PROTOCOL TITLE: Design and Implementation of a Health and Community Systems Strengthening Approach to Improve Health and Nutrition of Pregnant Women in Mbeya Region, Tanzania

Principal Investigators (PI):
Dr Germana Leyna (PhD) [1]
Tel: +255782847320
Email: germana.leyna@tfnc.go.tz or gerryleyna@yahoo.com

Principal Investigator (B):
Dr Ray Masumo (PhD) [1]
Tel: +255658229291
Email: ray.masumo@tfnc.go.tz or rmasumo@yahoo.com

Co-Investigator (A): Sauli Epimack[1]
Co-Investigator (B): Dr Geofrey Mchau (PhD) [1]
Co-Investigator (C): Dr. Esther Elisaria (PhD) [2]
Co-Investigator (D): Dr. Mary Mwanyika-Sando [3]
Co-Investigator (E): Dr. Salum Manyatta (MD) [4]
Co-Investigator (F): Benson Sanga [4]
Co-Investigator (G): Dr. Lunna Kyungu (PhD) [5]
Co-Investigator (H): Anna Godfrey [6]
Co-Investigator (I): Fatoumata Lankoande [7]
Co-Investigator (J): Dr. Ramadhani Noor (PhD) [7]
Co-Investigator (K): Abraham Sanga [7]
Co-Investigator (K): Erick killel [1]

1. Tanzania Food and Nutrition Centre (TFNC), P.O. Box 977, Dar es Salaam, Tanzania.
2. Ifakara Health Institute (IHI), Plot 463, Kiko Avenue Mikocheni, P.O. Box 78 373, Dar es Salaam, Tanzania.
3. Africa Academy of Public Health (AAPH), 82A Light Industrial Area, Mikocheni, P.O. Box 32273, Dar es Salaam, Tanzania.
4. Mbeya Region.
5. The Centre for Counselling, Nutrition and Health Care (COUNSENUTH), Plot 8 Sam Nujoma Rd, Dar es Salaam, Tanzania.
6. Catholic Relief Services
7. UNICEF Tanzania

Sponsor/s: UNICEF Tanzania

Budget: 1,114,709 USD

VERSION NUMBER: 1

DATE: 26/01/2022

Table of Contents

BACKGROUND INFORMATION 1
1.1. Overview of the problem 1
1.2. Situation Analysis 3
1.3. Rationale 7
1.4. Conceptual framework 8
1.5. Hypothesis 9
PROJECT DESCRIPTION 10
2.1. Project Goal and Objectives 10
2.2. Specific objectives 10
METHODS 12
3.1. Initiation of the project activities 12
3.1.1. National, regional, and local stakeholder commitment 12
3.1.2. Selection of partners 12
3.2. Developing detailed project logic model 12
3.2.1. The project interventions package 13
PROJECT DESIGN 15
4.1. Design 15
4.2. Setting 16
4.3. Study population 16
4.1.1. Inclusion criteria 17
4.1.2. Exclusion criteria 17
4.4. The key project interventions 17
4.4.1. Health Systems Strengthening Approach 17
4.4.2. Community Health Systems strengthening 18
4.5. Implementation strategy 19
4.6. Ethics Procedures 22
IMPLEMENTATION PLAN 23
5.1. Project Coordination 23
5.1.1. Project Steering and Oversight 23
5.1.2. Organization Structure 24
5.2. Roles and Responsibilities 25
5.2.1. Role of TFNC 25
5.2.2. Role of UNICEF 25

5.2.3. Role of MOH (Nutrition unit, Procurement and Supply Unit, health promotion Unit and RCH Unit) 26
5.2.4. Role of PORALG and Mbeya RS 26
5.2.5. Role of IHI and AAPH 26
5.2.6. Role of CRS and COUNSENUTH 27
5.2.7. Role of Sight and Life Foundation and Pennsylvania State University (PSU). 27
5.2.8. Role of Nutrition International (NI) 27
PROJECT MONITORING AND EVALUATION 29
6.1. Project Monitoring 29
6.2. Project Evaluation .....**Error! Bookmark not defined.**
CAPACITY BUILDING 32
PROJECT LEADING TEAM 33
PROJECT TIMELINE, BUDGET AND RESULT FRAMEWORK 38
8.1. Project timeline 38
8.2. Project budget – Detailed budget per year (Jan – Dec 2022) 44
8.3. Results Framework 45
REFERENCES 51

BACKGROUND INFORMATION

1.1. Overview of the problem

In Tanzania, maternal mortality ratio (MMR) has remained high at 556 /100,000 live births[1] and maternal malnutrition significantly contributes to adverse pregnancy and birth outcomes with long-lasting consequences for women and children, families, communities, and the country's economy. An estimated 45% of women of reproductive age (15 – 49 years) and 57% of pregnant women are anemic[2,3], and one in three women are estimated to suffer from multiple micronutrient deficiencies, especially iron, iodine, and vitamin A[4]**.** Tanzania experiences high rates of adverse pregnancy, birth, and poor child survival outcomes including low birth weight 8.3% (nearly 1 in 10) and early-life mortality rates with 39 deaths/1000 live births occurring around the time of birth or within the first seven days of birth [3,5]. Death rates for children during the first month of life have not declined with 29 neonatal deaths/1000 live births in 2010 as compared to 28 neonatal deaths/1000 live births in 2015/2016. Additionally, perinatal mortality data collected through maternal and perinatal death surveillance system (MPDSR) show an increasing trend in the number of stillbirth fresh (SBF) and stillbirth macerated (SBM)since 2018.

There are concerns that without concrete actions the maternal and early childhood death rates particularly deaths at birth and in the first 7 days of life may rise, and Tanzania will not meet most of the global and national committed goals including the Sustainable Development Goals (SDGs) 3.1 (reduce the global maternal mortality ratio to less than 70 per 100 000 live births) and 3.2 (ending preventable deaths of newborn and children under the age of 5) by 2030[6].

In 2016, the World Health Organization (WHO) has issued a new series of recommendations to improve quality of antenatal care to reduce the risk of stillbirths and pregnancy complications and give women a positive pregnancy experience. As improving nutrition among women of reproductive age and especially during pregnancy is vital to a healthy pregnancy, positive birth outcomes, and early child survival, WHO recommended sixteen (16) interventions. One of them being Iron Folic Acid Supplementation (IFAS) and Multiple Micronutrient Supplementation (MMS) in the context of research for pregnant women. Existing global evidence, partly generated from Tanzania, demonstrates that MMS is superior to IFAS alone in improving birth outcomes and has equivalent benefits for

[1] Tanzania Demographic and Health Survey 2015
[2] TNNS 2018
[3] Tanzania Demographic and Health Survey 2015
[4] Tanzania Demographic and Health Survey 2010.
[5] MPDSR Quarterly Reports
[6] Sustainable Development Goal 3: Health https://www.who.int/topics/sustainable-development-goals/targets/en/

reducing maternal anemia in the Tanzania context[7,8]. MMS also improves survival (maternal, neonates and infants) and has even greater benefits among women with poor nutrition status[9]. Hence updated WHO guidelines on global recommended interventions for antenatal care (ANC) include the provision of multiple micronutrient supplementation (MMS) as part of implementation research and part of an overall standard package of care which includes promotion of nutritious diets, and enhanced ANC care10,11. Multiple micronutrient supplements (MMS) have now been included in the World Health Organization (WHO) model Essential Medicines List (EML) as an antenatal supplement for pregnant women.

Daily oral IFA supplementation is recommended as part of the ANC to reduce the risk of iron deficiency, maternal anaemia, and low birthweight. Pregnant women are advised to take IFA supplements during pregnancy for at least 90 days to prevent anaemia and other complications (WHO, 2012a). Updated WHO guidelines on global recommended interventions for antenatal care (ANC) include the provision of Multiple Micronutrient Supplementation (MMS) as part of implementation research and part of an overall standard package of care which includes promotion of nutritious diets, and enhanced ANC care. In 2019, Tanzania incorporated these WHO recommendations into the revised ANC guidelines. After conducting several studies in 2019 and 2020, in 2021, the government agreed to conduct implementation research on improving maternal nutrition project to pilot MMS supplementation in Mbeya region that will test the transition from iron folic acid supplementation (IFAS) to multiple micronutrient supplementation (MMS) during pregnancy to improve maternal nutrition and pregnancy outcomes[12]. The project findings will inform further scaling up.

Even though the national guidelines have been updated, delivering quality evidence-based interventions for maternal and child health nutrition at scale, remains a challenge in Tanzania due to various bottlenecks starting at the community to the health facility level. The recent COVID-19 pandemic has further affected the timely and optimal delivery of essential services for health and nutrition especially for women and children and amplifies the basic needs and priorities for high quality, respectful, universal care throughout the MNCH (Maternal New-born Child Health) continuum and across all levels of the health system, including at community level[12].

[7] Christopher Sudfeld and Emily Smith; New Evidence Should Inform WHO Guidelines on Multiple Micronutrient Supplementation in Pregnancy; The Journal of Nutrition, Volume 149, Issue 3, March 2019, Pages 359–361

[8] Emily C Keats, Batool A Haider, Emily Tam, and Zulfiqar A Bhutta; Multiple-micronutrient supplementation for women during pregnancy; Cochrane Systematic Review - Intervention Version published: 14 March

[9] Emily R Smith, Anuraj H Shankar, Lee S-F Wu, Said Aboud, Seth Adu-Afarwuah, Hasmot Ali, et al.; Modifiers of the effect of maternal multiple micronutrient supplementation on stillbirth, birth outcomes, and infant mortality: a meta-analysis of individual patient data from 17 randomised trials in low-income and middle-income countries; Lancet Global Health, Volume 5, issue 11, pe1090-e1100, November 01, 2017

[10] WHO antenatal care recommendations for a positive pregnancy experience. Nutritional interventions update: Multiple micronutrient supplements during pregnancy. WHO 2020.

[11] WHO recommendations on antenatal care for a positive pregnancy experience, 2016

[12] Do no harm – Maternal, Newborn and Infant Care during COVID-19; IPA-UNICEF Scientific Brief, June 2021

Availability of ANC services is evident, there are few (43 percent) staff in the health facilities who are trained and ready to provide ANC services highlighting a key human resource gap. Iron and folic acid supplementation services are offered in 78 percent of health facilities.

While a majority (63 per cent) of child deliveries take place in health facilities, young women (less than 20 years) are less likely (67 per cent) to deliver in health facilities and hence miss out on critical nutrition education and counselling services[2]. More children (60 per cent) born in health facilities are likely to be breastfed within 1 hour of birth than those that deliver outside the health system (40 per cent).[4] According to the 2019 BNA (Bottleneck Analysis) reports,[13] pregnant women's access to ANC services at the community/village level is limited. Less than half (43 per cent) of villages have at least one health facility that provides ANC services for pregnant women. While there are more health facilities (96 per cent) with no stock outs of Iron Folic Acid (IFA) supplements lasting more than one month, intake and compliance with IFA supplementation for 90 plus days remain very low suggesting other bottlenecks rather than supplies. Very few health workers (25 percent) have been trained in national protocols on IFA supplementation. A recent health facility assessment in Mbeya also found these to be the key challenges and bottlenecks impeding the delivery of quality maternal nutrition services. Additionally, sub-optimal demand for essential nutrition services (late booking and fewer ANC contacts), poor uptake of evidence-based low cost, high impact interventions including Iron Folic Acid (IFA for 90 days or more remains low at 21%[2].

This implementation study aims at demonstrating how health systems strengthening approach coupled with intensive social behavior change communication can contribute to sustainable delivery of a low-cost, high-impact maternal nutrition package including promotion of healthy diets and MMS in line with the WHO 2016 recommended global ANC interventions.

1.2. Situation Analysis

This implementation research project is built based on the numerous baseline formative and landscaping surveys conducted in Mbeya region between 2019 and 2021 to generate necessary evidence for program designing and implementation (See list of studies in table 1 below).

[13] 2018/19 Bottleneck analysis Reports

Table 1: List of studies, assessments, and surveys for IMAN project

#	Study	Primary aim	Institution
1	Situation analysis of maternal health and nutrition in Tanzania	Assess the maternal and child nutrition status; coverage of maternal health and nutrition interventions; coverage of relevant nutrition sensitives interventions for women of reproductive age and pregnant women; identification of areas for which there is missing information, and/or additional information	Ifakara Health Institute (IHI)
2	Baseline analysis on compliance with ANC guideline recommendations for nutrition and IFAS intake	Baseline analysis on pregnant women's compliance with ANC guidelines recommendations for nutrition and intake of IFAS in the Mbeya region	AAPH
3	Regional nutrition survey (including micronutrients survey) among pregnant women attending antenatal care in Mbeya region	Assess the nutrition status (underweight, overweight, height/stature, dietary intake, and micronutrient status)	TFNC
4	Analysis of the enabling environment for maternal health and nutrition in Tanzania	Review of the national policies, strategies, guidelines, regulation, legislation; Coordination mechanisms; Budgeting and financing mechanisms; Monitoring and evaluation systems at national, regional and district levels	IHI
5	Analysis of delivery platforms for maternal health and nutrition in Tanzania	Understand the current provision of ANC services and delivery of maternal nutrition using community systems) and understand the human resource capacity at the national level and in the Mbeya region.	IHI
6	Qualitative assessment of the ethno-medical perspectives of illnesses and marketing of Multiple Micronutrients Supplements in Mbeya Region	Gain a local understanding of the perspectives of nutrition and diseases and capture all myths around food and diseases; understand social marketing of MMS	IHI
7	Assessment of supply chain, procurement, and production of nutrition commodities in Tanzania	Understand the feasibility of local production of iron and folic acid supplements and multiple micronutrient supplements in Tanzania.	Sight & Life and IHI
8	Barrier analysis on the provision of maternal and adolescent's nutrition services in the Mbeya region	Assess the barriers to the adoption of optimal maternal nutrition practices and understand the region-specific cultural, social, and behavioural elements that can potentially favour or avert maternal nutrition services and micronutrient supplementation utilization by adolescents, women of reproductive age, and pregnant women.	IHI

#	Study	Primary aim	Institution
9	Health facilities assessment	To assess the capacity of health facilities to deliver quality maternal nutrition servicers	TFNC
10	MMS cost-effectiveness analysis	To assess the cost-effectiveness of switching from IFA to MMS in Tanzania	NI

The situation analysis includes a review of the current state of maternal health and nutrition in Mbeya, an analysis of the enabling environment for maternal health and nutrition, and an analysis of delivery platforms for maternal health and nutrition (facility based ANC services and community systems) as well as related human resource capacity. The key findings of the situation analysis report were that delivery platforms at the community and health facility levels are not well coordinated. Therefore, there is a need to create synergies and strengthen the continuum of care to increase efficiencies in service delivery. Other key gaps identified in the situation analysis include late ANC booking, low financing of maternal nutrition interventions, low compliance of pregnant women to iron and folic acid (IFA) supplementation, and lack of spousal support, particularly during the first ANC visit.

The baseline analysis on compliance with ANC guidelines, recommendations for nutrition and IFAS intake, found that about 38% of women in the surveyed Mbeya districts were anaemic. This anaemia status varied across the districts with the highest prevalence of anaemia observed in Kyela (54.8%), Mbarali (52.7%), Mbeya DC (40.6%), and Busokelo (38.4%). Women in the first trimester had the lowest prevalence of anaemia (27%) as compared to those in the second (44%) and third trimester (40%). The study found variations in the proportion of women who had received clinical examination and laboratory tests in the ANC visit. About half (52%) of the women received urinal tests test, while 22% had their blood pressure not measured, which varied greatly between districts. Most facilities had equipment for anthropometric measurements such as length boards, MUAC tapes, and weighing scales. The study results also demonstrated variation in quality of nutrition counselling provided to pregnant women in Reproductive child health (RCH) clinics. More than half of the women (53%) attended ANC in the current pregnancy within first trimester and less than half (45%) of the surveyed women did attend four or more times to ANC clinic during the pregnancy. Most women (72%) used IFA at-least once during the current pregnancy. About 20% of them reported to have not received IFA supplements in some of their ANC visits due to a stock out. The majority of women understood that IFA helps to prevent anaemia but very few knew other benefits of IFA such as making bones strong and preventing birth defects. Overall, women reported being satisfied with ANC services. However, about 11% of them were not satisfied with waiting time, 8% were not happy with the distance and travel hurdles to the facility and 8% complained about difficulty in getting the prescribed medicines and supplements. Among interviewed CHWs, majority were satisfied with their work, however about half (50%) reported not having relevant required resources to deliver services and do their job adequately. Majority (80%) of the CHWs were not satisfied with their stipend. About two

thirds of the facilities received supportive supervision and were able to show evidence of feedback from the supervision visits.

The regional nutrition survey among pregnant women attending antenatal care in Mbeya region highlighted that Forty (40) % of pregnant women interviewed used iron-folic acid tablets or iron syrup for 90 days or more during that pregnancy. Among them, the majority (71%) were from Chunya DC. Most of the pregnant women (74%) attended ANC clinics between12 – 26 weeks of pregnancy and, about half of them visited ANC clinics only two to three times. Multiple micronutrient deficiencies among pregnant women in Mbeya remain highly prevalent. The prevalence of anemia in pregnant women was 25.6%. Iron deficiency was found among 61% of Pregnant Women (PW), Iodine deficiency among 17.4%, Vitamin A deficiency among 46.2%, folate deficiency among 50.7% of PW and Vitamin B12 among 42.0% of PW in Mbeya.

The assessment of supply chain, procurement and production of nutrition commodities in Tanzania highlighted that different brands (imported and locally produced) of multi vitamins and multi minerals, including multiple micronutrient supplements (MMS), are available and prescribed during antenatal care visits at both public and private hospitals but the recommended formulation is not available. The study also concluded that Tanzania has an enabling environment for local production of MMS: Tanzania's pharmacy industry development is a government priority and some local industries have the capacities to begin the local production of MMS. In addition, there are strong opportunities within the Southern Africa Development Community (SADC) for Tanzania to have a viable and valuable market for MMS.

The qualitative assessment of the ethno-medical perspectives of illnesses and marketing of Multiple Micronutrients Supplements in Mbeya Region indicated that mothers perceived that Iron and Folic Acid (IFA) are good for anaemia prevention and improved child health. The majority of PW reported not liking the sweet coated IFAS and overall, they experienced nausea and sometimes vomiting after taking the IFAS tablets. To mask the effects, participants swallowed the tablets with water and immediately ate lemon, sugar or chewing gum. Regarding the preferred colour and size of the MMS sample provided, PW came up with different views: the majority of PW felt that the red colour should be maintained as it symbolizes blood and participants are used to it. The majority felt that the size of MMS sample provided was good but only a few proposed to have a much smaller tablet-like "Piriton" to facilitate swallowing. Sixteen names were proposed to be used when messaging about MMS, but two names became dominant "virutubisho vya mama mjamzito" and "virutubishi lishe". Again, sixteen slogans were proposed, and three slogans were said to attract more attention ("okoa mama okoa mtoto", "boresha afya ya mama na mtoto" and "virutubishi bora kwa kinamama). Several myths regarding foods eaten during pregnancy in Mbeya. For example, eating eggs was associated with increased baby' weight

which might result in caesarean section during delivery or the baby being born with a bald head. Drinking milk was associated with babies being born with dirty fluids and eating liver was said to cause tongue problems i.e. the child's tongue will stick into the lower part of the mouth. Eating pork and goat meat was associated with babies being born with sores and patches.

The cost-effectiveness analysis for national policy switch from IFA to MMS was conducted in collaboration with Nutrition International in May 2019. The analysis findings show that transitioning to MMS leads to significant perinatal health outcomes as compared to IFA with no harm to the mother or baby. The transition is very cost-effective when compared to the WHO threshold and has a high return on investment – the long-term economic benefits of transitioning outweigh the costs on the order of hundreds of times. Additionally, as part of the adopted comprehensive approach to improve maternal nutrition, there is an opportunity to improve the measurement and investment of the coverage, quality and uptake of ANC nutrition and health services, including tracking coverage and adherence with MMS and birth outcomes.

The studies in Mbeya provided an in-depth understanding of key gaps in maternal nutrition service provision in the health system in Mbeya but also highlighted the opportunity to design and implement a project that will address the gaps and inform further scaling up of an adaptive model.

1.3. Rationale

The Government of Tanzania undertakes a renewed approach to improving maternal nutrition, pregnancy outcomes, and early child survival through vital interventions for nutrition and growth. Compared to IFAS, MMS is reported to be more superior especially for anemic and underweight women as these supplements contain iron and folic acid, in addition to 13-15 different micronutrients, while IFA alone contains only iron and folic acid. Recent evidence from Lancet shows that MMS lowers the risk of low birth weight by 19%, small-for-gestational-age births by 8%, preterm birth by 16%, reduces 6-month neonatal mortality by 29% as compared to IFAS alone. Besides, transitioning from IFAS to MMS is considered cost-effective, with positive health outcomes for both new-born and pregnant women, and an unprecedented return on investment (Kashi et al., 2019). However, the feasibility of transition from IFAS to MMS while utilizing the existing health platform in Tanzania is not known. It is with this background that a community-health system strengthening approach, that addresses key barriers of human resource capacity, supply chain and cultural and social norms is proposed to generate evidence and lessons on the strategies that can improve the delivery of quality maternal nutrition services as per the 2016 ANC recommendations for nutrition and inform the implementation of National Multisectoral Nutrition Action Plan (NMNAP) 2022-2026. Beyond MMS the project will

address issues of quality maternal nutrition counselling, promotion of consumption of nutritious food during pregnancy among other things.

1.4. Conceptual framework

The complexity of factors influencing increased coverage of adequate equitable and quality maternal nutrition services at community and facility level necessitate that the conceptual framework is guided by a holistic and systems perspective anchored on WHO's framework for health systems. Figure 1 shows seven sub-systems, viewed as investment areas (inputs) that are linked to the interventions (process) leading to intermediate and long term outcomes.

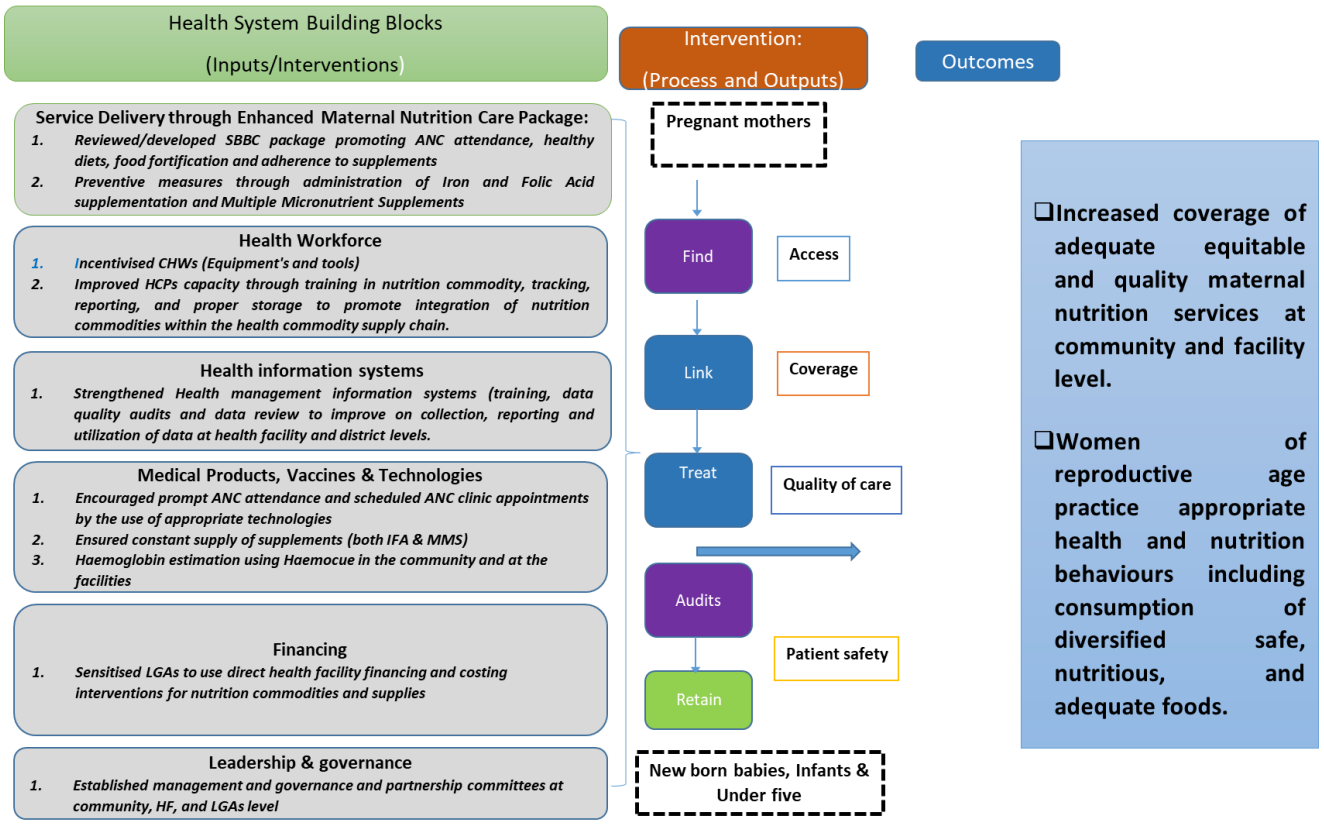

Figure 1: Conceptual framework: Linking Health System Inputs, Process, Outputs and Outcomes. Source: Adapted from [1]

The project aims to work closely within existing health systems to improve these intermediate outputs which will directly affect the scalability and sustainability of the study interventions. The long-term outcomes to be assessed at the end of the project include effectiveness and sustainability of the intervention in terms of increased coverage of adequate equitable and quality maternal nutrition services at community and facility level; women of reproductive age practice appropriate health and nutrition behaviors including consumption of diversified safe, nutritious, and adequate foods as well as reductions in inequities such as gender.

1.5. Hypothesis

The implementation of comprehensive maternal nutrition care package shall lead to a significant increase in antenatal care attendance, increase in health facility deliveries and improved pregnancy outcomes. The intervention to be tested is an implementation process early identification of pregnant women at the community level, encouragement of antenatal clinic/RCH attendance and assurance of actual delivery of ANC/RCH interventions through follow up at community and facility levels by Community Health Workers (CHWs).

PROJECT DESCRIPTION

Tanzania Food and Nutrition Centre and its partners, have developed a demonstration projects in Mbeya region with varied health system contexts where there were access, quality, and utilization barriers to safe maternal health care at individual, community, and facility levels. The objective of this section is to describe the project goal and objectives of the implementation research project. The project aim to promote essential nutrition actions including iron folic acid (IFA) and Multiple Micronutrients Supplements (MMS) supplementation in pregnancy, improve the quality and uptake of antenatal care (ANC); integrate essential nutrition actions into ANC and birth care; promote delivery with skilled and trained attendants; and promote postnatal care (PNC) in hard to reach populations. The project want to demonstrate the feasibility and potential for impact of a modified care package that can be used for decision-making and its potential for scale-up in Tanzania context.

2.1. Project Goal and Objectives

The overall objective of this study is to demonstrate that a health system strengthening approach coupled with intensive social behavior change communication and integrated delivery of low-cost, high-impact maternal nutrition interventions at scale, will contribute to improved maternal nutrition outcomes among pregnant women attending ANC in Mbeya region.

2.2. Specific objectives

Specifically, this study aims at the following:

1. ***To strengthen the enabling environment for improved delivery of essential services for nutrition among pregnant women attending ANC in Mbeya region:*** This will involve convening national and sub-national advocacy meetings, development of strategic partnerships, inputs to policy-relevant exchanges, and translation. In addition, districts and relevant ministries will be supported to plan, budget, and finance for the maternal nutrition service delivery. The focus is to design a scalable and sustainable maternal nutrition program in Mbeya. The focus will be on strengthening the overall planning and coordination of the maternal nutrition program.
2. ***To strengthen the supply chain system to ensure availability of essential maternal nutrition supplies:*** This will involve leveraging resources from the existing project, - including the MMS stock, filling gaps in the supply of IFA among non-MMS district, and ensuring proper forecasting, ordering / procuring and distribution and reporting of nutrition supplies. The focus will be on strengthening the capacity for supply chain management, as well as planning and budgeting for nutrition supplies to address the bottleneck of stock-outs and poor supply management.
3. ***To strengthen maternal nutrition service delivery:*** This will involve enhancing the capacity of facility and community health workers for the delivery of quality and respective maternal health and nutrition services, strengthening the facility and community-based health and nutrition information systems to contribute towards high coverage of multiple micronutrient

supplementation in Mbeya region. Additionally, there will be a focus on quality of care where the project will ensure support and supervision is conducted promptly and a quality improvement approach will be adopted to address identified gaps. Behavior change of the health service providers at all levels will be critical to ensure that respective quality services are available and utilized by pregnant women. Generate sustained demand for essential services for nutrition among pregnant women and delivered through the ANC and the community health platform.

Through the national CHW program and the primary healthcare facility workers, the project will leverage the new SBCC package developed to address social norms, women and girl empowerment, and gender roles associated with women, children, and adolescent's health and nutrition in Tanzania. CHWs and health service providers will be trained and supported to roll out this package for 12 months. The focus will be on ensuring pregnant women:

- Book ANC services early (before 12 weeks),
- Attend frequently (8 minimum visits),
- Express demands for and achieve high compliance to micronutrient supplementation and maternal dietary intakes.

The study will also scale-up screening for maternal anemia, weight gain monitoring and counselling on maternal diets through existing platforms at the community and facility level.

METHODS

The comprehensive maternal nutrition care package interventions are designed to improve access, coverage, quality, and/or efficiency of maternal health services, with emphasis on nutrition interventions, in two districts in Mbeya region building on existing platforms. The methodological approach included four steps as explained below.

3.1. Initiation of the project activities

3.1.1. National, regional, and local stakeholder commitment

To get the commitment of stakeholders to this implementation research project at national, regional, and local levels, a series of meetings were held at different levels to explain the project objectives. TFNC coordinated these meetings with the objective of getting stakeholder's engagement and ownership through an iterative and collaborative process of project design. The process of project leadership and stakeholder involvement growing into aligned stakeholder commitment also involved establishment of project Technical Advisory Group (TAG) that provide administrative, management, technical, and supportive supervision roles at all levels. The TAG meet at a scheduled quarterly basis throughout the project life and is vital in providing quality assurance of the implementation process and ensuring that the project plans and implementation approaches are of technically high quality and in line with national technical guidelines. The TAG also ensure that all relevant implementing partners' work is well coordinated and they resolve project challenges throughout the project life. We anticipate that the TAG will also have the responsibility of synthesizing the impact analysis results at country level and advising the MoH on the adoption for scale up of the components of the IMAN project.

3.1.2. Selection of partners

The TFNC is considered the main implementing partner supported by other partners responsible for specific components. The project teams are composed of competent researchers in various disciplines relevant to maternal health and nutrition with experience in designing and conducting epidemiological studies and a track record for publications. TFNC is responsible for coordination and synergy among partners.

3.2. Developing detailed project logic model

Embedding theory driven approaches to programme implementation and evaluation is well described in public health literature (Loechl et al., 2009; Rawat et al., 2013). To track how the IMAN project would achieve impact, it was important to develop an overall theory of change (TOC) (figure 2) that explain the specific country context and how components of the interventions are linked with each other and with the ultimate outcome of increased coverage of adequate equitable and quality maternal nutrition services at community and facility level and women of

reproductive age practice appropriate health and nutrition behaviours including consumption of diversified safe, nutritious, and adequate foods. Approaches described in theory of change were hypothesized to ultimately increase coverage of adequate equitable and quality maternal nutrition services at community and facility level in the Mbeya region. We identified ways to bridge gaps in the provision and utilization of maternal and neonatal health services. Quantitative key performance indicators along with frequency of collection of the indicators are defined to match the different levels of the key components of the TOC model and will be measured to track progress and change associated with the project interventions. Qualitative approaches will include formative assessments that will be used to design culturally appropriate behaviour change interventions. Behaviour change communication (BCC) strategies within IMAN project include social mobilization, interpersonal communication, branding, and use of promotional materials, dramas, scripts, and skits.

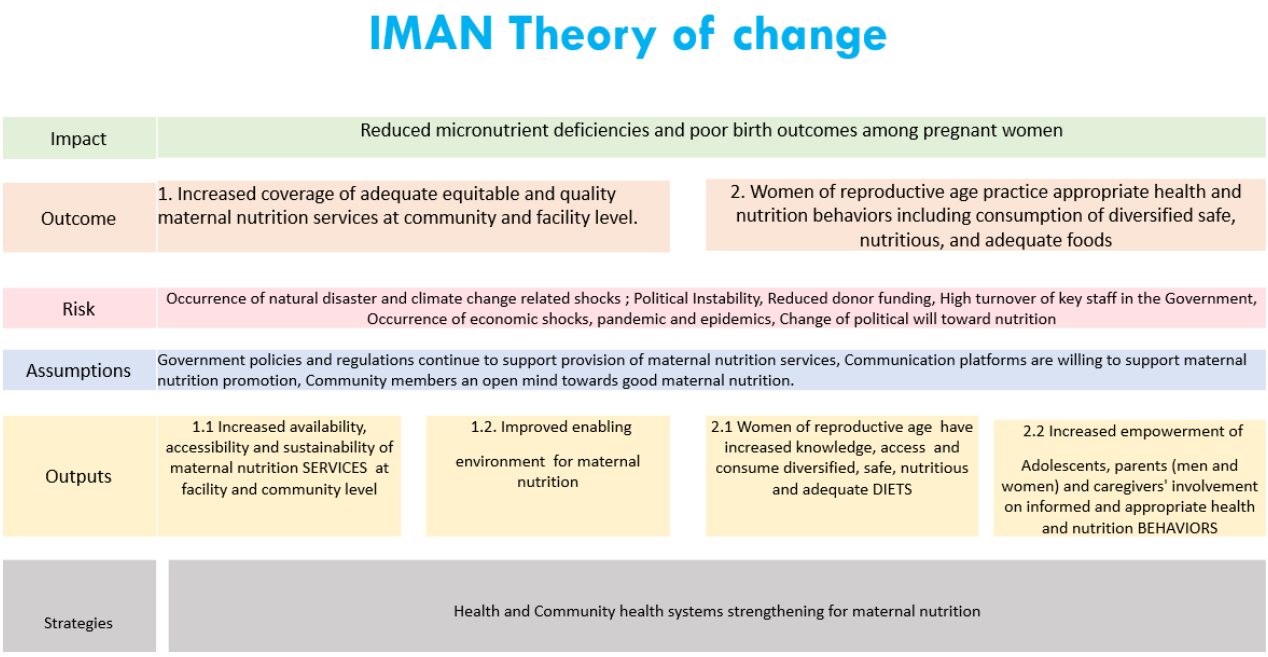

Figure 2: Overall community-health system strengthening approach for maternal nutrition theory of change model.

3.2.1. The project interventions package

The project intervention package: Comprehensive maternal nutrition care package as part of ANC services will support the implementation of the sixteen (16) WHO recommendations for nutrition in line with the national ANC guidelines by delivering a comprehensive package of high-impact maternal nutrition interventions with quality that target individuals at community and facility levels. The package to improve maternal nutrition status is comprising

- Early identification and surveillance of the pregnant woman
- Nutrition assessment
- Nutrition counselling

- Preventive measures through administration of IFA and MMS supplementation
- Haemoglobin estimation using Haemocue in the community and at the facilities

WHO recommendation
1. Counselling on healthy eating and physical activity to prevent excessive weight gain
2. Counselling in undernourished populations on increase energy and protein intake [a]
3. Balanced energy and protein dietary supplementation in undernourished population [b]
4. Daily iron and folic acid supplementation [c]
5. Intermittent iron and folic acid supplementation [d]
6. Calcium supplementation in populations with low calcium intake
7. Vitamin A supplementation in areas where deficiency is a severe public health problem [e]
8. Restricting caffeine intake [f]
9. Onsite haemoglobin testing with a haemoglobinometer [g]
10. In endemic areas preventive anthelminthic treatment [h]
11. In malaria-endemic areas, intermittent preventive treatment with sulfadoxine-pyrimethamine [i] • promoting the use of insecticide-treated nets among pregnant women • counselling for malaria prevention methods during pregnancy
12. Task shifting the distribution of recommended nutritional supplements and intermittent preventive treatment
13. Antenatal care models with a minimum of eight contacts
14a. Iron or IFA supplementation in adult women
14b. Iron or IFA supplementation in adolescent girls
15. Iron supplementation in postpartum women
16. Multiple micronutrient supplementations

It is well known that ANC is more beneficial in preventing adverse pregnancy outcomes when received early in the pregnancy and continued through delivery [2]. WHO recommends that a woman without complications should have at least eight ANC visits, the first of which should take place during the first trimester [3]. A key characteristic of this project will be a rigorous monitoring and evaluation system as part of the design of the project. To measure improvements in inputs and outcomes along the implementation pathway as outlined in the project TOC model, we highlight in this section the rationale for selection of key performance indicators based on an evidence informed programme model using proven interventions [4]. Uptake of the interventions is described as utilization of one or more components of the comprehensive maternal nutrition care package and will be assessed by measuring changes in key performance indicators. These include:-

- Proportion of PW disaggregated by age group attending ANC services in the first trimester (%)
- PW disaggregated by age group consuming IFA/MMS for 90+ days during pregnancy (%)
- Proportion of PW receiving nutrition counselling during last ANC visit (%)
- Proportion of PW receiving nutrition counselling from CHWs at least once in the past three months (%)

The result framework is available in the section eight of the protocol.

.

PROJECT DESIGN

4.1. Design

The project is a health system and community strengthening implementation research project framed as an **adaptive trial**. This design allows a comparison of outcomes between the intervention and control arms. The project will have three major arms targeting pregnant mothers:

- **Arm 1 (Intervention group):** Kyela district council will be assigned to transition from use of Iron and folic acid supplements to MMS with enhanced ANC clinic (quality of care) and community promotion (demand generation) through delivery of comprehensive maternal nutrition care package through the FILTAR (Find, Link, Treat, Audit and Retain) strategy.
- **Arm 2 (Intervention group):** Chunya district council will implement the standard of care – IFA enhanced clinic (quality of care) and community promotion (demand generation) through delivery of comprehensive maternal nutrition care package through the FILTAR (Find, Link, Treat, Auditing and Retain) strategy.
- **Arm 3 (Control group):** Mbarali district council will continue with usual standard of care (IFA supplements) to pregnant women.

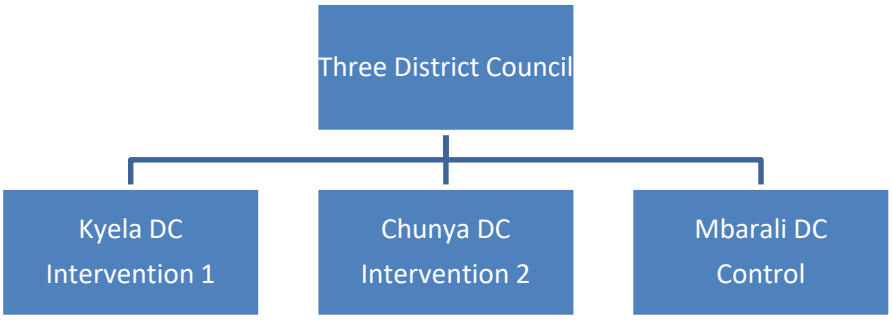

Figure 2: The study design

This study is being implemented in a phased manner:

- Phase1: In year one the project carried out different baseline surveys in all the seven districts of Mbeya region.
- Phase 2: The project activities in two districts (comprehensive maternal nutrition care package /FILTAR with MMS in Kyela DC and comprehensive maternal nutrition care package /FILTAR with IFA in Chunya DC) through community participation and ownership.

A strong learning component is integrated to phase 1 and 2 to inform further scale up at national level.

4.2. Setting

Three districts will be involved: Kyela DC (will receive MMS and systems strengthening interventions), Chunya DC (will receive IFA and systems strengthening interventions) and Mbarali DC which will serve as a control district. The three proposed districts were selected based on a high score of multiple deprivations experienced by their communities including relatively higher levels of anaemia among WRA.

Mbeya region is selected based on the following considerations: high prevalence of stunting (i.e. 38% in 2015/16 above the national average of 34%); the existence of enough quality infrastructures; a functional network of community health workers (CHWs) established in over 80% of villages; and the presence of health service providers (HSPs) in each health facility who have received on-job training, mentoring and coaching on maternal and child nutrition.

In addition, the Mbeya region was selected based on existence of an international and local partners with capacity to work in that region, including ability to ensure the safety of project implementation and evaluation teams.

Figure 3: Map of Tanzania and Mbeya region

.

4.3. Study population

The study population will be all pregnant women living within the catchment population of the health facilities during the life of the project. Three districts are purposefully selected. Two districts will be used as the intervention areas for the implementation of the IFA/MMS and

comprehensive maternal nutrition care package through the FILTAR strategy over a one-year period. The other district and affiliated health facilities shall be the control areas in which data will be collected with no intervention implemented. The health facilities have been evaluated in the baseline and will also be evaluated in the phases of the study in all the 3 districts.

The table below summarized the population to be reached during study implementation. The project therefore expects to enrol approximately 16,921 pregnant mothers in the two intervention councils of the Mbeya region. All pregnant mothers will be recruited at the health facility and community platforms such as VHNDs. The study will target 142 villages and 68 health facilities with RCH services. In each village, two community health workers will be trained and facilitated to undertake the assignment. The project will train a total of 272 community health workers from the intervention districts.

Table 1: Population targeted

Council	Population	Villages	Health facilities	HF with RCH	HH	Village with CHW	No. of CHW	PW
Chunya	197,372	43	28	28	40,280	43	86	8,539
Kyela	249.555	99	56	40	60,868	93	186	8,382
Mbarali	373,861	113	56	51	86,877	113	226	13,823
Total	571,483	255	140	119	188,025	249	498	30,744

4.1.1. Inclusion criteria

This health systems strengthening implementation research study will recruit all pregnant mothers aged 15-49 years in the selected districts.

4.1.2. Exclusion criteria

- Women were not residents in the cluster during the study period.
- Women living in the cluster that decline to give written consent

4.4. The key project interventions

4.4.1. Health Systems Strengthening Approach

The project will target pregnant women living in Kyela DC, Chunya DC and Mbarai DC during the critical period of the first 1,000 days. A comprehensive package of high-impact interventions to improve maternal nutrition status through promotion and counselling on consumption of diversified diets (including fortified staple foods), weight gain monitoring, micronutrient supplementation, promotion of physical activity and uptake of other ANC services will be implemented in Kyela DC and Chunya DC.

Human resource capacity strengthening: The Government through the MOH and TFNC, will adapt the existing maternal nutrition tools existing for mainstreaming maternal

nutrition interventions to build the capacity of health service providers at all levels. Based on the developed jobs aids, health service providers (HSPs) in each health facility, will receive intensive on the job training, mentoring, and coaching every quarter and competencies will be assessed on an ongoing basis. Regional and district health officials will receive a Training of Trainers (TOTs) and provide cascade training on maternal nutrition at both the health facility. Capacity building of health workers on the delivery of maternal nutrition services will also promote a culture of use of data and evidence to inform action and ongoing on-job training will be conducted to foster behaviour change among health service providers.

Skilled health workers in the two intervention districts will also be trained on the job in various areas of relevance to health systems, including health systems management, project management and health services management. Every three months there will be standardized assessment of competencies to ensure health service provider performance is consistent throughout the study period.

Supply chain strengthening: The opportunity of the project will be taken to strengthen Medical Store Department (MSD) to integrate nutrition supplies including MMS in the national chain supply and strengthen the capacities of HSPs, regional and districts pharmacists and nutritionists to ensure adequate procurement, management and distribution of IFA and MMS in Mbeya region. Health facility staff will be trained on quantification, forecasting, and ordering of MMS supplies as well as proper storage and handling at the facility level. Tools will be put in place to monitor stock levels, in line with other existing logistics management information systems for the Ministry of Health.

Health Information system strengthening: Through this project, the national multisectoral nutrition information system, including routine system (Health information management system, Bi-annual bottleneck analysis of specific nutrition interventions at district level, Bi-annual review of annual multisectoral nutrition action plans at district level and regional and national survey) will be strengthened. The district health management will be equipped with skills for data collection and reporting on time. The capacity to submit quality data and use of the data will be enhanced at community and facility levels. Additionally, approaches on how to make data flow efficient from the community to the health facility and then to the district levels will be explored and documented. Data on maternal nutrition and reporting will be linked to the ongoing capacity strengthening of the Integrated Monitoring and Evaluation System (IMES) and Multisectoral Nutrition Information System (MNIS) systems respectively managed by PoRALG and TFNC.

4.4.2. Community Health Systems strengthening

Based on the developed jobs aids, Community Health Workers (CHWs), will receive intensive on the job training, mentoring, and coaching every quarter and competencies will be assessed on an ongoing basis. Regional and district health officials will receive a Training of Trainers (TOTs) and provide cascade training on maternal nutrition at the health facility and community levels.

Pregnant women attending ANC in Chunya District will receive Iron Folic Acid supplementation (IFAS) as usual and in Kyela DC pregnant women will be initiated on MMS supplementation instead of IFAS. These supplements will be provided monthly as part of the ANC visits.

1. In each facility in collaboration with CHW located in their catchment areas will register each pregnant woman to list all women who are initiated on MMS or IFA. Each CHW will have a register of pregnant women located in his/her designated village or street. The CHW register will also contain information on status i.e. whether still active on MMS or IFA, default or discharged, and it will record additional support services such as adherence, referral etc.
2. To raise awareness on the importance of a diversified diet for pregnant women, CHWs will provide quality counselling on dietary diversity, consumption of fortified food and compliance with micronutrient supplementation including IFA and MMS. Existing mothers and caregivers counselling groups in Mbeya region established in over 80% of villages by the stunting reduction project, leveraged as a platform to provide on-going support to the pregnant women. In addition, home address detail for each pregnant woman will be filled at the facility during first ANC visit.
3. The community health system will also be strengthened for demand creation using a combination of communication approaches, including interpersonal communication among pregnant women group counselling, social mobilization events such as Village Health and Nutrition days (VHNDs) and the use of new technologies. Village Health and Nutrition Days will also be implemented quarterly in each hamlet in the two districts as an additional outreach platform for the delivery of integrated community nutrition interventions. This platform will be leveraged to reach pregnant women who are yet to book for ANC and will be used as part of the "Find" component of the FILTAR strategy.
4. Appropriate messages will be developed and disseminated to ensure the adherence of pregnant women to the project and compliance.
5. The existing social accountability and community mobilization digital platforms for antennal care attendance in Mbeya region will be used to provide reminders to women (*mama na mwana* digital platform).

4.5. Implementation strategy

The project will apply the FILTAR (Find, Link, Treat, Audit and Retain) strategy to support a successful implementation of comprehensive maternal nutrition care package (Figure 1). This requires direct investment in health system elements that directly and indirectly contribute to efficiency of the referral system between the community and primary care levels facilities.

- **Find**: - will involve providing adequate skills to CHWs from within the catchment area of the health facility to identify, refer and follow up pregnant women at community at any point of contact and deliver quality ANC services. There will be use of appropriate technologies and supplies (computers, HMIS, mobile phone and household registers) to improve efficiency and strengthen the data collection.

  Link: - CHWs will encourage prompt ANC/RCH clinic attendance and schedule ANC/MCH clinic appointments by the use of the mobile phone device at the time of initial CHW visit (Link). This links directly to efficiency in service delivery, investment in

technologies (mobile phone) and health information for efficient management of referrals. This will create a link between community level and health facility level of the health system. The CHWs will also be trained with tools developed using the national ANC guidelines which integrated the WHO recommendations on antenatal care for a positive pregnancy experience. This will include methods of approach to household and villages and confidentiality.

- **Audit of commodities** (Supplies ensured): Bottlenecks and gaps in supply chain will be identified and streamlined. The project will invest in improvement of quality of care through refresher training of all the skilled health workers in the health facilities on delivery and nutritional commodities forecasting, ordering, handling and management.
- **Treat**: - The ANC/RCH clinics in the facilities will provide the complete comprehensive maternal nutrition care package to each PW and will mainly address the quality of service delivery, commodities component. Any ailments will be treated at the local facility and where referral is needed, they will be referred to the higher-level facility. Capacity building of health workers on the delivery of maternal nutrition services and inculcate a culture of use of evidence to strengthen the performance of health systems will be done through on-job training. Skilled health workers in the two intervention districts will also be trained on the job in various areas of relevance to health systems including health systems management, project management and health services management. The health workers will also be taken through refreshers courses on maternal care. This is intending to ensure they provide quality care. They will be standardized every three months to ensure their performance is consistent throughout the study period.
- **Retain**: - Subjects will be tracked and if one defaults the CHW will be dispatched to the PW's home to counsel the woman/family and accompany the woman to the health facility for the ANC/RCH visit. This component of the intervention links to building an efficient and effective health information system that allows for efficiency in monitoring/tracking of PW at antenatal, delivery and postnatal care. The component will also cover cost-reduction in tracking by applying appropriate technologies such as use of mobile phones.

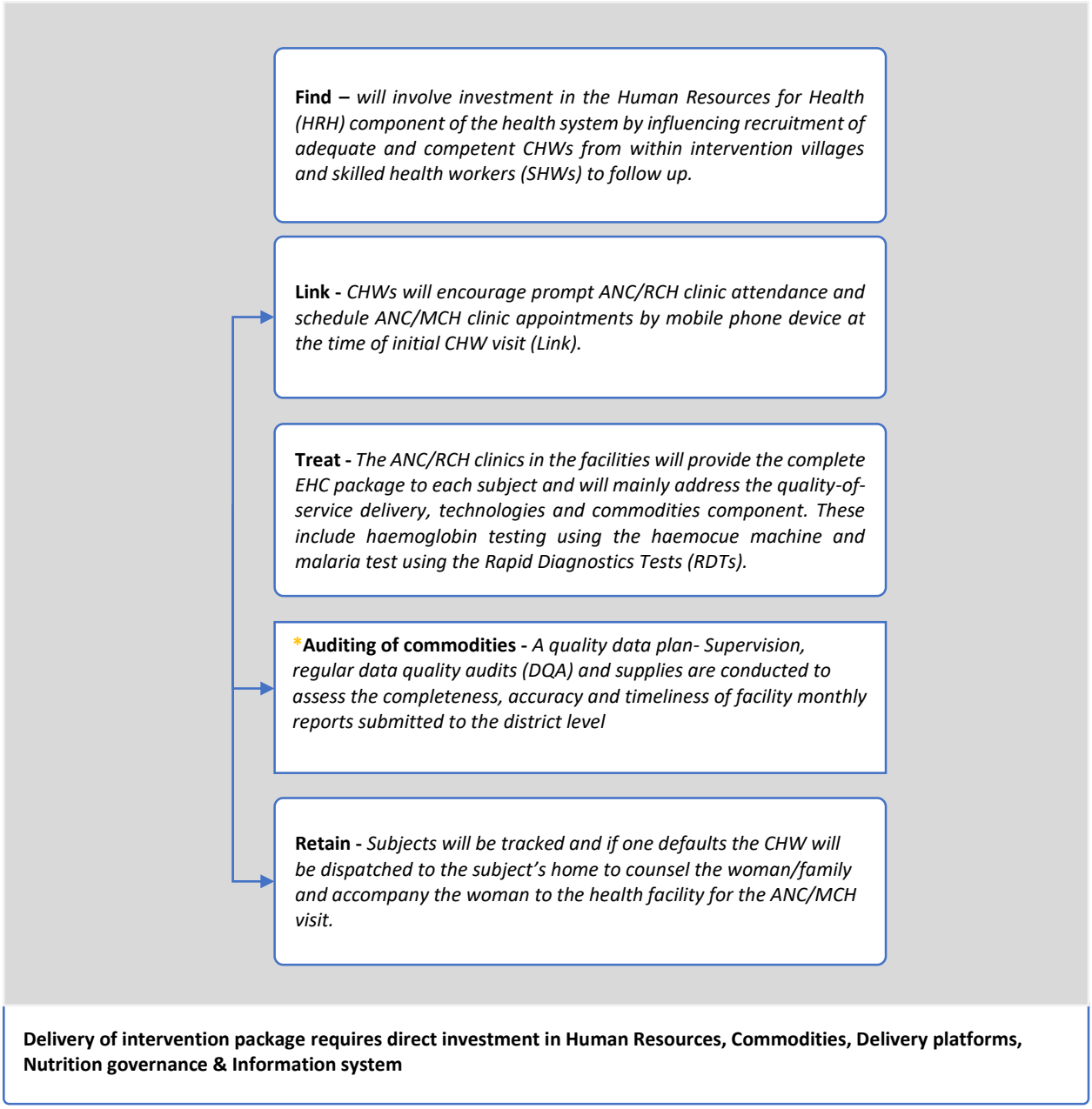

Figure 3: The implementation strategy

This FILTAR strategy will only apply to enroll pregnant mothers within the intervention facilities.

4.6. Ethics Procedures

The study protocol will be submitted for approval by the National Research Ethics Committee (NatREC) of the National Institute of Medical Research (NIMR) in Tanzania. The scientific validity of the study will be approved by all the collaborators involved before being submitted for ethical approval.

In addition, institution research permission will be obtained from the Local Government Authorities (LGAs) and from medical in-charges of the selected health facilities using a generic proposal before commencing the project activities.

5.1. Project Coordination

The project will be implemented under leadership of the Tanzania Food and Nutrition Centre, MOHCDGEC, especially RCH Unit and Nutrition Unit and in collaboration with the President Office – Regional Authorities and Local Government (PORALG), Regional Secretariat (RS) and Local Government Authorities (LGAs) in Mbeya region and with development partners from UN (especially UNICEF), CSOs (especially Catholic Relief services and COUNSENUTH in Mbeya region) and the Academia (especially African Academy of Public Health – AAPH, and Ifakara Health Institute – IHI).

The costs for the implementation of IMAN project in Mbeya region will be supported by the Government of Tanzania and UNICEF

5.1.1. Project Steering and Oversight

This implementation research proposal is conceived as a living document and will be regularly updated and improved based on the evidence generated and the guidance from the Technical Advisory Group (TAG).

A Technical Advisory Group (TAG) is established and includes members from the Ministry of Health Prevention Services, Procurement and Supply Unit, the Tanzania Food and Nutrition Centre (TFNC), the Medical Store Department (MSD), the President's Office – Regional Administration and Local Government Ministry (PORALG), Mbeya Regional Secretariat (RS), UNICEF, WHO, the African Academic Public Health (AAPH), Ifakara Health Institute (IHI), and the NGO (Catholic Relief Services (CRS) and COUNSENUTH). TAG will guide the design, implementation, and monitoring of the project, will oversee the project review, and disseminate the evidence generated and facilitate advocacy efforts based on the outcome of the project.

5.1.2. Organization Structure

The coordination of the project will rely on the existing National Multisectoral Nutrition Action Plan (NMNAP) coordination structures, shown in the figure below.

At the sub-national level, the project will be coordinated by the Regional Medical Officer (RMO) through the regional multisectoral steering committee on nutrition (MSCN), in collaboration with the Regional Nutrition Officer and the regional health management team (RHMT). Similarly, at the council level, the project will be coordinated by District Medical Officers (DMO) through councils' MSCN, in collaboration with District Nutrition Officers and the council health management teams (CHMT). The community component of the intervention will be managed by CRS and COUNSENUTH in close collaboration with local government authorities at regional, district, ward, and village levels.

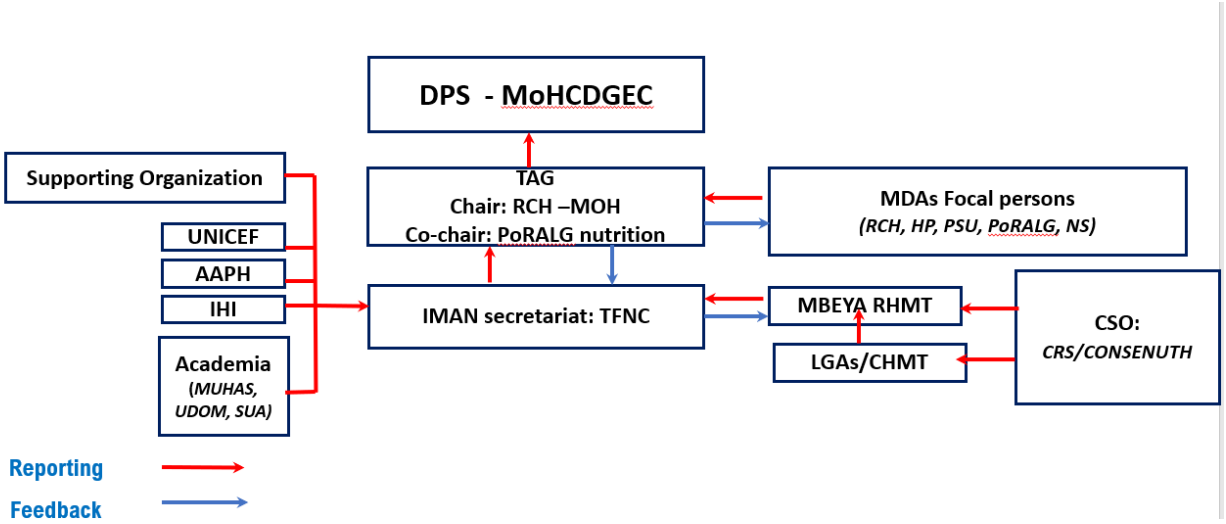

Figure 4: Organization structure

5.2. Roles and Responsibilities

5.2.1. Role of TFNC

TFNC will coordinate regularly and effectively with MOH so that all external assistance to improve nutrition outcomes are aligned with Government strategies and priorities while selection of project location appropriately takes into account other Government and development partners' projects. The TFNC is thus positioned as the main lead on the project overall with the following responsibilities:

- Project planning and coordination at the national level within the Department of Community Health and Nutrition of TFNC.
- Ensure the timely and adequate procurement of key micronutrient supplements in consultation with the MOH-Procurement and Supply Unit (PSU) to ensure availability at frontline distribution points.
- Support the capacity building of health workers to be provided under this project by conducting regular meetings and on the job training at district and regional levels to strengthen the service delivery.
- Facilitate the strengthening of monitoring and supervision on the part of health service providers in support of the initiatives introduced by this project.

5.2.2. Role of UNICEF

- Provide financial support for advocacy meetings and training at regional and district levels, regional and district coordinators, project monitoring and evaluation.
- Provide technical assistance in the form of advocacy; facilitation of training events and the development of tools and materials at regional and district levels for building the capacity of HSPs; provide advice and input to relevant officials on how to streamline, monitor and improve their planning and forecasting as well as distribution management of relevant supplies; provide catalytic support more generally for removing bottlenecks in project implementation.
- Provide financial and technical (review and development of training materials) support to training for the health staff to build their capacity for effective implementation, monitoring and supervision of the project.
- Provide technical and financial support for the design and conduct the project implementation.
- Facilitate meetings to review and revise the existing national guidelines.

5.2.3. Role of MOH (Nutrition unit, Procurement and Supply Unit, health promotion Unit and RCH Unit)

MOH will:

- Support the policy and advocacy of this project.
- Facilitate the review the existing Jobs aids, SBCC materials for HSPs and CHWs
- Develop additional operational guide and tools for HSPs and CHWs
- Participation of all relevant units from the ministry in the project design, implementation and monitoring
- Facilitate a series of meetings with government officials, PSU, TMDA and MSD which are responsible for supply of micronutrient supplements including IFA and MMS for problem solving and guidance.
- Facilitate meetings to review and revise the existing national guidelines.
- Manage all the supplies including IFA supplements and MMS.

5.2.4. Role of PORALG and Mbeya RS

The President's Office – Regional Administration and Local Government Ministry (PORALG) is responsible for:

- The project activities implementation, in collaboration with Mbeya Regional Secretariat (RS) and Local Government Authorities (LGAs) and CSOs (CRS and COUNSEUTH) in line with the nutrition compact requirement.

Mbeya RS and LGAs are responsible for:

- Coordination at regional and council levels
- HSPs training and mentorship
- Supportive supervision
- Project activities implementation at health facility level
- Project data collection, analysis and use of data for evidence-based planning and budgeting

5.2.5. Role of IHI and AAPH

The research institutions (IHI and AAPH) are responsible to conduct studies and assessments including comprehensive situation analysis, baseline survey, barriers analysis, formative monitoring.

5.2.6. Role of CRS and COUNSENUTH

CRS and CONSENUT are responsible for community Health Workers training and supervision, support for community activities implementation such as VHNDs, counselling at household level, community mobilization and engagement.

5.2.7. Role of Sight and Life Foundation and Pennsylvania State University (PSU).

Sight and Life Foundation is responsible to conduct the situation Analysis of Production and Procurement of Multiple Micronutrient Supplements in Tanzania. PSU is responsible to conduct the Formative Research for the Introduction of Multiple Micronutrient Supplements in Tanzania.

5.2.8. Role of Nutrition International (NI)

NI is responsible to conduct the MMS cost-effectiveness analysis.

PROJECT MANAGEMENT ARRANGEMENTS

There will be a single TFNC-based project management team for the implementation research that will guide and support all proposed work, with technical and monitoring and evaluation support from senior epidemiologists at the TFNC Nutritional Epidemiology unit. The management team will comprise the Project Principal Investigator Dr Germana Leyna, and a Project Coordinator Sauli Epimack and Assistant Project Coordinator Dr Geofrey Mchau. In addition, there will be two dedicated District Coordinators: Erick Killel for Chunya DC and Lilian Festo for Kyela DC. Both District Coordinators will be hosted at the TFNC office- nutritional epidemiology unit. They will be responsible in making follow up at district levels.

- The District Coordinator will closely work with the District Nutrion Officer (DNuO) and monitor the implementation of the program within the district.
- They will work with health officer in the health center of the districts to streamline bottlenecks in program implementation.

The Project Coordinator will supervise and monitor the two District Coordinators. The Project Coordinator, supported by UNICEF and the Project PI will liaise with national government and other stakeholders to keep them informed of progress and any issues arising.

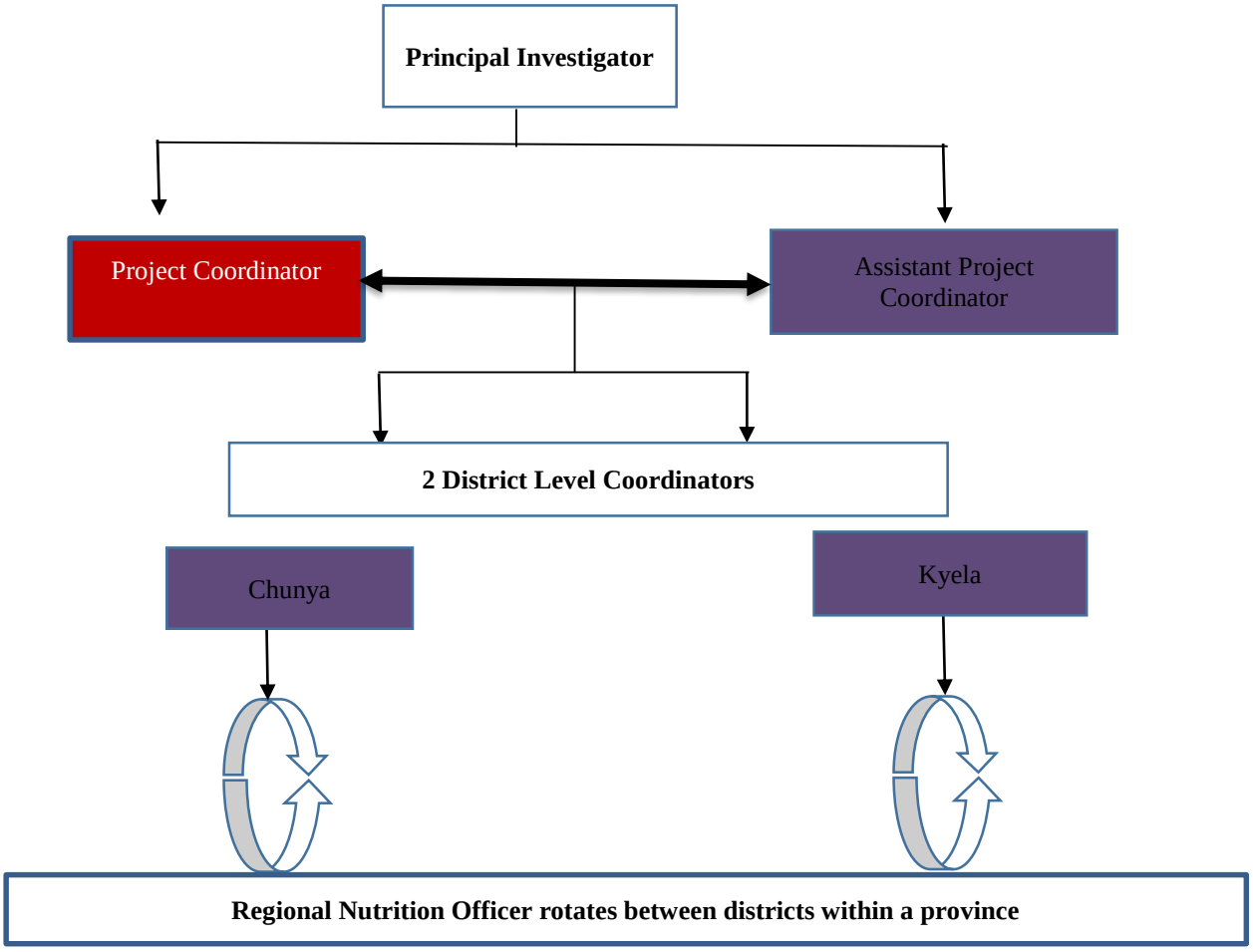

Figure 7: Organization structure

PROJECT MONITORING AND EVALUATION

The overall objective of the project monitoring and evaluation will be to (a) assess any changes in coverage and adherence of MMS and IFA; (b) evaluate the extent to which these are plausibly due to the project interventions and (c) provide this information to the national and regional governments to inform their further planning and scale-up.

Technical guidance and support for the evaluation will be provided by the Research and Evaluation team at the TFNC, IHI and AAPH.

6.1. Project Monitoring and Evaluation

To a large extent monitoring and evaluation of the activities to be implemented under IMAN will be done using existing data collection, reporting systems studies.

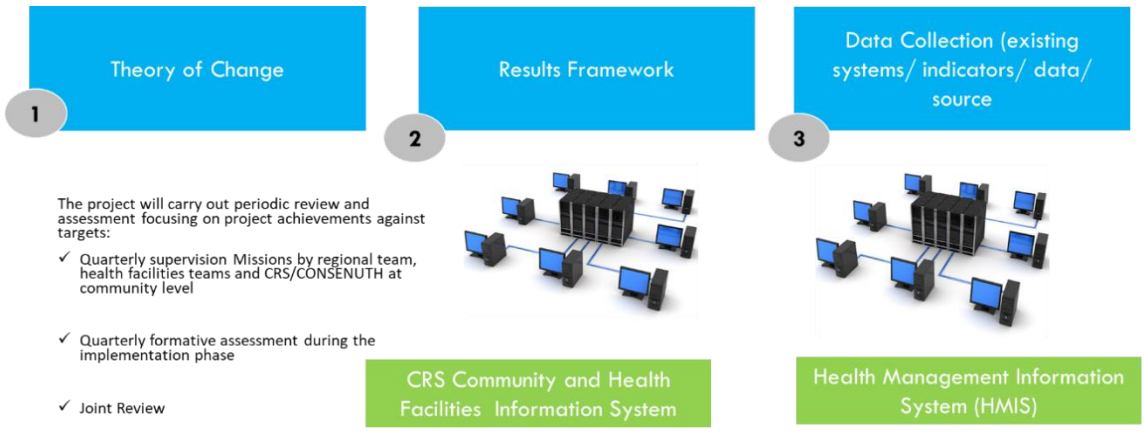

Figure 8: IMAN project Information collection, Monitoring, Evaluation and Reviews

The project will be evaluated using *a quasi-experimental pre- and post-intervention survey design*. The sample size will be powered to provide project area level estimates. Cross-sectional surveys have been conducted prior to the project roll out (baseline) and will be conducted at the end of the project exposure period (end line) among the following four groups of respondents:

- Recently delivered women to measure changes in coverage and utilization of IFA supplements and MMS during their last pregnancy as well as knowledge and practices related to iron deficiency anaemia and IFA and MMS supplementation. We will be considering recently delivered women to allow for a period of complete exposure to the entire duration of the pregnancy to be able to effectively assess levels of complete coverage and utilization of IFA and MMS during the entire duration of the last pregnancy. In addition, knowledge about the causes, symptoms and consequences of anaemia, ways to prevent anaemia, the possible reasons for non-compliance of IFA and MMS, knowledge of IFA and MMS dose, duration and benefits, methods to overcome side effects of IFA and MMS consumption, counselling provided and use of behavior change communication materials by health workers will also be assessed. Health worker knowledge and practices about causes, symptoms and consequences of anaemia, ways to prevent anaemia, IFA and MMS supplementation, dosage, duration and benefits of IFA and MMS utilization, supplies of IFA and MMS tablets, counselling provided and use of behavior change communication materials by the health workers will also be assessed.
- Pregnant women (pregnant at the time of survey), to measure the prevalence of any anaemia among pregnant women. Currently, anaemia prevalence among pregnant women has been assumed to be 39% as per the baseline study. To measure change in hemoglobin levels more precisely, we will be drawing blood samples from currently pregnant women during the baseline and end line surveys. In these surveys, samples will be drawn from pregnant women in all the three trimesters of pregnancy since the levels of anaemia may differ by gestational age, as reported in some studies. Further, during the end line survey, pregnant women who have been staying in the project area since the beginning of the project will be selected assuming that they have been exposed to the project interventions during the course of their pregnancy, and those who have migrated in and out of the project area during the project exposure period will be excluded. In addition, we will assess the coverage and utilization of IFA and MMS supplementation during the current and last pregnancy retrospectively as well as their knowledge and practices related to anaemia and IFA/MMS supplementation will also be assessed through a questionnaire so that we can analyze the association between the coverage and utilization of IFA/MMS and hemoglobin levels.

The evaluation design will detect council's level differences. The results of the evaluation will be disseminated in a workshop with the various stakeholders from the GoT, civil society organizations, private sector, academia, UN and donor agencies.

CAPACITY BUILDING

This project will contribute in the capacity building through engaging graduate students (MSc & PhD) in nutritional epidemiology from Muhimbili University of Health and Allied Sciences (MUHAS) to undertake their researches during the implementation period of the project and beyond in the health systems discipline. These masters and doctoral students will work with the health workers and community health workers during the study and implement their research projects at these sites. They will participate in the training and service provision while doing their research projects. The evidences to be generated will be used to strengthen the performance of health and community systems in delivering quality maternal nutrition services.

PROJECT LEADING TEAM

A brief bio-sketch of each of the core team member is provided below with the person level of effort for the entire period of project execution.

Dr Germana Leyna a Managing Director of Tanzania Food and Nutrition Centre will be a Lead person during the period of entire project implementation. She holds a Doctor of Philosophy (PhD) in food insecurity, associated factors and health-related outcomes in rural Tanzania and a Master of Philosophy in International Community Health, both from University of Oslo, Norway. Before, she has been a lecturer in Epidemiology and Biostatistics in the department of Epidemiology and Biostatistics of Muhimbili University of Health and Allied Sciences (MUHAS), she has vast experience in teaching, supervising, conducting research and consultancies for number of years, which foster her epidemiological research designs and data analysis skills. She has authored/co-authored several publications in international peer review journals in the area of population health, HIV, food insecurity, dietary intake and non-communicable dietary related diseases. Dr. Germana Leyna is currently leading several research projects as a Principle Investigator/Co-Principal Investigator such as: Pragmatic Trial for HIV Pre-Exposure prophylaxis roll-out in Tanzania; Building Capacity for Patient-Centred Outcomes Research to Improve the Quality and Impact of HIV Care in Tanzania; The Prime Diet Quality Score (PDQS) questionnaire validation among urban women in Tanzania and Diet, Environment, and Choices of positive living (DECIDE study): Evaluating personal and external food environment influences on diets among PLHIV and families in Dar es Salaam, Tanzania. She has 6 years of institutional leadership and management experience. She is a member of Tanzania Universities Quality Assurance Forum (TUQAF), East African Quality Assurance Network (EAQAN), Medical Women of Tanzania (MEWATA), Tanzania Public Health Association (TPHA) and Medical Association of Tanzania (MAT). In this survey, Dr. Germana Leyna will be responsible for:

- Overall technical leadership and vision
- Manage coordination and communication with IMAN
- Finalize study protocol, including developing survey instrument, and submit to Tanzanian IRB
- Complete data collection planning and training
- Lead, manage, and provide quality assurance for data collection
- Complete data cleaning
- Lead report writing
- Disseminate findings to IMAN project, Government of Tanzania, and other audiences as appropriate

Dr. Ray M. Masumo (Ph.D Epidemiology and Applied Biostatistics) from the Bergen University, Norway is a Director at the Department of Community Health and Nutrition at the TFNC and the Adjunct Fellow with the School of Nursing and Midwifery at Western Sydney University, Australia. He has extensive experience in public health research development, particularly in nutrition and oral health services. He has (co-) authored more than 15 papers in peer-reviewed scientific journals and, as well as two book chapters. His most recent work has focused on the contribution of social policies for public health in sub-Saharan African countries. In this survey he will participate in the scientific aspect of the survey particularly on the methodology and data analysis and link with Ministry of Health for policy dialogues.

Mr. Sauli Epimack (MSc. Nutrition and Health specialization Epidemiology and Public health) is working as a Research Officer-Nutrition at the TFNC will be an overall study coordinator. Sauli Epimack is a confident nutritional epidemiologist with experience and knowledge on designing, conducting and analyzing data from epidemiological studies. He has more than 6 years of working experience in planning, implementation, monitoring and evaluation of nutrition related interventions which has enabled him to acquire necessary skills to address questions of dietary intake and nutritional status and evaluate health intervention projects. Mr. Epimack has profound and advanced data analysis skills and ability to choose the appropriate method of data analysis, given the survey design and type of variables using either SPSS or SAS or Stata projects. In addition, he has the best experience in translating data in easy understandable way through National Evaluation Platform (NEP), Tanzania team. In this survey he will:

- Support the PI and Co PIs and participate in all aspects of survey implementation and reporting, ensuring that analyses are presented in a policy-relevant way.

Dr Geofrey J. Mchau (PhD) is a principal epidemiologist with more than 14 years of experience in disease surveillance, prevention and control at the Ministry of Health and Tanzania Food and Nutrition Center. He is experienced in organizing, planning, implementation, coordinating, monitoring and evaluating strategies and programs for diseases incidence reduction in the country. As experience researcher in nutrition and health issues with a new global breakthrough publication on evidence of health-related effects of unsafe water consumptions among other 14 peer-reviewed publications. He offers a potential linkage between academics/research and policies change influence at the Ministry of health as the key aspect of the outcome of this survey. His pivotal work over the past years has provided substantial insights into transforming research finding into practical strategies to improve quality of health care that aim at reducing the burden of diseases. He has experience in implementing a number of the international and national project of different scales which is an asset to the team of this survey. He will assist in implementation of the survey, data collection, analysis plan and report writing

Other project support members include the following:

Dr. Salum Manyatta is a Regional Medical Officer of Mbeya Region. He has been in medical field for health care practices for about 20 years under the umbrella of ministry of health**.** He has a Postgraduate Diploma in International Health Consultancy attained in Liverpool School of Tropical Medicine and a Master's degree in Public Health attained in KCM-College, Tumaini University. The Bachelor degree in Doctor of Medicine acquired at Muhimbili University College of Health Science (MUHAS). He has an experience in community and health facility management and coordination. Dr. Salum is experienced in health care facility management of patients and thereafter worked as Medical officer in charge at health care facility. He worked as District medical officer for a couple of years in Serengeti district council and thereafter upgraded to assistant Regional administrative secretary in health section. He also experienced in various areas like; Providing technical and professional expertise on improving quality of promotive, preventive, curative and rehabilitative health services to LGAs and the Region as a whole. Translating policies, guidelines and standards as set out by the Ministry for interpretation and implementation by Local Government Authorities. Monitoring all activities related to health services provision in the LGAs and across the region in partnership with all stakeholders and act as a link with Ministry of Health and the Local government authority. Advising the Council Health Management Teams within the Region on appropriate health system research and use of results to improve service delivery. In this research he will be working as a linkage between the research team and the local government authority.

Benson Sanga (MSc. in Human Nutrition) is a nutritionist experienced for 12 years in the nutrition field. He worked in medical field for 8 years with an experience in patient care and management at Hospital settings with Diploma in clinical medicine. He worked in Governmental health care facilities as well as private sector. He got majored in human nutrition with an experience at council level where he worked as District nutrition officer. Currently Mr. Benson is working as a Mbeya region Nutritionist coordinating all nutrition activities at region level. He has experienced in acute malnutrition assessment and management. He is a national TOT in IMAM services, NACS and MIYCAN. His roles as regional nutritionist is to work as nutrition coordinator at regional level and linkage to nutrition stake holders within the region. He also insures good planning and budgeting for nutrition interventions at council and regional level. He also has an experience in research in various disciplines. He participated in data collection for SMART Survey under TFNC coordination and nutrition data collection in southern highlands zone under the coordination of Concern worldwide a non-governmental organization. Mr. Benson ever worked as assistant research consultant in four researches related to satisfactory survey of community health fund services.

Fatoumata Lankoande is a nutrition specialist with 15 years' experience in the field of nutrition. She worked with the ministry of health in Burkina Faso and joined UNICEF Burkina as national specialist and later as nutrition specialist in different countries. Fatoumata has a master's degree in nutrition and worked on severe acute malnutrition management, micronutrients deficiencies reduction and stunting reduction programmes.

Ramadhani Noor (PhD) is a nutrition specialist working with the UNICEF Tanzania country office.

Abraham Sanga
Is a nutrition officer with 16 years' experience in the field of nutrition currently working in UNICEF Tanzania. He is currently supporting programming for Children, Adolescents, and women.

Anna Godfrey: (Msc master's degree on Food, Nutrition and Dietetics) is a qualified nutritionist with more than 13 years working experience on maternal and young child health and nutrition programs. Competent on managing and monitoring: projects, budget, team dynamics and staff wellbeing. Effectively engaged in strengthening partnership with Government Officials at Ministries, Region and District level, different stakeholders from non-Government institutions as well as community members. Anna is capable to ensure learning accompanies implementation of project activities and promotes innovations to adjust and improve project plans and implementation schedules**.**

Dr. Lunna Hemed Kyungu, PhD, has more than 25 years' experience working in the health and nutrition sector with focused expertise in the following areas: maternal infant, young child and adolescent nutrition (MIYCAN), prevention and control of malnutrition especially micronutrient deficiencies, protein-energy malnutrition; non-communicable diet-related diseases and care for vulnerable groups. Dr. Kyungu has vast experience in project management and implementation, capacity building, and development of educational and communication materials for improved health and nutrition outcomes. Dr. Kyungu has been involved in several training of health sector workers on health and nutritional related interventions; development of several national guidelines; she has also been responsible for designing, managing, coordination and providing technical support in the implementation of several nutrition and health related programs and interventions, including those related in scaling up innovative evidence based essential nutrition actions to reduce childhood stunting in the first 1000 days; community-based health and nutrition interventions and nutritional care and support for PLHIV. She has also been involved in the development of educational materials, training packages and job aids on health and nutrition. She has a strong experience in providing technical support and advice in development of project proposals, action plans, national guidelines and capacity building materials related to health and nutrition. In addition, Dr. Kyungu has expertise in

community level nutrition interventions and establishment/strengthening of linkages between health facilities and communities and advocacy.

Dr. Kyungu is currently a Senior Advisor for Programs and Research at the Centre for Counselling, Nutrition and Health Care (COUNSENUTH). She is responsible for providing technical support in planning, monitoring and evaluation of all program activities including capacity building of community level program implementers on project planning, implementation; capacity building and supportive supervision for health care providers around targeted nutrition interventions; and designing behavior change interventions, including use of mass media and development and dissemination of information, education and communication materials on nutrition. Prior to joining COUNSENUTH, Dr. Hemed-Kyungu worked for 15 years with the Tanzania Food and Nutrition Center. She holds a PhD in Ecotrophology from the Christian-Albrechts-Universität zu in Kiel, Germany and a Master's of Science (MSc) in Community Nutrition from University of Queensland, Australia.

PROJECT TIMELINE, BUDGET AND RESULT FRAMEWORK

8.1. Project timeline

No.	Activities	Lead Institution	Institution Providing close technical support	Collaborating Agencies	Jan-Dec2022											
					1	2	3	4	5	6	7	8	9	10	11	12
1.1 Increased coverage of adequate equitable and quality maternal nutrition services at community and facility level.																
1.1.1	Revise/develop SBCC and data collection materials and tools	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF												
1.1.1.1	Revise/develop Facilitator's guide	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF												
1.1.1.2	Revise/develop Participant guide	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF												
1.1.1.3	Revise/develop job aids/flipchart for HWs and CHWs	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF												
1.1.1.4	Revise/develop gender-based communication materials for different level including individual and community level (including leaflets, audio, audio-visual, digital, radio talk show)	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF												
1.1.1. 5	Revise/develop tools for data collection.	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF												
1.1.1.6	Print, distribute and disseminate the revised/developed SBCC materials and data collection tool	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF												

1.1.2	Train on integrated preventive and nutrition counselling, MMS/IFA supplementation, nutrition assessment and reporting based on the revised training tools for pregnant and postpartum women	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF														
1.1.2.1	Train selected RCHMT (RRCHCo, RNO, RNuO, Regional Pharmacist, Regional lab tech, RCDO) and CHMT members (DRCHCo, DNO, DNuO, Pharmacist, District lab tech, DCDO) on mentorship and supportive supervision of maternal nutrition services.	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF														
1.1.2.2	Train regional, district and facility pharmacists or focal persons and nutritionists on quantification and management of IFAS and MMS	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF														
1.1.2.3	Develop a procurement and distribution plans for IFA and MMS in the selected districts and procure IFA for Chunya and Microcuvette and Hemocue machine for Kyela and Chunya	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF														
1.1.2.4	Train HSPs on maternal nutrition services	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF														
1.1.2.5	Train CHWs on group and individual counselling on identified behaviours for improved maternal nutrition, defaulter tracking and reporting based on the revised training tools	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF														
1.1.2.6	Conduct on job mentorship to HSPs maternal nutrition services and data collection and advocate Health facility in charges on how Direct Health Facility Financing may support procurement and distribution of IFA and microcuvettes by selected CHMT members	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF														
1.1.2.7	Conduct job mentorship to CHW on identification, counselling, defaulter tracking and reporting for maternal nutrition services by HSP – CHWs supervisors.	TFNC	MOHCDGEC	RS, LGAs, PORALG, UNICEF														
1.2	**Improved enabling environment for maternal nutrition**																	

1.2.1	Conduct Technical Advisory Group to assess the renewed approach to improving maternal nutrition and inform policies, projects and guidelines at national and international levels.	TFNC	MOHCDGEC	PORALG, UNICEF														
1.2.2	Support coordination meetings for maternal nutrition interventions at regional and district level through council and regional level multisectoral steering committees	RAS, LGAs	PORALG	MOHCDGEC, TFNC, UNICEF														
1.2.3	Develop advocacy materials (policy briefs, dissemination package, and publications paper) to promote the adoption of key findings from the project.	TFNC	MOHCDGEC	PORALG, UNICEF														
1.2.4	Conduct a barrier analysis of maternal health and nutrition services (including commodities) in Mbeya region	IHI	TFNC	MOHCDGEC, PORALG, UNICEF														
1.2.5	Conduct a situation analysis of maternal nutrition at national level and in Mbeya region	AAPH	TFNC	MOHCDGEC, PORALG, UNICEF														
1.2.6	Conduct a baseline study on maternal health and nutrition services in Mbeya region	AAPH	TFNC	MOHCDGEC, PORALG, UNICEF														
1.2.7	Conduct formative assessment to monitor progress on addressing the identified barriers to maternal health and nutrition services	IHI	TFNC	MOHCDGEC, PORALG, UNICEF														
1.2.8	Conduct quarterly supportive supervision from region to district.	RS	PORALG	TFNC, UNICEF														
1.2.9	Conduct quarterly supportive supervision from district to facility and community level.	LGAs	RS	PORALG, TFNC, UNICEF														
1.2.10	Conduct Mbeya MN survey among pregnant women	TFNC	MOHCDGEC	PORALG, UNICEF														
1.2.11	Develop the project data quality assurance plan	TFNC	MOHCDGEC	PORALG, UNICEF														
1.2.14	Conduct joint IMAN mid-term review	TFNC	MOHCDGEC	PORALG, UNICEF														

1.2.15	Identify DMSCNs and CHMTs gaps on planning, implementing, and coordinating nutrition specific and sensitive interventions at health facility and community level interventions at health facility and community levels	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
1.2.16	Provide on-site mentorship to DMSCNs and CHMTs on planning, coordination, implementation, monitoring and reporting of nutrition specific and sensitive interventions at health facility and community levels	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
1.2.17	Support R/DMSCN and full council to use evidence in planning, implementation, monitoring of nutrition sensitive and specific interventions and CHWs incentives through quarterly R/DMSCN, CHMT and bi-annual nutrition compact review meetings	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
1.2.18	Provide orientation to DNuOs, WEOs and VEOs on the use of new analytical tools (IMES) in their review and interpretation of data	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
1.2.19	Support LGAs to review and harmonize existing reporting structures/systems on the community nutrition and health reporting mechanisms	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
1.2.20	Sensitize key leaders at all levels on interpretation and utilization of collected data in decision making	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
1.2.21	Support LGA's to ensure availability of M&E reporting tools and integrate Technology in data collection and management	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
1.2.22	Support DMSCNs and CHMTs to orient and monitor key frontline workers on their mandate as per national nutrition related policy/guideline documents	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
1.2.23	Support DMSCNs and CHMTs to provide onsite mentorship to community key structures to develop plans and monitor nutrition sensitive and specific interventions	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														

1.2.24	Support and monitor health facilities to plan and budget for nutrition interventions and supplies including IFAS and IMAM supplies	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
1.2.25	Advocate and monitor Wards Development Committees and Village Committees to plan and implement nutrition interventions	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.1	**Women of reproductive age have increased knowledge, access and consumption diversified, safe, nutritious, and adequate DIETS**																	
2.1.1	Conduct inventory to document locally available foods found in Mbeya region that can be used in developing different recipes including food prices and seasonality)	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.1.2	Conduct desk review to obtain existing food recipes (ingredients and how to prepare them)	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.1.3	Formulate/develop the recipes	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.1.4	Field-test and document the developed recipes	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.1.5	Mobilize and sensitize community members on the importance of maternal nutrition services	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.1.6	Work with WCDOs to identify existing community groups (farmer groups, peer support groups, religious groups, VICOBA etc.) and conduct cooking demonstrations (supported by CMSCN)	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.1.7	Work with WDC's coordinate and support cooking demonstrations through existing community platforms eg. VHNDs	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.1.8	Work with WDCs to support CHWs to conduct PDH+ sessions with caregivers of the identified malnourished children	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.1.9	Work with WDCs to support CHWs to promote 2-2-2 approach through VHNDs, Health facilities and community groups	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.2	**Increased empowerment of adolescents, parents (men and women) and caregivers' involvement on informed and appropriate health and nutrition BEHAVIORS**																	

2.2.1	Sensitization to village leaders, religious leaders and other influential people to advocate for male involvement to support optimal nutrition behaviours	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.2.2	Provide Children with opportunity to directly play and interact with caregivers in the community through VHND ECD corners, RCH clinics ECD corners, and MWHs and community crèches	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.2.3	Provide coaching and mentorship to CHWs on conducting Knowledge, Attitude, and Practices (KAP) assessment to track caregivers and pregnant women's behaviour on nutrition, ECD, WASH and health related issues	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.2.4	Provide coaching and mentorship to HFWs on conducting Knowledge and Attitude assessments to track caregivers and pregnant women's behaviour on nutrition, ECD, WASH and health related issues	CRS, COUNSENUT	LGAs	RS, TFNC, PORALG, UNICEF														
2.2.5	Create Male peer support to reinforce role male's involvement in maternal nutrition services	CRS, COUNSENUT	LGAS	RS, TFNC, PORALG, UNICEF														

8.2. Project budget – Detailed budget per year (Jan – Dec 2022)

No.	Activities	Nov 2021-Oct 2022												Total
		1	2	3	4	5	6	7	8	9	10	11	12	
1.1 Increased coverage of adequate equitable and quality maternal nutrition services at community and facility level.														
Total 1.1			0	0	0	0	0	0	0	0	0	0	0	56,000,000
1.2 Improved enabling environment for maternal nutrition														
Total 1.2		1,041,500,000	380,900,000	125,200,000	48,400,000	10,000,000	110,000,000	18,000,000	260,000,000	110,000,000	18,000,000	10,000,000	128,000,000	2,260,000,000
2.1. Women of reproductive age have increased knowledge, access and consume diversified, safe, nutritious, and adequate DIETS														
Total 2.1		17,625,000	51,430,000	0	20,625,000	0	0	17,625,000	0	0	13,125,000	4,500,000	0	124,930,000
2.2. Increased empowerment of adolescents, parents (men and women) and caregivers' involvement on informed and appropriate health and nutrition BEHAVIORS														
Total 2.2		11,850,000	7,500,000	17,000,000	11,850,000	17,000,000	0	11,850,000	17,000,000	0	11,850,000	17,000,000	0	122,900,000
Total (TSZ)		**1,126,975,000**	**439,830,000**	**142,200,000**	**80,875,000**	**27,000,000**	**110,000,000**	**47,475,000**	**277,000,000**	**110,000,000**	**42,975,000**	**31,500,000**	**128,000,000**	**2,563,830,000**
Total (USD)		**489,989**	**191,230**	**61,826**	**35,163**	**11,739**	**47,826**	**20,641**	**120,435**	**47,826**	**18,685**	**13,696**	**55,652**	**1,114,709**

8.3. Results Framework

No	Indicators	Baseline value and Source			Data collection and reporting		
		(year)	2021/22	2022/23	Frequency of reports	Verification sources	Responsibility for data collection
1.1 Increased coverage of adequate equitable and quality maternal nutrition services at community and facility level.							
1	Proportion of PW disaggregated by age group attending ANC services in the first trimester (%)	26% (2020 - Mbeya Biomaker)		50% (8460 PW for Kyela and Chunya)	Annually	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs & UNICEF
2	# of ANC visits attended by pregnant women during the study (average)	3 (2020)		8	Annually	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs & UNICEF
3	Proportion of PW disaggregated by age group receiving IFA on their 1st antenatal visit (%)	80 (2020)		95	Annually	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs & UNICEF
4	PW disaggregated by age group consuming IFA for 90+ days during pregnancy (%)	40% (2020 - Mbeya Biomaker)		50% (8460 PW for Kyela and Chunya)	Annually	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs & UNICEF
5	Proportion of PW disaggregated by age group receiving MMS on their 1st antenatal visit (%)	NA		50% (4191 PW for Kyela)	Annually	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs & UNICEF

No	Indicators	Baseline value and Source			Data collection and reporting		
		(year)	2021/22	2022/23	Frequency of reports	Verification sources	Responsibility for data collection
6	Proportion of PW disaggregated by age group consuming MMS for 90+ days during pregnancy (%)	0% (2018/19)		50% (4,191 PW for Kyela)	Annually	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs & UNICEF
7	Registered PW that reported 1 or more barriers to taking IFA/MMS	NA		50% (8,460 PW for Kyela and Chunya)	Annually	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs & UNICEF
8	Proportion of PW receiving nutrition counselling during last ANC visit (%)	80%		100	Annually	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs & UNICEF
9	Proportion of PW receiving nutrition counselling from CHWs at least once in the past three months (%)	20		90	Annually	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs, CRS, COUNSENUT & UNICEF
10	Proportion of CHWs trained on integrated maternal nutrition counselling (%)	0% (2018/19 - NGOs report)		100% (272 CHW 2 per Village for Kyela and Chunya)	Annually	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs, CRS, COUNSENUT & UNICEF
11	Proportion of HSPs trained on nutrition assessment and	0% (2018/19 - LGA report)		100% (152 HSPs 2 per Health	Annually	Project report	TFNC, MOHCDGEC, PORALG

No	Indicators	Baseline value and Source			Data collection and reporting		
		(year)	2021/22	2022/23	Frequency of reports	Verification sources	Responsibility for data collection
	respectful maternal care (%)			facility for Kyela and Chunya)			DNuOs, RNuOs & UNICEF
12	Proportion of HSPs trained on adequate quantification ordering and supply management of IFA and MMS (%)	0% (2018/19 - LGA report)		100% (152 HSPs 2 per Health facility for Kyela and Chunya)	Annually	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs & UNICEF
13	Proportion of health facilities that had an adequate stock of MMS for the target population served in the previous three months	0% (2018/19 - LGA report)		100% (41 HFs for Kyela)	Quarterly	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs & UNICEF
14	Proportion of health facilities that had an adequate stock of IFA for the target population served in the previous three months	0% (2018/19)		100% (35 HFs for Chunya)	Quarterly	Project report	TFNC, MOHCDGEC, PORALG DNuOs, RNuOs & UNICEF
1.2 Improved enabling environment for maternal nutrition							
1	Councils holding at least two meetings of the nutrition steering committee per year with an agenda on maternal nutrition in a year (%)	50% (2018/19 - Nutrition Steering Committee meetings minutes)	100% (2 councils, Kyela and Chunya)	100% (2 councils, Kyela and Chunya)	Quarterly	Nutrition Steering Committee meetings minutes	DNuOs,RNuOs, PORALG,TFNC, MOHCDGEC, CRS, COUNSENUT & UNICEF
2	percentage of TAG resolutions implemented (#)	90% (2021)	100%	100%	Quarterly	TAG meetings minutes	TFNC

No	Indicators	Baseline value and Source			Data collection and reporting		
		(year)	2021/22	2022/23	Frequency of reports	Verification sources	Responsibility for data collection
3	Situation analysis of maternal nutrition conducted (#)	Situation analysis not available (2018/19 - TFNC)			Annually	Situation Analysis Report	TFNC, AAPH, UNICEF
4	Baseline survey conducted (#)	Baseline survey not conducted (2018/19 - TFNC)			Annually	Baseline survey report	TFNC, AAPH, UNICEF
5	Barriers analysis of maternal nutrition services conducted (#)	Barrier analysis not conducted (2018/19 - TFNC)			Annually	Barrier analysis report	TFNC, IHI, UNICEF
6	Formative assessment to monitor the barriers identified (#)	Formative assessment not conducted (2018/19 - TFNC)	Formative assessment to monitor the barriers identified conducted	Formative assessment to monitor the barriers identified conducted	Biannually	Bi - annual formative assessment report	TFNC
7	Number of key leaders and frontline workers who received mentorship/coaching on planning, coordination, implementation, monitoring and reporting of nutrition specific and sensitive interventions	0 (2021)	25	50	Quarterly	Project report	CRS/CONSENUTH
8	proportion of villages submitting timely and complete data to the ward	0	50	100	Quarterly	Project report	CRS/CONSENUTH

No	Indicators	Baseline value and Source			Data collection and reporting		
		(year)	2021/22	2022/23	Frequency of reports	Verification sources	Responsibility for data collection
9	Proportion of ward submitting timely and complete data to the LGAs	0	50	100	Quarterly	Project report	CRS/CONSENUTH
2.1 Women of reproductive age have increased knowledge, access and consumption diversified, safe, nutritious and adequate DIETS							
1	Number of pregnant women who received counselling on dietary diversification, complementary feeding and WASH	0	0	16,921	Quarterly	Project report	CRS/CONSENUTH
2	Number of food receipts developed	0	3	6	Quarterly	Project report	CRS/CONSENUTH
3	Number of villages conducting cooking demonstration	0	80% (109 villages for Kyela and Chunya) conduct six monthly VHNDs)	100% (136 villages for Kyela and Chunya) conduct six monthly VHNDs)	Biannually	Project report	CRS, COUNSENUT TFNC& UNICEF
4	Villages conducting six-monthly Village Health and Nutrition Days (%)	70% (2018/19)	80% (109 villages for Kyela and Chunya) conduct six monthly VHNDs)	100% (136 villages for Kyela and Chunya) conduct six monthly VHNDs)	Biannually	Project report	CRS, COUNSENUT TFNC& UNICEF
2.2 Increased empowerment of Adolescents, parents (men and women) and caregivers' involvement on informed and appropriate health and nutrition BEHAVIORS							

No	Indicators	Baseline value and Source			Data collection and reporting		
		(year)	2021/22	2022/23	Frequency of reports	Verification sources	Responsibility for data collection
1	Proportion of PW accompanied by spouses during ANC visit (%)	0% (2018/19)	5% (846 PW accompanied by spouses during ANC visit)	10% (1692 PW accompanied by spouses during ANC visit)	Quarterly	Project report	DNuOs, TFNC, CRS, COUNSENUT TFNC& UNICEF
2	Number of PW assessed on KAP by CHWs	0	0	16921	Quarterly	Project report	CRS/CONSENUTH
3	Number of Male peer support groups created	0	109	136	Quarterly	Project report	CRS/CONSENUTH
4	Advocacy meeting conducted to village leaders, religious leaders and other influential people to advocate for male involvement to support optimal nutrition behaviours (#)	0 (2018/19)	17 advocacy meeting conducted	34 advocacy meetings conducted	Quarterly	Project report	CRS, COUNSENUT TFNC& UNICEF

REFERENCES

1. Balarajan, Y., Subramanian, S. V, & Fawzi, W. W. (2013). Maternal Iron and Folic Acid Supplementation Is Associated with Lower Risk of Low Birth Weight in India. The Journal of Nutrition, 143(8), 1309–1315. https://doi.org/10.3945/jn.112.172015
2. Black, R.E. & K.G. Dewey. 2019. Benefits of supplementation with multiple micronutrients in pregnancy. Ann. N.Y. Acad. Sci. 1444: 3–5. 5.
3. Bourassa, M.W., S.J.M. Osendarp, S. Adu-Afarwuah, et al. 2019. Review of the evidence regarding the use of antenatal multiple micronutrient supplementation in low- and middle-income countries. Ann. N.Y. Acad. Sci. 1444: 6–21. 4.
4. Casey GJ, Jolley D, Phuc TQ, Tinh TT, Tho DH, et al. (2010) Long-Term Weekly Iron-Folic Acid and De-Worming Is Associated with Stabilised Haemoglobin and Increasing Iron Stores in Non-Pregnant Women in Vietnam. PLoS ONE 5(12): e15691. doi: 10.1371/journal.pone.0015691
5. Casey, G. J., Jolley, D., Phuc, T. Q., Tinh, T. T., Tho, D. H., Montresor, A., & Biggs, B. A. (2010). Long-term weekly iron-folic acid and de-worming is associated with stabilised haemoglobin and increasing iron stores in non-pregnant women in Vietnam. PloS One, 5, e15691. https://doi. org/10.1371/journal.pone.0015691.
6. Engle-Stone, R., S.M. Kumordzie, L. Meinzen-Dick & S.A. Vosti. 2019. Replacing iron-folic acid with multiple micronutrient supplements among pregnant women in Bangladesh and Burkina Faso: costs, impacts, and costeffectiveness. Ann. N.Y. Acad. Sci. 1444: 35–51.
7. Etheredge AJ, Premji Z, Gunaratna NS, Abioye AI, Aboud S, Duggan C, Mongi R, Meloney L, Spiegelman D, Roberts D, Hamer DH, Fawzi WW. Iron Supplementation in Iron-Replete and Nonanemic Pregnant Women in Tanzania: A Randomized Clinical Trial. JAMA Pediatr. 2015 Oct;169(10):947-55. doi: 10.1001/jamapediatrics.2015.1480. PMID: 26280534; PMCID: PMC4904713.
8. Etheredge, A. J., Premji, Z., Gunaratna, N. S., Abioye, A. I., Aboud, S., Duggan, C., … Fawzi, W. W. (2015). Iron Supplementation in Iron-Replete and Nonanemic Pregnant Women in Tanzania. JAMA Pediatrics, 169(10), 947. https://doi.org/10.1001/jamapediatrics.2015.1480
9. Gonzalez-Casanova, I., Nguyen, P.H., Young, M.F. et al (2017). Predictors of adherence to micronutrient supplementation before and during pregnancy in Vietnam. BMC Public Health 17, 452 https://doi.org/10.1186/s12889-017-4379-4
10. Gunaratna NS, Masanja H, Mrema S, Levira F, Spiegelman D, Hertzmark E, et al. (2015) Multivitamin and Iron Supplementation to Prevent Periconceptional Anemia in Rural Tanzanian Women: A Randomized, Controlled Trial. PLoS ONE 10(4): e0121552. doi: 10.1371/journal.pone.0121552

11. Haider, B.A., Yakoob, M.Y. & Bhutta, Z.A. (2011). Effect of multiple micronutrient supplementation during pregnancy on maternal and birth outcomes. *BMC Public Health* **11,** S19 (2011). https://doi.org/10.1186/1471-2458-11-S3-S19
12. Harding, K. L., Aguayo, V. M., Namirembe, G., & Webb, P. (2018). Determinants of anemia among women and children in Nepal and Pakistan: An analysis of recent national survey data. Maternal & Child Nutrition, 14(S4). https://doi.org/10.1111/mcn.12478.
13. International Anaemia Consultative Group. Guidelines for the Eradication of iron Deficiency Anaemia: A Report of the International Nutritional Anaemia Consultative Group; The Nutrition Foundation: Washington, DC, USA, 1977; pp. 1–29.
14. Nguyen, P. H., Sanghvi, T., Kim, S. S., Tran, L. M., Afsana, K., Mahmud, Z., … Menon, P. (2017). Factors influencing maternal nutrition practices in a large scale maternal, newborn and child health project in Bangladesh. PLOS ONE, 12(7), e0179873. https://doi.org/10.1371/journal.pone.0179873
15. Northwest Vietnam (Casey et al., 2010; Passerini et al., 2012) and Ghana (MacDonald, Mildon, Neequaye, Namarika, & Yiannakis, 2007)
16. Northwest Vietnam (Casey et al., 2010; Passerini et al., 2012) and Ghana (MacDonald, Mildon, Neequaye, Namarika, & Yiannakis, 2007)
17. Ogundipe, O., Hoyo, C., Østbye, T., Oneko, O., Manongi, R., Lie, R. T., & Daltveit, A. K. (2012). Factors associated with prenatal folic acid and iron supplementation among 21,889 pregnant women in Northern Tanzania: a cross-sectional hospital-based study. BMC Public Health, 12(1), 481. Retrieved from http://www.biomedcentral.com/1471-2458/12/481
18. Peña-Rosas, J. P., & Viteri, F. E. (2009). Effects and safety of preventive oral iron or iron+folic acid supplementation for women during pregnancy. In J. P. Peña-Rosas (Ed.), Cochrane Database of Systematic Reviews (Vol. 4, p. CD004736). Chichester, UK: John Wiley & Sons, Ltd. https://doi.org/10.1002/14651858.CD004736.pub3
19. Simuyemba, M.C., Bwembya, P.A., Chola, M. *et al.* A root cause analysis of sub-optimal uptake and compliance to iron and folic acid supplementation in pregnancy in 7 districts of Zambia. *BMC Pregnancy Childbirth* **20,** 20 (2020). https://doi.org/10.1186/s12884-019-2700-1
20. Smith, E.R., et al., Modifiers of the effect of maternal multiple micronutrient supplementation on stillbirth, birth outcomes, and infant mortality: a meta-analysis of individual patient data from 17 randomized trials in low-income and middle-income countries. The Lancet Global Health, 2017. 5(11): p. e1090-e1100.
21. Soofi, S., Khan, G. N., Sadiq, K., Ariff, S., Habib, A., Kureishy, S., … Bhutta, Z. (2017). Prevalence and possible factors associated with anemia, and vitamin B 12

and folate deficiencies in women of reproductive age in Pakistan: analysis of national-level secondary survey data. BMJ Open, 7(12), e018007. https://doi.org/10.1136/bmjopen-2017-018007

22. Stephen, G., Mgongo, M., Hussein Hashim, T., Katanga, J., Stray-Pedersen, B., & Msuya, S. E. (2018). Anemia in Pregnancy: Prevalence, Risk Factors, and Adverse Perinatal Outcomes in Northern Tanzania. Anemia, 2018. https://doi.org/10.1155/2018/1846280
23. WHO. (2015a). The global prevalence of anemia in 2011. World Health Organization Geneva.
24. Winfrida B. Lyoba, Joyce D. Mwakatoga, Charles Festo, Jackline Mrema, Ester Elisaria, "Adherence to Iron-Folic Acid Supplementation and Associated Factors among Pregnant Women in Kasulu Communities in North-Western Tanzania", *International Journal of Reproductive Medicine*, vol. 2020, Article ID 3127245, 11 pages, 2020. https://doi.org/10.1155/2020/3127245
25. Yakoob, M. Y., Khan, Y. P., & Bhutta, Z. A. (2010). Maternal mineral and vitamin supplementation in pregnancy. Expert Review of Obstetrics & Gynecology, 5(2), 241–256. https://doi.org/10.1586/eog.10.8
26. Zeng L, Yan H, Cheng Y, Dang S, Dibley MJ. (2009). Adherence and costs of micronutrient supplementation in pregnancy in a double-blind, randomized, controlled trial in rural western China. Food Nutr Bull. Dec;30(4Suppl):S480-7. doi: 10.1177/15648265090304S402. PMID: 20120789.

1. Esamai, F., et al., *A system approach to improving maternal and child health care delivery in Kenya: innovations at the community and primary care facilities (a protocol).* Reproductive health, 2017. **14**(1): p. 1-18.
2. Klemm, R., et al., *Are we making progress on reducing anemia in women? Cross-country comparison of anemia prevalence, reach, and use of antenatal care and anemia reduction interventions.* A2Z: The USAID Micronutrient and Child Blindness Project, 2011.
3. Lincetto, O., et al., *Antenatal care.* Opportunities for Africa's newborns: Practical data, policy and programmatic support for newborn care in Africa, 2006: p. 55-62.
4. Bhutta, Z.A., et al., *Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost?* The lancet, 2013. **382**(9890): p. 452-477.