Brian M Njoroge
Alice M Mwangi
Isabelle Michaud Letourneau

Assessing bottlenecks within Iron and Folic Acid Supplementation Delivery in Kenya

A workshop report

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About this working paper

This paper, *Assessing bottlenecks within Iron and Folic Acid Supplementation Delivery in Kenya: a workshop report,* is a stakeholder-identified inventory of bottlenecks within Iron and Folic Acid Supplementation delivery systems in Kenya. This paper has not been professionally copyedited but has been formatted for publication by 3ie.

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Assessing bottlenecks within Iron and Folic Acid Supplementation Delivery in Kenya: a workshop report

Brian M Njoroge
FHI Partners

Alice M Mwangi
FHI Partners

Isabelle Michaud Letourneau
Cornell University

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Executive summary

Kenya has been implementing its maternal iron and folic acid supplementation (IFAS) program for five years, achieving national coverage of 70%. However, the anemia rates among pregnant women remain at 41%. This led the national nutrition research technical working group (TWG) to organize a workshop to review the objectives, theory, and design of the program and to identify questions for implementation research on IFAS during pregnancy. A total of 39 participants were engaged from the national, county and sub-county levels, also including researchers, donors and implementing partners in a two-day participatory workshop. More information on the participants can be found in Annex 1. An analytical tool for decision-making, called the Program Assessment Guide (PAG), was used as the guiding approach. Specifically, modules 1 – 7 were adapted and used for this workshop.

The workshop was officially opened by the Head of Nutrition and Dietetics unit, Ms Veronica Kirogo. In her opening remarks, she noted that nationally, through the Kenya Nutrition Action Plan 2019 – 2023, the country had committed to 40% reduction in the prevalence of anemia among pregnant women. To achieve this ambitious target, more effort and change in strategy is necessary for the IFAS program. She also indicated that the Cabinet secretary for health performance contract includes three nutrition indicators namely, IFAS coverage among pregnant women, vitamin supplementation coverage for children under five years and exclusive breastfeeding for 6 months. In this context, the Nutrition Unit will conduct a rapid results initiative in which monthly review of data will be done in 2019 regarding these indicators.

In Module 1 as part of clarifying the scope of the problem with IFAS, participants agreed that the root cause of poor utilization of IFA supplements was late initiation of antenatal care (ANC) which affects the provision of key services (including the hemoglobin (Hb) tests), the initiation of IFAS and the diagnosis of anemia. A factor that appear to contribute to high anemia rates is the high adolescent teenage pregnancy rates.

The summary goal statement was developed as part of Module 2 activities, it was summarized as: “Reduce iron deficiency anemia among pregnant women, through increased consumption of IFAS for at least 90 days by use of community health volunteers to: map, identify and refer pregnant women; promote disclosure of pregnancy and subsequent initiation of focused ANC services; and provide interpersonal counselling on maternal nutrition”.

As part of Module 3, participants reviewed the delivery system for IFAS and significant players were identified at each of the six levels identified in the delivery system. At national level, Kenya Medical Supply Agency (KEMSA) was considered a critical player in the provision of IFA supplements. At county level, the county assembly health committee and the county executive members of health are important in the allocation of resources for health including essential supplies and human resources. At sub county level, the health facility in-charges’ forum is essential to the monitoring of IFAS intervention based on agreed annual targets. At community level, the community health extension workers (CHEWs) and the community health volunteers (CHVs) are key players in promotion and targeting of the IFAS intervention.

In Module 4, the identification of vulnerable populations was specific to each context and some groups were common to all counties. For example, all the groups identified pregnant adolescent girls as a special hard to reach population.

In Module 5, the review of people roles and responsibilities for the IFAS at each level of the delivery system helped identifying tasks and significant others that are somewhat overlooked in the provision of IFAS. For example, participants identified male partner as key for service uptake and utilization of IFA supplements during pregnancy.

Participants identified the functionaries and significant others considered most critical to the success of the intervention as (1) male partner; (2) community health volunteers; (3) facility nurse; and (4) health facility in-charge.

Therefore, this led to focus on the two levels of the delivery system as potential areas for implementation research namely the household and community level. Four implementation research questions were proposed for further review and deliberation by national core implementation team.

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Acronyms

ANC	Antenatal Care
BFCI	Baby Friendly Community Initiative
CHEW	Community Health Extension Workers
CHV	Community Health Volunteer
CME	Continuing Medical Education
CPD	Continuous Professional Development
CU	Community Unit
FANC	Focused Antenatal Care
FHI360	Family Health International 360
FM	Modulated Frequency radio stations
Hb	Hemoglobin
HIV/AIDS	Human immunodeficiency virus / Acquired Immune Deficiency syndrome
HRIO	Health Records Information officer
IFAS	Iron and Folic Acid Supplementation
IPT	Isoniazid preventive therapy
KDHS	Kenya Demographic Health Survey
KEMSA	Kenya Medical Supplies Agency
KHIS	Kenya Health Information system
LMIC	Low Middle income countries
MCH	Maternal Child Health clinic
MOH	Ministry of Health
PAG	Program Assessment Guide
SMART	Standardized Monitoring and Assessment for Relief Transitions survey
TWG	Technical Working Group
UNICEF	United Nations International Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization
WRA	Women of Reproductive Age

1. Introduction

The Head of the Nutrition and Dietetics Unit (NDU), Veronica Kirogo, opened the workshop on Bottleneck Assessment for IFAS. The importance of the workshop in relation to IFAS programming was emphasized along with several key priorities. First, the Ministry of Health (MOH) recognizes that anemia is a problem with serious consequences for mothers and their babies. Nationally, the prevalence of anemia in pregnancy is 41%, even though its readily treatable anemia has been associated with increased prevalence of antenatal and post-partum hemorrhage. Hemorrhage is the leading cause of maternal death (Lale , et al., 2014). Second, as a signatory to the World Health Assembly Global targets 2025, Kenya has made a commitment to 50% reduction of anemia in women of reproductive age (WRA). Third, through the Kenya Nutrition Action Plan 2019 – 2023, the country has committed to 40% reduction in prevalence of anemia. Overall, to achieve this ambitious target, more effort and new strategies are necessary for the IFAS program. The Head of the NDU highlighted that the Bottleneck Assessment workshop would provide a deeper perspective of the IFAS program and identify what works and areas that require immediate and long-term actions.

Currently, the IFAS program is integrated into Focused Antenatal care (FANC) provided through the Maternal Child Health (MCH) clinics where the national policy indicates that all pregnant mothers should receive IFA supplements. The Kenya Health Information System (KHIS) indicates that the overall national coverage of IFAS is 70%, however, the country still has a high anemia prevalence and incidence of both maternal and neonatal deaths.

To demonstrate the national commitment to reduction of anemia, the Cabinet secretary for Health performance contract includes three nutrition indicators namely, IFAS coverage among pregnant women, vitamin supplementation coverage for children under five years and exclusive breastfeeding for 6 months. As a result, the Nutrition Unit is conducting a rapid results initiative for 2019 for these indicators where monthly review of data will be done. Analysis of the data from four counties participating in the workshop indicated that IFAS coverage from January to September 2018 in Busia, Kitui, Marsabit and Tharaka Nithi was 77%, 85%, 81% and 35% respectively. The Head of the NDU concluded by emphasizing that this activity was of great importance to inform policy and shift programming to make intervention sustainable and deliver desired impact. The speech set the stage for the tone of the workshop in which all participants' inputs and perspectives were valued to build a common understanding of the various important issues.

1.1 Objectives

To reduce the national anemia prevalence at 41% by half as envisioned in the Kenya Nutrition Action plan, MCH programs must deliver IFAS commodities and focused antenatal care (FANC) services to pregnant women on a large-scale basis. For this to happen successfully, the MOH at national and county levels must strengthen and organize systems, people and processes to ensure the IFA supplements are procured, delivered, and appropriately used by pregnant women and other WRA in our communities. In each case, attention must be directed to four key dimensions: 1) the supply system; 2) household and community demand, utilization, and compliance; 3)

information and decision support at each level of the system; and 4) social and political commitment. Each of these dimensions must be addressed to have a system-wide impact on achieving effective coverage at scale and intervention sustainability over time.

The overall objective of the Bottleneck Assessment workshop was to help identify areas and questions for implementation research based on contextual knowledge and experience of IFAS program in Kenya. The bottleneck assessment sought to assist in addressing critical programming gaps and help in designing implementing research agenda for IFAS with the following specific objectives:

Integrate evidence, contextual knowledge and experience in the evaluation of existing interventions for IFA supplementation Strengthen the shared understanding, commitment, and ownership of implementation research questions developed by respective counties; and Reinforce practices that advance the scaling up of IFA supplementation intervention while forging explicit links with broader nutrition, health, and nutrition sensitive programs.

1.2 Adapting the Program Assessment Guide (PAG) for Implementation Research Scenario

Kenya has been implementing its maternal IFAS program for five years, but national coverage is only 70% and anemia rates among pregnant women are still at 41%. The national nutrition research program organized a workshop to re-visit the objectives, theory, and design of the program and to identify questions for implementation research for IFAS intervention (Modules 1-7), engaging participants from the national, county and sub-county levels, also including researchers, donors and implementing partners.

2. Clarifying the Problem and Solution for IFAS in Kenya

As part of laying the ground work, the workshop begun by building a common understanding for Bottleneck Assessment on IFAS. This session linked the IFAS intervention to other problems namely anemia in pregnancy, maternal mortality, neonatal mortality and stunting because of early maternal age and poor maternal nutrition status. The presentation made on the IFAS in Kenya is summarized below with some key figures.

More than half of all pregnant women in low- and middle-income countries (LMIC) are diagnosed with anemia (Balarajan, et al., 2011), which affects 32 million pregnant women worldwide (Stevens, et al., 2013). Women in LMIC are at increased risk of anemia because of the higher frequency of dietary iron deficiency, haemoglobinopathies, macronutrient deficiencies, and infections such as malaria, HIV, and hookworm infestation in those countries compared to high-income countries (Benoist, et al., 2008). Anemia has been associated with increased prevalence of ante-partum and post-partum hemorrhage. In Kenya, 69% of women with a live birth in the last 5 years took iron tablets, iron syrup, or IFAS during the pregnancy of their most recent birth (KDHS, 2014). The highest prevalence of anemia, iron deficiency and iron deficiency anemia were noted in pregnant women (41.6%, 36.1% and 26% respectively).

The World Health Organization (WHO) has recognized anemia as a global problem with serious consequences for mothers and their babies. Data from several studies show an

association between maternal anemia and severe adverse maternal and perinatal outcomes. The main causes of maternal mortality for women of all ages are well documented. A recent systematic review (Lale , et al., 2014) suggests that around three quarters of all maternal deaths globally are a result of direct obstetric causes: hemorrhage is the leading global cause of maternal death (27 % of all maternal deaths) followed by hypertensive disorders (14 %) and sepsis (10 %). Other important direct causes are abortion (8 %) and embolism (3 %). While the main causes of maternal death for women of all ages were similar across all regions, the study found significant regional variation for the proportion each cause contributes to total maternal mortality. Around 27 % of maternal deaths for all ages are from indirect causes, but less is known about the specific conditions that contribute to this figure.

Severe anemia (Hb levels lower than 7.0 g/dl) presents a significant risk of mortality for WRA, whether or not they are pregnant. Pregnancy increases the risk of maternal anemia (specifically iron deficiency anemia) as there is an increase in maternal iron requirements to support both maternal and fetal needs. The odds of maternal death are twice as high in pregnant women with severe anemia compared with those without severe anemia (Daru, et al., 2018). In Kenya, maternal deaths account for 14 % of all deaths of women age 15-49.

Undernutrition in adolescent girls and WRA is a widespread problem that when neglected affects their well-being and the nutritional status of their children; it is also an indication or symptom of gender inequality that prevails in our society.

Adolescents 10-19 years of age represent the largest segment of the total population in East and Southern Africa (25%) and most underserved segment of the population. However, it is this segment of the population that is the key to breaking the cycle of intergenerational transmission of malnutrition, poverty and food insecurity. About 30% of girls in developing countries are married before age 18 and about 16 million adolescent girls give birth each year– 95% occur in LMIC. In Kenya, 15% of women age 15-19 have already had a birth, and 3% are pregnant with their first child. The percentage of women who have begun childbearing increases rapidly with age, from about 3% among those age 15 to 40% among those age 19 years.

Pregnancy during adolescence is associated with maternal mortality and 50% increased risk of stillbirths and neonatal deaths, increased risk of preterm birth, low birthweight and small for gestational age births compared to older mothers. Pregnancy during adolescence, particularly when the adolescent girl is undernourished, can slow and stunt growth, leading to shorter mothers and an intergenerational cycle of malnutrition. Investing in adolescents will ensure longer-term sustainable results for reduced poverty, food insecurity, fertility, and malnutrition.

A study investigating stunting by maternal age concluded that young maternal age and short birth intervals are risk factors for restricted linear growth, which implies that lowering adolescent fertility and increasing birth intervals have the potential to substantially reduce the number of stunted children (Fink, et al., 2014).

2.1 Focal Questions for Group Work

Four groups were constituted based on the number of counties represented i.e. Busia, Kitui, Marsabit and Tharaka Nithi. Table 1 summarizes the group responses that were based on the following questions:

- What is the focal problem on IFAS in your county?
- What solution(s) are being proposed?
- What is the evidence and reasoning supporting these choices currently?
- How can this initiative leverage attention to the broader health and nutrition interests and agendas?

Table 1: Clarifying the problem and solution

County	Focal problem identified	Solution proposed	Evidence and reasoning
Busia	• 26% anemia prevalence rate • Poor IFAS policy dissemination contributing to poor health practices for IFAS • Socio-cultural issues – men are key decision makers for women's health • Private facilities charge for IFA supplements • Poor counselling and follow up – side effects of IFA supplements	• Open maternity days that focus on group counselling to address knowledge gaps • Dialogue days at community level • Introduction of stipend for Community Health Volunteers • IFAS is on tracer list of essential commodities	• KHIS 2018 Health facility statistics
	• Other intervention e.g. Isoniazid preventive therapy (IPT)	• Support supervision to increase uptake based on assigned targets for each CHV	
Kitui	• Low utilization of IFAS among pregnant women due to late initiation of ANC • Poor counselling relating to consumption side effects • 92% received IFAS but only 42% consumed • High adolescent pregnancies • Lack of community awareness to support male involvement to prevent misconception on IFAS as family planning intervention	• Good coverage of IFAS at 83% • Adequate stocks of IFA supplements • Open maternity days • Maternity shelters (Tseikuru, Kyuso) • Sensitization of all CHVs on IFAS • Good sectoral collaboration between faith-based and public hospital	• SMART survey 2016

County	Focal problem identified	Solution proposed	Evidence and reasoning
Marsabit	• 35% pregnant women who visited ANC diagnosed with anemia • Poor dietary diversity • 45% of pregnant women attend at least 4 ANC visits • Poor lab service infrastructure for early detection • High adolescent pregnancy due to early marriage • 4.3% of pregnant mothers consumed IFAS for at least 180 days • High illiteracy levels	• Open maternity days that focus on group counselling to address knowledge gaps • Dialogue days at community level • Introduction of stipend for Community Health Volunteers	• KHIS 2018 Data • SMART survey July 2018
Tharaka Nithi	• IFAS coverage definition based on documentation at health facilities where iron and folate are prescribed separately • Stock out of combined IFA supplements • Low First ANC reporting data • High adolescent pregnancies i.e. 10 – 19 years • High prevalence of anemia in pregnant women – 32% • Staff turnover	• Regular supplies of essential commodities • Sensitization of health care workers on IFAS • Robust diagnosis of anemia • All MCH service points offer health talks for all pregnant mothers	• KHIS health facility

2.2 Summary of discussion

Based on the feedback from the group work and consensus during plenary discussions the root cause of poor utilization of IFAS (> 90 days) is late initiation of ANC. This affects provision of key ANC services including, the Hb testing, initiation of IFAS as well as diagnosis for anemia. A factor that contributes to high anemia rates is the high adolescent teenage pregnancy rates. The

issues raised were supported by evidence from DHS 2014 data, SMART surveys, and facility reports summarized in Kenya Health Information System (KHIS).

3. Goals and Associated Values

The purpose of this module was to develop a common goal statement, including a list of associated values. The output of this session was a goal statement that would specify a desired future for IFAS compared to current situation. (Pelletier, et al., 2010) A list of associated values will help guide decisions on how to design and implement IFA implementation research studies in ways that serve broader purpose (e.g., to build capacities, to foster better relationships between health personnel and community caregivers, etc.). Table 2 presents the guidance on developing goals and associated values was used for the exercise.

Table 2: Guidance for developing goals and associated values

GOAL		**Associated Values**
Questions		
What is it that we want the program to change or improve?	Purpose: (e.g. Reduce deficiencies)	**What are some high-level values or objectives that should be considered when pursuing the goal?** Examples: • to utilize and strengthen existing assets (e.g. delivery systems and human resources) in building and implementing the program • to promote and support a culture of professionalism and responsiveness at all levels of the program • to collect and use information and evidence in a timely fashion for on-going documentation and improvement of program performance • to strengthen the public image and reputation of all organizations involved in implementing and supporting the program
Who are the beneficiaries that this program will serve?	Target population	
What percent of beneficiaries do we want to reach with these services?	Coverage or % of target population reached	
Where are they located?	Location	
When do we want to achieve this goal?	Time bound	

3.1 Summary of Group discussions

As part of the group discussions, the participants were divided into six groups, to agree on a common goal, and establish a clear focus and outcome for the IFAS intervention integrated within FANC package. They proposed several goal statements based on associated values and objectives identified in the previous session. The six groups have identified one key output:

1. Reduce the prevalence of iron deficiency anemia among pregnant women attending antenatal care in Busia, Kitui, Marsabit and Tharaka Nithi by 50% in two years.
2. To achieve 80% coverage of iron folic acid supplements consumption for at least 180 days among pregnant women in three years.
3. To increase consumption rate of iron folic acid supplements for at least 90 days among pregnant women from 4.3% to 10% in three years, by strengthening capacity of health workers and CHVs to provide nutrition counselling.
4. To achieve 80% coverage of pregnant women who attend at least 4 ANC visits through improved access, capacity building of health workers, and strengthened commodity management on IFAS in 3 years.
5. To increase IFAS coverage from 34% to 80% among pregnant women in two years through integration of IFAS into routine antenatal care services, enhanced commodity reporting and scaling up the use of CHVs for social mobilization at community level.
6. To achieve 90% coverage of IFAS among pregnant women through early disclosure of pregnancy and initiation of ANC, by strengthening capacity of existing community units to promote mapping, identification and referral of pregnant women for FANC services.

Table 3 summarizes the common goal statement based on the six group outputs.

Table 3: Summary Goal statement

GOAL		Associated Values
Questions	**Outputs**	
What is it that we want the program to change or improve?	Reduce iron deficiency anemia in pregnancy by increasing utilization of IFAS	**What are some high-level values or objectives that should be considered when pursuing the goal?** • Strengthen capacity of community health volunteers to provide interpersonal communication on maternal nutrition during pregnancy • increase consumption of IFAS for at least 90 days among pregnant women who have completed 4 ANC visits • Strengthen existing community units to conduct targeted household mapping for early identification and referral of pregnant women to focused ANC services • To promote early disclosure of pregnancy and subsequent initiation of ANC services among WRA
Who are the beneficiaries that this program will serve?	Pregnant women	
What percent of beneficiaries do we want to reach with these services?	80% coverage of pregnant women	
Where are they located?	Households within community units, in all sub counties of Busia, Kitui, Marsabit and Tharaka Nithi	
When do we want to achieve this goal?	2 years	

3.2 Summary Goal Statement

Reduce iron deficiency anemia among pregnant women through increased consumption of IFAS for at least 90 days by use of community health volunteers to: map, identify and refer pregnant women; promote disclosure of pregnancy and subsequent initiation of focused ANC services; and provide interpersonal counselling on maternal nutrition.

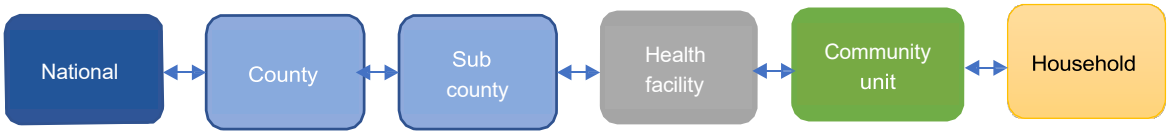
4. Delivery Systems for IFAS

The purpose of this module was to map out the systems (the primary people, organizations and processes) involved in delivering IFAS commodities and FANC package to pregnant women, and specify these at national, county, sub county, facility, community, and household levels. (Pelletier, et al., 2010) By using physical mapping of the delivery system(s) in a participatory process, this module created a visual and concrete image of the system, that enabled all participants to pool their knowledge, reveal weaknesses and questionable assumptions about certain portions of the IFAS delivery system. Organization of Health care in Kenya

The health system in Kenya is organized around six levels of care based on the scope and complexity of services offered. The first level comprises community units (CUs) that are a collection of households staffed by volunteer community health workers. Activities at the community unit level focus mainly on promotive health through health education, treatment of minor ailments, and identification of cases for referral to health facilities. Levels 2 (dispensaries) and 3 (health centres) offer primary health care services. These levels of care form the interface between the community and the higher-level facilities.

These facilities offer basic outpatient care, minor surgical services, basic laboratory services, maternity care, and limited inpatient facilities. They also coordinate the community units under their jurisdiction. Levels 4 and 5, the secondary referral facilities, form the county referral facilities. They offer a broad spectrum of curative services, and some are also health training centres. Level 6 constitutes the tertiary referral facilities that offer specialised care and specialised training to health workers. The national government manages these facilities, but they are semi-autonomous organizations (MOH, 2014).

Figure 1: Delivery System of IFAS in Kenya



The discussions during the workshop identified six levels of the delivery system for IFAS that currently implementing the intervention, as presented in table 4.

Table 4: Key players involved at all levels of the delivery system for IFAS

Levels	Key players
National	KEMSA, MOH – Department of Family Health, implementing partners (USAID, Nutrition International, UNICEF)
County	County Assembly Health committee, County Executive Member for Health, County Health Management Team, implementing partners
Sub County	Sub County Health Management Team, Health Facility in-charges, Implementing partners
Health Facility	Health facility management team,
Community unit	(CHV, CHEW, ward administrator
Household	Household head, pregnant woman

In summary, the participatory exercise of mapping the system allowed reaching consensus on six levels of the system and key players at all national levels.

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Based on the participatory discussions on mapping the system, notable players were identified at each level; at national level KEMSA was considered a critical player in the provision of IFA supplements. At county level, the county assembly health committee and county executive member for health are important in the allocation of resources for health including essential supplies and human resources. At sub county level the health facility in-charges' forum is essential to the monitoring of IFAS intervention based on agreed annual targets. At community level, the CHEW and CHV were identified as key players in promotion and targeting of the IFAS intervention.

5. Hard to Reach Populations for IFAS

The purpose of this module was to identify the vulnerable and hard to reach segments of the population and the contact points that may reach them, to ensure that this at-risk population is reached by the IFAS intervention (Pelletier, et al., 2010). The general target group of pregnant women was identified in module 2, however, in this module, participants identified specific vulnerable or hard to reach groups and some of the community level people and organizations ("contact points") that might help reach them in the counties.

The rationale of this module was to create the shared understanding that the most vulnerable often are not reached by mainstream delivery systems and encourage the participants to identify who they are, what special needs they have and what special strategies may be needed to reach them. It also stimulated a re-consideration of the goal statement (in module 2) to include special attention to these groups.

The participants were grouped into respective counties and the two focal questions for the module discussed and documented using templates provided. The focal questions for discussion were:

1. What are the vulnerable or hard to reach target populations in your county?
2. Which people and organizations are available at the community level to help reach these caregivers and make the intervention successful there? These are referred to as contact points.

The following tables summarize the outputs of the group work activities for each of the respective counties.

5.1 Feedback from Group work on Special Populations and contact points

Table 5: Busia County - Special Populations and Contact Points

Special Populations (vulnerable and hard to reach)	Key Needs	Potential Contact Points
Pregnant adolescent girls	• Knowledge information & skills • Awareness • Support • Commitment and motivation	• Youth-friendly service providers • Church • Schools • Peers • Youth centres
Pregnant women in fisher folk – communities living in islands on the lake	• Knowledge information & skills • Support	• Outreach services • CHVs
Pregnant women living in cross border communities	• Knowledge information & skills • Awareness	• Outreach service posts • CHVs
Pregnant women in internally displaced camps	• Resources • Awareness	• Emergency response teams • CHVs • Health workers

Table 6: Kitui County - Special Populations and Contact points

Special Populations (vulnerable and hard to reach)	Key Needs	Potential Contact Points
Pregnant adolescent girls	• Knowledge information & skills • Awareness • Support • Commitment and motivation	• Household head • Church • Schools • Peers • Youth clubs
Pregnant women practicing indigenous religious beliefs – (*Kabonokya Sect* does not believe in human medicine)	• Knowledge information & skills • Commitment and motivation • awareness • Support	• Outreach services • CHVs • Spiritual leaders • Heads of household
Pregnant women from pastoralist communities	• Knowledge information & skills • Awareness • Commitment and motivation	• Outreach service posts • CHVs • Head of households
Pregnant women living in potential ethnic conflict zones	• Resources • Awareness • Knowledge information & skills • Support	• Emergency response teams • CHVs • Health care workers
Pregnant women in urban informal settlements	• Knowledge information & skills • Awareness • Support • Commitment and motivation	• Household • Church • Schools • Outreach posts • Market days

Table 7: Marsabit County - Special Populations and Contact points

Special Populations (vulnerable and hard to reach)	Key Needs	Potential Contact Points
Pregnant adolescent girls - early marriages	• Knowledge and information on linkage to community units health facilities • Awareness on life skills services uptake and utilization • Community support • Support at youth friendly centers	• Adolescent support groups • Community Units • Schools • Churches, mosques • Local leaders • BFCI villages support groups • Youth-friendly support centers
Pregnant women in migrant pastoral communities	• Knowledge and information on access to services	• Outreach service points • BFCI village mother support
	• Commitment and motivation to make follow up visits • Awareness on importance of focused ANC services	groups • Nomadic clinics • Local media
Pregnant women in conflict areas	• Resources • Awareness • Knowledge information & skills • Support	• Local leaders • Humanitarian agencies • Administration • Multisector peace forums • Outreach services
Pregnant women living in marginalized communities – illeret	• Knowledge information & skills • Awareness • Support • Commitment and motivation	• Local FM stations • Local leaders • CUs • Village mother support groups
Pregnant women in cross boarder communities	• Knowledge information & skills • Awareness • Support • Commitment and motivation	• Cross border health forums • Local FM stations • Outreach service points
Pregnant women living with HIV/AIDS	• Knowledge information & skills • Awareness • Support • Commitment and motivation	• CHVs • HIV clinics • Patient support groups

Table 8: Tharaka Nithi County - Special Populations and Contact points

Special Populations (vulnerable and hard to reach)	Key Needs	Potential Contact Points
Pregnant adolescent girls	• Knowledge and information on ANC and Maternal nutrition • Awareness on life skills building, return to school policies • Community support • Support at youth friendly centers	• Adolescent support groups • CUs • Schools • BFCI villages support groups • Youth friendly support centers
Pregnant women practicing indigenous religious beliefs	• Knowledge and information on access to services • Commitment and motivation to make follow up visits • Awareness on importance of focused ANC services	• Outreach service points • BFCI village mother support groups
Pregnant women in conflict areas	• Resources • Awareness • Knowledge information & skills • Support	• Designated temporary shelters • Humanitarian agencies • County Administration • Outreach services
Pregnant women living in marginalized communities	• Knowledge information & skills • Awareness • Support • Commitment and motivation	• Outreaches • Local leaders • CUs • Village mother support groups
Pregnant women with high wealth index	• Knowledge information & skills • Awareness • Support • Commitment and motivation	• Churches • High profile personalities • Gynecologist
Pregnant women living with HIV/AIDS	• Knowledge information & skills • Awareness • Support • Commitment and motivation	• CHVs • HIV clinics • Patient support groups
Pregnant women whose HIV status is unknown	• Knowledge information & skills • Awareness • Support • Commitment and motivation	• Outreach • CHV • Health facility

5.2 Conclusions

Based on plenary discussions from each of the four groups, the identification of vulnerable populations was specific to each context and some groups were common to all counties. For example, all the groups identified pregnant adolescent girls as a special hard to reach population. Busia and Marsabit, being counties that have border crossing points into neighboring countries of Uganda and Ethiopia respectively, identified pregnant women living in refugee or internally displaced camps. Also notable was that

each county identified a unique vulnerable population due to cultural, religious or geographic barriers. For example, Kitui and Tharaka Nithi identified pregnant women belonging to *kavonokya* sect (religious beliefs barriers); Busia identified fisher folk living in islands of Lake Victoria, while Marsabit identified pregnant women in migrant pastoralist communities (geographical barriers).

The potential contacts for each of the vulnerable groups varied from community health volunteers, adolescent mother support groups, schools, churches to heads of households based on the key needs for each population.

A review of the goal statement developed in module 2 indicated that there is a need to qualify “pregnant women” with addition to focus on adolescent pregnant women.

6. People, Roles & Responsibilities

6.1 Purpose and Rationale

The purpose of this module is to identify the people and the roles and responsibilities that must be fulfilled at each level of the delivery system for the IFAS intervention to reach all pregnant women. This includes the primary functionaries (health workers, community health volunteers, etc.) as well as significant others (spouses, mothers-in-law, etc.) who may enable or inhibit the functionaries in fulfilling their responsibilities.

The success of the IFAS intervention will depend on its integration into existing health systems and programs, it is important to map the points or people of influence and support at each level of the program. This is fundamental for assuring that each level can function properly and that all levels are integrated into a functional system.

During the workshop participants identified the influential people and their roles and responsibilities at each level of the system by answering the following questions:

1. Who are the functionaries that are responsible for completing specific tasks in the delivery and support system? What are their roles, responsibilities in delivering the intervention?
2. Who are the significant others that have an influence on the functionaries, or on the commitment, the sustainability or other aspects of the intervention? What role can and should they play?

The overall responses from each of the four groups are summarized below.

Table 9: Group work on Roles and Responsibilities

Levels	People (functionaries and significant others)	Roles and Responsibilities: Description
Household	Male partner	Head of household and key decision maker on health and finances are key for clinic attendance
	Parent/Guardian/ Mother-in law	Guidance to the pregnant woman on expected behavior during pregnancy
	Pregnant mother	Utilization of IFAS, adherence to ANC visits
Community	CHVs, peer educators, community midwives,	Home visits to enhance compliance-referral, interpersonal communication, mapping, psychosocial support
	Community mother-to- mother support groups, Community Health committees,	Demonstration on best practices and reinforcement of key behaviors; advocacy using public forums
	Ward / Village administrators, religious leaders, village elders	Sensitization, administration and enforcement of key government policy
	Health facility in-charge	Monthly performance review for IFAS, approval of orders for facility level Reporting on IFAS indicators performance for coverage and utilization
Health Facility	MCH Nurse	Assessment, ANC profile, dispensing of IFAS
	Pharmacist	Monthly reporting and requesting of IFAS stock based on consumption
	Nutritionist	Nutrition assessment and counselling on maternal nutrition
Sub County	Sub County Medical Officer of Health, Sub County Health Records and information Officer, Sub county Public Health Nurse	Assessment of performance and strategies for increasing coverage
	Sub-County Nutrition officer	Identification of facilities that require support supervision for IFAS
	Implementing partners	Facilitate implementation of sub county work plans on IFAS
County	County Executive Committee Member for Health	Advocacy for increased funding and appropriation for procurement of IFAS commodities; domestication of IFAS policy
	County Health Records and information Officer (HRIO), County Health Promotion Officer, County Nutrition Coordinator	Target setting for each sub county based on population estimates, appraising sub county performance every quarter
National	Reproductive Health Maternal Services Unit, Neonatal Child Adolescent Health Unit, Nutrition Dietetics Unit	Review of policy and dissemination of existing policies, development of scorecard to monitor performance of counties
	Kenya Medical Supplies Agency (KEMSA)	Procurement, warehousing and distribution of IFAS commodities

6.2 Conclusion

The identification of people roles and responsibilities for the IFAS at each level of the delivery system helped shed light on tasks and significant others that are somewhat overlooked in the provision of IFAS. For example, participants agreed that the role of male partners could not be overlooked in service uptake and utilization of IFA supplements. Likewise, the mothers-in-law also appears key for determining behavior and norms during pregnancy. The information summarized in the table above forms the basis that will help to define various integrated approaches to strengthen IFAS program.

7. Needs, Inputs, Activities, and System Changes

7.1 Purpose and rationale

The purpose of this module was to identify what each person in the system needs in order to successfully fulfill their roles and responsibilities, the inputs, activities and systems changes required to meet those needs in each case, and the uncertainties in this analysis which form the basis for an implementation research agenda. (Pelletier, et al., 2010) Each person in the intervention has certain needs that must be met to fulfill their roles or responsibilities. These can be met through inputs, activities, and/or system changes.

The rationale for this module was that it provided a structured process for the participants to draw upon their detailed contextual knowledge and experience to identify areas for possible implementation research.

For this module, the functionaries and significant others considered most critical to the success of the intervention were identified as (1) male partner; (2) community health volunteers, (3) facility nurse and (4) health facility in-charge. The focal questions used to guide group discussions were as follows:

- What does each functionary and significant other need to fulfill their role/responsibility in the IFAS intervention (daily)?
- What inputs, activities and system changes are required to ensure their needs are met?

Table 10: Feedback from Group work - Needs, Inputs, Activities and System Changes

Functionary	Key Needs	Final Proposed Inputs, Activities & System Changes	Lingering Concerns
Male partner	• Awareness • Knowledge and information	• Contextualized information products • Incentives provided to couples who attend ANC clinic together • Sensitization on importance of IFA supplements • Use of public baraza's as channels of delivering information to male partners	• Use of trained peers to counsel pregnant adolescent girls at community level • Incentives for couples visiting ANC could result in long waiting times for other pregnant women, this may create a barrier to services
Pregnant women	• Knowledge and information • Support • Resources	• Context specific products for interpersonal communication • Use of small doable actions as strategy for utilization of IFAS during pregnancy • Use of village mother support groups as channel of communication	• Pregnant adolescent girls require specific information products and tailored services for ANC • Pregnant adolescent girls are stigmatized by communities leading to
		• Integration of FANC into Baby Friendly Community Initiative (BFCI)	poor health-seeking behaviors
Community Health volunteers	• Awareness • Knowledge and information • Support • Resources • Incentives	• Sensitization on integrated package using CHV integrated curricula – Module 9 • Contextualized CHV information booklet with key standard messages on IFAS • Use of defined community dialogue day topics for village mother support groups • Regular mapping for identification of households with pregnant women • Support supervision by community health extension workers	• CHVs performance incentive package based on early identification of pregnant women and defined number of household visits made during pregnancy • Sustainability of the use of mobile phones to map and follow up pregnant women within villages • Applicability of confirmation of the utilization of IFA supplements through pill counts during household visits and defined actions for the pregnant woman

Functionary	Key Needs	Final Proposed Inputs, Activities & System Changes	Lingering Concerns
Facility Nurse	• Awareness • Support • Resources • Incentives	• Provision of outreach kit for rapid test kits for Hb, blood pressure, Mother Child booklet and IFA supplements • Sensitization through Continuing Medical Education CMEs on integrated maternal nutrition package • Monitoring of ANC visits, IFAS coverage and utilization using simple run charts at MCH • Outcome monitoring of cohorts based on identified pregnant women who had positive pregnancy outcomes	• Ability of facility nurse to provide context specific integrated ANC package for adolescent pregnant women • Linkage of facility to community units that are implementing BFCI or have defined integrated outreach activities in the communities • Facility nurse accompanying the CHEW for supportive supervision household visits to targeted pregnant women
Health facility in-charge	• Support • Resources	• Development of targets for IFAS program integrated into FANC • Monthly review of achievements based on	• Sustainability of allocating finances for the facility-based on outcome of ANC visits and utilization of IFA supplements
		annual targets set for facility on IFAS indicators • Provision of job aids and training aids for CME packages on integrated ANC package • Procurement of equipment • Strengthening facility community unit linkage • Registration of Facility CME schedule with sub county health management team • Award of continuing professional development (CPD) points for health workers attending weekly CME sessions • Annual recognition award for best employee	• Funding of community units linked to facility and provision of performance-based incentives for CHVs based new pregnancies reported every quarter and successful skill births

The review of group discussions summarized above identified several lingering concerns or uncertainties for each functionary involved in the delivery system for IFAS. These uncertainties formed the basis for the next module in determining the potential implementation research questions that consider the context and relevance and effectiveness and potential impact.

8. Determining Potential Implementation Research Questions

The review of the group work from each module that allowed determining the vulnerable populations, the structure of the delivery system, the people, roles responsibilities and the requisite needs, inputs and activities enabled the participants to identify potential areas for implementation research. The bottlenecks identified in provision of IFAS services at each level of the delivery system were particularly useful in the identification of areas of priorities and they are presented in the table below with proposed system changes. This module was slightly adapted from the original PAG module 7 (Action planning) to move faster towards implementation research.

Table 11: Summary of IFAS bottlenecks at each level of delivery system

Levels	Functionaries	Bottlenecks	Final Proposed System Changes	Lingering Concerns
Household	Male partner	• Knowledge on IFAS and effect on pregnancy • Participation in collective decision- making about health of pregnant woman	• Provision of Contextualized information products • Incentives provided to couples who attend ANC clinic together • Sensitization on importance of IFA supplements • Use of public baraza's as channels of delivering information to male partners	• Incentives for couples visiting ANC could result in long waiting times for other pregnant women and create a barrier to services
Household	Pregnant women	• Lack of awareness on importance of disclosure of pregnancy • Late initiation of focused ANC package • Poor utilization of IFAS during pregnancy	• Context specific products for interpersonal communication • Use of small doable actions as strategy for utilization of IFAS during pregnancy • Use of village mother support groups as channel of communication • Integration of FANC into BFCI	• Use of trained peers to counsel pregnant adolescent girls at community level • Pregnant adolescent girls require specific information products and tailored services for ANC • Pregnant adolescent girls are stigmatized by communities leading to poor health-seeking behaviors

Levels	Functionaries	Bottlenecks	Final Proposed System Changes	Lingering Concerns
Community	Community health volunteers	• Lack of regular information on number of households with pregnant women within defined community unit • Poor linkage between ANC package and defined household visits for pregnant women within community unit • Lack of context specific jobs for integrated community package for FANC	• Sensitization on integrated package using CHV integrated curricula – Module 9 • Contextualized CHV information booklet with key standard messages on IFAS • Use of defined community dialogue day topics for village mother support groups • Regular mapping for identification of households with pregnant women • Support supervision by community health extension workers	• CHVs performance incentive package based on early identification of pregnant women and defined number of household visits made during pregnancy • Sustainability of the use of mobile phones to map and follow up pregnant women within villages • Applicability of direct observation for the utilization of IFA supplements through pill counts during household visits and defined actions for the pregnant woman
Health facility	Facility Nurse	• Poor access to ANC services for pregnant women in catchment areas • Late initiation of ANC services • Poor follow up of pregnant mothers	• Provision of outreach kit for rapid test kits for Hb, blood pressure, Mother Child booklet and IFA supplements • Sensitization through CMEs on integrated maternal nutrition package • Monitoring of ANC visits, IFAS coverage and utilization using simple run charts at MCH • Outcome monitoring of cohorts based on identified pregnant women who had	• Ability of facility nurse to provide context-specific integrated ANC package for adolescent pregnant women • Linkage of facility to community units that are implementing BFCI or have defined integrated outreach activities in the communities • Facility nurse accompanying the CHEW for
			positive pregnancy outcomes	supportive supervision household visits to targeted pregnant women

Levels	Functionaries	Bottlenecks	Final Proposed System Changes	Lingering Concerns
	Health facility in-charge	• Weak outcome monitoring of indicators and IFAS and linkage to maternal and child program • Lack of equipment for integrated outreach activities • Weak monitoring of community level performance indicators for maternal and child program activities	• Development of targets for IFAS program integrated into FANC • Monthly review of achievements based on annual targets set for facility on IFAS indicators • Provision of job aids and training aids for CME packages on integrated ANC package • Procurement of equipment • Strengthening facility community unit linkage • Registration of facility CME schedule with sub county health management team • Award of CPD points for health workers attending weekly CME sessions • Annual recognition award for best employee	• Sustainability of allocating finances for the facility-based on outcome of ANC visits and utilization of IFA supplements • Funding of community units linked to facility and provision of performance-based incentives for CHVs based new pregnancies reported every quarter and successful skill births

A review of information in the table above guided the ranking of potential questions for implementation research. The two levels within delivery system that seemed to require more focus were the household and community levels. Therefore, several suggestions were made for implementation research questions:

- What is the feasibility of integration of the maternal nutrition interventions (including intensified interpersonal counselling, community mobilization, distribution of IFA supplements, and weight-gain monitoring) into community level MCH programs?
- Does the coverage, quality, frequency and intensity of maternal nutrition counselling have any impact on the outcomes of the pregnancy among adolescent pregnant women?
- What is the impact of engaging male partners in maternal nutrition programs for improved IFA supplements utilization and dietary diversity?
- What is the feasibility of performance-based incentives for community health volunteers involved in nutrition focused MCH activities?

The above questions were not exhaustive and will be improved based on a further review by the core team. Some of the suggested system changes could be achieved through engagement and facilitation of sub county teams and therefore were not considered as primary areas for implementation research.

8.1 Recommendation and Next Steps

The approach of the Program Assessment Guide used for this workshop provided an assessment of the IFAS program that was based on contextual experiences from four counties and wide diversity of participants. This workshop provided a deeper understanding on the current performance of the IFAS program and possible changes that can be made to existing program activities.

The information presented in this report will guide the next steps in finalizing questions for implementation research. The national core team will review and finalize questions that will form part of the proposal for submission to the nutrition research TWG and KEMRI Ethics and Scientific Review Committee. The core team will also undertake several key activities including the finalization of data collection tools based on approved proposal.

Appendix A: List of participants

County	Name	Gender	Organization	Job Title
Busia	Alice Yaite	F	BUSIA	Nursing Officer
Busia	Dr. Tiberius A. Aluda	M	MOH-BUSIA	County Pharmacist
Busia	Innocent Onno Kaala	M	MOH- BUSIA	Sub County Health Records Information Officer
Busia	Joan Mukhule	F	MOH-BUSIA	Facility Nurse
Busia	Joyce Nabwire	F	MOH-BUSIA	County Nutrition Coordinator
Busia	Maryline Obenga	F	FHI360	Technical officer Nutrition
Busia	Oscar Opiyo	M	MOH-BUSIA	Sub County Medical Officer
Kitui	Dr. Daniel A Misiani	M	MOH-KITUI	Sub County Medical Officer
Kitui	Geoffrey Muthui	M	MOH-MWINGI	Sub County Public Health
Kitui	Lena Mulewa	F	MOH-KITUI	Facility Nurse
Kitui	Lydia Muite	F	MOH-KITUI	Sub County Nutrition Officer
Kitui	Patrick Muthini	M	MOH-KITUI	Sub County Pharmacist
Kitui	Patrick Mwilu	M	MOH	Sub County Health Records Information Officer
Marsabit	Ali Dida	M	MOH-MARSABIT	Nursing Officer
Marsabit	Dr. Ibrae Umuro	M	MOH	SCMOH
Marsabit	Edwin Chomba	M	MOH-MARSABIT	Sub County Pharmacist
Marsabit	Galgallo Boru	M	FHI360	Technical officer Nutrition
Marsabit	Mayling Busuru	F	MOH-MARSABIT	Sub County Nutrition Officer
Marsabit	Peter Mwangi	M	MOH-MARSABIT	Sub County Health Records Information Officer
Marsabit	Sarah Chiwe	F	MOH-MARSABIT	County Nursing officer
Nairobi	Andolo Miheso	M	MOH-Neo-natal Child Adolescent Health Unit	Program Officer
Nairobi	Betty Samburu	F	MOH-NAIROBI	Deputy Head Nutrition Dietetics Services
Nairobi	Brian Ayugi	M	FHI360	Program Assistant
Nairobi	Brian Njoroge	M	FHI360	Nutrition Specialist
Nairobi	Dr. Christine Wambugu	F	MOH	Program Manager, Neonatal Health Adolescent Unit
Nairobi	James Kabeni	M	KEMSA	Customer Service Officer -
Nairobi	Julia Rotich	F	MOH-NDU	Micronutrients Technical
Nairobi	Stephen Mwangi	M	NUTRITION INTERNATIONAL	Senior Program Officer
Nairobi	Veronicah Kirogo	F	MOH-NDU	Head Nutrition Dietetics Unit
Nairobi	Zipporah Bukania	F	KEMRI-CPHR	Ag Director Centre for Public Health Research
Nakuru	Bernard Nyauchi	M	FHI360	Learning and Knowledge Management Officer

County	Name	Gender	Organization	Job Title
Nakuru	Dr. Paul Odila	M	FHI360	FP/MNCH Specialist
Tharaka Nithi	Doreen Mbae	F	MOH-THARAKA NITHI	Nursing Officer
Tharaka Nithi	Dr. Bedan Maina	M	MOH-THARAKA NITHI	Sub County Pharmacist
Tharaka Nithi	Gilbert Muchiri	M	MOH-THARAKA NITHI	Sub County Medical Officer of Health
Tharaka Nithi	Jescah Vaati	F	MOH-THARAKA NITHI	Sub County Health Records Information Officer
Tharaka Nithi	Lemity Kawira	F	MOH-THARAKA NITHI	Sub County Nutrition Officer
Tharaka Nithi	Rose G. Micheni	F	MOH-THARAKA NITHI	County Nursing officer
Tharaka Nithi	Victor Mwiti	M	FHI360	Technical officer Nutrition

Appendix B: Bottleneck Assessment and Inventory

1. Introduction

The Kenya Iron Folic Acid (IFA) supplementation Implementation Science Initiative (ISI) was conducted in four counties in collaboration with the Society for Implementation Science in Nutrition (SISN) and supported by the International Initiative for Impact Evaluation (3ie). As part of applying the principles of Implementation Science (IS), a bottleneck assessment workshop (BNA) was conducted to identify bottlenecks affecting access to and utilization of IFA supplements for pregnant women in four counties namely Busia, Kitui, Marsabit and Tharaka Nithi. The outcome of the bottleneck assessment was twofold

(1) Questions for implementation research and (2) Inventory of bottlenecks for IFA supplementation.

This brief presents a summary of insights from the bottleneck assessment and inventory with a focus on actions undertaken and results during the project.

The overall objective of the Bottleneck Assessment workshop was to help identify questions for implementation research and develop an inventory of bottlenecks that sought to assist in addressing critical programming gaps for IFA supplementation during pregnancy.

2. Bottleneck Assessment Workshop

A total of 39 participants attended the two-day workshop to identify bottlenecks for the IFA supplementation delivery system. The participants represented each level of the delivery system for IFA supplementation namely (1) national, (2) county, (3) sub-county, (4) ward, and (5) community. (the list of participants and organizations is summarized in annex 6.1). The bottleneck assessment workshop was organized in modular format based on the Program Assessment Guide booklet.1

2.1 Summary of bottlenecks identified across the Delivery System

Table B1: Summary of Bottlenecks Identified across the delivery system for IFA supplementation

Level	Bottleneck	Reason
National	Stock out of IFA supplements	No consumption data on IFA supplementation from counties to inform quantification
County	Lack of regular information on pregnant mothers who are in the first trimester	No system to identify pregnant mothers in the first trimester
Sub county	Stock out of IFA supplements	Poor inventory management at the Health facilities
Ward: Health Facility	Poor maternal counselling and follow up at household level	Lack of contextualized counselling material on maternal nutrition
	Stock out of IFA supplements	Erratic supply of IFA supplements

Level	Bottleneck	Reason
Ward: Community unit	Late initiation of ANC	High incidence of adolescent and teenage pregnancies
	Lack of regular information on number of households with pregnant women within defined community unit	No household mapping by community health volunteers (CHV)
	Poor linkage between Focused ANC package and defined household visits for pregnant women within community unit	No capacity building for CHVs on Integrated curricula – module 10 on community maternal & childcare
	Lack of context specific job aids on integrated community package for FANC+BFCI with clear actions for CHVs during HH visits	No simplified integrated context specific job aids for CHVs to guide household visit activities
	Lack of regular information on number of households with pregnant women within defined community unit	CHVs conduct household mapping bi-annually instead of bi-monthly
	Lack of male involvement	Lack of knowledge on male partner engagement during pregnancy

3. Formulation of Questions for Implementation Research

Implementation research (IR)[1] refers to the scientific study of implementation that focuses on the how and why of successes and failures of innovations in real-world settings; goal is generalizable knowledge. The Bottleneck assessment (BNA) workshop was able to formulate bottlenecks across the delivery system of IFA supplementation during pregnancy.

The bottleneck assessment workshop led to the identification of important bottlenecks within the system. Those helped to shed light on many elements that are important to consider: the vulnerable populations; the structure of the delivery system; the various people, roles responsibilities; and the requisite needs, inputs and activities. Such exercises enabled the participants to identify the areas of potential IR. Those were not exhaustive and were further refined during development of the IR study proposal. Some of the suggested system changes can be achieved through engagement and facilitation of sub county teams and therefore those were not considered as primary areas for IR. At the workshop, the outputs of the six groups of participants were consolidated into a common goal statement for the overall IR to be undertaken as follows:

> Reduce iron deficiency anemia among pregnant women through increased consumption of IFAS for at least 90 days by use of CHV to: map, identify and refer pregnant women; promote disclosure of pregnancy and subsequent initiation of focused ANC services; and provide interpersonal counselling on maternal nutrition

During the BNA workshop, participants identified one key bottleneck that was common across the four counties, which was used to develop further questions for IR: the late initiation of pregnant women into focused antenatal care (FANC). This bottleneck was

[1] *Implementation Science and Nutrition Education and Behavior: Opportunities for Integration*. Taren Swindle, PhD; Geoff M. Curran, PhD; Susan L. Johnson, PhD

present at the lowest levels of the delivery system namely, community unit and household. See annex for the

3.1 Implementation research question

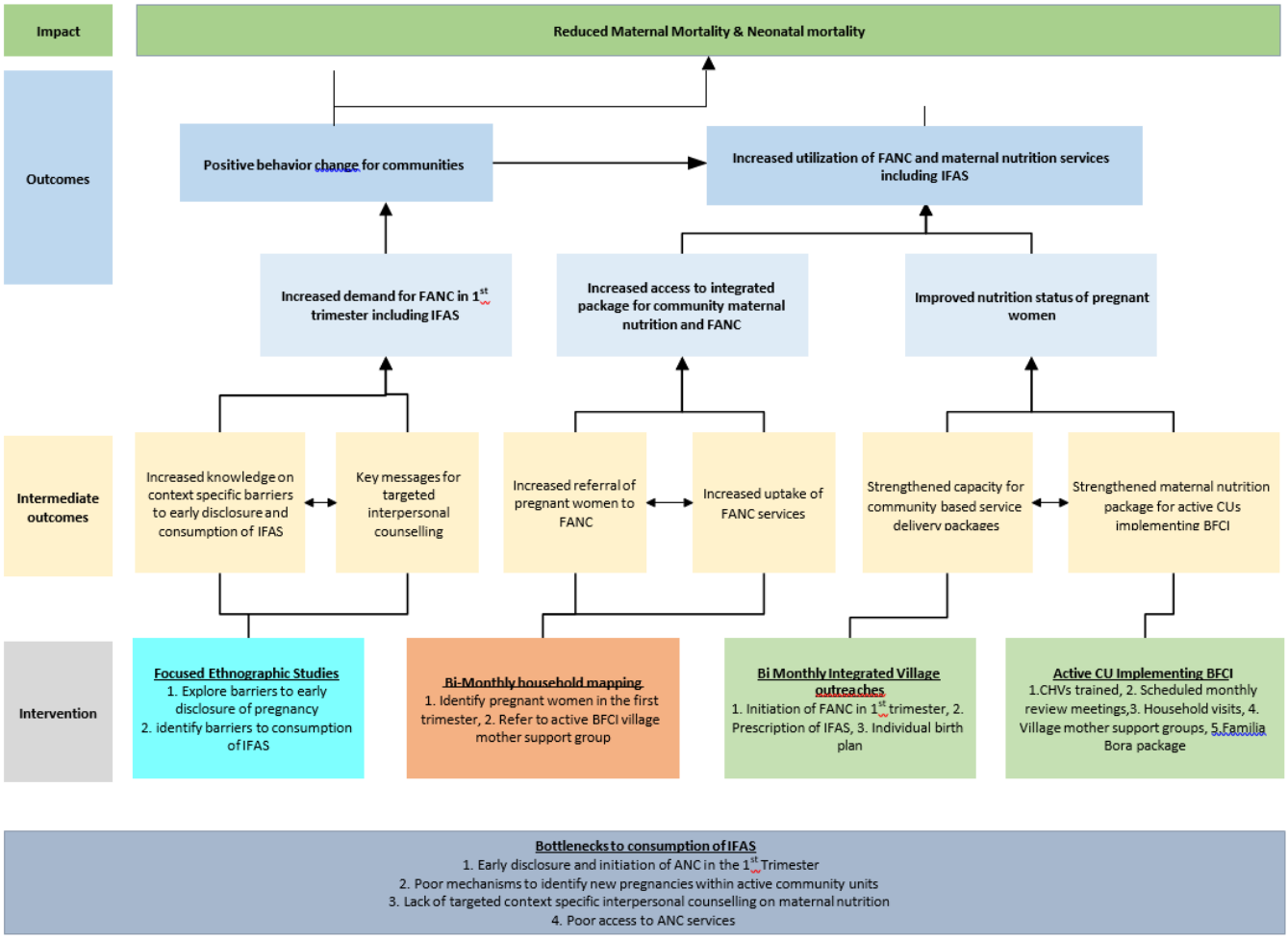
The focus of the IR was to improve the delivery of defined community activities related to IFA supplementation and assess their effects on increasing early initiation of FANC and adherence to the consumption of IFA supplements for at least 90 days by pregnant women.

The IR question was developed based on the bottlenecks identified. The IR question is "How can the implementation of an enhanced package for IFA supplementation address some major implementation bottlenecks and increase the early initiation of FANC and adherence to IFAS among pregnant women?"

This question was used as the basis for developing the IR proposal for submission and approval by a scientific ethical review committee.

3.2 Theory of Change for IFA supplementation during Pregnancy

One of the outcomes of the BNA workshop was the theory of change (ToC) to guide development of the IR Proposal. This is illustrated in the figure below. The bottlenecks identified at community level were used to inform the development of the IR proposal and guide the activities of the research. Specifically, it facilitated the refinement of the objectives and activities for each objective.



4. Bottleneck Inventory

The bottleneck inventory was developed to track specific actions intended to effect changes to activities that would help address some bottlenecks identified. The strategy used to operationalize some activities for the creation of the bottleneck inventory was through embedding these activities within the framework of the IR. This ensured that the activities would be documented, monitored, and evaluated as part of the research. A template that captured the specific programmed actions before and after implementation was used. It was referred to as the “Before Action” and After Action” Review template.

The bottleneck inventory informed the proposed log frame for research activities and identification of topics for desk research.

4.1 Monitoring the Bottleneck Inventory Activities

To monitor proposed activities to address the identified bottlenecks, a logic framework was developed to identify inputs, expected outcomes of the activities. The Logic framework shown in the table below was developed for use to guide implementers and focus on key outcome-oriented activities. It serves as an example of how to use existing infrastructure to implement and monitor key activities.

Table B2: Log Frame for Activities to address Inventory of Bottlenecks for IFA supplementation

Level	Narrative Summary	Indicators	Data Sources	Assumptions
Goal	Reduced maternal & neonatal mortality			
Program Purpose	To increase utilization of focused antenatal care (FANC) including IFA supplementation and maternal nutrition services	**HL. CUST MCH 7.0** Number of women who received at least 4 ANC visits during the latest pregnancy	MoH 711 – Integrated MCH Summary form	• No health worker unrest • Sub county Health Management teams
Sub-Purpose 1.1	To increase demand for integrated package for community -FANC including IFA supplements and maternal nutrition	• Number of women receiving iron and folic acid supplementation • Number of women receiving counselling on maternal and/or child nutrition	MoH 711- Integrated MCH Summary form	Standardized package for integrated community FANC exists
Immediate Outcome 1.1.1	Increased Referral of pregnant women in 1st trimester from community units (CUs) to primary care facilities providing FANC	Number of women referred from CUs to primary health care facilities for FANC services	MoH 100 Community referral tool	Bi-monthly mapping by CHVs is conducted as scheduled in the wards
Output 1.1.1	Increased uptake of integrated community level FANC services	• Number of community level outreaches conducted at ward level • Number of pregnant women in the 1st trimester who receive integrated FANC package • Number of pregnant women who received prescription of IFA supplements for 90 days	MoH 237 – Mother Child Handbook MoH 405 ANC register	
Input 1.1.1	• Sensitization of CHVs on Bi-Monthly Household mapping • Sensitization of CHVs on integrated package for FANC including maternal nutrition • Allowances for CHVs • Provision of Mother Child Booklets to pregnant mothers • Sensitization of select multidisciplinary disciplinary team from primary health facility on conducting outreaches at ward level • Allowances for multidisciplinary team			

Immediate Outcome 1.1.2	Improved nutrition status of pregnant women	**HL.9-3** Number of pregnant women reached with nutrition-specific interventions through USG- supported programs	MoH 711 – Integrated MCH Summary form	
Output 1.1.2	Strengthened capacity of CUs to provide integrated package of FANC & Maternal nutrition including IFA supplements at community level	Number of active CUs implementing BFCI providing integrated package of FANC & Maternal nutrition for pregnant mothers	MoH 515 CHEW Summary	Active CUs are trained on BFCI
Input 1.1.2	• Training of CHVs on for Module 10 Maternal Newborn Health curricula for community level • Sensitization of CHVs on defined 10 visits for maternal and child health • Sensitization of CHVs on key topic for schedule dialogue days at village level • Sensitization of CHEWs on supervision and mentorship for CHVs			
Immediate Outcome 1.1.3	Strengthened maternal nutrition counselling package for pregnant mothers at community level	Proportion of pregnant mothers who have consumed IFA supplements for at least 90 days	MoH 514 – Service Delivery Logbook	IFA supplements are available at primary health care facility
Output 1.1.3	Increased capacity of CHVs to provide context specific interpersonal counselling on maternal nutrition	Number of pregnant mothers who have received Familia bora Excellent action calendars and have checked excellent action one	MoH 514 – Service Delivery Logbook	Every pregnant mother in 1st trimester receives Familia Bora score card
Input 1.1.3	• 3-day training of CHVs on Familia Bora package for interpersonal counselling (IPC) • Development of village level mother to mother support group program for monthly group meetings • Provision of CHV Household visit guide to CHVs • Provision of Familia bora /MIYCN counselling guide for CHVs • Village maps for household with pregnant women receiving Familia Bora IPC package			
Immediate Outcome 1.1.4	Strengthened capacity for quantification of IFA supplementation at primary health care facility	Percentage of primary health facilities where IFA supplements are stocked according to plan, by level in supply system	MoH 734B	IFA supplements consumption data is available and reported monthly
Output 1.1.4	Primary health facility month of stock for IFA supplements is according to prescribed level	Number of stock status observations for IFA supplements that are between designed minimum and maximum levels of stock for primary health care level	MoH 734B	MoH 734B reporting tools available and data upload onto KHIS
Input 1.1.4	• Monthly facility in charge's meeting at sub county level • Sensitization of ANC staff on use of Nutrition commodities consumption data collection			

HL = High level global indicator; CUST = Custom USG indicator; MCH = Maternal Child Health

4.2 Desk Research activities

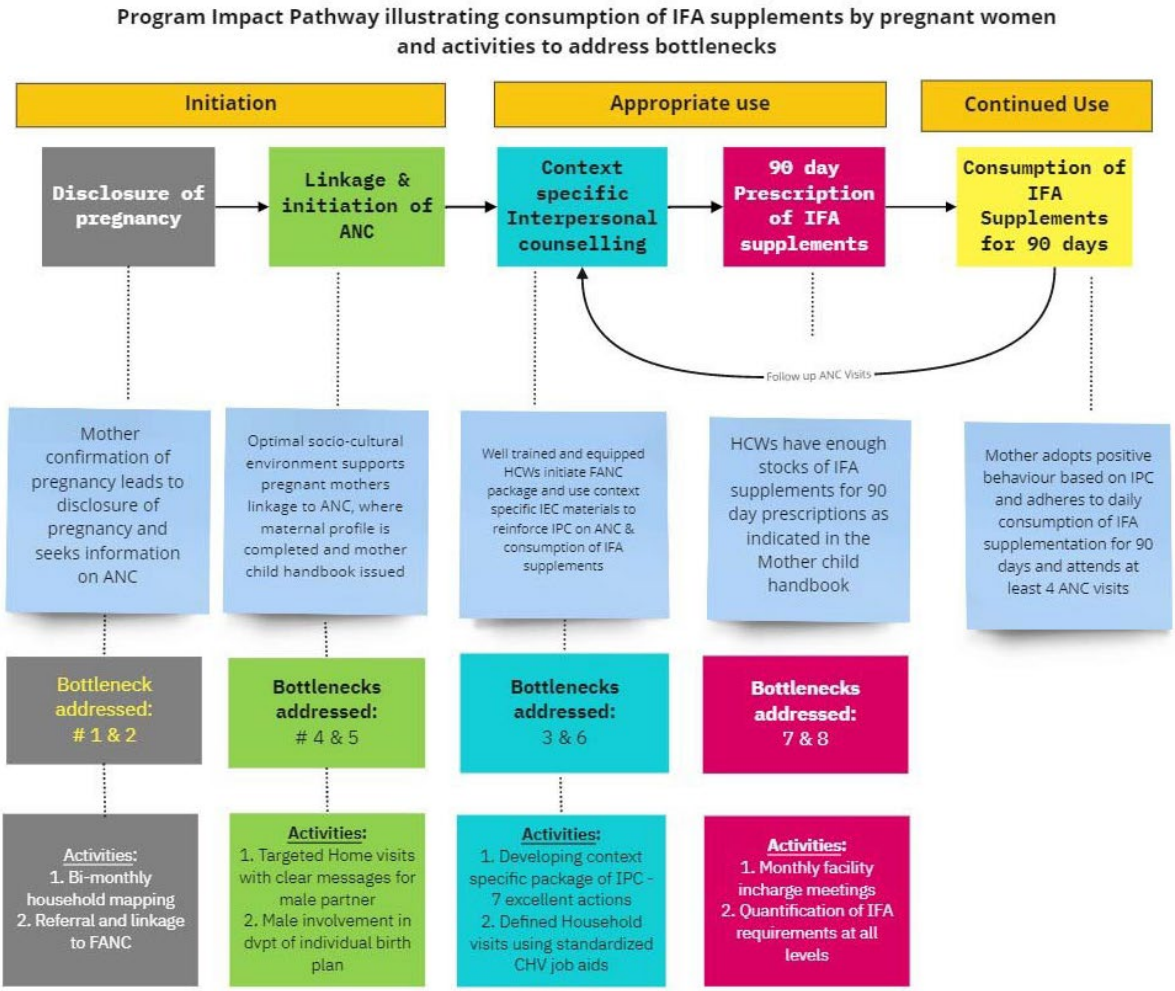
Following the BNA workshop in 2018, the implementation research protocol to study some of the bottlenecks of IFA supplements consumption during pregnancy was completed and approved[2]. The approved research protocol focused on two counties (Busia and Kitui[3]) and had four objectives, two of which had incorporated data collection activities to study and resolve some of the bottlenecks.

However, the COVID19 pandemic hindered field-based primary data collection activities resulting in a change of strategy to the use of desk review research. This involved the review of published literature with the intention of learning from those who have implemented IFA supplementation programs in different contexts to understand the barriers and enablers to consumption of IFA supplements. The figure below summarizes the program impact pathway that was developed as an outcome of the literature review.

[2] Implementation Research to Support Iron and Folic Acid Supplementation in Counties of Busia and Kitui in Kenya, 2019; Bukania Z., Njoroge B., *et al.*

[3] The selection of Busia and Kitui was informed by the *Kenya Reproductive, Maternal, Newborn, Child and Adolescent Health Investment Framework 2016* based on high burden of poor maternal and child health outcomes, low coverage rates and large underserved populations. The two counties also are among those with the highest burden of adolescent and teenage pregnancies according to the Demographic and Health survey of 2014.

Figure B1: Program Impact pathway illustration consumption of IFA supplements by pregnant women



5. Lessons learned and Recommendation

There is adequate evidence on the efficacy of various nutrition interventions. In the case of IFA supplementation, daily oral IFA supplementation with 30 mg to 60 mg of elemental iron and 400 µg (0.4 mg) folic acid is recommended for pregnant women to prevent maternal anemia, puerperal sepsis, low birth weight, and preterm birth[4]. However, in Kenya, very little is known about how to implement an effective IFA supplementation program at scale. The bottleneck assessment activities for IFA supplementation conducted with four counties is not exhaustive but provides useful lessons that can be applied to help improve the implementation of sustainable, effective programs that result in impact at scale. It is important to note that the lessons and recommendations are drawn from the experience of the bottleneck assessment workshop alone. The absence of actual community level activities in the counties of Busia and Kitui restricts further lessons, recommendations and discussions on the limitations of this approach. The following are the lessons learned and recommendations for future activities.

[4] WHO (2016) *WHO recommendations on antenatal care for a positive pregnancy experience*.Geneva.

5.1 Lessons learned

- The application of the standardized approaches to nutrition programs should be the norm rather than the exception especially in programs that achieve coverage levels above 50% in target populations but have low outcomes. The use of tools such as the Program Assessment Guide enables counties to have a systematic way of conducting program improvement activities that can be sustainable in the long run.
- The use of a structured participatory approach to discuss program improvement provides a safe environment for objective criticism and builds collective responsibility as well as commitment among stakeholders to address the improvement efforts.
- Forums organized to discuss program improvement should be inclusive and mapped to identify all key stakeholders across the delivery system of the intervention. The participation of policy makers in these forums should be based on relevance and experience.
- Program improvement efforts must be driven and owned by the respective functionaries or key players in the delivery system. For the improvement efforts to be successful, policy makers at national and county levels should support and recognize efforts made at levels of implementation to improve key programs. The efforts made at various levels should be complemented by increasing investments in health based on results and outcomes.

5.2 Recommendations

- The application of bottleneck assessment and bottleneck inventory to understand and improve the implementation of various nutrition interventions needs to be widely disseminated as a simple approach to developing focused and outcome-oriented activities.
- The bottleneck assessment approach can be applied in different settings, however, for it to be widely accepted, users should be guided on how to contextualize the Program Assessment Guide and apply various modules to suit different contexts and program areas.
- The use of the Program Assessment Guide[5] and thereby application of bottleneck assessment can be used to derive useful products for implementers. For example, the identification of bottlenecks across the mapped delivery system, development of an inventory of bottlenecks allows implementers to focus on activities that result in meaningful change and yield intended outcomes. This can be done by integrating activities to resolve the bottlenecks into annual work plans that are monitored and evaluated using logic frameworks to guide improvement and achievement of outcomes.
- The application of bottleneck assessment should be used as a first step to identifying specific implementation research questions. This process is also useful as it helps implementers focus improvement efforts that are guided by context specific theory of change and well-defined activities.
- Nutrition is a cross-cutting area, hence must be integrated into other clinical or health-oriented interventions to achieve intended outcomes and impact at scale.

[5] Pelletier, D., Corsi, A., Hoey, L., Houston, R., Faillace, S. Program Assessment Guide. August 2010, A2Z Project, AED, Washington, DC.

One approach to get buy-in across different cadres in health is application of the bottleneck assessment to build collaboration and synergies between different professionals for collective and sustainable impact.

6. Appendix

6.1 IFAS Bottleneck Assessment Workshop List of Participants

Table B3: Profile of Organizations that participated in the IFAS Bottleneck Assessment Workshop

Organization	Job Title	Number
FHI360	Family Planning/Maternal Neonatal Child Health Specialist	1
	Learning and Knowledge Management Officer	1
	Nutrition Specialist	1
	Program Assistant	1
	Technical officer Nutrition	3
KEMRI-Centre for Public Health Research	Deputy Director Centre for Public Health Research	1
Kenya Medical Supplies Agency (KEMSA)	Customer Service Officer - Nutrition	1
Ministry of Health – Department of Family Health	Program Manager, Neonatal Health Adolescent Unit	1
	Program Officer, Neonatal Health Adolescent Unit	1
BUSIA County Department of Health	Sub County Health Records Information Officer	1
	County Nutrition Coordinator	1
	County Pharmacist	1
	Facility Nurse	1
	Nursing Officer	1
	Sub County Medical Officer of Health	1
KITUI County Department of Health	Facility Nurse	1
	Sub County Health Records Information Officer	1
	Sub County Medical Officer of Health	1
	Sub County Nutrition Officer	1
	Sub County Pharmacist	1
	Sub County Public Health Nurse	1
MARSABIT County Department of Health	County Nursing officer	1
	Nursing Officer	1
	Sub County Medical Officer of Health	1
	Sub County Health Records Information Officer	1
	Sub County Nutrition Officer	1
	Sub County Pharmacist	1
Ministry of Health – Division of Nutrition and Dietetics	Head Division of Nutrition and Dietetics	1
	Deputy Head Division of Nutrition and Dietetics	1
	Micronutrients Technical Lead, Division of Nutrition and Dietetics	1
THARAKA NITHI County Department of Health	County Nursing officer	1
	Nursing Officer	1
	Sub County Health Records Information Officer	1
	Sub County Medical Officer of Health	1
	Sub County Nutrition Officer	1
	Sub County Pharmacist	1
NUTRITION INTERNATIONAL	Senior Program Officer, Maternal Child Health	1
	Grand Total	**39**

3.2 Goal Statement from Bottleneck Assessment Workshop

Table B4: Summary Goal Statement from the six groups representing IFA supplementation Delivery system in four counties

GOAL		**Associated Values**
Questions	**Outputs**	
What is it that we want the program to change or improve?	Reduce iron deficiency anemia in pregnancy by increasing utilization of IFAS	**What are some high-level values or objectives that should be considered when pursuing the goal?** • Strengthen capacity of CHV to provide interpersonal communication on maternal nutrition during pregnancy • Increase consumption of IFAS for at least 90 days among pregnant women who have completed 4 ANC visits • Strengthen existing community units to conduct targeted household mapping for early identification and referral of pregnant women to focused antennal care services • To promote early disclosure of pregnancy and subsequent initiation of ANC services among women of reproductive age
Who are the beneficiaries that this program will serve?	Pregnant women	
What percentage of beneficiaries do we want to reach with these services?	80% coverage of pregnant women	
Where are they located?	Households within community units, in all sub counties of Busia, Kitui, Marsabit and Tharaka Nithi	
When do we want to achieve this goal?	2 years	

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