

# Report from Kenya

## Fortification with Micronutrient Powder to Address Malnutrition in Rural Kenya

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Malnutrition is a serious public health problem in most rural communities of Sub-Saharan Africa, contributing significantly to the morbidity and mortality of children under five years of age. This burden of malnutrition is reflected in all of the Millennium Villages Project (MVP) sites, including Sauri Millennium Village (MV) and Dertu MV in Kenya. Sauri is a rural community of about 70,000 people in Siaya County, Nyanza province in western Kenya, while Dertu is a mostly pastoral community in Garissa Country, northeastern Kenya. The MVP is an integrated rural development project jointly implemented by the Earth Institute at Columbia University and the Millennium Promise Alliance in ten countries in Sub-Saharan Africa. The MVP aims to demonstrate if and how poor remote communities can achieve the Millennium Development Goals with an estimated investment of US\$60 per capita per year (16 cents per day) for five to ten years. The MVP's integrated model employs a multi-sectoral development strategy to simultaneously address the many underlying causes of extreme poverty, including food production, access to health care, education, infrastructure and business development.

A baseline survey conducted in Sauri in 2005 revealed that, among the 300 households interviewed, roughly 60.2%\* of children under five were stunted (i.e., low height-for-age, an indicator of chronic malnutrition) and roughly 7.5%\* of children under five were wasted (i.e., low weight-for-height, a sign of acute malnutrition). The prevalence of underweight – a composite indicator

of chronic and acute malnutrition defined as low weight-for-age – among children under five in these households was 25.3%.\* In Dertu MV, the prevalence of stunting, wasting and underweight among children under five surveyed was 38.7%,\* 20.0%,\* and 38.6%\* respectively at baseline (2006). Additionally, the rates of anemia were an astonishing 100% in Dertu and 77% in Sauri among the children under five surveyed. The high prevalence of malnutrition in Sauri and Dertu MVs at baseline suggested that local diets were not sufficient for meeting the micronutrient needs of young children, who, along with pregnant and lactating women, are the most vulnerable to macro- and micro-nutrient deficiencies.

### Bolstering each pillar of food security

The Millennium Villages Project works in conjunction with communities and governments to bolster each pillar of food security – availability, access, and utilization of nutrient-rich foods – by engaging different sectors. Improved seeds, agricultural extension programs, and investments in irrigation have led to higher crop yields and agricultural biodiversity to ensure availability of nutritious foods. The MVP's infrastructure and business development initiatives promote income-generating activities that enable greater access to diverse foods. In addition, community members are counseled on better utilization of nutrient-dense foods through cooking demonstrations, school-based nutrition campaigns, and a robust Community Health Worker program. However, food security alone is insufficient to prevent child malnutrition. Inadequate care and poor water, sanitation and hygiene (WASH) conditions cause morbidities that lead to malnutrition, which in turn undermines the immune system, leaving children more vulnerable to infections and disease. While the MVP aims to address most or all of the factors in the nutrition impact pathway, including strengthening the primary health care system and increasing access to safe water and improved sanitation facilities, malnutrition remains a persistent and complex challenge that affects all but two countries globally.<sup>1</sup>

\*Preliminary, unpublished data. The MVP nutrition data from baseline to the present, including new 2015 data, will be analyzed in greater detail as part of the final evaluation of the new project which is now under way and will be published in 2016.



A mother in Sauri Millennium Village, Kenya, feeds her child porridge fortified with MNP

## “Malnutrition remains a persistent and complex challenge”

Over the first three years of the project, the MVP, which aims to address all aspects of the nutrition impact pathway, observed substantial reductions in stunting prevalence. Across nine of the MV sites, stunting prevalence among children under two was, on average, 43% lower in 2008–9 than at baseline.<sup>2</sup> However, the early gains in nutritional outcomes were difficult to replicate in subsequent years, and progress began to stagnate.

In August 2012, the MVP partnered with *Sight and Life* to find ways to continue improving the nutritional status of children in Sauri and Dertu. The 1,000 days between conception and a child’s second birthday is widely recognized as a critical window of opportunity to positively impact a child’s cognitive development, physical growth, and long-term health. Accordingly, *Sight and Life* and the MVP chose to focus on point-of-use fortification with micronutrient powders (MNP) for children six to 23 months of age, which was later declared by the World Health Organization (WHO) as one of the Essential Nutrition Actions for improving maternal, newborn, infant, and young child health in 2013.

### MixMe™ micronutrient powder

DSM’s MixMe™ micronutrient powder contains 15 vitamins and minerals considered essential for healthy development and

growth, including vitamin D for bone development and iron for cognitive development, and zinc for overall growth.<sup>3</sup> It is packaged in single serving, one-gram sachets for daily use and can be easily mixed into a small amount of soft or semi-solid complementary food for the child to consume. Noted by the WHO for their long shelf-life and limited transport and storage concerns, MNPs have been found to reduce iron deficiency and anemia in infants and young children.<sup>4</sup>

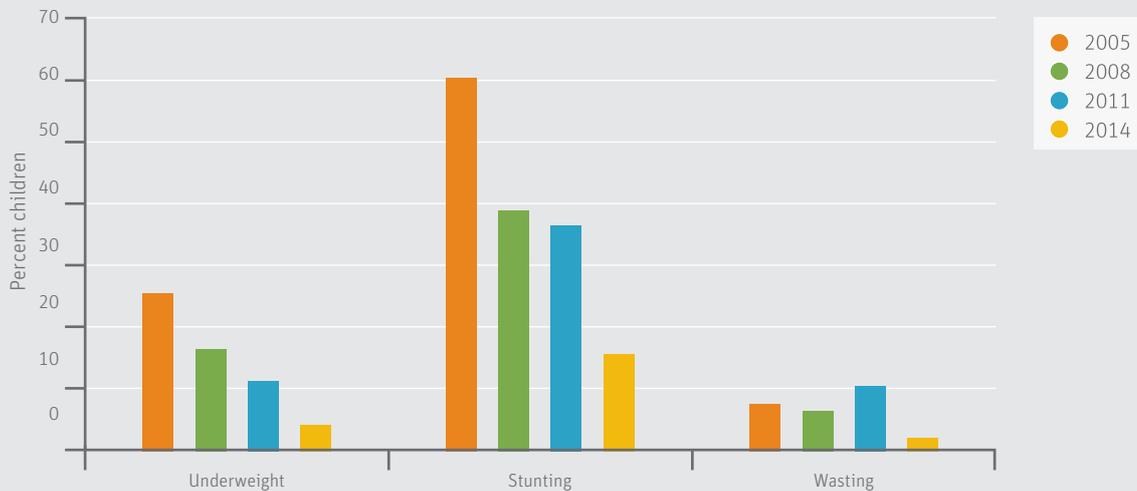
## “MNPs have been found to reduce iron deficiency and anemia in infants and young children”

To initiate the new project, the Sauri and Dertu MVP teams first met with community members and government officials to present the initiative and collectively design a plan for implementation. Information, education, and communication (IEC) materials on infant and young child feeding (IYCF) and point-of-use fortification with MixMe™ were developed, translated into the local languages, tested with community health workers and community members, revised, and finalized. Additionally, the project team developed monitoring and evaluation tools including registers, ration cards, monitoring logs, and monthly report forms for understanding compliance. Next, community health workers and their supervisors were trained on distributing MNP, IYCF counseling, and demonstrating proper use.

In Sauri, the MVP team and District Health Management team took advantage of a door-to-door polio campaign to sensitize mothers and caregivers of young children about the upcoming MNP initiative. In Dertu, where communities are predominantly pastoralist and nomadic, community-based health care workers conducted the sensitizations during routine household visits. In total, over 3,500 children aged six to 23 months were enrolled in and around Sauri and Dertu Millennium Villages and received MixMe™ sachets to improve their micronutrient intake.

### Acceptance by the community

MixMe™ was generally well-accepted by community members, most of whom noted that it is easy to use, convenient, lightweight, and simple to transport and store. Most mothers were also pleased that the MNP did not alter the taste or texture of foods. However, four mothers stated that their children did not like the taste of the MNP and that one child experienced diarrhea after consuming the powder. Other negative feedback included the absence of instructions in the local language on the packaging, the fact that the sachets may resemble condom packaging, and difficulty understanding the nutrition content as conveyed on the box. Overall, the intervention was well received by com-

**FIGURE 1:** Sauri Millennium Village

munity members and there was high demand for MixMe™ to be provided to all children under five, not just those from six to 23 months of age.

A nutrition survey conducted in Sauri in 2014 showed remarkable reductions in stunting, wasting and underweight prevalence among children under five in the research area. Unfortunately, due to insecurity in northern Kenya, the survey was not administered in Dertu, and so a similar comparison cannot be drawn.

#### A note of caution

Since home fortification with MixMe™ was only one of many nutrition-specific and nutrition-sensitive interventions implemented by the MVP, it is important to interpret the data with caution and not attribute these results directly to the MNP intervention or any other specific intervention. However, the significant reduction in all indicators of chronic and acute malnutrition between 2011 and 2014 may suggest that an integrated, multi-sectoral approach could contribute to improved nutritional outcomes among children under five years of age. The Millennium Villages Project is grateful to *Sight and Life* for its generosity and support.

**“An integrated, multisectoral approach could contribute to improved nutritional outcomes”**

Lessons learned from the planning, implementation and monitoring of this project were discussed with key nutrition partners at the Kenyan Ministry of Health in Nairobi. These dis-

cussions contributed to the country’s National Nutrition Action Plan, launched in 2012, which includes home fortification with MNP as a strategy to achieve its third objective, to reduce the prevalence of micronutrient deficiencies.

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