

A Feasibility Study of
Integrating Maternal, Infant and Young Child Nutrition
(MIYCN) Counseling Services in Urban Maternal,
Neonatal and Child Health (MNCH) Services
in Bangladesh:

A quasi-experimental evaluation

Endline Study Protocol

International Food Policy Research Institute (IFPRI)

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1. Background

Bangladesh is experiencing rapid urbanization, with more than a third of people (~65 million) living in urban areas in 2018; by 2050, this number is projected to increase to 118 million[1]. Despite increasing urbanization, significant gaps remain in nutrition outcomes, determinants, and quality of health services in urban areas, particularly for the poor. Chronic malnutrition (stunting) in urban areas is decreasing at a slower rate than in rural areas [2], with stunting rates remaining as high as 50% in urban slums [3]. Furthermore, health policy heavily focuses on rural delivery of health services and improvements in health and nutrition outcomes for rural residents [4]. Coverage, standardization, and quality of maternal, infant, and young child nutrition (MIYCN) counselling is neglected and weak across health care delivery systems in Bangladesh [5].

To address these gaps, Alive & Thrive (A&T) aims to develop and test effective, feasible, and scalable models for delivering MIYCN counselling in urban areas and evaluate their impact on utilization, knowledge, and behaviors. The Bangladeshi urban MIYCN model is being delivered through NGO platforms that currently provide health services to urban women and children. The intervention includes community mobilization and social and behavior change communication (SBCC) for MIYCN. The package of maternal nutrition interventions is aligned with the latest global evidence [6] and the national policies and guidelines of Bangladesh Government within routine maternal, newborn and child health (MNCH) services. These include building capacity for health providers and nutritional counselors in urban health facilities, creating friendly environment for MIYCN counselling in health facility settings, community mobilization for demand creation of MIYCN services, interpersonal counselling on diet during pregnancy and consumption of iron folic acid (IFA) and calcium, promotion of adequate weight-gain monitoring during pregnancy, and counselling on breastfeeding and complementary feeding practices.

To assess the effectiveness of the interventions, A&T and IFPRI designed a quasi-experimental evaluation study with data collection taking place in three stages: 1) Baseline data collection to assess comparability of facilities, service quality and client's behaviors, 2) Facility-based endline data collection and 3) Community-based endline survey. A&T partnered with 2 NGOs, Radda and Marie Stopes, whose facilities provide MNCH services in urban areas, but not affiliated with the Bangladesh Urban Primary Health Care Services Delivery Project (UPHCSDP). These NGOs each operates 4 facilities in Dhaka (8 in total) which are eligible for the study to form the intervention

group. The evaluation comparison group is a matched sample of 8 facilities operated by NGOs Nari Maitree and Shimantik (NGOs under contract with the UPHCSDP implemented by Government of Bangladesh). The UPHCSDP agreed to provide facilities for baseline and endline data.

2. Impact of COVID-19 on program interventions and implementation

In March 2020, the World Health Organization declared COVID-19 a pandemic. Bangladesh reported its first case on March 8, 2020. On March 26, the Government of Bangladesh issued a nationwide extended public holiday and strict stay-at-home order. The initial stay-at-home order remained in place through May 30, after which localized restrictions were enforced.

Disruptions to field conditions and health facility operations resulted in adaptations to program implementation. In-person orientations and trainings to all healthcare providers was no longer possible; instead, A&T began providing virtual orientations to MIYCN Counselors and community workers (CWs) and providing newly recruited counselors and CWs with periodic technical refreshers and peer-to-peer training with trained counselors. Community mobilization, media activities, and other interventions which required in-person gatherings were suspended due to restrictions on social gatherings. In their place, MIYCN flyers promoting health facility counselling services and a script for the provision of MIYCN education and counselling services via phone were developed. Supportive supervision was also conducted via phone. The full description of planned and actual interventions at health facilities are provided in Table 1.

Table 1. Description of interventions and differences between intervention and comparison facilities

CORE INTERVENTIONS	PLANNED INTERVENTION	ACTUAL INTERVENTION	CONTROL
At health facilities:			
Training for health providers and nutritional counselors	In-person training on MIYCN SBCC from A&T, counseling skills training, general SBCC training, and supportive supervision training (managers only).	Only MIYCN Counselors received the full, in-person training. CW training was disrupted by COVID and CWs received basic training only Adapted virtual orientations, trainings, and technical periodic refreshers were provided. High staff turnover. Replacement MIYCN Counselors and CWs received peer-to-peer training with trained counselors.	Standard training on counseling skills, SBCC and supervision, if available
Counseling rooms in health facility settings	Counseling rooms available with standardized layouts, displays of government IYCF logo, and other specifications.	As planned	Non-standardized counseling rooms
SBCC materials and job aids	Availability of standardized MIYCN-specific BCC materials and job aids.	As planned, with the additional development of the mobile MIYCN (m-MIYCN) script and MIYCN flyer.	Standard SBCC materials and job aids if available, but used for mixed purposes
MIYCN counseling services and procedures	Standardized MIYCN counseling services and procedures by a dedicated counselor. MIYCN counseling topics include diet diversity and quantity, IFA and calcium supplementation, weight gain monitoring, exclusive and early initiation of breastfeeding, complementary feeding, and water, sanitation and health.	MIYCN Counselors provide routine MIYCN counseling services during individual appointments. Small group education sessions (with 4-5 women) began at health facilities in July 2021. General counselors provide these services in the absence of the MIYCN Counselor.	Offered only at facilities where a counselor is available
In the community:			
Social mobilization and community events	Mass media campaigns, advocacy meetings, MIYCN fair, film shows, special day/week events (Safe Motherhood Day, National Handwashing Day, National Nutrition Week, World Breastfeeding Week), ANC camps and other community meetings.	Mass media campaigns, advocacy meetings, MIYCN fairs and film shows were permanently suspended. Light community mobilization efforts include satellite clinic outreach (RADDA facilities only) and MIYCN flyer distribution, distribution of MIYCN flyers to community referrers (MSB facilities only), and monthly ANC camps for pregnant women (MSB facilities only).	Standard community events

Home visits	Promote health facility visits, referrals to MIYCN counselors, attendance at special events, and general MIYCN information.	Mobile MIYCN (m-MIYCN) education (provided by CWs) was provided via phone to pregnant women and mothers in place of home visits until November 2020.	Home visits for routine health services
Staff hiring and supervision			
Hire, train, equip and support a dedicated MIYCN counselor and CW at each health facility.	MIYCN Counselors will deliver standardized nutrition interventions and messages as part of MICYN services, maintain client registers for monitoring and reporting, and provide supervision. CWs will identify and mobilize beneficiaries needing services in the community	As planned	No additional staff hiring
Supportive supervision of MIYCN Counselors and CWs	Program Managers, Facility Managers, and Field Supervisors conduct supportive supervision of services provided by MIYCN Counselors and CWs.	Supportive supervision of MIYCN Counselors and CWs was conducted via phone and included listening in on mobile counseling sessions, using a checklist to assess quality of counseling, and providing feedback. In-person supportive supervision resumed in October 2020.	Standard health facility supervision.

3. Objectives of study

The primary objectives of the proposed evaluation are to answer the following questions using a quasi-experimental evaluation design:

- Is it **feasible** to standardize the delivery of MIYCN counseling services in existing urban health facilities?
- Can **quality of MIYCN counseling service** be improved by upgrading and standardizing existing MIYCN counseling service in urban health facilities?
- What are the **impacts** of standardized and upgraded MIYCN counseling service **on utilization** of MIYCN services and knowledge of clients?

The secondary objectives are:

- What are the **impacts** of standardized and upgraded MIYCN counseling service on behaviors of clients including:
 - Pregnant women: 1) consumption of diversified foods; 2) intake of IFA and calcium supplements during pregnancy
 - Mothers of children <1 y: age-appropriate infant feeding

4. Key study outcomes

The primary outcomes to be evaluated include **quality measures of MIYCN counseling in urban areas**

- Facility readiness for nutrition services, resources, and staffing
- Knowledge of service providers on key nutrition services
- Quality of nutrition counseling during ANC (such as diversified diet during pregnancy, IFA and calcium intake, promotion of maternal weight monitoring and related counseling) and during well-child or sick-child contacts (such as age-appropriate feeding practices, promotion of child growth and related counseling).
- Clients' utilization of and satisfaction with MIYCN services
- Clients' knowledge of MIYCN topics and best practices

The secondary outcomes to be evaluated include **maternal nutrition practices and IYCF practices**

- Maternal dietary diversity

- Iron/folic acid supplementation: proportion of women who consumed at least 100 IFA tablets and the mean number of tablets consumed.
- Calcium supplementation: proportion of women who consumed calcium and the mean number of tablets consumed.
- Early initiation of breastfeeding
- An indicator of age-appropriate feeding that includes exclusive breastfeeding for children <6 months, breastfeeding + complementary feeding for children 6-12 months. We consider children < 12 months as they are more likely to be exposed to the program through immunization contacts.

5. Study design

The study will use a quasi-experimental design, with data collection taking place in three different stages: 1) Baseline data collection to assess comparability of facilities, service quality and client's behaviors, 2) Facility-based endline data collection and 3) Community-based endline survey (**Figure 1**).

The study will use mixed data collection methods including: 1) facility assessment; 2) provider survey; 3) case observations (namely ANC visits, child visits [both sick child and immunization], and counseling sessions), 4) client interviews and 5) in-depth interview with Program Managers and Field Supervisors.

Figure 1: Impact Evaluation Design



*Baseline was conducted on 16 health facilities but were very imbalanced.

6. Overview of intervention and comparison facilities

The program interventions are implemented in 8 NGO-run urban health facilities, 4 of which are operated by Radda and 4 of which are operated by Marie Stopes. These 8 facilities will serve as the intervention group. The comparison group will also consist of 8 NGO-run urban health facilities, but these are run by Nari Maitree and Shimantik, which operate under the Urban Primary Health Care Services Delivery Project. The list of facilities in the intervention and comparison groups is presented in **Appendix 1**.

7. Sample size and power calculation

Sample size has been estimated based on the baseline prevalence of the primary outcomes, the expected change after intervention, the power to detect those differences at 0.80, and a level of significance of 0.05. The outcomes used for sample size calculation were quality of nutrition service delivery (including provision of counseling on diet and breastfeeding practices). The sample size was calculated at 2 levels: provision of services (measured through case observation) and receipt of services (measured through client interviews).

Based on data from baseline assessment, we calculated the prevalence for expected outcomes, and the intra-cluster correlations (ICCs). We estimated that a minimum sample size of 1200 clients per group during the first phase of the endline survey conducted at the facilities would have at least 80 percent power to detect a difference of 10-19 percentage points (pp) between intervention and comparison groups in the changes over time for different context-specific outcomes (**Table 2**), e.g. maternal counselling during pregnancy and IYCF counselling to caregivers of young children. During the follow up in the communities, we expect a ~30-33% loss from the original sample, and thus estimate we will collect information from 65-70%. We expect that this will give us enough power to detect changes in context-specific behavioral outcomes. Instead of separating the sample for ANC and child contacts, we will pool them to examine context-appropriate behavior such as pregnant women with dietary diversity/IFA and calcium consumption and caregivers with age-appropriate child feedings. These detectable differences are of reasonable public health significance and based on the previous experience from evaluation of the A&T Bangladesh maternal nutrition study [7].

For facility readiness and provider knowledge, with the sample size of 8 facilities and 40-64 providers in this group, we will mainly report the descriptive analyses between two groups, but not report statistical test due to small sample size.

Table 2. Sample size and power calculation

	Control group, baseline ³	Expected difference	Treatment group, baseline	Power	ICC	Alpha	Sample size per group
Quality of services¹ (measured through case observation)							1200
Counseling on diet	68.0	19.0	87.0	0.8	0.103	5	
Counseling on breastfeeding	71.6	17.1	88.7	0.8	0.09	5	
Context-appropriate behavioral outcomes² (measured through client interview)							1200 at facility-based baseline 800 (67%) at community-based baseline
Consume 100+ IFA	54.5	9.5	64.0	0.8	0.001	5	
Dietary diversity during pregnancy	74.0	9.5	83.5	0.8	0.009	5	
Early initiation of breastfeeding	32.8	13.5	46.3	0.8	0.024	5	

¹Data from AINNS study [8]²Data from Bangladesh DHS 2014 [9]³We expect to see no difference in the control group at baseline vs. endline.

8. Sampling and enrollment of study subjects

Sampling providers: The program interventions are implemented in 8 NGO-run health facilities in Dhaka, with another 8 serving as comparison facilities; thus, 16 facilities will be included in the survey. From each facility, we will interview 6-8 health providers (1 medical officer or 1 paramedic, 1-2 counselors, and 3-4 community workers) (**Table 3**). We expect that the number of counselors across facilities may differ; counselors may already be present at some intervention and comparison facilities prior to the intervention. Therefore, 1 counselor may be interviewed at comparison facilities, and 1-2 counselors (1 existing counsellor and 1 additional A&T MIYCN Counselor) may be interviewed at intervention facilities. Similarly, dedicated Community Workers hired by A&T will be available at intervention facilities but not at comparison facilities. Due to the small numbers of Program Managers (n=2) and Field Supervisors (n=4), we plan to conduct in-depth interviews with them to obtain some additional insights on overall intervention impact pathway, uptake of interventions, program performance and supportive supervision activities.

Table 3. Sampling healthcare personnel at intervention and comparison facilities

Levels		Intervention facilities (n=8)	Comparison facilities (n=8)
Baseline	Permanent facility personnel		
	<i>Medical officer</i>	1	1
	<i>Counsellor</i>	1	1
	<i>Paramedic</i>	1	1
	<i>Community worker</i>	3	3
	Total:	N=48	N=48
Endline: Quantitative survey	Permanent facility personnel		
	<i>Medical officer</i>	1	1
	<i>Counsellor</i>	1	1
	<i>Paramedic</i>	1	1
	<i>Community worker</i>	3	3
	A&T temporary hiring		
	<i>MIYCN Counsellor</i>	1	0
	<i>Community Worker</i>	1	0
	Total:	N=64	N= 48
Endline: Qualitative in-depth interview	Program Manager	2	0
	Field Supervisor	4	0
	Total:	N=6	N=0

Sampling clients: At each health facility, 4 intervals of time (8-10 AM, 10AM-12PM, 1-3 PM and 3-5 PM) will be chosen. Pregnant women or children visiting the facility within these 4 selected intervals will be randomly selected (in proportion to the case load in each interval) for interview and observation. We plan to sample 10 clients each day from each facility (5 pregnant women and 5 mothers with children <12 months).

The inclusion criteria for recruiting clients are as follows:

- Pregnant women who are visiting the health facilities for ANC visits (at least twice during her pregnancy, around half of clients)
- Mothers with children <12 months of age who are visiting the health facilities for health check-ups or vaccination

Exclusion criteria:

- Pregnant women with severe illness or complications
- Mothers with severely ill children

For the assessment of **impacts** of standardized and upgraded MIYCN counseling service on coverage and behavior changes we will identify each facility's catchment area and find women in the community who accessed services at those health facilities to sample 1600 facility clients (PW and RDW) to interview (**Table 4**). During the facility interviews, we will seek their consent to be interviewed at home for the community

interview at a later time. Follow-up with clients for the community interview was conducted within 3 months following the facility interview at baseline. At endline, facility clients will be visited within one month to conduct the community interview. We expect that we will be able to follow 65-70% of these women. By doing so, we ensure that our clients will have at least one visit in the evaluation facilities (both intervention and control areas). We can track the number of clinic visits and thus conduct the dose response analysis.

Table 4. Sampling clients at intervention and comparison facilities

Levels		Intervention facilities (n=8)	Comparison facilities (n=8) ¹
Baseline	Case observation		
	ANC	600	100
	IMCI	600	100
	Client interview		
	ANC	400	70
	IMCI	400	70
	Total:	2,000	340
Endline	Case observation		
	ANC	600	600
	IMCI	600	600
	Client interview		
	ANC	400	400
	IMCI	400	400
	Total:	2,000	2,000

Informed consent

Written consent will be obtained from both clients and providers using informed consent forms. These forms are available in both English and Bengali, and clearly explain the purpose of the research, how the collected data will be used, why the respondent has been selected, interview process, risks and benefits, and steps to ensure the privacy, anonymity and confidentiality of the collected information. All COVID-19 transmission risks to study participants and the precautionary measures that will be followed during data collection to limit the risk of transmission will be included in the informed consent. The respondent's right to withhold consent or withdraw at any time, as well as contact details for questions about the study, are clearly outlined. These details will be mentioned verbally to the respondent to ensure comprehension.

9. Data collection methods

The survey will use mixed data collection methods including: 1) facility assessment; 2) provider survey; 3) case observations (include ANC visits, child visits [both sick child and immunization], and counseling session), 4) client interviews, and 5) in-depth interview with Program Managers and Field Supervisors. At baseline, we will have two rounds of client interviews: one round at the health facility to measure utilization and one round to follow up clients (within a months later) in the community to measure behavior changes.

9.1. NGO-run urban health facility assessment

The urban health facility assessment will be conducted at baseline and endline for 8 intervention and 8 comparison health facilities. The health facility questionnaire will contain modules related to facility infrastructure (both in terms of overall organization as well as basic amenities), services provided to women and children (either at the facility or through outreach activities), service readiness, case load, and availability of trained providers. Additional questions will focus on identification and tracking of clients and the catchment area for the facility (**Table 5**).

There are two components to the urban facility assessment:

- Interview with the manager of the facility to obtain information on available personnel and services offered. Data were also gathered from monitoring forms to assess utilization and coverage of MIYCN-related services.
- A facility observation checklist will be included to obtain information on the counseling room or space. A predefined checklist will be developed to document the presence and condition of infrastructure, equipment, supplies and information, education and communication (IEC) materials in the counseling area.

Table 5. Modules included in the urban facility assessment

Module	Topic	Description
1	Characteristics of facility	Identification, location, type, provision of in-patient or outpatient care, catchment areas
2	Facility infrastructure	Overall organization and basic amenities
3	Service readiness of facility	Including availability of counseling room, functional nutrition supplies, logistics, drugs, IEC materials
4	Services provided	Serviced provided either at facility or through outreach including nutrition services for pregnant women, immunization, well-child care, sick under-5 children, SAM/MAM management
5	Caseload	Case load for ANC, immunization, sick child, SAM/MAM, supplementation, referrals, counselling
6	Human resources	Availability of trained providers and their qualification
7	Monitoring system	How the facility monitors and track clients

9.2. Provider survey

The provider survey will be conducted at baseline and endline. Modules for the provider questionnaire will include provider characteristics, workload and time commitments for services provided, exposure to training, knowledge (both theoretical and application based), motivation and self-efficacy, and incentives and remuneration (**Table 6**).

Table 6. Modules included in provider survey

Module	Topic	Description
1	Background and demographic characteristics	Factors such as age, education, prior experience, etc., have influences on worker performance and ability to deliver services.
2	Workload and time commitment (both actual and perceived)	Information on workload and time commitments are needed for three purposes: 1) to understand demands made by project interventions on workload and time commitments; 2) to understand how perceptions of workload, in addition to actual workload, influence FHW motivation and performance; 3) to use data on time commitments, and shifts in time commitments and activities due to the interventions; and 4) additional and different workload and time commitments due to COVID-19.
3	Training exposure and needs assessment for future training	To effectively deliver the MIYCN service delivery package, providers require training to develop their competency in performing required duties. In addition, training is known to be a motivating influence on health providers. Training was also required to adapt and continue the implementation of the MIYCN service delivery package during COVID-19.
4	Knowledge and skills related to MIYCN	A basic prerequisite for delivering the MIYCN intervention successfully is knowledge of providers about the core topics of MIYCN. Additional knowledge and skills were required during COVID-19.
5	Self-efficacy and confidence	Self-efficacy and confidence is a basic driver of job motivation and job performance during normal circumstances and during COVID-19.
6	Job motivation and satisfaction	Several factors influence provider motivation. These include factors that are extrinsic to the provider as well as intrinsic motivators. Motivation is strongly related to job performance; therefore, capturing perceptions related to motivation and motivators is important both at the baseline and endline. Job satisfaction is also an influence on job performance, and therefore important to capture. COVID-19 will also influence job motivation and satisfaction.
7	Supervisory support	Supportive supervision is documented to be critical in provider performance, motivation, and training during normal circumstances and during COVID-19.
8	Incentives and remuneration	Incentives and remuneration influences motivation and performance of providers during normal circumstances and during COVID-19.

9.3. Case observation

Case observations will be conducted in both intervention and comparison health facilities at baseline and endline. The observation checklists will be used to observe the service content as well as interactions between the client and provider. Specifically, the counseling observation checklist will be developed based on the MIYCN service delivery package guidelines. In addition to content coverage, a checklist will also be used to assess counselors' skills and counseling processes. Items from this checklist will be used to measure the quality of the counseling session. At the end of the counseling session, a short exit interview (5-10 minutes) will be used, to ask the respondents about services received during that visit, nutrition information provided, and their satisfaction with the services they received

At baseline, 1400 case observations (1200 in intervention and 200 in control groups) were conducted, along with basic client information. During the facility-based endline, 1200 case observations will be conducted in each group. We expect to have 15 days of observations in each facility, 10 observations per day: 5 ANC visits (include counseling), 5 child or immunization visits (include counseling). Total: $10 \times 15 \text{ days} \times 8 \text{ facilities} = 1200$ observations in interventions and 1200 in comparison facilities.

9.4. Client interview

Clients who are observed at facilities will also be interviewed in their homes as a follow-up to measure behavior change (**Table 7**). During the facility interviews, we will seek their consent for the community interview to contact them to set up home visit within one month. We expect that we will be able to follow 65-70% of these women. By doing so, we ensure that our clients will have at least one visit in the evaluation facilities (both intervention and control areas). We can track the number of facilities visits and thus conduct the dose response analysis.

Table 7. Modules included in client interview

Module	Topic	Description
1	Background and demographic characteristics	Factors such age, education, religion, living standard, etc., have influences on client's behaviors, including MIYCN practices and service utilization. This data also provides information about outside factors, including the COVID-19 pandemic that may constrain mothers' ability to benefit from services. Data will be collected on household information, socioeconomic status, income and expenditure, and the education and other characteristics of the women and their husbands.
2	Obstetric history	This section information on the woman's pregnancy history including complications, total parity and age at first parity.
3	Previous ANC care/care seeking for the child	This will include receipt and consumption of IFA and calcium and antenatal care and counselling during current pregnancy for pregnant women. Mothers of sick children will also be asked about postnatal services, morbidity and care of children, and vaccination history. This will help to assess if exposure to

Module	Topic	Description
		intended program is occurring as expected and assess impact trends by levels of exposure to interventions.
4	MN Dietary intake/IYCF practices	Respondents will be asked to recall what they ate (ANC clients) or what they fed their children (mothers of sick children) on the previous day. Mothers of sick children will also be asked other questions on IYCF practices and behaviors. This will provide information on MIYCN behaviors.
5	Current MIYCN knowledge and perceptions	Data on mothers' MIYCN knowledge and perceptions can be used to assess trends in impact indicators and to identify pathways to positive behavior change. Questions on self-efficacy will be included.
6	Social desirability	This is a factor that may affect the woman's ability to change behaviors and practices around MIYCN.
7	Food security	Questions on food security will be included as they are related to the respondent's ability to follow counselling on diet for herself and her children.
8	Decision-making power and mental health	Decision-making power and mental health are also related to the woman's ability to change behaviors and practices around MIYCN.
9	Current MIYCN knowledge and practices	Follow-up data on mothers' MIYCN knowledge and practices can be used to identify the impact of the intervention in terms of promoting behavior change. For data comparability, the same tools will be used for this round of data collection.

9.5. Program Manager and Field Supervisor interviews

In-depth interviews will be conducted using a qualitative interview guide. The interview guide will be developed in English and then translated into Bengali (if needed). These tools will be pretested for clarity, flow, and priority questions (to cover all domains with the least number of questions) and modified accordingly. The in-depth interviews will be conducted in English or Bengali by skilled and trained research assistants with accompanying researchers. Audio recordings will be transcribed (and independently translated into English, if needed) and compared to the original as a quality check.

9.6. COVID-19 precautionary measures

Since early 2020, close-range contacts between enumerators and study participants during data collection activities present a particular risk for spreading COVID-19 in communities with vulnerable populations. The collaborating survey firm, Data Analysis and Technical Assistance (DATA) has developed formal guidelines to be followed during enumerator training and fieldwork. As part of the guidelines, all study staff will be tested for COVID-19 before enumerator training begins. Any individual who tests positive will be excluded from the training and advised to isolate and seek appropriate health services as per government and local guidelines. Before each day of training, participants will be screened for COVID-19-related symptoms (fever, dry cough, respiratory problems, or any unusual illness). If any participant presents symptoms, they will be advised to take a COVID-19 test and may only rejoin training after presenting a negative test result. All

participants must wear face masks (provided to them) throughout the duration of training. During data collection, field supervisors will assess enumerators for COVID-19 symptoms each day before starting data collection and tested twice (once per month of data collection). As with training, any enumerator or staff who tests positive or presents symptoms will be immediately excluded from fieldwork and must present a negative COVID-19 test result before rejoining fieldwork. Any study participants with COVID-19 symptoms will be excluded from the study and advised to isolate and seek appropriate health services as described above. All enumerators and study participants will wear masks (provided to them) and wash or sanitize their hands before and after each interview. Interviews will be conducted outside or in a well-ventilated space and enumerators will maintain two meters of distance from the interviewee and other household members. Co- and Principal Investigators of the project will be in daily contact with DATA and in-country partners during data collection to assess the changing risks and government measures.

10. Analysis plan

All statistical analysis using quantitative data will be done using Stata 17. Data collected at baseline will be analysed to examine the balance on key baseline characteristics between intervention and comparison groups. Statistical testing for differences between the two groups will be done using a random effects regression, taking into account the clustering of errors within and across health facilities.

Appropriate variables will be created for each set of outcomes. For quality of care, the key indicators will be facility readiness, knowledge of healthcare providers, nutrition counselling service scores, and clients' utilization of and satisfaction with MIYCN services. For behaviour outcomes, the key indicators will be maternal nutrition practices (dietary diversity, IFA and calcium consumption) and age-appropriate IYCF practices. Impacts on these outcomes will be estimated using analysis of covariance which is an accepted impact evaluation analysis approach that is widely used. Further adjustment for geographic clustering at the facility level will be done using random effects.

Qualitative interview data (transcripts) will be organized and analyzed using software such as NVivo, Excel or others as appropriate. Data analysis will identify the emerging deductive and inductive themes that emerge from the interviews under 4 study domains: intervention impact pathway, uptake of interventions, programmatic performance, and supportive supervision activities. Categories and subcategories under these domains will be identified and defined (conceptualized) to feed into a narrative complementing the quantitative data results.

11. Detailed Timeline

Table 6. Overall study timeline

Deliverables/Activities	2019											
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Discuss study design with A&T	x	x	x									
Baseline - prepare study protocol and survey instrument	x	x	x	x	x	x	x	x	x			
IRB application for US and Bangladesh		x	x				x					
Contract survey firm		x	x	x								
Baseline survey- field work (comparison facilities)										x	x	
Baseline survey- field work (intervention facilities)												
Baseline report- Data analyses and report writing												
COVID-19 survey												
COVID-19 draft manuscript, revised												
Endline- decisions on endline design												
Endline- prepare study protocol and survey instruments												
Endline – testing and validation to finalize CAPI												
Endline – Enumerator's training												
Endline survey												
Field work												
Data analyses, slide deck												
Tables/figure/executive summary												
Additional analyses- manuscript writing												

Deliverables/Activities	2020											
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Discuss study design with A&T												
Baseline - prepare study protocol and survey instrument												
IRB application for US and Bangladesh												
Contract survey firm												
Baseline survey- field work (comparison facilities)												
Baseline survey- field work (intervention facilities)		x	x									
Baseline report- Data analyses and report writing				x	x	x	x	x				
COVID-19 survey									x	x		
COVID-19 manuscript											x	x
Endline- decisions on endline design												
Endline- prepare study protocol and survey instruments												
Endline – testing and validation to finalize CAPI												
Endline – Enumerator's training												
Endline survey Field work												
Data analyses, slide deck												
Tables/figure/executive summary												
Additional analyses- manuscript writing												

Deliverables/Activities	2021											
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Discuss study design with A&T												
Baseline - prepare study protocol and survey instrument												
IRB application for US and Bangladesh												
Contract survey firm												
Baseline survey- field work (comparison facilities)												
Baseline survey- field work (intervention facilities)												
Baseline report- Data analyses and report writing												
COVID-19 survey												
COVID-19 manuscript	x	x	x	x	x							
Endline- decisions on endline design						x	x		x	x		
Endline- prepare study protocol and survey instruments							x	x		x	x	x
Endline – testing and validation to finalize CAPI												
Endline – Enumerator’s training												
Endline survey Field work												
Data analyses, slide deck												
Tables/figure/executive summary												
Additional analyses- manuscript writing												

Deliverables/Activities	2022											
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Discuss study design with A&T												
Baseline - prepare study protocol and survey instrument												
IRB application for US and Bangladesh												
Contract survey firm												
Baseline survey- field work (comparison facilities)												
Baseline survey- field work (intervention facilities)												
Baseline report- Data analyses and report writing												
COVID-19 survey												
COVID-19 manuscript												
Endline- decisions on endline design												
Endline- prepare study protocol and survey instruments	x											
Endline – testing and validation to finalize CAPI		x	x									
Endline – Enumerator’s training				x								
Endline survey Field work					x	x						
Data analyses, slide deck							x	x	x			
Tables/figure/executive summary								x	x	x		
Additional analyses- manuscript writing									x	x		

Table 7. Details of activities and study timeline for endline survey

Activities	2021											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Discuss study designed with A&T									x	x		
Prepare study protocol										x		
Prepare survey questionnaire											x	x
Sign contract with survey firm												
Facility selection and matching												
IRB at IFPRI												
IRB in Bangladesh												
Translating questionnaire												
Pre-test survey questionnaire, revision and finalization												
Developing CAPI form												
Training enumerators												
Data collection												
Data cleaning												
Data analyses												
Headline findings (PPT)												
Tables/figure/executive summary												
Additional analyses- manuscript writing												

Activities	2022											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Discuss study designed with A&T												
Prepare study protocol												
Prepare survey questionnaire	x											
Sign contract with survey firm	x											
Facility selection and matching												
IRB at IFPRI	x											
IRB in Bangladesh		x										
Translating questionnaire		x	x									
Pre-test survey questionnaire, revision and finalization			x	x								
Developing CAPI form				x								
Training enumerators				x								
Data collection					x	x						
Data cleaning							x	x				
Data analyses								x	x	x		
Headline findings (PPT)								x				
Tables/figure/executive summary									x	x		
Additional analyses- manuscript writing									x	x		

12. References

1. UN: 2018 revision of world urbanization prospects. In.: United Nations New York; 2018.
2. Richards K: Malnutrition in Bangladesh: harnessing social protection for the most vulnerable. In. London: Save the Children; 2015.
3. NIPOORT: Bangladesh Urban Health Survey. National Institute of Population Research and Training (NIPOORT), Measure Evaluation, University of North Carolina at Chapel Hill, USA, and icddr, b. In.; 2013.
4. Govindaraj R, Raju D, Secci F, Chowdhury S, Frere J-J: Health and Nutrition in Urban Bangladesh: Social Determinants and Health Sector Governance. Washington DC: International Bank for Reconstruction and Development / The World Bank; 2018.
5. Billah SM, Saha KK, Khan ANS, Chowdhury AH, Garnett SP, Arifeen SE, Menon P. Quality of nutrition services in primary health care facilities: Implications for integrating nutrition into the health system in Bangladesh. *PLoS One* 2017; 12:e0178121.
6. WHO: WHO recommendations on antenatal care for a positive pregnancy experience. In.: World Health Organization; 2016.
7. Nguyen PH, Kim SS, Sanghvi T, Mahmud Z, Tran LM, Shabnam S, Aktar B, Haque R, Afsana K, Frongillo EA, et al. Integrating Nutrition Interventions into an Existing Maternal, Neonatal, and Child Health Program Increased Maternal Dietary Diversity, Micronutrient Intake, and Exclusive Breastfeeding Practices in Bangladesh: Results of a Cluster-Randomized Program Evaluation. *J Nutr* 2017; 147:2326-2337.
8. icddr, IDS, IFPRI: Evaluation of Accelerating Implementation of the Bangladesh National Nutrition Services. Initial Assessment 2016. Final report. In. Dhaka, Bangladesh: International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b), Institute of Development Studies, UK (IDS), International Food Policy Research Institute (IFPRI); 2016.
9. NIPOORT: National Institute of Population Research and Training (NIPOORT), Mitra and Associates, and ICF International. Bangladesh Demographic and Health Survey 2014. In. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPOORT, Mitra and Associates, and ICF International; 2016.

Appendix 1: Facility selection

NGOs	Address	Treatment group
<i>Shimantik (comparison)</i>	House# 671/4/5, Block-A, Sipahibagh, Kh	Control
	325, South Goran, Hawai Goli, Goran, Kh	Control
	Balurmat, Gandaria (near to Jurain Kobo	Control
	462, Gulbagh, Malibagh, Dhaka-1219	Control
<i>Nari Maitree (comparison)</i>	6/28, Humayan Road, Mohammedpur, Dhaka	Control
	778, Salimullah Road, Mohammedpur, Dha	Control
	Pall Somity Market, Sultangonj, Rayarba	Control
	230, West Agargoan, Dhaka-1207	Control
<i>RADDA (intervention)</i>	Plot-324, Khan Bahadur Ahsanullah Road,	Intervention
	Plot-10, Main Road, Section-1, Mirpur,	Intervention
	Plot-159/A, Road-2/1, Block-A, Section-	Intervention
	Community Hall, Block-B, Bowniabandh, M	Intervention
<i>Marie Stopes (intervention)</i>	House# 320, Road# 8/A (New), Dhanmondi-	Intervention
	House# 2, Road# 5, Block-A, Section-10,	Intervention
	House# 3, Road# 2, Block-E, Balurmath,	Intervention
	153, Jalil Khan Market, Mymensingh Road	Intervention