

## **EXECUTIVE SUMMARY**

## The Tanzania Mixed Methods **Baseline Report**

External evaluation of mobile phone technology-based nutrition and agriculture advisory services in Africa and South Asia













## mNutrition in Tanzania highlights

# Highlights

mNutrition is a five-year global initiative that has been supported by the Department for International Development (DFID) since 2013, organised by Groupe Spéciale Mobile Association (GSMA), and implemented by in-country mobile network operators (MNOs) to use mobile technology to improve the health and nutritional status of children and adults in low-income countries around the world.

In Tanzania, mNutrition is implemented through the 'Healthy Pregnancy, Healthy Baby' (HPHB) SMS (text messaging) programme, which is part of the Wazazi Nipendeni mHealth platform (WN) which is available nationally and on all phone networks. Information disseminated through the mNutrition programme aims to change nutrition-related practices and influence nutrition outcomes.

Whilst Tanzania is one of the fastestgrowing economies in East Africa poverty levels remain unacceptably high. Despite good progress in health, undernutrition remains a public health challenge and childhood stunting levels and micronutrient deficiencies are high. Our baseline studies the scope to improve the outcomes which the intervention aims to change: women's dietary diversity, some Infant and Young Child Feeding (IYFC) practices and children's nutritional status. A consortium of researchers from Gamos, the Institute of Development Studies (IDS) and the International Food Policy Research Institute (IFPRI) are evaluating the mNutrition programme to assess its' impact, cost effectiveness and commercial viability.

We use a mixed methods approach with three interlinked components to find out about the impact of the mNutrition intervention in Tanzania: a quantitative and qualitative impact evaluation and a business model and cost-effectiveness evaluation.

Our baseline studies found that mobile phone ownership is high across the evaluation sites. However fewer women own mobile phones and access was often strictly controlled and monitored by the owner (usually their spouse).

We found information gaps among pregnant women and mothers, which mNutrition could help to address.

However we also found contextual factors that may stand in the way of mNutrition's effectiveness: work often placed a considerable physical strain and time burden on women and forced them to condense time and energy spent on household chores and child care.

Cover image: Farmer Showcasing Maize in a Crop Field. Photo credit: Mitchell Maher / International Food Policy Institute, CC BY-NC-ND 2.0

# **About VFC in Tanzania**

mNutrition is a five-year global initiative that has been supported by the Department for International Development (DFID) since 2013, organised by Groupe Spéciale Mobile Association (GSMA), and implemented by in-country mobile network operators (MNOs) to use mobile technology to improve the health and nutritional status of children and adults in low-income countries around the world. The nutrition content of the programme aims to promote behaviour change around key dietary and child feeding practices that are likely to result in improved nutritional health within a household.

It summarises and integrates the key findings from the initial data collection round of each evaluation component carried out between October 2016 and January 2017. This report uses these findings to assess the underlying assumptions and draw conclusions about whether and how mNutrition may lead to the desired impact. In Tanzania, mNutrition is implemented through the 'Healthy Pregnancy, Healthy Baby' (HPHB) SMS (text messaging) programme, which is part of the Wazazi Nipendeni mHealth platform (WN). The programme is run by the mHealth Tanzania public-private partnership, which was initiated in 2012 by the Ministry of Health and Social Welfare, with financial support from the US government Centers for Disease Control and Prevention (CDCP). WN is targeted at pregnant women and mothers of young children, and their partners (husbands, etc). It is available nationally and on all phone networks.

The HPHB SMS service sends free text messages in Swahili on a range of pregnancy and early childhood issues.



Image: A woman shows of her mobile phone in Tanzania. Photo credit: Cilia Schubert, CC BY-NC-ND 2.0

## **Evaluating mNutrition in Tanzania**

A consortium of researchers from Gamos, the Institute of Development Studies (IDS) and the International Food Policy Research Institute (IFPRI) are evaluating the mNutrition programme to assess its impact, cost effectiveness and commercial viability.

# Our evaluation addresses the following research questions:

- 1 What are the impacts and cost effectiveness of mobile phone-based nutrition services on nutrition and health outcomes, especially among women, children and the extreme poor?
- 2 How effective are mobile phonebased services in reaching, increasing the knowledge and changing the behaviour of the specific target groups?
- 3 Has the process of adapting globally agreed messages to local contexts led to content that is relevant to the needs of children and pregnant women and mothers in their specific context?
- 4 What factors make mobile phonebased services effective in promoting and achieving behaviour change (if observed), leading to improved nutrition and livelihood outcomes?
- 5 How commercially viable are the different business models being employed at country level?
- 6 What lessons can be learned about best practices in the design and implementation of mobile phonebased nutrition services to ensure (a) behaviour change and (b) continued private sector engagement in different countries?

We use a mixed methods approach with three interlinked components to gather evidence about the impact of the mNutrition intervention in Tanzania, including:

- A quantitative impact evaluation, employing a randomised control design to determine the causal effect of the programme on the impact on dietary diversity, infant and young child feeding (IYCF) practices, and child anthropometry.
- A qualitative impact evaluation, which consists of three qualitative data collection rounds and aims to provide understanding of the context, underlying mechanisms of change and the implementation process of mNutrition.
- A business model and costeffectiveness evaluation, employing stakeholder interviews, commercial and end user data, document analysis and evidence from the quantitative and qualitative evaluation to generate a business model framework and estimate the wider imputed benefits from the value-added service for the range of stakeholders involved.

The three evaluation components are closely linked and integrated with each other at all stages of the evaluation to inform, enhance and explain the design, the development of data collection tools and the analysis of each individual component.

## **mNutrition in Tanzania**

Tanzania is one of the fastest-growing economies in East Africa, mainly due to its natural resources and tourism. Despite promising economic growth and the vision of the government of Tanzania becoming a middle-income country by 2025, poverty levels remain unacceptably high. The Household Budget Survey 2012 estimated that 28.2 percent of the population of Tanzania were poor and 9.7 percent extremely poor. Poverty is estimated to be more prevalent in rural areas (30 percent of all households) than in urban areas (22 percent).

Despite good progress in health, undernutrition remains a public health challenge in Tanzania. Childhood stunting levels are high and so are micronutrient deficiencies (especially vitamin A, iron, iodine). Child undernutrition is common among the children we measured in the Iringa region of Tanzania where the research is being carried out. Despite being less than one year of age - and therefore expected to have a lower prevalence of stunting than children under five years of age who have had longer exposure to detriments to nutritional status - 29.6 percent of children in the mNutrition quantitative sample were stunted. This suggests that dietary inputs, the health and sanitation environment, and caring practices are inadequate, limiting growth for a large proportion of children in the sample. This stunting prevalence will continue to grow as these children age.

Information disseminated through the mNutrition programme aims to modify individual and household information sets and beliefs, which may then change nutritionrelated practices and influence nutrition



Image: Market Table of Grains and Seeds in Dar Es Salaam. Photo Credit: Mitchell Maher / International Food Policy Institute

outcomes. The first step in this causal chain is the presence of gaps in nutrition knowledge among beneficiaries. Given these gaps, and contingent on the resources necessary to change behaviours and that messages can be effectively delivered to women through mobile phones, the mNutrition programme will be most effective if it targets knowledge deficits that are especially common and deemed particularly critical for determining nutrition outcomes.

Women in the target regions have clear knowledge gaps and they also struggle to access credible information to address these gaps. Improving nutrition knowledge among pregnant women and mothers of young children is the highest priority for many nutrition information campaigns because mothers usually play a leading role in nutrition-related caring practices.

## **KEY FINDINGS** from the baseline studies

#### 1.4.1

# Women's dietary diversity, IYCF practices and children's nutritional status

Our baseline studies plenty of scope to improve the outcomes which the intervention aims to change: women's dietary diversity, some IYCF practices and children's nutritional status (with regards to stunting). But we also found contextual factors that may stand in the way of the desired improvements; some of these might be addressed by careful intervention design, whereas other factors are outside the influence of the intervention.

Both available time and money are likely to be major barriers to change. Mothers' work commitments in and around the house as well as outside the home (e.g. in tea plantations) are likely to negatively interfere with good breastfeeding and child feeding practices. Lack of available cash and competing priorities for the money that is available is likely to be a constraint to purchasing healthier and more varied foods (e.g. animal-sourced foods). The WN plus mNutrition service cannot address these issues and they are likely pose a significant risk to the effectiveness of the intervention. Nevertheless, they should be considered carefully when designing text messages (e.g. text messages specifically targeted at lactating mothers who work full time, recommendations for low-cost alternatives to animal-sourced foods).

An assumption that only partially holds true is the perception that unwanted spam messages will not distract from/interfere with WN plus mNutrition services. The qualitative baseline research suggests that spam messages are a concern for many households and, in particular, messages sent with a 15\*\*\* number are often disregarded immediately as they are perceived as spam. WN plus mNutrition messages are sent with such a number and there is a considerable risk that messages will be deleted. To reduce this risk, we strongly recommend that the intervention uses a different sender ID (e.g. Wazazi Nipendeni or similar).

One of the underlying motivations for mNutrition is the assumption that pregnant women/ mothers lack access to credible information on child feeding and nutrition practices and that mobile phone-based services can help to address these existing gaps. While there are certainly knowledge gaps with regards to nutrition among pregnant women and mothers, no acute lack of access to credible information could be identified. In fact, most women had (at least some) access to credible information (e.g. health worker, radio, TV). In this context the value of WN plus mNutrition messages is likely to be as a reminder of existing knowledge; in fact, the service has never been designed to operate in isolation but always meant as a complement to existing sources. Nevertheless, for the service to be perceived as valuable (above and beyond the existing information sources) it needs to extend existing information (e.g. by facilitating operationalisation of information women received during antenatal care (ANC) visits), be more tailored and personalised to specific needs, and/or be more convenient to access.

WN plus mNutrition can be regarded as a multi-sided platform business model. It provides a means of making a product free to one group of customers, while another group pays. Wazazi Nipendeni brings together two groups, providing a link between funders, who pay for the service, and users, who receive the service for free. In the Wazazi Nipendeni model, funders are motivated by improved health outcomes for poor people. Because the customers do not pay, the viability of the service does not depend only on the material (or perceived) benefit to individual users in terms of reduced health expenditures, deaths averted and so on. Rather, it depends on yielding wider benefits that are of value to the funding institutions. The model also benefits from endorsement from the very highest levels of government, and it has a 'cooperative spirit' working with other health providers as one element of integrated multimedia campaigns.

Information disseminated through the mNutrition programme aims to modify individual and household information sets and beliefs, which may then change nutrition-related practices and influence nutrition outcomes. The first step in this causal chain is the presence of gaps in nutrition knowledge among beneficiaries. Given these gaps, and contingent on the resources necessary to change behaviours and that messages can be effectively delivered to women through mobile phones, the mNutrition programme will be most effective if it targets knowledge deficits that are especially common and deemed particularly critical for determining nutrition outcomes.

Contextual factors that may stand in the way of the outcomes (womens dietary diversity, IYCF practices and childrens nutritional status) the intervention aims to change:



Available time and money



Mothers' work commitments in and around the house as well as outside the home



Lack of available cash and competing priorities for the money that is available



The women viewing the messages as spam and deleting them before reading

#### Mobile phone use by pregnant women and mothers

Mobile phone ownership was high across the evaluation sites, with 59 percent of women and 91 percent of men reporting that they owned a mobile phone. While fewer women owned a mobile phone, most women could get access to a mobile phone if needed (e.g. their spouse's or the neighbour's mobile). However, the qualitative data suggests that mobile phone access was often strictly controlled and monitored by the owner (usually their spouse). Young and recently married women in particular were often excluded from regular access and ownership of a mobile phone by their husbands.

Mobile phones were generally perceived as an individual and personal device only to be shared temporarily and in emergencies. The practice of regular mobile phone sharing was uncommon mainly due to trust issues between spouses. Several women who owned a mobile phone explained that their husbands had bought their mobile phones and that therefore their husbands could (and in several cases would) withhold the phone if they had doubts about their wives' use of the phone.

Several women did not own a mobile phone handset but owned a SIM card that they used in the handset of neighbours or family members. This way they had some control and privacy (e.g. the telephone numbers of their personal contacts saved on the SIM) even without owning a phone. This practice would also allow women who do not own a mobile phone to subscribe to WN plus mNutrition service using their SIM card.

Therefore, while network coverage seems to be adequate, multi-SIM card use was common and may lead to mNutrition messages being missed.

Pregnant women and mothers are literate and comfortable with receiving SMS messages: both the quantitative and qualitative data suggest that the majority of women are comfortable with receiving SMS messages. The quantitative survey found that 62 percent of all women (and 84 percent of men) received an SMS in the last 14 days. High levels of literacy (94 percent of women reported to have some formal education) further increased women's receptiveness to SMS messages.

The majority of households did not have access to electricity and had to charge the mobile at a mobile phone kiosk or another place. Only 46 percent of women were able to charge their phones at home. Households without access to electricity usually charged their mobile phones for a fee at the nearest mobile phone kiosk (97 percent of those households reported to have charging facilities less than 30 minutes away from their house). In households where both men and women owned a mobile phone, charging the man's phone was a priority. This is corroborated by the quantitative data, which suggest that men spent almost double the charging fee that women spend per month (1,813 versus 988 TZ Shillings).

The qualitative data also found that charging the mobile phone at a kiosk (especially a kiosk outside the village) was a logistical challenge for many women. Women often had limited mobility due to farming and household chore commitments and also because of social norms that restricted them from travelling outside their village. As a result, mobile phones that ran out of power often remained switched off for several days. This means that mNutrition messages could be missed.





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Therefore, while network coverage seems to be adequate, multi-SIM card use was common and may lead to mNutrition messages being missed.

#### Mobile phone ownership



59 percent of women and 91 percent of men reporting that they owned a mobile phone The majority of households did not have access to electricity and had to charge the mobile at a mobile phone kiosk or another place. Mobility to go to these kiosks is an issue for many women.

When households had a charge point, mens phones took priority.

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Data suggests that mobile phone access was often strictly controlled and monitored by the owner (usually the husband).

## 1.4.3 Social norms

Our data found that the majority of households (82 percent) would be receptive to and would trust a mobile phone-based information service on nutrition.

Mothers and pregnant women expressed the opinion that mobile phone-based information could offer an inexpensive and convenient channel for new information. They also liked the fact that SMS messages could be read repeatedly, were private (in contrast to information they received during village meetings or public child growth monitoring sessions) and had the potential to be very timely (i.e. women receive the information they need at the time they need it).

Households frequently complained about mobile spam – meaning unsolicited text messages, especially advertising. Households frequently pointed out that the number or name of the sender of an SMS message helped them to determine whether it is spam or worth reading. At the time of the baseline data collections mNutrition messages were sent from a 15001 number. Several interviewees said they were generally suspicious of 15\*\*\* numbers, as many promotional messages are sent using this number.

If women miss or disregard messages or message notifications, believing the message to be spam, this could negatively impact on the uptake of mNutrition messages. Mobile spam might also fill up women's inboxes, making it impossible to receive new messages.





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**Positive**: Mothers and pregnant women expressed the opinion that mobile phone-based information could offer an inexpensive and convenient channel for new information.

They also liked the fact that SMS messages could be read repeatedly, were private (in contrast to information they received during village meetings or public child growth monitoring sessions) and had the potential to be very timely (i.e. women receive the information they need at the time they need it).



**Negative**: Households frequently complained about mobile spam – meaning unsolicited text messages, especially advertising.

1.4.4

## Information gaps related to nutritional practices

The quantitative baseline survey used 11 questions to assess pregnant women's and mothers' current knowledge levels and practices about feeding children and babies covering breastfeeding, complementary feeding, and other health and nutrition topics. The assessment suggests medium knowledge levels. But they lacked specific (often practical) information (e.g. regarding the management of breastmilk supply, nutrient rich foods).

These findings suggest that mNutrition could help to address existing information gaps among pregnant women and mothers, especially if the information provided is specific (given that general knowledge was already relatively good).

Both the qualitative and the quantitative data suggest that pregnant women and mothers perceived government health workers as the most trusted formal information source on health and nutrition (98 percent of households agreed they would trust a government health worker). In line with this, 80 percent of households said that their most important source of health and nutrition information were government health workers and 17 percent of households mentioned other health workers (e.g. NGO). Most pregnant women and mothers with children had received at least some information on IYCF from health workers during their antenatal visits (99.8 percent of women attend at least one visit and the average number of visits was four). However, both the qualitative and quantitative data indicate that the number of services women received during antenatal visits was high (including pelvic examination, different clinical tests, supplement administration, checks for obstetric complications). Consequently, the time for nutrition advice during antenatal visits was very limited and the advice provided was seldom in depth. While a few mothers also said they had received nutrition advice during the child growth monitoring sessions, most had not.

Only three-quarters of all households had access to improved sanitation and 82 percent had access to improved drinking water sources. The remaining households had to rely on unsafe, not improved sanitation and/or water sources, which increase the risk of diarrhoea and worm infestations (both of which have been linked to undernutrition). Access to improved sanitation and drinking water may be a limiting factor for the improvement of child nutrition.



Most pregnant women and mothers with children had received at least some information on IYCF from health workers during their antenatal visits. However the time for nutrition advice during antenatal visits was very limited and the advice provided was not in depth because other issues took precedence.

Only three-quarters of all households had access to improved sanitation and 82 percent had access to improved drinking water sources. Access to improved sanitation and drinking water may be a limiting factor for the improvement of child nutrition.





#### Time and resources to improve child feeding practices

Most women lacked both time and resources to improve feeding practices. 77 percent of women work in agriculture (on the household's farm or tea plantations). The qualitative data suggest that petty trading and small business were other common economic activities of women (especially in Mufundi). Work often placed a considerable physical strain and time burden on women and forced them to condense time and energy spent on household chores and child care.

Many women (in particular women who worked on tea plantations) were also away from the home for long periods of time. Various child care arrangements were in place when mothers were absent and could not take young children with them (older siblings, grandmothers, neighbours).

Maternal work and the associated time and energy demands of work may pose a barrier to improving child feeding practices.

Household poverty emerged as the main barrier to improving dietary intake during pregnancy and IYCF in all six villages. In the qualitative interviews women frequently said that they are unable to purchase nutritious varied foodstuffs from local markets.

#### 1.4.6

#### Sustainable commercialisation pathway

mNutrition services target viable customer segments as mobile phone ownership and literacy levels are relatively good among the targeted users. The Wazazi Nipendeni service explicitly accommodates four categories of users:

- Pregnant women
- New mothers
- Supporters (of pregnant women or young mothers)
- General interest.

A limiting factor was revealed by the qualitative research, which found that many husbands control their wives' access to mobile phones. Husbands are, therefore, a key customer segment, and indeed are accommodated in the Wazazi Nipendeni service as supporters of pregnant women. Moreover, men are clearly targeted in the Wazazi Nipendeni campaign materials, which focus on the role of couples in bringing up children.

This is in contrast with findings from the qualitative research that men are generally

supportive of receiving messages on nutrition and child health, and women can see the advantage in their husbands receiving messages. Women felt that sending messages to men would help engender a sense of responsibility for health and nutrition in the family, which is key to improved nutrition, given that it is men who are the main decision makers regarding food to buy and crops to grow. Men recognised that the efficacy of messaging could be improved by sending messages to both husbands and wives, as they would then be more likely to discuss issues, although there was no suggestion that messages should be sent to men in preference over women.

The fact that the service is text-based will mean that it is likely to be of limited value to illiterate sections of the population. Although adult literacy rates for the population as a whole are around 80 percent, rates are much higher among the young – literacy among young women (aged 15-24) was 85 percent (2012). This still leaves a substantial proportion of the potential target group who may be unable to access the Wazazi Nipendeni service.

#### Time and resources to improve child feeding practices



### Sustainable commercialisation pathway



The Wazazi Nipendeni service explicitly accommodates four categories of users:

# Testing the mNutrition theory of change

Our research highlighted various ways that the mNutrition programme can be designed to have the maximum impact and effectiveness. It shows us that the programme could make a really valuable contribution by addressing pregnant women's and mothers' information needs.

However mNutrition might be **less effective** if it fails to:

- Consider women's existing work burden in agriculture and other areas and how these might conflict with improved child feeding practices.
- Consider women's financial resource limitations and how these might hamper improvements in child feeding practices (e.g. lack of money to purchase more varied food).

This research also highlights various contextual factors that may limit the effectiveness of mNutrition if not addressed or considered in the programme design/marketing including:

- Limited or controlled access to mobile phones for women
- Illiteracy of some members of the potential target group who may be unable to access the Wazazi Nipendeni service, as it is text based
- Limited access to electricity and the associated risk of being offline for some time
- The risk that mNutrition messages are perceived as spam
- The role of government health workers as highly trusted information sources and how mNutrition messages can support/ complement the work of health workers
- Poor access to improved sanitation and drinking water sources
- Operate as part of a broader multi-media campaign, as the text messaging service is not intended to operate in isolation
- Ensure that key suppliers including the local aggregator make resources available after seeing the performance of mNutrition
- The costs of the dedicated, specialised team continue to be met and that in-kind contributions continue to be made by MNOs.





Read the full report here: http://bit.ly/mNut-Tanz-mixedmethodsbaseline