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Research Center

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Social Return on Investment Evaluation Report Maternal Infant and Young Child Nutrition Project

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List of Acronyms

ANC: Antenatal care

APHRC: African Population and Health Research Center

BFCI: Baby-Friendly Community Initiative

CHV: Community Health Volunteer

FGD: Focus Group Discussion

IDI: In-Depth Interview

KAP: Knowledge Attitude and Practices

KII: Key Informant Interview

MIYCN: Maternal Infant and Young Child Nutrition

MNCH: Maternal Neonatal and Child Health

MAM: Moderate Acute Malnutrition

PNC: Postnatal Care

RCT: Randomized Controlled Trial

SAM: Severe Acute Malnutrition

SROI: Social Return On Investment

WASH: Water, Sanitation and Hygiene

WTP: Willingness To Pay

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Introduction

This report presents the findings of the Social Return On Investment (SROI) analysis of a nutritional intervention known as Maternal Infant and Young Child Nutrition (MIYCN) in Kenya, conducted by the African Population Health Research Center (APHRC) in collaboration with the Ministry of Health. The MIYCN study (<http://bit.ly/1HARcJB>) was conducted between 2012 and 2015 and was funded by the Wellcome Trust. The project aimed to improve the health and nutritional status of children in urban poor settings in Kenya and inform the implementation of the Government's Baby Friendly Community Initiative (BFCl). The intervention consisted of home-based nutritional counseling of pregnant women and mothers of young children on optimal breastfeeding and other optimal early child nutrition practices. The SROI study, conducted between March 2015 and March 2016, evaluated the social impact of the intervention on the people who were directly or indirectly involved. It was conducted by APHRC in collaboration with the Ministry of Health, Kenya, and was supported by the research consortium Transform Nutrition, funded by DFID, UK. The SROI evaluation followed the principles developed by the SROI Network (SROI Network 2012) and was produced under the guidance of an SROI mentor and an SROI-trained practitioner.



Lead Organization and Project Presentation

About the African Population and Health Research Center

The African Population and Health Research Center (APHRC) is an international non-profit research organization headquartered in Nairobi, Kenya, whose main mission is to generate and deliver scientific evidence for policy and action on population, health and education in Africa. APHRC has long-standing research experience in Africa and brings together a multidisciplinary team of highly experienced African scholars with expertise in various fields including public health, anthropology, sociology, demography, health economics and biostatistics to lead the development of priority research programs and enhance the use of research findings for policy formulation and program improvement in sub-Saharan Africa. The Center has a well-established working relationship with key stakeholders in the various Government ministries and with parliamentarians throughout the Southern and East African region and continues to engage national and international policymakers and program implementers with research evidence (<http://www.aphrc.org>).

About the Maternal Infant and Young Child Nutrition Project

The Kenyan Ministry of Health has adopted the Baby Friendly Community Initiative (BFCI) as part of its 2012-2017 national nutrition action plan (<http://bit.ly/1G8RVz8>) as a strategy to provide comprehensive support to mothers at the community level to improve maternal, infant and young child nutrition and health – with an emphasis on protecting, promoting and supporting breastfeeding. BFCI is a high-impact nutrition intervention, with great potential to accelerate reductions in child malnutrition and mortality. While a healthy mother and child is the primary outcome of the initiative, BFCI has far-reaching advantages for the family and even for the community.

APHRC, in collaboration with the Unit of Nutrition and Dietetics and the Unit of Community Health Services, Ministry of Health, Kenya, implemented a nutrition intervention study aimed to improve the health and nutritional status of children in urban poor settings in Kenya, and to inform the implementation of the Government's BFCI. The intervention study consisted of home-based nutritional counseling of mothers by Community Health Volunteers, and was known as the Maternal Infant and Young Child Nutrition (MIYCN) project (<http://bit.ly/1HARcJB>). The MIYCN intervention study was a randomized controlled trial in urban slums in Kenya (Kimani-Murage et al., 2013). The study, employing a cluster-randomized study design, was conducted in two slums in Nairobi, Korogocho and Viwandani, where 14 community units (defined by the Kenyan Government's healthcare system) formed the unit of randomization. A total of 1100 pregnant women and their children were recruited into the study and followed up. The mother-child pairs were followed up until the child was one year old. The mothers received regular, personalized, home-based counseling by trained Community Health Volunteers (CHVs) on MIYCN. Regular assessment of knowledge, attitudes and practices on MIYCN was carried out, coupled with assessments of the nutritional status of the mother-child pairs and diarrhea morbidity for the children. The project was funded by the Wellcome Trust and implemented from 2012 to 2015.

The activities of focus under the MIYCN were:

- Engagement of policymakers and decision-makers via stakeholder meetings (national and county level);
- Community mobilization on and promotion of the intervention;
- Deployment and training of Community Health Volunteers on standard care, maternal nutrition, breastfeeding and complementary feeding, and compensation;
- Home-based counseling for all pregnant women enrolled on maternal nutrition, breastfeeding and

complementary feeding programs, and encouragement to comply with ANC/PNC visits, birth planning, immunization and water sanitation hygiene (WASH) practices in relation to the child;

- Monitoring of MIYCN Knowledge, Attitude and Practices (KAP) and nutritional status (weight, height, MUAC), morbidity status and development milestones;
- Referral of severely acute malnourished (SAM), moderate acute malnourished (MAM) and sick children to health facilities, and follow-up; and
- Supervision of CHVs.

The key findings from the study indicate that the rate of exclusive breastfeeding for six months increased from about 2% at baseline (before the intervention) to approximately 55% after intervention in both groups. The prevalence of stunting for children aged 6-12 months reduced from about 33% at baseline to about 30% after the intervention, while it increased to 38% in the control group.

About Social Return on Investment (SROI)

SROI is a recognized methodology used to value the impact of a program. It examines the social, economic and environmental impact of an intervention. The methods used are based upon the SROI as presented in the guide (SROI Network 2012) and in the practical guide for international cooperation (Browers et al 2010). The SROI principles are as follows: 1) involve stakeholders; 2) understand what changes; 3) value what matters; 4) include only what is material; 5) avoid over-claiming; 6) be transparent; and 7) verify the result.

The process to conduct the SROI analysis used the following steps: 1) established the scope and identified key stakeholders; 2) explored the theory of change; 3) mapped the outcomes; 4) evidenced the outcomes and gave them a value; 5) established the impact; 6) calculated the SROI ratio; and 7) carried out reporting and dissemination.

The rest of the report follows these steps except for Step 7, which is the report itself.

Scope and Stakeholders

Scope

Purpose of the SROI

The purpose of the SROI was to inform on the prioritization, implementation and scaling-up of nutrition-specific interventions in Kenya and beyond. Specifically, it was expected that the SROI would inform the programming of the proposed national Baby Friendly Community Initiative (BFCI) in Kenya.

A sub-objective was to explore, identify and value negative and unintended outcomes to inform future interventions.

APHRC's main mission is to generate and deliver scientific evidence for policy and action on different issues, including health. The purpose of this SROI therefore aligned with the Center's mission

The target audience

The target audience of the SROI was the policy- and decision-makers working on maternal, infant and young child nutrition in Kenya and beyond.

Available resources

Funding was granted for the SROI analysis by Transform Nutrition. A team of researchers from APHRC worked with a team from Loughborough University to conduct the SROI. Elizabeth Kimani-Murage was the PI, and was closely assisted by Sophie Goudet, a co-PI from Loughborough, who was trained on conducting the SROI analysis. Tim Goodspeed from Social Value UK offered mentorship on the conduct of the SROI.

The period of delivery covered by the analysis was from September 2012 to February 2015. The analysis was an evaluation.

Stakeholders

“Stakeholders are defined as people or organisations that experience change or affect the activity, whether positive or negative, as a result of the activity being analysed” (SROI Network 2012).

The first step was to identify all of the potential stakeholder groups that were likely to have been impacted by the intervention and to decide whether to include them in the SROI assessment. The research team elicited a potential stakeholder list. During the study's inception meeting held in June 2015, representatives from the Ministry of Health (at the county and national levels), UNICEF, USAID, Non-Governmental Organizations, research organizations and academic institutions contributed to firming up the identification of stakeholders. An influence and importance matrix was used to identify and select stakeholders (Figure 1, Annex 1).

The stakeholders listed in Table 1 were identified during this brainstorming.

Table 1: List of stakeholders and subgroups

Stakeholders	Explanations
Mothers in the two slums involved in the intervention	They were the primary beneficiaries of the intervention. Mothers were counseled and followed up by Community Health Volunteers (CHVs) from pregnancy to when the child was over six months.
Children in the intervention	They were the primary beneficiaries who should have benefited from better nutrition and WASH practices, as their mothers were counseled on optimal practices in nutrition, health and WASH.
Fathers of children involved in the intervention	Some of the fathers attended the counseling sessions. Their wives shared knowledge with them.
Grandmothers of children involved in the intervention	They often looked after their grandchildren in the absence of the mothers, and attended some of the counseling sessions. Their daughters could have shared knowledge with them.
Grandfathers of children involved in the intervention	They could have benefited from the knowledge gained by the grandmothers or the mothers.
Neighbors, friends and relatives of mothers involved in the intervention	They could have observed changes in practices, and the mothers in the intervention could have shared knowledge with them.
Healthcare providers in the community	They could have been consulted as mothers were sensitized towards the importance of seeking healthcare.
Traditional birth attendants /Herbalists	They could have been less frequently used as pregnant mothers were counseled to give birth in health facilities.
NGOs/CBOs/Feeding Centers/ Programs	These organizations could have treated more malnourished children as there was a better case-finding and referral system under the intervention. There could also have been fewer malnourished children, as mothers were more knowledgeable about their children's nutrition, resulting in better nutritional health.
Ministry of Health: National level; Community level: Unit of Nutrition and Dietetics, Unit of Community Health Services and Child Health, SCHMT	Ministry of Health and healthcare providers participated by providing healthcare, immunizations, child checkups, ANCs, supplementary information materials and health talks. Ministry of Health at the community level was involved in the work of the CHVs, by providing supervision and enabling 2. Need to set up headers throughout the smooth running of the CHVs' work in the community. The Ministry of Health could have benefited from having trained CHVs and healthier children in the community.
Community Health Volunteers	CHVs were trained to counsel mothers. They could have gained knowledge and skills through training and experience. They were also given a monthly financial incentive.
Data collection team	The data collection team was trained and could have benefited from the knowledge gained. They were also paid a salary.

Day care center managers	They could have benefited from the intervention as counseled mothers could have asked for better nutrition and hygiene practices in daycare centers.
Local leaders	Community leaders may have supported in the mobilization of the community and assisted with acceptability challenges faced by CHVs and field workers.
Business community	They could have sold more nutritious food due to the counseling received by mothers. On the other hand, they could have experienced reduced sales of replacement foods as mothers were counseled on optimal breastfeeding.
Media	They could have contributed to the intervention by promoting it and communicating about it.

Regarding the mothers' group, it is important to note that as the intervention under study is an RCT, the mothers were split into two groups: intervention and control. We have decided to include the control group as the mothers in the control group also received counseling and we expected them to have benefited from it. Analysis from the two groups on exclusive breastfeeding indicates similar changes.

We decided to exclude the following groups from the analysis as these stakeholders did not experience material changes as a result of the intervention. Some of these stakeholders were part of the data collection and the decision to exclude them was taken after data analysis.

- Grandfathers: They did not experience material changes due to the intervention.
- Neighbors, friends and relatives: They did not influence the running of the project and did not directly benefit from the project. They could have benefited from knowledge and observed changes in practices, but we considered this immaterial.
- Traditional birth attendants: They did not report tangible outcomes when we interviewed them about the intervention.
- Therapeutic feeding centers: Most of the therapeutic feeding centers where malnourished children were referred were at health facilities and were included among the health facility stakeholders.
- Ministry of Health: The impact at county level was a healthier community, which was reflected by the mother and child stakeholders.
- Local community leaders: They were not directly involved in the project and did not experience direct benefits as a result. They were involved in data collection to establish outcomes for the community members.
- Business community: They reported limited impact when we interviewed them about the intervention.
- Media: The media was little involved in the project.

We decided to include siblings of children involved the project as a stakeholder group as they were identified by the mothers' stakeholder group as being impacted by the project.

The intervention rationale

“A Theory of Change is a specific and measurable description of a social change initiative that forms the basis for strategic planning, ongoing decision-making and evaluation. It can be seen as a tool to explain the logic of your strategy. It represents the belief about causal relationships between certain actions and desired outcomes” (Browsers et al. 2010).

The expected theory of change was discussed within the research team. The home-based nutrition counseling intervention aimed to make mothers more knowledgeable and skilled in maternal and child nutrition and care, and in turn to improve their maternal and child feeding and care practices. As a result, mothers may have become healthier and had healthier children, which may have reduced household expenditure on healthcare and family members’ stress and anxiety due to maternal or child illnesses. The counseling may have led to mothers or families making decisions around issues such as work for the mother (e.g. the mother could have stopped working to look after the baby), child care (e.g. the mother could have opted not to take the baby to a daycare center for child care), or exclusive breastfeeding (rather than formula feeding), which could have had some economic impact on the mothers and families. In addition, training the Community Health Volunteers on maternal and child nutrition made them more knowledgeable and skilled to offer counseling to mothers, which may have led to improvements in healthcare-seeking behavior and reductions in risky behaviors such as giving birth with unskilled assistance. These changes may have led to overall health, social and economic improvements in the community.

Methods

Data collection took place using qualitative and quantitative methods. Inclusion and exclusion criteria for the methods used are presented in Table 1, Annex 1.

Qualitative methods used to identify the changes as a result of the intervention

The main objective of the qualitative work was to gain a general understanding of the changes observed or experienced as a result of the intervention. Qualitative interviews were conducted in July and August 2015 with the stakeholders identified. Data were collected through 19 focus group discussions (FGDs), 27 key informant interviews (KIIs) and 20 in-depth interviews (IDIs) in Korogocho and Viwandani slums with 161 participants in total (Table 2).

Table 2: Data collection for the qualitative approach

STAKEHOLDER	IDIs	FGDs	KIIs
Mothers (Intervention)	2	2	0
Mothers (Control)	2	2	0
Fathers	4	2	0
Grandmothers	4	2	0
Other relatives	4	2	0
Healthcare providers	0	0	4
Traditional Birth Attendants (TBAs)	0	0	4
Feeding centers	0	0	3
MoH: National, community level	0	0	4
Community Health Volunteers (Control)	0	2	0
Community Health Volunteers (Intervention)	0	2	0

Daycare center managers	0	0	4	
Community leaders	0	2	4	
Data collectors	0	1	0	
Business community	0	0	4	
Families not in project (mothers)	4	2	0	
Total	20	19	27	
Total # of Participants	161 =	20	114	27

Focus group discussions were conducted with intervention mothers, fathers, Community Health Volunteers involved in the project, other relatives (living with the intervention mothers) and grandmothers (Table 2).

Key informant interviews were conducted with different stakeholders who had a good understanding of the communities' maternal and child feeding practices, who may have been directly or indirectly impacted by some of the project's activities, although they were not directly involved in the project. These included healthcare providers, community leaders, daycare center managers, feeding centers or programs in the community, and Government officials from the Community Health Strategy and Nutrition units (Table 2).

In-depth interviews were conducted with mothers, fathers, grandmothers and traditional birth attendants, with the objective of gaining an in-depth understanding of individual experiences with regard to the changes observed and the impact of the intervention, as well as the value of the impacts to these specific groups (Table 2).

Quantitative methods used to assess the level of impact experienced

Quantitative methods were used to assess the level of impact experienced or observed by the project participants and the frequency of participants who reported changes in terms of nutrition, health and hygiene practices or other outcomes, whether positive or negative, as a result of the project. These included the perceived benefits and losses incurred as a result of the project and the estimated changes in expenditure resulting from the intervention. Questions to assess what would have happened if the intervention had not taken place were included to estimate deadweight rate (refer to section on MIYCN impact below). Quantitative data collection was carried out in October and November 2015. Data were collected from mothers, Community Health Volunteers, TBAs, field interviewers, daycare center representatives, grandmothers, healthcare providers and the business community (Table 3). For the mothers' group, the sample was randomly selected based on 10% of the sub-groups (intervention, control, and from the IVP study which recruited women not involved in the MIYCN study). For the other groups we purposefully sampled from the community as no existing lists were available. Interviews were carried out through structured questionnaires, developed by the study team and reviewed by SROI experts. The tools were translated into Swahili, the most commonly-used language in the study setting.

Table 3: Data collection for the quantitative approach

STAKEHOLDER	Sample Size
Mothers	150
Community Health Volunteers	25
Grandmothers	56
Daycare center owners	10
Business community	20
Healthcare providers	10
Data collection team	10
Total	281

Questionnaire data were collected using electronic data capture devices by a team of ten field interviewers. The team was trained for seven days on the SROI approach, study objectives, quantitative data collection methods and the study's data collection tools. Prior to the main data collection, a pilot activity was conducted to pre-test the tools, and feedback from the pilot was used to review the tools accordingly. During the data collection process, two field supervisors were involved in supervising data collection and 100% data editing to ensure high-quality data.

A self-administered questionnaire was used to collect data from the field interviewers (data collection team) who were involved in the MIYCN study data collection.

The final data were uploaded into STATA software for cleaning and analysis.

Value game technique used to value outcomes without a market value

In an SROI, some of the outcomes may not have a tangible value (e.g. less stressed mothers). For such outcomes, and based on the SROI principles, we used valuation for non-market value techniques (value games). These techniques provide a practical approach to valuing outcomes and involving stakeholders. They show how stakeholders value the outcomes they experienced relative to other items they also value that have marketplace values (prices). We consulted stakeholders through focus group interviews and key informant interviews between January and February 2016. A total of 16 focus group discussions were conducted: four groups of mothers, four groups of fathers, four groups of grandmothers, three groups of CHVs and one group of data collectors. The key informants included three healthcare providers and three daycare centers. The monetization or valuation was carried out by conducting a value game for each of the outcomes the participants experienced as a result of the intervention that did not have a market value (an example of the value game is given in Annex 2). An average of the higher and lower cost items was used to assess the market value of the outcome. For example, grandmothers placed the outcome 'reduced burden of care' between 'food paid for one year' and 'rent paid for one year' in terms of importance.

Other data sources

In addition to the quantitative and qualitative data, other project data collected prior to the SROI were used for triangulation. These include the MIYCN project's randomized controlled trial (RCT) data, and qualitative midline, endline and cost effectiveness analysis (CEA) data (Table 4). A description of each source is included in Annex 3.

Table 4: Other sources of data by stakeholder

STAKEHOLDER	RCT	Endline Data	CEA Qualitative
Mothers	No	Yes	Yes
Fathers	No	Yes	Yes
Children	Yes	No	No
Healthcare providers	No	Yes	No
TBAs	Yes	Yes	No
MoH: National, community level	No	No	Yes
Community Health Volunteers	No	Yes	No

Data analysis

The qualitative data was analyzed through the thematic content analysis method. The quantitative data was analyzed by STATA software, and data expected to arise from the analysis included the quantity of changes that participants experienced as a result of the project, the quantity of changes that would have occurred if the project had not been implemented, and the duration of the changes.

Ethical approval

Ethical approval for this study was obtained from the Kenya Medical Research Institute (KEMRI) ethical review committee in June 2015. Written consent and permission to record the qualitative interviews were sought from each study participant before every interview following full disclosure of the study.

Outcomes and Evidence

In this section, the inputs, outputs, outcomes and associated assumptions for quantity, duration and value are presented. Details can be found in the impact map (Annex 4).

MIYCN Inputs

The inputs refer to what stakeholders contributed in order to make the activities possible. The inputs to the program were valued for each of the main stakeholder groups as follows.

APHRC

The total intervention and research cost was estimated at USD\$394,544 using APHRC's financial system. Assumptions were made to include part of the salaries of the research team based on the time they spent on the intervention.

Mothers and grandmothers

Mothers' and grandmothers' time spent during counseling sessions was costed based on what activity they could have done in the time they spent being counseled and how much income they could have made from this activity.

Healthcare providers

The input costs for healthcare providers was estimated based on the number of referrals and how much time each referral took. The time spent was then converted to money, based on the pay for staff for that period of time or treatment.

CHVs and data collectors

We costed the handouts to the communities out of their own pockets, e.g. to support poor mothers in buying food.

We did not cost the time spent by CHVs and data collectors, as their salary costs were already included in the total intervention cost.

The total input is USD\$419,716.

MIYCN Outputs

“The outputs of a project are the tangible (easily measurable, practical), immediate and intended results to be produced through sound management of the agreed inputs” (Browsers

et al. 2010).

The outputs of the project were:

- 1100 mothers participating in the MIYCN project;
- 1100 children benefiting from changes in IYCN practices;
- 1100 children being monitored for nutritional status and diarrhea;
- 935 fathers benefiting from 1100 mothers participating in the MIYCN project;
- 52 grandmothers benefiting from 1100 mothers participating in the MIYCN project;
- 325 referrals by CHVs to healthcare centers;
- 30 CHVs trained and supervised; and
- 15 teams of data collectors trained and supervised.

The quantities of outputs were calculated for fathers and grandmothers using data collected via questionnaires. Monitoring data from the RCT were used to estimate the number of referrals.

MIYCN Outcomes

“Outcomes can be defined as the likely or achieved short-term effects of an intervention’s total set of outputs. Outcomes can be seen as the actual use of the outputs” (Browers et al. 2010).

The outcomes that emerged from the qualitative analysis are listed and grouped per output in Table 5.

Table 5: Outcomes grouped per outputs and stakeholder

Stakeholders	Outputs	Outcomes
Mothers	1100 mothers participated in the MIYCN intervention	Outcome 1.1: Increased expenditure on nutritious food and/or healthcare
	1100 mothers participated in the MIYCN intervention	Outcome 1.2: More worried mother due to loss in baby weight and poor health
	1100 mothers participated in the MIYCN intervention	Outcome 1.3: Less worried mother due to better health of her children
	1100 mothers participated in the MIYCN intervention	Outcome 1.4: Decreased expenditure on food and/or healthcare
	1100 mothers participated in the MIYCN intervention	Outcome 1.5: Confident mother able to overcome family pressure in making Infant and Young Child Feeding (IYCF) decisions
	1100 mothers participated in the MIYCN intervention	Outcome 1.6: Having less burden of care
	1100 mothers participated in the MIYCN intervention	Outcome 1.7: Improved relationships at home
	1100 mothers participated in the MIYCN intervention	Outcome 1.8: Less stressed mother because less dependent on others

	1100 mothers participated in the MIYCN intervention	Outcome 1.9: Less income due to job loss in order to be able to breastfeed optimally
	1100 mothers participated in the MIYCN intervention	Outcome 1.10: Healthier mother
	1100 mothers participated in the MIYCN intervention	Outcome 1.11: Receiving more support from father
Children	1100 children benefiting from change in IYCN practices and being monitored for nutritional status and diarrhea	Outcome 2.1: Healthier baby
	1100 children benefiting from change in IYCN practices and being monitored for nutritional status and diarrhea	Outcome 2.2: Less healthy baby due to difficulty in introducing complementary feeding
	1100 children benefiting from change in IYCN practices and being monitored for nutritional status and diarrhea	Outcome 2.3: Better cognitive development
Siblings	1100 mothers participated in the MIYCN intervention	Outcome 3.1: Improved school performance for siblings
	1100 mothers participated in the MIYCN intervention	Outcome 3.2: Healthier siblings
Fathers	935 fathers benefiting from 1100 mothers participating in the MIYCN intervention	Outcome 4.1: Increased support to mother and child
	935 fathers benefiting from 1100 mothers participating in the MIYCN intervention	Outcome 4.2: Increased labor participation
	935 fathers benefiting from 1100 mothers participating in the MIYCN intervention	Outcome 4.3: Improved living standards at home
Grandmothers	52 grandmothers benefiting from 1100 mothers participating in the MIYCN intervention	Outcome 5.1: Reduced stress due to mother caring better for her children
	52 grandmothers benefiting from 1100 mothers participating in the MIYCN intervention	Outcome 5.2: Happier grandmother due to reduced burden of care, responsible young mothers
	52 grandmothers benefiting from 1100 mothers participating in the MIYCN intervention	Outcome 5.3: Decreased healthcare expenditure
Healthcare providers	325 referrals by CHWs to healthcare centers, 1100 mothers participated in the MIYCN intervention	Outcome 6.1: Decrease in workload due to healthier children in the community and increased staffing

	325 referrals by CHWs to healthcare centers, 1100 mothers participated in the MIYCN intervention	Outcome 6.2: Increased workload due to mothers seeking child checkups
Community Health Volunteers	30 CHVs trained and supervised	Outcome 7.1: Financial gain vs strain (salary vs own contribution to vulnerable children)
	30 CHVs trained and supervised	Outcome 7.2: Increased stress due to the difficulties posed by the work
	30 CHVs trained and supervised	Outcome 7.3: Increased confidence due to training received
Data collectors	15 team members trained and supervised	Outcome 8.1: Increased income
	15 team members trained and supervised	Outcome 8.2: Increased confidence
	15 team members trained and supervised	Outcome 8.3: Increased stress due to the difficulties posed by the work
	15 team members trained and supervised	Outcome 8.4: Financial strain due to financial aid given to vulnerable mothers
Daycare centers	1100 mothers participated in the MIYCN intervention	Outcome 9.1: Increased stress due to increased enrollment calling for increased amenities
	1100 mothers participated in the MIYCN intervention	Outcome 9.2: Increased expenditure due to improved hygiene and nutritious food provided but parents unwilling to pay more
	1100 mothers participated in the MIYCN intervention	Outcome 9.3: Increased attendance of children since they are less sick

Outcomes and chain of events for each stakeholder

The chain of events describes different stages of one change (SROI Network 2012). We used a theory of change to present the story of stakeholders' perceptions and beliefs about how their lives had changed due to the intervention. We present here a few outcomes for each stakeholder.

Mothers

Outcome 1.2: Mother worried about the child's weight and health

The mothers followed advice on exclusive breastfeeding (EBF) for six months, but faced challenges in introducing complementary foods. Mothers reported that following the six months of exclusive breastfeeding, their babies refused to eat and only wanted to breastfeed. They lost weight and became sickly, resulting in the mother becoming worried.

Up to six months the baby was fine but when I started giving [the baby] food, the baby did not want [it] and only wanted to breastfeed. The baby reduced in weight and started being sickly. (FGD, Mothers, Nairobi Slums)

Outcome 1.3: Less worried mother due to better health of her children

The counseling of mothers regarding household hygiene resulted in improved knowledge about hygiene practices and better household hygiene practices. Babies were reported to have less incidences of diarrhea and to have gained weight well. This resulted in fewer hospital visits and reduced expenditure on healthcare, which resulted in turn in mothers being less worried about the growth and health of their children, compared to before the MIYCN project.

Many people used to leave their children dirty and didn't bother how they were feeding the baby, but now we are told to wash our hands and to prepare food hygienically. If the baby doesn't finish the food, I keep the leftovers well. Some people just come from the toilet and pick [up] the baby and start breastfeeding without even washing their hands, and that causes diarrhea in the baby, but they [CHVs] came and taught us. Since the program came children don't [have] diarrhea a lot. (FGD, Mothers, Nairobi Slums)

Outcome 1.5: Confident mother able to overcome family pressure

As a result of the counseling, mothers reported that they were more knowledgeable and skillful in MIYCN and childcare practices, and hence they were more confident and able to overcome negative pressure from family members such as grandmothers (their mothers or mothers-in-law) that in the past had led to suboptimal feeding practices.

“When I gave birth, my husband told me that I should stop working until the baby was two years, so my mother-in-law was asking, ‘Is the baby an egg that he should be breastfed for two years?’ She said that when the navel heals, the baby should stop breastfeeding. So based on what we were taught by the CHV, his father refused, so we decided that the baby [would] breastfeed exclusively for six months and then he [would] start eating, and then he continued to breastfeed until two years and [I] put my job aside. (IDI, Mother, Nairobi Slums)

Children

Outcome 2.1: Healthier baby

Due to the counseling on reproductive health, mothers were more knowledgeable in family planning and used methods of contraception. They were able to breastfeed for a longer period, which resulted in improved growth and health of their children.

The mothers reported improved health behaviors such as better nutrition, and stopped or reduced smoking and alcohol use. This led to improved birth weights. They also felt more confident in seeking healthcare because they did not quarrel with health professionals due to their children's weight. Thus they reported increased routine health checkups for their children.

Mine is doing well, I didn't know about clinics and breastfeeding the baby exclusively till six months, because I have another one whom I started giving milk at two weeks. So it has helped me because this one has not been as sickly as the other one. (FGD, Mothers, Nairobi Slums)

Outcome 2.2: Less healthy baby due to difficulty in introducing complementary feeding

Due to counseling on optimal infant feeding practices, mothers followed exclusive breastfeeding for six

months, but they reported facing challenges in introducing complementary feeding. The children refused to eat and only wanted to breastfeed, which led to the children losing weight and becoming sickly.

I breastfed the baby exclusively for six months. So the baby was just used to breastfeeding. So when I started introducing them to foods, it was difficult because they didn't want [them]. The baby just wanted to breastfeed all the time. So before the baby agreed to eat foods, it was really a struggle. (FGD, Mothers, Nairobi Slums)

Outcome 2.3: Better developmental milestones

Due to counseling on breastfeeding, mothers reported that their children fed adequately and slept well. Mothers also reported that their children were more active and playful, developed better cognitive skills and reached their milestones faster.

For me it meant that the way I was able to breastfeed the baby for six months without giving the baby anything, the child grew, you know, the child's brain also grows, you see the baby does other things that...in the mind the baby becomes active, the baby becomes sharp, grasps things quickly. (IDI, Mother, Nairobi Slums)

Siblings

Outcome 3.1: Improved school performance for siblings

Mothers felt strong and healthy because of better nutrition. They had more energy to pay attention to their children's education and to attend school meetings. As a result, children were reported to perform better at school.

At times [before the MIYCN project] I would be called to my child's school but I couldn't go as I was unwell during pregnancy. They [the children] used to complain that, 'whenever you are called to school you don't come and the teacher keeps saying that you don't want to come to school'. With the nutrition advice I got from them [CHVs] now I am healthy and can go. (IDI Mother, Nairobi Slums)

Outcome 3.3: Healthier siblings

Due to optimal feeding practices, mothers had time for other activities, such as caring for the other children in the household and relaxing. The other children in the household benefited from better care and the nutritional knowledge from their mothers, and thus had better health.

My two other children were just lucky because I now knew about balanced diets so even them, their diet changed and right now, health-wise, they are okay. (FGD, Mothers, Nairobi Slums)

Fathers

Outcome 4.1: Increased support to mother and child

Outcome 1.3, "less worried mother", led to happier fathers. Fathers were reported as improving their motivation and support for the mothers, and as increasing their allocation of money for food. The fathers were also happy to see the improved health status of their children and the dispelled myths about

diarrhea and unfaithfulness, which encouraged them to be more involved in IYCF and to therefore offer more support at home.

I feel on my side it has helped me because now I don't have stress in the house because now I am not having to go to chemists, neither do I go to hospitals frequently because the baby is healthy and the mother is also fine. (IDI, Father, Nairobi Slums)

The changes I have observed on the part of the mother, she knows these things about breastfeeding the baby and maintaining hygiene more than in the past. Therefore, the family has stabilized. (FGD, Fathers, Nairobi Slums)

Outcome 4.2: Increased labor participation

Outcome 2.1, “healthier children”, led to fathers being more motivated to work and reduced their absenteeism from work on the days their children were sick and they had to take them to the hospital. As a consequence, there was more income in the household.

Since now there are no diseases [in the family], we can just use the money well and not like before. We see that the project helped us and that is why we are trying to work hard. (FGD, Fathers, Nairobi Slums)

When my child is healthy I can work harder... If I was going to work, but my child falls sick, you see if I wake up at eleven o'clock in the night to go to Kenyatta [hospital], I will leave there in the morning, so I won't go to work the following day. And if I don't go to work that day I will not get money. (FGD, Fathers, Nairobi Slums)

Outcome 4.3: Improved living standards

Households were reported to have fewer debts due to decreases in healthcare costs, and also more income (linked to Outcome 4.2, “increased labor participation”). Fathers were said to be able to save money and start their own businesses. The knowledge of family planning embraced by fathers also enabled them to plan their families.

It has helped me, as in now I can plan, I can sit and know let me spare this money for a certain business. I know that first I will raise this child up to a certain age, then know that I will get another child at another specific time. (IDI, Father, Nairobi Slums)

Grandmothers

Outcome 5.1: Reduced stress due to mother caring better for her children

Grandmothers and mothers were counseled by CHVs on MIYCN. The grandmothers were more knowledgeable and skilled on MIYCN and the young and teenage mothers were more responsible regarding caring for their children, which resulted in reduced neglect and improved health for the children. The grandmothers benefited from a reduced burden of care, as they would have been the ones taking care of the children if the mothers had been unable, and were therefore less stressed. It has helped me too because if it was not [were it not] for the teachings, I would not be going to my work, I would be at home because I am taking care of that child, she did not know how to wash her child but she was taught what to do...So MIYCN has helped me. (FGD, Grandmothers, Nairobi Slums)

Outcome 5.2: Happier grandmother

Following the counseling of mothers and some grandmothers offered by CHVs, childcare and feeding improved, leading to reduced morbidity among children and hence healthier children. The children also achieved development milestones earlier, and were reported to be more intelligent, which made their grandmothers happy. This was particularly important for the grandmothers who had the burden of caring for their grandchildren and incurring the costs for their healthcare.

After counseling started, I have seen that there is a very big difference because the children don't get sick, only a common cold, but even diarrhea, it is hard to see that they have a diarrhea. (FGD, Grandmother, Nairobi Slums)

Outcome 5.3: Decreased healthcare expenditure

Counseling on hygiene by CHVs led to better hygiene practices among grandmothers. They boiled drinking water, improved on their hygiene and ensured a clean environment, which reduced illnesses at home and led to savings on healthcare.

The child [grandchild] was born in my home and remained in my home. So everything, even when a banana is needed it is on me, it is the shilling that I have. So the counseling was important and we were lucky, I can say it is luck on our side. We as the community, when we don't rush to hospital now and then it is a benefit to us and it is also a benefit to the child because their health doesn't deteriorate. (IDI, Grandmother, Nairobi Slums)

Healthcare provider

Outcome 6.2: Increased workload due to mothers seeking child checkups

During counseling, the CHVs monitored the children and referred sick children and those with undernutrition for checkups at a health facility. This led to an increase in the number of children who were taken to the hospital and therefore increased workloads for healthcare providers.

Like the workload increased because we never used to have a nutrition clinic. Whoever was there used to come out of that place fatigued, you just want to go home and rest for the rest of the day. (KII, Nurse, Nairobi slums)

Outcome 6.1: Decrease in workload due to healthier children in the community and increased staffing

Due to counseling on the need to go to ANC clinics, and to take children for growth monitoring and to the hospital when sick, the mothers improved their health-seeking behavior and the health of the children was better. Additionally, increased health-seeking led to an increase in the number of people visiting health facilities. As a result, more clinics were opened, there was increased staffing and access to drugs improved as there was more allocation. The mothers and children became healthier and there were fewer visits to the hospital. As a result, workloads of healthcare providers decreased.

To me it is positive because when the number goes up then I have the powers to ask for more health workers, and of course I said we started in 2013, we started when we were only three nurses and now we are 14. (KII, Nurse, Nairobi Slums)

Actually right now we have a nutritionist, we never used to have one, the nurse was doing everything but due to increased referrals they [Concern Worldwide] posted a nutritionist

here, after seeing our data, they saw that there was a need in Korogocho. (KII, Nurse, Nairobi slums)

Community Health Volunteers

Outcome 9.1: Financial gain vs strain (salary vs own contribution to vulnerable families)

Community Health Volunteers benefited financially from the project through a monthly incentive. On the other hand, they also underwent financial strain, as after the mothers were counseled on nutrition, some of them were unable to afford food. The CHVs also contributed to families in vulnerable circumstances, for example when a child was sick and the mother did not have the money to take the child to the hospital. The CHVs did not get any official support from the project to cater for this.

You go to counsel a mother and she tells you ‘I even did not eat, I slept hungry’. So I used to be forced to call my supervisor because at times I did not have money, ‘come to such and such house and see this mother,’ so we were forced to contribute and give her. Maybe the mother has three days since delivery, you cannot tell her to go and work...So it was a big change that I did not expect. (FGD CHVs, Nairobi Slums)

Outcome 9.3: Increased confidence

After the mothers were counseled on nutrition, they practiced exclusive breastfeeding and some opted to go to work after introducing their children to complementary foods at six months. Children with malnutrition were referred to feeding centers by CHVs and when they became healthier and more active, the CHVs were happy to see their advice being followed and the children growing well, which increased their confidence.

When you advise them and they listen to you it motivates you so much and you know, as I was trained, with my training I am giving back to the community and they listen and follow up, you feel happy. (FGD, CHVs, Nairobi slums)

Data collectors

Outcome 10.1: More Income

APHRC's training of the data collectors, who were recruited from the community, increased their knowledge, which led to increased confidence. This improved knowledge and confidence increased their income and made them more employable. One of the data collectors could afford to pay for her university degree and hence gain even more skills and income.

Outcome 10.2: Increased confidence

The training also increased the data collectors' self-esteem and improved their social skills. Being given responsibilities by the MIYCN project boosted their self-belief as they were happy to be entrusted with the work. The data collectors gained trust in the community, which increased their acceptability as they did their work. All this led to increased confidence.

It is very important because my self-esteem is higher as compared to before I started the MYCN project. Now I have confidence, unlike when I was starting the MYCN project, because you know I had not worked with children, mothers, so my confidence is high. (FGD, Field Workers, Nairobi Slums)

Outcome 10.3: Increased stress due to the difficulties posed by the work

In the course of monitoring the mothers and their children, the data collectors were exposed to their living conditions, which included the mothers not having food. They were also exposed to the death of some of the babies they were monitoring, which affected them psychosocially.

Daycare centers

Outcome 12.1: Increased stress due to increased enrollment

The information and advice given by the CHVs made the daycare owners more knowledgeable. They practiced better hygiene and were recognized for maintaining a clean environment. This led to increased enrollment of children in daycare centers, and an increased workload for their staff. One daycare owner reported being stressed as there was no place to sit or sleep.

Outcome 12.2: Increase in expenditure due to improved hygiene and nutritious food provided

After the daycare owners began to adhere to the CHVs' advice on hygiene, they experienced increased expenditure (e.g. increases in rent, having to pay for water and use of toilets, paying teachers) while parents were still paying little for their services.

The change that I got is hygiene, we didn't have proper toilets, so we were forced to look for somewhere to take them where they can go to the toilet although paying is hard because the place is expensive... but it will force me to stay there because that is the place that is suitable for children. (KII Daycare owner, Nairobi Slums)

Outcome 12.3: Increased attendance

Better hygiene and balanced diets were promoted at the daycare centers. Fewer children fell sick, and they were healthy and playful. This led to reduced absenteeism.

The good hygiene has brought good relationships because when parents bring children and then come back and get that they are dirty they won't feel well. It made parents to love our school and they also love the teachers and that has made us get many children, we maintain cleanliness, there is balanced diet, they don't have stress when they [leave] children there. (Daycare owner, Nairobi Slums)

Outcomes indicators

"Indicators are ways of knowing that change has happened. In SROI they are applied to outcomes as these are the measures of change that we are interested in" (SROI Network 2012). Table 6 shows the indicators and the sources of these indicators for each identified outcome.

Table 6: Indicators and sources by outcome and stakeholder

Stakeholders	Outcomes	Indicators	Source
Mothers	Outcome 1.1: Increased expenditure on nutritious food and/or healthcare	Number of mothers who reported: 1) buying more nutritious food, 2) spending more on healthcare; increase in expenditure on buying nutritious food and/or healthcare compared to before the intervention	Mother questionnaire
	Outcome 1.2: More worried mother due to loss in baby weight and poor health	Number of mothers who reported: 1) that their level of worry increased due to baby refusing to eat and hence losing weight; 2) baby getting sicker as a result of introducing complementary food	Mother questionnaire
	Outcome 1.3: Less worried mother due to better health of her children	Number of mothers who reported: 1) a reduction in the level of worry as a result of baby becoming less sick; 2) a reduction in the number of visits to hospital	Mother questionnaire
	Outcome 1.4: Decreased expenditure on food and/or healthcare	Number of mothers who reported; 1) a decrease in money spent on food; 2) a decrease in money spent on healthcare	Mother questionnaire
	Outcome 1.5: Confident mother able to overcome family pressure	Number of mothers who reported: an increase in their level of confidence. Number of times the child was taken for checkup as a result of mother's improved confidence due to counseling compared to the number of checkups before the counseling	Mother questionnaire
	Outcome 1.6: Reduced burden of care	Number of mothers who reported: 1) an increase in time availability after the intervention as compared to before the intervention; 2) an increase in levels of freedom in being able to do other things	Mother questionnaire
	Outcome 1.7: Improved relationships at home	Number of mothers who reported: 1) improved relationships in the home as a result of less conflict over mothers' lack of attention to other children in the home; 2) improvements in children's academic performance	Mother questionnaire

	Outcome 1.8: Less stressed mother because less dependent on others	Number of mothers who reported: 1) a decrease in levels of stress; 2) less dependency on others because of being able to work	Mother questionnaire
	Outcome 1.9: Less income due to job loss	Number of mothers who reported a decrease in income as a result of leaving their jobs to practice six months of EBF compared to when they were working	Mother questionnaire
	Outcome 1.10: Healthier mother	Number of mothers who reported: 1) a reduction in delivery complications as a result of delivering in a health facility compared to delivery elsewhere; 2) better health status	Mother questionnaire
	Outcome 1.11: Receiving more support from father	Number of mothers who reported: 1) an increase in levels of support from spouse; (2) an increase in money allocated for food as compared to before the counseling	Mother questionnaire
Children	Outcome 2.1: Healthier baby	Number of mothers who reported: (1) improvements in nutritional status; (2) improvements in health status of baby due to adequate duration of breastfeeding	Mother questionnaire; RCT
	Outcome 2.2: Less healthy baby due to difficulty in introducing complementary feeding	Number of mothers who reported: (1) decreases in nutritional status; (2) decreases in health status of baby due to difficulty in transition to complementary feeding	Mother questionnaire; RCT
	Outcome 2.3: Better cognitive development	Number of mothers who reported: (1) improvement in development and growth of the baby; 2) baby being more active/playful after adequate feeding	Mother questionnaire; RCT
Siblings	Outcome 3.1: Improved school performance for siblings	Number of mothers who reported: 1) improvements in academic performance; 2) children indicating they are getting more attention by mother attending school meetings	Mother questionnaire
	Outcome 3.2: Healthier siblings	Number of mothers who reported an improvement in the health status of other children in the home	Mother questionnaire

Fathers	Outcome 4.1: Increased support to mother and child	Number of mothers who reported an increase in the level of support from father/spouse	Mother questionnaire
	Outcome 4.2: Increased labor participation	Number of mothers who reported: 1) an increase in the father's/spouse's income; (2) an increase in the number of days worked as compared to before the counseling	Mother questionnaire
	Outcome 4.3: Improved living standards at home	Number of mothers who reported: 1) an increase in money saved on healthcare expenditure; 2) spouse starting a business with money saved	Mother questionnaire
Grandmothers	Outcome 5.1: Reduced stress due to mother caring better for her children	Number of grandmothers who reported: 1) having more time to do other things instead of looking after baby compared to before the intervention; 2) decrease in burden of care; 3) decrease in level of stress	Grandmother questionnaire
	Outcome 5.2: Happier grandmother	Number of grandmothers who reported an increase in happiness (from moderate)	Grandmother questionnaire
	Outcome 5.3: Decreased healthcare expenditure	Number of grandmothers who reported a decrease in expenditure on healthcare	Grandmother questionnaire
Healthcare providers	Outcome 6.1: Decrease in workload due to healthier children in the community	Number of healthcare providers who reported a decrease in workload as a result of reduced hospital visits	Healthcare provider questionnaire
	Outcome 6.2: Increased workload due to mothers seeking child checkups	Number of healthcare providers who reported an increase in the number of child checkups and referrals after counseling compared to before the intervention	Healthcare provider questionnaire
Community health volunteers	Outcome 7.1: Financial gain vs strain (salary vs own contribution to vulnerable children)	Number of gifts or financial aid given to mothers by CHWs.	CHV questionnaire
	Outcome 7.2: Increased stress due to the difficulties posed by the work	Number of CHWs who reported an increase in their level of stress	CHV questionnaire
	Outcome 7.3: Increased confidence	Number of CHWs who reported an increase in their level of confidence	CHV questionnaire
Data collectors	Outcome 8.1: Increased income	Number of field workers who reported: 1) an increase in their opportunities to get other jobs; 2) a change in their level of income	Data collector questionnaire

	Outcome 8.2: Increased confidence	Number of field workers who reported: 1) an increase in their level of confidence; 2) an increase in their level of acceptability due to increased trust by the community	Data collector questionnaire
	Outcome 8.3: Increased stress due to the difficulties posed by the work	Number of field workers who reported: 1) an increase in their level of stress; 2) an increase in conflicts with other team members	Data collector questionnaire
	Outcome 8.4: Financial strain due to financial aid given to vulnerable mothers	Number of gifts or financial aid given to mothers by data collectors	Data collector questionnaire
Daycare centers	Outcome 9.1: Increased stress due to increased enrollment	Number of daycare owners who reported an increase in their level of stress	Day care questionnaire
	Outcome 9.2: Increased in expenditure due to improved hygiene and nutritious food provided	Number of daycare owners who reported an increase in their level of expenditure (amount of money spent on food, rent, water, salaries, use of toilet)	Day care questionnaire
	Outcome 9.3: Increased attendance of children	Number of daycare owners who reported a decrease in the number of children absent due to sickness	Day care questionnaire

Quantity

We analyzed the questionnaire responses from each of the main stakeholder groups and calculated the frequency for each outcome reported. In order to estimate the quantity per stakeholder, the frequency was multiplied by the total number of stakeholders and rounded to the nearest one digit (Table 7).

Table 7: Quantity per stakeholder based on frequency

Stakeholders	Outcomes	Quantity	Stakeholders (n)	Frequency of the outcome (%)	Assumption
Mothers	Outcome 1.1: Increased expenditure on nutritious food and/or healthcare	409	1100	37%	Total number of mothers (intervention and control) * frequency of the outcome
	Outcome 1.2: More worried mother due to loss in baby weight and poor health	49	1100	4%	Total number of mothers (intervention and control) * frequency of the outcome

	Outcome 1.3: Less worried mother due to better health of her children	908	1100	82%	Total number of mothers (intervention and control) * frequency of the outcome
	Outcome 1.4: Decreased expenditure on food and/or healthcare	322	1100	29%	Total number of mothers (intervention and control) * frequency of the outcome
	Outcome 1.5: Confident mother able to overcome family pressure	1100	1100	100%	Total number of mothers (intervention and control) * frequency of the outcome
	Outcome 1.6: Having less burden of care	1004	1100	91%	Total number of mothers (intervention and control) * frequency of the outcome
	Outcome 1.7: Improved relationships at home	1018	1100	93%	Total number of mothers (intervention and control) * frequency of the outcome
	Outcome 1.8: Less stressed mother because less dependent on others	483	1100	44%	Total number of mothers (intervention and control) * frequency of the outcome
	Outcome 1.9: Less income due to job loss	40	1100	4%	Total number of mothers (intervention and control) * frequency of the outcome
	Outcome 1.10: Healthier mother	1069	1100	97%	Total number of mothers (intervention and control) * frequency of the outcome

	Outcome 1.11: Receiving more support from father	803	1100	73%	Total number of mothers (intervention and control) * frequency of the outcome
Children	Outcome 2.1: Healthier baby	1089	1100	99%	Total number of children (intervention and control) * frequency of the outcome
	Outcome 2.2: Less healthy baby due to difficulty in introducing complementary feeding	136	1100	12%	Total number of children (intervention and control) * frequency of the outcome
	Outcome 2.3: Better cognitive development	1089	1100	99%	Total number of children (intervention and control) * frequency of the outcome
Siblings	Outcome 3.1: Improved school performance for siblings	1018	1100	93%	Total number of siblings * frequency of the outcome
	Outcome 3.2: Healthier siblings	648	1100	59%	Total number of siblings * frequency of the outcome
Fathers	Outcome 4.1: Increased support to mother and child	845	935	90%	Total number of fathers (intervention and control) * frequency of the outcome
	Outcome 4.2: Increased labor participation	166	935	18%	Total number of fathers (intervention and control) * frequency of the outcome
	Outcome 4.3: Improved living standards at home	926	935	99%	Total number of fathers (intervention and control) * frequency of the outcome

Grandmothers	Outcome 5.1: Reduced stress due to mother caring better for her children	38	52	71%	Total number of grandmothers (intervention and control) * frequency of the outcome
	Outcome 5.2: Happier grandmother	53	52	100%	Total number of grandmothers (intervention and control) * frequency of the outcome
	Outcome 5.3: Decreased healthcare expenditure	53	52	100%	Total number of grandmothers (intervention and control) * frequency of the outcome
Healthcare providers	Outcome 6.1: Decreased workload due to healthier children in the community	35	91	38%	Total number of healthcare providers * frequency of the outcome
	Outcome 6.2: Increased workload due to mothers seeking child checkups	57	91	63%	Total number of healthcare providers * frequency of the outcome
Community health volunteers	Outcome 7.1: Financial gain vs strain (salary vs own contribution to vulnerable children)	19	30	61%	Total number of CHWs * frequency of the outcome
	Outcome 7.2: Increased stress due to the difficulties posed by the work	23	30	75%	Total number of CHWs * frequency of the outcome
	Outcome 7.3: Increased confidence	30	30	100%	Total number of CHWs * frequency of the outcome
Data collectors	Outcome 8.1: Increased income	15	15	100%	Total number of data collectors * frequency of the outcome
	Outcome 8.2: Increased confidence	15	15	100%	Total number of data collectors * frequency of the outcome
	Outcome 8.3: Increased stress due to the difficulties posed by the work	15	15	100%	Total number of data collectors * frequency of the outcome

	Outcome 8.4: Financial strain due to financial aid given to vulnerable mothers	3	15	20%	Total number of data collectors * frequency of the outcome
Day-care centers	Outcome 9.1: Increased stress due to increased enrollment	2	10	20%	Total number of daycare center providers * frequency of the outcome
	Outcome 9.2: Increased expenditure due to improved hygiene and nutritious food provided	6	10	57%	Total number of daycare center providers * frequency of the outcome
	Outcome 9.3: Increased attendance of children	5	10	43%	Total number of daycare center providers * frequency of the outcome

Duration

The duration of the outcome was assessed in the questionnaire by asking participants to estimate how long the impact would last. We assumed a maximum duration of five years, although some of the outcomes could have a lifelong impact (e.g. nutritional health promotion during the two-year window of opportunity, or increased confidence). As there is no evidence we can use to value the future impact of such outcomes, we limited the duration to five years. We analyzed participants' responses, and in some instances we reviewed the duration based on our assumptions (Table 8).

Table 8: Estimated duration of outcomes and the underlying assumptions

Stakeholders	Outcomes	Duration in years	Assumption
Mothers	Outcome 1.1: Increased expenditure on nutritious food and/or healthcare	5	This change in behavior is likely to persist beyond the intervention's duration. This is confirmed by participants reporting a decrease in savings lasting five years or more.
	Outcome 1.2: More worried mother due to loss in baby weight and poor health	2	In the questionnaire, participants reported this change would last forever. However, as we think that this is likely to happen during the introduction of complementary food, we limited it to two years.
	Outcome 1.3: Less worried mother due to better health of her children	2	In the questionnaire, participants reported this change would last forever. However, as we think that this is likely to happen during the first two years of the child's life, we limited it to two years.

	Outcome 1.4: Decreased expenditure on food and/or healthcare	5	This change in behavior is likely to persist beyond the intervention's duration. This is confirmed by participants reporting an increase in savings lasting five years or more.
	Outcome 1.5: Confident mother able to overcome family pressure	5	This change in behavior is likely to persist beyond the intervention's duration. This was confirmed by data collected via the questionnaires.
	Outcome 1.6: Having less burden of care	4	In the questionnaire, the majority of participants reported a duration of four years regarding the increase in their level of freedom.
	Outcome 1.7: Improved relationships at home	5	This change in behavior is likely to persist beyond the intervention's duration. The majority of participants reported a five year or more impact regarding improved academic performance.
	Outcome 1.8: Less stressed mother because less dependent on others	5	This change in behavior is likely to persist beyond the intervention's duration. The majority of participants reported a five year or more impact regarding increased income.
	Outcome 1.9: Less income due to job loss	1	In the questionnaire, the majority of participants reported a change lasting five years or more. We limited the duration to one year as we believe that the change is likely to last for the duration of EBF plus the time required to find a new job.
	Outcome 1.10: Healthier mother	5	This change in behavior is likely to persist beyond the intervention's duration. This was confirmed by data collected via the questionnaires.
	Outcome 1.11: Receiving more support from father	5	This change in behavior is likely to persist beyond the intervention's duration.
Children	Outcome 2.1: Healthier baby	5	This is likely to have a lasting impact due to the window of opportunity when a child is under two years old.
	Outcome 2.2: Less healthy baby due to difficulty in introducing complementary feeding	5	This is likely to have a lasting impact due to the window of opportunity when a child is under two years old. In the questionnaire, mothers reported five years or more for the deterioration of their children's health.
	Outcome 2.3: Better cognitive development	5	This is likely to have a lasting impact due to the window of opportunity when a child is under two years old.

Siblings	Outcome 3.1: Improved school performance for siblings	5	This change of behavior is likely to persist beyond the intervention's duration.
	Outcome 3.2: Healthier siblings	5	This is likely to have a lasting impact due to the window of opportunity when a child is under two years old.
Fathers	Outcome 4.1: Increased support to mother and child	5	This change of behavior is likely to persist beyond the intervention's duration.
	Outcome 4.2: Increased labor participation	5	This change of behavior is likely to persist beyond the intervention's duration.
	Outcome 4.3: Improved living standards at home	5	This change of behavior is likely to persist beyond the intervention's duration.
Grandmothers	Outcome 5.1: Reduced stress due to mother caring better for her children	5	This change of behavior is likely to persist beyond the intervention's duration.
	Outcome 5.2: Happier grandmother	5	This change of behavior is likely to persist beyond the intervention's duration.
	Outcome 5.3: Decreased healthcare expenditure	5	This change of behavior is likely to persist beyond the intervention's duration.
Healthcare providers	Outcome 6.1: Decreased workload due to healthier children in the community	5	This change of behavior is likely to persist beyond the intervention's duration.
	Outcome 6.2: Increased workload due to mothers seeking child checkups	2	This change of behavior is likely to be short-term as we expect that the improved practices will lead to a healthier community.
Community health volunteers	Outcome 7.1: Financial gain vs strain (salary vs own contribution to vulnerable children)	2	This change will be limited to the intervention's duration.
	Outcome 7.2: Increased stress due to the difficulties posed by the work	2	This change will be limited to the intervention's duration.
	Outcome 7.3: Increased confidence	5	This change of behavior is likely to persist beyond the intervention's duration.
Data collectors	Outcome 8.1: Increased income	5	This change of behavior is likely to persist beyond the intervention's duration as they have gained skills and knowledge.
	Outcome 8.2: Increased confidence	5	This change of behavior is likely to persist beyond the intervention's duration.
	Outcome 8.3: Increased stress due to the difficulties posed by the work	2	This change will be limited to the intervention's duration.
	Outcome 8.4: Financial strain due to financial aid given to vulnerable mothers	2	This change will be limited to the intervention's duration.

Day-care centers	Outcome 9.1: Increased stress due to increased enrollment	2	This change will be limited to the intervention's duration.
	Outcome 9.2: Increased expenditure due to improved hygiene and nutritious food provided	4	Based on participants' responses.
	Outcome 9.3: Increased attendance of children	5	Based on participants' responses.

Financial proxy

“This process of valuation is often referred to as monetisation because we assign a monetary value to things that do not have a market price” (SROI network 2012). Some of the outcomes had market values, but for those that did not have market values we used a value game exercise to explore participants' willingness to pay (WTP) (Table 9). In the value game exercise, participants were asked to list items that have a market value and to place the outcome of interest within the list. An average was calculated of the items below and above the outcome of interest (an example of a value game for grandmothers is included in Annex 2). This value of the outcome was validated by checking back with the participants to see if they would be willing to pay the minimum amount reflected by the cheaper item below the outcome of interest, or if the cost or value of the outcome actually represented how much they would pay to get the outcome of interest.

In some instances, we used a negative WTP. For example, for the outcome 'less healthy baby', we used the negative, i.e. WTP to have a healthy baby. For some outcomes, we used WTP and another financial proxy to check the data.

Table 9: Description of the financial proxy for each identified outcome and the source of this proxy

Stakeholders	Outcomes	Financial proxy
Mothers	Outcome 1.1: Increased expenditure on nutritious food and/or healthcare	Cost of nutritious food and healthcare
	Outcome 1.2: More worried mother due to loss in baby weight and poor health	WTP to be less worried (negative)
	Outcome 1.3: Less worried mother due to better health of her children	WTP to be less worried
	Outcome 1.4: Decreased expenditure on food and/or healthcare	Cost of nutritious food and healthcare (saving)
	Outcome 1.5: Confident mother able to overcome family pressure	WTP to be confident
	Outcome 1.6: Having less burden of care	Hourly hour cost * number of hours free
	Outcome 1.7: Improved relationships at home	WTP to be happy

	Outcome 1.8: Less stressed mother because less dependent on others	WTP to be less stressed
	Outcome 1.9: Less income due to job loss	Amount of income lost
	Outcome 1.10: Healthier mother	WTP to be healthy
	Outcome 1.11: Receiving more support from father	Amount of money spent on food
Children	Outcome 2.1: Healthier baby	WTP to have healthy baby
	Outcome 2.2: Less healthy baby due to difficulty in introducing complementary feeding	WTP to have healthy baby (negative)
	Outcome 2.3: Better cognitive development	WTP to have a child with better cognitive development
Siblings	Outcome 3.1: Improved school performance for siblings	WTP to have a child with higher education performance
	Outcome 3.2: Healthier siblings	WTP to have healthy baby
Fathers	Outcome 4.1: Increased support to mother and child	WTP to be happy. Already valued in Outcome 1.11
	Outcome 4.2: Increased labor participation	Daily wage * number of extra days worked or change in income
	Outcome 4.3: Improved living standards at home	Amount saved on healthcare costs
Grandmothers	Outcome 5.1: Reduced stress due to mother caring better for her children	WTP to be less stressed
	Outcome 5.2: Happier grandmother	WTP to be happy
	Outcome 5.3: Decreased healthcare expenditure	Cost of healthcare
Healthcare providers	Outcome 6.1: Decreased workload due to healthier children in the community	Cost of referral * number of referrals (saving) or WTP to have decreased workload
	Outcome 6.2: Increased workload due to mothers seeking child checkups	Cost of referral * number of referrals or WTP to have decreased workload (negative)
Community health volunteers	Outcome 7.1: Financial gain vs strain (salary vs own contribution to vulnerable children)	Difference between salary and cost of gifts
	Outcome 7.2: Increased stress due to the difficulties posed by the work	WTP to be less stressed (negative)
	Outcome 7.3: Increased confidence	WTP to be confident
Data collectors	Outcome 8.1: Increased income	Difference in salary

	Outcome 8.2: Increased confidence	Valued in Outcome 10.1
	Outcome 8.3: Increased stress due to the difficulties posed by the work	Cost of psychosocial support
	Outcome 8.4: Financial strain due to financial aid given to vulnerable mothers	Difference in expenditure
Day-care centers	Outcome 9.1: Increased stress due to increased enrollment	WTP to be less stressed
	Outcome 9.2: Increased expenditure due to improved hygiene and provision of nutritious food	Cost of additional food, rent, water, salaries and use of toilet
	Outcome 9.3: Increased attendance of children	Daily fee * number of days missed because of sickness or WTP to retain children or WTP to increase attendance

MIYCN Impact

In this section, we examine the impact of the program and assess the impact of other factors on the intervention.

Attribution: The part of the outcome that can be attributed to activities

Attribution was used to recognize that some of the changes seen were not only due to the intervention. These changes may have occurred due to other organizations or persons working together. We used qualitative data to estimate the attribution rate. Participants identified NGOs (Concern Worldwide, Redeemed Church), hospitals, city councils and the Ministry of Health as organizations or agents that contributed to the change. While some participants identified other organizations or services, some did not. Thus, we assumed an attribution rate of 25% to account for the influence of other organizations mentioned during data collection (Table 10). The attribution rate in the impact map is deducted from the total impact.

Table 10: Attribution of the identified outcomes and assumption

Stakeholders	Outcomes	Attribution	Assumptions
Mothers	Outcome 1.1: Increased expenditure on nutritious food and/or healthcare	0%	We did not use attribution for negative outcomes.
	Outcome 1.2: More worried mother due to loss in baby weight and poor health	0%	We did not use attribution for negative outcomes.
	Outcome 1.3: Less worried mother due to better health of her children	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
	Outcome 1.4: Decreased expenditure on food and/or healthcare	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
	Outcome 1.5: Confident mother able to overcome family pressure	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.

	Outcome 1.6: Having less burden of care	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
	Outcome 1.7: Improved relationships at home	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
	Outcome 1.8: Less stressed mother because less dependent on others	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
	Outcome 1.9: Less income due to job loss	0%	We did not use attribution for negative outcomes.
	Outcome 1.10: Healthier mother	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
	Outcome 1.11: Receiving more support from father	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
Children	Outcome 2.1: Healthier baby	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
	Outcome 2.2: Less healthy baby due to difficulty in introducing complementary feeding	0%	We did not use attribution for negative outcomes.

	Outcome 2.3: Better cognitive development	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
Siblings	Outcome 3.1: Improved school performance for siblings	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
	Outcome 3.2: Healthier siblings	25%	Attribution was explored in the feedback from mothers. NGOs and media were identified as contributing partially to the outcome. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
Fathers	Outcome 4.1: Increased support to mother and child	25%	Attribution was explored in the feedback from fathers. They did not identify other organizations or services that may have contributed to the change. Nevertheless, we opted for an attribution level of 25% to guard against the possibly of over-claiming.
	Outcome 4.2: Increased labor participation	25%	Attribution was explored in the feedback from fathers. They did not identify other organizations or services that may have contributed to the change. Nevertheless, we opted for an attribution level of 25% to guard against the possibly of over-claiming.
	Outcome 4.3: Improved living standards at home	25%	Attribution was explored in the feedback from fathers. They did not identify other organizations or services that may have contributed to the change. Nevertheless, we opted for an attribution level of 25% to guard against the possibly of over-claiming.
Grandmothers	Outcome 5.1: Reduced stress due to mother caring better for her children	25%	Attribution was explored in the feedback from grandmothers. They identified one NGO (Concern Worldwide) that could have contributed to the change by providing food. We opted for an attribution level of 25% to guard against the possibly of over-claiming.

	Outcome 5.2: Happier grandmother	25%	Attribution was explored in the feedback from grandmothers. They identified one NGO (Concern Worldwide) that could have contributed to the change by providing food. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
	Outcome 5.3: Decreased healthcare expenditure	25%	Attribution was explored in the feedback from grandmothers. They identified one NGO (Concern Worldwide) that could have contributed to the change by providing food. We opted for an attribution level of 25% to guard against the possibly of over-claiming.
Healthcare providers	Outcome 6.1: Decreased workload due to healthier children in the community	25%	The respondents identified NGOs and other projects aiming towards better health and nutrition. We used 25% to reflect this.
	Outcome 6.2: Increased workload due to mothers seeking child checkups	0%	We did not use attribution for negative outcomes.
Community health volunteers	Outcome 7.1: Financial gain vs strain (salary vs own contribution to vulnerable children)	0%	We did not use attribution for negative outcomes.
	Outcome 7.2: Increased stress due to the difficulties posed by the work	0%	We did not use attribution for negative outcomes.
	Outcome 7.3: Increased confidence	0%	Attribution was explored in the feedback from CHWs. They did not identify other organizations that contributed to their training.
Data collectors	Outcome 8.1: Increased income	0%	Data collectors did not identify other organizations that could have contributed to the outcome.
	Outcome 8.2: Increased confidence	0%	Data collectors did not identify other organizations that could have contributed to the outcome.
	Outcome 8.3: Increased stress due to the difficulties posed by the work	0%	We did not use attribution for negative outcomes.
	Outcome 8.4: Financial strain due to financial aid given to vulnerable mothers	0%	We did not use attribution for negative outcomes.
Day-care centers	Outcome 9.1: Increased stress due to increased enrollment	0%	We did not use attribution for negative outcomes.
	Outcome 9.2: Increased expenditure due to improved hygiene and provision of nutritious food	0%	We did not use attribution for negative outcomes.

	Outcome 9.3: Increased attendance of children	25%	Attribution was explored in the feedback from daycare centers. They identified churches, the city council and NGOs as organizations that could have contributed to the change. We opted for an attribution level of 10% to guard against the possibly of over-claiming.
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Displacement: What activities or services are displaced by the activities

We assessed displacement by exploring to what extent the outcomes from MIYCN have displaced other outcomes that were likely to happen. We did not find any evidence that this might have been the case, except for mothers stopping work in order to carry out exclusive breastfeeding (EBF). This was already accounted for in the impact map as a negative outcome. We tested the influence of displacement in the sensitivity analysis and reported on this.

Deadweight: The extent to which the outcomes would have happened anyway

Deadweight was explored in the questionnaire by asking participants to rate the likelihood of an outcome if the intervention had not taken place (Table 11). When we did not have a frequency, we used 5% to guard against the possibility of over-claiming.

Table 11: Deadweight of the outcomes identified

Stakeholders	Outcomes	Deadweight	Rationale
Mothers	Outcome 1.1: Increased expenditure on nutritious food and/or healthcare	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 1.2: More worried mother due to loss in baby weight and poor health	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 1.3: Less worried mother due to better health of her children	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 1.4: Decreased expenditure on food and/or healthcare	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 1.5: Confident mother able to overcome family pressure	17%	Frequency of mothers reporting a change in confidence if MIYCN had not been implemented.

	Outcome 1.6: Having less burden of care	66%	Frequency of mothers reporting a change in freedom if MIYCN had not been implemented.
	Outcome 1.7: Improved relationships at home	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 1.8: Less stressed mother because less dependent on others	21%	Frequency of mothers reporting that there would be no stress if MIYCN had not been implemented; changes in levels of dependence if MIYCN had not been implemented.
	Outcome 1.9: Less income due to job loss	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 1.10: Healthier mother	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 1.11: Receiving more support from father	5%	Frequency of mothers reporting a likely change in father's support if MIYCN had not been implemented.
Children	Outcome 2.1: Healthier baby	59%	Frequency of mothers reporting a positive change in the baby's health if MIYCN had not been implemented.
	Outcome 2.2: Less healthy baby due to difficulty in introducing complementary feeding	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 2.3: Better cognitive development	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
Siblings	Outcome 3.1: Improved school performance for siblings	87%	Frequency of mothers reporting a positive change in children's likely academic performance if MIYCN had not been implemented.
	Outcome 3.2: Healthier siblings	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
Fathers	Outcome 4.1: Increased support to mother and child	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 4.2: Increased labor participation	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.

	Outcome 4.3: Improved living standards at home	28%	Frequency of mothers reporting a change in living standards if MIYCN had not been implemented; changes in levels of savings if MIYCN had not been implemented.
Grandmothers	Outcome 5.1: Reduced stress due to mother caring better for her children	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 5.2: Happier grandmother	24%	Frequency of grandmothers reporting a change in happiness if MIYCN had not been implemented (from moderate).
	Outcome 5.3: Decreased healthcare expenditure	5%	Frequency of grandmothers reporting a change in expenditure if MIYCN had not been implemented.
Healthcare providers	Outcome 6.1: Decreased workload due to healthier children in the community	63%	Frequency of healthcare providers reporting a change in workload if MIYCN had not been implemented.
	Outcome 6.2: Increased workload due to mothers seeking child checkups	38%	Frequency of healthcare providers reporting a change in workload if MIYCN had not been implemented.
Community health volunteers	Outcome 7.1: Financial gain vs strain (salary vs own contribution to vulnerable children)	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 7.2: Increased stress due to the difficulties posed by the work	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 7.3: Increased confidence	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
Data collectors	Outcome 8.1: Increased income	0%	Frequency of data collectors reporting a change in income if MIYCN had not been implemented.
	Outcome 8.2: Increased confidence	21%	Frequency of data collectors reporting a change employability if MIYCN had not been implemented (moderate).
	Outcome 8.3: Increased stress due to the difficulties posed by the work	100%	Frequency of data collectors reporting a change in level of stress if MIYCN had not been implemented.
	Outcome 8.4: Financial strain due to financial aid given to vulnerable mothers	83%	Frequency of data collectors reporting a change in financial strain in MIYCN had not been implemented.
Day-care centers	Outcome 9.1: Increased stress due to increased enrollment	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
	Outcome 9.2: Increased expenditure due to improved hygiene and nutritious food provided	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.

	Outcome 9.3: Increased attendance of children	5%	We found no evidence of deadweight for this outcome but we used 5% to guard against the possibly of over-claiming.
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Drop-off: The decline in outcomes over time

The effect of outcomes will decrease over time, and outcomes are likely to be influenced by other factors. We did not find any evidence to allow us to estimate drop-off per outcome or specific to a stakeholder group. Therefore, we have assumed a drop-off rate of 20% for this SROI analysis, which is based on the assumption that the effect of the intervention will be zero after five years.

Discount

A discount rate recognizes that people generally prefer to receive money today rather than tomorrow, which discounts the value of future benefits. We used a discount rate of 6.5 percent per annum, which was Kenya's inflation rate in 2014. Discounting was applied to values having a duration of more than one year.

Social return calculation

SROI ratio

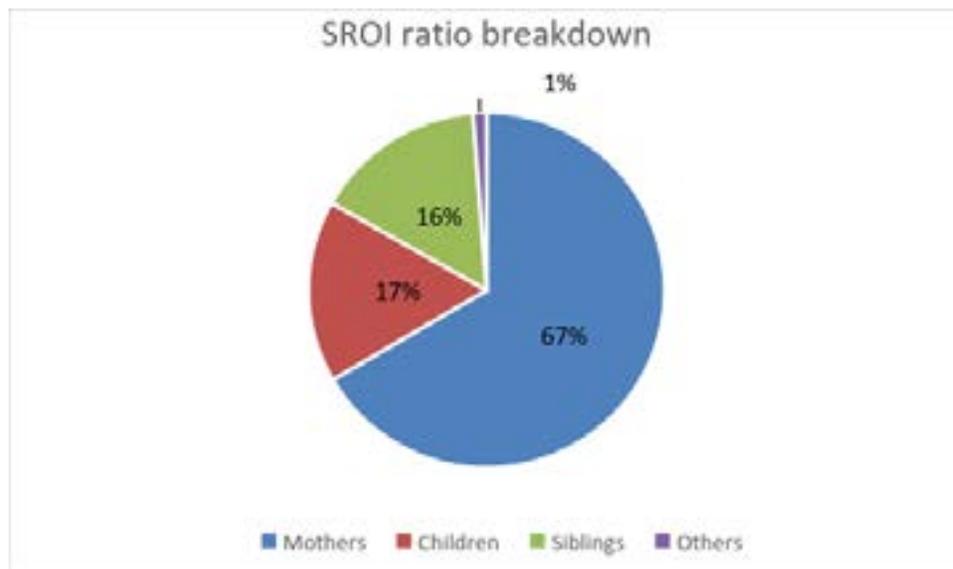
The SROI ratio was calculated by comparing the investments (inputs) and the financial, social and environmental returns (outcomes and impact of an intervention) as follows: $SROI\ ratio = \frac{\text{Total (adjusted) value of results}}{\text{Total value of inputs}}$ OR $SROI\ ratio = \frac{\text{Total results} * \text{deadweight} * \text{attribution} * \text{inflation adjustment}}{\text{Total value of inputs}}$.

Based on our calculations and assumptions, the total value created by the project was USD\$8,053,972. The Total Present Value for the project, at a discount rate of 6.5%, was USD\$29,874,419. The Net Present Value is USD\$21,769,502 (the Total Present Value minus the total of all inputs) (Table 12).

Thus, the SROI ratio is of $\frac{USD\$29,454,703}{419,716} = \mathbf{USD\$71 : USD\$1}$. This means that for every dollar of investment in the MIYCN project, **USD\$71** of social value was created.

Mothers, children and siblings were the stakeholder groups that benefited the most, with mothers representing 67%, children 17% and siblings 16% of the impact (Figure 1).

Figure 1: SROI ratio breakdown per stakeholder group



All stakeholder groups experienced a positive impact, except for healthcare providers and daycare centers.

Table 12: Summary findings of impact by stakeholder group

	Total impact	Discount rate 6.5%						Total Present value	Net Present Value
		Present value per year							
		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5		
Mothers	5,363,010	5,363,010	5,035,690	3,797,333	2,176,684	1,636,006	1,227,893	19,236,616	19,233,529
Children	1,334,900	1,334,900	1,253,428	941,542	707,261	531,276	399,081	5,167,488	5,167,488
Siblings	1,257,541	1,257,541	1,180,790	886,978	666,275	500,488	375,954	4,868,026	4,868,026
Fathers	59,287	59,287	55,669	41,817	31,412	23,596	17,725	229,506	229,506
Grandmothers	111,284	111,284	104,482	78,492	58,061	44,290	33,270	430,789	429,884
Healthcare providers	-115,969	-115,969	-108,891	-81,796	23,480	17,623	13,238	-252,336	-273,516
CHVs	49,407	49,407	46,392	34,848	33,850	25,427	19,100	209,025	209,025
Data collection team	857	857	804	604	467	351	264	3,347	3,347
Day care	-6,346	-6,346	-5,958	-4,476	-1,410	-1,059	1,208	-18,042	-18,042
APHRC									394,544
Total	8,053,972							29,874,419	29,454,703
SROI ratio per amount invested	71								

In Banke-Thomas et al. s (2015) systematic review of SROI, 12 studies were identified in health promotion, four in child health and three in nutrition (references grouped by theme are in the references list). The reported SROI ratios varied from 1.1:1 to 65:1. The MIYCN SROI ratio is higher than this range. Two studies in Kenya have used SROI, one on reproductive health and one on water interventions (Jönsson et al. 2011, Christian Aid 2012), both with lower SROI ratios.

Sensitivity analysis

Sensitivity analysis was used to test the variables and assumptions used based on the base and new scenarios. We checked changes for estimates of deadweight, attribution, displacement, drop-off and discount rate, the frequency of the outcome and the value of the outcome, where we used value games. The sensitivity analysis showed that the ratio can fluctuate from 34 to 136 depending on new case values (Table 13). The SROI ratio is most sensitive to variations in the value of outcomes that were based on value game exercises, deadweight and frequency used in key outcomes.

Table 13: Base and new case scenarios

	Base case	New case	New ratio
Attribution	0 – 25%	50%	USD\$44:1
Deadweight	5 – 100%	50%	USD\$47:1
Displacement	No displacement	25%	USD\$51:1
Drop-off	20%	50%	USD\$50:1
Discount rate	6.5%	3.3%	USD\$72:1
Outcome frequency use			
2.1	99%	50%	USD\$56:1
3.2	99%	50%	
Outcome frequency use			
2.1	99%	50%	USD\$47:1
3.2	59%	0%	
Outcome frequency use			
1.10	97%	48.5%	USD\$60:1
Value of the outcome using value game	On average USD \$ 2150	Value divided by 2	USD\$34:1
Value of the outcome using value game	On average USD \$ 2150	Value multiplied by 2	USD\$136:1

Limitations

The limitations of the study are related to the complexity of assessing future health benefits and the challenges in valuing non-market valued outcomes. We decided not to value future health benefits and to limit the duration of the study to five years. We feel that this may underestimate future health benefits, but without data on how to evaluate these, we chose not to include them. We used willingness to pay (WTP) via value games to monetize outcomes that do not have a current market value such as confidence, less burden of care and less stress. While value games exercises were done to minimize subjectivity and to reach a consensus per stakeholder group, the sensitivity analysis showed that the SROI ratio was most sensitive to these.

Discussion and Conclusion

Overall, the MIYCN intervention demonstrated an important positive impact, with mothers, children and siblings benefiting the most. A comparison of the MIYCN SROI ratios against other SROI studies showed that the ratio MIYCN obtained was the highest. This is possibly because this was a preventive intervention, recruiting mothers as early as possible during pregnancy and continuing the intervention until the child was one-year-old. A limited number of SROIs have been done on nutrition interventions, particularly preventive interventions. The intervention resulted in improved health for mothers and children, and increased confidence of mothers, among other outcomes. The impact was less for grandmothers, fathers and CHVs. Nevertheless, these stakeholders also reported positive outcomes such as increased happiness, or improved living standards at home. Conversely, the intervention had a negative impact on daycare centers and healthcare providers, putting too much pressure on them without providing extra support.

The outcomes that generated the most social value to mothers and children were Outcome 1.10 ('healthier mother') and Outcome 1.3 ('less worried mother due to better health') (Table 14).

Table 14: Outcomes that generated the most social value

Stakeholder	Outcome	Values in USD
Mother	Outcome 1.10: Healthier mother	1,677,133
	Outcome 1.3: Less worried mother due to better health of her children	1,378,419
	Outcome 1.5: Confident mother able to overcome family pressure	1,057,745
	Outcome 1.7: Improved relationships at home	1,008,473
Children	Outcome 2.3: Better cognitive development	839,760
	Outcome 2.1: Healthier baby	803,370
Sibling	Outcome 3.2: Healthier siblings	1,101,471

The negative outcomes that will need to be tackled in future programming were Outcome 2.2 ('less healthy baby due to difficulty in introducing complementary feeding') and Outcome 6.2 ('increased workload [for healthcare providers] due to mothers seeking child checkups'). In Table 15, practical recommendations are presented to minimize negative outcomes in future programming.

Table 15: Outcomes that generated negative social value

Stakeholder	Outcome	Values in USD	Recommendations
Mothers	Outcome 1.1: Increased expenditure on nutritious food and/or healthcare	-16,084	Provide small subsidy for food and healthcare.
	Outcome 1.2: More worried mother due to loss in baby weight and poor health	-99,181	Provide targeted counseling around the introduction of complementary feeding.
	Outcome 1.9: Less income due to job loss	-14,747	Provide small subsidy such as cash transfer. Advocate for maternity leave benefits.

Children	Outcome 2.2: Less healthy baby due to difficulty in introducing complementary feeding	-308,230	Provide targeted counseling around the introduction of complementary feeding.
Healthcare providers	Outcome 6.2: Increased workload due to mothers seeking child checkups	-160,248	Provide extra staff and support via Ministry of Health.
CHVs	Outcome 7.2: Increased stress due to the difficulties posed by the work	-21,859	Provide support to vulnerable mothers and children via a dedicated budget.
Data collectors	Outcome 8.4: Financial strain due to financial aid given to vulnerable mothers	-25	Provide support to vulnerable mothers and children via a dedicated budget.
Daycare centers	Outcome 9.1: Increased stress due to increased enrollment	-3,683	Provide small subsidy for food and hygiene.
	Outcome 9.2: Increased expenditure due to improved hygiene and nutritious food provided	-6,703	Provide small subsidy for food and hygiene.

Based on these findings, the recommendations for future programming or scale-up are:

1. To National and County Governments and Donors

- Fund BFCI as a priority health promotion tool. BFCI has many far-reaching positive impacts on the health and wellbeing of both family and community members, including mothers, fathers, children and grandmothers.
- Support the Community Health Strategy by providing incentives for community health volunteers and adequately training CHVs on handling psychosocial issues.
- Empower the community economically through social protection measures such as job creation and support of mothers who wish to successfully combine work with breastfeeding.
- Include fathers in BFCI interventions as they are a key determinant of its success.

2. To Researchers, NGOs and Donors

- Adopt the SROI approach in the evaluation of interventions in order to manage unexpected outcomes and value social outcomes.
- Build the capacity of program implementers to include SROI in their evaluations.

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Annex 1: Influence / importance map

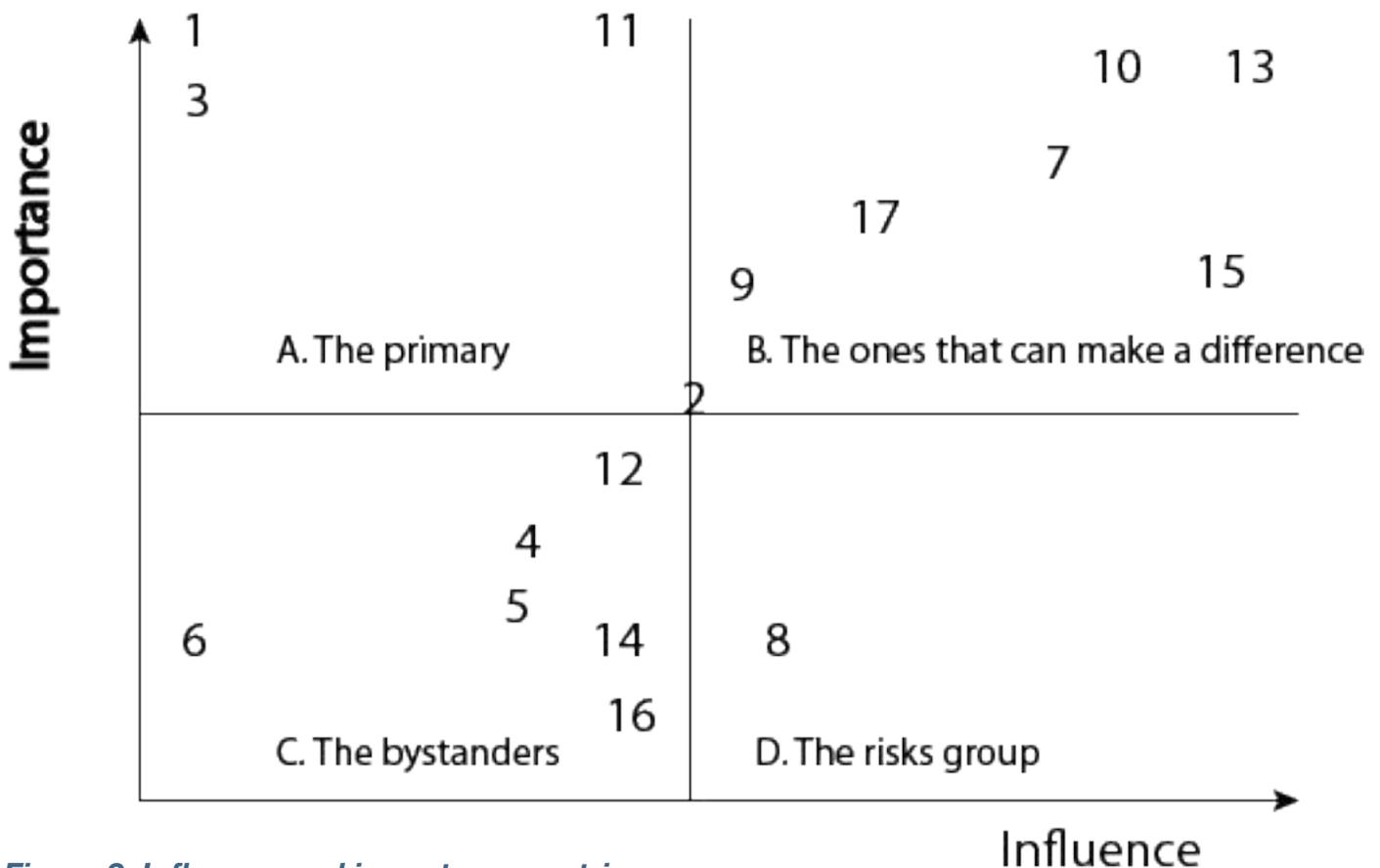


Figure 2: Influence and importance matrix

Legend:

A: Stakeholders in Square A require special initiatives if their interests are to be protected as they are your primary stakeholders.

B: Your project needs to build good working relationships with the stakeholders in Square B, to ensure effective coalition of support.

C: The stakeholders in Square C may be a source of significant risk, and are the stakeholders who require careful monitoring and management in your project.

D: These stakeholders are unlikely to be the subject of project activities or management, but may have an indirect influence.

1: Mothers were the primary beneficiaries and had a lot of importance but less influence in the success of the project.

2: Fathers had some influence and importance in the success of the project, hence were placed on the borderline between being beneficiaries, influencers, bystanders and at risk. Some fathers were present at the counseling sessions and hence were considered primary beneficiaries. As the major financial providers, they can influence the uptake of the counseling by the CHVs, which also leads to them being considered at risk if they hinder the uptake of the counseling advice.

3: Children have great importance in the success of the project but have no influence on the running of

the project, hence primary beneficiaries.

4: Grandmothers have some influence and some importance, especially if they are caregivers, but do not have as much influence or importance in affecting the project, hence categorized as bystanders.

5: Neighbors have less influence and importance in the running of the project, hence classified as bystanders.

6: Other relatives have little or no influence on the project, hence classified as bystanders.

7. Healthcare providers have very great importance and are influential in the project, hence categorized as influencers.

8. The informal health sector has a lot of influence through the use of TBAs for delivery services and herbal treatment from herbalists, but little importance in the project.

9. NGOs and CBOs have some influence on the project depending on their role in the community, as well as some importance, for example in running therapeutic feeding centers, hence are categorized as influencers. Can also be bystanders, especially where they have no impact on the project or the project has no impact on their work.

10: Ministry of Health is very influential, as it includes policy- and decision-makers and can determine the success of the project. It is also very important in the project, hence categorized as an influencer.

11. Community health volunteers have some influence and are very important. Were directly trained in the project, hence categorized as primary beneficiaries.

12. Data collection teams have some influence and some importance but are not the subject of the project activities, hence categorized as bystanders.

13. The APHRC team is very important to the project and very influential in the outcome of the project, hence categorized as influencers.

14. Day care centers were not the subject of the project and thus seen as not very important, but are seen as influential as they can determine the feeding of the children under their care and thus can affect the uptake of the counseling given by the CHVs. They are therefore categorized as bystanders, but also closer to the at risk group.

15. Local community leaders are very influential as they can determine the kind of support accorded to the project. They are also important as decision makers, thus are categorized as influencers.

16. The business community is influential as they trade and promote foods/breast milk substitutes that may hinder mothers from practicing optimal infant feeding, hence placed near the at risk group. They are not very important and have no direct influence on the project, hence categorized as bystanders.

17. The media are influential and important as they can be used as medium to promote better infant feeding practices or can hinder the same practices through the promotion of products and practices that hinder the uptake of proper MIYCN. They are therefore categorized as influencers.

Table 1: Inclusion and exclusion criteria per stakeholder group

Stakeholders	Included	Excluded

Mothers	Mothers involved in the intervention	Mothers who were lost to follow-up in the course of the project
Fathers	Fathers (spouses) living in the same household as mothers involved in the intervention	Fathers (spouses) not living with the intervention mothers
Children	Children involved in the intervention	Children who were lost to follow-up in the course of the project
Grandmothers	Grandmothers of children in the intervention Living together with the mothers / children in the intervention	Grandmothers not living with the intervention mothers /children
Neighbors	Neighbors of mothers involved in the intervention	
Other Relatives Grandfathers of children involved in the intervention Aunties, uncles, siblings	Relatives living with the mothers/ children in the intervention	Relatives not living with the intervention mothers
Healthcare providers in the community	Providers working in health facilities in the intervention area Mainly nurses and community health extension workers because they were in more direct contact with the intervention mothers and CHVs	Other health workers who are not in direct contact with the mothers and CHVs.
Informal health sector Traditional Birth Attendants, herbalists	TBAs providing delivery services in the area/ villages where the intervention was implemented.	
Therapeutic feeding centers	Therapeutic feeding centers operational in the same area/villages as the APHRC's MIYCN intervention	

<p>Ministry of Health</p> <p>National level</p> <p>Unit of Nutrition and Dietetics</p> <p>Unit of Community Health Services and Child Health</p> <p>DHMT</p>	<p>Those involved in the MIYCN intervention activities (mainly the MIYCN program manager at national level, and the community health services coordinators and nutrition coordinators at county level.</p>	<p>Those who were not involved in the intervention</p>
<p>Community Health Volunteers</p>	<p>Trained on MIYCN module and involved in delivery of the intervention (counseling mothers on MIYCN)</p>	<p>CHVs not trained on MIYCN module or involved in the MIYCN intervention</p>
<p>Data collection</p>	<p>Those involved in data collection activities/monitoring of the intervention</p>	

Annex 2 – Value Game Example with Grandmothers

The stakeholders should have experienced the outcome: In this case the grandmothers agreed to having experienced the outcome of interest ('happy grandmother' and 'reduced burden of care').

Steps in SROI value game:

1. The grandmothers individually list at least three to four material items that can last at least a year.
2. The list is compiled and the grandmothers list the items in order of priority: What would make them happiest to least happy.
3. The grandmothers then place the outcome of interest within the ranked outcomes, again in order of priority.
4. The material items are then ranked according to their monetary worth for one year, from the most expensive to the least expensive.
5. The outcomes of interest are then placed back in their original positions and valued.
6. Finally, the grandmothers are asked if they agree with the value of the outcome of interest.

Material items ranked in order of priority, and outcome placed (Step 3)	Material items costed by the grandmothers and ranked (Step 4)	Outcomes placed in their original positions (Step 5)
Land	Food - 365,000 (1000/= per day)	Food - 365,000 (1000/= per day)
Income	Rent - 90,000 (7500/= per month)	Burden of care
Rent	Land - 75,000 per year	Rent - 90,000 (7500/= per month)
Food	School fees - 70,000 (Primary & Secondary)	Land - 75,000
Burden of care	Income - 66,000 (5,500/=per month)	School fees - 70,000 (Primary & Secondary)
School fees (for grandchildren)		Happy grandmother
Happy grandmother		Source of income - 60,000 (5,500/=per month)

In the case presented in the table above, the grandmothers were willing to pay 60,000 to be happy, and 90,000 to 365,000 to have a reduced burden of care.

Annex 3 – Other sources

MIYCN study (RCT) data sets.

Quantitative data for the RCT MIYCN study was collected from about 1100 mother-child pairs in both intervention and control groups. This was done through interviewer-administered questionnaires using data capture devices. Data were collected before the intervention (baseline data collection), during the intervention (bi-monthly during pregnancy and every three months post-delivery) and after the intervention (post-intervention data collection). Data collected mainly included:

- Maternal knowledge, attitudes and practices around MIYCN;
- Breastfeeding and complementary feeding practices;
- Anthropometric measurements (weight and length);
- Diarrhea morbidity;
- Contextual data including morbidity from common childhood illnesses, antenatal care, postnatal care and immunization; and
- Household food security and hygiene and sanitation data.

Midline / endline

The qualitative midline evaluation was conducted in June and July 2013, midway through the project's implementation. Data were collected through 24 in-depth interviews (IDIs) with pregnant and lactating women, four focus group discussions (FGDs) with community health volunteers and four key informant interviews (KIIs) with Community Health Volunteers. The main aim of this evaluation was to understand the experiences of the mothers and Community Health Volunteers in the intervention and evaluate the various intervention activities through feedback from them, since they were the primary beneficiaries of the intervention.

The endline qualitative evaluation was conducted in October and November 2014, after completion of the intervention activities. Data were collected through 24 in-depth interviews (IDIs) with women who participated in the study (both in control and intervention groups), six IDIs with fathers, four focus group discussions (FGDs) with Community Health Volunteers and six key informant interviews (KIIs) with health workers in the community (community health extension workers, nurses from the health facilities serving the study community and community health strategy coordinators).

Cost effectiveness analysis: Qualitative data

As part of the cost effectiveness analysis, data were collected in November 2014 through six in-depth interviews with the intervention mothers. The main aim of this evaluation was to understand the cost of participating in the intervention for the mothers who were the primary beneficiaries. The interviews focused mainly on the changes observed or experienced by the mothers themselves, by their children and by their families, the impact of the changes on their expenditure (increased or decreased expenditure) and the value of the changes in expenditure (by how much the expenditure increased or decreased).

Annex 4 - Impact Map

The Impact Map can be downloaded from: <http://aphrc.org/publications/annex-4-impact-map-final-22-03-2016-1/>

