REPLICATING THE MAMATOTO PROGRAMME IN RURAL TANZANIA

Final Process Evaluation Report

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Innovating for Maternal and Child Health in Africa (IMCHA) Initiative

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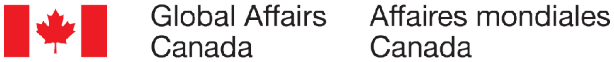

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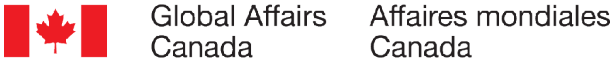


1. Executive Summary

Background

In Sub-Saharan Africa, maternal and child morbidity and mortality remain key health priorities. As a result, major global investments have been made towards Maternal, Newborn, and Child Health (MNCH) over the past 20 years, including the implementation of large-scale and district-wide interventions in countries such as Uganda and Tanzania. Despite these efforts, there is limited documentation related to how these interventions are implemented, what specific aspects of implementation are effective, and under what conditions these interventions are effective. This has important implications for optimizing health outcomes as well as for scale up and spread of effective interventions.

In 2012-2015, the Healthy Child Uganda Partnership implemented the MamaToto package, a district-wide approach that was effective in successfully engaging stakeholders at all levels throughout implementation to make the changes needed for sustained improvements in MNCH. This study "Replicating the MamaToto programme in rural Tanzania," funded by the International development Research Centre, aimed to improve MNCH in Lake Zone, Mwanza region. The study tested the replicability of the successful MamaToto model in Misungwi and Kwimba districts (combined population of 853,952) between 2016-2020 and to assess the specific factors and/or adaptations that influence implementation outcomes. The comprehensive package, known locally as "Mama na Mtoto," addressed MNCH gaps at three levels: (1) district (through health system strengthening activities); (2) health facility (through training and some support for infrastructure and equipment); and (3) community (by supporting establishment of a volunteer community health worker network). Mama na Mtoto implementation was led by districts, integrated within existing plans and programs, and aligned with Government of Tanzania health policies. The intervention also used a gender and equity lens to guide the implementation of activities.

Approach & Methods

We conducted a 54-month Effectiveness-Implementation Hybrid Design (Type 2) using the RE-AIM (Reach, Effectiveness, Adoption, Implementation and Maintenance) evaluation framework study to answer the following research questions:

1. Can implementation of MNCH facility and community-based interventions using the 'Mama na Mtoto Process' in rural Misungwi District improve specific maternal and newborn indicators?
2. Can the 'Mama Toto Process', which has proven successful in Uganda, be adapted to support successful district-led implementation of a package of policy-recommended MNCH activities in rural Tanzania?

The study involved the use of multiple methods to answer the research questions, including operational data, MNCH Coverage Survey, a health facility survey, a qualitative inquiry, a rapid evaluation using the Consolidated Framework for Implementation Research (CIFR), a sub-study evaluating a simulation training and peer-to-peer learning program, an external evaluation, and a partnership reflection and feedback meeting. The operational data was conducted throughout the project, while the MNCH Coverage Survey and health facility survey were conducted at project baseline (2016) and endline (2019), to provide the pre and post intervention comparisons. The qualitative inquiry, rapid evaluation, external evaluation, and partnership meeting were conducted only at endline (2018-2019).

Key Findings

Research Question 1: Clinical Effectiveness

The implementation of Mama na Mtoto was found to improve a number of MNCH indicators in both Misungwi and Kwimba districts from 2016-2019. Statistically significant increases were found for four or

more antenatal care visits (+12%), delivery by a skilled birth attendant (+16%), delivery at a health facility (+17%), postnatal care for mothers within 48 hours (+8%), childhood nutrition (dietary diversity among children 6-23 months: increase of 55% from baseline), and care-seeking for children under 5 for fever (+17%). Care-seeking at health facilities greatly improved within the time period as a result of the CHW program and improved delivery of care at the health facilities. Some findings suggest gaps remain with regards to family planning (not an intervention target) and continued resistance of some community members to change care seeking behaviours and practices. A number of non-health outcomes were also reported as a result of the project's lens on gender equality and health equity. This included enhanced male engagement in MNCH issues and greater support to their partners in seeking care. Additionally, stakeholders also reported improvements related to gender equality at the health facility and district levels, including changed attitudes and existing beliefs among district and health facility staff regarding gender, and perceived increase the status of women as a result of the CHW program.

Research Question 2: Process Evaluation

The project attained high levels of adoption at the district, health facility, and community levels in both Misungwi and Kwimba (100% adoption). The project also saw an extensive implementation reach; either 100% or close to 100% of local community leaders, CHW supervisors, and health facility in-charges, in both districts participated in the program. The Mama na Mtoto processes related to promoting district program integration, enhancing district leadership capacity, improving health facility management and quality improvement capacity, and establishing a functional CHW network supported effective implementation of the project. In particular, the participatory process of engagement at all levels was found to be highly effective for promoting program integration with the districts and enhancing health facility capacity. The simulation training and peer-to-peer learning program was also found to be especially effective in supporting the retention of skills and knowledge, as well as in changing the culture of care at the facilities (more teamwork, provision of dignified and respectful care). Additionally, project participants commended CHWs for the active presence in communities and ability to build trusted relationships.

Stakeholders were optimistic about sustainability of the project activities. Among CHWs, 94% were still active two years following initial training in Misungwi, while 98% were still active after one year in Kwimba. Yet, it was also acknowledged that sustainability may be threatened by continued needs for refresher training and mentorship, as well as tools and materials for CHW meetings and household visits.

While some process adaptions were made to the model that was implemented in Uganda, many of these adaptations were considered important to ensure that the intervention met the specific needs in Tanzania and fit with the cultural context. However, other adaptations made confirmed the importance of fidelity to specific aspects of the model, including the importance of the cascade approach to engagement and CHW selection.

Other important findings that emerged from this study include needed refinements to the packaging and communication of the process model that was implemented in Uganda (SOPETAR: Scan-Orient-Plan-Equip-Train, Act, and Reflect), as well as and identification of lessons learned and best practices for partnerships.

Conclusion

This project provides needed evidence for testing the replication of a comprehensive, district-wide MNCH program from one context to another, and contributes to global efforts to improve the health of mothers and children in Sub-Saharan Africa.

2. List of Acronyms

ANC	Antenatal care
BEmONC	Basic Emergency Obstetric and Newborn Care
CEmONC	Comprehensive Emergency Obstetric and Newborn Care
CHMT	Council Health Management Team
CHW	Community Health Worker
CIFR	Consolidated Framework for Implementation Research
CUHAS	Catholic University of Health and Allied Sciences
HF	Health facility
HFD	Health facility deliveries
HFGC	Health Facility Governance Committee
HMIS	Health Management Information Systems
IDRC	International Development Research Centre
MNCH	Maternal, Newborn and Child Health
MNH	Maternal Newborn Health
MnM	Mama na Mtoto
MUST	Mbarara University of Science and Technology
PNC	Postnatal care
QI	Quality Improvement
RHMT	Regional Health Management Team
RMO	Regional Medical Officer
SIM	Simulation (refers to simulation project)
U2	Under two (child under two years old)
U5	Under five (child under five years old)
UC	University of Calgary
W/VEO	Ward/Village Executive Officer

3. Background

3.1 Context

In the United Republic of Tanzania, it was estimated that in 2015, almost 8,000 women died due to pregnancy and delivery complications and nearly 40,000 babies die during their first month of life (Countdown to 2015., Health Metrics Network., 2011). Moreover, in the same year, mortality was highest among rural and poor populations in the country (Countdown to 2015). To meet the Sustainable Development Goals, Tanzania's national government identified Maternal, Newborn, and Child Health (MNCH) issues among its top health and development priorities.

Tanzanian Policy on Maternal, Newborn and Child Health
The Tanzanian health system is decentralized and framed most explicitly by its National Health Policy. The Tanzanian National Health Policy is driven primarily by the objective to provide access to quality primary health care for all citizens. Explicitly linked to the MNCH targets are two key policies, Big Results Now (BRN) (Government of Tanzania, 2015) and One Plan II (Government of Tanzania, 2016), both which focus on resources towards an essential health care package, which is "an integrated collection of cost. A high national priority is safe, facility-based delivery care and implementation of Basic Emergency Obstetric and Newborn Care (BEmONC) and Comprehensive Emergency Obstetric and Newborn Care (CEmONC) at all facilities across the country. Achievement of BEmONC and CEmONC status involves a facility being able and ready to provide a series of specific interventions to manage common and unpredictable complications during pre-, intra-, and post-partum.

The Tanzanian Health System – Delivery of Maternal, Newborn, and Child Health Services
Regional Health Management Teams (RHMTs) led by Regional Medical Officers (RMOs) coordinate efforts across their regions and ensure adherence with Government of Tanzania policy. RHMTs are tasked with strengthening district level governance and service delivery through dispensaries, health centers (HCs), and hospitals. Council Health Management Teams (CHMTs) led by District Medical Officers (DMOs) report to and are financially supported through the District Executive Director's office. Health Facility Governance Committees (HFGCs) and Health Boards are mandated to participate in the governance of health facilities, including resource mobilization. Each health facility has a designated 'In-Charge' staff member who, in addition to clinical care, provides oversight for facility management. Communities contribute to local health facilities and participate in their management through HFGCs. Volunteer and professionally-paid Community Health Workers (CHWs) have been trained and act as liaisons with facilities and support a variety of community-based services.

A high national priority is safe, facility-based delivery care and implementation of Basic Emergency Obstetric and Newborn Care (BEmONC) and Comprehensive Emergency Obstetric and Newborn Care (CEmONC) at all facilities across the country. Achievement of BEmONC and CEmONC status involves a facility being able and ready to provide a series of specific interventions, called 'signal functions', to manage common and unpredictable complications during pre-, intra-, and post-partum. Table 1 lists the signal functions for routine delivery care, BEmONC, and CEmONC.

Table 1: Signal Functions for Routine Delivery Care, BEmONC, and CEmONC
Routine Delivery Care – All Women, All Facilities
• Respectful care for women and their families • Infection prevention practices • Partograph use for clinical decision-making • Active management of 3rd stage of labour • Immediate newborn care
BEmONC Signal Functions
1. Parenteral antibiotics 2. Uterotonic drugs 3. Parenteral anticonvulsants for pre-eclampsia and eclampsia 4. Manual removal of placenta 5. Manual vacuum aspiration 6. Assisted vaginal delivery (e.g. vacuum extraction)* 7. Newborn resuscitation
CEmONC Signal Functions
Perform signal functions 1-7 (above) and: 8. Caesarean section 9. Blood transfusion

*not commonly practiced in Tanzania

Misungwi and Kwimba Districts, Mwanza Region

The Lake Zone, in Mwanza region, was identified through One Plan II and BRN as a priority geographic target area due to poor MNCH indicators. Misungwi and Kwimba are two of eight districts in Mwanza Region. With a combined population of 853,952[1], these rural districts and others in the Lake Zone are considered to have amongst the worst MNCH indicators in the country. Administratively, Misungwi District is divided into four divisions, 27 wards, 113 villages and 724 hamlets. Kwimba District is divided into five divisions, 30 wards, 119 villages and 870 hamlets (Government of Tanzania 2015).

To address the persistent high maternal and child mortality and gaps in MNCH service delivery, the Catholic University of Health and Allied Sciences (CUHAS) and the University of Calgary (UC), in collaboration with Council Health Management Teams (CHMTs) in both Misungwi and Kwimba Districts in Mwanza Region, implemented a district-led, policy-based, and low cost MNCH intervention package in rural Tanzania called the 'Mama na Mtoto' package between 2015-2020. Mama na Mtoto follows a process based on a similar package (MamaToto, Healthy Child Uganda Partnership), which has proven successful in improving maternal and child health in Uganda (Global Affairs Canada, 2012-2015). Adapted for the Tanzanian setting and policy, the intervention builds upon the existing district health system structure and resources to promote district-wide "readiness" to implement a comprehensive approach to strengthening maternal and child health services and improving the health of mothers and children.

3.2 Study Rationale

In our previous experience implementing the MamaToto package through the Healthy Child Uganda Partnership (2012-2015), a district-wide approach was effective in successfully engaging stakeholders at all levels throughout implementation to make the changes needed for sustained improvements in MNCH

[1] Estimated population for 2016, based on an average annual growth rate of 3% in Mwanza Region (Government of Tanzania 2012).

(Healthy Child Uganda, 2015). Moreover, the literature suggests that a comprehensive approach to implementing MNCH initiatives requires multi-level inputs - beginning with the strengthening of primary health care infrastructure and health information systems (Bhutta et al., 2014). Salam et al. 2014 further assert that the sustainability of these interventions necessitates the engagement of local opinion leaders and policy makers, program managers and service providers (Salam et al., 2014).

Despite this, there remains limited evidence for district-wide approaches for MNCH interventions. Indeed, little research has been done with regards to the mechanisms by which district level inputs improve MNCH outcomes in low-income settings (Salam, Lassi, Das, & Bhutta, 2014). In particular, more evidence is needed related to district supervision, monitoring and effectiveness (Das et al., 2014). At the facility level in particular, further studies need to understand that factors that influence the delivery of MNCH services, including staffing composition, facility structure and culture, and intervention impact on workforce performance and patient outcomes (Das et al., 2014). For MNCH community level inputs, an increasing literature base provides evidence for packaged care involving outreach, referral, community mobilization and training that have shown improvements in maternal and newborn health outcomes (Bhutta et al., 2014). However, there remain gaps in knowledge with respect to costs and equity of these interventions (Lassi et al., 2014), and additional study is also (Haines et al., 2007) needed in evaluating the processes related to CHWs (Haines et al., 2007).

In addition, despite global efforts to scale up best-practices, studies related to scale-up of MNCH interventions are lacking (Brenner et al., 2011; Countdown to 2015., 2013); there is need to describe individual intervention components and process measures in detail for reproducibility in resource limited settings (Bhutta et al., 2014). Documentation is needed to describe implementation and process understanding to show 'if' and 'how' implementation of district-integrated interventions can occur; implementation research is key in accelerating progress in MNCH (Mason E. et al., 2014). Many large-scale and district-wide interventions involve substantial funding investments, as they are implemented with the intention for scale up and spread. Yet, even high-quality evidence-based interventions are not consistently being applied in practice or policy, resulting in inefficiencies, and reduced quality and quantity of life (Straus et al., 2013). Furthermore, these challenges with implementing evidence have implications for the effective and optimal use of healthcare and research resources (Graham et al., 2006).

The field of implementation science (a sub-field under knowledge translation) provides an opportunity to address these gaps related to district-wide MNCH implementation. Handley et al. (2016) discuss the importance of implementation science in seeking to understand the factors that determine why an evidence-based intervention may or may not be adopted in healthcare or public health, and using this information to improve the speed, quantity, and quality of uptake.

The 'Mama na Mtoto' intervention aimed to use an implementation science approach to conduct a study that would evaluate an adaptation of a tested MNCH-focused intervention. In particular, we aimed to assess the effectiveness of specific implementation strategies in achieving improvements in MNCH service delivery and outcomes, as well as to obtain an enhanced understanding of the critical factors that influence implementation success and sustainability. Our findings will inform future efforts to scale up and spread of MNCH initiatives and to contribute to the evidence for district-wide approaches to implementation.

The project involved a coalition of partners who worked together with Misungwi and Kwimba Districts, including the University of Calgary (project lead), Agriteam Canada (now Alinea), Catholic University of

Health and Allied Sciences (CUHAS)-Bugando (local implementing partner), Save the Mothers, the Canadian Paediatric Society, and Mbarara University of Science and Technology (MUST; in Uganda).

3.3 Intervention Description

What is the Mama na Mtoto Package?

The Mama na Moto Package is package of strategies approaches and considerations/ best practices that helps health systems effectively implement a comprehensive suite of multi-level (district, health facility, and community) MNCH interventions. It was adapted from what is known as the 'MamaToto Package,' which was developed by the Healthy Child Uganda Partnership, from over a decade of implementation and synthesis of real-world best practices in rural Uganda. The package was developed *by implementers for implementers*. Previous implementation studies have evaluated its effectiveness (Healthy Child Uganda, 2015). Adaptions for the Mama na Mtoto (including package name change) incorporated considerations for the Tanzanian context and policy.

Unique feature of the Mama na Mtoto Package include:

1. A focus on building health system capacity to promote the uptake, adoption, and effective implementation of MNCH activities.
2. The Mama na Mtoto Package is a multi-level initiative, which seeks to engage stakeholders at all levels of the health system. Partnerships are developed with local health districts and leaders, and capacity building begins at this level, consistent with a health system strengthening approach. Through a 'cascade' approach, district leaders are supported to lead capacity building at the health facilities, who in turn work with communities, primarily through Community Health Workers (CHWs).
3. The focus on a district-led approach helps to ensure that sustainability is built into the process at the beginning; local district leaders are able to identify what activities should be prioritized, feasible, and sustainable. Moreover, by promoting system strengthening and building capacity at all levels, the intervention is less likely to rely on external support in the long-term.

How does it work?

1. The Mama na Mtoto Package uses specific change strategies. These include: training, equipping, collaborative and consensus building meetings, and technical assistance/mentorship to enhance capacity at the district, health facility, and community levels.
2. Implementation is guided by a comprehensive process model called SOPETAR – Scan, Orient, Plan, Equip, Train, act, Reflect (Healthy Child Uganda, 2015). Process models exist to describe steps/phases of activity that are necessary to meet implementation outcomes. It may be used iteratively, as needed. SOPETAR is used at each level of implementation (district, facility, community health worker) to engage stakeholders and enhance their capacity to implement MNCH interventions. that are warranted within their contexts. SOPETAR describes the sequence and operationalization ('how-to') of the strategies described above. The goal of SOPETAR is to provide each level of implementation (e.g., districts, health facilities, and communities) with a model that can be used to help understand local needs, orient stakeholders to the activities,

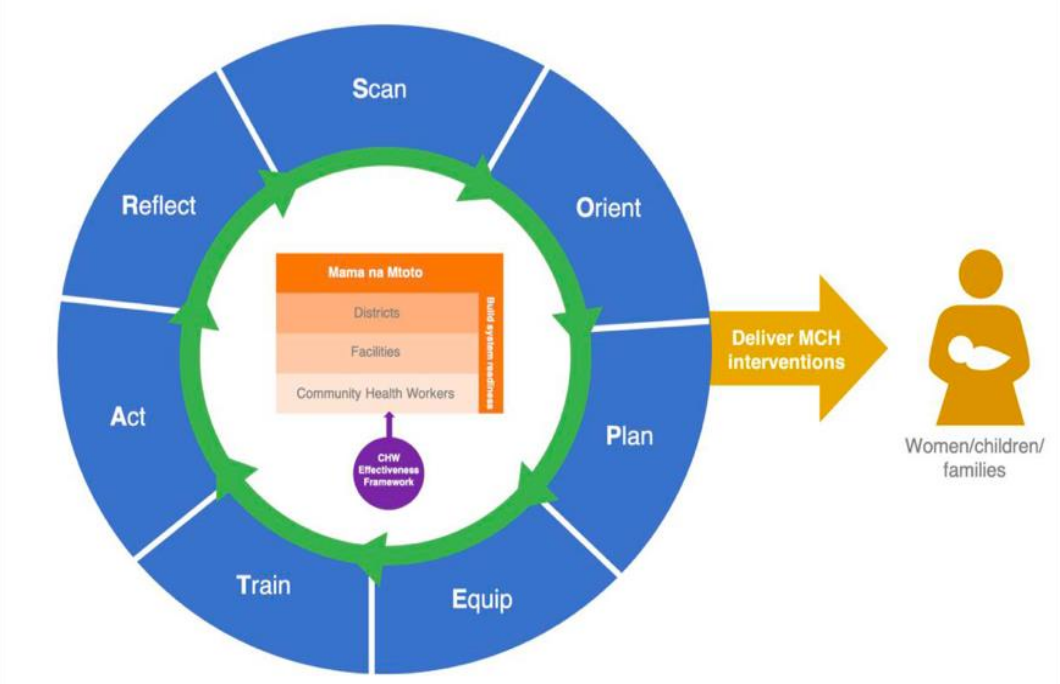
engage in action planning to identify and articulate local needs, enhance capacity through equipping and training, implementing activities, and reflecting on the processes, challenges and successes, which will inform any needed improvements to implementation. (See Box 1)

3. A CHW Effectiveness Framework (Ludwick et al., 2018) is comprised of 8 key factors that influence effective implementation of CHW programs. The Mama na Mtoto Package uses these factors to guide the specific activities and approaches regarding the recruitment and training of CHWs to engage communities in health promotion and prevention. These factors also include considerations for sustainability of CHW programs. The key factors have been identified in the literature (6 of 9 factors) and based on previous experience with implementing CHW programmes in rural Uganda through the Healthy Child Uganda Partnership, and include: strong management and supervision, appropriate selection, participatory and ongoing training, adequate retention and incentives, strong link with health facilities, community embeddedness, peer support, and district leadership.

Box 1. The SOPETAR Process Model

- **Scan** to understand local (e.g., district, health facility, community) needs and what will be implemented
- **Orient** staff to the implementation strategies and process
- **Plan** for implementation
- **Equip** each level of implementation with the required resources
- **Train** staff on the intervention, using a cascade approach (train-the-trainer across levels of implementation)
- **Act** to implement the components of the plan
- **Reflect** on challenges and successes

Figure 1: Components of the Mama na Mtoto Package – Multi-level Approach for Implementation, SOPETAR Process Model, and CHW Effectiveness Framework



4. Methods

4.1 Study Setting

Misungwi and Kwimba are two of eight districts in Mwanza Region. With a combined population of 853,952[2], these rural districts and others in the Lake Zone are considered to have amongst the worst MNCH indicators in the country (Kilonzo 2001, Government of Tanzania 2015, Government of Tanzania 2016); the Big Results Now development policy (Government of Tanzania 2015) identified the Lake Zone as a priority for MNCH interventions. Administratively, Misungwi District is divided into four divisions, 27 wards, 113 villages and 724 hamlets. Kwimba District is divided into five divisions, 30 wards, 119 villages and 870 hamlets (Government of Tanzania 2015).

Table 2 provides estimated catchment populations for 2016 in Mwanza Region (Government of Tanzania, 2013, 2016a); according to the same source, an average household comprises 6.6 residents in Misungwi and 6.4 residents in Kwimba. The estimates are based on an estimated 3.02% annual growth rate according to census data.

Table 2: Estimated 2016 Misungwi and Kwimba District Population

	Total District Population	Women of reproductive age (15-49 years)	Boys under 5 years	Girls under 5 years
Misungwi District	396, 055	93,353	35,739	35,739
Kwimba District	457, 897	107,929	41,288	41,319
Total	853,952	201,282	76,999	77,058

4.2 Study Overview

We conducted a 54-month Effectiveness-Implementation Hybrid Design (Type 2) study (Curran et al., 2012) with the following study objectives:

1. To **adapt and implement** a government-policy guided package of MNCH interventions incorporating the district-led 'Mama Toto Process', using a knowledge user-informed engagement strategy, in Misungwi District and subsequently in Kwimba District in rural Tanzania.

2. To evaluate the **effectiveness** of this implementation strategy, using a quasi- experimental pre/post intervention trial.

3. To conduct a process **evaluation** of the implementation strategy.

4. To adapt and then implement a district-led, policy-based, low cost MNCH intervention package using the Mama Toto process in rural Tanzania.

Our two main research questions align with the Study 'Logic Model' Outcomes (see *Figure 2* below), which was developed to guide the research study for testing the Mama na Mtoto Package theory of change.

[2] Estimated population for 2016, based on an average annual growth rate of 3% in Mwanza Region (Government of Tanzania 2012).

Research Question 1 (Clinical Effectiveness): can implementation of MNCH facility and community-based interventions using the 'Mama na Mtoto Process' in rural Misungwi District improve specific maternal and newborn indicators?

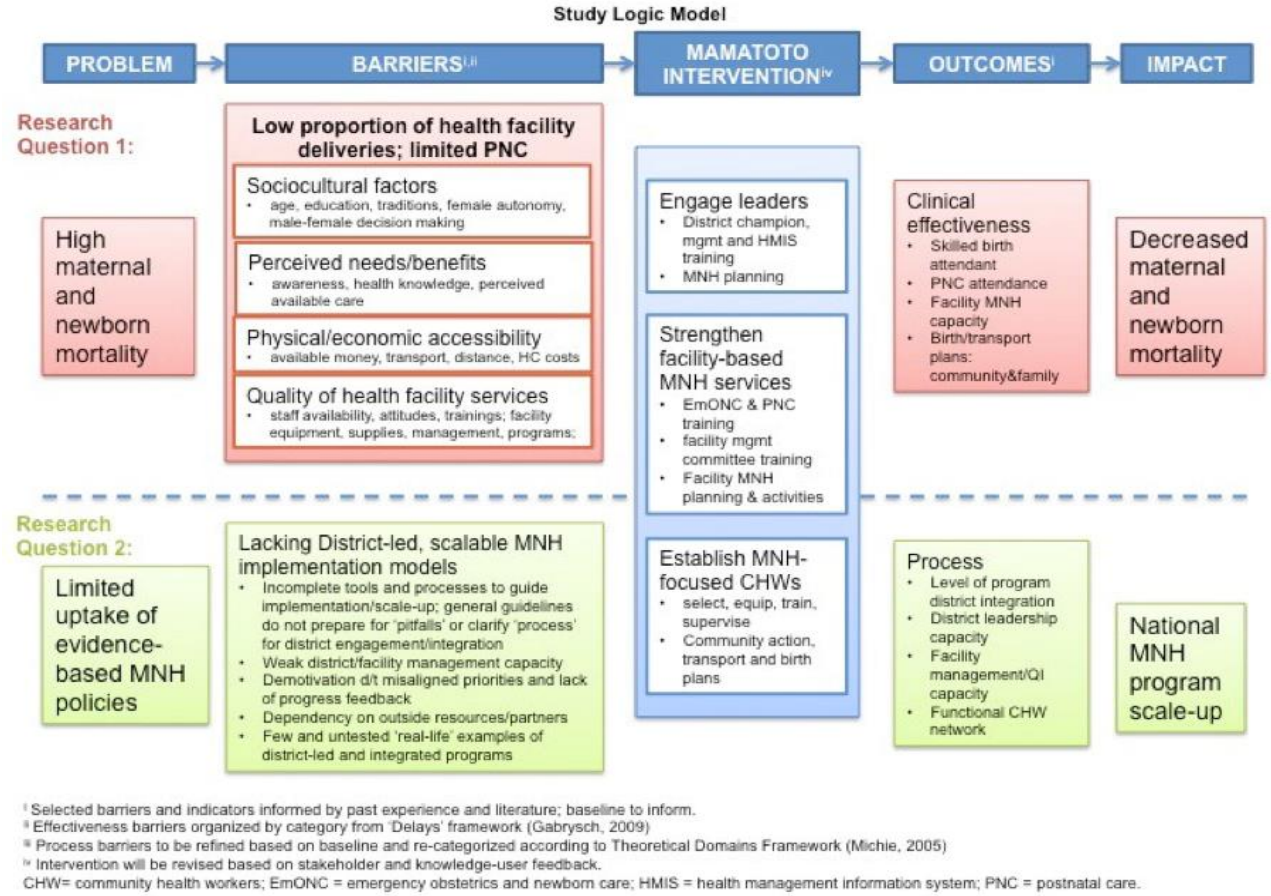
Research Question 2 (Process Evaluation): can the 'Mama Toto Process', which has proven successful in Uganda, be adapted to support successful district-led implementation of a package of policy-recommended MNCH activities in rural Tanzania?

The RE-AIM framework (i.e. Reach, Effectiveness, Adaption, Implementation, Maintenance) (Glasgow et al., 1999) was used as our implementation evaluation framework as it is a well-established framework that has been widely used for real-world implementation studies.

While the research questions are specific to Misungwi, since the project was implemented in both Misungwi and Kwimba (based on lessons learned from implementation in Misgunwi), the findings for implementation Kwimba are also presented in this report, where results are available.

Additionally, this project aimed to use a gender and equity lens through engagement with stakeholders as well as through training, in line with the funder goals.

Figure 2: Mama na Mtoto Study Logic Model



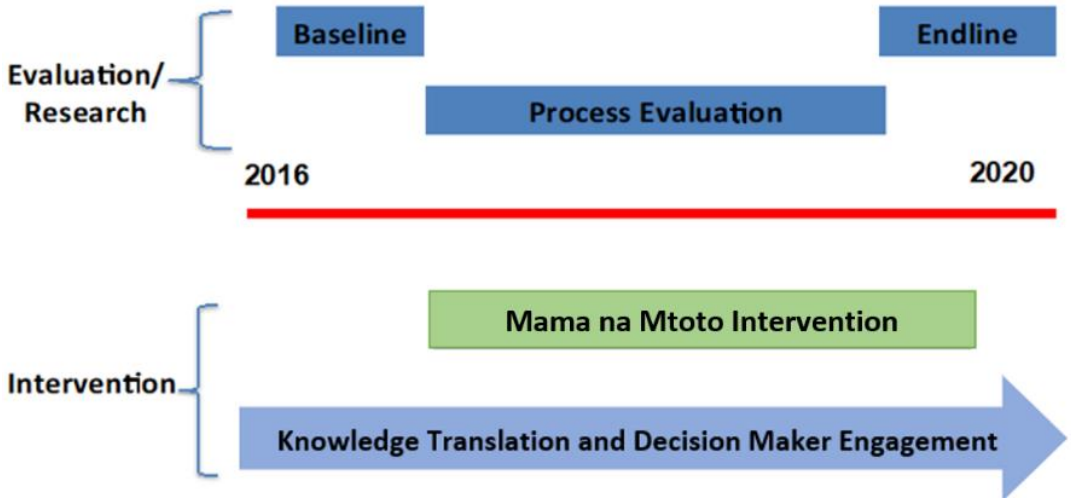
[i] Selected barriers and indicators informed by past experience and literature; baseline to inform.
[ii] Effectiveness barriers organized by category from 'Delays' framework (Gabrysch, 2009)
[iii] Process barriers to be refined based on baseline and re-categorized according to Theoretical Domains Framework (Michie, 2005)
[iv] Intervention will be revised based on stakeholder and knowledge-user feedback.
CHW= community health workers; EmONC = emergency obstetrics and newborn care; HMIS = health management information system; PNC = postnatal care.

4.2.1 Research Question 1 – Clinical Effectiveness

Research Question 1 included an assessment of proximal indicators that measured progress towards improved MNCH as an impact, focusing on "Effectiveness." Baseline data was collected in 2016, prior to Mama na Mtoto implementation. Endline data was collected in 2019 at the completion of Mama na Mtoto package implementation. The main purpose was to assess MNCH status in Misungwi District (all main indicators) and Kwimba District (select service indicators). Key indicators measured at baseline (2016) were re-evaluated to assess any changes. Clinical effectiveness was measured using a mixed methods convergent design (Morgan, 2017) using the following methods:

1. Qualitative Methods - focus groups and interviews
2. MNCH Coverage Survey (household survey)

Figure 3: Project Evaluation Timeline (2016-2020)



Note: KT (knowledge translation) refers to ongoing dissemination of the research findings and engagement with decision makers who undergo a process of reflection and development of action plans in response to the findings.

Qualitative data collection was conducted in both districts, whereas the MNCH Coverage Survey was only conducted in Misungwi. While the project aimed to assess clinical outcomes at the outset of the study, non-clinical outcomes were also evaluated as part of the endline study.

4.2.2 Research Question 2 – Process Evaluation

Research Question 2 sub-questions and indicators were used to provide measures of implementation success, including:

- "Adoption" of Mama na Mtoto by Misungwi and Kwimba districts, health facilities, and communities that have adopted the Mama na Mtoto Package;
- "Reach" of the Mama na Mtoto Package to women, children, district, and health facility staff, in Misungwi and Kwimba;
- "Implementation" was evaluated to determine whether the Mama na Mtoto Package was implemented as intended to promote district integration of the intervention, increase district leadership capacity, enhance facility management/quality improvement capacity, and establish a functional CHW network. Implementation was assessed looking at available indicators related to

project targets met, as well as other measures of implementation, such as: adaptation/fidelity (i.e. what was changed), participant responsiveness (e.g. effects of the intervention on the beneficiaries), and quality of the delivery (e.g. whether change strategies were well designed) (Durlak and DuPre, 2008). Mama na Mtoto change strategies, the SOPETAR process, and CHW effectiveness factors guided these processes for implementation.

- "Maintenance" (sustainability) which examined the effects and continuation of activities over time on both clinical and non-clinical outcomes, including CHW retention.

While the qualitative endline evaluation and MNCH coverage survey were used to evaluate clinical effectiveness, a number of process indicators (to address Research Question 2) were also measured using these sources of data. Other sources of data include: operational project databases and the CHW registry, a health facility survey, an evaluation of the simulation-based training and peer-to-peer learning programmed, a rapid evaluation using the Consolidated Framework for Implementation Research (CFIR), partner feedback and reflection meetings, and an external evaluation that was conducted for the Mama na Mtoto project.

Table 3 (below) provides a summary of the key indicators and data collection sources using the RE-AIM Evaluation Framework, which will be presented in this report.

Table 3: Summary of Key Indicators and Data Sources using the RE-AIM Evaluation Framework

RE-AIM Component	Description	Key Indicators	Data Sources
Adoption	The proportion and representativeness of settings that adopted Mama na Mtoto	% Districts targeted in Lake Zone % Health facilities in Misungwi and Kwimba districts % Wards in Misungwi and Kwimba districts % Hamlets in Misungwi and Kwimba districts % Villages with Community Health Workers (CHWs)	• Operational project data
Reach	Numbers or proportions of those who participated in the Mama na Mtoto intervention in Misungwi and Kwimba districts	# Council Health Management Team (CHMT)/Regional Health Management Team (RHMT) members # Other district officials # District councilors # Ward Executive Officers (WEO) # Village Executive Officers (VEO) # Health Facility In-charges # CHW Supervisors # Health Facility Governance Committee Members # CHWs # Hamlet leaders # Community members (innovation participants)	• Operational project data

Implementation	An assessment of whether Mama na Mtoto was delivered as intended by evaluating the targets met, adaptation/fidelity, participant responsiveness, and quality of the delivery. The indicators relate to the project "outputs" and "immediate outcomes" that support health system readiness and strengthening for MNCH.	Level of program district integration • Project engagement of the District • District buy-in and ownership District leadership capacity • District communication • Capacity for MNCH planning • Capacity for mentorship/supportive supervision of health facilities Facility management/quality improvement capacity • Health facility MNCH equipment • Capacity for MNCH signal functions • MNCH 'readiness' for for seven key MNCH service areas: ANC, essential newborn care, newborn resuscitation, labour and delivery, family planning, ill child management, and well child management. • MNCH training retention ○ Simulation and peer-to-peer learning Functional CHW network • Health facility CHW supervision • CHW training • CHW equipment • Community engagement through CHWs	• Operational project data • Qualitative endline evaluation • Health facility survey • Simulation and peer-to-peer learning evaluation • MNCH coverage survey – CHW engagement • Consolidated Framework for Implementation Research (CFIR) – Rapid Evaluation • Partner feedback and reflection meeting • External evaluation
Effectiveness	Clinical and non-clinical outcomes as a result of the Mama na Mtoto intervention. The indicators relate to "intermediate outcomes" that support improvements in maternal and child morbidity and mortality.	• Health Facility Deliveries (HFD) • Antenatal care (ANC) • Post-natal care (PNC) attendance • Improved quality of health services • Birth preparedness and planning • Child health • Gender equality • Male engagement in MNCH	• MNCH coverage survey • Simulation and peer-to-peer learning evaluation • Qualitative endline evaluation

Maintenance	An assessment of the effects and continuation of activities over time on both clinical and non-clinical outcomes, including CHW retention.	• Leadership engagement • Education and training • CHW retention	• CHW retention study • Qualitative endline evaluation • Consolidated Framework for Implementation Research (CFIR) – Rapid Evaluation • Simulation and peer-to-peer learning evaluation • External evaluation

4.2.2.1 Simulation training and Peer-to-Peer Learning Sub-Study

In response to an emergent need to enhance MNCH training retention, the project implemented a simulation-based training and peer-to-peer learning program. In low-resourced contexts, such as the Lake Zone, Tanzania, health workers must work in teams and have the confidence and skills to manage these critical newborn emergencies, despite difficult conditions and isolation. Learning and maintaining such skills in rural and remote facilities can be challenging if health workers lack training, have minimal mentorship support, or lack exposure to emergency cases.

Simulation-based training was previously conducted in Uganda, through the partnership between the University of Calgary (UC) and Mbarara University of Science and Technology (MUST) in Uganda. Members of the Mama na Mtoto technical team had expertise in implementing the peer-to-peer learning program. Simulation replicates real clinical encounters using mock scenarios and lifelike mannequins to provide hands-on clinical practice for health workers. Using simulation, teams can practice managing emergency cases in a safe and controlled environment with supportive coaching. In Mama na Mtoto, simulation was used to refresh MNCH clinical care skills through 5-day workshops for 200 health workers in Misungwi and Kwimba Districts. Simulation practice stations were established at 12 health facility sites. Peer-to-peer practice case cards were also designed and distributed. Simulation workshop participants learned to guide ongoing practice sessions to colleagues, facilitating an environment of shared peer-to-peer learning. Guidelines and schedules for peer-to-peer learning were developed and endorsed by Misungwi and Kwimba Districts, encouraging regular practice amongst health facility staff.

MNCH Simulation Workshop Modules include:

- Helping Babies Breathe
- Essential Care for Every Baby
- Pre-Eclampsia and Eclampsia
- Antenatal Care
- Normal Labour and Delivery
- Bleeding After Birth
- Kangaroo Mother Care

Mini Modules: Simulation Methods; Infection Prevention and Control; Implementing Change; Respectful Care; Peer-to-Peer Learning

As a specific change strategy (under 'training'), the study team conducted a sub-study to evaluate the simulation-based training and peer-to-peer program using pre and post-tests as well as focus group discussions with the staff who received the training.

Some clinical outcomes were reported as part of the focus group discussions, and will also be presented here, as part of Research Question 1/Clinical Effectiveness.

4.2.2.2 Evaluation of SOPETAR as a Process Model

A separate emerging research question looked at evaluating SOPETAR as a process model. As an adaption of the MamaToto project that was implemented in Uganda as part of the Healthy Child Uganda partnership, the research team endeavored to better understand whether and how SOPETAR would be implemented in the Tanzanian context. The findings from this sub-study could be used for refinements to the package and to inform future implementation.

The CFIR rapid evaluation and the partner reflection and feedback meeting provided an opportunity for project stakeholders (field team staff from Agriteam, District leadership, and project technical team volunteers from UC, MUST, and CUHAS) to provide their experiences and perspectives to using SOPETAR as a process model to guide project activities.

4.2.2.3 Partnership Evaluation

In addition to evaluating the SOPETAR process, the project team aimed to assess the Mama na Mtoto partnership as the project progressed. While the Healthy Child Uganda partnership is a long-standing partnership where relationships have been established since 2001, project staff and technical team volunteers observed greater challenges in coordination and communication while implementing the Mama na Mtoto intervention. There is evidence to suggest that networks and communication among project stakeholders influence implementation (Damschroder et al. 2009).

To better understand the dynamics associated with forming new partnerships, the research team also asked project stakeholders about their experiences and perspectives regarding the partnership. This was done through the CFIR rapid evaluation, external evaluation, and partner reflection and feedback meeting.

The findings from the SOPETAR evaluation and the partner evaluation will also be presented as part of this report.

4.3 Methodology

4.3.1 Operational Project Data & CHW Retention

Operational databases were set up for Misungwi and Kwimba districts to track all operational data, including training participants, outputs, and data relevant to the project's key performance indicators. A data dictionary, templates, and data collection forms were developed. Healthcare provider data was collected and included in the operational databases, including the providers' names, health facility, gender, cadre, and training courses completed. Data regarding implementation activities/plans are included as part of the project work plan. Any adaptations or details regarding implementation were included in semi and annual reports.

To evaluate CHW retention (a measure of a functional CHW network), a CHW registry was also developed for both districts. The registry included all existing (prior to the intervention) and new CHWs who received initial basic training, as well as their demographics (e.g. age, highest education received, village, reporting

health facility). On a quarterly basis, CHW Supervisors reported attrition, including the date and reason for the CHW leaving their position. CHW Supervisors also noted any new replacements of CHWs.

4.3.2 Health Facility Survey

The objective of the Health Facility Survey was to assess key indicators relevant to providing MNCH services at health facilities in Misungwi and Kwimba Districts, including governance, infrastructure, equipment and supplies, and staffing.

Sampling and Recruitment
All government-supervised health facilities functioning at the time of data collection were surveyed; at baseline, 45 health facilities were surveyed in Misungwi and 52 in Kwimba, and at endline 49 health facilities were surveyed in Misungwi and 58 in Kwimba. In-Charges were contacted in advance to plan visits and allow staff to prepare necessary documentation.

Data Collection
Baseline data collection was conducted in July 2016 in Misungwi and December 2017 in Kwimba. Endline data collection was conducted between July 8-15, 2019 in Misungwi and July 22-30, 2019 in Kwimba.

The Health Facility Survey questionnaire was developed by adapting the framework of the Averting Maternal Death and Disability 'Needs Assessment of Emergency Obstetric and Newborn Care' (Mailman School of Public Health 2009), and incorporating validated questions from the *Big Results Now* 'Star Rating Tool' (Tanzania Ministry of Health and Social Welfare 2015), Demographic and Health Surveys 'Service Provision Assessment' (World Health Organization 2012), and MamaToto 'Health Centre Audit' (Healthy Child Uganda 2012). Questions were adapted for the Tanzanian context and included modules in facility identification, infrastructure, infection prevention control, referral, supervision and governance, CHWs, essential drugs, equipment and supplies, facility services, antenatal care (ANC), labour and delivery, essential newborn care and postnatal care (PNC), child health, family planning, HMIS, and MNCH HMIS data.

Research teams verbally administered the questionnaire to health facility In-Charges, validating responses through observation.

Data Analysis
R and Python statistical software were used to calculate descriptive statistics of key indicators and demographics, presented as percent, mean with range, or median with IQR, as appropriate. Baseline and endline results of key indicators were compared using 95% Clopper-Pearson CI and a paired sample sign test.

Composite indicators calculated achievement of BEmONC and CEmONC signal functions and 'readiness' to provide MNCH services. BEmONC and CEmONC achievement were analyzed with the 'assisted vaginal delivery' signal function excluded (i.e. out of a total of six and eight signal functions, respectively), since it is not a common medical practice in most Tanzanian facilities. 'Readiness scores' were assessed using pre-defined scoring criteria for seven key MNCH service areas: ANC, essential newborn care, newborn resuscitation, labour and delivery, family planning, ill child management, and well child management.

Additional details regarding the Health Facility Survey can be found as part of ***Appendix A – Endline Study Report.***

4.3.3 MNCH Coverage Survey (Household Survey)

The objective of the MNCH Coverage Survey was to assess the demographics, health status, care-seeking, and practices related to MNCH for women, children, and their households.

Sampling and Recruitment
Data collection was conducted in Misungwi District only in September 2016 and 2019. A two-stage stratified cluster sampling method was used, where clusters were district hamlets (the smallest identifiable geopolitical units) and stratification was by hamlet type (urban/mixed/rural). Hamlets were sampled by a random list function and according to proportions in the district. Based on a sample size goal of 2,000 households (calculated for three key MNCH indicators with 80% power and 0.05% precision) and a pre-determined cluster size of 30 households per hamlet (the expected number of households an interviewer team can survey in one day), a total of 67 out of 724 hamlets were randomly selected in the district: two urban, 25 mixed, and 40 rural. The same hamlets were used at baseline and endline. A wedge sampling method was used to identify the representative sample of households to survey within each hamlet. This was conducted by the 'mappers' of the research team. All households inside a 'wedge' were documented and screened by mappers until 30 available households that met survey eligibility criteria were identified. Smaller hamlets (less than 40 households) were mapped entirely. Only households that were mapped were surveyed by interviewing teams.

Data Collection
The MNCH Coverage Survey tools were adapted from Johns Hopkins University's 'Real Accountability: Data Analysis for Results (RADAR) Coverage Survey' (RADAR Project, n.d.), with some questions and modules revised for project relevance and local context. The RADAR Coverage Survey, based on standard questions from the Demographic and Health Survey (The DHS Program, n.d.-a) and Multiple Indicator Cluster Survey (UNICEF, n.d.), was developed to measure priority MNCH coverage indicators for Global Affairs Canada's project investments. The tools comprised of three questionnaires for each household:

1) Household Questionnaire administered to the household head or adult household member knowledgeable about household composition and information
2) Woman Questionnaire administered to women aged 15-49 years that were usual residents or slept in the household the night before
3) Child Questionnaire administered to the caretaker of each child U5 (0-59 months) that were usual residents or slept in the household the night before

Survey tools were developed in English, translated to Swahili, converted into an electronic format using Open Data Kit (ODK) (https://opendatakit.org/), and field piloted prior to data collection. Since tools were only available in English or Swahili, Sukuma translations were also verbally reviewed with research team members who could speak Sukuma.

Mapping was conducted in advance of interviewing. Following the consent process, interviewers then verbally administered the questionnaires to eligible household participants using the ODK Collect app on tablet devices (Asus ZenPad 7, Samsung Galaxy Tab A 7). When possible, participants who did not understand Swahili were assigned a Sukuma-speaking interviewer. Anthropometry measurements for the Child Questionnaire were conducted using a weight scale (Beurer BF480 Diagnostic Scale, Beurer BG21 Diagnostic Scale) and height board (ShorrBoard supplied by Tanzania Food and Nutrition Centre); due to limited equipment, only half of the interviewers (18) were asked to conduct the anthropometry module.

Interviewing supervisors maintained data quality assurance by regularly reviewing questionnaire responses for accuracy, conducting spot-checks, and facilitating re-interviews if needed. Debrief meetings were held with all research team members daily to review progress and troubleshoot any challenges. StatsReport (https://statsreport.io/) was used as a data quality monitoring tool.

Data Analysis
Weighted point estimates and 95% confidence intervals were calculated for each indicator. Sampling weights for each cluster were assigned by calculating the inverse probability of selection of a household within each cluster in the stratum (hamlet). Estimates of the total number of households in each cluster for the purpose of weighting the data were collected during mapping by asking local administrative leaders and verifying with household lists, when available. Weights were adjusted for non-response for household, women, and children and were then standardized by dividing each weight by the mean of all the weights. Data analysis used Taylor linearization to adjust standard errors for the effects of clustering.

A detailed description of these methods, including detailed indicator definitions, can be found in ***Appendix A – Endline Study Report***.

4.3.4 Qualitative Endline Evaluation – Focus Group Discussions and Interviews

Focus group discussions and key informant interviews were used to gather 'stories of change'. A variety of participant groups were targeted from Misungwi and Kwimba Districts with a goal of collecting diverse perspectives, including from:

1) Regional and district government representatives
2) Health facility In-Charges
3) Health workers
4) HFGC members
5) VEOs
6) CHW supervisors
7) CHWs
8) Mothers and fathers

Sampling and recruitment
Purposeful and convenience sampling methods were used to recruit participants to facilitate cost-effective data collection and analysis within a limited time period. Target participants were those who could speak Swahili to overcome limited translation capacity, and those who demonstrated strong engagement with the intervention (e.g. currently active in their role, participated in all necessary training sessions) to ensure relevant and rich discussions. Participants with diverse characteristics were also purposefully selected to gather a variety of perspectives; these 'selection mixtures' varied for each participant group and took into consideration differences such as gender, age, profession, level of training, type of health facility, geographic location, or experience.

Eligible participants were identified using an operational database of project contacts and consultation with implementation staff. A maximum of 10 participants were invited to each focus group discussion, and only one individual was invited for each interview. Participants were only allowed to participate in one focus group or interview.

Data Collection

Data collection was conducted between April 8-May 7, 2019 in Misungwi and Kwimba Districts. Each participant group had at least one focus group or interview conducted in each district, with an additional interview conducted at the regional health systems level. Data collection was staggered overall several weeks to allow the research team to read transcripts and review emerging themes between sessions, thereby facilitating an iterative and reflective approach to data collection.

All sessions were conducted in Swahili and recorded with a digital audio recorder. Focus group participants were organized in a circular seating arrangement to establish comfort and enable group engagement. Each participant also had a unique ID which they were referred to throughout the discussions to maintain anonymity in audio recordings. Participants did not receive any incentives to participate, aside from refreshments and a small transportation allowance.

Facilitators conducted focus groups and interviews using prepared semi-structured facilitator guides. These guides were organized into domains based on outcomes of the study logic model: a) clinical effectiveness outcomes, which included questions on health and non-health outcomes and impacts, and b) process outcomes, which included questions on general successes/challenges, district integration, leadership capacity, district leadership, district ownership, CHW networking, and sustainability.

Using a pre-determined transcription protocol, all audio recordings were transcribed verbatim into Swahili then translated into separate English transcripts. Research team members conducted quality checks of English transcripts by comparing Swahili audio recordings with English transcripts for translational accuracy, substantive accuracy, and to ensure that no information was missing. Each focus group and interview had a unique identifying number.

Data Analysis

Data analysis of English transcripts was conducted by a Canadian research analyst from University of Calgary who had no previous involvement or familiarity with Mama na Mtoto. Analysis began with an initial period of data immersion where transcripts were read through multiple times and annotated to gain familiarity and structure content analysis (Cropley, 2002). Deductive content analysis was then used to analyze transcripts, structured by the pre-determined domains of the facilitator guides. The analysis process involved familiarization, annotating, coding, theming, member checking, and research team reflexivity through a theoretical lens of global MNCH (Creswell, 2009). Each transcript was independently read, coded, and themed, developing a provisional thematic map for participant groups with the aim of identifying relevant patterns of interest within the dataset (Braun & Clarke, 2013). Participant enrollment forms, notetaking forms, contact summary forms, and team debrief forms were also reviewed as supplementary documentation to help inform data analysis and provide context. Deductive coding continued to the point of thematic saturation, where no additional patterns or themes emerged from the data and all meaning was captured (Braun & Clarke, 2006).

Following a review of the coding tree by research and implementation team members, a final revision of themes was conducted by University of Calgary research staff, where the headings, quotes, and narrative interpretations were re-organized and re-written for clarity and to streamline key messages according to the pre-determined domains.

A detailed description of these methods can be found in ***Appendix A – Endline Study Report*.**

Table 4 summarizes the methods and tools for the Health Facility Survey, MNCH Coverage Survey and the qualitative study.

Table 4: Summary of Research Methods			
	QUALITATIVE INQUIRY	**HEALTH FACILITY SURVEY**	**MNCH COVERAGE SURVEY**
Data Collection Period	**April-May 2019**	**July 2016, December 2017, July 2019**	**September 2016, September 2019**
Research Type	Qualitative	Quantitative	Quantitative
Method	Focus group discussions, key informant interviews	Cross-sectional survey	Cross-sectional survey, anthropometry
Tools	Semi-structured facilitator guides, observation notes	Health Facility Survey questionnaire (interviewer-administered on a tablet using REDCap)	Household Questionnaire, Woman Questionnaire, Child Questionnaire, anthropometric equipment (interviewer-administered on a tablet using Open Data Kit)
Key Indicators	Health and non-health outcomes, general successes and challenges, district integration, leadership capacity, district leadership, district ownership, CHW networking, sustainability, stories of change	Health facility governance, infrastructure, equipment, supplies, staffing, and signal functions related to MNCH service provision	Demographics, household practices, equity, MNCH care-seeking, maternal and U5 morbidity and mortality
Target Participants	Regional and district government, health workers, health facility In-Charges, HFGC members, Village Executive Officers (VEOs), CHWs, mothers, fathers	Health facility In-Charges and staff	Household heads, women 15-49 years old, children U5
Sampling	Purposeful sampling, convenience sampling (Misungwi and Kwimba Districts)	All government-supervised health facilities (Misungwi and Kwimba Districts)	Cluster sampling, wedge sampling (Misungwi District only)
Sample Size	24 focus groups, 11 interviews, 224 participants	All health facilities	67 hamlets, 2,000 households
Data Analysis	Deductive content analysis structured by facilitator guide domains	Descriptive statistics, composite indicators, paired sample sign test, paired sample Wilcoxon test (using R and Python)	Descriptive statistics, 95% confidence interval (using Stata)

4.3.5 Consolidated Framework for Implementation Research (CFIR) – Rapid Evaluation

A rapid qualitative analysis approach (Beebe, 2001) was used to evaluate the process outcomes (level of program district integration; district leadership capacity; facility management/QI capacity; and a functional CHW network), as well as to evaluate other aspects of our implementation, including the SOPETAR process and study partnership.

We used the Consolidated Framework for Implementation Research (CFIR), based on consultation with implementation science specialists, Laura Damschroder (developed the CFIR) and Caitlin Reardon. A rapid evaluation was conducted to ensure adherence to project timelines. As a meta-theoretical framework, the CFIR was identified as an appropriate framework to understand the context of implementation, which may inform what aspects of the implementation system context was important (including the quality of the partnerships). The CFIR also allowed us to explore some of the individual-level factors associated with implementation successes and challenges experienced by project stakeholders. The CFIR identifies constructs across five domains: intervention (e.g., evidence strength and quality); outer setting (e.g., patient needs and resources); inner setting (e.g., culture, leadership engagement); individual characteristics; and process (e.g., plan, evaluate and reflect). Individuals can assess whether the constructs could be considered barriers or facilitators to implementation effectiveness.

Tool development and participant recruitment
Semi-structured individual interviews were conducted with district leadership from Misungwi and Kwimba, field team staff, and technical team members, who were either project volunteers or research team members from the CUHAS, MUST, and the University of Calgary.

The CIFR rapid evaluation was conducted over two phases:
Phase I (September-October 2018): Data was collected through a key document review. Meeting notes (with technical teams, implementation teams and stakeholders), reports (technical and implementation), and email communication between project team members from during implementation were selected and assessed during a detailed review of files by the Canadian Project Director. This review informed the key constructs in the CFIR to prioritize and further explore through individual interviews. An interview guide based on the key CFIR constructs identified was then developed, using the interview guide tools available on the CFIR website (https://cfirguide.org/). Additional open-ended questions were added to the interview guide, in order to ensure data not captured through the structured interview questions would be explored. The interview guide was reviewed by the research team to ensure questions were relevant and would be understood by all participants.

Phase II (October 2018-2019): Semi-structured interviews with purposefully selected stakeholders were conducted. Participants were chosen based on convenience and their potential for informative contributions. Considerations were made to ensure representation of each stakeholder group, with additional participants recruited as needed to achieve saturation. Interviews were conducted by research team members were familiar with the intervention and participants but not directly part of the implementation field team.

Data collection and analysis:
Interview participants were required to provide signed consent for participation. Interviews will be recorded (when permitted by participant) and field notes were made by the interviewer. Interviews were conducted in English and transcribed verbatim.

A total of 12 interviews were conducted with Mama na Mtoto stakeholders for the CFIR rapid analysis between September 2018-October 2019 including:

- District leadership for Misungwi and Kwimba: 2
- Field Staff: 5
- Technical Team Volunteers: 5

Analysis commenced with a review of all transcripts and field notes for familiarization with the data (Green & Thorogood, 2018). Content analysis methods were used, following a deductive approach (Hseih & Shannon, 2005; Elo & Kyngas, 2008) to facilitate rapid analysis by one independent researcher, who was not involved in the project's implementation, but had familiarity with the context of implementation and intervention content. The CIFR codebook (obtained from the CIFR website), containing a definition of each construct, including inclusion and exclusion criteria was used to guide coding. An analysis template was used for analysis to help categorize data as either a barrier or facilitator for implementation. Principles of constant comparison were followed by comparing the experiences of both within and across stakeholder groups (Green & Thorogood, 2018). Nvivo 12 software was used to code and manage the data.

Key themes were identified from the constructs, based on the relative importance of the construct as being a barrier and/or facilitator to implementation. Relative importance was determined by:

- Constructs that related to the specific process outcomes that were evaluated for the study (the factors hypothesized to be important determinants of implementation)
- The frequency of codes for a particular construct as well as the emergence of both common and diverging perspectives across stakeholder groups.

Some constructs that were perceived by stakeholders to be highly related (i.e. often touching on one more construct at the same time) were collapsed into broader themes. Themes were refined based on the data itself, representing language used by participants.

Trustworthiness measures were employed: Ensuring credibility (i.e. prolonged engagement with participants; triangulation with other sources of data (i.e. project documentation and peer debriefing with the research team, and confirmability (i.e. code book for transparency, and reflexivity) (Lincoln & Guba, 1986).

4.3.6 Simulation-Based Training and Peer-to-Peer Learning

We studied 16 health workers who attended the five-day MNCH clinical simulation workshop and were from health facilities with established simulation practice stations. Standard clinical scenario assessments at intervals (before and after the workshop, then 6 and 12 months after) and focus groups were conducted to assess their skills and experiences.

Pre-Post Test

Participant knowledge was assessed pre/post workshop using a written 24-question multiple choice question (MCQ) test covering all modules. Participant clinical skills were assessed pre/post workshop using four Objective Structured Clinical Examination (OSCE) stations (i.e. a practical evaluation), each administered by a trained rater. OSCE skill raters demonstrated good inter-rater reliability pre-evaluation (HBB = 0.951, ECEB =0.914, HMS = 0.959, ANC = 0.852). Data management and analysis was performed in SPSS.

Focus Group Discussions

Qualitative data were collected through two focus groups with the intervention study participants who attended the last simulation evaluation, using a qualitative description approach (Sandelowski, 2010). The focus groups were conducted in Kiswahili. As part of the SIM study evaluation conducted at Ndilima training venue in Kwimba district, following the completion of the end-of-study post-test, participants were invited to participate in focus group discussions. Participants were asked about any specific impacts or changes that the intervention had on them personally, on the health facility and others on the care team. As well, specific questions were asked about experiences with Helping Babies Breathe, providing care for very sick newborns, and managing pregnant women with pre-eclampsia, bleeding, or obstructed labour since the training occurred. Finally, participants were also asked about changes to their approach in managing adolescents and vulnerable populations. The focus group interviews were audio-recorded, field notes taken and later simultaneously translated and transcribed into English (Hennink, 2007). Informed consent was obtained from all participants.

Qualitative analysis was conducted by an independent researcher, who initially read both transcripts to become familiarized with the data (Green & Thorogood, 2018). A semi-inductive content analysis approach was used (Hseih & Shannon, 2005; Elo & Kyngas, 2008), following the principles of constant comparison to uncover underlying patterns (Berg, 2004). Prior to analysis, initial codes were developed, based on the focus group interview guide and evaluation outcomes. Nvivo 12 software was used to code and manage the data. Coded statements were grouped into categories and distilled and refined into broader themes and sub-themes.

4.3.7 Partner Reflection and Feedback

Following the conclusion of endline data collection and the CFIR rapid evaluation, team leads from CUHAS, UCalgary, and Agriteam as well as key technical team members met in Calgary to review the findings. A one-day meeting was conducted specifically to review the evaluation of Mama na Mtoto implementation. In a two-part meeting, we obtained input and feedback from Mama na Mtoto partners and staff regarding:

1. MnM processes and activities conducted in Misungwi and Kwimba districts;
2. The structures (e.g. partnerships, networks) and operations (e.g. communication, meetings) that support MnM implementation.

The partners reviewed the key themes that emerged from the CIFR rapid evaluation and the endline qualitative evaluation to support the discussions. This meeting informed the synthesis and the articulation of our lessons learned, best practices, as well as future dissemination regarding the implementation process.

4.3.8 External Evaluation

The purpose of the external evaluation was to examine the effectiveness of the MnM project in terms of the strengths and weaknesses of the project and its key elements and implementation strategies or approaches, the achievement and sustainability of results and the key factors contributing to results achievement, and to identify any particular weak elements or areas where the project could have performed better.

Two general methodological approaches were used for the external evaluation of the Mama na Mtoto project:

1. Key informant interviews (KII) and group discussions.
2. Case studies inspired from Global Affairs Canada's 'Stories of Change'

Interviews and group discussions began prior to the field mission and were completed after the field mission was concluded. Key informants included members from UC, MUST, Agriteam, CUHAS, local civil society organizations (i.e., NGO Kivulini) and donor partners (i.e., Aga Khan foundation). The case study approach allowed the evaluation to determine the extent to which the project services were appropriate for the project aims, and according to the unique socio-economic and cultural contexts across communities, including the presence of gender-based inequalities. For this purpose of this report, mainly the findings from the key informant interviews and group discussions will be presented.

Data collection and recruitment

Data was collected following semi-structured interview guides. Interview guides were developed according to the evaluation questions as well as to respondents' roles and responsibilities in the project Four types of qualitative data (or lines of evidence) were collected: 1- desk review; 2- virtual KIIs; 3- field mission KIIs and focus group discussions; 4- field mission case studies. In total, 25 KIIs and 16 group discussions were completed, and included 94 respondents, with a fairly equal representation of males and females. Respondents were part of the technical team (TT) (n=9), project implementing team (n=9), Ministry of Health, Community Development, Gender, Elderly and Children and other government departments (n=29), Health Facility (HF) staff (n=17), Health Facility Governance Council (HFGC) (n-=11), Community Health Workers (CHW) (n=17) and other relevant actors (n=2).

Interviews during field mission were primarily completed in Swahili. Simultaneous translation into English permitted clarifications and further probing. During interviews, data was collected on notes, and was subsequently transferred into electronic format, shared and cross-checked between the evaluation consultants within the hours or days which followed the interviews.

Data analysis

Data analysis combined deductive and inductive analysis. Data was first coded deductively according to predetermined evaluation questions and sub questions which corresponded to the project components (i.e., health systems, health facilities, community health workers, gender and health equity). Data was next coded inductively using theme analysis. Data was organized, managed and analyzed using the computer assisted qualitative data analysis software (CAQDAS) Atlas.ti.

The data was coded deductively according to the predetermined analytic framework (i.e., indicators) as well as inductively in order to provide rich context specific detail to the larger evaluation indicators. This permitted the evaluation to describe the project mechanisms and their relationship with project achievements and likelihood for sustainability. Data analysis proceeded by creating themes that responded to evaluation questions.

4.4 Study Ethics and Trial Registration

Issues of consent, confidentiality, and other ethical issues were reviewed with research team members during training. Informed written consent was obtained from all participants prior to their involvement in any data collection. When participants could not read or write, research team members verbally read the contents of the consent form to them. Proof of consent was indicated by a signature or thumbprint on the consent form, and a copy of the form was provided to the participants.

As part of the larger Mama na Mtoto evaluation, the endline study had institutional ethical clearance from the University of Calgary Conjoint Health Research Ethics Board (REB15-1919), the National Institute for Medical Research Lake Zone Institutional Review Board (MR/53/100/400), and the Catholic University of Health and Allied Sciences/Bugando Medical Centre Ethics and Review Committee (CREC/070/2015). The Mama na Mtoto intervention was also registered with ClinicalTrials.gov (NCT02506413).

5. Results

5.1 Adoption

A review of the operational project data confirmed full adoption of the Mama na Mtoto Package in both Misungwi and Kwimba districts shown in Table 5:

Table 5: Adoption of Mama na Mtoto in Misungwi and Kwimba Districts		
Indicator	Misungwi (4 divisions)	Kwimba (5 divisions)
% Districts targeted (Misungwi and Kwimba) in Lake Zone	100% (1/1)	100% (1/1)
% Health facilities in Misungwi and Kwimba districts	100% (48/48)	100% (59/59)
% Wards in Misungwi and Kwimba districts	100% (27/27)	100% (30/30)
% Villages with Community Health Workers (CHWs)	100% (113/113)	100% (119/119)
% Hamlets in Misungwi and Kwimba districts	100% (724/724)	100% (871/871)

5.2 Reach

The reach of the Mama na Mtoto Package was assessed based on a review of population data and the project operational data. This includes all people who participated in Mama na Mtoto. The numbers and available proportions are shown below in Table 6:

Table 6: Reach of Mama na Mtoto in Misungwi and Kwimba Districts		
Indicator	Misungwi	Kwimba
# Council Health Management Team (CHMT) / Regional Health Management Team (RHMT) members	29	33
# Other district officials	11	14
# District councilors	24	31
# Ward Executive Officers (WEO)	26/27 (96%)	28/30 (93%)
# Village Executive Officers (VEO)	113/113 (100%)	119/119 (100%)
# Health Facility In-charges	48/48 (100%)	59/59 (100%)
# CHW Supervisors	47/48 (98%)	57/59 (97%)
# Health Facility Governance Committee Members	235	295
# CHWs	775	871
# Hamlet leaders	724/724 (100%)	871/871 (100%)
# Community members (innovation participants)	2850	3660

5.3 Implementation

The process evaluation of the study (related to Research Question 2) aimed to understand whether the intervention was implemented as intended to facilitate program district integration, enhance district leadership capacity, improvement facility management and quality improvement capacity for MNCH, as well as to establish a functional CHW network. These key intervention processes were guided by the Mama na Mtoto change strategies: training, equipping, collaborative and consensus building meetings, and technical assistance/mentorship/supervision, as well as the steps provided by the SOPETAR model

(Scan-Orient-Plan-Equip-Train-Act-Reflect). The CHW effectiveness factors specifically guided the implementation of the CHW activities.

A number of data sources were used to evaluate the Mama na Mtoto intervention implementation, including: operational project data, the qualitative endline study, the health facility survey, MNCH Coverage Study – CHW engagement, the simulation and peer-to-peer learning evaluation, the CFIR Rapid Evaluation, partner feedback and reflection meeting, and the external evaluation.

The findings from the various data sources will be integrated below with a 1. Description of the activities associated with each of the key intervention processes; 2. A summary of the targets reached (data disaggregated by district if available); 3. A summary of participant responsiveness and comments related to the quality of the delivery; and 4. A description of the adaptations or fidelity to the activities.

5.3.1 Level of Program District Integration

The indicators related to program district integration were:

- Project engagement of the District
- District buy-in and ownership

5.3.1.1 Activities

Activities related to enhancing program district integration included all meetings related to engaging district stakeholders at all levels through a cascade approach – starting with the district, who would engage with the health facilities, and communities.

5.3.1.2 Targets

See Table 6 above for numbers of district stakeholders who were engaged and participated in the Mama na Mtoto intervention. No specific numbers were targeted for engagement. Rather, the project aimed to engage widely and at all levels with the people that the district determined to be appropriate.

5.3.1.3 Participant responsiveness and quality of delivery

Table 7: Summary of Findings for Program District Integration

Comprehensive and Participatory Approach to Foster Ownership

Findings from the external evaluation as well as the CFIR Rapid Evaluation highlighted the importance of Mama na Mtoto's participatory approach to engagement. Both the district leadership as well as the technical team volunteers commented on the CHMT's sense of ownership over the project activities. Priorities and the associated activities were thus entirely owned by the CHMT and became part of the Comprehensive Council Health Plans (CCHT). The subsequent project activities resulted from their own planning and were accounted into their budget. Ownership was also remarked by the interest of the Regional Medical Officer took for his office to lead an upcoming MNCH symposium. The CHMT decided which members would be part of the Mama na Mtoto project and who would assume which leadership roles. This process of identifying the leads was an important as it integrated, from the beginning, the notion of reflection and a sense of ownership (but risky when a new District Medical Officer takes the lead). A similar reflection was shared regarding the nature of reflection of the root causes of problems;

"rather than thinking someone from outside can help, for example lack of fuel, lack of funds, inadequate staff- we help(ed) them to think and analyze the root causes of problems and most of the time the problem (identified was) not inadequate staff or fuel, but unclear priorities, bureaucracy in the system" [MnM project coordinator, External Evaluation]

The acting DMO of Misungwi further described this level of inclusion as reaching out across various levels of the health system, whereby "all levels staff in the health sector in the district were involved since the very beginning." According to the acting DMO, "we put (the challenges) on the table and discussed how improvements could be made." In this regard, the MnM project was exceptional in its approach to integrating RHMT and CHMT in planning.

Contrarily, findings from the CIFR Rapid Evaluation also suggest that while district engagement was high (particularly in Kwimba), there was little buy-in from the national government.

Alignment with District Priorities

Participants from the qualitative endline study noted that a defining characteristic of Mama na Mtoto project implementation was its efforts to align activities with pre-existing district priorities and systems, as opposed to initiating a new system. This was considered a key factor to implementation success and it was attributed to the project's efforts to engage participation at all levels, from the hamlets to the Ministry of Health. A Regional Health representative recognized this as a key factor to sustainability.

> *"The MnM project was success to be aligned with government priorities, because of the involvement of government in all steps from the planning to the implementations." [Government Interview (CHMT Member)]*
>
> *"I think MnM didn't come with the new system, it maintained the common system that involves the district to the facility level but the great target is to improve the standards and reducing the maternal deaths … to increase the number of pregnant women delivering at the hospitals … MnM has complied the common system and the district's involvement is of a hundred percent." [Health Facility In-Charge Focus Group]*
>
> *"… the rules were maintained … when they want to know how many children were vaccinated … I use the same book … they never said change … but remained the same, even during the CHW training the books used are those from the Ministry so they complied the Ministry's system of trained and nothing was changed." [Health Facility In-Charge Focus Group]*
>
> *"I can say MnM was a participatory project … implemented according to what you want to achieve … according to their district or their area of challenges … implementing according to your needs … give them cooperation, they should be open not to hide any problems within, even if it is a bad thing or even if it touches you … they have not come to sentence a person, they come for results to be seen, positive results." [Government Interview (CHMT Member)]*
>
> *"… the most important thing is that the project used the existing structures, the project has not come with staff, apart from the project management team, in all other levels we have used the existing health providers and where there was an addition it was through the existing system. We have used the existing staff in the health facilities, health committees they have not come with a new committee structure, they have used the existing one … that has been our concern that partners should not come with new things, rather they should align with the government structures that will ensure sustainability after the projects." [Government Interview (RHMT Member)]*

Similar findings were noted from the CFIR Rapid Evaluation. In particular, alignment with the following policies and guidelines were mentioned National CHW policies, leadership and supervision government guidelines, and District comprehensive health plans.

Leadership Engagement

Leaders from the districts, health facilities, and communities expressed valuing the practical knowledge and engagement brought by Mama na Mtoto project implementation and training. Participants appreciated being involved in decision-making processes, which enabled them to guide project initiatives so that they were relevant to the population and aligned with district needs and goals.

> *"The involvement from the higher level to lower level have been very useful … I have seen in the district their target is to reduce death … now the engagement from higher levels come with recommendation and what to do, they are encouraging us from above." [VEO Focus Group]*

> *"… we were involved directly in decision making over the project's related activities … in MnM we are involved in the skills imparting training, innovation for efficiency … we are enabled and what was added was things that can help me in the implementation of the activities targeted by the project, so I participated and implemented directly." [Health Facility In-Charge Focus Group]*

> *"… as a human being and a leader I am learning every day. … MnM has its scope, but it welcomed other ideas from us as leaders, so it has been so helpful even to sharpen our leadership skills rather than just to leave the project to be implemented … this project it allowed innovations to be done, so as a leader I have to sit and think what kind of innovation … because the project allowed that innovation, if the innovation is for improvements it was accommodated … involvement which has helps us to increase innovation as leader I using the available resources to maximize our implementations." [Government Interview (CHMT Member)]*

> *"… the government was willingly to implement the project … from the Regional Medical Officer's office, who is part of the Ministries both, the Regional Administration and the local government and the Ministry of Health gave us a big support and they own the project and they had wish to see more results to happen … though this project, this support enabled the project to meet its goals." [Government Interview (CHMT Member)]*

However, there were also some comments suggesting room for improvement, particularly in communicating ongoing MnM project implementation progress. Although all participant groups were generally aware of project goals and benefits, not all participants expressed a clear sense of implementation timelines or objectives in their specific community or health facility.

> *"The involvement was good and to some extent we have enjoy the feedback which were shared after the implementation. But also there are some areas which are not clear for the implementation of MnM project … there was a project of implementing the staff houses, construction and improvement of health facilities … but of today we are not informed that how does that implementations going on, my facility was one of the area which was selected for that implementations, but we have not get any feedback … so we have not been well involved we are not aware what is going on." [CHW Supervisor Focus Group]*

From the external evaluation, there was also an appreciation expressed by stakeholders that the project engaged local leadership outside of the health sector. The commitment of WEO and VEO in supporting CHWs was something project staff identified as a project achievement. Furthermore, structuring CHWs and CHW coordinators according to governance structures and in so doing, connecting CHWs to both elected and appointed leadership was described as politically strategic.

The CIFR Rapid Evaluation also found that one of the key enablers to promoting continued district engagement was the presence of a district-based project office.

5.3.1.4 Adaptations and fidelity

As discussed in the external evaluation, the MamaToto package implemented in Uganda highlighted the importance of engagement with local leadership outside of the health sector. Orientations with local leadership, with the participation of health system leadership, were part of Mama na Mtoto orientations. The importance of including both appointed (V/WEO) and elected (hamlet, village leaders) leadership was further recognized and incorporated into orientations in Kwimba but less so in Misungwi.

The CFIR Rapid Evaluation also identified this adaptation; stakeholders noted that Kwimba's approach to engaging communities was done especially well – everyone received orientation, including women's groups, people with disabilities, and youth groups. The deep and early engagement in Kwimba was seen to provide a strong foundation for buy-in for implementation, creating champions, and for sustainability.

"I think that maybe, two things that were different: one is that Kwimba was waiting, because they would say 'you are doing it in Misungwi, you are doing it in Misungwi, come here'. So, their, they were in the educational model, they were really, at the readiness phase." [Tech team volunteer, CFIR Rapid Evaluation]

5.3.2 District Leadership Capacity

The indicators related to district leadership capacity were:

- District communication
- Capacity for MNCH planning
- Capacity for mentorship/supportive supervision of health facilities

5.3.2.1 Activities

Activities related to fostering district leadership capacity included:

- Meetings of district leaders were convened to scan, orient, plan and reflect on systems to enhance gender and equity-sensitive MNCH services
- Council Health Management Teams were equipped to support district MNCH services
- Training and technical assistance was provided to Council Health Management Teams to strengthen gender and equity-sensitive MNCH governance, planning, coordination, supervision, management and health management information systems
- Council Health Management Teams were mentored to implement MNCH improvements

5.3.2.2 Targets

Table 8: District Leadership Capacity – Project Achievements						
Output/ Outcome	**Indicator**	**District**	**Baseline**	**Project Target**	**End of Project**	**Comments**
Meetings of district leaders to scan, orient, plan, and reflect on systems to enhance gender and equity sensitive MNCH services	# participants (M/F) in scans, orientations, planning meetings and cross visits	Not disaggregated	0	50	300 (190M/110F)	Target exceeded
CHMTs equipped to support MNCH services	# of updated computers at HF	Misungwi	0	4	7	Target exceeded
		Kwimba	0	4	4	Target achieved
	# operational vehicles for referral per district	Misungwi	1	2	4	Target exceeded
		Kwimba	3	5	5	Target achieved
Training and technical assistance provided to CHMTs to strengthen gender and equity sensitive MNCH governance, planning, coordination, supervision, management, and HMIS	# participants (M/F) trained on gender-and-equity focused MNCH governance, planning, coordination, supervision, management and HMIS by course	Misungwi	0	40 (18F)	178 (78M/100F)	Target exceeded
		Kwimba	0	45	68 (34M/34F)	Target exceeded
	% of orientation and training activities that integrate content on gender equality and social equity issues	Not disaggregated	0	85% (of all trainings)	90% (64/71)	Target achieved
CHMTs mentored to implement gender and equity-sensitive MNCH improvements	# of mentorship visits to CHMTs	Not disaggregated	0	36	144	Target exceeded

Improved capacity of selected Mwanza CHMTs in gender and equity sensitive governance, planning, supervision, management, and HMIS	% of key CHMT members reporting improved capacity in MNCH programming incl. gender and equity sensitivity, governance, planning, supervision, management and HMIS	Misungwi	Data not available	100% (of 8 CHMT)	94%	Target almost met
		Kwimba	27% reported moderate-high capacity	100% (of 8 CHMT)	91%	Target almost met
	% of HFs seeking supportive supervision from the CHMT in the previous 3 months	Misungwi	67%	80% (of 47 HFs)	100%	Target exceeded
		Kwimba	61%	85% (of 57 HFs)	100%	Target exceeded
	# (m/f) and % CHMT members and In-Charges reporting increased capacity to plan, manage, and supervise taking into account gender and social equity issues	Misungwi	Data not available	80% (of at least 50% of 55 CHMT/in-charges)	98%	Target exceeded
		Kwimba	31% (2018)	80% (of at least 50% of 65 CHMT/in-charges)	95%	Target exceeded

5.3.2.3 Participant responsiveness and quality of delivery

Table 9: Summary of Findings for District Leadership Capacity
Enhanced Leadership & Communication Several participants with a leadership role in the project perceived enhanced leadership capacity as a result of Mama na Mtoto training and implementation, both in their own ability to lead and in the leadership capacity of their colleagues. Participants described being better at effective communication and decision-making, which are skills that can also be used in their personal lives. The findings are also corroborated in both the CFIR Rapid Evaluation as well as the external evaluation. In particular, district leadership (particularly CHMT) remarked on the improvements in the way that they work and collaborate. The members of the CHMT in Misungwi similarly described themselves as "more friendly" and as "learning from past mistakes". The CHMT learned "to accept feedback from facility staff, from lower staff on how they would like to be supported." They contrasted this attitude with one whereby previously, they were "looking for weaknesses and telling the HF to do better next time." Despite this, there were also some comments from technical team members and field staff who felt that capacities around management, planning and evaluation were not yet built, as they are long-range competencies. Moreover, there were some questions regarding the use of financial incentives and allowances – whether they drove motivation. From the CFIR Rapid Evaluation, field staff expressed concerns about the potential burden on the district team (many meetings, simultaneous activities). It was also noted that Mama na Mtoto may have been too dependent on champions, and that any changes to the district team (turnover, staffing changes, etc.) would be challenging.
Unique Approach to Capacity Building The findings from the CFIR Rapid Evaluation indicate that stakeholders appreciated Mama na Mtoto's "facilitation"/capacity building approach. The highly participatory approach was seen as very key to Mama na Mtoto's success. In particular, the emphasis on fostering local innovation was seen to enhance leadership capacity and resourcefulness. "… as a human being and a leader I am learning every day. …MnM has its scope, but it welcomed other ideas from us as leaders, so it has been so helpful even to sharpen our leadership skills rather than just to leave the project to be implemented … this project it allowed innovations to be done, so as a leader I have to sit and think what kind of innovation … because the project allowed that innovation, if the innovation is for improvements it was accommodated … involvement which has helps us to increase innovation as leader I using the available resources to maximize our implementations." *[DMO, CFIR Rapid Evaluation]* In addition, the involvement of Kwimba district staff was 'Master Trainers' was very positive and resulted in commitment and engagement from the leadership in Kwimba.
Strengthened Supportive Supervision Both health district representatives and health workers highlighted the value of the supportive supervision training that Mama na Mtoto provided to health leaders, particularly in strengthening interpersonal relationships with colleagues. Health district representatives commented on improved collaboration with health facilities, and conversely health workers expressed being managed and treated better by CHMTs, including their efforts to gather feedback on the supervision experience. These relationships not only improve work dynamics but can also enhance the quality of healthcare at facilities. *"… what I have seen in the district … supervisions they were not going well … but we appreciate this time when there is supervision we are given the timetable … so this helps us to have a mind preparation … you have a peaceful mind … you cooperate well and direct each other compared to before … after the supervision they give a chance to share your opinions, how do you see the supervision, how does it help you … things like that." [CHW Supervisor Focus Group]*

Good Leadership Accountability

District health leaders acknowledged the importance of good leadership accountability and governance for successful project implementation and sustainability. They expressed that accountability in the project has generally been good, particularly amongst individuals who have been very involved in activities.

"… accountability in the project is good, majority, especially for those who are direct involved in the Mama na Mtoto activities. Challenge might be for those … have not been fully involved … then accountability might not be high. But for those who directly involved their accountability is high and that why we have been able to see the positive changes." [Government Interview (CHMT Member)]

5.3.2.4 Adaptations and Fidelity

Through the external evaluation, some adaptations were identified with regards to leadership capacity development. It was noted that the content of Mama na Mtoto adapted to emergent needs through the integration of supportive supervision and leadership training. These trainings were adapted from the original plan to fit the local context (i.e., Tanzanian policy context and supportive supervision guidelines). As such, content was adapted from the Ugandan context.

In addition, while the Uganda model was developed as a "low-cost" model, feedback from the partnership reflection meetings indicates that district staff received full per diems. As noted in the external evaluation (described above), this may have been a motivating driver for district staff participation.

5.3.3 Facility Management/Quality Improvement Capacity

The indicators related to facility management/quality improvement capacity were:

- Health facility MNCH equipment
- Capacity for MNCH signal function areas: ANC, essential newborn care, newborn resuscitation, labour and delivery, family planning, ill child management, and well child management.
- MNCH training retention
    - Simulation and peer-to-peer learning

5.3.3.1 Activities

Activities related to strengthening facility management/quality improvement capacity included:

- Meetings of health facility in-charges/staff and committees were convened to scan, orient, plan and reflect on enhancing gender- and equity-sensitive MNCH services
- Health facilities were equipped and upgraded for improved MNCH services
- Training and technical assistance were provided to health facility managers and staff on gender- and equity-sensitive MNCH clinical care and management, including simulation and peer-to-peer learning training
- Health facility staff mentored to implement MNCH improvements and innovations

5.3.3.2 Targets

Table 10: Facility Management/QI – Project Achievements						
Output/ Outcome	**Indicator**	**District**	**Baseline**	**Project Target**	**End of Project**	**Comments**
Meetings of HF in-charges/staff and committees convened to scan, orient, plan, and reflect on enhancing gender and equity sensitive MNCH services	#participants (M/F) in scans, orientations, and planning meetings by HF	Not disaggregated	0	300 (at least 2 per HF)	1,482 (907M/ 575F)	Target exceeded
CHMTs equipped to support MNCH services	# updated computers at HF	Misungwi	0	4	7	Target exceeded
		Kwimba	0	4	4	Target achieved
	# operational vehicles for referral per district	Misungwi	1	2	4	Target exceeded
		Kwimba	3	5	5	Target achieved
HF equipped and upgraded for improved MNCH services	# of HF provided with MNCH and infection control equipment	Not disaggregated	0	20 MNCH/ 50 infection control	104	Target exceeded
Training, technical assistance provided to HF managers and staff on gender and equity sensitive MNCH improvements and innovations	# participants (M/F) trained on gender and equity sensitive MNCH clinical care and management	Not disaggregated	0	300 (50%F)	479 (222M/ 257F)	Target exceeded
HF staff mentored to implement gender and equity sensitive MNCH improvements and innovations	#of mentorship visits to HFs for improvements	Not disaggregated	0	150	274	Target exceeded
Improved capacity of selected HFs in Mwanza to provide gender and equity sensitive MNCH services	#HFs with one or more staff trained in BEmONC signal functions skills	Misungwi	18% (2016)	50% (of 47 HFs)	94% (46 of 49 HFs)	Target exceeded
		Kwimba	48% (2018)	No target	93% (55 of 59 HFs)	No target set
	%HF in-charges reporting improved capacity to	Misungwi	86%	75% (of sample of ~30 respondents)	98% (48 of 49 HFs)	Target exceeded

	provide gender and equity sensitive MNCH services	Kwimba	72%	75% (of sample of ~30 respond-ents)	93% (55 of 59 HFs)	Target exceeded
	%retention by trained health workers of knowledge and skills acquired through project simulation trainings	Misungwi/ Kwimba	0	75%	87%	Target exceeded

5.3.3.3 Participant responsiveness and quality of delivery

5.3.3.3.a MNCH Service Readiness to Provide Signal Functions

A key indicator around increased facility capacity in management and quality improvement includes assessing the facilities' MNCH readiness to provide the seven signal functions, which are prioritized by the Tanzanian government (i.e. antenatal care, essential newborn care, newborn resuscitation, labour and delivery, family planning, ill child management, and well child assessment). The following include the results from the Health Facility Survey:

Misungwi District

MNCH Service Readiness indicators are presented for 45 health facilities that had complete data from both 2016 and 2019 survey data collection (Table 11).

In 2019, facility readiness ranged from 74%-95% across the seven MNCH service indicators, compared to 46%-74% at baseline. The largest increases were in essential newborn care (+42%) and newborn resuscitation (+34%). All other MNCH service areas showed a 24%-29% increase in facility readiness, except for family planning which showed no change; however, the latter was not a key intervention area for Mama na Mtoto.

Table 11: Health Facility MNCH Service Readiness, Misungwi District

MNCH Service	Baseline (2016)	Endline (2019)	Absolute Change
Antenatal Care	63%	88%	**+25%** *
Essential Newborn Care	46%	88%	**+42%** *
Newborn Resuscitation	60%	94%	**+34%** *
Labour and Delivery	50%	79%	**+29%** *
Family Planning	74%	74%	**0%**
Ill Child Management	62%	90%	**+28%** *
Well Child Assessment	71%	95%	**+24%** *

*statistically significant based on p<0.05

Kwimba District

MNCH Service Readiness indicators are presented for 52 health facilities that had complete data from both 2017 and 2019 survey data collection (Table 12).

In 2019, facility readiness ranged from 81%-95% across the seven MNCH service indicators, compared to 60%-88% at baseline. The largest increases were in newborn resuscitation (+35%), antenatal care (+21%), and family planning (+13%). All other MNCH service areas showed a 13% increase in readiness, except for well child assessment (+4%). All changes were statistically significant.

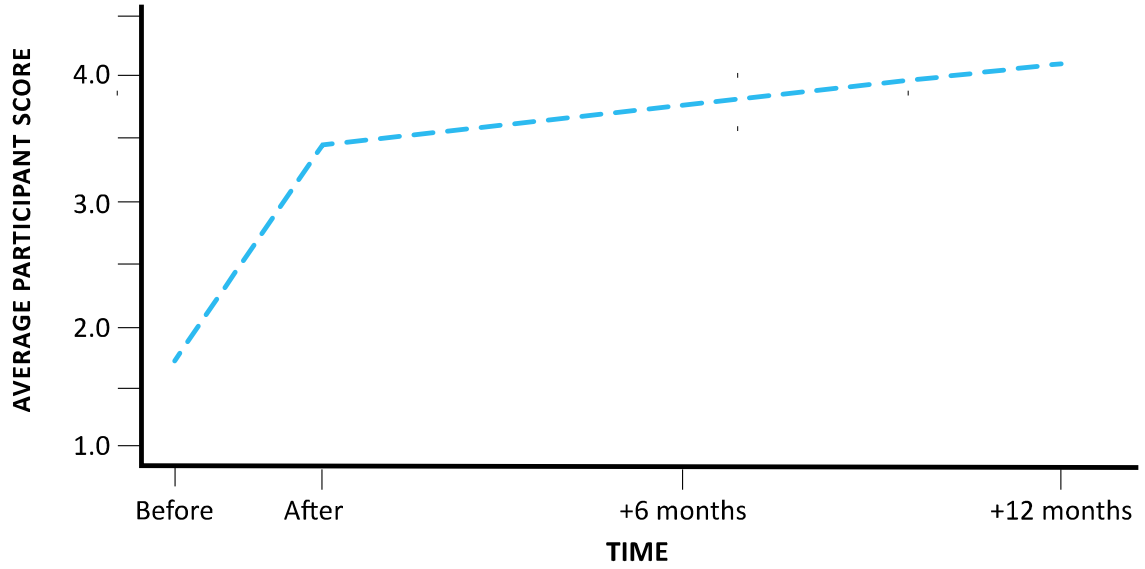
Table 12: Health Facility MNCH Service Readiness, Kwimba District			
MNCH Service	**Baseline (2017)**	**Endline (2019)**	**Absolute Change**
Antenatal Care	74%	95%	**+21%** *
Essential Newborn Care	73%	86%	**+13%** *
Newborn Resuscitation	60%	95%	**+35%** *
Labour and Delivery	63%	81%	**+18%** *
Family Planning	69%	82%	**+13%** *
Ill Child Management	77%	90%	**+13%** *
Well Child Assessment	88%	92%	**+4%** *

*statistically significant based on p<0.05

5.3.3.3.b Simulation Study

In addition to assessing the facilities' readiness to conduct the seven signal functions for MNCH, the research team also conducted a sub-study to evaluate the simulation-based training and peer-to-peer program, as part of Mama na Mtoto's training change strategy. Pre and post training tests were conducted with 16 health facility staff. Figure 4 illustrates an increase in average test scores following simulation-based training.

Figure 4: Clinical Scenario Assessment Scores Before and After Workshop



5.3.3.3.c Qualitative Findings for Health Facility Management/QI Capacity

The following table includes the findings from the CFIR Rapid Evaluation, the external evaluation, as well as the simulation and peer-to-peer learning evaluation. The findings from the simulation study are included here, as respondents did not always distinguish between the simulation training and other training they received.

Table 13: Summary of Findings for Facility Management/QI Capacity

Health Facility Engagement and Mentorship

Participants from the simulation study found engagement to be highly effective through the training approach. In particular, they appreciated the facilitators' high level of expertise and competence, and that the training was conducted using a more discussions-based hand-on approach. These facilitation approaches were observed to provide a model for their own facilitation techniques as part of the peer-to-peer learning.

The Mama na moto project was seen to create champions out of the health facility staff. In one of the focus groups for the simulation study, there were participants who called themselves "champions" at their facility because of seeing the impacts of the training and how they have been able to help mothers and children.
"So MnM program has made me a "champion". Many providers are getting trainings from different NGOs such as trainings by IMPACT; they teach BEmONC for two weeks but if someone comes back, we give the toys and peer learning cards from MnM for him/her to demonstrate. What she/he does is questionable….." [Sim study, Focus Group 2]

From the CIFR Rapid Evaluation, participants spoke about how the specific engagement of in-charge staff and midwives at facilities was also positive in creating champions at the health facilities who were very committed to the project and also engaging others (e.g. CHMT, CHWs). The training in leadership and management was seen to be an important aspect of engaging the health facility leadership.
"… the great thing MnM did is to train the committees, you know the committees were sleepy and didn't know their roles … we thought of making changes but it was a brilliant thing from MnM … after the leadership training every person realized oneself how a leader should be you see and honestly we succeeded in solving problems in some places and people started to live peacefully and everyone was new thereafter." [Health Facility In-Charge Focus Group]

The external evaluation also found that leadership within the health facilities was built by the Mama na Mtoto project by training clinical mentors. These mentors, who were particularly competent in MNCH were now supporting health staff in health facilities and dispensaries. Challenges were raised, however, whereby some mentors were failing to implement this training cascade due to many demanding tasks. In this respect, it was suggested that there may be too much dependency on these busy clinicians.

Health Facility Equipment for MNCH

The external evaluation found that health facility capacity was strengthened by the Mama na Mtoto project by providing vital medical equipment, including toll-free telephones, which were directly supplied to all health facilities according to their own identified needs. Other types of infrastructure provided by the project included: a new theatre, maternity wards, out-patient department, staff houses and an ambulance vehicle. From the evaluation, it would found that the Kwimba innovation competition in particular helped to contribute to the advancement of health equity as facilities that were considered the "worst" and could not access Results-Based Financing were able to obtain support through the project.

Some findings from the CFIR Rapid Evaluation suggested that there was some appreciation that equipment needs were tailored to the facilities. However, while smaller dispensaries were given equipment and training, there was a lack of support given to them, which resulted in gaps.

The mixed sentiments were also confirmed in in the simulation study. Participants described situations where equipment was available and allowed them to provide the right care when needed, including blood pressure machines. In particular, participants spoke about their appreciation for having the newborn resuscitation equipment for learning at SIM labs and performing resuscitations (e.g. ambu bags, mannequins). One participant noted that having a new vehicle from MnM allowed them to be able to transfer patients to the hospital for referral.
"...Equipment for learning like ambu bags, mannequins...We have them and some facilities also have this equipment as well and have established the SIM sites where there are SIM labs. There is other equipment for helping mothers during delivery. For example, B.P machines were brought, and they are helpful in recognizing these mothers with danger signs..." [Sim Study, Focus Group 2]

However, participants also talked about the persistent need for equipment/lack of supplies, such as Vitamin K. Since they are trained to use it, it is important for them to have it in stock. There was also a suggestion that other facilities should have SIM labs, to address discrepancies between facilities.

The external evaluation also found that the trainings to health service providers highlighted the absence of some essential basic equipment for obstetric care. The service providers now have been empowered to use this voice to make demands for the equipment they need.
"This equipment or material became priorities, they know why this is so, and they can argue why this needs to be a priority and included in the budget." [Field Staff, External Evaluation]

Capacity in Management, Planning, and Quality Improvement

The external evaluation found that according to district leadership, the capacity of health facility in-charges had improved;
"We know the level of confidence, determination and knowledge has changed among these in-charges such that majority of (them) are able to make changes (that) could improve service delivery in their health facilities in collaboration with their HFGC, as demonstrated during health facility innovative competitions" [District Medical Officer, External Evaluation].

Training allowed the health facilities to do their own planning, whereas they would have depended on the districts to do this for them in the past. Reports from in-charges indicate that with training has also allowed them to learn how to use data; more data is now being captured due to higher capacity to use the data in new ways. The Mama na Mtoto project also provided health facilities with computers to improve the quality of data they collect. Despite this, the Health Monitoring Information System (HMIS) remains a challenge. The HMIS process was described as overwhelming and taking up a significant amount of time. According to HF staff "HFs have too many registers to manually fill." Additionally, as reported in the CFIR Rapid Evaluation, there were some initial issues identified with the quality improvement training, as it was not grounded in an already existing government quality framework, which created confusion.

The external evaluation also revealed that the Health Facility Governance Committees (HFGC)were also more effective. The HFGC described themselves as having greater understanding and stronger self-efficacy as a result of the project. Prior to MnM the HFGC tended to agree with health facility staff without a full understanding of the issues.
"we are satisfied with how that HFGC is functioning - they are a great help - they help us with the control of resources." [CHMT member, External Evaluation]

Training Supports Knowledge and Skill Retention

The CFIR Rapid Evaluation, external evaluation, and simulation study all found that stakeholders appreciated that high quality of health facility clinical training. (hands-on training, simulation workshops, and peer-to-peer learning).
"…you know when we talk about engaging the people, people who are specialized like pediatricians, and uh gynecologists, and people who are, they are exposed in the university, they have moved to the low health facility to train, to be trained, imagine a nurse who has been trained maybe with a certain color of tutor, and she is receiving the knowledge from the high technical people like the gynecologists and the obstetricians, which is very rare in our , in our area." [Field staff, CFIR Rapid Evaluation]

Several procedures and practices were identified as having been improved as a result of the MnM project, including infections prevention and control (IPC) in maternity wards, responding to postpartum hemorrhage and early detection of eclampsia. Health centres would systematically respond to preeclampsia by referring as they admitted they did not have knowledge on how to administer magnesium sulfate.

Participants remarked that they have observed a change in themselves and in their peers after receiving SIM training through the Mama na Mtoto (MnM) project. In particular, they attributed the practical nature of the training to enhancing and retaining their knowledge and skills for caring for mothers and children and in saving lives. A number of participants referred to the steps learned in the training as being very helpful when providing care.

Participants shared stories of recalling what they learned in the training and through their hands-on practice in the SIM labs and reminding one another as part of the peer-to-peer learning program. The Mama na Mtoto training was often compared to other training by different NGOs. Some participants commented that in their previous college training or in the training they received through other NGOs, they were not able to retain the information learned.

"…we still learn more because here we learn in practice but still we have something extra to do in our facilities, we have the materials we have been oriented on how to use them to teach others. Using the peer to peer learning card so the materials help us so much when you forget your colleague reminds you. Since it involves a series of things, when you forget something, your colleague reminds you because you cannot remember all of them. And, if it happens your colleague forgets you also remind each other thus it becomes difficult to forget, so it helps us to keep in mind, it is very hard to forget everything" [Sim study, Focus Group 2]

Another area of improvement was identified from the simulation study. Participants described skills and knowledge they learned from the MnM project related to referral when they are unable to manage an emergency situation appropriately. One participant noted that prior to their training the doctor had the "final say." Now, they do know that they can refer the patient if needed. Participants also mentioned having greater capacity to do referrals through an improved system supported by MnM, including a new vehicle and improved communication between facilities/system of referral.
"We used to provide referrals before even trying to handle the case. But after the Mama na Mtoto training, we have the skills and we know when to provide referral." [Sim study, Focus Group 1]

Improved Confidence in Knowledge and Skills as a Result of Training

Both the external evaluation and the simulation study found that health facility staff felt more confident to provide care and save lives. They also felt pride in their work and more as a result of the training they received, new skills and knowledge that have been acquired, in addition to the opportunity to continue to learn through peer-to-peer learning and practice using the SIM labs.

Many participants noted their appreciation for the peer-to-peer learning in particular, for enhancing their confidence. The approach has been attributed to participants' increased confidence through teaching one another. Participants commented on how they have learned to provide constructive and encouraging feedback, so that everyone feels comfortable. Despite this, it was noted that the person doing the orienting must consider doing it carefully, as not to teach others procedures that are not correct.
"Peer learning cards to be honest, makes a person confident because he can be a teacher while others are learners, so changing experience from each other makes you equal, even a person who had not gone for training gain confidence through this, so this makes things better." [Sim Study, Focus Group 1]

Strengthening the Connection Between the Community and Health Facilities

The external evaluation found that after the training, the HFGC saw their role as strengthening the connection between the community and the health facilities. This connection was strengthened by building the health facilities' positive image and communicating needs from the community to the health facility. The HFGC was strengthening the connection between the HF and the community by communicating key health education issues to the health facility, posting spending for transparency, communicating ideas from health facility staff to community and encouraging community members to join health insurance scheme. These activities helped to develop the community's trust of the health facility, improved health insurance contribution and increased the health facility's financial strength. Similarly, communication improved health facility responsiveness to community needs or specific education topics.

In the simulation study, participants also talked about the value of training the CHWs, who encourage mothers to deliver at the health facility. One participant noted that more mothers delivering at the health facility, compared to before, and that the death rate has decreased. Participants also commented on how CHWs tell people about the health facility services and they have seen an increase in mothers coming to the health facility. CHWs were seen as a link to the community
"MnM has provided trainings to community health workers (CHWs) from each hamlet in the villages, so when they visit mothers, they insist them to come to deliver at health facility, so the delivery numbers has improved in our facilities. Previously, we used to attend few mothers for delivery but now the number has increased, and the death rate has decreased." [Sim Study, Focus Group 2]

Despite this, there was also the opinion from a technical team member (CFIR Rapid Evaluation) that more efforts should be made to engage the community to demand high quality of care. This would promote sustainability (continued investment) if patients were empowered.

Changes to the Health Facility Culture

Participants from the simulation study attributed their training to contributing towards creating a new culture of care (beyond just improving technical skills) and how this contributes to improved quality of care and outcomes.
"..For my part these training is something new that has added cooperation and good communication at the workplace amongst staff. We have seen the importance of cooperating well and communicating well when we are at work, having a good working relationship we can provide better service to the patient." [Sim Study, Focus Group 1]

The peer-to-peer learning program was described as facilitating a positive "culture of giving feedback" where health worker peers remind and teach each other, including those who have not obtained the training directly. This program is being received very well at the facilities, where they have seen a benefit to all staff.

Participants also spoke about how the training has helped staff improve their communication and foster a more cooperative work environment and better working relationships, including developing improving friendships among staff. Participants mentioned that they no longer hesitate to ask for help, where in the past they worked more independently.
"After this training, everyone has confidence, for example; if you have a case and you call for help, it is not like previous days before the training when my fellow providers were reductant to support. But now if call someone for help, if may be it is eclampsia case - everyone will run coming to support you. My teammate and me are working close to each other" [Sim Study, Focus Group 1]

The training has also given them the confidence and skills to improve their communication with patients, including communicating more clearly. One participant noted that patients enjoy their services, and this has resulted in the other staff being interested in learning from them. Participants also commented on how the training has helped improve their communication with regards to sharing their knowledge from the training and being able to train others.
"Today, I am able to talk very clearly to clients. Even the clients are enjoying my services, this makes my fellow providers to listen to me join me when I organize a session for learning." [Sim Study, Focus Group 1]

The training has also been seen to help address hierarchies. Participants felt that they are able to better support their leaders and the doctors (who have confidence in what they have learned). Participants shared stories about correcting the doctor, or proving them wrong in emergency care situations. Despite this, there were cautions from participants that not all providers are "ready" for peer-to-peer learning, particularly if the person who is training is considered more junior.

The external evaluation corroborated much of the findings from the simulation study. According to the HFGC, there was an improvement in attitude among of all service provision staff, whereby everybody was made aware that they had a role in making service welcoming to clients and treating people well. In this regard, there were no longer complaints about the use of poor language. The in-charge stated that before, clinicians did not sense the urgency, due to a lack of knowledge. Clinicians also shared that their dedication had improved;
"Now I am interested, I see what other warning signs there might be, I am curious, and I take my role with a seriousness that I did not before - their life is in my hands - I can do something" [Health Facility Clinician; External Evaluation]

Providing Dignified and Respectful Care

In one of the focus groups for the simulation study, participants shared specific stories about providing dignified and respectful care, attributing the training to inspiring them to ground their care in the "spirit of compassion and love." Other participants compared their facility with other facilities, where the staff were known not to treat patients nicely, noting that their staff have "different hearts." One participant spoke specifically about how the training has provided them with a greater understanding about the patient's "right" to care, regardless of whether they are late to seek care and the importance of respecting all patients, regardless of their status in the village or if the patient lives with a disability. Another participant shared an experience of providing care to a shy and adolescent mother, and how providing polite and friendly counselling fostered a more trusting relationship (i.e. maintaining patient confidentiality).
"The respective care has given us some skills and knowledge of understanding that everyone has the right to treatment, and has the right to be attended by me. This is different from the past when I was sometimes looking for the person and decide whether I must attend him/her first even if that person is late. We were doing that because we didn't know the real meaning of the respective care. After being trained and oriented by MnM program about and the meaning of respective care at our facilities, we noticed that we should respect all and give services without looking at somebody's status in the village, we listen to someone, we attend the people with disabilities in delivery well." [Sim Study, Focus Group 2]

5.3.3.4 Adaptations and fidelity

With regards to adaptations and fidelity, the external evaluation identified the addition of the practice-based and peer-to-peer learning as not part of the initial plan. Training materials were adapted to both supplement and simply the approach. Peer-to-peer learnings were planned, but modifications arose from project expertise (technical team member) whereby it became clear during implementation that practice of skills was not enough and that the component of decision-making needed strengthening. Tools were consequently modified and improved for suitability to this form of learning.

Other activities, such as the health facility competition were part of the Uganda experience, but were largely adapted to respond to the particular needs in Tanzania. Activities emerged in response to the learnings of three common issues across health facilities. First, there was a lack of special services for adolescents. Activities tended to focus on family planning or ongoing to schools to provide education and there was nothing at the health facility that could support adolescents and make them feel comfortable to come to the health facility. Second, there was an issue related to men coming to the health facility, whereby men would avoid visiting or accompanying the family for services. The third issue concerned the attitudes with which the HF would address patients. The health facility innovation competition invited the health facility to develop a way to improve one of the three issues: 1) how to include men in the antenatal care visits of their wives; 2) how to integrate adolescents into the health facility and ease the comfort at coming to the health facility; 3) how to improve mistreatment of patients and their families from health providers. These issues were further integrated in Kwimba based on the dignified and respectful care training and activities.

Adaptation at the level of the health facility was also described in terms of the provision of materials and equipment. The project also adapted to new needs for infrastructure. Although the original protocol emphasized training and capacity building with provisions for smaller scale renovations, at project kick-off the RHMT informed the project manager that project lacked sufficient infrastructure. As a result, the project included the construction of a theatre and maternity ward, with a prioritization in health centres that were geographically far from the district hospital. Notably, project partners had to fundraise separately for some of this construction as the funds in the project were insufficient and not designated for construction.

Although this cascading order of activities was part of the original project work plan, it was difficult to implement in practice. Some processes took longer than anticipated whereby the time required for consultation with districts and facilities was underestimated. It was thus not possible to delay the community mobilization and CHW training activities until these health facility activities were completed. In Kwimba, the cascading was implemented with a higher level of fidelity to the original plan, due to learnings from Misungwi.

5.3.4 Functional CHW Network

The indicators related to a functional CHW network were:

- Health facility CHW supervision
- CHW training
- CHW equipment
- Community engagement through CHWs

5.3.4.1 Activities

Activities related to establishing a functional CHW network included:

- Meetings of Council Health Management Teams, CHW coordinators and supervisors were convened to scan, orient, plan and reflect on improving community health worker programming
- Council Health Management Teams were equipped to enhance the work of CHWs
- Training and technical assistance provided to Council Health Management Teams/health staff on training, supervising, and monitoring community health workers
- Meetings of community groups were convened to scan, orient, plan and reflect on gender- and equity-sensitive MNCH promotion
- Community groups were mentored to promote gender- and-equity sensitive MNCH and implement innovations

5.3.4.2 Targets

Table 14: District Leadership Capacity – Project Achievements

Output/ Outcome	Indicator	District	Baseline	Project Target	End of Project	Comments
Meetings of CHMT, CHW coordinators and supervisors convened to scan, orient, plan, and reflect on improving CHW programming	# participants (M/F) in CHW scan, orientation, planning meetings and reflect	Not disaggregated	0	100	297 (149M/ 158F)	Target exceeded
CHMTs equipped to enhance the work of CHWs	# of CHW kits distributed	Not disaggregated	0	1,500	1,799	Target exceeded
Training and technical assistance provided to CHMT/health staff on gender and equity sensitive training, supervising, and mentoring CHWs	# of HF staff (M/F) trained as CHW supervisors	Not disaggregated	0	80	101 (45M/ 56F)	Target exceeded
	# of CHWs trained on MNCH	Not disaggregated	0	1,500	1757 (844M/ 913F	Target exceeded
Meetings of community groups convened to scan, orient, plan, and reflect on gender and equity sensitive MNCH processes	# participants (M/F) community scan, orientation and planning meetings	Not disaggregated	0	300	9,759 (5,072M/ 4,687F)	Target exceeded

Community groups mentored to promote gender and equity sensitive MNCH and implement innovations	# households participated in community innovation	Not disaggregated	0	6,280 HHs	3,255 HHs	Target not met, but set unrealistically
Improved capacity of CHMT and HF staff to supervise and monitor a network of CHWs	% HFs reporting one or more meetings per quarter with CHWs	Misungwi	58%	70% (of 47 HFs)	98% (48 of 49 HFs)	Target exceeded
		Kwimba	44% (2017)	80% (of 57 HFs)	100% (57 HFs)	Target exceeded
	% of key CHMT members and in-charges (M/F) reporting improved capacity to train, supervise, and monitor CHWs	Misungwi	No data available	95% (of sample of ~46 respond-ents)	98%	Target exceeded
		Kwimba	77%	95% (of sample of ~57 respond-ents)	93%	Target almost met
Increased capacity of community groups to promote gender and equity sensitive MNCH	% hamlets with active CHWs	Misungwi	15% (2016)	70% (of 724 hamlets)	100% (724 hamlets)	Target exceeded
		Kwimba	27% (2017)	70% (of 871 hamlets)	100% (871 hamlets)	Target exceeded
	% of CHW groups reporting community-level MNCH activities	Misungwi	0	50% by Y3	100% (of 48HFs with CHW groups)	Target exceeded
		Kwimba	0	50% by Y4	100% (of 57 HFs with CHW groups)	Target exceeded
	% of CHWs that can relate three core gender issues to MNCH	Misungwi/ Kwimba	0	75%	90%	Target exceeded

5.3.4.3 Participant responsiveness and quality of delivery

5.3.4.3a. CHW Activities

In 2019, the MNCH Coverage Survey reported an increase in CHWs engaging with households in Misungwi District. Since baseline, there was a 30% increase in women who were able to name at least one CHW, a 33% increase in women who reported a visit from a CHW since their last birth, and a 30% increase in women who reported receiving help or advice for their sick child (Table 15).

Table 15: Community Health Worker Activities, Misungwi District			
Indicator	**Baseline (2016)**	**Endline (2019)**	**Absolute Change**
Respondent can name one CHW	23%	53%	+30%
CHW visited woman's home since last birth	5%	38%	+33%
CHW provided help or advice for sick child	6%	36%	+30%

Table 16 provides a summary of the qualitative findings regarding CHW activities in the community from the qualitative endline inquiry, the CFIR Rapid Evaluation, and the external evaluation.

Table 16: CHW Activities in the Community
Visible CHW Presence in Communities Participants described a visible and felt CHW presence in the communities, emphasizing that CHWs have been able to reach families and cultivate a real community connection through building trusting relationships. This highlights a success of the project to establish the CHW network in their communities. *"We have been seeing them helping in the communities … when they visit household to household. They … advise on issues of health related issues … they have been good people for visits us on the issues of health, even on the use of the latrine, you are supposed to have a good latrine … they have done a lot of seminars to teach women and us old men, they have taught us a lot of things." [Fathers Focus Group]*
CHWs Taking Action All participants expressed awareness of CHWs actively working in their communities. Participants were able to identify various CHW activities including community education, household visits, promoting earlier antenatal care at health facilities, attending health facilities with women and families, escorting pregnant women to deliver at health facilities, working at health facilities to ensure a clean environment and positive client experience, supporting healthcare staff, promoting child wellness, and educating households about reproductive health and family planning. Participants shared that, through income-generating activities and the establishment of CHW networks and groups, many district areas have been able to establish a sustainable, functional CHW network in and for their communities. Participants identified that, through their outreach and work, one important CHW role has been to identify specific challenges in their hamlet or village. Local challenges are communicated through CHW reporting so that government and health leaders are positioned to help stakeholders take action. Where CHWs have identified a specific community challenge or need, they have been able to offer community education through household visits and local forums. *"These CHWs are accountable in the community by visit the households and provide health education but also to support the community to be able to take action on health issues … they must provide a report to their supervisor at every health facility … we go through report and see in case there is any challenge … we go the specific areas to solve it in order to support the CHWs in their implementation." [Government Interview (CHMT Member)]* The external evaluation also found that the Mama na Mtoto's project had made contributions to health equity. The CHWs who told the evaluation team they were reaching the most disadvantaged families; they recognized the challenge of helping the disabled and the schoolgirls. In response, they were visiting schoolgirls each Friday, and encouraged girls to visit health facilities.

CHW Home Visits

Participant groups discussed the importance of CHW home visits in their communities. By building personal relationships with families through home visits, CHWs have been successful in educating households about maternal and child health and bridging previous community resistance to seek health facility care.

"Indeed we appreciate Mama na Mtoto people for what they have done, we had big problems, but currently those problems have reduced. Here I am, have a baby, when a baby is sick I don't know Swahili, I cannot go and tell the doctor my child has a boil at the buttock, I am afraid. Mama na Mtoto have brought us CHWs, they visit us every day, I mean every day. Even when you have a problem they come at your home and ask you 'how are you, how is your child,' I say … and he has already take you to the doctor and you get good service." [Mothers Focus Group]

From the CIFR Rapid Evaluation and external evaluation, the project's decision to improve the ratio of CHWs to households (have one CHW per hamlet) and organize CHWs into teams allowed CHWs to be able to visit all of the households and to talk to all of the pregnant women in their areas. This relationship solidified the integration of the CHW in the community due to a mutual benefit for the CHW as well as the local leadership (i.e., elected hamlet leader). Due to this organization and structure, the CHW program was made more effective and sustainable.

"(this) was a critical piece. In other projects, it wasn't done that way." [Technical Team Member, External Evaluation]

CHW Referrals to Health Facilities

Participants discussed the impact of CHW referrals to health facilities in encouraging families to attend health facilities. Numerous participants also commented on the important role of CHWs in enhancing the care-seeking experience, particularly for pregnant women. This includes CHWs providing referral forms for mothers and children, helping to arrange transport, or even personally escorting clients to the facilities.

"In my working area, CHWs they have done good things … giving referrals to the patients to come in the facility … giving reasonable referrals … referral letters … accompanying pregnancy mothers to deliver at the health facility, they have been very helpful to accompany pregnant mothers who are coming from far areas … but also CHWs have been involved in the cleanness activities at the facility … before conducting the meeting they will come at least half an hour before and conduct cleanness at the facility. So those are some of the good things that have been identified and conducted by CHWs in our area." [CHW Supervisor Focus Group]

However, many CHWs also discussed some challenges with carrying out the referrals, where clients or health facilities may not always honour the referral forms. These challenges highlight an area that may require further implementation support.

"The challenges I have come across … in my hamlet when I visited a client either mother or child, and she has not normal symptoms, I must give her a referral, and then she will go to the health facility and bring back the piece of paper from that referral during home visits … when a client go with that referral once she reach the health facility they will read it, it has written where she is from, name of CHW. They give back that referral to the client saying 'take your paper … we don't know' … the client is given back that referral paper as it was, so this is reduced the trust to the client and me." [CHW Focus Group]

5.3.4.3a. Community Engagement through CHWs

Table 17 provides a summary of the qualitative findings regarding community engagement through CHWs from the qualitative endline inquiry, the CFIR Rapid Evaluation, and the external evaluation.

Table 17: Community Engagement through CHWs

Community Engagement

In addition to district and facility engagement, participants also discussed the importance of community ownership and engagement for successful project implementation and sustainability. Participants appreciated the project's efforts to also involve individuals that do not have a traditional leadership role, including health workers, CHWs, and families.

"What interesting me in this project is how they have involved the community in general. They have involved from the top leaders, middle leaders and the low leaders, health providers, CHWs and the final beneficiaries. Therefore, it has been easy because everyone was involved … so the good thing is that involvement from the higher to the low levels. That means we are not getting more challenge, because the community is aware … we are the recipient of the service." [CHW Supervisor Focus Group]

CHW Engagement in Community Entrepreneurship

Participants mentioned increased entrepreneurship and enhanced economic development associated with the Mama na Mtoto project, particularly amongst CHWs. Though such activities were not a planned component of the project, CHWs reported working with their peers to establish entrepreneurial and income-generating activities for personal and community benefit. Activities included making and selling liquid soaps and textiles, animal husbandry such as keeping goats and chickens, and financial saving and lending. Through role modelling, CHWs have also played a role in mobilizing communities to participate in similar activities, recognizing the important connection between enhanced economic activity and community health, particularly for birth planning and preparedness.

"… through CHWs they have been motivated that they should not stay idle … they have established their groups which are existing to the moment, they have motivated each other, there are some CHWs who are keeping goats, others chicken … others have been able to get income through these goats and other animals they are keeping … it has helped even at their community and they continued to motivate other community members to establish groups and make sure that they are improved economically." [Government Interview (CHMT Member)]

Appreciation for Community-Based Efforts

Some participants described the importance of activities that aim to reach families deep in the community, as opposed to only addressing issues at the health service level, for example. Participants expressed appreciation for Mama na Mtoto's use of CHWs to facilitate sustainable changes within the community; as a result, community members felt impacted by this project, which encouraged participation, empowerment, and local ownership.

"… a lot of projects aimed at the health service providers, to teach us how to do our tasks, but they hadn't gone too deep in the community itself because the community is the source of everything, if the community does well at their level and we here in the health facilities perform well it will be better. So a lot of projects have based in teaching us on family planning how to do it, how it is but they haven't reach the families." [Health Workers Focus Group]

5.3.4.4 Adaptations and fidelity

The CFIR Rapid Evaluation as well as the external evaluation identified some important modifications with regards to the CHW program implementation. According to the technical team members, best practices developed in Uganda were not initiated immediately in Misungiwi due to the need to follow the Tanzanian protocol around CHW selection. Experiences developed in Misungwi thus permitted adaptions to be made in Kwimba such that the selection of CHWs was less politicized, expectations were tempered, and gender representation was improved. Importantly, modifications in Tanzanian protocol were possible following the experiences gained in Misungwi. The demonstration of 'best' practices in Uganda were thus not immediately taken up in Tanzania; it was not always sufficient to acquire interest among local decision makers based upon experiences foreign to Tanzania.

The orientation and recruitment of CHWs in Kwimba benefited from the project's experience in Misungwi and aligned more closely to the experience in Uganda. In Kwimba, the Community Engagement Project Officer (CEPO) from the project participated directly in the orientation of the community instead of leaving this task to community leaders. This was a modification based upon the experience in Misungwi whereby it was learned that local leadership had limited capacity to mobilize the community around the issue of maternal and neonatal health. The project orientation also included a wider representation of community leaders; in particular, all hamlets leaders were called to participate (even) though they were not part of the WDC (Ward Development Committee) in order to ensure that the project was well rooted. In Misungwi these community leaders were excluded. In Kwimba community attendance almost doubled relative to Misungwi.

Other changes in Kwimba concerned the preselection and voting processes, whereby the CHW section process was lengthier due to a process which became more democratic and transparent. Criteria for selecting CHWs was also refined in Kwimba in order to provide clearer guidance for communities to make

informed decisions. Indeed, the DMO in Kwimba was very proud of the attention given to the selection of the CHWs;
"They (the CHWs) were not chosen by the project, they were chosen by the community." [District Medical Officer, External Evaluation]

This process resulted in the project being "very rooted in Kwimba compared to Misungwi." Moreover, the democratic voting process and selection criteria allowed the voting for CHWs with a positive reputation within the community. By including the local leadership early on, leadership continued to have an important role in the implementation of the project. Local leadership was involved in quarterly review meetings, community mobilization and supported the use of community materials for additional infrastructures around the health facility (e.g., huts). The training of CHW had taken place in the Ward Executive Officer's (WEO) office. Indeed, when the evaluation team asked a group of CHWs whom they referred to for support, they emphasized the role of the HF and local leadership.

An alternative solution was developed for the CHW training in Kwimba, compared with Misungwi (as mentioned above), whereby some selected CHMT and health facility staff were trained to become nationally certified CHW trainers. This achieved two objectives both of which contributed to the relevancy of the training. First, similar to the supportive supervision approach, trainings became more participatory over time consequent to the MnM process which incorporated feedback and reflection into learning and project adaptation. Second, by involving local trainers (all trainers were local), trainings could be provided in the local language by trainers known to the participants who understood the local context, rather than being uniquely in Swahili, as many CHWs did not speak this national language. These improvements were particularly notable in Kwimba, whereby these modifications in both supportive supervision and CHW trainings were fully implemented.

5.4 Effectiveness

Effectiveness of the intervention was evaluated through the MNCH Coverage Survey, the qualitative study, as well as the simulation sub-study. Additional details regarding the full results of the MNCH Coverage Survey as well as the qualitative study can be found in ***Appendix A – Endline Study Report.***

5.4.1 Summary of Key MNCH Indicators from the MNCH Coverage Survey

Table 18 provides a summary of the results for the key indicators from the MNCH Coverage Survey.

Modest increases were documented for ANC and PNC indicators since 2016. A higher proportion of women reported attending four or more ANC visits (+12%) and accessing ANC services prior to 12 weeks of pregnancy (+7%). An increase in PNC service access for mothers (+8%) and babies (+5%) was documented, though the latter was not statistically significant.

Regarding newborn and child health indicators, some statistically significant changes were noted between 2016 and 2019. There was a 10% increase in newborns being breastfed within one hour after birth, a 55% increase in young children receiving a diverse diet (foods from four or more food groups), and a 3% increase in young children receiving adequate nutrition. With morbidity, U5 diarrhea and fever have reduced since baseline (-4% an -5%, respectively), and care-seeking practices have improved, including the use of deworming medication (+5%), zinc for diarrhea (+4%), and seeking advice or treatment for fever

(+17%). There was also a 14% increase in care-seeking for pneumonia, though this was not considered statistically different from baseline, among others.

Table 18: MNCH Coverage Survey Key Indicators, Misungwi District					
Indicator			**Baseline (2016)**	**Endline (2019)**	**Absolute Change**
MATERNAL & NEWBORN HEALTH					
Antenatal Care	ANC four or more times		47%	59%	**+12%** *
	ANC before 12 weeks		13%	20%	**+7%** *
Delivery	Delivery by a skilled birth attendant		64%	80%	**+16%** *
	Delivery at a health facility		61%	78%	**+17%** *
Postnatal Care	PNC for mothers		43%	51%	**+8%** *
	PNC for babies		51%	56%	**+5%**
Family Planning	Met need for contraception		73%	70%	**-3%**
	Prevalence of modern contraception		17%	15%	**-2%**
CHILD HEALTH					
Breastfeeding	Exclusive breastfeeding (<6 months)		50%	55%	**+5%**
	Early initiation of breastfeeding (<1 hr)		16%	26%	**+10%** *
Nutrition	Appropriate feeding practices (6-23 months)	Dietary diversity	12%	67%	**+55%** *
		Meal frequency	28%	23%	**-5%**
		Minimal acceptable diet	4%	7%	**+3%** *
Immunizations & Supplements	Measles (12-23 months)		82%	83%	**+1%**
	Diphtheria, tetanus, and pertussis (DTP3) (12-23 months)		87%	85%	**-2%**
	Vitamin A (6-59 months)		73%	77%	**+4%**
	Deworming (6-59 months)		52%	57%	**+5%** *
U5 Diarrhea	Diarrhea in last two weeks		16%	12%	**-4%** *
	Diarrhea treatment with oral rehydration salts		52%	56%	**+4%**
	Diarrhea treatment with zinc		<1%	5%	**+4%** *
U5 Fever	Fever in last two weeks		30%	25%	**-5%** *
	Care-seeking for fever		53%	70%	**+17%** *
	Antimalarial treatment		95%	83%	**-12%**
U5 Pneumonia	Care-seeking for pneumonia		56%	70%	**+14%**
U2 Anthropometry	Underweight (moderate and severe)		14%	10%	**-4%**
	Wasted (moderate and severe)		7%	5%	**-2%**
	Stunted (moderate and severe)		27%	29%	**+2%**

*statistically significant based on comparison of baseline/endline 95% CIs

5.4.2 MNCH Health Outcome Indicators – Qualitative Findings

Consistent with a convergent mixed methods design, the qualitative inquiry was designed to provide a more comprehensive understanding of the effectiveness of the Mama na Mtoto intervention. Table 19 provides a summary of the key clinical indicators that were evaluated. Findings from the simulation sub-study have also been included as similar themes emerged from the study.

Table 19: MNCH Health Outcome Indicators – Qualitative Findings

Reduced Maternal & Child Mortality

The primary health outcome mentioned by all participant groups was a perception of reduced maternal and child deaths. Several participants linked the perception of reduced deaths with the work of Mama na Mtoto-trained CHWs, who mobilized communities by sharing education and increasing awareness to seek care at health facilities.

"In my working areas, since the beginning of this Mama na Mtoto project, pregnant mothers and newborn deaths are reduced." [CHW Focus Group]

Improved Maternal Health Care-Seeking Behaviours

Increased Health Facility Attendance

Increased health facility attendance by women, children, and families—at all levels of care from dispensary to hospital—was reported by all participant groups. Several participant groups observed busier health facilities, with a particular increase in pregnant women accessing antenatal care. This increase in health facility attendance was attributed to CHW engagement in communities.

"… we have seen increased number of clients coming to our health facilities … yes … mothers under 12 weeks … the existing of CHWs has contributed to increase the number of clients, they visit to the community and direct the clients, and they come in the health facility and the improvement of our health facilities …" [Government Interview (CHMT Member)]

However, this increased attendance has also put an increased pressure on health facility resources, resulting in overcrowding and long wait times.

"There is a big response from the community. Children are measured at the clinic as well as pregnant mothers and other patients but … we have few health workers … you may find that there is one nurse, one doctor who is supposed to attend children and pregnant mothers. Children are waiting … it become overcrowded and you have to leave there late. But if we could increase staff the service will be more … providers are few…" [Mothers Focus Group]

Accessing Earlier Antenatal Care

Many participant groups commented that pregnant women are seeking earlier antenatal care, largely attributed to CHW home visits and community education. Participants linked earlier care-seeking to CHW household visits and mobilization at the hamlet level, perceiving that health education is reaching woman and families.

"For the positive results we have seen since the project began, first of all is the increased number of pregnant mothers who attending clinic with pregnant below 10 weeks. The numbers have been increased compared to before the implementation of Mama na Mtoto project started to train CHWs." [CHW Supervisors Focus Group]

Increased Awareness of Birth Preparedness & Planning

Participants expressed that CHWs have been working with families in the communities to promote awareness around birth planning and preparedness, including the importance of saving early to buy birthing supplies. Community participants also reported giving value to being prepared for deliveries. The findings suggest that when women are prepared for birth, they are more likely to attend at a health facility for delivery, owing to a sense of increased confidence, security, and a diminished fear of judgment.

"… mothers used to go to traditional birth attendant for delivery … we didn't know the importance of attending clinic and take children for vaccinations. But after the introduction of this Mama na Mtoto project, I have come to learn those two important things. First, I should deliver at the hospital. But also, I was told that when I am pregnant you must have birth preparedness plan when the deliver days are closer, so that I can go to the dispensary." [Mothers Focus Group]

Increased Health Facility Deliveries

Most participant groups identified an increase in the number of pregnant women delivering in health facilities, compared to previously when many women delivered babies at home. Community members perceived health facilities to be a safer environment for giving birth. Health providers were particularly aware of the increase in women delivering at health facilities, attributing the outcome to increased community awareness and CHW support.

"… the community are now aware on the importance of a pregnant woman to give birth at the health facility … these CHWs whom you have trained and the village leaders now know the importance of giving birth at the hospital, when a mother feels labor pains she can't wait for anyone there at home she will be escorted with her fellow or the community health worker here at the facility." [Health Workers Focus Group]

Improved Quality of Health Facility Services

Improved Delivery Health Outcomes

Participants, especially mothers and fathers, spoke about improved health outcomes related to deliveries, particularly with cases requiring intervention (e.g. C-sections, retained placenta). This was attributed to improved services provided by health providers in facilities, and CHWs assisting with accessing healthcare in a timely manner. In particular, participants reported situations where procedures conducted by health providers in facilities were critical in producing a good outcome, compared to getting treated outside the health facility.

"The safe delivering services in [facility] I delivered but my baby was not breathing and the doctors served her which she breathed and she is safe up to now and I am very grateful for the help." [Mothers Focus Group]

With respect to conducting safe deliveries, health workers who received the simulation and peer-to-peer training shared experiences about saving the lives of mothers and children at the health facilitates by doing blood pressure check-ups, recognizing danger signs, and managing eclampsia appropriately (including giving magnesium sulfate and/or doing referrals). Participants also discussed observing providers in the past who did not check for BP and discovering a woman has eclampsia, and situations where the doctor had not managed or recognized eclampsia, but that they were able to identify it and follow the correct procedures to the save the mother's life.

"MnM training program has been very helpful and especially to helping mothers with Preeclampsia and Eclampsia. I can manage a mother with Eclampsia very well. I have been able and confident to calculate the proper dose of Magnesium Sulfate to mother with such problem. But at the beginning I did not know what to do, but now I have the ability to manage Eclampsia and have saved mom and child's lives." [Sim Study Focus Group 2]

Enhanced Health Facility Experiences

Several participants described an improved service experience at health facilities, including being welcomed by health providers and receiving timely care, compared to past experiences when they may have had to wait a long time, were sent away, or felt somehow less important. Participants also noted that in some communities, CHWs help to clean health facility grounds, which not only contribute to a friendly and welcome environment for clients, but also help ease the workload of health workers. One HFGC representative attributed enhanced quality of health services to the Mama na Mtoto project training health workers on respectful communication.

"… our client are so excited with the quality of service provided, you know when the client reach at the facility, she better get what she expecting to get and not be delayed. Should not be treated badly … good language taught by Mama na Mtoto, most people have been coming to provide the service and they normally introduce themselves that they come from Mama na Mtoto … through Mama na Mtoto people were trained … pregnant mothers can even mention who helped her during delivery, she mention a name … so through those trainings and clients are satisfied with the service provided." [HFGC Focus Group]

Prioritization of Maternal Health Care at Health Facilities

Participants experienced a prioritization of maternal care at health facilities and linked this change to the Mama na Mtoto project. This was noted as a change from the past, when women would wait longer to receive health services. Whereas now, participants described health facilities to demonstrate a new priority for pregnant women and newborns, resulting in more efficient services and timely transfer of care when needed.

"… before Mama na Mtoto project, I used to see in health facility like where I work, they were supposed to queue as normal patient to see health providers, but after Mama na Mtoto project there changes and there is a special place for mother and children and that is what I saw as significant changes and I congratulate the project …" [HFGC Focus Group]

Child Health
Improved newborn health outcomes Many participants who received training in simulation and peer-to-peer learning described experiences about helping a baby(ies) to breathe and recover, sterilizing the equipment, using the equipment for resuscitation, getting help from colleagues as needed, as well as rubbing the baby's back. Some participants described helping multiple babies to breathe in a month (15 babies at one health facility) and commented on how prior to the training many children were left to die because they did not know how to help them survive. They also shared about the practices they did before or what they observed the doctors to do, which were not appropriate (e.g. slap the baby, hold the baby upside down until they cried) and that it used to be a major challenge. *"I together with my other health providers, have saved the life of newborns for a huge extent. for example; we have helped baby to breathe to 15 babies in last one month. This is the efforts of Mama na Mtoto trainings. Could not have the skills got from Mama na Mtoto, we might have lost some of them. But all 15 were helped to breathe and they survived." – [Sim Study Focus Group 1]*
Overall Improved Under-Five Child Wellness A recurring theme emerging from participant groups was perceptions of overall improved child wellness that was attributed to Mama na Mtoto implementation (particularly for children under five) in the areas of nutrition, immunization, disease prevention, and health facility visits. *"The success brought by Mama na Mtoto project is that … children under five are brought to the facility for weight measure but also children are coming for vaccination at the right time." [CHW Focus Group]*
Improved Nutrition Participants described enhanced community education regarding nutrition for infants and young children. Some parents spoke about the impact of CHW education on breastfeeding and the health benefits of colostrum, introducing solid foods, food preparation, preventing malnutrition, and the availability of support from CHWs. Household visits from CHWs appear to positively impact families, leading to enhanced nutritional awareness and practices. Community members shared an increased willingness to seek help when needed. *"… we have benefitted through our CHWs that the first milk is rich for the baby and it is nutrition and a cure, so we have that knowledge which is a benefit for us, in the community and family." [Mothers Focus Group]*
Increased Uptake of Vaccinations When describing health changes resulting from Mama na Mtoto implementation, participants (particularly health and government leaders) spoke of increased uptake of child immunization services. Participants perceived that more children are receiving timely vaccinations, which was attributed to increased community awareness facilitated by CHWs. *"I have see the changes to my community, people have been motivated and increased awareness, majority are deliver at the clinic and children are getting vaccines at the right time. Before we find other children with three years without any vaccine even one vaccine, but for now they are no longer … all of them are going to clinic and get vaccine. And for those who are sick, those mothers are staying at home while they are sick, now they are coming to clinic and get vaccine at the right time." [CHW Focus Group]* One CHW described an experience with a family who resisted vaccinations due to a fear that they would cause disability. However, through education and moral support, the CHW was able to convince the mother to take her children to the health centre for immunizations.
Improved Well Child Care-Seeking Behaviours Participants shared a perception that overall more children are receiving health services and immunizations in Kwimba and Misungwi districts. Participants spoke of an increased willingness of families to bring infants and young children to health facilities for routine check-ups and immunizations as well as to address illnesses. Likewise, VEOs and health workers described health facilities receiving more child patients. Some of these participants also spoke about the role of the CHWs in encouraging postnatal care and health facility check-ups for children. However, specific discussion of postnatal care and follow-ups for women and mothers was not apparent from the data. *"Another positive result seen is for the children in the community with different health challenges. Through CHWs who have been trained by the Mama na Mtoto project they have been able to identify them and give the referrals to come to the health facilities, and these children have been attended immediately … in case there are children who have not been given vaccinations, they are also given referrals and come, and these have been a positive results which has support us to identify children at the early stage." [CHW Supervisor Focus Group]*

Improved Home Hygiene & Sanitation Practices
Numerous participants, particularly mothers and fathers, discussed the role of CHWs in encouraging people to live in a clean, healthy environment with proper sanitation for washing and food preparation. In particular, many participants mentioned an increased awareness around having proper latrines and toilets. Participants highlighted the impact of community education through CHW home visits and public meetings. Community members shared an awareness of the importance of healthy home practices, suggesting that many households have improved their living environments. *"There is a big understanding compared to the previous time … before people were not aware about health regulations … but they have come to sensitize about toilets, people nowadays are educated … almost each household has a toilet and clean water … people have this awareness after the Mama na Mtoto project." [Mothers Focus Group]*
Reproductive Health & Family Planning Awareness
Engagement of Youth in Reproductive Health Participants shared that communities, particularly youth, were receptive to education surrounding safe reproductive health. *"… introducing CHW at the community level was there purposely to ensure availability of knowledge to the community members … they were not utilizing it because of lack of knowledge … now we're visiting secondary schools on reproductive health, it is good. In the future … perhaps every community member will be aware … after the Mama na Mtoto reproductive health education spread in the secondary school, everyone will be aware." [VEO Focus Group]*
Uptake of Family Planning Education Participants observed that CHWs are bringing family planning awareness to community members—men, women, and youth—through education. This includes using contraceptives to control the number of children in a family and the intervals between their births. *"… the CHWs are advising us to apply the family planning methods and spacing between children and get time to use contraceptives." [Mothers Focus Group]*

5.4.3 MNCH Non-Health Outcome Indicators – Qualitative Findings

Table 20 provides a summary of non-health indicators that were evaluated, which were identified in the qualitative inquiry and the external evaluation.

Table 20: Key Qualitative Themes, Non-Health Outcomes
Enhanced Male Engagement in Maternal & Child Health
Improved Family Dynamics Fathers, community leaders, HFGC representatives, and CHWs mentioned a noticeable increase in male engagement in maternal, newborn, and child health. Numerous participants commented on enhanced closeness, communication, and cooperation within families, particularly between husbands and wives. Fathers were particularly forthcoming when discussing male engagement and the positive impact on family relationships and functioning. Many participants commented that the increase in male engagement was, in large part, due to CHW home visits and education about the important role of fathers in antenatal care and birth preparedness. *"Let me give another example about relationship, since the project began … I think motivation has been there, we have peace now and the love been restored in our families … speaking on the issues of mother and child, we were mobilized that if the mother maybe has another child, you as father you're supposed to help her with other responsibilities in the household … not a normal thing for men … in that sense I think peace has been retained." [Fathers Focus Group]*
Increased Partner Attendance at Health Facilities Several participants commented on the role of men in encouraging pregnant women to attend health facilities for antenatal care, coupled with an observed increase in attendance at health facilities by pregnant women together with their male partners. All types of participants, but particularly men—including fathers, village leaders, and HFGC representatives—commented on an increased community awareness about the importance of men attending clinics with their pregnant wives, and the noticeable overall increase in male engagement at health facilities. *"There is a personal change … I was not aware on health education that I supposed to attend clinic with my wife, so I thought it was for her to go and come back or attend clinic alone. But now I have understood … I thought it was mothers' responsibility to go to clinic all alone. After educated I am aware that I have a chance to go and listen to the health expertise while educating on the reproductive health and child care sessions … thank you … there are so many thing we are educated, reproductive health, how to upbringing children … so I am enjoying." [VEO Focus Group]* However, participants mentioned that some resistance from men still exists due to traditional attitudes and beliefs that men should not be involved in women's health. Many participants identified the need for ongoing education to maintain the momentum of male involvement and further inform community members.
Male Desire to Lead by Example When speaking about male engagement, some male participants identified the importance of role modelling, indicating a personal desire to set a positive example for other men in the community. Several male participants also mentioned the personal benefits derived from becoming more involved in the health of their partners and children including education, awareness, leadership, and healthier families. *"I personal I do get involved so that my community to know the importance of the project … I attend clinic with my wife for health services … sometimes they see us together, therefore through my involvement that why we can see that achievements … yes, I am a role model … that we have not brought something which is harmful to their health." [VEO Focus Group]*
Improved Gender Equality & Female Empowerment
Impact of Gender Equality Training Participants reflected on enhanced knowledge of gender equality in the community, including increased family cooperation and female empowerment, which in turn can lead to improved maternal, newborn, and child health, especially in the areas of birth preparedness, accessing timely care, and decreased family violence. This enhanced knowledge was attributed to the gender equality training that Mama na Mtoto provided to CHWs, health providers, and local leaders. This change in perspective may impact society at multiple levels: individuals, families, health facilities, and communities. *"Changes which I see … most of men have changed, we used to segregate work that these work are for women only and those are for men, but for now we are cooperating very well … like fetching water we used to leave it for women, but as for now we have been educated we are close with them and we are helping each other heavy work." [Fathers Focus Group]*

However, one participant noted that though the movement towards gender equality is important, it can be challenging in a society where male-dominated customs and beliefs are so entrenched in the local culture. Care must be taken to ensure that gender equality issues are addressed in a way that is still sensitive to existing social norms.

"… there is something good from Mama na Mtoto I saw but is contradicting the community's culture. It is really meant to improve the peoples' health but is contradicting. The thing is this gender equality which good but when you go to the community it needs a great experience and it should go gradually and we later see its fruits but as per now it is a challenge in changing this community from chauvinism to feminism when things to consider is that people are born in an inequality men dominating world which is a normal thing in a community so it is like you are intervening their norms it is the thing that needs courtesy for you to move with the community." [Health Facility In-Charge Focus Group]

The external evaluation revealed some impacts of the Dignified Respectful Care (DRC) approach within the district health management teams and across some health facilities.

"*We began to see a difference around what gender-responsive care means. In multiple and reinforcing ways, the quality of care was improved. It's also improving the attitude of all service provision staff, and that everybody has a role in making service welcoming to clients and treating people well. I think we did that very effectively" [Project staff, External Evaluation]*

The project also had an influential role in changing perceptions of local bylaws requiring pregnant women be accompanied with their husband for ANC, or fining families when women gave birth at their homes. The project increased understanding that such by-laws were ineffective and counterproductive. Consequently, the districts changed their approach and did not support the enforcement of this policy.

In response to the gender equity content provided to CHWs, CHWs were reporting on GBV to the CHW coordinators; these issues were raised within the HF and connections were made with the police gender desk. The CHMT confirmed that GBV was being reported to the CHWs who could access medical and legal action. The CHMT further reported the presence of cooperation with the local police. The coordinator further commented there had been improvements in the trust women had for the HF, whereby they were more willing to share information.

Other outcomes include the CHMT in Misungwi reporting they had begun allocating staff to HFs according to gender considerations. This was feasible within the HC where there was a good mix of staff, but at the dispensary level there was an insufficient number of female clinicians.

The technical team members noted a greater level of involvement among women in the Misungwi CHMT. At project onset, they observed women would not speak aloud during group meetings in the presence of male counterparts. During orientation the technical team project leads felt challenged to find a way to encourage the participation of women; if they could get women to speak, they would learn a lot about the issues the CHMT was facing. According to the technical teams, female CHMT members began to confidently share their thoughts over time. The project's participatory approach contributed to this change.

Increased Female Empowerment

In addition to gender equality, participants commented on the improved status of women in households and in society. Participants also noted increased female empowerment as more and more women are being seen in frontline roles, such as being a CHW. The role modelling and leadership of CHWs has improved the status of women in communities where women report feeling that their voices are now being heard. As the status of women increases, some participants identified this as an opportunity for women to step into a new leadership role of being advocates for and empowering other women.

"I would like to talk about leadership, if I look in our area, in the past the community used to say that if a woman stand up and talk on something it seems as whatever she is talking is pointless, but if I look now, when I look at these CHWs in our village a big percent are women so through that the community see that even women can do something." [Health Workers Focus Group]

5.5 Maintenance (Sustainability)

To evaluate sustainability, three key indicators were assessed through the CHW retention study, qualitative inquiry, the CFIR rapid evaluation, simulation study, and the external evaluation. These include:

- Leadership engagement
- Education and training at all levels (district, health facility, and CHWs)
- CHW retention and sustainability of the CHW program

5.5.1 Leadership Engagement

The findings regarding sustainability of leadership engagement are summarized in Table 21 below:

Table 21: Sustainability of Leadership Engagement
Importance of Engaging at Different Levels From the CFIR Rapid Evaluation, project stakeholders spoke about the importance of engaging different stakeholders at different levels as important for sustainability. In particular, one technical team volunteer noted that the engagement of district staff in Kwimba was particularly effective and encouraging for sustainability. A field staff commented on the effective approach of engaging In-Charge staff at the facility level, to ensure that there is a continued budget to support activities. These staff have seen some benefits of the activities and are motivated to maintain them.
Importance of Strong Leadership & Collaboration Participants discussed the importance of continued leadership, accountability, and collaboration to maintain sustainability of project activities. Many participants felt this was possible due to their involvement with the project's decision-making and planning thus far, creating a feeling of ownership. However, they also recognize that this cannot be done without putting in the work. While participants recognized that the Mama na Mtoto project would ultimately come to an end, they hoped that a system of supports could be implemented through collaboration with government and health leaders in order to sustain project activities and goals for the ongoing benefit of communities. Many stakeholders expressed hope that, with structures and supports in place, CHW activities could continue without Mama na Mtoto oversight. *"We want to build that sense in the community or to our government structures that every project should be sustainable … we have trained CHWs … knowing that s/he will be trained … will be recognized in the community, but the issue is how are we support CHWs to implement their responsibilities through the existing structures. We know that … this is our people and we can continue to use them I other programs which will be conducted … so that will enable to sustain that people … even if the project has stopped or Mama na Mtoto have finished their time … activities will continue to be implemented … the most important thing on accountability to enable the project sustained in the community." [Government Interview (CHMT Member)]*
Strengthened Community Relationships The qualitative research inquiry found that the Mama na Mtoto project has built important relationships—or strengthened existing ones—between many levels of the community structure. All types of community members, including mothers, fathers, children, traditional healers, health providers, and community leaders, were described to have been interconnected by the project in some way, and many participants felt that they have benefitted. This includes CHWs developing supportive relationships with their peers, CHWs establishing better linkages with the health system and local leaders, improved reporting and communication about household issues, and facilitation of peer-to-peer mentorship and training between health district staff, health workers, CHWs, and community members. These strengthened community relationships may help to ensure that the project benefits can be sustained in the long term. *"My advice to any other district … to implement Mama na Mtoto project, they should not only expect benefits for mother and children … they should expect that the project will improve health service in their area including the skills of the health providers … capacity building and mentorship from the project it has a benefit to the staff. But more than that, is to the community in general … it helps them to get health education from the hamlet level … help to link the community and the health providers … link health providers and make sure the health services are provided well … the project is helping to link community and community because it provided trainings to the health committees … better techniques to implement health services in their areas." [CHW Supervisor Focus Group]*

5.5.2 Education and Training at All Levels (District, Health Facility, and CHWs)

The findings regarding sustainability of education and training are summarized in Table 22 below:

Table 22: Sustainability of Education and Training

Learned Knowledge & Skills

Participants spoke about the benefits of the training and education provided by the project, indicating that their new leadership skills and health promotion knowledge are unlikely to be forgotten. Community members also discussed sharing their knowledge to other community members or the future generation so that the education can be sustained.

"This activity will be sustained because every one of us, through CHWs, we have learned … the way we have been taught for example, in my family I am already a teacher to my generations, when my child grow up I will direct her on how to care about the pregnant … they will continue in the future generation even when this project come to an end, we as mothers will already have the knowledge so it will not be much problem, we will be benefitting." [Mothers Focus Group]

With regards to the skills developed by the District in planning, procurement of equipment, mentorship, and using simulation, the District felt confident in maintaining what they had learned. They had credited the participatory approach of Mama na Mtoto to build the Districts capacity to identify gaps and determine priorities for improvement, to lay good foundations for sustainability. In particular, skills in reflection were seen as "transformational" for district staff to assess what is working and what is not. Communication skills were also seen as skills learned through the project that would sustain, as they have changed attitudes of the staff.

"we learned our problems are resolved by ourselves". [CHMT member, External Evaluation]

Despite this, some project staff were uncertain about the CHMT's ability to maintain skills and to mentor health facility staff in clinical training without refreshers.

In the evaluation of the simulation and peer-to-peer learning program, participants also viewed the peer-to-peer program in particular, as a way to sustain and retain knowledge in a practical way. Participants described having developed a training schedule at their facilities to teach each other on a regular basis.

"We always have a weekly class on every Wednesday so we all participate even those from the labor, we appoint a person who got training, all health practitioners will come that day even those off-duty join us. We planned that we learn on every Wednesday about eclampsia, the doctor is there, all people, all nurses attend, so we all teach one another regardless of age and positions." [Sim study, Focus Group 1]

Moreover, participants described how the Sim-lab has helped them retain their skills through practice using the equipment. The sim-labs have also allowed them to continue training others and have helped them to feel more confident in providing care, especially if they have not practiced their skills in some time.

"…the equipments on the SIM lab station, at the facility; I see we should progress because it is helpful when you forget, when you reach on the table you are there is something I didn't practice for long so sim-lab is very important in strengthening and widening our experiences" [Sim study, Focus Group 2]

Request for Continued Education & Mentorship

While participant groups discussed the positive impact of the education and training they have received through the project, several participants identified the need for ongoing education and support, particularly for volunteer CHWs. Village leaders highlighted the importance of ongoing community education to promote health facility attendance and ensure continued results.

"There are some changes in my village … before the Mama na Mtoto project and now. The education has been very useful to majority of people, they are now aware on the importance of attending to clinic at the right time … whenever you go to educate the community, you expect good result, so when you see a good result you must be proud of it that we are in a good situation … yes, we are heading in a good place although we are still needing the education." [VEO Focus Group]

One participant from the simulation study requested for more training or expanding training to other technical areas.

"The workshop helped me very much, I think the Mama na Mtoto project should continue to stretch their effort to other technical areas." [Sim study, Focus Group 1]

With regards to sustainability, the health providers who received simulation and peer-to-peer training noted that mentorship support through the District should continue. One participant noted the value of mentorship and supportive supervision, particularly in ensuring that the facility had appropriate equipment available.
"I go back to the mentors' service it should continue in our facilities through DMO, communicate with him for sustainability and keep updating." *[Sim Study Focus Group 1]*

CUHAS' Role in Sustainability

From the CIFR Rapid Evaluation, it was noted by one of the technical team volunteers that CUHAS would be an important facilitator for sustainability, as they could provide ongoing training and mentorship. Likewise, the external evaluation also found that sustainability was seen to be contingent on the ability of CUAHS to maintain support and assuring continued cascading of training and mentorship. In particular, stakeholders found that there is strong potential for health facility staff to maintain their training in clinical neonatal care with CUHAS' support.

5.5.3 CHW Retention

The findings from the CHW retention study found that after two years, 49 of the 769 CHWs in Misungwi were no longer active as CHWs. This represents a retention rate of 94%. In Kwimba, the retention was 98% a year after initial training; only 20 of 895 CHWs were no longer active in their roles.

A total of 69 CHWs in both districts 'exited' their roles (Table 23). Most CHWs (77%) left for reasons that were not related to their CHW role; the most common amongst these were moving or relocating (62%). Twenty-three percent of exiting CHWs left for reasons that were related to their role; reasons included community rejection (9%), no longer being interested (7%), or being too busy (7%).

Table 23: Reasons for Exit, Initial CHWs, Misungwi & Kwimba Districts Combined

Category	Reason	Frequency
Not Role-Related	Moved or Relocated	43
	Own Death	3
	New Job	3
	Family Duties or Health	2
	Divorce or Separation	1
	Poor Personal Health	1
	TOTAL NOT ROLE-RELATED	**53 (77%)**
Role-Related	Community Rejection	6
	No Longer Interested	5
	Too Busy – Personal Reason	5
	TOTAL ROLE-RELATED	**16 (23%)**
	Combined Total	**69 (100%)**

The findings regarding sustainability of the CHW program are summarized in Table 24 below:

Table 24: Sustainability of CHW Program
CHWs Will Continue to Exist Many participants were optimistic that activities, including CHW involvement in communities, would endure after project completion. Reasons provided were that the CHW network was established within pre-existing structures, CHWs have built skills and capacity, CHWs have developed good relationships with their communities, and CHWs have demonstrated strong collaboration and a commitment to their volunteerism, including starting their own income-generating activities. One government representative also felt optimistic due to the success of the sustained CHWs in Uganda, describing appreciation for learning from their successes and failures. *"CHWs will continue to exist, because they have the capacity and they can be sustainable, for example … they have established their groups, whereby some of the groups have been for money lending, and others is for economic empowerment … we believe these CHWs groups will continue to work … they have their coordinator at the district level … there is a need to have CHWs coordinator at the district level, he is there and collaborates with them, in report collection to ensure that they are going ahead under the district leadership." [Government Interview (CHMT Member)]* From the CIFR Rapid Evaluation, one participant confirmed the sustainability of the CHW program, indicating that the presence of national trainers embedded in the districts would allow the District to access these resources without the same costs. Another participant described discussions they were involved with regarding sustainability of the CHW program. They found that the CHMTs and in-charges of facilities were trying to find ways of sustaining the program because they saw the advantages of it *"So whenever we have the platform of meetings with CHMTs or with in-charges of the facilities we normally speak to them and try to analyze on how they can help the CHW program after we have left. So most of them because they have seen the advantage of having the CHW program at the program, at the facility level, they are positive and they see that they can do something to enhance sustainability." [Field staff CFIR rapid evaluation]*
Reduced CHW Motivation Threatens Sustainability While all participants wish to see continued positive outcomes, particularly through CHW involvement, many also recognized challenges to sustaining their volunteer roles, highlighting motivation as a potential sustainability barrier. Specifically, participants mentioned the lack of remuneration, coupled with a heavy workload as having an affect on deteriorating motivation. Suggestions were made to provide CHWs allowances to sustain their motivation after the project. *"The challenge we are facing … it is a voluntary work, what they get is not enough to cover for their family needs … we have drop outs, some of them caused by family responsibilities, because of the limited incomes. If we could be able to add for what they are getting, we could be able to sustain their performance … they are using a lot of time to serve the community, it is a tough job, it is real tough … they should volunteer but it is a difficult job." [Government Interview (RHMT Member)]*
CHW and Supervisor Requests for Equipment & Transport Support CHWs and CHW Supervisors also articulated the need for ongoing provision of their working tools and supplies, as well as support to continue their group meetings. For instance, there was a concern that CHW register and report books would not be replenished, or that the team meetings would not be sustained after the project. Additionally, a recurring theme was a request for provision of equipment and transport that may help CHWs to better serve their area, including notebooks, protective gloves, rain gear, bicycles, or other transport supports. CHWs expressed a concern about attending to women and families in a timely way, especially in the night and particularly if they serve a geographically large area. *"I am worried if the project activities will continue after the end of the project, for example … submission of monthly report, this may not continue because CHWs may have a limited working tools such as register and report books … my request to the Mama na Mtoto project … would look more on how to strengthen CHW groups … enable them to be together for a long time … enable them to meet regularly and discuss important issues which they can sustain." [CHW Supervisor Focus Group]*
CHW Incentive The external evaluation found that the training on financial incentive opportunities (IGA and savings loans) offered to the CHWs would help to strengthen the likelihood that groups will remain active. This was recognized as a best practice among technical team volunteers regarding CHW retention. The CHWs shared a sense of belonging. The CHWs shared many of their personal gains, such as the purchase of corrugated iron sheets for home; pay for school fees and bicycles.

5.6 Evaluation of SOPETAR – CFIR Rapid Analysis & Partnership Feedback and Reflections

In evaluating SOPETAR as a process model, feedback was obtained from the field staff (Agriteam members), technical team volunteers (representing UC, MUST, and CUHAS), as well as district leadership through the CIFR rapid evaluation and meetings with partners, where they shared their feedback and reflections. An analysis of the feedback showed two major themes emerge:

1. The acceptability of SOPETAR as a process model (identified by the CFIR constructs related to evidence strength and quality, adaptability, complexity, and design quality and packaging)
2. Perspective and experiences related to the SOPETAR processes. The SOPETAR phases were aligned with the CFIR constructs related to implementation processes:
    - Scan (Planning)
    - Orient (Engagement)
    - Plan (Planning)
    - Equip (Execute)
    - Train (Execute)
    - Act (Execute)
    - Reflect (Reflection and Evaluation)

A summary of the findings based on what partners thought 'worked well' (facilitators) and 'what did not work well' (barriers) is found in Table 25. The external evaluation obtained similar feedback from stakeholders.

Table 25: Summary of SOPETAR Evaluation

What *Didn't* Work Well?	What *Did* Work Well?	Quotes
Packaging and Adaptability of SOPETAR		
• There were noted challenges in understanding SOPETAR (seen a complex), what makes it unique, and what is need to have vs. nice to have • SOPETAR did not take into account the importance of considering cultural nuances • SOPETAR was presented in a "fixed way" and not seen as flexible for adaptation • Challenges with implementation resources for SOPETAR (incomplete – too much/too little detail, not translated into Swahili, resources such as videos not used)	• SOPETAR gives "names" and "categories" to help streamline a complex intervention ("now we are orienting, etc.) and provide direction • SOPETAR steps were seen to be meaningful – helpful to think through sequence of processes and resources required that would inform future steps • Seen as participatory by using it at all levels with the districts, health facility, and community • Process seen as flexible and promoted adaptations for implementation in Kwimba, based on learning from Misungwi	*"…the flexibility within the SOPETAR is very high because once you find that…is it not working, you are not going anywhere, there is room for flexibility regarding to planning again. So that way, that flexibility kind of, it was, really helpful in, in making sure that things are happening. Because there is a room of reflection, then you come back again. Is it a model that is, can be, uhm, applied in a, in any time."* – Field staff *"…mmm flexibility of the Mama na Mtoto I would say is something unique. We have had several partners, we have done a lot of projects with other partners but the room of flexibility with Mama na Mtoto is, I would say is maximum."* – District stakeholder *"I think that with the adaptability to, the model has a lot to offer in terms of the adaptability. Um, but how we present it is also important, that, that*

		we don't present it has a fixed and hard way, that there is cultural humility in that conversation as well, because we don't know everything about, you know, all of the other bits and pieces, right?" – Tech team volunteer
SOPETAR Phases		
SCAN • Timing of scan was a challenge (done early), then key people changed (field staff, DMT), resulting in a lack of buy-in **ORIENT** • Lack of communication - need for extensive engagement was not initially valued (wanting to see action instead) • Orientation of too many people was not seen to be an effective way to spend time if not everyone was actively contributing to implementation • High levels of staff turnover was a challenge for orientation (e.g. CHMT), where new staff were not familiar with the project and their roles **PLAN** • Challenges with implementation in Misungwi was seen to be due to a lack of time given to planning • Planning steps (i.e. Action Planning) in health facilities was not a clear process **EQUIP** • Timing for equipping is not always ideal – there are issues with storage if equipment is procured early, delays in activities if equipping is late (impacts handover strategy)	**SCAN** • Baseline evaluation (with both qualitative and quantitative data) seen as being helpful for understanding the situation in the district and informing implementation **ORIENT** • Field visits in Uganda helped to understand the process • The cascading approach to orientation was seen to be effective; recognized power/hierarchy structures **PLAN** • Staff involvement in planning • Took into consideration of the needs at each level, including budget needs and priorities (i.e. construction of health facilities) **EQUIP** • Project's ability to buy equipment was seen to be important in order to carry out activities **TRAIN** • Supervision (mentorship) approach that was supported by the field and tech teams was seen to be	*"Ya, in the, in the, the good thing that I've been involved is the planning. Planning, when you reflect about the whole cycle, that the important things is planning. When you plan it, it will be really depend on how are you going to go through all of those stages. Because when you plan better, is it the way you will be moving that SOPETAR, it will make you easier for that, so it is, it is, kind of spending a lot of time, spending a lot of time in planning."* – Field staff *"So for Kwimba, the lessons we learned from here, I sat down with the teams, with the Kwimba team and with the Misungwi team, and with the CUHAS team, to try and plan on how things would go better. And they had very definitive ideas on how these programs should be delivered which was slightly different. So the programs were the same, but the way we organized it was different."* – Tech team volunteer *" And we have like, a model, is applicable to… different stakeholders you have to move with the same pace…So in sometimes, because of that you find that some of the stakeholders may lag behind"* – Field staff member *"I can say the inclusion of local government leaders was high, that's why we experienced a lot in the community today. Uhm, the support from the, but also the support from the hamlet leaders, the hamlet leaders are the ones who normally mobilize the people at the grassroot in the community. So they did a lot on supporting the program. For instance, on the village meeting, the one who was, uhm, speaking about, for instance,*

TRAIN • Potentially too much training **ACT** • Activities happening simultaneously required the same people **REFLECT** • Poorly understood and not clear as being part of an iterative cycle • More time was needed to follow up after each stage (not as helpful for learning in the phase-out of the project) • Should have included more sustainability planning; CUHAS can play a role as a permanent support network for the Districts	effective in promoting ongoing learning • Training received through the project inspired district to be more inquisitive, not judging people by their attitudes or behaviours, but trying to understand why they might act a certain way • Quality of the training was seen to promote effective implementation, especially simulation/peer-to-peer training **ACT** • Project staff were credited for ensuring smooth coordination of activities, schedules, and resources needed **REFLECT** • Seen to be a valuable process to allow for discussing challenges and working to make improvements or changes	*a lot of the CHWs were, there were the local government leaders, the one who was just introducing into the community, so we were just there observing, but also supporting the achievement. But the ownership was high to the local government leaders."* – Field staff *"…the government leaders support…yes because, because of the proper orientation we did before, now we see the outcome of that. The support from the government is too high. Yes and we have seen even some of the local government leaders, they have started strategy of motivating the CHW themselves, for instance, exempting them from doing the public activities at the village levels."* - Field staff *"…Because of the new government. So probably, most of them do not really understand what does it takes to become a CHMT. That is one thing, ok, and that's probably why they before given those roles and responsibilities - were they properly oriented?"* - Tech team member *"There has been sometimes maybe, stages where you can jump, once you jump like, we were implementing like, we were supposed to start with the training and then immediately you have to go for the equipment. You plan, then you go to training, then you go to equipment, but sometimes you find that you delay a bit somewhere because of the delay of the find, like, equipment, ya, or maybe delay because there is other activities. Then you have to jump to other like, you have to make like, mentorship, following of what has been, what you have been training, because the process, the engaging, getting the equipment."* – Field staff

5.7 Partnership Evaluation

Feedback was also obtained from project partners, including the Mama na Mtoto field staff (Agriteam members), technical team volunteers (representing UC, MUST, and CUHAS), as well as district leadership through the CIFR rapid evaluation and meetings with partners. An analysis of the feedback showed two major themes emerge:

1. Engagement and orientation of implementation partners
2. Networks and communications

These major themes were identified from the CIFR constructs related to the 'inner setting,' including: structural characteristics, networks and communication, culture, implementation climate, goals and feedback, learning climate, and leadership engagement.

A summary of the findings based on what partners thought 'worked well' (facilitators) and 'what did not work well' (barriers) is found in Table 26. The external evaluation obtained similar feedback from stakeholders.

Table 26: Summary of Partnership Evaluation

What *Didn't* Work Well?	What *Did* Work Well?	Quotes
Engagement and orientation of implementation partners		
• Partnership development and power dynamics were seen to be a challenge, particularly at the beginning • It was recognized that time is needed to develop partnerships (compared to long-standing relationships in Uganda) • There was a lack of clarity and appreciation around the various roles and responsibilities of team members and partners • There were many partners, and it was challenging to reconcile different priorities and expectations • It was suggested that there was a need for longer orientation for staff and tech teams, particularly as many were not familiar with the activities or experience with working in the community.	• Strong leadership in the field was seen to be important in keeping the field team engaged. • The engagement of people with technical expertise was seen as important, as they were seen to have appropriate expertise and could be trusted for their knowledge/training. • There was appreciation by a tech team member for being engaged throughout the project and having opportunities to work with people they developed positive relationships with.	*"…of course we had a lot of challenges just between the Canadians at the beginning with the multiple partners…that was a big challenge for implementation as well, in terms of understanding roles and responsibilities, [even] just among the Canadians."* – Tech team member *"…you know when we talk about engaging the people, people who are specialized like pediatricians, and uh gynecologists, and people who are, they are exposed in the university, they have moved to the low health facility to train, to be trained, imagine a nurse who has been trained maybe with a certain color of tutor, and she is receiving the knowledge from the high technical people like the gynecologists and the obstetricians, which is very rare in our , in our area."* – Field staff

Networks and communications		
• Communication and coordination challenges between the technical teams, Canadian office, and field staff was seen to hinder implementation, especially at the beginning • Technical team members were often not aware of what the others were doing; they were missing the "big picture," leading to some overlap, especially between the health systems and health facility components • Expectations and perspectives were at odds at times, particularly for field visits, where tech team expectations were seen to be high and visits sometimes disrupted activities • More consultation with the field team could have ensured more productive visits and less tension between partners • Cultural communication styles may have led to poor communication between team members • Perceived hierarchies were also seen to hinder communication, where staff did not feel comfortable communicating directly with the Directors.	• Good leadership and team members were seen to facilitate improvements in the relationships between team members and promote commitment, by forging friendships, changing/clarifying roles. • Communication in the field was found to be effective (people knew what others were working on) due to having staff located in the same area were "cross-fertilization" could take place. • Shared values for commitment and passion for working with community was seen as a factor for MnM's success.	*"…at the very beginning…that was a very difficult visit, in fact…if I was, I actually came home prepared to not participate in the project at all based on how that visit went. Um, but um, changes happened…But that changed… and it became very good."* – Tech team member *"…this was Tanzania's first go at it, and thinking about things from a different way. And trying to do things in a different way, and so you know there was, you can completely understand some of the tensions between some of the Ugandans and the Tanzanians…"* - Tech team member

6. Knowledge Dissemination

Stakeholder groups were involved at all stages of this endline study including planning, tool development, and data collection. The overall evaluation within which this endline study is embedded is designed to engage stakeholders and data users at all stages of evaluation through processes as outlined in the Knowledge to Action Cycle (Graham et al. 2006) endorsed by the Canadian Institutes for Health Research (CIHR).

Dissemination Meetings with Key District Personnel
Dissemination of endline data began in December 2019 with all results shared with high-level stakeholders in Misungwi and Kwimba districts over several meeting. These meetings were led by the PI, Dr. Dismas Matovelo and the Co-PI, Dr. Jenn Brenner. In January 2020, members of the research team and Agriteam presented project results to district champions – individuals that played a major role in MnM.

From this point onwards, champions with support from the MnM team took ownership of the results and were responsible for presenting at future meetings. After every meeting with district personnel, MnM implementation team guided participants through breakout sessions to discuss areas of improvement and brainstorm concrete action plans moving forward. Action plan items consisted of the area of concern, cause, intervention needed, timeline and party responsible. This process was repeated, and the results documented for every meeting.

Community Dissemination
After sharing project results with key district personnel, these individuals were well prepared to share information with CHWs and carry out community-level disseminations. The meetings were largely led by CHW Supervisors and CHWs in their respective communities with support provided by VEOs and health facility personnel when needed. High importance was given to sharing data showcasing the impact of CHWs on health facility deliveries, ANC, and PNC. Furthermore, these meetings were also used as an opportunity to clarify the role and responsibilities of CHWs in their communities and relay the importance of continuing CHW activities. Community dissemination started in early March and was planned to continue until information had been shared in all hamlets. However, COVID-19 travel restrictions and bans on public gatherings have halted dissemination progress since April 2020.

Mama na Mtoto Symposium
Endline results were shared during the Mama na Mtoto Experience Showcase on March 10, 2020 in Mwanza city; accomplishments and key results of the Mama na Mtoto intervention were celebrated with regional/district stakeholders, partners, and communities. The event consisted of a full day of presentations and discussion of evaluation results, including findings from sub-studies from IDRC-funded sister-projects. Printed materials were developed based on the experiences and feedback from dissemination meetings (see https://www.mnmtanzania.com/ for copies). An interactive 'Ideas Marketplace' engaged attendees through posters highlighting research and implementation outcomes, booths demonstrating newborn resuscitation and community innovations, and CHWs sharing products developed from income-generating activities.

Additional details regarding dissemination and stakeholders can be found in ***Appendix A – Endline Study Report.***

7. Lessons Learned & Best Practices for Implementation

A review of the findings from the process evaluation resulted in a synthesis of the lessons learned and recommended best practices related to implementation, the use of SOPETAR, and the Mama na Mtoto Package partnership.

7.1 Implementation

7.1.1 Lessons Learned

1. Mama na Mtoto's approach in using *deep* and *early* engagement at all levels was considered highly effective for enhancing district integration, increasing district leadership capacity, facility management/QI capacity, and establishing a functional CHW network. While it was acknowledged that there was little buy-in from the National government, the project was able to actively engage the following stakeholders:
    a. District staff, especially those from Kwimba, where implementation would take place one year later (after Misungwi)
    b. Health facility staff, such as health facility committees, In-Charges, midwives
    c. Local leaders (hamlet, ward, village levels)
    d. Community members, including women's groups, people with disabilities, youth groups
2. The project's "facilitation"/capacity-building approach was seen to be critical to the project's success and unique to the MnM project
    a. High quality training (e.g. hands-on training, simulation workshops, and peer-to-peer learning) was a key strength of the project
    b. The focus on mentorship was aligned with local government guidelines, although there was little planning for sustainability post-project
    c. The influence of key district staff enabled and motivated others
3. High levels of engagement if district staff in project activities was seen to be burdensome (i.e. many meetings, simultaneous activities), having implications for sustainability and delays to project activities
4. While CHWs played an important role in engaging community members and promoting healthy behaviors and care-seeking at health facilities, there were some gaps in community engagement, such as:
    a. More efforts should have been made to engage the community in issues around quality of care (e.g. respectful care from staff). This was seen to promote sustainability (continued investment) if patients were empowered to demand higher quality of care
    b. Understanding care-seeking among community members was seen to be a challenge, as it was expected for change to take place quickly (behavior changes take time)
5. High levels of retention among CHWs could be contributed to:
    a. Their motivation through their work, recognition in the community, and income-generating activities
    b. Organization of CHWs into teams to cover all households and provide a peer-network of support

7.1.2 Best Practices

1. Facilitating high levels of engagement at all levels of stakeholders to ensure a strong and comprehensive foundation for buy-in for implementation, creating champions, promoting sustainability
    a. Engaging stakeholders should also include clear communication about the key components of the intervention and necessary processes (e.g. CHW selection criteria)
2. Establishing a field office within the District (rather than in a city/outside the District) will facilitate continued engagement, foster relationship-building and enhance communication with the District, health facilities, and community.
3. Promote program integration by building on/leveraging existing processes, polices and structures (e.g. National CHW policies, leadership and supervision government guidelines, District comprehensive health plans, and regional/geographical organization, such as hamlets in Tanzania)
4. Providing adequate support to CHWs will facilitate a functional and sustainable CHW network, in particular:
    a. Training many CHWs and organizing them into teams to decrease the burden on individual CHWs
    b. Appreciating and recognizing CHWs through non-monetary means, by highlighting the importance of their work in the community
    c. Facilitating income generating/savings and loans groups among CHWs
5. Hiring staff with a passion and commitment to working with communities (e.g. Coordinators, Community Engagement Peace Officers - CEPOs), as they are critical for building relationships with community, engaging CHWs, and understanding community needs
6. A strategy should be developed in collaboration with District staff to address potential issues related to staff participation in activities, particularly:
    a. Mitigating burden on staff to engage in activities/reliance on key champions
    b. Orientation of new staff due to turnover

7.2 SOPETAR – Implementation Process

7.2.1 Lessons Learned

1. SOPETAR was seen as a valuable and participatory tool for guiding implementing staff and partners
    a. It provides a common language among partners and staff
    b. It helps partners and staff to think through and reflect on the sequence of processes and resources that could inform future steps
    c. SOPETAR provided a process to learn from the implementation of MnM in Misungwi in order to make the necessary changes to improving how MnM was implemented in Kwimba
2. There were some challenges in communicating SOPETAR, including the history of why and how it was developed, as well as how could be used.
    a. It was not clear that in using SOPETAR, there is a need to balance adherence (fidelity) to certain critical elements of the SOPETAR steps and the MnM model, while ensuring that there is enough flexibility to adapt components of MnM to better fit the local context (including adapting to culture, different priorities and needs)

3. SOPETAR provided little guidance for considering cultural nuances when replicating the Maternal, Newborn, and Child Health (MamaToto) intervention from Uganda to Tanzania (MnM)
4. Project time constraints challenged efforts to complete the packaging of implementation resources, which led to some frustrations experienced by field staff
    a. Further development of content was needed to ensure appropriate levels of detail were provided for various target audiences
    b. The materials were not translated into Swahili
5. For the SOPETAR "7 Steps":
    a. SCAN: Seen to be helpful for understanding the situation in the district, particularly with informing implementation with data
    b. ORIENT: The cascading approach to orientation was effective, as it acknowledged existing organizational structures. However, staff turnover (particularly for CHMTs) made it challenging to ensure everyone had adequate orientation and clarity about their roles
    c. PLAN: Promoted a participatory approach. However, considerations should be made for ensuring adequate time for planning and clarity regarding the planning process
    d. EQUIP: Viewed as essential to support implementation, but challenges with logistics can hinder implementation – either by needing to find storage for equipment if procured early or delaying activities if late
    e. TRAIN: Quality of training and supervision support (through mentoring) was found to be important for implementation and promoted continual learning (especially with simulation and peer-to-peer learning)
    f. ACT: Project/field staff were critical for smooth implementation. However, the use of the same District staff for simultaneous activities was seen to potentially challenge implementation (e.g. overload district staff, result in delays)
    g. REFLECT: A valuable process to discuss challenges and make improvements/changes. However, this step was not seen to be well understood as being part of an iterative cycle, and that there should be a process for reflection after each stage of implementation (not just at the end), as well as building in discussions around sustainability

7.2.2 Best Practices

1. The participatory approach of engaging all levels (District, health facility, and community) to be guided by the SOPETAR 7 Steps is key to ensuring adequate buy-in and readiness of stakeholders for implementation, as well as integration and sustainability of MNCH activities
    a. Considerations should be made for existing organizational structures of the local context. In Uganda and Tanzania, capacity was built among District staff to lead implementation using SOPETAR, who in turn mentored health facility staff, then community through the CHWs
2. SOPETAR should be communicated clearly among all stakeholders – why it is a valuable tool for implementation and how it is used
    a. Communication of SOPETAR should consider information that is appropriate to each audience, including language level, readability, and format
        i. Researchers tend to favour higher level of detail, including the guiding theories models and frameworks, and more technical language.
        ii. Policymakers and system partners tend to want high level descriptions of what the intervention is seeking to impact, and the basic components of the intervention.

iii. Implementers at the front line tend to want easy-to-read documents that outline logistics of what they are expected to do and why

b. Clarity should be made regarding the core elements (what is necessary to maintain the evidence and practice-based foundation of the intervention) and what could be adapted or tailored to the local setting

c. Use of SOPETAR for implementation of interventions across different cultural contexts (e.g. countries East African countries) should be explicit about the importance of considering cultural nuances and potential adaptations that should be made to ensure greater relevancy, including the translation of materials

3. Consideration should be made for timing and time allocated for SOPETAR steps, particularly for orientation and planning, which are critical steps for engaging stakeholders in implementation (and subsequent steps)

7.3 Partnership

7.3.1 Lessons Learned

1. Partnerships are complex
    a. The different working cultures, expectations, competing priorities, and mandates of the various partners are important to consider in partnership development
2. Timelines for the intervention did not take into account the complexity of partnership development and need for adequate orientation
    a. Little time was given to allow all partners to better understand each other's roles, contributions, cultures, communication styles, expectations (e.g. per diems), and priorities, as well as to develop partnership structures and processes
        i. South-south linkages in particular require time to evolve
    b. Implementation packages and strategies for communicating the intervention were not fully developed in time for implementation, resulting in initial frustration among implementation staff and subsequent challenges in communication
    c. Turnover among staff (i.e. District, CUHAS) was a challenge for ensuring all partners/staff had adequate orientation and understanding about the partnership and project
3. Challenges experienced among partners have implications for implementation
    a. Lack of an understanding of the various roles and contributions of people can result in challenges in building relationships and trust (e.g. not feeling appreciated or respected), as well as creating silos which can lead to duplicating efforts or not maximizing opportunities for synergies (particularly among tech teams)
    b. While there were opportunities to partners to report on project activities and progress, there were few opportunities/mechanisms for partners to jointly plan together and contribute to different project areas (e.g. implementation staff to provide input into evaluation)
4. A common vision, goals and commitment of partners (including leadership, staff) to improve Maternal, Newborn, and Child Health and sustain activities facilitated continued efforts to work together despite partnership challenges
5. Spin-off studies, including the Synergy project and simulation study provided opportunities for implementation and research staff/faculty to learn and work together, and to demonstrate how research can be used to inform implementation

7.3.2 Best Practices

1. Establish common values around partnership, such as:
    a. Working together towards the common goal of improving the health of mothers, newborns, and children
    b. Commitment from all partners to invest in building and maintaining relationships
    c. Fostering a respectful "learning climate" where everyone is open and willing to learn, give and receive feedback, in order to promote mutual multi-lateral learning and benefit from different perspectives and expertise
    d. Giving each other the "benefit of the doubt"
2. Recognition that good partnerships require time and effort - plan more time to establish partnership structures, even before project implementation (at least six months to one year):
    a. Setting up expectations of all partners around timelines, engagement in activities (e.g. including implementation, research, planning, reporting, etc.), staffing requirements, priorities
    b. Establishing a clear and common understanding of partner roles and contributions, and how all partners contribute towards common project goals (e.g. how research, cross-cultural teams, etc. can contribute towards informing implementation and contributing to improving outcomes).
        i. Develop clear and shared documentation outlining roles, management, and decision-making
        ii. A potential framework that may be helpful to understanding and describing different roles is the Interactive Systems Framework for Dissemination and Implementation (Wandersman et al., 2008)
    c. Develop clear and structured processes and channels of communication (online project management platforms, social media groups, etc.)
3. Ensure ongoing partner management:
    a. Provide a thorough orientation for all partners about the project at the same time, while building in processes to onboard new staff/address turn-over (i.e. planning for replacement training/catch-up)
    b. Have clear mechanisms in place for dispute resolution
    c. Identify a designated person to support partnership management
4. Identify opportunities for partners to communicate both formally and informally, and to collaborate more frequently (i.e. in research, evaluation, tech team meetings)
    a. More frequent interaction will allow partners to contribute their expertise and build relationships
5. Hold regular partnership meetings to:
    a. Facilitate on-going relationship building
    b. Have check-in points to review partnership (self-evaluation) and discuss areas of improvement and plans for moving forward
    c. Conduct structured and frequent joint planning around project activities or adaptions in order to maximize contributions of all partners

8. Updates to the Mama na Mtoto Package: A Focus on Readiness

In addition to incorporating the lessons learned and best practices identified by the study partners, with facilitation by the Centre for Implementation, we identified aspects of the Mama na Mtoto Package that could be updated and further refined. In collaboration with partners from the UC, CUHAS, and MUST, the package has been developed into what is now known as the "Maximizing Engagement for Readiness and Impact" (MERI) approach.

In particular, we aimed to strengthen the theoretical basis for this implementation approach as we plan for future projects, including a project that was recently funded by Global Affairs Canada related to sexual and reproductive health and rights in rural Uganda ("Her Voice Her Choice" Initiative). Having a strong theoretical foundation for the MERI Approach will enable us to test the specific mechanisms of change and to further refine the Package in the aim of optimizing implementation and effectiveness of the intervention.

An updated Theory of Change was developed, which reflects an improved articulation (and understanding) of how this approach focuses on strengthening health system readiness to implement health interventions. System readiness interventions "set the stage" for implementation of specific clinical interventions, to ensure that the context/environment and people involved in implementation are amenable to, and capable of, change. Readiness involves both the capacity and the motivation for change – meaning that individuals, organizations, communities and systems must be both *able* and *willing* to do something differently (Scaccia 2015).

Research on organizational readiness for change also highlights the embeddedness of readiness – that individual capacities and motivations are required in addition to collective capacities and motivations (Weiner 2008). Moreover, the literature distinguishes between enabling implementation settings (and individuals within those settings) to be generally capable of change (e.g., having an innovative culture, a learning climate, being well-resourced and equipped, knowing how to plan for and implement change) and being capable of implementing a specific change (e.g., having implementation supports in place for that specific change, knowing how to do the specific change, being resourced for that specific change) (Scaccia 2015).

The **change strategies** (collaborative and consensus building meetings, equipping, training, technical assistance-mentorship) improve *general capacity* (i.e., the capability to adopt and implement any intervention) and *intervention-specific capacity* (i.e., the capability to adopt and implement specific selected interventions).

To address motivation, we have also developed a **framework of foundational factors** to maximize *motivation* for adopting, implementing and sustaining the intervention. Five 'Motivational' factors core to MERI have been identified and synthesized reflecting on two decades of implementation experience. Motivational factors cut across different levels (e.g., district, health facilities, communities), optimizing the change strategies and SOPETAR Process Model process during implementation. These include: embeddedness, comprehensiveness, self-reliance, transparency, and collective action.

A full description of the approach can be found in ***Appendix B – MERI Approach Summary.***

9. Discussion

9.1 Summary of Key findings

Research Question 1: Clinical Effectiveness

The implementation of Mama na Mtoto was found to improve a number of MNH indicators in both Misungwi and Kwimba districts from 2016-2019. A review of the MNCH Coverage Survey Key Indicators show statistically significant increases in women receiving ANC four or more times (+12%), delivery by a skilled birth attendant (+16%), delivery at a health facility (+17%), and PNC for mothers (+8%). Other significant improvements were related to childhood nutrition (dietary diversity among children 6-23 months: increase of 55% from baseline), care seeking for children under 5 for fever (+17%), and early initiation of breastfeeding <1 hour after birth (+ 10%). The project also saw more moderate improvements regarding exclusive breastfeeding (+5%), as well as some child health indicators (i.e. deworming for children 6-59 months (+4%), diarrheal treatment with zinc for children under the age of five (+4%), diarrhea in the last two weeks for children under five (-4%), and fever among children under five (-5%). These are notable improvements given the relatively short period of implementation in Misungwi. In particular, care-seeking at health facilities has vastly improved within the time period. The project did, however, fail to see improvements in a few indicators, such as for family planning (met need for contraception at -3%, prevalence of modern contraception at -2%), and stunting among children under two (+2%). Although, it can be noted that these were not statistically significant decreases.

The qualitative findings (from the endline qualitative inquiry and simulation study) provide support for the results from the MNCH Coverage Survey and provide a more comprehensive perspective in which we can we interpret the findings. Participants confirmed improvements in maternal and child health care seeking. Stakeholders commented on the increase in health facility visits by women (especially pregnant women), children, and families. CHWs, in particular, are credited for their role in engaging communities to seek care when needed.

"… we have seen increased number of clients coming to our health facilities … yes … mothers under 12 weeks … the existing of CHWs has contributed to increase the number of clients, they visit to the community and direct the clients, and they come in the health facility and the improvement of our health facilities …" [Government Interview (CHMT Member)]

Additionally, parents, CHWs, and health workers described more children presenting to health facilities for vaccinations, routine check-ups, and addressing illnesses. Despite this, some challenges have been noted with respect to continued community resistance to change health behaviours. As well with the increased demand for services, participants have experienced some overcrowding and wait times.

Related to the increase in care seeking health facilities for MNCH is the perceived improvements in the delivery of care as well as the prioritization of maternal health at health facilities as a result of Mama na Mtoto. Several participants shared improved experiences with accessing care, including receiving treatments that resulted in good health outcomes, receiving timely care and being welcomed by health providers.

"… our client are so excited with the quality of service provided, you know when the client reach at the facility, she better get what she expecting to get and not be delayed. Should not be treated badly … good language taught by Mama na Mtoto, most people have been coming to provide the service and they normally introduce themselves that they come from Mama na Mtoto … through Mama na Mtoto people

were trained … pregnant mothers can even mention who helped her during delivery, she mention a name … so through those trainings and clients are satisfied with the service provided." [HFGC Focus Group]

With regards to family planning, while the MNCH Coverage Survey found decreases in family planning indicators, participants from the qualitative inquiry commented on some positive outcomes in this area. Specifically, participants noted the engagement of youth in reproductive health issues, and that CHWs were helping to bring awareness around family planning to community member.

While the research question focused on clinical effectiveness, the qualitative inquiry and external evaluation identified a number of non-health outcomes as a result of the project's lens on gender equality and health equity. Stakeholders perceived enhanced male engagement to be an important outcome of the project. CHWs were seen to play a major contributing role in the engagement men (fathers, village leaders, and HGFC representatives) in MNCH issues and in supporting improvements to maternal and child health services and care-seeking. Male partners were reported to be more supportive to their partners (e.g. contributing to household tasks and child-minding) as well as striving to be good role models for other men.

"There is a personal change … I was not aware on health education that I supposed to attend clinic with my wife, so I thought it was for her to go and come back or attend clinic alone. But now I have understood … I thought it was mothers' responsibility to go to clinic all alone. After educated I am aware that I have a chance to go and listen to the health expertise while educating on the reproductive health and child care sessions … thank you … there are so many thing we are educated, reproductive health, how to upbringing children … so I am enjoying." [VEO Focus Group]

Stakeholders also reported improvements related to gender equality at the health facility and district levels. For instance, the training related to dignified and respectful care helped to change attitudes and existing beliefs among district and health facility staff regarding gender. There were also reports about enhanced female empowerment, where women CHMT members felt more confident in sharing their thoughts in meetings and that CHWs were seen to improve the status of women in community.

"I would like to talk about leadership, if I look in our area, in the past the community used to say that if a woman stand up and talk on something it seems as whatever she is talking is pointless, but if I look now, when I look at these CHWs in our village a big percent are women so through that the community see that even women can do something." [Health Workers Focus Group]

Research Question 2: Process Evaluation

This research question looked to evaluate whether the package of interventions (MamaToto) can be adapted to support successful district-led implementation of a package of policy-recommended MNCH activities in rural Tanzania.

In evaluating the adoption and reach of Mama na Moto, adoption of the intervention was highly successful, with both Misungwi and Kwimba adopting the intervention across all levels. There was 100% of adoption of Mama na Mtoto at health facilities, wards, villages, and hamlets. The project also saw an extensive implementation reach; either 100% or close to 100% of WEOs, VEOs, hamlet leaders, CHW supervisors, and health facility in-charges, in both districts participated in the program. Total numbers (denominators) for CHMTs, district officials, district councilors, HFGC members, and community members were not available. As such it is difficult to assess reach. 2,850 CHWs in Misungwi and 3,660 CHWs in Kwimba were selected and trained through the project, which exceeded the national guideline

requirements of having one CHW per hamlet. Thus, this could be considered a major project achievement towards establishing a functional CHW network.

Level of Program District Integration

The project attained high levels of success in promoting program district integration. Stakeholders considered the "cascade" approach to engagement a critical approach in actively engaging all levels within the districts and to obtain buy-in and ownership from the districts. This was seen to both acknowledge and leverage existing structures and to strengthen links between the levels (district – health facility – community). Additionally, a number of stakeholders credited the project's participatory district-led approach to foster a sense of ownership and resourcefulness, where district staff, health facility, staff, and community members were empowered to identify gaps and improvements on their own. There was also appreciation for the project's efforts to align with existing policies and processes, which would facilitate the implementation of project activities.

"… the most important thing is that the project used the existing structures, the project has not come with staff, apart from the project management team, in all other levels we have used the existing health providers and where there was an addition it was through the existing system. We have used the existing staff in the health facilities, health committees they have not come with a new committee structure, they have used the existing one … that has been our concern that partners should not come with new things, rather they should align with the government structures that will ensure sustainability after the projects." [Government Interview (RHMT Member)]

Despite this, there were some suggestions for improvement, such as communicating ongoing project progress.

Adaptations from the Uganda model included some changes in the engagement of local community leaders. Due to differences in governance structures, it was later recognized that both elected and appointed leadership needed to be engaged. This adaptation to the engagement process in Kwimba was highly praised and seen to be a key factor in the higher levels of program integration seen in Kwimba.

District Leadership Capacity

For most of its targets related to enhancing district leadership capacity, the project either met its targets or exceeded them. The project almost met its target for having 100% of CHMT members reporting improved capacity in MNCH programming, including gender and equity sensitivity, governance, planning, supervision, management and HMIS (94% in Misungwi; 91% in Kwimba). However, this target was ambitious, considering the number of content areas where improvements were expected.

Qualitative feedback from stakeholders showed perceived increased capacity of district leadership (i.e. District staff and CHMTs). Through meetings with CHMTs and district staff, providing equipment, training, technical assistance, and mentorship, district leaders reported improvements in their leadership skills, communication, and ability to provide supportive supervision. Participants also commented on how the skills they have received have translated into their personal relationships and relationships with colleagues. The facilitation/participatory approach of Mama na Mtoto was also mentioned with regards to leadership capacity, where participants perceived the project to foster innovation.

"First they trained me how to be a good leader, and there were things which we used to do which were not correct for what a good leader is supposed to do, to be harsh and harass your subordinate on how you are supposed to talk to and direct them. Those are the things [Mama na Mtoto] directed me. But also they have been able to help me one thing which I see it to be more big, I was enabled to become a teacher

which I never thought about that. So I have come to find that sometimes I became a teacher to another districts and I understand that I gained this knowledge through Mama na Mtoto project." [Government Interview (CHMT Member)]

While the project was perceived to be highly successful in building district capacity, there were also concerns expressed by some stakeholders. In particular, field staff were concerned about the district's capacity to lead all of the project's activities, seeing them as a potential burden (given the large number of meetings, simultaneous activities, etc.) and the possible reliance on champions. Additionally, there were some concerns that the competencies among district health leaders were not yet built, as they required long-term capacity building.

With regards to adaptations from the Uganda model, there were content adaptations based on the emergent needs related to supportive supervision and leadership training. Additionally, as a "low-cost" model, the use of per diems for district leadership was not part of the original model. This was potentially seen to drive motivation.

Facility Management/Quality Improvement Capacity

In improving health facility processes and capacity for quality improvement, the project either achieved or exceeded all of its targets related to conducting meetings, equipping health facilities, and providing training and mentorship to health facilities. Of note, the project reported 1,482 meetings of health in-charges/staff and committees convened to scan, orient, plan, and reflect on enhancing gender and equity sensitive MNCH services (target 300, at least 2 per health facility), reporting high levels of engagement and increased capacity to conduct quality improvement for MNCH. Additionally, health facilities' capacity to provide gender and equity sensitive MNCH services improved considerably since baseline. The number of health facilities with one or more staff trained in BEmONC signal functions skills went from 18% (in 2016) to 94% in Misungwi (target 50%) and from 48% (in 2018) to 93% (no target set) in Kwimba.

With regards to readiness to provide the seven key MNCH signal functions, readiness ranged from 74%-95% in Misungwi at endline, compared to 46%-74% at baseline, and 85%-95% in Kwimba, compared to 60%-88% at baseline. In Misungwi, the largest increases were in essential newborn care (+42%) and newborn resuscitation (+34%). While in Kwimba, the largest increases were in newborn resuscitation (+35%), antenatal care (+21%), and family planning (+13%).

In addition to assessing the facilities' readiness to conduct the seven signal functions for MNCH, a sub-study for the simulation and peer-to-peer learning program found that clinical assessment scores increased after training, again after months following the training, and once again twelve months after training. This indicates a retention and increase in the clinical knowledge and skills of the participants. The qualitative feedback from the simulation study also found a number of significant outcomes as a result of the simulation and peer feedback program. Health facility staff commented on their ability to retain knowledge and skills from the program and to put their skills into practice and having increased confidence as a result of the training and feedback they received. In addition, health facility staff also credited the Mama na Mtoto program for promoting changes to the culture of care at the health facility – improving communications and teamwork as well as breaking down hierarchies (staff felt competent and trusted in their skills and knowledge). Moreover, health facility staff who were part of the simulation and peer-to-peer program commented on providing dignified and respectful care, becoming more compassionate towards their patients, regardless of disabilities or status in the village.

"The respective care has given us some skills and knowledge of understanding that everyone has the right to treatment, and has the right to be attended by me. This is different from the past when I was sometimes looking for the person and decide whether I must attend him/her first even if that person is late. We were doing that because we didn't know the real meaning of the respective care. After being trained and oriented by MnM program about and the meaning of respective care at our facilities, we noticed that we should respect all and give services without looking at somebody's status in the village, we listen to someone, we attend the people with disabilities in delivery well." [Sim Study, Focus Group 2]

Other qualitative feedback highlighted other outcomes, including the increased capacity of the health facilities to do planning, management, and quality improvement as a result of the training and mentorship they received during the project. District stakeholders also commented on the facility's increased capacity to provide MNCH services due to the project's provision of equipment and infrastructure.
"We know the level of confidence, determination and knowledge has changed among these in-charges such that majority of (them) are able to make changes (that) could improve service delivery in their health facilities in collaboration with their HFGC, as demonstrated during health facility innovative competitions" [District Medical Officer, External Evaluation].

Some adaptations that were described by project stakeholders included the addition of the simulation and peer-to-peer learning program, which was found to be highly successful. While not part of the original Uganda model, it may be considered an important aspect of the model moving forward. Other adaptations included those that were specific to the needs of the context in Tanzania, such as focusing the health facility competitions to specific gaps (e.g. integrating adolescents in the health facility) and the provision of additional materials, equipment, and infrastructure, which was not originally planned for. It was also found that the cascading order of activities was difficult to implement in practice as activities took longer than anticipated. This resulted in suboptimal timing of activities in Misungwi, where higher fidelity to the cascade approach was done in Kwimba.

Functional CHW Network

The project exceeded the vast majority of its targets related to establishing a functional CHW network though meetings with CHMTs, CHW supervisors and coordinators, equipping and training CHMTs and health staff to support CHWs, and community meetings regarding MNCH promotion and innovations. While the project did not meet its target for the households who participated in community innovation (3,255 compared to target of 6,280), this target was found to be unrealistic.

Both quantitative data and qualitative data report positively regarding CHW activity. Since baseline, there was a 30% increase in women who were able to name at least one CHW, a 33% increase in women who reported a visit from a CHW since their last birth, and a 30% increase in women who reported receiving help or advice for their sick child. The qualitative findings confirm the high visibility of CHWs in their communities and ability to build trusting relationships to community members. Home visits by CHWs were seen to be important for educating households and for promoting care seeking at health facilities.
"Indeed we appreciate Mama na Mtoto people for what they have done, we had big problems, but currently those problems have reduced. Here I am, have a baby, when a baby is sick I don't know Swahili, I cannot go and tell the doctor my child has a boil at the buttock, I am afraid. Mama na Mtoto have brought us CHWs, they visit us every day, I mean every day. Even when you have a problem they come at your home and ask you 'how are you, how is your child,' I say … and he has already take you to the doctor and you get good service." [Mothers Focus Group]

In addition to this, stakeholders saw CHWs playing a critical role for engaging communities and fostering ownership over the Mama na Mtoto activities. CHWs also participated in income generating and entrepreneurial activities, which helped to sustain the CHWs (as volunteers) and also to role-model these activities for community members.

"… through CHWs they have been motivated that they should not stay idle … they have established their groups which are existing to the moment, they have motivated each other, there are some CHWs who are keeping goats, others chicken … others have been able to get income through these goats and other animals they are keeping … it has helped even at their community and they continued to motivate other community members to establish groups and make sure that they are improved economically." [Government Interview (CHMT Member)]

A number of adaptations to the Uganda model were described by stakeholders. Namely, best practices from Uganda were not taken up early on in the Mama na Mtoto project, as there were efforts to adapt to the local Tanzanian protocol. As a result, some challenges were experienced with CHW selection in Misungwi. Learning from this experience led to a stronger adherence to the best practices from Uganda in Kwimba, where selection and recruitment of CHWs went much more smoothly. Another key adaptation related to the training of CHWs (not reflected in the Uganda model or in Misungwi) was that some selected CHMT and health facility staff were trained to become nationally certified CHW trainers. This resulted in more participatory training and ensured that training could be done in the local language (rather than Swahili).

The following box provides a high-level summary of the adaptations/fidelity to the MamaToto model that was implemented in Uganda and their impact on outcomes:

Box 2: Adaptations/Fidelity Implementing the Uganda model in Tanzania

The following would be considered core aspects to the model, which should be implemented with high fidelity:

- Cascade approach to engagement – Not following this approach led to delays in activities in Misungwi
- Process of CHW selection and recruitment – It was found to be important to follow the approach from Uganda to ensure a less politicized process and that the most appropriate CHWs are recruited

These activities are not part of the Uganda model, but could be considered part of the model moving forward:

- Training local trainers as National CHW Trainers – As done in Kwimba, this ensured a more participatory training approach and that training is conducted in local language. This was a necessary approach to align with Tanzania's structures/requirements for CHW trainers (CHW trainers were previously centralized).
- Whole district orientation – This was conducted in Kwimba, where both appointed and elected officials were engaged, in addition to other social groups (e.g. women's groups, etc.)
- The gender and equity lens - Not explicitly part of the model, but given the positive outcomes, it may be an important aspect of implementing future health interventions

While the simulation training and peer-to-peer learning program was implemented in Uganda, the level of commitment to this methodology in clinical settings was enhanced in Tanzania. As part of the training change strategy, this specific program was effective in helping health workers retain skills and knowledge, improve the delivery of care, and lead to improved health outcomes. Thus, strengthening the evidence for the importance of high fidelity to the program for future implementation.

There is some uncertainty about whether the provision of per diems in Tanzania (which differ with regards to the per diem structure from Uganda) influenced motivation.

Adaptations to training content and specific district needs were appreciated by stakeholders and seen as effective for achieving desired outcomes.

Sustainability

An evaluation of Mama na Mtoto's sustainability involved an assessment of the sustainability of the leadership engagement, education and training at all levels, and CHW retention and sustainability of the CHW program.

In terms of the sustainability of leadership engagement, project stakeholders were optimistic about the level of engagement, particularly among district staff in Kwimba. Stakeholders found that the approach to engagement at all levels, not just at the district level, but also with in-charge staff and with community. Some participants expressed hope that collaboration between government and health leaders would help to develop a system of supports that would allow the CHW program to be sustained.

With regards to education and training at all levels, participants felt that the new knowledge and skills they received would not be forgotten. District leadership were especially positive about their skills in reflection (to help identify what is working and what is not), and their communication skills. Additionally, participants in the simulation and peer-to-peer learning perceived the program to provide long-term skill and knowledge retention as they are able to continue practicing through simulation and regular peer feedback.

"…the equipments on the SIM lab station, at the facility; I see we should progress because it is helpful when you forget, when you reach on the table you are there is something I didn't practice for long so sim-lab is very important in strengthening and widening our experiences" [Sim study, Focus Group 2]

Despite this, some stakeholders noted that it would be important to continue with mentor visits and refreshers in order to maintain the skills and knowledge that have been developed through the project. Moreover, stakeholders saw CUHAS playing an important role in helping to sustain what has been learned through training.

CHW sustainability was assessed through retention: two years following initial training, 94% of CHWs were considered still active in Misungwi, while the retention rate for active CHWs was 98% a year after initial training in Kwimba. This suggests a high level of sustained retention of CHWs in both districts.

The qualitative findings indicate that many participants are also optimistic about the sustainability of the CHW program and activities, as CHWs have established good relationships with their communities, and that income-generating activities will help to motivate them. However, stakeholders also commented on some perceived challenges, including the potential lack of motivation due to voluntarism (a need for allowances), as well as ongoing needs for working tools and supplies for meetings and conducting home visits.

"I am worried if the project activities will continue after the end of the project, for example … submission of monthly report, this may not continue because CHWs may have a limited working tools such as register and report books … my request to the Mama na Mtoto project … would look more on how to strengthen CHW groups … enable them to be together for a long time … enable them to meet regularly and discuss important issues which they can sustain." [CHW Supervisor Focus Group]

Other Considerations for Implementation

While the project did not explicitly seek to assess SOPETAR as a process model or to evaluate the project partnership, these were found to be important factors related to implementation. Although, in general, SOPETAR was seen to be a valuable tool for guiding implementation partners and staff, there were some challenges experienced with its use. In particular, it was challenging to understand for some stakeholders at first (the history and purpose of each step). As a result, there was a lack of understanding about the importance of the ordering of the steps, which impacted implementation, particularly in Misungwi. This highlighted gaps in the packaging and communication of the model. However, as the first time the Uganda model was implemented in another setting, this presents a learning for future implementation – that more time is needed for packaging and that certain aspects of the packaging require additional details for others to implement as intended.

From both the CFIR Rapid Evaluation and the External Evaluation, partnership challenges were experienced, due to differences in culture, expectations, competing priorities and mandates. Partnership challenges were also seen to impact implementation. Specifically, these challenges led to a lack of trust and relationship building, resulting in a duplication of efforts or not maximizing opportunities for combined efforts and input from all partners. It was agreed by partners that time underestimated for partnership development, which would provide an opportunity to better understand each other's roles, cultures, expectations, and processes, as well as to build relationships with one another. Partners commented on the importance of taking into account the work needed to develop new partnerships, comparing this project to the previous project implemented in Uganda, where partnerships have been long established for close to 20 years, and where relationships have already been built.

9.2 Evaluation of Program Theory (Logic Model)

A reflection and critical review of the Mama na Mtoto implementation lead to the updates to the Mama na Mtoto project (see ***Appendix B – MERI Approach Summary***). With a better understanding of how the Package has resulted in change – improvements in MNCH outcomes, care-seeking, and health behaviours – we have identified a need to update the program theory (see **Figure 2 Logic Model**) to better reflect how the intervention builds district readiness to implement MNCH activities, such as training and mentoring health facility staff and CHWs. Moreover, while the study logic model has included some of the key change strategies (training and equipping), it does not include the other change strategies that are considered core to Mama na Mtoto, including collaborative and consensus building meetings and technical assistance/mentorship. At such, it is difficult to assess these specific change strategies as they relate to the theorized clinical and process outcomes. Including these change strategies into an update program of theory would facilitate the evaluation and streamline data collection, to ensure these aspects are intentionally assessed.

Additionally, while these change strategies relate to increasing capacity at the district, health facility, and community levels, the study logic model did not include the foundational factors, which enhance motivation for a district to implement, and are intended to act as guiding principles for implementing the change strategies. These foundational factors would be included as part of an updated program theory and evaluated to assess their impact on implementation.

9.3 Limitations & Strengths

While the study identified significant improvements in health and non-health indicators and outcomes between 2016 and 2019 in target districts, these results cannot be directly attributed to the Mama na Mtoto intervention. Rather, Mama na Mtoto likely contributed alongside ongoing district efforts and other programs, projects, and activities. Optimistically, qualitative findings suggested a strong linkage between Mama na Mtoto activities and outcomes in the districts.

The three-year intervention timeframe is short to effectively measure change, particularly in the context of public health programming where behaviour change is an important factor; realization of full project impact can take years. Therefore, medium-term level outcome indicators which were trending towards improvement may have potential for further betterment due to the intervention, especially in Kwimba, where endline data collection occurred prior to the end of the intervention and less than two years after baseline.

Additionally, some indicators (such as antenatal care) measure maternal reporting of events occurring two years prior (or two years and nine months where pregnancy is involved); therefore results from the endline study may not reflect the Mama na Mtoto intervention for all responses, depending on the timing of when a respondent was exposed to the intervention. For instance, a woman reporting on a birth two years before the survey would not yet have had the opportunity for antenatal counsel with a CHW, since her pregnancy occurred prior to the start of CHW deployment. Other indicators affected include anthropometry (especially stunting), which are measured on children under five and two years but reflect years of nutrition prior to the survey. Some additional limitations specific to the qualitative inquiry, health facility survey, and MNCH coverage survey can be found in ***Appendix A – Endline Study Report.***

In evaluating the process of implementation, stakeholders from the CFIR Rapid Evaluation and the External Evaluation highlighted the challenges around defining the intervention, given that it is a complex, multi-faceted model. The implementation model adopts a rigorous, participatory approach to community engagement at all levels. This all-encompassing approach made it difficult to define what exactly the intervention was, as it was seen as involving many interventions in different areas or aspects of the health system. This was a key limitation, as there tended to be differences in perceptions around what exactly was being assessed with regards to process – whether it was the SOPETAR process model, the change strategies, or achievement of specific outputs and outcomes. As a district-led model, there were also challenges in distinguishing between users/beneficiaries and leadership. Moreover, despite many sources of data, there was relatively little data that could help adequately assess the adaptations and fidelity to the Uganda model. For instance, data was not available regarding the number of sessions of training done in Uganda versus what was ultimately done in Tanzania (referring to the "dose" of the intervention). There was also limited documentation of the specific adaptations and why they were done. Having this data would help in the assessment/confirmation of what is indeed "core" to the intervention and what can be adapted without compromising project implementation and outcomes. In addition, while new research questions emerged regarding the project partnership and SOPETAR, these were not well developed. As a result, most evaluation tools were not designed to capture this data, however, some data was available from the CFIR Rapid Evaluation, and further explored through the external evaluation.

Specific limitations to some of the data collection methods and sub-studies include: The simulation and peer-to-peer learning program evaluation had a very small sample (16 participants, 2 focus groups). While this program was not implemented widely, the findings from this program are impressive; a larger sample

size would support greater generalizability of the findings. With regards to the CFIR Rapid Evaluation, interviews were conducted around two main time points within the span of a year (October 2018, then again around April – October 2019). Research team members identified some differences in perceptions between the two major time points, likely reflecting changes in the experiences of stakeholders, where more challenges were experienced around October 2018, whereas implementation was smoother as time passed. Despite this, there is some consistency in the findings from the external evaluation, which demonstrates a range of perspectives related to implementation (the external evaluation was conducted in April 2020), indicating that the different time periods for data collection was not an important limitation. The main limitation to the external evaluation was the limited time frame to conduct the evaluation. Finally, the key limitation to the partnership and reflection feedback meeting was that there was limited representation from all partners, potentially limiting the perspective reflected in the lessons learned and best practices.

A major strength of this study was its use of multiple sources of data, of which three are comprehensive data collection methods. The two district-wide quantitative surveys were adapted from well-known standardized tools, coupled with a thorough qualitative evaluation, which produced a large volume of research data to support project outcomes. A mixed methods interpretation with extensive stakeholder engagement enabled broad reflection and comparison with district HMIS data. Although not all presented here, survey data also provided disaggregated results which can help target future district actions and interventions. The CFIR Rapid Evaluation used a well-known framework for implementation science (Damschroder et al., 2009), which allowed us to more fully assess our implementation context, as well as to understand the partnership dynamics. The external evaluation provides an outside perspective on the project's achievements in relation to its processes and outcomes. Importantly, this study had high levels of participation from stakeholders, implementers, and beneficiaries throughout data collection and dissemination periods; these have been critical for meaningful interpretation and development of effective actions going forward.

9.4 Future Directions

Future directions for the Mama na Mtoto Package include working in collaboration with partners from the UC, CUHAS, MUST, and the Misungwi and Kwimba districts for knowledge translation, following the dissemination of the study findings. Some of this work is currently underway, with specific recommendations from stakeholders on addressing gaps that have been identified through this project (See ***Appendix A: Endline Study Report***). Additionally, the project partners plan to share the best practices and lessons learned, particularly with regards to partnership development. The project partners would like to recommend that funders consider additional time and budget needed prior to implementation for partnership development, especially when new partnerships are being formed.

Since the end of the Mama na Mtoto project, substantial work has been done to reflect on the implementation and to identify aspects of the Mama na Mtoto Package that could be updated and further refined. Furthermore, work has been done to strengthen the theoretical basis for the package of interventions, in what is now known as the "Maximizing Engagement for Readiness and Impact" (MERI) approach (See ***Appendix B: MERI Approach Summary***). Future plans for implementing the MERI Approach will include a testing of the refined package in Uganda, in the effort to further refine the package and to produce additional evidence for this approach to implementation. The package will be adapted for implementation of an adolescent sexual and reproductive health and rights project.

10. Conclusion

The Mama na Mtoto processes related to promoting district program integration, enhancing district leadership capacity, improving health facility management and quality improvement capacity, and establishing a functional CHW network supported effective implementation of the project. While some process adaptions were made to the model that was implemented in Uganda, many of these adaptations were considered important to ensure that the intervention met the specific needs in Tanzania and fit with the cultural context. However, other adaptations made confirmed the importance of fidelity to specific aspects of the model, including the importance of the cascade approach to engagement and CHW selection.

The study's findings suggest that these tested implementation processes contributed to significant improvements in Maternal, Newborn, and Child Health in Misungwi and Kwimba districts in Lake Zone, Tanzania. High levels of engagement were also seen to be critical to project sustainability. Despite these successes, gaps remain around family planning, and some community resistance to changing health behaviours and care seeking. Additionally, sustainability may be threatened by continued needs for refresher training and mentorship, as well as tools and materials for CHW meetings and household visits.

This project provides needed evidence for testing the replication of a comprehensive, district-wide MNCH program from one context to another, and contributes to global efforts to improve the health of mothers and children in Sub-Saharan Africa.

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12. Appendices

A. Endline Study Report (available here)

B. MERI Approach Summary (available here)