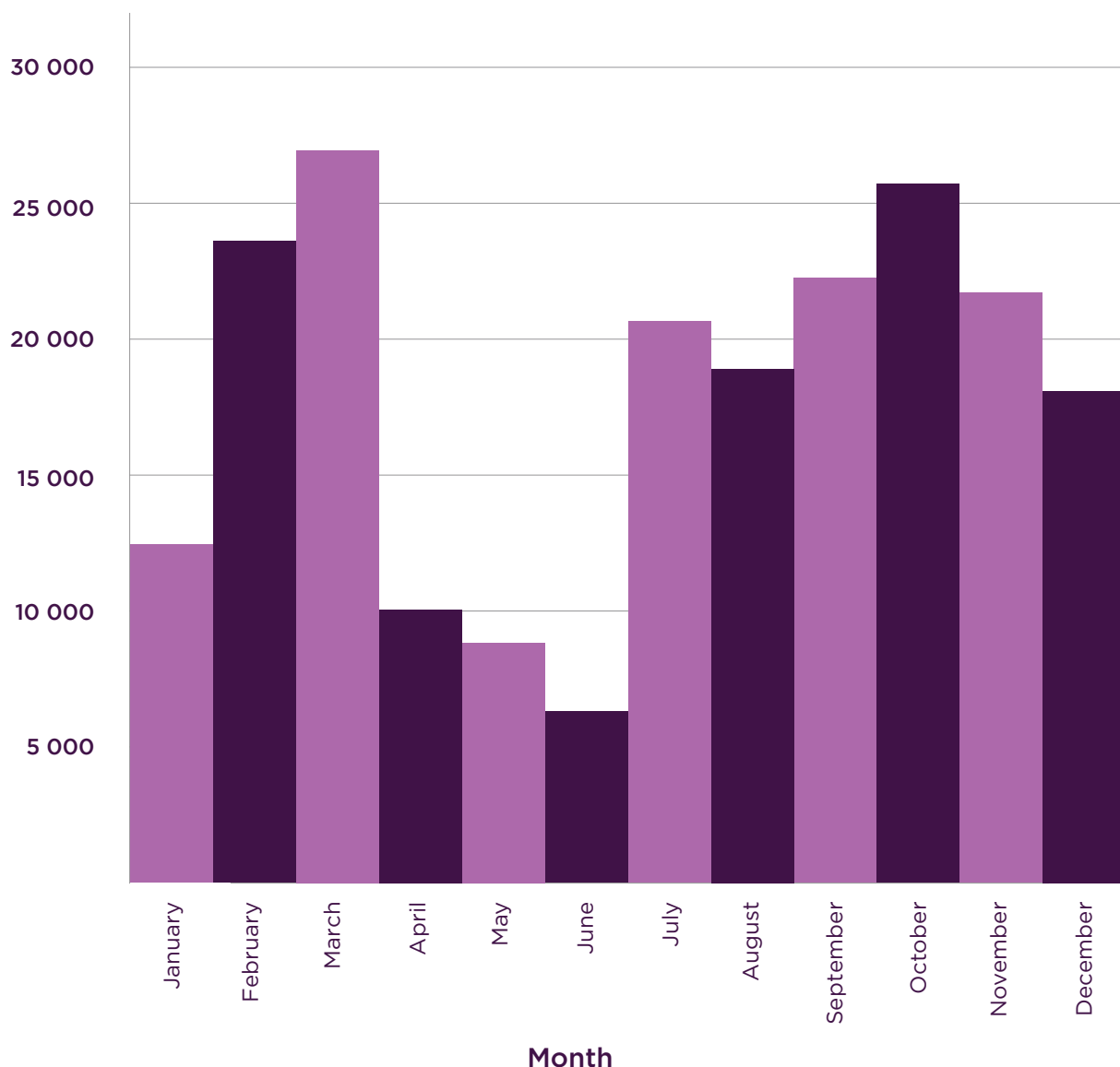
<sup>9</sup> <http://www.thecitizen.co.tz/News/-Big-Results--initiative-now-focuses-on-health-sector/-/1840392/2483604/-/11atmy7z/-/index.html>



## Multiple marketing channels that drive customer acquisition of service

Increased awareness of the service through multi-media campaign and local partnerships also contributed to the consistent and continued growth and uptake of Wazazi Nipendeni. As Wazazi Nipendeni allows for both self-registration and facility based registration (guided by CHWs), general awareness of the service is essential for continued adoption of the service. The currently active nationwide Wazazi Nipendeni multi-media campaign secures a constant flow of self-registration (around 20,000 registrations per month) accounting for the majority of new registrants. The breakdown of monthly self-registration data for 2014 is given in Figure 8. The valuable contribution that the multimedia campaign made to increasing self-registrations by beneficiaries can be seen in the difference between self-registrations between April through June (averaging approximately 8,000 self-registrations) when the multi-media campaign was not running and July through December (averaging approximately 20,000 self-registrations) when the multi-media campaign was running. This proves that the multi-media campaign is an essential activity, almost tripling the number of monthly self-registrations.

**Figure 8:** Wazazi Nipendeni: monthly self-registration data for 2014<sup>10</sup>



The additional efforts of local partners increase awareness of the service at the community level and target in-person registration. This on-the-ground promotion is rare with mHealth value added services (VAS) and is therefore a unique aspect of the Wazazi Nipendeni service that contributes to its growing success.

<sup>10</sup> Source: mHealth Tanzania PPP

# Similar client education and behaviour change services with a nutrition focus

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## Mobile Midwife - Ghana

Grameen Foundation is using the MOTECH mobile technology suite to implement the Mobile Midwife Application in 136 health facilities across 7 districts and 4 regions in Ghana. The application enables pregnant women and their families to receive pre-recorded voice messages or SMS's on their mobile phones which provide time-specific information about their pregnancy in their own language. The content of text messages relating to nutrition includes information on vitamin A deficiency and the importance of iron and folic acid supplements. The messages continue throughout the first year of life for the newborn and reinforce well-child care practices and vaccination schedules <sup>11</sup>.

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## Maternal Health (Nutrition) - Tanzania

In Tanzania, D-tree International is using mobile technology to disseminate information (via SMS) on the importance of maternal nutrition and specific recommendations such as eating protein and iron rich foods. The application also features decision support tools to assist health workers in registering, screening, treating, counselling and referring pregnant and postpartum women. The application shares a single database of clients between community, primary and secondary level health facilities. This feature enables tracking of the mother's weight across visits, such that weight loss or inadequate weight gain is flagged to the service provider. The service is active in five districts across three regions in Tanzania <sup>12</sup>.

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<sup>11</sup> Source: <http://ghana.gsmamhealthfeasibility.com/>

<sup>12</sup> Source: GSMA mHealth Tracker

## 2) Data collection and reporting

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This refers to the use of mobile devices which enable frontline workers and health systems to move from paper-based systems of ledgers, rosters and aggregated reports to the near-instantaneous reporting of survey or patient data<sup>13</sup>. Within nutrition, data collection and reporting applications often relate to/include elements of reporting on maternal, infant and young child nutrition indicators such as height, weight, and Mid-Upper Arm Circumference (MUAC) to name a few. 19 of the 27 mNutrition services are currently including data collection and reporting within their service offering. Data collection and reporting within mHealth is typically facilitated by software applications installed or embedded on mobile devices. Almost half of these mNutrition services are using CommCare, a software application developed by Dimagi, for data collection and reporting within their service.

### Case Study: Muecate MNCH - Mozambique

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#### **mHealth use case**

The 'Muecate Maternal, Newborn and Child Health' project, led by World Vision Mozambique, seeks to improve maternal, newborn and child health (MNCH) through sustainable nutrition interventions using mobile technology. The mobile applications utilized to achieve these aims are focused on data collection and monitoring. Specifically, the project is implementing two models of health programming which focus on behaviour change and health promotion for MNCH and malnutrition, respectively. Both programme models utilize mobile tools which enable immediate feedback to community volunteers and beneficiaries, such that data is available in real time to project staff at all levels<sup>14</sup>.

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<sup>13</sup> Source: <http://www.ghspjournal.org/content/1/2/160.full>

<sup>14</sup> Source: <http://mozambique.gsmamhealthfeasibility.com/>

## Icons

### Delivery channels

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App

### Target audience

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Pregnant women



Infants and young children

### Tech device

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Feature phone



Women of reproductive age



Caregivers

### Geographical areas of focus

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Mozambique



Nampula Province



Muecate district

### Mobile operators

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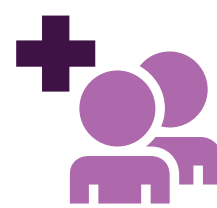


### Target actors

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Nurses



CHWs





The 'Timed and Targeted Counseling' (ttC) model focuses on promoting MNCH interventions, health practices and MNCH behaviours, particularly for pregnant women. Mobile phones facilitate data collection for the ttC programmes and maternal and child health data using the SMAP application.

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The 'Positive Deviance/Hearth' (PDH) model is used primarily as a behaviour change approach, which seeks to rehabilitate, sustain and prevent malnutrition in moderate acute malnutrition (MAM) and underweight (low weight-for-height) children in the home setting. The 'Positive Deviance' aspect of PDH refers to the sharing and promotion of uncommon yet beneficial practices by mothers or caretakers of well-nourished children in an impoverished community to others in the community with malnourished children. The 'Hearth' aspect of PDH refers to the setting where the nutrition education and rehabilitation components of the programme are carried out - in this case, the home setting. A key differentiator between the ttC model and the PDH model is that the latter enables effective case management where a mother and her child are routinely monitored and followed up on until the child is 5 years old. Decision support protocols are built into the CommCare application to support the CHW in her consultations with the mother and her child. The service is currently impacting on the lives of 32,700 beneficiaries.

# Best practices

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## High quality evidence of efficacy

Currently, mobile-based data collection is only being implemented across 17 of the 31 World Vision programme sites. One of the key best practices within the World Vision Muecate project is that they are using the data which is collected within these sites to validate the scale-up and use of mobile across all their other sites in Mozambique. They are actively trying to provide evidence that the use of mobile is having a positive impact on health outcomes and based on this evidence, they will expand their mobile based data collection.

### Some of the success proof points include:

#### 1. Improvement in health outcomes:

There is a growing proportion of children who graduate from being malnourished to normal which is clearly illustrated in figure 9.

#### 2. Improvement in data completeness:

When comparing the completeness of data collected by mobile to the data collected in the non-mobile sites, it is clear that the mobile enabled data collection ensures that data is not lost. 100% of data that is collected in the mobile sites is able to be analysed and reviewed, in comparison to only 70% of the data collected in the non-mobile sites.

#### 3. Improvement in data quality:

Within the mobile sites, World Vision staff are trained on how to collect data using mobile. These training sessions, along with their clinical background and familiarity with the project, already ensure that the quality of the captured data is improved. In addition to this, there are several quality control algorithms built into the data collection applications. Certain fields have limitations as to which amounts (with acceptable variances) can be input into the system. For example, a baby's weight can only be within an acceptable weight range and any amounts which fall outside of this range are not accepted by the system. This greatly reduces the amount of incorrect data entries. In the non-mobile sites, enumerators are hired to execute the data collection. In many cases, the robustness of the data collected by these enumerators may be challenged by multiple entries that simply cannot be true. This makes one question whether any of the data collected can be considered a source of truth.

#### 4. Improved frequency of data collection:

In figure 9 the data collection periods are illustrated (baseline, day 12, day 30, 3 months, 6 months, 1 year). This is far more frequent than the nutrition data collection for the non-mobile sites which is typically done at baseline and then in some cases only again in 3, 4, or 5 years later. Because data collection becomes much easier and more affordable with the aid of mobile phones, it is feasible to collect data more frequently and ultimately ensure more effective and accurate monitoring of a child's nutritional status.

**Figure 9:** Muecate MNCH: Results of PD/Hearth implementation in World Vision programme sites in Mozambique



### User-centric design

Within the PDH programme, World Vision facilitates feedback sessions between field assistants who are actors of the service. Feedback from the assistants is considered and where appropriate, informs improvements in programme design. For example, field assistants reported back that the nutrition outcomes of this programme are greatly improved when community leaders are formally informed of the value of the programme. This ensures better adoption of the programme by the community. Children in communities where community leaders have been formally consulted gain weight more quickly than in communities where this initial consultation has not taken place. As such, World Vision has now included consultation with community leaders as a key activity within their programme.

# Similar data collection and reporting services with a nutrition focus

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## Mawa Project - Zambia

Feed the Future Zambia Mawa Project provides an integrated package of services that help households reap the nutrition and economic benefits of diversified agricultural production. The core activities include agriculture production, nutrition and market access. Mawa reaches 20,000 smallholder farmers, the majority of whom are women, in 19 agricultural communities in Chipata and Lundazi districts, Zambia<sup>15</sup>.

Mawa enlists a network of 26 health promoters, supporting 950 nutrition volunteers, to carry out 'Community-led Complementary Feeding and Learning Sessions' (CCFLS), the goal of which is to prevent malnutrition among the most vulnerable groups. CommCare enables and optimizes delivery of CCFLS through: improved data visibility and monitoring of growth and weight gain throughout CCFLS and follow-up, improved quality of growth measurements, improved data quality and reporting and improved post-referral follow-up management<sup>16</sup>. Select nutrition volunteers (100) use CommCare to facilitate delivery of quality and consistent peer-to-peer health and nutrition education to households.

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## Growth Monitoring & Promotion (GMP) - Mozambique

The Growth Monitoring & Promotion (GMP) application is a CommCare enabled tool initially targeted at improving nutritional surveillance of 5,000 children under-five in Palma District, Mozambique. Piloted by Food for the Hungry (FH), GMP was integrated into FH's existing community nutrition programme in order to improve real-time reporting of surveillance data by Community Health Agents (CHAs), to enable more efficient referrals and improve community-based follow-up of malnourished children by CHAs and Community Development Committees (CDCs)<sup>17</sup>. The GMP design includes a module on child nutrition states containing three forms: registering new children, following-up with returning cases and closing cases. Registration and follow-up forms calculate the child's z-score using input variables (age, weight, sex); the child's specific status and age are then used to guide the CHAs through visual and text aids that correspond with the specific child. This decision support helps the CHAs to offer more personalized, targeted counselling to mothers<sup>18</sup>.

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<sup>15</sup> Source: Mawa, CCFLS overview, Catholic Relief Services

<sup>16</sup> Source: Dimagi, CommCare for Nutrition, CCFLS program overview

<sup>17</sup> Source: <http://www.coregroup.org/get-involved/attend-event/fall-2014-global-health-practitioner-conference/261-mhealth-grant-projects>

<sup>18</sup> <https://www.commcarehq.org/exchange/f2bbc396847256445750e0d666aa02f8/info/>



## 3) Supply chain management



The supply chain management mHealth strategy includes mobile technology-enabled tools to track and manage stocks and supplies of essential commodities.

The use of simple technologies allow remote clinics or pharmacies to report daily stock levels of drugs and supplies or to request additional materials electronically<sup>19</sup>. Within nutrition, supply chain management applications may include nutrition commodity tracking (i.e. essential drugs, vitamins, deworming, etc.). 6 of the 27 services include supply chain management or stock monitoring in their service offering. Zinc and vitamin A appear to be amongst the nutrition commodities that are most frequently tracked amongst these 6 services.

<sup>19</sup> Source: <http://www.ghspjournal.org/content/1/2/160.full>

# Case Study: Movercado - Mozambique

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## mHealth use case

Movercado, implemented by Population Services International (PSI), is an eco-system of networks. One of the applications of this eco-system is an mHealth platform, supported by mobile technology, to increase efficiency of health commodities for bottom of the pyramid populations, through utilizing local markets and SMS messaging. The mobile-powered platform has the ability to facilitate many applications with an endless combination of components.

These components reflect elements of a supply chain marketplace, including micro-entrepreneurs and small businesses, and are enabled by high-level algorithm-based personalization and interaction. The application of Movercado within health has two main components, the 'Troca Aki' voucher system which addresses the cash-flow barrier and the 'activista' and CHW engagement which addresses integrated and personalized outreach to beneficiaries.

**Within 4 months of launching, 1 million sachets of Super Bebe were supplied to beneficiaries.**

Troca Aki ("Swap here" in Portuguese) is the name for the registered dispensary/shop which users can access health commodities free of charge using an encrypted voucher which is verified by the Movercado system. The commodities are: condoms, water purifiers, mosquito nets, long-term family planning and, as of February 2014, nutrition fortification packets called Super Bebe. Within 4 months of launching, 1 million sachets of Super Bebe were supplied to beneficiaries.

As a supplement to the technology solution, Movercado employs CHWs to serve as activists for the platform. They enrol and educate mothers on the proper use of products distributed within Movercado and provide consultations on health topics associated with these products. CHWs receive performance-based compensation for delivering on their quantitative and qualitative objectives: to enrol mothers into programme and to educate/ advise registered mothers, respectively.



## Icons

### Delivery channels

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SMS

### Target audience

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Pregnant women



Women of reproductive age

### Tech device

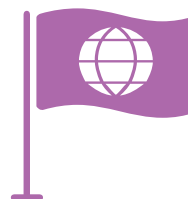
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Basic phone

### Geographical areas of focus

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Nationwide

### Target actors

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CHWs



Patient/beneficiary



Pharmacist/other

# Best practices and successes

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## Quality control measures throughout service design and delivery

Movercado service delivery and quality is strengthened by quality control features embedded in the programme design. Performance-based compensation incentivises CHWs to perform well across quantitative and qualitative indicators - they are incentivised based on the number of new enrolments and beneficiary sessions they have, and on the quality of these sessions. CHWs are tasked with increasing registration numbers through actively enrolling new mothers into the programme. Registration requires a first meeting with the mother to educate her on the importance of the voucher system, referred to as 'having a session'. Qualitative assessments are needed to validate the quality of these sessions - essentially, to assure that CHWs are actively rather than passively recruiting and engaging with mothers.



The Movercado call centre follows up with almost 30% of recruited mothers to determine the quality of CHW engagement; this is done through informal telephone interviews.

Mothers are asked about the nature of their session with the CHW and what parts of the information which was shared with them they have retained. CHWs are subsequently compensated according to the strength of their performance as assessed by these indicators. This incentive model aims to control sub-par CHW commitment, thus maximizing financial resources while ensuring high service quality.

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## High quality evidence of user adoption

Movercado was launched in April 2013 and has since been scaled up to nationwide implementation, in urban and peri-urban areas in Mozambique.



4M  
2014

In 2014, almost 4 MILLION messages were exchanged through this platform. Due to 300,000 successful CHW sessions, 500,000 beneficiaries are currently registered and 200,000 commodities have been redeemed to date (Q4 2014).

In addition to recruitment efforts made daily by CHWs, roll-out of a multi-media campaign promoting uptake of the service contributed to the growth in scale. The success that Movercado has seen in Mozambique has prompted plans for further expansion to Tanzania, Uganda and Ghana.

## User-centric design

*“Beneficiary experience and business logic drive design. The technology is almost invisible to the user”*

- Movercado<sup>20</sup>

Developers of Movercado have harnessed every interaction with the beneficiaries as an opportunity to learn more about them. Movercado has embedded algorithms to ensure that each interaction is uniquely tailored to the beneficiary. The more complex the platform’s interaction is with the beneficiary, the more tailored the experience provided to that beneficiary will be. For example, if a beneficiary routinely purchases an array of commodities and her purchase of micro-nutrient powder suddenly decreases, the algorithm captures every change and subsequent messages she receives will be informed by this behaviour (i.e. educational reminders on the importance of using micro-nutrient supplements). And, vice versa, timely messages will promote the uptake of certain commodities at the right stage of a child’s development. For example, when a baby is 6 months old, a mother will receive a message with information about nutrition and a voucher for a one month dose of micronutrient powder, or information for fortified staple, referral for vaccination, etc. The Movercado call centre also executes systematic surveys with beneficiaries to better understand their knowledge on various health subjects and experience with various products. Feedback from these surveys informs improvements to the service.

*“Movercado is built around the idea that the impact of any interaction increases with the increase in personalization and relevance of the interaction. In other words, a highly relevant message received at the right place and right time is more likely to have an impact than a generic message received at a random moment”*

- Movercado<sup>21</sup>

<sup>20</sup> Source: [http://www.slideshare.net/i\\_circo/movercado-eco-system](http://www.slideshare.net/i_circo/movercado-eco-system)

<sup>21</sup> Source: [http://www.slideshare.net/i\\_circo/movercado-eco-system](http://www.slideshare.net/i_circo/movercado-eco-system)



## Incorporate key activities to support the mobile component of the service

The underlying concept of Movercado is itself a model for best practice: a two-pronged approach which ensures that the supply of products is able to meet the demand generated by the mobile-enabled educational messaging featured in the service. In many mHealth services, there is a demand generation component to drive increased uptake of services or products. For example, a service may be aimed at increasing uptake of vaccinations for children. Messages would be delivered to a mother to encourage her to take her child to a healthcare facility where the child can receive the necessary vaccinations. However, in some cases the health facility does not have stock of the necessary vaccination and is therefore unable to meet the need of the child. The Movercado supply model eliminates the possibility of stock outs of in-demand products by ensuring that the supply of products always meets the demand generated for these products by the service.

Behaviour change is facilitated by this two-pronged supply/demand phenomenon, through both traditional and innovative demand generation: in addition to generating demand through educational messaging, Movercado ensures that the specific product the mother is being encouraged to use is actually available on the shelf, by requiring Troca Akis to stock these products. In this way, the platform drives uptake of certain products over others by both the distributor and the consumer. Additionally, all voucher redeemable products have a health benefit. For example, a mother's voucher would cover fortified rice but not non-fortified rice, which means the fortified rice must be made available to her by the Troca Aki. The result is behaviour change systematically imposed on both groups: the Troca Akis, in that they must continually respond to the prominent health needs, and the beneficiaries, in that they are restricted to consuming health positive commodities.



## Robust, multi-sectorial partnerships

Movercado has successfully partnered with all mobile operators, due largely to the use of an external aggregator. PSI has partnered with the aggregator, SISLOG, who is responsible for brokering and facilitating relationships with all 3 mobile operators. A pre-existing relationship between the aggregator and the mobile operators ensures improved engagement and thus a more effective collaboration between PSI and the mobile operators.

# Similar supply chain management services with a nutrition focus

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## SAM Reports, RapidSMS – Nigeria

**The management of the SAM programme has expanded to approximately 300,000 admissions a year.**

UNICEF Nigeria, in collaboration with government and implementation partners, launched the Severe Acute Malnutrition (SAM) Reports in three states in Northern Nigeria in July 2013. SAM Reports is a RapidSMS application being used for the monitoring and evaluation of community-based management of acute malnutrition (CMAM), called integrated management of acute malnutrition (IMAM) in Nigeria. RapidSMS technology enables real-time reporting, allowing those working with CMAM services to send programme and stock level data to the application via SMS. Specifically, the tool tracks stock of ready-to-use therapeutic foods (RUTF), vitamin A and deworming treatment. The application reviews the validity of this data and provides either immediate confirmation or a request for corrections. There is an accompanying web-based dashboard which presents the automated analysis in the form of tables, maps and graphs. The management of the SAM programme has expanded to approximately 300,000 admissions a year. Expansion of the SAM Reports tool to national scale was planned for summer 2014 <sup>22</sup>.

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<sup>22</sup> Source: <http://www.cmamforum.org/Pool/Resources/Use-of-ICT-in-nutrition-CMAM-Forum-Nov-2014.pdf>

# 4) Electronic decision support

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The electronic decision support mHealth strategy refers to tools which allow automated algorithm- or rule-based instructions to prompt or guide frontline health workers to follow guidelines and provide quality care to patients.

Electronic decision support tools can be used to identify and prioritize high-risk clients for healthcare, targeting interventions in contexts where resources are limited<sup>23</sup>. Within nutrition, electronic decision support tools enable the user to make decisions coupled with procedures relating to specific nutrition indicators. For example, measuring the mid-upper arm circumference (MUAC) and receiving appropriate, targeted decision support based on this data. 14 of the 27 mNutrition services have electronic decision support protocols built into their service.

## Case Study: Millennium Villages - Ghana

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### **mHealth use case**

A primary aim of the Millennium Villages Project (MVP) in Africa is to meet the Millennium Development Goals (MDGs) by integrated multi-sectorial interventions in health and nutrition, agriculture and environmental sustainability in hunger and poverty hotspots in Africa. The Millennium Villages mHealth platform is aimed at empowering CHWs to improve child and maternal health. CHWs use android phones which provide algorithm-based decision support for targeted counselling, case management and performance monitoring. This application is developed using free, open-source software called CommCare<sup>24</sup>.

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<sup>23</sup> Source: <http://www.ghspjournal.org/content/1/2/160.full>

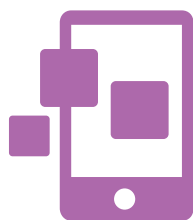
<sup>24</sup> Source: <http://ghana.gsmamhealthfeasibility.com/>



## Icons

### Delivery channels

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App

### Target audience

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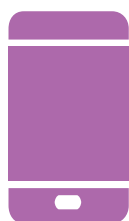
Pregnant women



Women of reproductive age

### Tech device

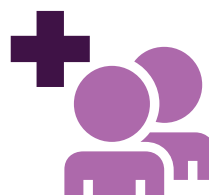
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Feature phone

### Target actors

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CHWs

### Geographical areas of focus

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Ashanti Region



Northern Region



Upper East Region

### Mobile operators

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# Best practices and successes

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## User-centric and data-driven design

Decision support protocols and audio counselling content were translated into French and tested against the decision protocol of the Ghana Health Service (GHS). The content was tested with the district health staff from the Ministry of Health and the decision support protocols were tested with CHWs for usability. Regular reviews of content and decision support protocols occur on a continuous and ongoing basis. Specific attention is paid to cultural and societal considerations. Changes are made to incorporate suggestions from CHWs and other actors.

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Success features are also derived from the data-driven service design. Due to the availability of real time data, reporting on nutritional statistics occurs instantaneously. These reports are reviewed on a weekly basis and, based on the results, nutrition interventions are more targeted and timely. For example, if there are any reported cases of malnutrition within a household, nutritionists are then prompted to respond accordingly at the community level.

The data from the system can also be aggregated to identify trends in nutrition for specific regions, to increase nutrition intervention efforts around these indicators and improve deployment of nutritionists in these areas. This could be extended to inform seasonal interventions, for example if it was found that in a previous year there were increased cases of malnutrition in a certain community/area during a certain season, then nutrition intervention activities, such as promoting increased use of locally available foods, or timely planting of crops, can be implemented to prevent the recurrence of malnutrition within this community again.

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*“If you cannot make informed decisions with data, then there is no point collecting it.”*

- Richard Attandoh, Millennium Villages Project Ghana

## Incorporate key activities to support the mobile component of the service

In addition to the improved quality of consultations on proper nutrition practices provided by CHWs (enabled by the decision support algorithms embedded on their phones), pregnant mothers are also educated about and assisted in initiating income-generating activities. Some of these activities include poultry keeping and home gardening, which provide mothers with the opportunity to have a balanced diet as well as earning money by selling their produce.

A unique aspect of Millennium Villages Project is the involvement and targeted deployment of nutritionists to at-risk communities. Millennium Villages Project partners with trained nutritionists and uses data collected through the system to position nutritionists in high-risk project sites. For example, reported incidence of malnutrition in one site would prompt deployment of a nutritionist from Millennium Villages Project to investigate the case in person. This system enables personalized care as well as tighter surveillance overall. Data is also used to identify best practice sites, to which nutritionists are also deployed to investigate successful practices and consider how to replicate these across other sites.

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## Leveraging learnings across different service deployments

Millennium Villages Project is currently being deployed in 8 countries in Sub-Saharan Africa: Tanzania, Kenya, Malawi, Mali, Nigeria, Rwanda, Senegal and Uganda. The health component of Millennium Villages Project compounds the project's other focus areas, including agricultural sustainability and infrastructure, which are contextually unique across these markets. Shared learning is facilitated across these project implementations and best practices from one country are replicated in others. Millennium Villages Project has specifically employed project managers that oversee multiple countries. This ensures that project managers transfer knowledge and success across all of their project implementations.



# Similar electronic decision support services with a nutrition focus

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## eNutrition Facility-based Outpatient Therapeutic Care (OTC) – Tanzania

D-tree International in collaboration with UNICEF and the Zanzibar Ministry of Health developed a mobile application which uses decision support software to guide nurses through the process of screening, registering, examining, treating and tracking malnourished children over a period of time. The application has been rolled out to 12 health facilities with plans to scale up to additional districts <sup>25</sup>. An additional service component, currently under development, is the integration of this malnutrition-focused application with the Integrated Management of Childhood Illnesses (IMCI) algorithm. This algorithm allows health workers to use a single application to view data for all sick children, not only those who are malnourished. The project aims to improve quality at the point of care in order to decrease the impact of severe acute malnutrition on child and infant mortality outcomes <sup>26</sup>.

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<sup>25</sup> Source: <http://www.cmamforum.org/Pool/Resources/Use-of-ICT-in-nutrition-CMAM-Forum-Nov-2014.pdf>

<sup>26</sup> Source: [http://www.unicef.org/evaldatabase/files/Tanzania\\_2013-004\\_Evaluation\\_of\\_D-Tree\\_Projects\\_FINAL.pdf](http://www.unicef.org/evaldatabase/files/Tanzania_2013-004_Evaluation_of_D-Tree_Projects_FINAL.pdf)



# 5) Financial transactions and incentives

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The financial transactions and incentives mHealth strategy refers to the convergence of mHealth and mobile money through mobile-based financial transactions to pay for healthcare, transport, supplies or drugs, or to improve the deployment and scalability of incentive schemes . Within nutrition, this application can be vouchers for nutrition commodities, using mobile money solutions to facilitate payments within mNutrition services (staff payments, transport etc.) or health insurance or health savings plans. Only 2 of the 27 mNutrition services are currently implementing some form of mobile money within their service.

## Case Study: Movercado - Mozambique (providing vouchers & financial incentives)

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Another very important achievement of Movercado is the possibility of generating reimbursements based on performance. This ability allows everyone who performs a service or delivers a product to be compensated for it in a quick and easy way.

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<sup>27</sup> Source: <http://www.ghspjournal.org/content/1/2/160.full>

## Incorporate key activities to support the mHealth component of the service

Movercado is further optimising its utility by driving use of mobile money to make payments within the service. In the current system, the cost of delivering physical cash payments to CHWs outweighs the entire cost of service operations. To operate more cost effectively, PSI has instituted exclusive payment through mobile money. In this system, CHWs must have a mobile money account in order to access their earnings. In addition to this, in cases where mothers require transportation to healthcare facilities, the transport cost can be paid through a mobile money transaction to the driver <sup>28</sup>.



Increased uptake of mobile money amongst the beneficiaries and actors interacting with Movercado creates an opportunity to grow market share for the two mobile operators currently offering mobile money.

This drives competition. To mitigate existing challenges of low financial literacy and still low penetration of the mobile money offer, Movercado is developing its own financial offer, called Tiko.

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<sup>28</sup> Source: <https://www.youtube.com/watch?v=6wx9YyOK94o>

# Similar financial transactions and incentives services with a nutrition focus

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## Better than Cash Alliance

In 2012, the World Food Programme (WFP) in collaboration with partners launched the Better than Cash Alliance. The programme has partnered with governments in 5 African countries: Malawi, Kenya, Rwanda, Ghana and Senegal. A growing trend in improving the health of mothers and children through technology is in digital food assistance. Using text messages sent through mobile phones, the Better than Cash Alliance delivers digital food vouchers, or e-vouchers, which enable people to buy food from local markets. WFP also expects that 30% of its assistance programmes will be delivered in the form of cash and electronic vouchers. WFP has recently joined forces with MasterCard to create the Digital Food Project. WFP uses MasterCard's technological platform to distribute food vouchers through both mobile phones and banking cards. These vouchers can be used at local markets, which also bolsters local economies<sup>29</sup>.

## Kerio Valley Cash Transfer Pilot (KVCTP) - Kenya

A notable concern with regards to sustainable financing of programmes is that technology may not be able to play a significant role at the level of donor coordination and health systems financing. However, models have been developed which focus on enabling more efficient distribution of resources within health programmes. An example of one such innovative model for nutrition programmes is the Kerio Valley Cash Transfer Pilot (KVCTP), instituted in 2008 by Concern Worldwide in the Baringo North and Pokot East Districts, Kenya. Mobile money was used as a way to digitize the distribution of food aid to areas affected by the post-election violence. Money was sent via m-pesa to clusters of beneficiaries as well as individual beneficiaries, enabling them to collect funds from a local agent and purchase food in their locality. This system alleviated the usual constraints of physical food distribution, disrupting local prices with food distribution and security risks associated with carrying, distributing and accounting for local cash<sup>30</sup>.

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<sup>29</sup> Source: <http://www.cmamforum.org/Pool/Resources/Use-of-ICT-in-nutrition-CMAM-Forum-Nov-2014.pdf>

<sup>30</sup> Source: <https://www.concern.net/sites/www.concern.net/files/resource/2008/08/1193-kenyacashtransferpilot-evaluationreport-july08.pdf>



# Conclusion

This research reviewed five mHealth strategies implemented within nutrition interventions:

1

Client education & BCC

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2

Data collection and reporting

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3

Supply chain management

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4

Electronic decision support

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5

Financial transactions and incentives

Best practices from successful mNutrition services facilitating these mHealth strategies were showcased in this report. It is important to leverage these best practices across other mNutrition services to ensure improved impact on nutrition outcomes, not only in Sub-Saharan Africa, but globally. The GSMA has identified the following 7 best practices and recommends the adoption of these within all mHealth services:

## 1. Robust, multi-sectorial partnerships

The mHealth Tanzania PPP has effectively managed, and continues to secure valuable partnerships with various organisations that drive increased implementation and adoption of Wazazi Nipendeni. There appears to be a correlation between the reach of Wazazi Nipendeni and number of partners within the mHealth Tanzania PPP, with numbers of registered beneficiaries increasing as new partnerships are added to the consortium or existing partnerships are strengthened.

The mHealth Tanzania PPP and PSI have both managed to secure partnerships with all mobile operators in Tanzania and Mozambique, respectively. However their approaches to achieving this success were slightly different. While the mHealth Tanzania PPP has an individual who is formally appointed to broker and strengthen relationships with mobile operators, PSI has outsourced this position to an aggregator. In both cases, there is specific human resource allocated to perform this duty and this may be the reason why they have both achieved success on this front. The critical task of securing and maintaining partnerships with mobile operators requires a concerted effort and reasonable time resource. It is therefore beneficial to appoint someone to take ownership of this task.

In both cases, the relationships with mobile operators provide distinct benefits for the service. Consumer access to services is positively affected by these partnerships.

## 2. Quality control measures throughout service design and delivery

It is seldom that mHealth services effectively ensure that the quality of care delivered to the end user is of an acceptable standard. Movercado has successfully built quality control mechanisms into programme design. This is facilitated through incentive schemes for CHW performance and follow-up calls with the beneficiaries. Movercado can ensure that a high quality service is provided constantly, and that corrective action is taken where service quality is deemed insufficient.

### 3. High quality evidence of efficacy and user adoption

There is growing concern around the scaling up of mHealth services for which there is no existing evidence along these indicators. World Vision is a good example of a service that is actively providing evidence to support scale. Within the Muecate MNCH project, data collected within the programme sites that use mobile phones is compared to a control group of data from sites where mobile phones are not being used. This comparative data, which provides evidence in the lines of efficacy and cost efficiency of the use of mobile, is the foundation upon which they base the need to scale-up the use of mobile across all of their programme sites in Mozambique.

**Both Wazazi Nipendeni and Movercado are exhibiting evidence of high user adoption which strongly supports the need to scale these services.**

### 4. Sustainable business models that create value for all stakeholders

The key factor in mHealth Tanzania PPP's success in brokering partnerships lies in the leveraging of synergies between partner organisations - understanding, pitching to, and delivering on value drivers for all the stakeholders. They have understood the importance of shifting the discussion from a public health focus to a conversation around mutual benefits for all mHealth stakeholders.

Few mHealth services have demonstrated the ability to ensure commercial sustainability. With the cooperation of mobile operators, Wazazi Nipendeni is moving away from being a purely donor funded service to adopting various models for revenue generation. Part of this success can be attributed to the fact that there is someone within the mHealth Tanzania PPP who is formally appointed to manage this aspect of the service - someone who is actively pursuing commercial sustainability for Wazazi Nipendeni.

## 5. Multiple marketing channels which drive customer acquisition of service

Simply launching an mHealth service may not be enough to drive adoption of the service. There need to be parallel efforts in place to market the service to its target audience. Within Wazazi Nipendeni, evidence demonstrates the value of the multimedia campaign that has been implemented. Self-registrations to Wazazi Nipendeni almost triple when media bursts are active. Additional on-the-ground registration of mothers at healthcare facilities, which is promoted by CHWs, is ensuring steady monthly registration rates, now totalling more than 540,000 registered beneficiaries.

Similarly, Movercado has also reached more than 500,000 beneficiaries and this success can also partially be attributed to social marketing campaigns which use different mediums such as posters, promotional material, music cassettes, pamphlets, radio, television, newspapers, theatre and peer groups.

## 6. User-centric and data-driven design

mHealth service and programme design needs to be informed by those who are using the service. In this report we have highlighted a few examples where this is currently being achieved in different ways:

- Movercado has built algorithms into the system to ensure that each interaction with a beneficiary is a uniquely tailored experience. Regular surveys on beneficiary health knowledge also inform improvements to service.
- World Vision facilitates feedback sessions between field assistants who are actors of the service. Where appropriate, feedback from the field assistants informs improvements in programme design ensuring far more effective delivery of the service.
- Millennium Villages Project ensured that the content used within this service underwent a complete translation and localisation process, adapting the content, and testing it to ensure that the content is culturally and socially acceptable for use within the target audience.

Data is often collected to meet the requirements of third parties such as district or provincial health departments. There are cases where mHealth services are collecting a lot of data within their service, but this data is not effectively used to inform improvements in programme design. Millennium Villages Project has managed to deliver more targeted nutrition interventions based on results of analysis of the data that they are collecting in their service.

## 7. Incorporate key activities to support the mHealth component of the service

Another reality brought to light by this report is that mobile technology on its own is not enough to achieve the intended health impact.

Supplementing the use of mobile with other activities optimizes utility of the mHealth strategy and improves the effectiveness of the service.

Two such examples from this case study, Movercado and the Millennium Villages Project, represent the enhanced utility of mHealth services when coupled with enabling activities. In some mHealth services there is demand generation, but there is no way to ensure that this demand can actually be met. In the Movercado eco-system, demand generation to increase the uptake of certain products is facilitated via text messaging and, at the same time, the service ensures that the product supply can meet the generated demand. Movercado also facilitates the use of mobile money within the service thereby enabling more efficient payments of the various actors and also reducing overall operational costs of the service.

In addition to the mNutrition intervention, the Millennium Villages Project offers training and support on complementary nutrition practices (such as farming) which ensure that the beneficiary maintains a good nutrition status. Millennium Villages Project also deploys trained nutritionists to high-risk sites, based on results from data analysis, who are then able to provide personalized consultations to caretakers of malnourished children.



The GSMA has also identified some of the evidence gaps within the nutrition priority countries and recommends the consideration of these within all mHealth services:

## 1) Lack of high quality evidence of safety, health system impact and cost

At the recent University College London (UCL) mHealth conference, much emphasis was placed on the need to provide evidence for scaling mHealth programmes. mHealth services should be able to demonstrate value on the following 5 fronts:

1. Safety
2. Efficacy
3. Health system impact
4. User adoption
5. Cost



Whilst services are starting to exhibit evidence for points 2 and 4 above.



There is still a large requirement for evidence around points 1, 3 and 5.

This gap extends beyond the mNutrition priority countries. One of the most challenging and vital exercises in mHealth is conducting health economic modelling to prove the capability of mobile to reduce the burden on the health system. All mHealth services should be looking to meet this need by providing proof points around the capability of the use of mobile within health. mHealth services need to be able to both qualify and quantify the positive impact that mobile has on these 5 evidence categories.

## 2) Lack of interoperability and integration of mHealth services

Although this concept of bundling mHealth services is not a best practice that we are seeing within mHealth services across the GSMA mNutrition markets, it is something the GSMA would recommend the industry moves towards.

When looking at the various best practices highlighted above, it is clear that each of the mNutrition services that are profiled in this report is achieving success on different fronts. This observation leads to an interesting thought - what would mHealth look like if all these mHealth services were to hold hands and work together? How much more could they achieve together?

The mHealth Tanzania PPP and the success of Wazazi Nipendeni, are examples of how an mHealth service can be improved when different organisations work together, where the strength of each of these organisations is leveraged for the benefit of the service and its target audience. This is proof that organisations can work together towards one goal, but what if we broadened the goal, or rather the mechanism for achieving that goal? What would be the impact of a Wazazi Nipendeni if we added a Movercado, a Millennium Villages Project and a Muecate MNCH programme to it? Not only will the service offering be broadened to cover more mHealth strategies such as data collection and reporting, supply chain management, electronic decision support and financial transactions and incentives, but it will also meet the needs of a broader audience whilst simultaneously addressing more health burdens. The real victory would lie in the fact that each of these services would be managing mHealth strategies already mastered, and would be bringing their individual expertise or best practices to the table. We go from having one service which caters to one aspect of health, and is only successful in one area of mHealth, to an ecosystem of services which offer a more complete continuum of care and together deliver a far more comprehensive and successful mHealth offering.

This concept of true interoperability and integration in mHealth - an mHealth ecosystem rather than a number of stand-alone mHealth interventions - is an ideal which should be pursued by the mHealth industry. This is largely what we, as the GSMA mHealth team, are trying to achieve through our mNutrition Initiative. Rather than launch new mHealth services we are working with a community of relevant mHealth stakeholders to try to bring together existing mHealth services, providing availability of each service in one consolidated access point. The hope is that this is a model which can be replicated across other countries.

# Abbreviations

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ANC	Antenatal Care
BCC	Behaviour Change Communication
CCFLS	Community-led Complementary Feeding and Learning Sessions
CDC	Centers for Disease Control and Prevention
CHA	Community Healthcare Agent
CHW	Community Healthcare Worker
CMAM	Community Based Management of Acute Malnutrition
CSR	Corporate Social Responsibility
GMP	Growth Monitoring and Promotion
HPHB	Health Pregnancy, Health Baby
MNCH	Maternal Newborn and Child Health
MoHSW	Ministry of Health and Social Welfare
NGO	Non-Governmental Organisation
PDH	Positive Deviance/Hearth
PPP	Public Private Partnership
PSI	Population Services International
SAM	Severe Acute Malnutrition
SMS	Short Message Service
ttC	Timed and Targeted Counseling
USSD	Unstructured Supplementary Services Data
WFP	World Food Programme
WHO	World Health Organization



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