Impact Analysis Report

Impact Analysis of Selected Indicators of USAID's MaMoni Maternal and Newborn Care Strengthening Project

July 2024

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Impact Analysis of Selected Indicators of USAID's MaMoni Maternal and Newborn Care Strengthening Project

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Contents

Acknowledgments 2

Suggested Citation 3

Contents 4

Figures 6

Tables 9

Abbreviations 11

Executive Summary 13

Objective of the Impact Analysis 13

Methodology 13

Findings 14

Recommendations 15

Background 17

The State of Maternal and Newborn Health: Global Scenario 17

The State of Maternal and Newborn Health: Bangladesh Scenario 17

WHO Recommendations for Maternal and Newborn Health 18

USAID's MaMoni MNCSP in Bangladesh 19

Methods 21

Study Design 21

Study Sites 21

Study Population 22

Sample Size 22

Enrollment 23

Data Collection Method 23

Difference between Baseline and Endline Questionnaire 24

Data Analysis 24

Ethical Considerations 27

Limitations 27

Results 28

Discussion 44

Overall Program Impact 44
Recommendations 49
References 51
Appendix A. Supplementary Tables 53
Appendix B. Supplementary Figures 66

Figures

Figure 1. Study sites 22

Figure 2. Difference in receiving at least four ANC among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 30

Figure 3. Difference in receiving at least four ANC among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates 31

Figure 4. Difference in receiving all five components of ANC at least once among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates 32

Figure 5. Difference in quality ANC among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 33

Figure 6. Difference in quality ANC among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates 33

Figure 7. Difference in receiving first ANC within the first trimester among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 34

Figure 8. Difference in receiving first ANC within first trimester among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates 34

Figure 9. Difference in delivery at any health facility among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates 35

Figure 10. Difference in delivery at a public facility among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates 36

Figure 11. Difference in delivery at a union level public facility among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 37

Figure 12. Difference in delivery at a union level public facility among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates 37

Figure 13. Difference in delivery by a skilled birth attendant among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates 38

Figure 14. Difference in breastfeeding within the first hour of birth among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 39

Figure 15. Difference in breastfeeding within the first hour of birth among married women who had a live birth in the last 15 months preceding the survey in high Intensity and low Intensity MaMoni areas versus comparison areas over time and DID impact estimates 40

Figure 16. Difference in postnatal care to newborns within two days of birth among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 41

Figure 17. Difference in postnatal care to newborns within two days of birth among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates 41

Figure 18. Difference in postpartum modern family planning among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates 42

Figure 19. Difference in delivery at union level public facility in MaMoni areas over time, from HMIS data 43

Figure 20. Number of UHFWCs and number of deliveries per UHFWC over time, from HMIS data..... 43

Figure 21. Summary findings – ANC, Delivery, Postnatal, and Postpartum Care 46

Figure S1: Difference in receiving any ANC among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 67

Figure S2: Difference in receiving any ANC among married women who had a live birth in the last 15 months preceding the survey in High Intensity and Low Intensity MaMoni areas versus comparison areas over time and DID impact estimates 67

Figure S3: Difference in receiving at least one ANC from medically trained provider among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 68

Figure S4: Difference in receiving at least one ANC from medically trained provider among married women who had a live birth in the last 15 months preceding the survey in High Intensity and Low Intensity MaMoni areas versus comparison areas over time and DID impact estimates 68

Figure S5: Difference in receiving all five components of ANC at least once among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 69

Figure S6: Difference in delivery at any health facility among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 69

Figure S7: Difference in delivery at public facility among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 69

Figure S8: Difference in delivery by a skilled birth attendant among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates..... 70

Figure S9: Difference in use of misoprostol in home deliveries married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates 70

Figure S10: Difference in use of misoprostol in home deliveries married women who had a live birth in the last 15 months preceding the survey in High Intensity and Low Intensity MaMoni areas versus comparison areas over time and DID impact estimates..... 70

Figure SII: Difference in postpartum modern family planning among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates..... 71

Tables

Table 1. Definition of the indicators 19

Table 2. Sample size according to area 23

Table 3. Sociodemographic characteristics of interviewed women 28

Table A1. By SES Quintile: Received any ANC among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 53

Table A2. By SES Quintile: Received at least four ANC among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 54

Table A3. By SES Quintile: At least one ANC from medically trained provider among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 55

Table A4. By SES Quintile: Received all five components of ANC at least once among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 56

Table A5. By SES Quintile: Quality ANC4 among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 57

Table A6. By SES Quintile: Received first ANC within first trimester among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 58

Table A7. By SES Quintile: Delivery at any health facility among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 59

Table A8. By SES Quintile: Delivery at public facility among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 60

Table A9. By SES Quintile: Delivery at union level public facility among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 61

Table A10. By SES Quintile: Delivery by skilled birth attendant among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 62

Table A11. By SES Quintile: Misoprostol use at home delivery among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates..... 63

Table A12. By SES Quintile: Breastfeeding within first hour of birth among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 64

Table A13. By SES Quintile: Baby received PNC within 2 days after delivery from medically trained provider among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 65

Table A14. By SES Quintile: PPFP adoption within first year of birth among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates 66

Abbreviations

ANC	antenatal care
BDHS	Bangladesh Demographic and Health Survey
DC	data collector
DDID	Difference-in-DID
DGFP	Directorate General of Family Planning
DGHS	Directorate General of Health Services
DID	Difference-in-Differences
EGH	Engender Health
ERC	Ethics Review Committee
FP	family planning
FRA	Field Research Assistant
FRM	Field Research Manager
FRO	Field Research Officer
FWA	Family Welfare Assistant
FWV	Family Welfare Visitor
HIA	high intensity areas
IRB	Institutional Review Board
IUD	intrauterine device
KPI	key performance indicator
LIA	low intensity areas
LPM	linear probability models
MaMoni MNCSP	MaMoni Maternal and Newborn Care Strengthening Project
MCHD	Maternal and Child Health Division
MCWC	Mother and Child Welfare Centre
MMR	maternal mortality ratio
MNC	maternal and newborn care

MNH	maternal and newborn health
MNCH	maternal, neonatal and child health
MTP	medically trained provider
MOH&FW	Ministry of Health and Family Welfare
NIPORT	National Institute of Population Research and Training
NMR	neonatal mortality ratio
PNC	postnatal care
PPFP	postpartum family planning
QI	quality improvement
RDW	recently delivered woman
SBA	skilled birth attendant
UHC	Upazila Health Complex
UHFWC	Union Health and Family Welfare Center
USAID	United States Agency for International Development
WHO	World Health Organization

Executive Summary

The goal of the United States Agency for International Development's (USAID) Maternal and Newborn Care Strengthening Project (MaMoni MNCSP) (2018–2023) was to improve public sector maternal and newborn care (MNC) services by developing and scaling up successful MNC initiatives and improving learning. The project's goal was to increase, fairly and consistently, use of high-quality MNC services to address the major health system concerns at the national, district, and sub-district levels. The initial geographic scope of the MaMoni MNCSP was to provide direct implementation support to target districts (10 during the baseline and 17 during the endline), where MNC methods and interventions would be institutionalized, scaled up, and eventually sustained through Ministry of Health and Family Welfare (MOH&FW) systems. District selection was guided by factors such as existing maternal and neonatal mortality rates, the extent of intervention coverage, and the potential for synergizing efforts between USAID Bangladesh (BD) and the MOH&FW.

The strategic objective of MaMoni was to increase equitable utilization of quality MNC services through four intermediate results:

1. Improved responsiveness of district health systems to deliver patient centered MNC services.
2. Improved quality of MNC services and governance of quality of care.
3. Sustained improvement in access and demand for MNC services and household practices.
4. Improved national capacity to deliver quality MNC services at scale.

Objective of the Impact Analysis

The objective of this impact analysis was threefold:

1. Determine the impact of MaMoni MNCSP on key maternal and newborn health (MNH) performance indicators in the original 10 intervention districts.
2. Evaluate the differential impact of the MaMoni MNCSP on the utilization of MNC services between the poorest and richest socioeconomic groups within the project areas.
3. Examine the increase in utilization of delivery services in union level public healthcare facilities situated within the project areas, utilizing data extracted from the Health Management Information System (HMIS).

Methodology

A baseline (March 13 to September 13, 2019) and an endline household survey (December 26, 2022, to March 23, 2023) in 10 intervention (six high intensity districts – receiving all intervention packages; and four low intensity areas – receiving selected intervention packages) and four comparison districts gathered data on the adoption of critical MNC practices, accessibility to MNH services, and the socio-demographic profiles of women. Both baseline and endline surveys were conducted by icddr,b. The baseline sample

consists of 13,618 and 3,541 women in intervention and comparison areas, respectively; and the corresponding endline sample was 7,510 and 2,646 women in intervention and comparison areas. This analysis gathered data from icddr,b through USAID/BD and employed the Difference-in-Differences (DID) methodology, to compare changes in 14 selected indicators (Table A) over time between MaMoni MNCSP intervention and non-intervention areas. This analytical model facilitated the evaluation of causal effects attributable to USAID's MaMoni MNCSP, ensuring a robust assessment of its impact on MNC outcomes. The analysis is also done separately for the low intensity and high intensity districts.

Findings

Table A shows a summary of the program impact across outcomes. Significant program impact was observed among 10 indicators out of 14 that were considered in the analysis. However, as expected, the impact was more common (in terms of number of indicators) in the high-intensity districts than in low-intensity districts. The impact measured by three indicators, "received any ANC", "At least one ANC from a medically trained provider" and "Misoprostol use at home delivery" was not significant in either group of districts. The impact measured by three indicators, "Received at least four ANC", "Delivery at union level public facility", and "Breastfeeding within first hour of birth" was significant in both groups of districts—high and low-intensity. The impact on PPFP was only significant in the low-intensity districts but this finding should be interpreted cautiously as it was only marginally significant and overall, the MaMoni project did not impact the outcome for all intervention districts combined.

The impact of the program was higher among the lowest wealth quintile group than among the highest quintile group for the indicators "Delivery at union level public facility" and "Breastfeeding within first hour of birth." The impact was higher for the wealthiest in the low-intensity districts for the indicators "Received first ANC within first trimester", and "Baby received PNC within 2 days after delivery from a medically trained provider".

Table A. Summary findings

Indicators	Had significant impact		Higher impact among poorest vs wealthiest	
	High intensity districts	Low intensity districts	High intensity districts	Low intensity districts
Received any ANC	-	-	-	-
Received at least four ANC	Yes	Yes	-	-
At least one ANC from medically trained provider	-	-	-	-
Received all five components of ANC at least once	Yes	-	-	-
Quality ANC	Yes	-	-	-
Received first ANC within first trimester	Yes	-	-	Wealthiest
Delivery at any health facility	Yes	-	-	-
Delivery at public facility	Yes	-	-	-
Delivery at union level public facility	Yes	Yes	-	Poorest

Indicators	Had significant impact		Higher impact among poorest vs wealthiest	
	High intensity districts	Low intensity districts	High intensity districts	Low intensity districts
Delivery by skilled birth attendant	Yes	-	-	-
Misoprostol use at home delivery	-	-	-	-
Breastfeeding within first hour of birth	Yes	Yes	Poorest	-
Baby received PNC within 2 days after delivery from medically trained provider	Yes	-	-	Wealthiest
PPFP adoption within first year of birth	-	Yes	-	-

Recommendations

The following recommendations relate to scaling up elements of the MaMoni Intervention package based on the impacts identified:

- Train providers by covering a wide range of clinical topics, focusing on the most recent protocols, evidence-based treatments, and quality improvement (QI) bundles. In addition, regular on-the-job refresher training coupled with on-site clinical mentorship should be instituted.
- Establish a robust monitoring system to track the availability of essential medicines and essential tests at upazila health complexes (UHCs) and rapid test kits at union level facilities.
- Continue to revitalize the laboratory infrastructure where needed and keep in place all necessary equipment in facilities.
- Continue revitalizing UHFWCs by leveraging existing resources, mobilizing local support, and providing necessary inputs to meet facility requirements. Engage local governments to identify and address any gaps or challenges faced by the facilities. Institute regular committee meetings at UHFWCs with local governments.
- Assess facility performance through data review and present them in relevant administrative level meetings— district, upazila, and union— and identify issues and find solutions. These meetings provide an invaluable opportunity to refine and fine tune strategies which will help yield optimal improvement results.
- Orient and train supervisors on supportive supervision along with creating a routine and systematic feedback mechanism. Instituting this will increase provider skills and efficiency and thus improve the standard of services.

The following recommendations relate to addressing areas where impacts were not found.

- Further synthesis and analysis of existing data or formative qualitative data collection targeted specifically at better understanding barriers to use of MNCH services among the poorest families and then closely link interventions to those barriers in a clear theory of change to identify

innovative ways to address these gaps. There may be additional social and economic barriers than those identified and addressed by the MaMoni project interventions. These barriers may go beyond what a service-delivery oriented project typically addresses.

- Review and strengthen interventions related to use of misoprostol in home deliveries to prevent post-partum hemorrhage.

  Review and strengthen interventions to support post-partum family planning. Examples of interventions that could be considered include strengthening PPFP counseling during antenatal and postnatal care, as well as expanding community-based awareness campaigns. Additionally, efforts should be directed towards assessing and enhancing PPFP services in both private and public facilities, considering that most deliveries occur in the private sector.

Background

The State of Maternal and Newborn Health: Global Scenario

Around 300,000 women die each year from pregnancy or childbirth-related issues around the world, with nearly all these deaths being recorded in low-resource settings like Bangladesh, and most of these deaths are preventable (Alkema et al., 2016), (WHO, 2016a). Proper maternal care during pregnancy, labor, and the postnatal period is critical for averting these deaths. Investing in maternal and newborn care protects not only individual health but also ensures community resilience by creating a healthier future generation. Currently, the global landscape of maternal and newborn care shows a mixed picture. While there has been progress in certain areas, disparities persist. In terms of Antenatal Care (ANC), more women (88%) around the world receive at least one ANC visit, but only 66% receive the minimum of four visits recommended under the WHO focus ANC model (WHO, 2016b). Ensuring the protection of newborn babies is also a matter of global concern. Initiating breastfeeding within the first hour of birth is a life saving measure for newborns as infants who started breastfeeding between two and 23 hours after birth had a 33% higher risk of neonatal death than infants who started breastfeeding within the first hour of life (Smith et al., 2017). Furthermore, postnatal care within the first two days of birth is imperative for early detection and intervention in case of any neonatal health concerns. Postpartum family planning (PPFP) is another important MNC service which focuses on providing family planning (FP) counselling and services to women and couples in the first 12 months after birth. Effective PPFP programs help to improve maternal and child health through the reduction of short birth intervals. If couples spaced their pregnancies more than two years apart, it was predicted that 30% of maternal fatalities and 10% of infant mortality in the developing countries would be avoided (Cleland et al., 2012).

The State of Maternal and Newborn Health: Bangladesh Scenario

From the Bangladesh Demographic and Health Survey 2022, it was shown that 40.5%of women had all four ANC visits from any provider. In Bangladesh, 64.8% of newborns were delivered at a health institution. A skilled professional assisted with 69.8% of deliveries (NIPORT and ICF, 2023).

Another survey conducted with 3,162 mothers who reported giving birth within two years shows that 51% of them initiated breastfeeding within one hour of birth. Breastfeeding initiation within one hour of birth was much lower among the women who had C-sections (29%) than those who had normal deliveries (60%). Breastfeeding initiation within one hour of birth was also much lower among those who delivered at a health facility compared to those who gave birth at home (39% versus 59%, respectively) (Karim et al., 2019). Although over 90%of Bangladeshi mothers continue breastfeeding their infants up to 20-23 months of life, initiation in the first hour of life, which is associated with neonatal survival, is only at 47% (Government of the People's Republic of Bangladesh Ministry of Health and Family Welfare, n.d.)

According to the Maternal and Newborn Health (MNH) Service Accreditation Program in Bangladesh, if a birth is in a health facility, mothers and newborns should receive postnatal care in the facility within 24

hours after birth. If the birth is at home, the first postnatal contact should be as early as possible and within 24 hours of birth. But, according to the Bangladesh Demographic and Health Survey (BDHS) 2017-2018, 47.3% of newborns in rural areas received postnatal care (PNC) within 2 days after birth compared to 65.6% of newborns in urban areas (NIPORT and ICF, 2020).

According to the BDHS 2017-2018, 11% of second and higher order births were born after an interval of less than 24 months; these births are at higher risk of infant death (NIPORT and ICF, 2020). In 2002, the government of Bangladesh started a small number of PPFP interventions, beginning with the promotion of tubectomy in a few facilities. Despite the initial promise, scaling up was difficult because of logistical problems and competing priorities. Immediate postpartum intrauterine device (IUD) services were launched in 2008 because of a coordinated effort by Directorate General of Health Services (DGHS), Directorate General of Family Planning (DGFP), Engender Health (EGH), and USAID. The need to strengthen PPFP services nationally is evident in the problems that still exist, including low client awareness, insufficient provider training, and a lack of method choice in important facilities (Rahman & Barkataki, 2020).

WHO Recommendations for Maternal and Newborn Health

The World Health Organization (WHO) envisions that “every pregnant woman and newborn infant receives good quality care throughout pregnancy, childbirth and the postnatal period” (Tunçalp et.al, 2015). According to new guidance, pregnant women need to have their first contact in the first 12 weeks’ gestation, with subsequent contacts taking place at gestation week 20, 26, 30, 34, 36, 38, and 40. The term "contact" is used in the recommendation because it suggests an active relationship between a pregnant woman and the “service provider”, that is not necessarily implied by the word "visit" (WHO, 2016a). The term “service provider” entails the presence of a medically trained provider (MTP) or skilled birth attendant (SBA), such as a trained midwife, doctor, or nurse, who is proficient in managing routine pregnancies, childbirth, and the immediate postnatal period, as per WHO guideline. The WHO also suggests that the service providers are capable of identifying and handling complications, with a primary focus on the wellbeing of both mothers and newborns (WHO, 2016a). Traditional birth attendants, whether trained or not, do not fall under the category of "skilled attendants at delivery" (*Births Attended by Skilled Health Personnel*, n.d.). Where women give birth outside of a health facility and in the absence of skilled health personnel, a strategy of antenatal distribution of Misoprostol to pregnant women for self-administration is also recommended by the WHO for prevention of postpartum hemorrhage, only with targeted monitoring and evaluation (WHO, 2006). For an ideal start to life, the WHO recommends that children initiate breastfeeding within the first hour of birth and be exclusively breastfed for the first six months of life (WHO, 2022). Providing postnatal care in the first 24 hours to all mothers and babies, regardless of where the birth occurs, is also strongly recommended by the WHO (WHO, 2022). WHO also advises the provision of PPFP counseling and related services during any contact with women giving birth in facilities or at home throughout the delivery period, 48 hours after delivery, and six weeks after delivery by skilled birth attendants (SBA) for the health of both the newborn and mother (WHO, 2013).

USAID's MaMoni MNCSP in Bangladesh

USAID's MaMoni MNCSP (2018–2023) envisioned to improve public sector maternal and newborn care (MNC) services by developing and scaling up successful MNC initiatives. The project worked to increase fair and consistent use of high-quality MNC services to address the major health system concerns at the national, district, and sub-district levels. The initial geographic scope of the MaMoni MNCSP was to provide direct implementation support to target districts (10 during the baseline and 17 during the endline), where MNC methods and interventions would be institutionalized, scaled up, and eventually sustained through Ministry of Health and Family Welfare (MOH&FW) systems. The selection of districts was guided by factors like existing MMR and NMR, the extent of intervention coverage, and the potential for synergizing efforts between USAID/BD and the MOH&FW.

The strategic objective of MaMoni was to increase equitable utilization of quality MNC services through four intermediate results:

1. Improved responsiveness of district health systems to deliver patient centered MNC services.
2. Improved quality of MNC services and governance of quality of care.
3. Sustained improvement in access and demand for MNC services and household practices.
4. Improved national capacity to deliver quality MNC services at scale.

Objective of the Impact Analysis

After completion of the project, based on USAID/BD's request, D4I conducted an impact analysis of selected indicators using baseline and endline data collected by icddr,b. The objectives of this impact analysis are threefold:

1. Determine the impact of MaMoni MNCSP on key maternal and newborn health (MNH) performance indicators in the original 10 intervention districts.
2. Evaluate the differential impact of the MaMoni MNCSP on the utilization of MNC services between the poorest and richest socioeconomic groups within the project areas.
3. Examine the increase in utilization of delivery services in union level public healthcare facilities situated within the project areas, utilizing data extracted from the Health Management Information System (HMIS).

Selected Indicators of the Impact Analysis

A total of 14 indicators were selected for this impact analysis. Table 1 presents the definition of these indicators.

Table 1. Definition of the indicators

Indicator	Definition
Received any ANC	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **received ANC from any provider or any place** for the most recent live birth

Indicator	Definition
Received at least four ANC	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **received at least four ANC from any provider or any place** for the most recent live birth
At least one ANC from medically trained provider	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **received at least four ANC from any provider or any place** for the most recent live birth
Received all five components of ANC at least once	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **received all five components of ANC** for the most recent live birth. Five components of ANC include measurement of weight and blood pressure, urine and blood testing, and being informed of signs of possible complications
Quality ANC	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **received at least four ANC visits from any place, of which at least one from medically trained provider and received all five components of ANC** for the most recent live birth
Received first ANC within first trimester	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **received first ANC from any provider or any place within first trimester** for the most recent live birth
Delivery at any health facility	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **had delivery at any health facility by any provider** for the most recent live birth
Delivery at public facility	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **had delivery at public facility by any provider** for the most recent live birth
Delivery at union level public facility	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **had delivery at union level public facility by any provider** for the most recent live birth
Delivery by skilled birth attendant	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **had delivery at any health facility or home by a medically trained provider** for the most recent live birth
Misoprostol use at home delivery	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **used misoprostol during delivery at home** for the most recent live birth
Breastfeeding within first hour of birth	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **initiated breastfeeding within first hour of birth** for the most recent live birth
Baby received PNC within two days after delivery from medically trained provider	Percentage of children born in the last 15 months preceding the survey **received PNC from medically trained provider within two days of birth**
PPFP adoption within first year of birth	Percentage of married women aged 15 to 49 who had a live birth in the last 15 months preceding the survey **initiated postpartum family planning within first year of birth** for the most recent live birth

Methods

The impact analysis used the baseline and endline survey data collected by icddr,b as part of Mamoni's own M&E. The details of the study design can be found in the report "Household Survey Final Summary Report 2023" (icddr,b 2023).

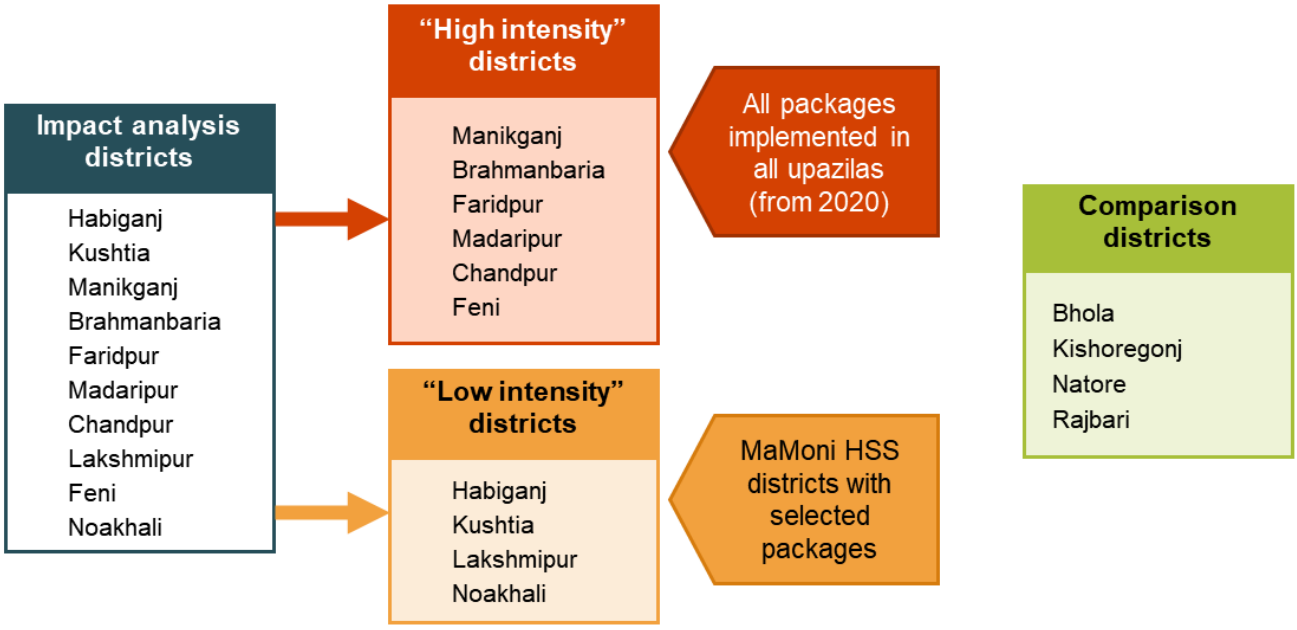
Study Design

The research employed a cross-sectional baseline survey (March 13 to September 13, 2019) and an endline household survey (December 26, 2022, to March 23, 2023) to assess the coverage of specific Maternal and Newborn Care (MNC) indicators across MaMoni MNCSP's 10 intervention and four comparison districts. The household survey gathered data on the adoption of critical MNC practices, accessibility to Maternal and Newborn Health (MNH) services, and the socio-demographic profiles of women. Employing a quasi-experimental approach, particularly the Difference-in-Differences (DID) methodology, the study compared changes in selected indicators over time between MaMoni MNCSP intervention and non-intervention areas. This analytical model facilitated the evaluation of causal effects attributable to the USAID's MaMoni Maternal and Newborn Care Strengthening Project, ensuring a robust assessment of its impact on maternal and newborn care outcomes.

Study Sites

The baseline and endline studies were conducted in the original 10 MaMoni MNCSP intervention districts (Brahmanbaria, Chandpur, Lakshmipur, Feni, Noakhali, Faridpur, Manikganj, Madaripur, Kushtia, and Habiganj) and in four comparison districts (Kishoreganj, Natore, Rajbari, and Bhola). The comparison districts were selected by matching their background characteristics scores, generated by principal component analysis (PCA), to ensure they were closely comparable to the intervention districts (icddr,b, 2020). This comprehensive geographic spread allows for a representative understanding of the intervention's impact across various contexts. For the impact analysis we divided the study sites in the following way:

Figure 1. Study sites



Study Population

The study targets recently delivered women (RDW), defined as those who have had a pregnancy outcome (live birth or stillbirth) within the preceding 15 months before the survey. Additionally, icddr,b also collected data from an extensive population including mothers, newborns, their family members, government health service providers, supervisors, managers, community-level structures, local government institutions, and stakeholders from the private sector, but these data are not used in this study. This comprehensive approach enables an in-depth evaluation of USAID's MaMoni Maternal and Newborn Care Strengthening Project, considering the multifaceted network of individuals and entities involved in the provision of maternal and newborn healthcare services. This approach ensures a holistic understanding of the project's impact on the entire spectrum of stakeholders within the healthcare sector.

Sample Size

The sample size for this study was calculated through a power analysis aimed at detecting significant changes in selected indicators. The stratification was based on intensity levels, distinguishing between high and low intensity areas, and encompassed both intervention and comparison districts. This study includes married women of age 15 to 49 years who had a live birth in the last 15 months preceding the baseline and endline survey. The detailed sampling strategy is presented in the "Household Survey Final Summary Report 2023" (icddr,b 2023).

Baseline

Initially, the sample size was determined to discern the smallest meaningful difference between intervention and comparison districts. This led to an initial total sample size of 17,236 RDWs, with 13,695 participants in intervention districts and 3,541 in comparison districts. However, for analytical purposes, only RDWs who had a live birth were considered. Consequently, 77 cases were excluded, resulting in a final sample size of 13,618 participants for the MaMoni intervention area at baseline.

Endline

In the endline assessment, the total sample size amounted to 10,156 participants, comprising 7,510 individuals from intervention districts and 2,646 from comparison districts. The study followed a rigorous sampling methodology to ensure accurate representation and meaningful analysis of the targeted population.

Table 2. Sample size according to area

Area	Survey	Sample
MaMoni	Baseline	13,618
	Endline	7,510
Comparison	Baseline	3,541
	Endline	2,646

Enrollment

Participants were identified through an extensive survey process that involved mapping villages, listing households, and interviewing RDWs. Eligible couple registers, maintained by Family Welfare Assistants (FWAs), were employed to randomly select the first household (index household) within a cluster. In instances where villages had multiple clusters, the eligible couple register was divided accordingly, and index households were randomly selected from each section. In areas lacking FWAs, existing health service delivery points were identified for selection. Training sessions for both baseline and endline surveys included comprehensive lectures on questionnaire completion and mock interviews, followed by field practice.

Data Collection Method

For the baseline survey districts were categorized into five zones based on geographical distribution, each supervised by field research officers (FROs) and a field research manager (FRM). Survey teams, led by FROs, consisted of field research assistants (FRAs) and data collectors (DCs) utilizing tablet-based data collection. Baseline data was collected between March 13 and September 30, 2019. The endline survey involved a team of two FROs, six FRAs, and 56 field assistants for household listing and RDW interviews, along with 3%-5% re-interviews for quality assurance. Data collection for the endline survey spanned three months (December 26, 2022, to March 23, 2023) and was facilitated through custom data collection apps on Android-based tablets. The Maternal and Child Health Division's (MCHD) data management system, designed and maintained by icddr,b, played a pivotal role in capturing and transmitting the data. Both surveys utilized a structured questionnaire encompassing household listing, socioeconomic information,

and RDW-specific sections, with the questionnaire initially developed in English and subsequently translated into Bangla.

Difference between Baseline and Endline Questionnaire

There were changes between baseline and endline questionnaires which included omitting the birth history module in the endline survey, as neonatal mortality assessment was no longer the primary objective. Instead, a module on the number of births in the last three years was added. Additionally, another question was added to inquire if any women in the family chose a health facility for delivery and the reasons for not selecting a public one. In the ANC section, new questions assessed if participants received recommendations for healthcare services at a health facility for their delivery. The delivery care section included questions for participants who used home or private facilities, asking if they would recommend a public health facility. More details on cesarean sections were also gathered. The experience of the care section incorporated questions on satisfaction levels and recommendations for the facility. These changes aimed to enhance the relevance and depth of data collected in the endline questionnaire.

Data Analysis

First, all variables' frequency distributions were prepared in order to clean and inspect the data for missing values and out of range errors. After the data was cleaned, it was inspected and re-coded as needed for the analysis. Following DHS methodology, we used principal Components Analysis to construct the household asset scores. We limited our research to RDWs that gave birth to live children. For intervention districts, we performed a comparative descriptive analysis of the MNC indicators at the baseline and endline. A few indicators were broken down at the facility level in accordance with the specifications. To measure the impact at the project level, we also performed difference in difference (DID) analysis on all coverage-level KPIs. Stata 15 was used throughout the entire analysis.

Analyses under Objective One

We examined the impact of MaMoni on utilization of MNC services using a difference-in-difference (DID) framework. For DID estimation, we constructed a set of linear probability models (LPMs) that controlled for women's characteristics (age at birth, education, religion, parity), household's socioeconomic status in asset quintiles, and fixed effects at the district level. Robust standard errors were obtained by clustering at the sampling cluster level and are shown in parentheses in tables in the appendices. Statistical significance is shown with the following notation: * 10% significance, ** 5% significance, *** 1% significance. The analysis under objective one was done in following steps:

First step: The change in utilization of MNC services over the study period was examined separately for program areas and comparison areas using the linear probability model:

Model: $Y_{it} = B_0 + B_1 T_t + e_{it}$

where, Y_{it} is the probability that individual "i" has experienced the outcome of interest at time "t" for each outcome indicator

$T_t = 1$, if observation is from endline; 0, if from baseline

Second step: Overall impact of MaMoni on utilization of MNC services was examined using the following DID model:

Model: $Y_{itp} = B_0 + B_1T_t + B_2P_p + B_3(P_p*T_t) + B_4X_{itp} + e_{itp}$

Where,

Y_{itp} is the probability that individual "i" from area "p" has experienced the outcome of interest at time "t" for each outcome indicator

P_p = 1, if observation is in MaMoni areas; 0, if in comparison areas

T_t = 1, if observation is from endline; 0, if from baseline

B_3 is the impact size, $B_3 > 0$, positive impact; $B_3 < 0$, negative impact

X represents the control variables

Third step: Impacts of MaMoni on utilization of MNC services in high and low intensity program areas were examined using the following DID model:

Model: $Y_{itp} = B_0 + B_1T_t + B_2P_1 + B_3P_2 + B_4(P_1*T_t) + B_5(P_2*T_t) + B_6X_{itp} + e_{itp}$

Where,

Y_{itp} is the probability that individual "i" from area "p" has experienced the outcome of interest at time "t" for each outcome indicator

P_1 = 1, if observation is in MaMoni areas with low intensity program; 0, if in other areas

P_2 = 1, if observation is in MaMoni areas with high intensity program; 0, if in other areas

T_t = 1, if observation is from endline; 0, if from baseline

B_4 and B_5 are the impact size in low and high intensity area, respectively.

$B_4, B_5 > 0$, positive impact; $B_4, B_5 < 0$, negative impact

X represents the control variables

Analyses under Objective Two

We used the difference-in-difference-in differences (DDID) framework (the extended version of DID with triple interaction) to investigate whether the MaMoni program reduces the rich-poor gap in MNC services utilization. We used the same list of control variables while employing the LPM. We first estimated the impact of MaMoni for each wealth quintile group. Then we estimated the difference in the impact of MaMoni between the highest and lowest wealth quintile groups (rich-poor impact gap) and tested whether this difference is statistically significant. Indicators for which this difference is not statistically significant are interpreted as the MaMoni program does not help reduce the rich-poor gap in that indicator. The

indicators for which the impact of MaMoni is significantly higher in the lowest quintile in comparison to the highest wealth quintile (negative rich-poor impact gap) are generally interpreted as that the MaMoni program helps reduce the rich-poor gap in that indicator (assuming that the rich have better outcomes than the poor on the outcome indicator and the Mamoni program has a positive impact on the outcome indicator).

The following DDID model was used to serve objective 2:

Model: $Y_{itpq} = B_0 + B_1T_t + B_2P_p + B_3Q_2 + B_4Q_3 + B_5Q_4 + B_6Q_5 +$

$B_7 P_p*Q_2 + B_8 P_p*Q_3 + B_9 P_p*Q_4 + B_{10} P_p*Q_5 +$

$B_{11} T_t*Q_2 + B_{12} T_t*Q_3 + B_{13} T_t*Q_4 + B_{14} T_t*Q_5 +$

$B_{15}(P_p*T_t) +$

$B_{16}(P_p*T_t*Q_2) + B_{17}(P_p*T_t*Q_3) + B_{18}(P_p*T_t*Q_4) + B_{19}(P_p*T_t*Q_5) +$

$B_{20}X_{itpq} + e_{itpq}$

Where,

Y_{itpq} is the probability that individual "i" from area "p" and wealth quintile "q" has experienced the outcome of interest at time t for each outcome indicator

P_p = 1, if observation is in MaMoni areas; 0, if in comparison areas

T_t = 1, if observation is from endline; 0, if from baseline

Impact size for 1st quintile: B_{15}

Impact size for 2nd quintile: $B_{15} + B_{16}$

Impact size for 3rd quintile: $B_{15} + B_{17}$

Impact size for the 4th quintile: $B_{15} + B_{18}$

Impact size for 5th quintile: $B_{15} + B_{19}$

Impact on 5th quintile over 1st quintile B_{19}

$B_{19} > 0$, denotes that impact is higher among rich than among poor: Rich-poor gap increased

$B_{19} < 0$, impact is higher among poor than among rich: Rich-poor gap reduced

$B_{19} = 0$, impact is not unequal between rich and poor: Rich-poor gap remain unchanged

X represents the control variables

Ethical Considerations

The icddr,b and Save the Children received ethical approval from the ERC (Ethics Review Committee) of the IRB (Institutional Review Board) of icddr,b for the original data collection under the MaMoni project. Participant privacy was protected by adhering to the ethical standards approved by the ERC. Since this analysis used previously collected data with no identifiers and did not involve primary data collection, it was exempt from further ethical review.

Limitations

The impact analysis took place with previously collected data and focused only on selected indicators, limiting the impact analysis team's ability to explore reasons behind the impact results. Impact analysis is suited to determining the quantitative impacts of a project on specific outcomes but, it does not provide information on which specific components of a complex package of interventions were or were not effective or why the interventions were or were not effective. This limitation was mitigated by a series of meetings with MaMoni MNCSP team members and USAID/BD AOR. The impact analysis team also reviewed all relevant documents provided by MaMoni MNCSP and USAID/BD. However, evidence for specific operational recommendations from this type of analysis is limited.

The MaMoni project was implemented during the period of the COVID-19 pandemic. Baseline data collection was conducted in 2019 before the start of the pandemic and endline data collection occurred in 2022/23. However, the COVID-19 pandemic impacts both intervention and comparison areas so should be controlled for by the analysis assuming COVID impacts were similar in the two areas. If MaMoni helps intervention areas cope with Covid better that would be a program effect that would be captured by this analysis.

Results

Respondents Characteristics

Table 3 presents the comparability between the intervention and comparison group in terms of age, educational level, religious affiliation, parity, household wealth quintiles, and districts at baseline and at endline. Irrespective of enrollment, these sociodemographic characteristics of the women were similar in both the MaMoni and comparison areas during the baseline and endline surveys.

Table 3. Sociodemographic characteristics of interviewed women

Control Variables	MaMoni Intervention Area		Comparison Area		Overall
	Baseline	Endline	Baseline	Endline	
Age at Birth					
13-19	22.1	22.3	24.3	24.8	22.7
20-24	32.5	34.5	32	32.6	33
25-29	24	24	22.1	22.3	23.6
30-34	15.6	14.1	14.9	14.7	15
35-49	5.8	5.1	6.7	5.6	5.7
Education					
No education	7.2	3.9	8.1	4.9	6.2
Primary incomplete	11.5	10.5	16.6	14.1	12.1
Primary complete	14.8	10.3	17.2	11	13.5
Secondary incomplete	45.4	45.6	37.6	41.4	44
Secondary complete or above	21.2	29.7	20.4	28.6	24.2
Religious Affiliation					
Islam	94.3	94.1	95.3	95.4	94.5
Other	5.7	5.9	4.7	4.6	5.5
Parity					
First	32.2	35.9	32.3	37.8	33.8
Second	31.9	32.4	32.8	32.3	32.2
Third	21.3	20.2	20.8	20	20.8
Fourth or above	14.6	11.5	14	10	13.2
Wealth Quintile					
Q1	17.9	16.5	24.9	25.2	19.2
Q2	18.1	18.6	25.2	22.7	19.6
Q3	20.5	21.3	18.3	17.6	20.2
Q4	21.5	20.9	16.6	20.3	20.6
Q5	21.9	22.8	15	14.2	20.5
District					
Brahmanbaria	13.8	12.8	-	-	10.4
Chandpur	11.9	11.2	-	-	9
Faridpur	9	10.6	-	-	7.4

Control Variables	MaMoni Intervention Area		Comparison Area		Overall
	Baseline	Endline	Baseline	Endline	
Feni	7.3	7.4	-	-	5.7
Habiganj	10.3	9.8	-	-	7.8
Kushtia	10.6	10.9	-	-	8.3
Lakshmipur	9.1	8.8	-	-	7
Madaripur	5.6	6	-	-	4.4
Manikganj	5.8	6.9	-	-	4.8
Noakhali	16.7	15.6	-	-	12.6
Bhola	-	-	29.3	24.8	6.2
Kishoregonj	-	-	40.2	27.8	7.9
Natore	-	-	19.3	24.8	4.9
Rajbari	-	-	11.2	22.6	3.6
Number of Women	*13618*	*7510*	*3541*	*2646*	*27315*

Antenatal Care (ANC)

For ANC program impact, we analyzed the following 6 indicators:

Received Any ANC

In all 10 MaMoni implementing districts, the utilization of any ANC increased from 77% to 90.6%, while in comparison areas, it rose from 74.5% to 88.5% (Figure S1 and Table A2). After including the control variables, the estimated impact of the program (the difference between the change in the intervention area and the change in the comparison area, controlling for background characteristics) was 0.6, which was not statistically significant. The program impact in the lowest quintile was 1.6 and in the highest quintile it was 4.7 so the difference in impact between the richest and poorest quintiles was 3.2 (rich-poor impact gap), which was not statistically significant. Therefore, the MaMoni intervention has no impact on receipt of any ANC and did not increase equity in any ANC use.

The program impact in high-intensity districts was slightly higher than in all intervention districts at 1.6, whereas low-intensity districts saw a slight negative impact (-0.6), but neither estimate was statistically significant (Figure S2 and Table A1). The difference in the impact in the richest and in the poorest quintiles was also not significant in either high intensity areas (1.3) or low intensity areas (3.8).

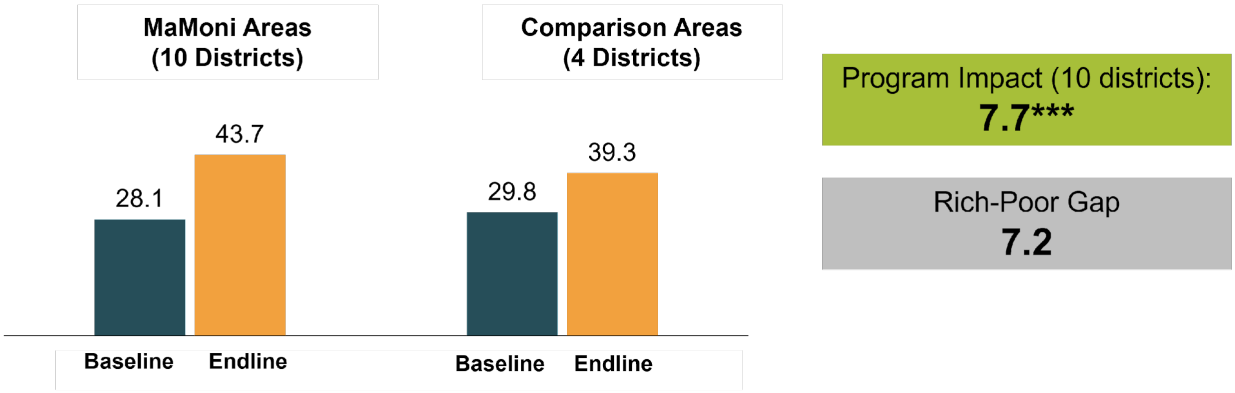
Received at Least Four ANC

In all 10 MaMoni implementing districts, the utilization of at least four ANC increased from 28.1% to 43.7%, while in comparison areas, it rose from 29.8% to 39.9% (Figure 2[1] and Table A). After including the control

[1] In Figures 2-18 (and in Figures S1-S11) program impact and the rich-poor impact gap estimated from the DID and DDID models are shown in boxes. A green box indicates a statistically significant effect in the desired direction, a grey box indicates that the effect is not statistically significant, and a red box indicators that the effect is statistically significant but not in the desired direction.

variables, the estimated impact of the program was 7.7, which was statistically significant. The program impact in the lowest quintile was 1.9 and in the highest quintile it was 9.1 so the difference in impact between the richest and poorest quintiles was 7.2 (rich-poor impact gap), which was not statistically significant. Therefore, the MaMoni intervention has impact on receipt of at least four ANC but did not increase equity in at least four ANC use.

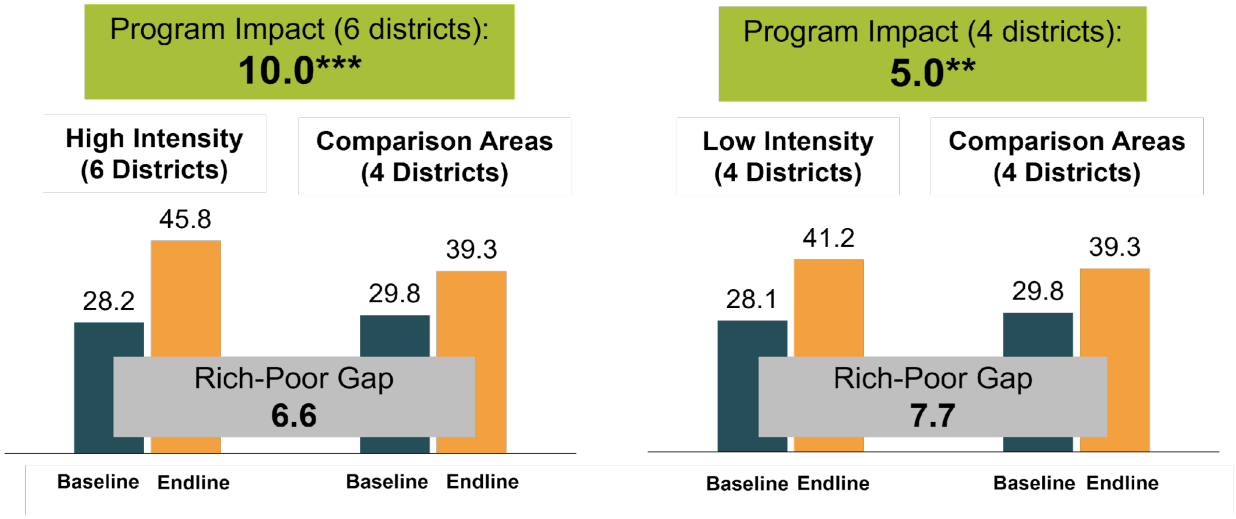
Figure 2. Difference in receiving at least four ANC among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01.

The program impact in high-intensity districts was higher than in all intervention districts at 10, whereas low-intensity districts saw a lower program impact (5.0), and both estimates were statistically significant (Figure 3 and Table A2). The difference in the impact in the richest and in the poorest quintiles was also not significant in either high intensity areas (6.6) or low intensity areas (7.7).

Figure 3. Difference in receiving at least four ANC among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

Received at Least One ANC from a Medically Trained Provider

In all 10 MaMoni implementing districts, the receipt of at least one ANC from a medically trained provider (MTP) increased from 71.2% to 88.5%, while in comparison areas, it rose from 69.6% to 85.4% (Figure S3 and Table A4). After including the control variables, the estimated impact of the program was 2.4, which was statistically not significant. The program impact in the lowest quintile was 4.8 and in the highest quintile it was 5.2 so the difference in impact between the richest and poorest quintiles was 0.4 (rich-poor impact gap), which was not statistically significant. Therefore, the MaMoni intervention has no impact on receipt of at least one ANC from a MTP and did not increase equity in receiving at least one ANC from MTP.

The program impact in high and low intensity districts was similar to the impact in all intervention districts and neither estimate was statistically significant (Figure S4 and Table A3). The difference in the impact in the richest and in the poorest quintiles was also not significant in either high intensity areas (2.8) or low intensity areas (-1.8).

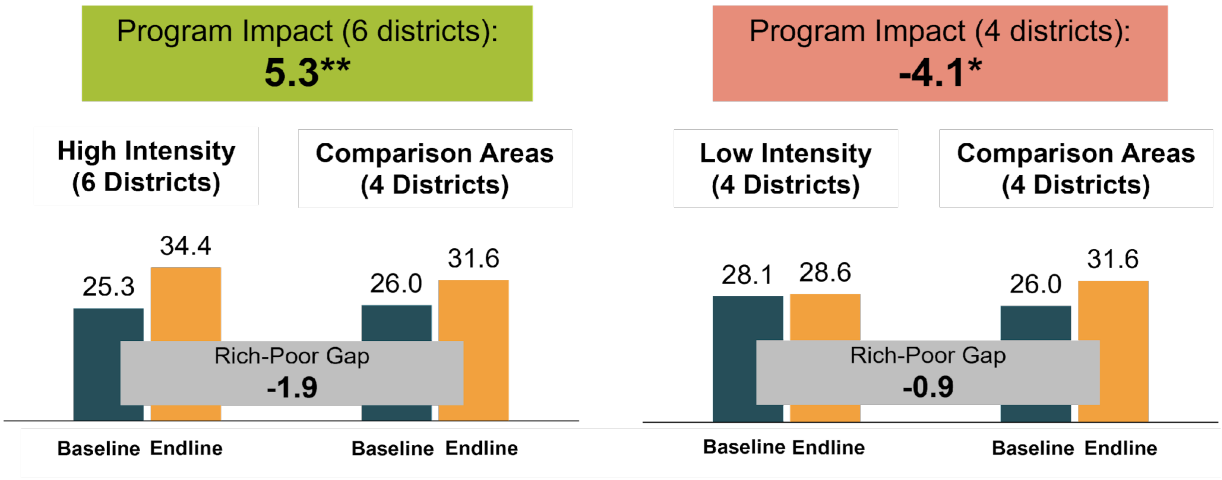
Received all Five Components of ANC at Least Once

In all 10 MaMoni implementing districts, the reception of all five components of ANC at least once increased from 26.6% to 31.8%, while in comparison areas, it rose from 26.0% to 31.6% (Figure S5 and Table A4). After including the control variables, the estimated impact of the program was 1.0, which was statistically not significant. The program impact in the lowest quintile was 3.6 and in the highest quintile it was 3.4 so the difference in impact between the richest and poorest quintiles was -0.2 (rich-poor impact gap), which was not statistically significant. Therefore, the MaMoni intervention has no impact on receipt of all five

components of ANC at least once and did not increase equity in receiving all five components of ANC at least once.

The program impact in high-intensity districts was higher than in all intervention districts at 5.3, whereas low-intensity districts saw a negative program impact (-4.1), and both estimates were statistically significant (Figure 4 and Table A4). However, the difference in the impact in the richest and in the poorest quintiles was not significant in either high intensity areas (-1.9) or low intensity areas (-0.9).

Figure 4. Difference in receiving all five components of ANC at least once among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates

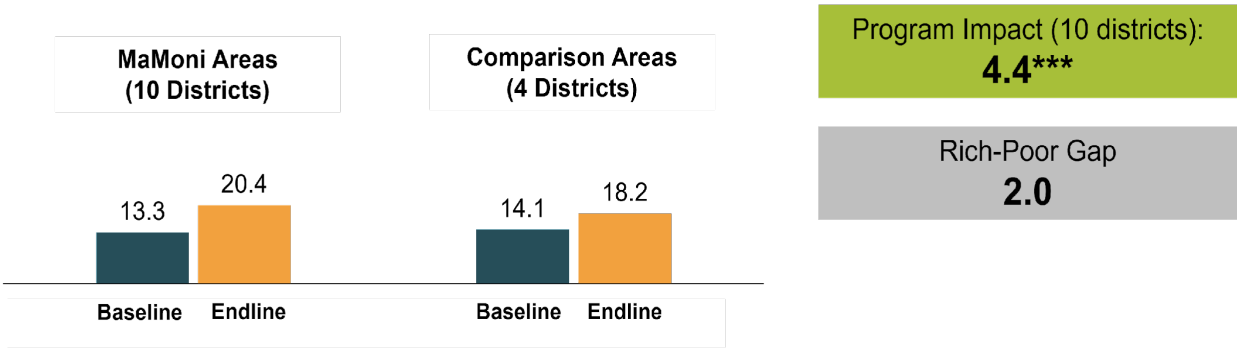


NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

Quality ANC

In all 10 MaMoni implementing districts, the receipt of quality ANC increased from 13.3% to 20.4%, while in comparison areas, it rose from 14.1% to 18.2% (Figure 5 and Table A6). After including the control variables, the estimated impact of the program was 4.4, which was statistically significant. The program impact in the lowest quintile was 3.8 and in the highest quintile it was 5.8 so the difference in impact between the richest and poorest quintiles was 2.0 (rich-poor impact gap), which was statistically not significant. Therefore, the MaMoni intervention has impact on receipt of quality ANC but did not increase equity in receiving quality ANC.

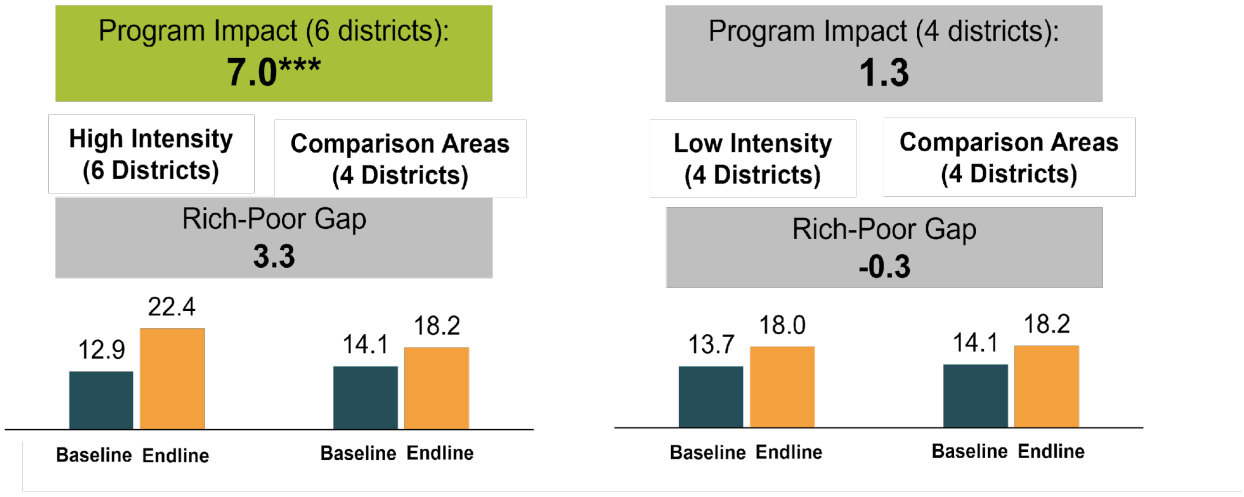
Figure 5. Difference in quality ANC among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

The program impact in high-intensity districts was statistically significant and higher than in all intervention districts at 7.0, whereas low-intensity districts saw a lower insignificant program impact (1.3) (Figure 6 and Table A5). However, the difference in the impact in the richest and in the poorest quintiles was not significant in either high intensity areas (3.3) or low intensity areas (-0.3).

Figure 6. Difference in quality ANC among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates



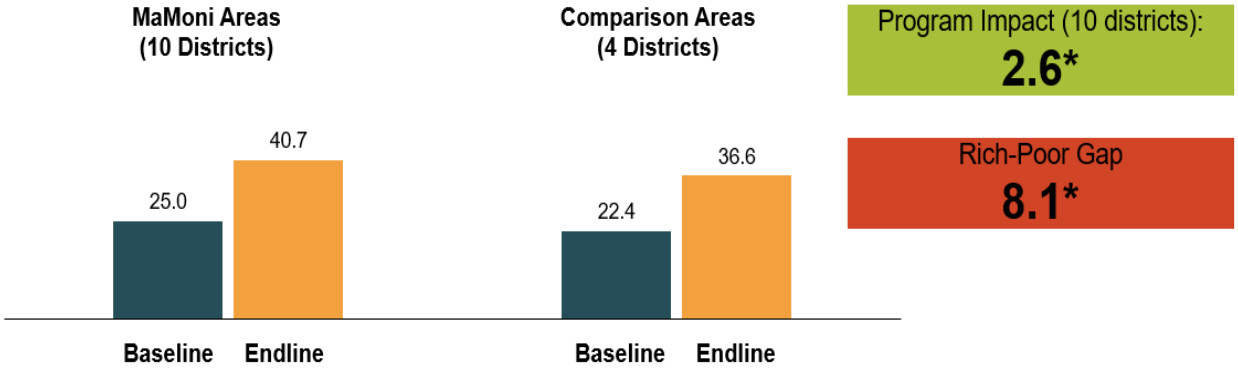
NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

Received First ANC within First Trimester

In all 10 MaMoni implementing districts, the receipt of first ANC within the first trimester increased from 25.0% to 40.7%, while in comparison areas, it rose from 22.4% to 36.6% (Figure 7 and Table A6). After including the control variables, the estimated impact of the program was 2.6, which was marginally

statistically significant (10% level). The program impact in the lowest quintile was -3.3 and in the highest quintile it was 4.8 so the difference in impact between the richest and poorest quintiles was 8.1 (rich-poor impact gap), which was statistically significant but in the direction of higher impact for the richest quintile than for the poorest quintile. Therefore, the MaMoni intervention has impact on receipt of first ANC within the first trimester but significantly decreased equity in receiving first ANC within the first trimester.

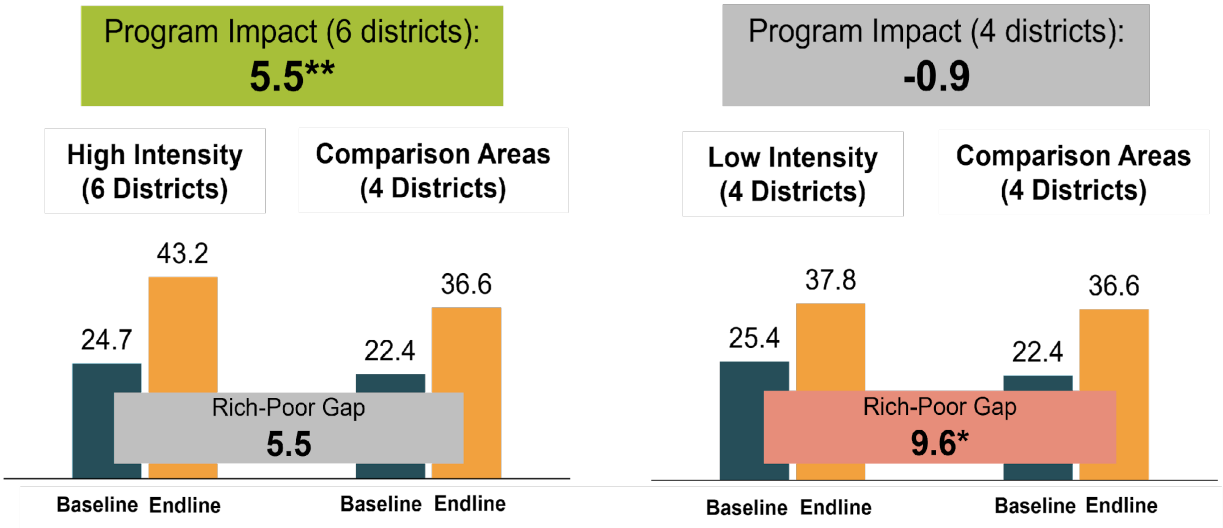
Figure 7. Difference in receiving first ANC within the first trimester among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

The program impact in high-intensity districts was statistically significant and higher than in all intervention districts at 5.5, whereas low-intensity districts saw a lower insignificant negative program impact (-0.9) (Figure 8 and Table A6). The difference in the impact in the richest and in the poorest quintiles was not significant in high intensity areas (5.5) but was significant in low intensity areas (9.6).

Figure 8. Difference in receiving first ANC within first trimester among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

Delivery

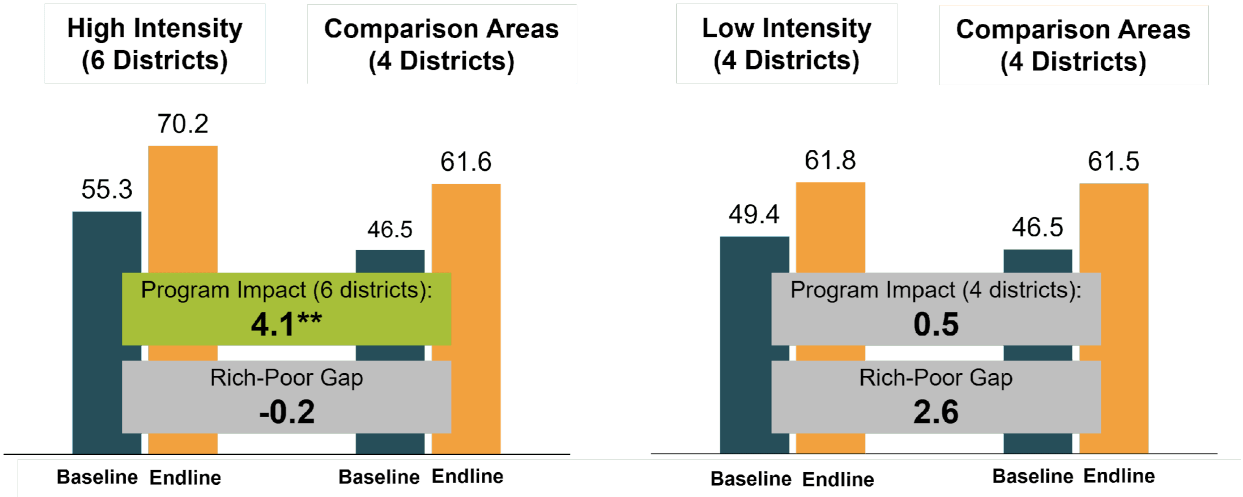
Under this outcome category, the following indicators were investigated.

Delivery in a Health Facility

In all 10 MaMoni implementing districts, delivery in a health facility increased from 52.6% to 66.4%, while in comparison areas, it rose from 46.5% to 61.6% (Figure S6 and Table A7). After including the control variables, the estimated impact of the program was 2.4, which was not statistically significant. The program impact in the lowest quintile was 0.0 and in the highest quintile it was 1.3 so the difference in impact between the richest and poorest quintiles was 1.3 (rich-poor impact gap), which was not statistically significant. Therefore, the MaMoni intervention has no impact on delivery in a health facility and did not increase equity in delivering in a health facility.

The program impact in high-intensity districts was statistically significant and higher than in all intervention districts at 4.1, whereas low-intensity districts saw a lower insignificant positive program impact (0.5) (Figure 9 and Table A7). The difference in the impact in the richest and in the poorest quintiles was not significant in either high intensity areas (-0.2) or low intensity areas (2.6).

Figure 9. Difference in delivery at any health facility among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

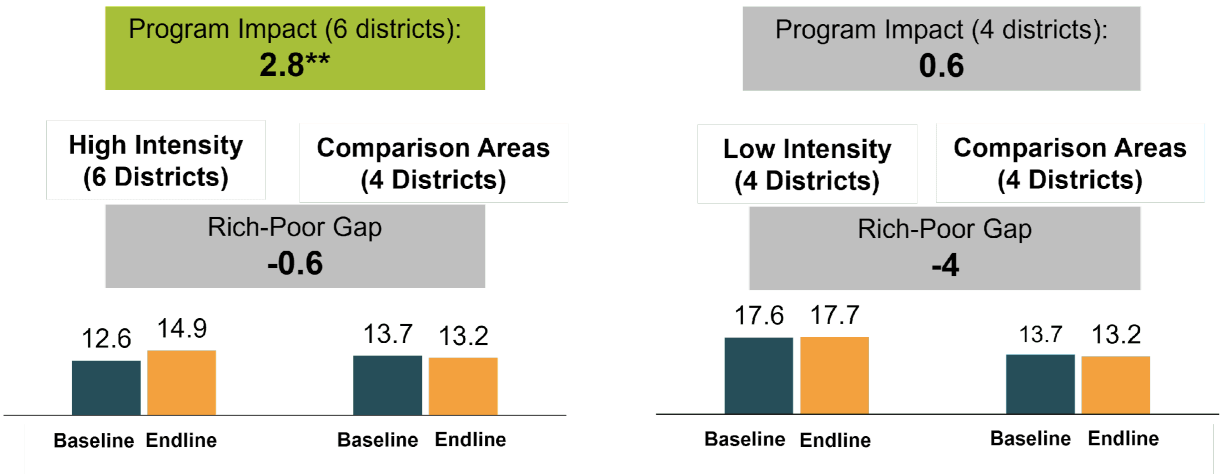
Delivery in a Public Facility

In all 10 MaMoni implementing districts, delivery in a public facility increased from 14.9% to 16.1%, while in comparison areas, it falls from 13.7% to 13.2% (Figure S7 and Table A8). After including the control variables, the estimated impact of the program was 1.8, which was not statistically significant. The program impact in the lowest quintile was 2.1 and in the highest quintile it was 0.0 so the difference in impact between the richest and poorest quintiles was -2.0 (rich-poor impact gap), which was not

statistically significant. Therefore, the MaMoni intervention has no impact on delivery in a public facility and did not increase equity in delivering in a public facility.

The program impact in high-intensity districts was statistically significant and higher than in all intervention districts at 2.8, whereas low-intensity districts saw a lower insignificant positive program impact (0.6) (Figure 10 and Table A8). The difference in the impact in the richest and in the poorest quintiles was not significant in either high intensity areas (-0.6) and low intensity areas (-4.0).

Figure 10. Difference in delivery at a public facility among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates

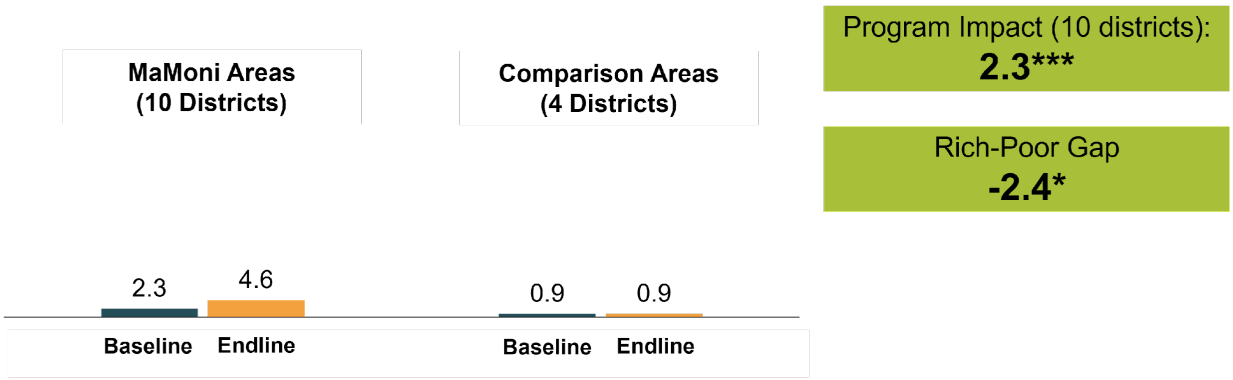


NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

Delivery at a Union Level Public Facility

In all 10 MaMoni implementing districts, delivery in a union-level public facility increased from 2.3% to 4.6%, while in comparison areas, it remains the same at 0.9%(Figure 11 and Table A9). After including the control variables, the estimated impact of the program was 2.3, which was statistically significant. The program impact in the lowest quintile was 2.9 and in the highest quintile it was 0.5 so the difference in impact between the richest and poorest quintiles was -2.4 (rich-poor impact gap), which was statistically significant. Therefore, the MaMoni intervention has impact on delivery in a union-level public facility and the impact was higher in the poorest quintile than in the wealthiest quintile.

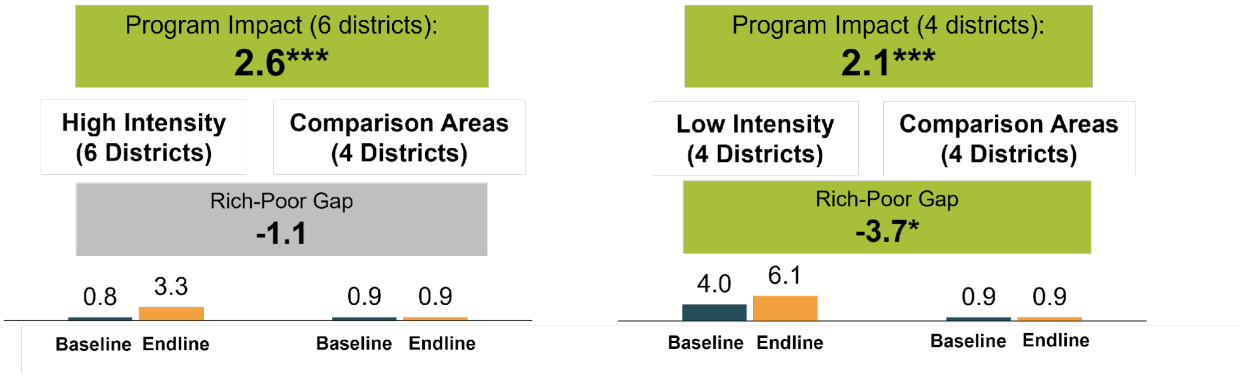
Figure 11. Difference in delivery at a union level public facility among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

The program impact in high and low intensity districts was statistically significant and similar (Figure 12 and Table A9). The difference in the impact in the richest and in the poorest quintiles was not significant in high intensity areas (-1.1) but was significant in low intensity areas (-3.7).

Figure 12. Difference in delivery at a union level public facility among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

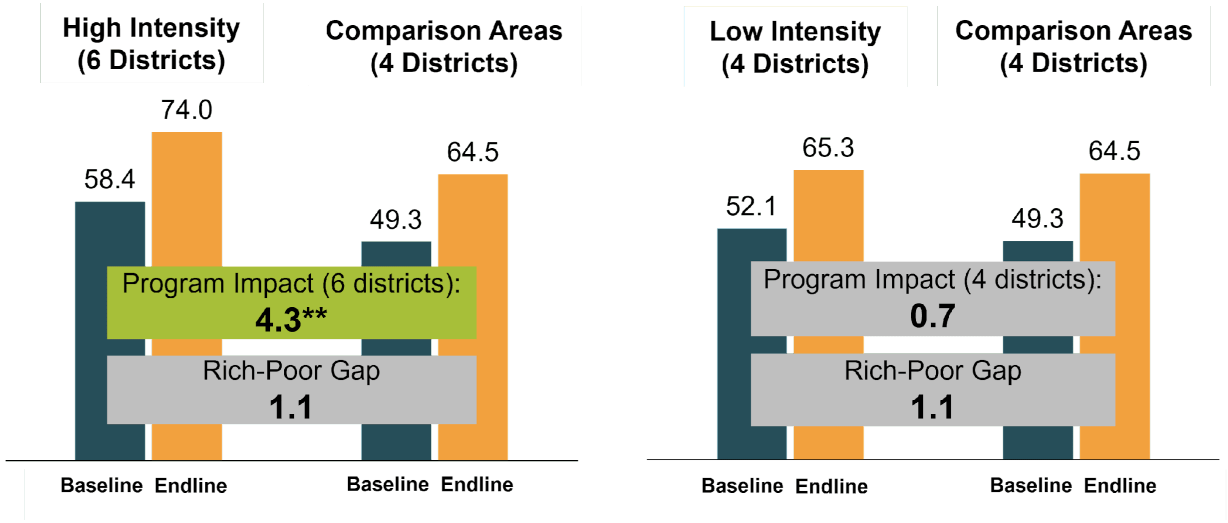
Delivery by a Skilled Birth Attendant

In all 10 MaMoni implementing districts, delivery by a skilled birth attendant increased from 55.4% to 70.1%, while in comparison areas, it rose from 49.3% to 64.5% (Figure S8 and Table A10). After including the control variables, the estimated impact of the program was 2.7, which was not statistically significant. The program impact in the lowest quintile was 0.7 and in the highest quintile it was 2.0 so the difference in impact between the richest and poorest quintiles was 1.3 (rich-poor impact gap), which was statistically

not significant. Therefore, the MaMoni intervention has no impact on delivery by a skilled birth attendant and did not increase equity in delivering by a skilled birth attendant.

The program impact in high intensity districts was statistically significant at 4.3 but not significant in low intensity districts at 0.7 (Figure 13 and Table A10). The difference in the impact in the richest and in the poorest quintiles was not significant in either high intensity areas (1.1) or low intensity areas (1.1).

Figure 13. Difference in delivery by a skilled birth attendant among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

Misoprostol Use in Home Deliveries

In all 10 MaMoni implementing districts, usage of Misoprostol in home deliveries increased from 15.3% to 17.8%, while in comparison areas, it rose from 10.6% to 15.6% (Figure S9 and Table A11). After including the control variables, the estimated impact of the program was -2.1, which was not statistically significant. The program impact in the lowest quintile was -1.4 and in the highest quintile it was 9.1 so the difference in impact between the richest and poorest quintiles was 10.5 (rich-poor impact gap), which was statistically significant. However, the significant impact in the highest wealth quintile was primarily driven by a drop in Misoprostol use in this quintile in the comparison areas. Therefore, the MaMoni intervention has no impact on usage of Misoprostol in home deliveries and had a larger impact in the wealthiest quintile than in poorer quintiles.

The program impact in high intensity districts was not statistically significant at 2.2 but low intensity districts saw a significant negative impact -6.3 (Figure S10 and Table A11). The difference in the impact in the richest and in the poorest quintiles was not significant in either high intensity areas (11.9) or low intensity areas (5.9).

Postnatal and Postpartum Care

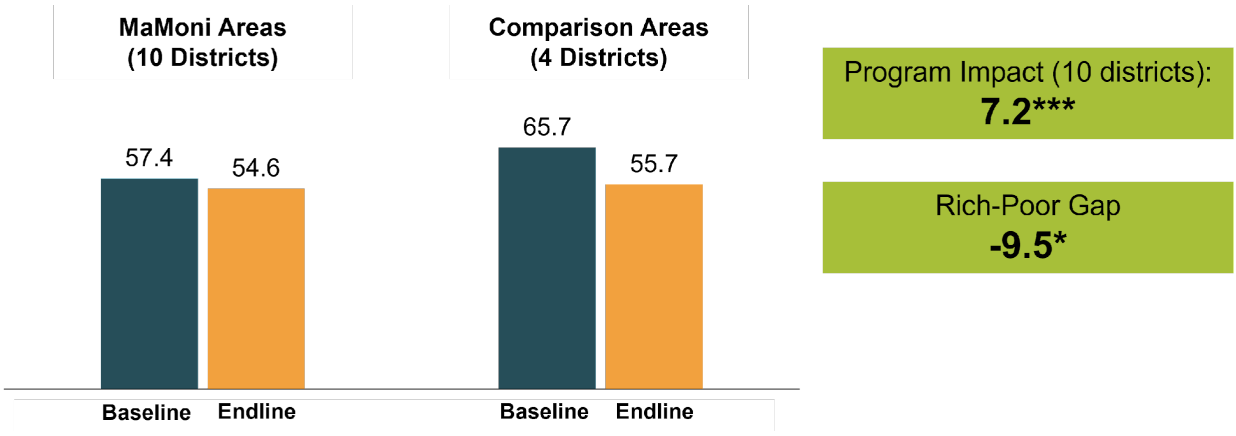
Under this category, the following indicators are investigated.

Breastfeeding within First Hour of Birth

In all 10 MaMoni implementing districts, breastfeeding within the first hour of birth fell from 57.4% to 54.6%, while in comparison areas, it fell from 65.7% to 55.7% (Figure 14 and Table A12). After including the control variables, the estimated impact of the program was 7.2, which was statistically significant. The program impact in the lowest quintile was 9.5 and in the highest quintile it was 0.1 so the difference in impact between the richest and poorest quintiles was -9.5 (rich-poor impact gap), which was marginally significant at the 10% level. Therefore, the MaMoni intervention has impact on receipt of breastfeeding within the first hour of birth by reducing or preventing declines in this indicator as seen in the comparison area and had a larger impact in the poorest quintile versus in the richest quintile.

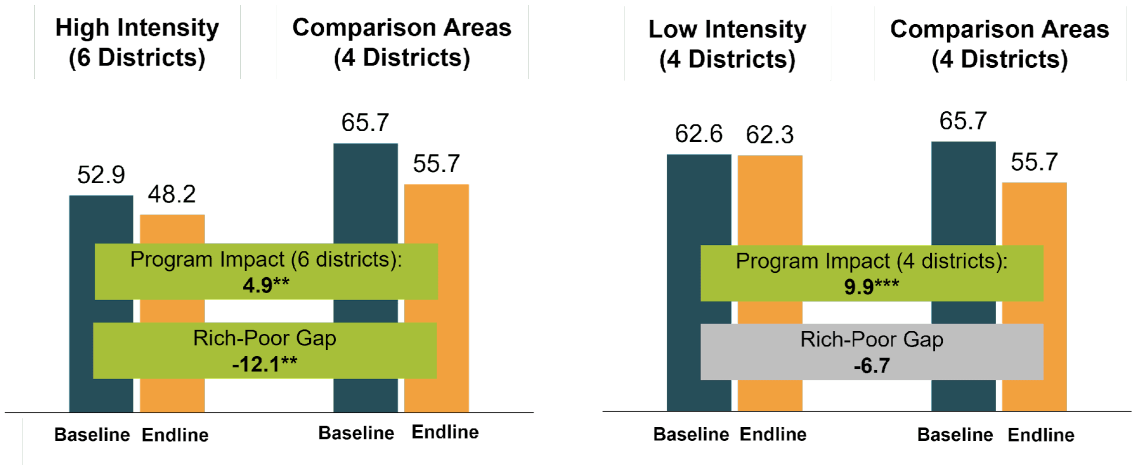
The program impact in high-intensity districts was lower than in all intervention districts at 4.9, whereas low-intensity districts saw a much larger program impact (9.9), and both estimates were statistically significant (Figure 15 and Table A12). The difference in the impact in the richest and in the poorest quintiles was significant in high intensity areas (-12.1) but not significant in low intensity areas (-6.7).

Figure 14. Difference in breastfeeding within the first hour of birth among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

Figure 15. Difference in breastfeeding within the first hour of birth among married women who had a live birth in the last 15 months preceding the survey in high Intensity and low Intensity MaMoni areas versus comparison areas over time and DID impact estimates



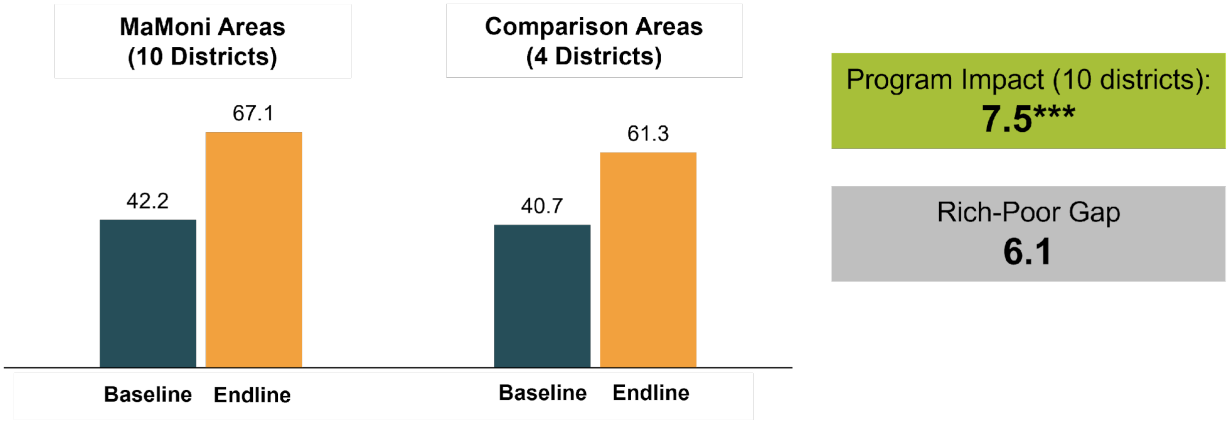
NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

Postnatal Care to Newborns within Two Days of Birth

In all 10 MaMoni implementing districts, postnatal care (PNC) to newborns within two days of birth increased from 42.2% to 67.1%, while in comparison areas, it increased from 40.7% to 61.3% (Figure 16 and Table A13). After including the control variables, the estimated impact of the program was 7.5, which was statistically significant. The program impact in the lowest quintile was 1.7 and in the highest quintile it was 7.8 so the difference in impact between the richest and poorest quintiles was -6.1 (rich-poor impact gap), which was not statistically significant. Therefore, the MaMoni intervention has impact on receipt of PNC to newborns but did not increase equity in PNC to newborns within two days of birth.

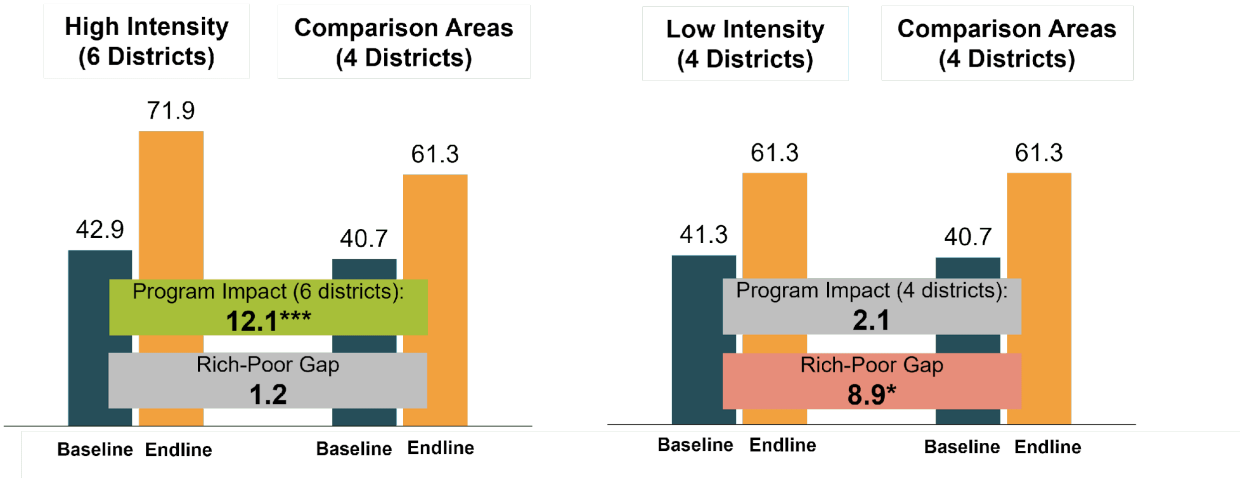
The program impact in high-intensity districts was significant and higher than in all intervention districts at 12.1, whereas low-intensity districts had insignificant program impact (2.1) (Figure 17 and Table A13). However, the difference in the impact in the richest and in the poorest quintiles was not significant in high intensity areas (1.2) but was marginally significant in low intensity areas (8.9).

Figure 16. Difference in postnatal care to newborns within two days of birth among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

Figure 17. Difference in postnatal care to newborns within two days of birth among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates



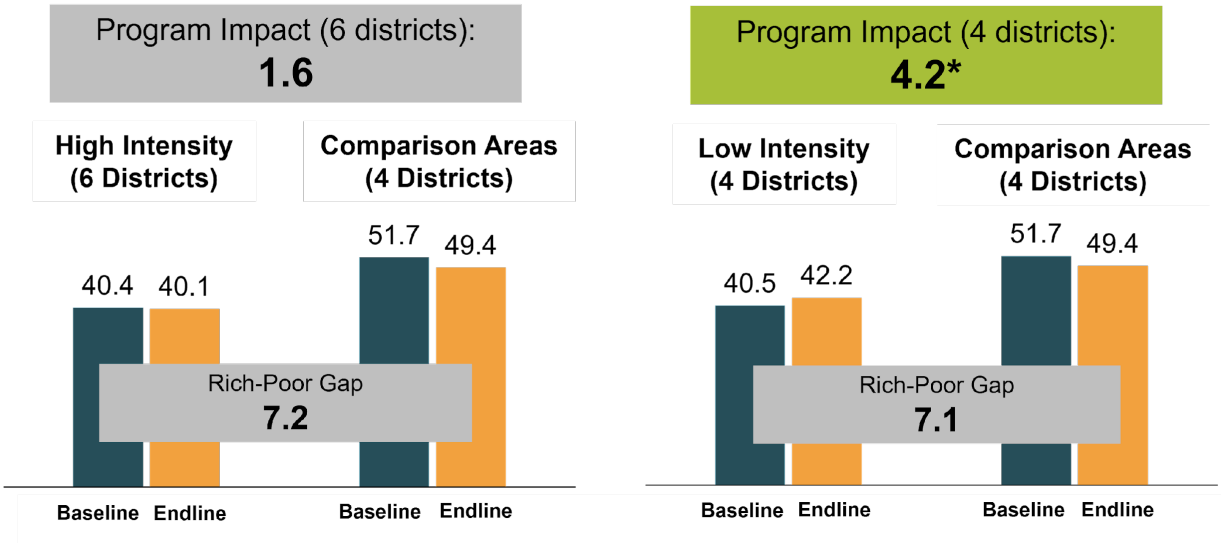
NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

Postpartum Modern Family Planning

In all 10 MaMoni implementing districts, postpartum modern family planning (PPFP) adoption increased from 40.4% to 41.0%, while in comparison areas, it fell from 51.7% to 49.4% (Figure S11 and Table A14). After including the control variables, the estimated impact of the program was 2.8, which was not statistically significant. The program impact in the lowest quintile was -2.5 and in the highest quintile it was 4.6 so the difference in impact between the richest and poorest quintiles was 7.1 (rich-poor impact gap), which was not significant. Therefore, the MaMoni intervention has no impact on PPFP adoption and did not increase equity in PPFP adoption.

The program impact in high-intensity districts was not significant, whereas low-intensity districts saw a marginally significantly positive program impact (4.2) (Figure 18 and Table A14). However, the difference in the impact in the richest and in the poorest quintiles was not significant in either high intensity areas (7.2) or low intensity areas (7.1).

Figure 18. Difference in postpartum modern family planning among married women who had a live birth in the last 15 months preceding the survey in high intensity and low intensity MaMoni areas versus comparison areas over time and DID impact estimates



NOTE: Program impact estimation methods and covariates controlled in the regression models are described in the methods section.
* p<0.1, ** p<0.05, *** p<0.01

Increase in Utilization of Delivery Services in Union Level Public Facilities

Using the HMIS data from the MaMoni program, it was found that during the project period the number of deliveries at union level public facilities in MaMoni areas between 2018 and 2022 increased from 17,035 to 74,886 (Figure 19). However, looking at Figure 20, we observe that during the same period the number of Union Health and Family Welfare Centre (UHFWC) increased from 87 to 468. Now, looking at the number of deliveries per UHFWC over time, we observe that it decreased from 186 in 2018 to 171 in 2022. This implies that the increase observed in Figure 19 is the increase of number of UHFWCs and not the increase in utilization of delivery services in individual union level public facilities.

Figure 19. Difference in delivery at union level public facility in MaMoni areas over time, from HMIS data

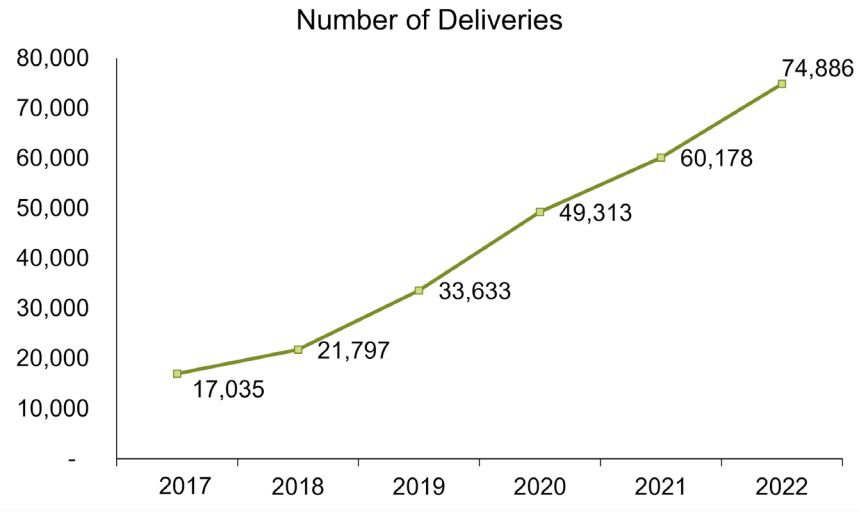
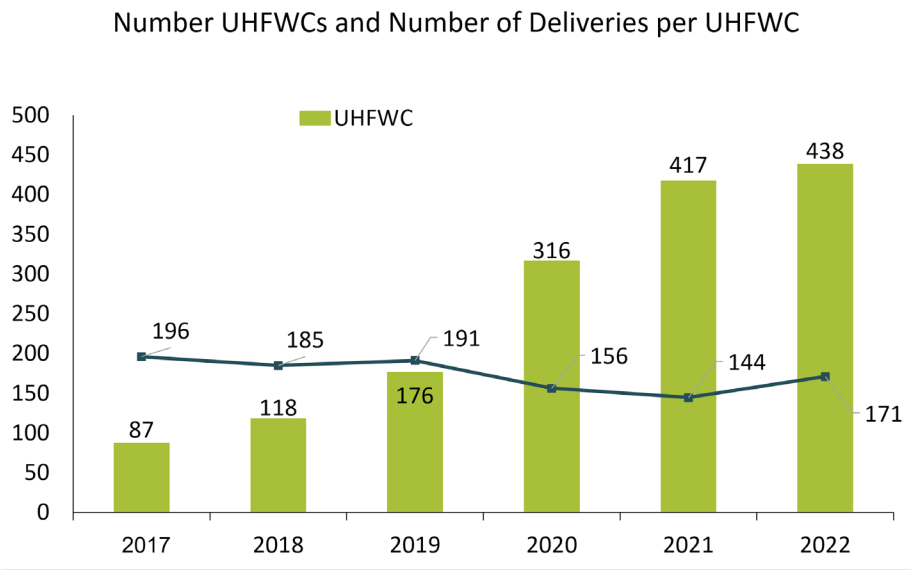


Figure 20. Number of UHFWCs and number of deliveries per UHFWC over time, from HMIS data



Discussion

Overall Program Impact

Figure 21 summarizes the findings of the impact analyses. Green boxes indicate significant program impacts in the desired direction, red boxes indicate significant program impacts but not in the desired direction, and grey boxes indicate no significant program impacts. Both intervention and comparison areas demonstrated improvements in ANC coverage over time, indicating positive trends in maternal healthcare seeking behavior. Notably, high-intensity districts experienced substantial increases in having at least four ANC visits. For instance, in high-intensity districts, there was an impressive 17.6 percentage points increase in the proportion of women receiving at least four ANC visits. Additionally, the program's impact on receiving quality ANC highlights its role in delivering maternal healthcare services.

Despite these successes it is crucial to acknowledge that the program did not significantly decrease existing differentials in any ANC indicators between the richest and poorest quintiles. Addressing these disparities is vital to ensure equal access to ANC services for all women, regardless of their economic status. The positive impact is evident in the increased coverage, improved quality of care, and timely initiation of ANC. While these accomplishments are commendable, there remains a need to address disparities in ANC utilization.

Moving forward it is imperative to implement targeted interventions and monitor progress to further enhance accessibility and utilization of ANC services, particularly in areas with lower baseline utilization rates. Ongoing efforts to bridge socioeconomic disparities will be crucial in achieving equitable access to quality maternal healthcare services.

The results of the MaMoni MNCSP endline survey indicate a notable increase in deliveries at union-level public facilities. This increase is plausibly related to the project's strategic efforts to strengthen union-level health facilities, enabling them to provide around-the-clock maternal and neonatal care, as well as establishing alternative health services in remote and hard-to-reach areas. The data underscores an improvement in the utilization of any health facilities for childbirth in both intervention and comparison areas, but the increase was significantly higher in high-intensity MaMoni program areas. This increase signifies an achievement in promoting institutional deliveries. Moreover, the program has successfully encouraged deliveries in public facilities in high-intensity areas, enhancing confidence and access to such services.

Particularly noteworthy is the program's impact on deliveries at the union-level public facilities, which demonstrated a significant rise in MaMoni areas. Women in poorer wealth quintiles are more likely to use union-level facilities for delivery care than are women in the richest quintile and poorer women appear to have benefitted more from the expansion in delivery care at union-level facilities in intervention areas. However, only a small proportion of all deliveries take place in union-level facilities even among poorer women and poorer women are less likely to deliver in any health facility. The program did not significantly narrow the differentials in any facility delivery. Addressing such disparities is crucial for equitable access to

quality maternal healthcare. Overall, the MaMoni program has played a pivotal role in strengthening maternal healthcare services, underscoring the importance of targeted interventions for further progress in this area.

Delivery by skilled birth attendants also saw notable improvements in both the MaMoni intervention and comparison areas. Importantly, six of the MaMoni intervention regions are high-intensity districts, where the increase in skilled birth attendance was very noticeable, indicating a significant positive impact of the program. In the comparable areas skilled birth attendance did grow as well, but to a lower degree compared to high-intensity districts. However, there was no program impact in low-intensity areas. The examination of the wealth-poverty impact gap shows that more work is needed to close the gaps in access to high-quality birth attendance services, particularly in places where program intensity is lower. Sustaining improvements and reducing gaps in maternal healthcare service access requires ongoing work.

There is no positive impact of the MaMoni program on Misoprostol use in home deliveries; Misoprostol use increased somewhat in both intervention and comparison areas and disparities in Misoprostol use persist. These findings underscore the need for continued efforts to ensure equitable access to crucial interventions like Misoprostol across all socioeconomic strata. It is recommended that future interventions prioritize targeting areas with lower baseline usage rates, focusing on sustained knowledge on the importance of Misoprostol in reducing the risk of deaths due to postpartum hemorrhage and accessibility.

In MaMoni intervention areas, breastfeeding initiation within the first hour of birth decreased over the intervention period but it decreased more in comparison areas resulting in an overall positive program impact in mitigating the declines. Since the private sector handles most facility births, it is crucial to involve the private sector in quality improvement procedures to guarantee compliance with national infant care guidelines. For the consistently high percentage of women who give birth at home, community interventions need to be strengthened.

The analysis reveals a substantial improvement in the provision of postnatal care (PNC) to newborns within two days of birth in the MaMoni intervention areas, reflecting a positive impact of the program. Particularly noteworthy is the significant increase in PNC coverage within the high-intensity intervention districts, indicating the effectiveness of focused efforts in these regions. However, it is essential to acknowledge the existing disparities, as evidenced by the rich-poor impact gap. This underlines the need for continued efforts to ensure equitable access to essential postnatal services, especially in areas with lower baseline coverage rates. It is recommended that future interventions concentrate on sustaining and expanding PNC initiatives with an emphasis on reaching underserved populations.

There was no significant change in PPFP utilization in either the MaMoni intervention areas or the comparison areas, indicating no overall impact of the MaMoni program on this outcome. There was a marginally significant program impact in low-intensity intervention districts. However, any program-oriented actions based on this result should be taken cautiously as the impact was only significant at 10% level of significance, and changes in PPFP are inconsistent between intervention and comparison areas across wealth quintiles, so program impacts may reflect declines in comparison areas rather than

increases in intervention areas or may be spurious.

Two overarching conclusions from this impact analysis are first, that program impacts are more consistent across outcomes in high-intensity program areas and are more limited in low-intensity program areas. Therefore, it appears that intensity matters and that the full package of interventions needs to be implemented to see consistent impacts. Second, the interventions did not in general have significantly higher impacts among the poorest than among the richest quintiles (except for delivery in a union-level facility and early initiation of breastfeeding), and in some cases impacts were significantly higher among wealthier women. The lack of significance may be associated at least in part with lower statistical power to detect third order interactions, but it appears that most interventions have not been effective in differentially reaching the poorest women so further innovation is needed to reach these women.

Figure 21. Summary findings – ANC, Delivery, Postnatal, and Postpartum Care

Interventions That May Have Influenced Program Impact

We investigated the interventions that were implemented to attain MaMoni objectives and attempted to link them to overall changes observed between MaMoni and comparison areas over time. Our assumption is that the following activities may have influenced program impact. However, the impact evaluation is not granular enough to attribute changes to specific interventions within the MaMoni intervention package, only to the overall package, so this discussion summarizes program components that may have plausibly contributed to the outcomes observed.

Improved Service Readiness

MaMoni placed a special emphasis on ensuring that there are enough service providers in the facilities for providing maternal (including 24X7 delivery services) and childcare services. This included facilitation of recruitment of midwives and paramedics and empowering midwives at UHC level. Furthermore, to fill the training needs for delivering high-quality services, a specialized training program was administered to healthcare providers. Family Welfare Visitors (FWVs) were given training which focused on elevating their midwifery proficiency and newborn care and which aimed to equip healthcare professionals with the latest clinical practices and instill confidence in their ability to deliver superior ANC. The training covered a wide range of clinical topics, focusing on the most recent protocols, evidence-based treatments, and quality improvement bundles. In addition, regular on-the-job refresher training coupled with on-site clinical mentorship were instituted. This means the FWVs got practical guidance and feedback while working with patients.

Additionally, MaMoni worked on creating and putting in place a robust monitoring system. This monitoring system tracks the availability of essential medicines (oxytocin, magnesium sulfate, iron, and folate), essential tests like Hemoglobin (Hb) and urine tests at UHCs, and rapid test kits at union level facilities. This also works by revitalizing the laboratory infrastructure where needed and provides necessary equipment (BP machine, stethoscopes, ANC cards, laboratory supplies, and medicines) from divisional/UHC warehouses to the facilities. Along with facility readiness, MaMoni also worked on creating a functional and facilitated referral system, including encouraging local governments to pay for transportation expenses.

Alternate Service Delivery Model for Underserved Areas

The program understood the varied geography and took steps to improve healthcare facilities in specific unions. The most notable intervention in this approach was to provide facility delivery services in union-level facilities coupled with various ways of encouraging women to seek ANC services and to deliver at the facility. This strategic approach was instrumental in extending the reach of ANC, delivery, and PNC services, particularly to populations residing in remote or hard-to-access areas. By prioritizing the enhancement of healthcare infrastructure in these regions, the program aimed to bridge the gap in maternal healthcare services, to ultimately ensure that pregnant women and children receive the essential care they need, regardless of their location.

Revitalizing UHFWC through a Multi-Faceted Approach and Government Engagement

To ensure 24x7 access to labor and delivery services, the program supported revitalization of UHFWCs. This involved a multifaceted approach, including leveraging existing resources, mobilizing local support, and providing necessary inputs to meet facility requirements. Collaboration with local governments was also instrumental in recruiting additional staff like Aya (helping hand) and night guards (a person who will be present at the facility at night). MaMoni also emphasized the importance of regular committee meetings at UHFWCs to assess and enhance maternal and child health services. These meetings serve as a platform to identify and address any gaps or challenges faced by the facilities.

Early Detection, SMS Reminders, and ANC Satellite Sessions

Early detection, regular special follow up through SMS reminders (in Noakhali and Habiganj), routine follow up, and focused satellite sessions for encouraging pregnant women to attend ANC sessions were some of the key activities that may have influenced the ANC related program impact. In addition, to minimize “lost to follow-up”, special training was provided to utilize the eMIS system. This also enabled timely reminders and reinforced the message of delivering at a health facility for a safer birthing experience. They also used technology to remind pregnant women through SMS, particularly in Habiganj and selected upazila of Noakhali, which served as a valuable tool in encouraging timely and facility-based deliveries.

Local Government Engagement to Increase Community Demand for MCH Services

Active engagement from local government entities, especially at the union level, was one of the key interventions of MaMoni to raise awareness in the community of the vital need for early and consistent maternal and child health services. This project made use of several platforms, including community courtyard sessions, mother group meetings, and public announcements through the involvement of local government representatives.

Data Review and Performance Assessment

Facilitated by MaMoni staff, regular review meetings were held at various administrative levels including district, upazila, and union. During these sessions data was analyzed, allowing for the identification of specific areas that may require additional support or intervention. Furthermore, these gatherings provide an invaluable opportunity to refine and fine tune strategies, ensuring that the program yields the most optimal results.

Supportive Supervision

Establishing committees at district hospitals and UHCs allowed MaMoni a scope for collaborative problem solving. These committees facilitated the process of addressing challenges related to maternal and newborn services and facilitated a conducive environment for quality care. This also enhanced a supportive environment on strengthening the supervision of health workers, representing a critical intervention in bolstering ANC utilization. By providing supervisors with the required training and creating a systematic feedback system, this initiative has improved the standard of services.

Recommendations

As described in the Methods and Limitations sections, this type of impact analysis provides evidence on the impact of the complex package of interventions implemented by the MaMoni project on the various outcomes examined. It does not provide evidence on the effectiveness of specific interventions within the overall package implemented, or on why specific interventions within the package did or did not work. Our findings show impacts of the MaMoni package of interventions across the multiple outcomes examined, particularly in high intensity program areas where impacts were demonstrated across most outcome domains (ANC, delivery care, postnatal care). Therefore, the following recommendations for the Bangladesh MOHFW for USAID/Bangladesh and its MCH implementing partners are based on scaling up the elements of the intervention package described in the previous section.

- Train providers by covering a wide range of clinical topics, focusing on the most recent protocols, evidence-based treatments, and QI bundles. In addition, regular on-the-job refresher training coupled with on-site clinical mentorship should be instituted. The government and non-government healthcare training agencies should include a similar training curriculum in pre-service training.
- Establish a robust monitoring system to track the availability of essential medicines and essential tests at UHCs and rapid test kits at union level facilities.
- Continue to revitalize the laboratory infrastructure where needed and keep in place all necessary equipment in facilities.
- Continue revitalizing UHFWCs by leveraging existing resources, mobilizing local support, and providing necessary inputs to meet facility requirements. Engage local governments to identify and address any gaps or challenges faced by the facilities. Institute regular committee meetings at UHFWCs with local governments.
- Assess facility performance through data review and present them in relevant administrative level meetings— district, upazila, and union— and identify issues and find solutions. These meetings provide an invaluable opportunity to refine and fine tune strategies which will help yield optimal improvement results.
- Orient and train supervisors on supportive supervision along with creating a routine and systematic feedback mechanism. Instituting this will increase provider skills and efficiency and thus improve the standard of services.

The Ministry of Health is likely to benefit by scaling up these interventions. The development partner(s) may do advocacy with the Ministry on these interventions, including providing implementation technical assistance.

The results of the impact analysis show that the MaMoni program interventions did not in general have stronger impacts on the poorer quintiles in the population so did not reduce existing inequities in use of

maternal and newborn health services. To address this finding, we recommend the following to USAID/Bangladesh and its implementing partners:

- Further synthesis and analysis of existing data or formative qualitative data collection targeted specifically at better understanding barriers to the use of MNCH services among the poorest families and then closely linking interventions to those barriers in a clear theory of change to identify innovative ways to address these gaps. There may be additional social and economic barriers than those identified and addressed by the MaMoni project interventions. These barriers may go beyond what a service-delivery oriented project typically addresses.

The impact analysis also found no or limited impacts for two outcome domains, suggesting gaps in these program areas that should be addressed in future programs. We recommend the following:

- Review and strengthen interventions related to use of Misoprostol in home deliveries to prevent postpartum hemorrhage.
- Review and strengthen interventions to support postpartum family planning. Examples of interventions that could be considered include strengthening PPFP counseling during antenatal and postnatal care, as well as expanding community-based awareness campaigns (Rahman et al. 2020; Rahman et al. 2023a; Rahman et al. 2023b). Additionally, efforts should be directed towards assessing and enhancing PPFP services in both private and public facilities, considering that most deliveries occur in the private sector.

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Appendix A. Supplementary Tables

Table A1. By SES Quintile: Received any ANC among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Received any ANC	77.0	90.6	13.6*** [0.008] (<0.001)	74.5	88.5	14.0*** [0.015] (<0.001)	0.6 [0.015] (0.687)	1.6 [0.016] (0.296)	-0.6 [0.018] (0.721)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	62.8	79.9	17.1*** [0.021] (<0.001)	65	80.1	15.0*** [0.029] (<0.001)	1.6 [0.034] (0.646)	4.9 [0.038] (0.193)	-1.1 [0.040] (0.779)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	71.8	86.7	14.9*** [0.015] (<0.001)	68.4	87	18.6*** [0.024] (<0.001)	-1.9 [0.026] (0.466)	-0.1 [0.029] (0.960)	-3.8 [0.032] (0.230)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	77	92.9	15.8*** [0.012] (<0.001)	75.7	91.4	15.7*** [0.024] (<0.001)	1.7 [0.026] (0.510)	1.8 [0.027] (0.493)	1.5 [0.030] (0.612)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	81.7	93.1	11.5*** [0.011] (<0.001)	82.5	92.9	10.4*** [0.021] (<0.001)	1.8 [0.023] (0.438)	2.3 [0.025] (0.346)	1.1 [0.027] (0.690)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	88.3	97	8.7*** [0.009] (<0.001)	90.2	95.7	5.6*** [0.018] (<0.001)	4.7** [0.020] (0.017)	6.2*** [0.021] (0.003)	2.7 [0.023] (0.230)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***3.2*** [0.038] (0.406)	1.3 [0.042] (0.762)	3.8 [0.044] (0.390)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	***27,315***	***27,315***

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

Table A2. By SES Quintile: Received at least four ANC among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Received at least four ANC	28.1	43.7	15.6*** [0.011] (<0.001)	29.8	39.3	9.5*** [0.018] (<0.001)	7.7*** (0.019) (<0.001)	10.0*** (0.020) (<0.001)	5.0** (0.022) (0.023)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	15.2	27.6	12.4*** [0.018] (<0.001)	18.4	29.5	11.1*** [0.027] (<0.001)	1.9 [0.032] (0.557)	2.5 [0.035] (0.482)	1.4 [0.036] (0.693)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	19.8	34.7	14.9*** [0.018] (<0.001)	24.2	34.3	10.1*** [0.029] (0.001)	7.5** [0.032] (0.020)	8.5** [0.034] (0.015)	6.4* [0.038] (0.096)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	24.1	42.6	18.5*** [0.018] (<0.001)	30.5	37	6.5** [0.031] (0.039)	14.5*** [0.034] (<0.001)	17.7*** [0.036] (<0.001)	10.5*** [0.039] (0.008)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	31	48.2	17.2*** [0.018] (<0.001)	36.2	46.7	10.5*** [0.033] (0.001)	7.8** [0.036] (0.031)	13.1*** [0.038] (0.001)	0.1 [0.042] (0.984)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	46.6	59.5	12.9*** [0.018] (<0.001)	50.4	57.2	6.8* [0.037] (0.070)	9.1** [0.036] (0.031)	9.1** [0.042] (0.032)	9.1** [0.044] (0.041)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***7.2*** [0.048] (0.134)	6.6 [0.053] (0.211)	7.7 [0.055] (0.164)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	27,315	27,315

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

Table A3. By SES Quintile: At least one ANC from medically trained provider among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
At least one ANC from medically trained provider	71.2	88.5	17.3*** [0.009] (<0.001)	69.6	85.4	15.7*** [0.016] (<0.001)	2.4 [0.016] (0.137)	2.3 [0.017] (0.165)	2.4 [0.019] (0.202)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	53.7	76.4	22.7*** [0.022] (<0.001)	58.7	75.7	17.0*** [0.030] (<0.001)	4.8 [0.035] (0.172)	3.7 [0.038] (0.333)	5.2 [0.040] (0.202)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	64.1	84	19.9*** [0.016] (<0.001)	62.1	83.3	21.2*** [0.025] (<0.001)	0.2 [0.028] (0.951)	0.9 [0.030] (0.768)	-0.6 [0.034] (0.861)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	71	90.7	19.8*** [0.013] (<0.001)	71.5	88.8	17.3*** [0.025] (<0.001	3.7 [0.028] (0.188)	3.8 [0.029] (0.191)	3.6 [0.032] (0.276)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	76.9	91.7	14.7*** [0.012] (<0.001	78.6	90.1	11.5*** [0.023] (<0.001	3.9 [0.025] (0.121)	3.9 [0.026] (0.145)	4.0 [0.029] (0.178)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	85.9	96	10.1*** [0.009] (<0.001)	88.3	94.7	6.4*** [0.019] (0.001)	5.2** [0.022] (0.017)	6.5*** [0.022] (0.004)	3.4 [0.034] (0.168)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***0.4*** [0.040] (0.915)	2.8 [0.043] (0.521)	-1.8 [0.047] (0.699)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	27,315	27,315

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

Table A4. By SES Quintile: Received all five components of ANC at least once among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Received all five components of ANC at least once[b]	26.6	31.8	5.2*** [0.012] (<0.001)	26.0	31.6	5.6*** [0.020] (0.004)	1.0 [0.022] (0.650)	5.3** [0.024] (0.025)	-4.1* [0.025] (0.099)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	13.3	20.9	7.5*** [0.018] (<0.001)	17.4	20.7	3.3 [0.024] (0.175)	3.6 [0.030] (0.218)	8.3** [0.035] (0.020)	0.0 [0.032] (0.998)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	18.9	25.4	6.5*** [0.017] (<0.001)	18.4	27.8	9.4*** [0.027] (<0.001)	-0.7 [0.031] (0.820)	3.8 [0.033] (0.255)	-5.7 [0.035] (0.110)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	24.9	30.1	5.3*** [0.017] (0.003)	27.4	34.8	7.4** [0.033] (0.024)	-0.4 [0.036] (0.912)	5.5 [0.037] (0.146)	-7.9* [0.041] (0.055)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	31.5	36.5	5.0** [0.020] (0.010)	33.1	37.9	4.8 [0.035] (0.166)	1.6 [0.040] (0.697)	5.9 [0.042] (0.162)	-4.5 [0.047] (0.339)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	40.7	42.1	1.4 [0.021] (0.504)	43.8	44.1	0.4 [0.042] (0.928)	3.4 [0.047] (0.462)	6.4 [0.050] (0.199)	-0.9 [0.051] (0.866)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***-0.2*** [0.051] (0.967)	-1.9 [0.056] (0.737)	-0.9 [0.058] (0.879)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	27,315	27,315

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.
"b": Five components of ANC include measurement of weight and blood pressure, urine and blood testing, and being informed of signs of possible complications

Table A5. By SES Quintile: Quality ANC4 among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Quality ANC[c]	13.3	20.4	7.2*** [0.009] (<0.001)	14.1	18.2	4.1*** [0.014] (0.004)	4.4*** [0.016] (0.005)	7.0*** [0.017] (<0.001)	1.3 [0.018] (0.464)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	4.7	11.4	6.7*** [0.012] (<0.001	6.9	9.9	3.0* [0.016] (0.062)	3.8* [0.019] (0.050)	4.7** [0.023] (0.044)	3.1 [0.021] (0.156)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	7	14.4	7.4*** [0.012] (<0.001)	8.4	15.2	6.8*** [0.021] (0.001)	2.5 [0.023] (0.277)	4.3* [0.025] (0.087)	0.6 [0.027] (0.826)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	9.8	18.8	9.1*** [0.013] (<0.001	15.1	18.9	3.8 [0.025] (0.126)	7.0** [0.027] (0.011)	9.7*** [0.029] (0.001)	3.5 [0.031] (0.265)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	16.1	24.1	7.9*** [0.016] (<0.001	17.8	22.3	4.5 [0.029] (0.118)	4.5 [0.033] (0.178)	9.2*** [0.035] (0.009)	-2.3 [0.038] (0.550)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	25.9	30.1	4.2** [0.018] (0.016)	30.2	30.9	0.7 [0.036] (0.852)	5.8 [0.040] (0.141)	8* [0.042] (0.058)	2.8 [0.045] (0.535)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***2.0*** [0.043] (0.633)	3.3 [0.047] (0.482)	-0.3 [0.048] (0.948)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	27,315	27,315

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.
"c": received at least four ANC visits from any place, of which at least one from medically trained provider and received all five components of ANC

Table A6. By SES Quintile: Received first ANC within first trimester among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Received first ANC within first trimester	25.0	40.7	15.7*** [0.010] (<0.001)	22.4	36.6	14.2*** [0.016] (<0.001)	2.6* [0.016] (0.100)	5.5*** [0.017] (0.001)	-0.9 [0.018] (0.615)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	14.5	23.2	8.7*** [0.016] (<0.001)	12.8	24.9	12.1*** [0.023] (<0.001)	-3.3 [0.027] (0.230)	0.2 [0.033] (0.957)	-6** [0.029] (0.044)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	16.6	31.4	14.8*** [0.017] (<0.001)	17.9	31.2	13.2*** [0.025] (<0.001)	3.4 [0.029] (0.239)	5.7* [0.032] (0.070)	0.9 [0.035] (0.801)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	21.9	39.3	17.4*** [0.017] (<0.001)	21	37.4	16.5*** [0.030] (<0.001)	2.7 [0.034] (0.419)	7.1* [0.036] (0.050)	-2.9 [0.039] (0.462)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	27.4	45.4	18.0*** [0.017] (<0.001)	28.7	43.5	14.8*** [0.030] (<0.001)	3.5 [0.034] (0.302)	6.1* [0.036] (0.088)	-0.3 [0.039] (0.940)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	41.1	58.1	16.9*** [0.018] (<0.001)	40.8	55.1	14.3*** [0.035] (<0.001)	4.8 [0.038] (0.200)	5.7 [0.039] (0.147)	3.6 [0.044] (0.416)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***8.1**** [0.047] (0.085)	5.5 [0.052] (0.285)	9.6* [0.053] (0.073)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	27,315	27,315

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

Table A7. By SES Quintile: Delivery at any health facility among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Delivery at any health facility	52.6	66.4	13.8*** [0.013] (<0.001)	46.5	61.6	15.1*** [0.022] (<0.001)	2.4 [0.016] (0.124)	4.1** [0.017] (0.016)	0.5 [0.020] (0.804)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	29.7	43.8	14.1*** [0.023] (<0.001)	29.3	44.5	15.2*** [0.032] (<0.001)	0.0 [0.032] (0.998)	1.5 [0.038] (0.698)	-1.3 [0.036] (0.719)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	42.1	59.2	17.2*** [0.022] (<0.001)	35.9	54	18.1*** [0.033] (<0.001)	3.3 [0.032] (0.305)	7.4** [0.035] (0.038)	-1 [0.039] (0.793)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	51.1	67.6	16.5*** [0.019] (<0.001)	49.9	63.2	13.3*** [0.033] (<0.001)	8.6** [0.035] (0.014)	10.9*** [0.037] (0.003)	5.6 [0.041] (0.173)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	61.6	73.6	12.0*** [0.018] (<0.001)	59.4	71.7	12.3*** [0.031] (<0.001)	2.5 [0.031] (0.425)	4.2 [0.033] (0.207)	0.2 [0.037] (0.963)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	72.4	80.9	8.5*** [0.016] (<0.001)	74.2	87.2	13.1*** [0.027] (<0.001)	1.3 [0.031] (0.676)	1.3 [0.033] (0.703)	1.3 [0.035] (0.704)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***1.3*** [0.043] (0.765)	-0.2 [0.049] (0.963)	2.6 [0.048] (0.585)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	27,315	27,315

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

Table A8. By SES Quintile: Delivery at public facility among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Delivery at public facility	14.9	16.1	1.2* [0.007] (0.089)	13.7	13.2	-0.5 [0.010] (0.598)	1.8 [0.012] (0.149)	2.8** [0.014] (0.040)	0.6 [0.015] (0.684)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	12.3	16.1	3.8** [0.015] (0.011)	10.9	12.4	1.5 [0.018] (0.385)	2.1 [0.023] (0.361)	2.1 [0.025] (0.407)	1.8 [0.027] (0.503)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	14.6	17.2	2.7* [0.014] (0.061)	12.2	11.8	-0.4 [0.017] (0.821)	3.5 [0.022] (0.111)	5.4** [0.025] (0.030)	1.5 [0.027] (0.588)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	15.4	17.7	2.3* [0.014] (0.094)	15.6	14.2	-1.4 [0.023] (0.555)	3.7 [0.027] (0.176)	4.9* [0.028] (0.092)	2.2 [0.032] (0.498)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	16.6	15.5	-1.1 [0.013] (0.393)	16.1	13.6	-2.6 [0.022] (0.255)	1.3 [0.026] (0.624)	2.3 [0.028] (0.418)	0 [0.031] (0.993)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	15.3	14.3	-1 [0.012] (0.426)	15.8	14.6	-1.2 [0.024] (0.615)	0.0 [0.027] (0.992)	1.5 [0.029] (0.593)	-2.1 [0.031] (0.497)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***-2.0*** [0.035] (0.555)	-0.6 [0.037] (0.876)	-4.0 [0.041] (0.334)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	27,315	27,315

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

Table A9. By SES Quintile: Delivery at union level public facility among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Delivery at union level public facility	2.3	4.6	2.3*** [0.004] (<0.001)	0.9	0.9	0 [0.003] (0.917)	2.3*** [0.005] (<0.001)	2.6*** [0.006] (<0.001)	2.1*** [0.008] (0.009)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	2.9	6.3	3.4*** [0.010] (0.001)	1.1	1.6	0.5 [0.007] (0.466)	2.9** [0.012] (0.015)	2* [0.012] (0.081)	3.5** [0.017] (0.035)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	2.7	5.5	2.8*** [0.008] (0.001)	0.7	0.5	-0.2 [0.004] (0.660)	3.2*** [0.009] (0.001)	4.5*** [0.012] (<0.001)	1.9 [0.013] (0.164)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	2.6	5.6	3.0*** [0.008] (<0.001)	1.2	0.9	-0.4 [0.006] (0.564)	3.3*** [0.010] (0.002)	3.3*** [0.011] (0.003)	3.2** [0.016] (0.044)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	1.7	3.2	1.5** [0.006] (0.014)	0.8	0.2	-0.7 [0.004] (0.115)	2.1*** [0.007] (0.004)	2.4*** [0.008] (0.002)	1.8 [0.012] (0.138)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	1.6	2.8	1.2** [0.005] (0.027)	0.6	1.1	0.5 [0.007] (0.492)	0.5 [0.009] (0.604)	0.9 [0.009] (0.323)	-0.2 [0.012] (0.861)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***-2.4**** [0.014] (0.097)	-1.1 [0.015] (0.449)	-3.7* [0.020] (0.062)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	27,315	27,315

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

Table A10. By SES Quintile: Delivery by skilled birth attendant among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Delivery by skilled birth attendant	55.4	70.1	14.6*** [0.013] (<0.001)	49.3	64.5	15.3*** [0.021] (<0.001)	2.7 [0.016] (0.106)	4.3** [0.017] (0.013)	0.7 [0.021] (0.743)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	31.1	47.1	16.0*** [0.024] (<0.001)	32.2	48.4	16.2*** [0.031] (<0.001)	0.7 [0.033] (0.821)	1.8 [0.038] (0.646)	-0.3 [0.038] (0.932)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	44.5	62	17.5*** [0.023] (<0.001)	38.9	56.7	17.8*** [0.033] (<0.001)	3.7 [0.037] (0.275)	7.6** [0.036] (0.035)	-0.6 [0.042] (0.886)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	54	71.7	17.6*** [0.018] (<0.001)	51.8	66.5	14.7*** [0.032] (<0.001)	7.7** [0.034] (0.023)	9.2** [0.036] (0.012)	6 [0.040] (0.139)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	64.6	77.1	12.4*** [0.017] (<0.001)	62.1	74.2	12.0*** [0.030] (<0.001)	3.0 [0.031] (0.326)	5.3 [0.032] (0.103)	-0.1 [0.037] (0.972)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	76.7	85.4	8.7*** [0.014] (<0.001)	77.5	89.4	11.8*** [0.025] (<0.001)	2.0 [0.028] (0.483)	2.8 [0.030] (0.351)	0.8 [0.033] (0.807)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***1.3*** [0.042] (0.766)	1.1 [0.047] (0.821)	1.1 [0.049] (0.818)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	27,315	27,315

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

Table A11. By SES Quintile: Misoprostol use at home delivery among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Misoprostol use at home delivery	15.3	17.8	2.5* [0.013] (0.052)	10.6	15.6	5.1*** [0.018] (0.005)	-2.1 [0.022] (0.343)	2.2 [0.026] (0.396)	-6.3** [0.025] (0.013)
Number of women	6,229	2,417	8,646	1,881	1,017	2,898	11,544	*11,544*	*11,544*
By Quintile:									
Q1	12.2	17.0	4.7** [0.022] (0.034)	7.9	13.8	5.9** [0.025] (0.020)	-1.4 [0.034] (0.675)	1.8 [0.044] (0.679)	-3.6 [0.038] (0.345)
Number of women	1,655	661	2,316	619	370	989	11,544	11,544	11,544
Q2	14.3	15.2	0.8 [0.021] (0.696)	10.2	17.8	7.5** [0.030] (0.014)	-5.1 [0.037] (0.166)	-1.2 [0.043] (0.788)	-8.5** [0.042] (0.043)
Number of women	1,391	545	1,936	567	276	843	11,544	11,544	11,544
Q3	14.9	18.9	4.0* [0.022] (0.066)	13.9	18.1	4.2 [0.038] (0.267)	0.4 [0.044] (0.932)	5.2 [0.048] (0.283)	-4.8 [0.049] (0.329)
Number of women	1,323	506	1,829	323	171	494	11,544	11,544	11,544
Q4	17.9	17.9	0 [0.025] (0.992)	12.6	16.4	3.8 [0.040] (0.339)	-3.7 [0.047] (0.430)	1.9 [0.051] (0.712)	-11.6** [0.055] (0.037)
Number of women	1,061	394	1,455	238	152	390	11,544	11,544	11,544
Q5	20.5	22.5	1.9 [0.030] (0.524)	12.7	6.3	-6.4 [0.044] (0.148)	9.1* [0.054] (0.091)	13.8** [0.059] (0.020)	2.3 [0.064] (0.720)
Number of women	799	311	1,110	134	48	182	11,544	11,544	11,544
Difference Q5-Q1							***10.5**** [0.063] (0.093)	11.9 [0.073] (0.100)	5.9 [0.073] (0.420)
Number of women	***6,229***	***2,417***	***8,646***	***1,881***	***1,017***	***2,898***	***11,544***	11,544	11,544

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

Table A12. By SES Quintile: Breastfeeding within first hour of birth among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Breastfeeding within first hour of birth	57.4	54.6	-2.8*** [0.013] (0.027)	65.7	55.7	-10.1*** [0.019] (<0.001)	7.2*** [0.021] (0.001)	4.9** [0.024] (0.040)	9.9*** [0.024] (<0.001)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	65.5	67.6	2.1 [0.021] (0.321)	69.5	62.4	-7.1** [0.030] (0.019)	9.5*** [0.036] (0.009)	10.6** [0.043] (0.013)	8.9** [0.039] (0.024)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	61.2	59.5	-1.8 [0.021] (0.402)	69.2	51.3	-17.8*** [0.030] (<0.001)	16.3*** [0.036] (<0.001)	13.6*** [0.042] (0.001)	19.2*** [0.040] (<0.001)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	58.3	53.9	-4.4** [0.020] (0.026)	65.9	54.6	-11.3*** [0.031] (<0.001)	6.2* [0.036] (0.087)	3.3 [0.040] (0.419)	9.8** [0.041] (0.017)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	53.4	49.5	-3.8** [0.019] (0.046)	62.3	55.6	-6.7** [0.033] (0.044)	2.8 [0.037] (0.447)	-0.4 [0.040] (0.928)	7.2* [0.042] (0.090)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	50.8	46.5	-4.4** [0.019] (0.024)	57.4	52.1	-5.2 [0.039] (0.179)	0.1 [0.043] (0.990)	-1.5 [0.045] (0.737)	2.3 [0.049] (0.641)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***-9.5**** [0.054] (0.081)	-12.1** [0.059] (0.040)	-6.7 [0.062] (0.281)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	*27,315*	*27,315*

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

Table A13. By SES Quintile: Baby received PNC within 2 days after delivery from medically trained provider among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
Baby received PNC within 2 days after delivery from medically trained provider	42.2	67.1	25.0*** [0.013] (<0.001)	40.7	61.3	20.6*** [0.021] (<0.001)	7.5*** [0.018] (<0.001)	12.1*** [0.019] (<0.001)	2.1 [0.022] (0.337)
Number of women	13,618	7,510	21,128	3,541	2,646	6,187	27,315	*27,315*	*27,315*
By Quintile:									
Q1	23.5	43.6	20.1*** [0.022] (<0.001)	26.0	45.1	19.1*** [0.030] (<0.001)	1.7 [0.032] (0.583)	8.4** [0.037] (0.025)	-3.4 [0.036] (0.337)
Number of women	2,420	1,217	3,637	881	667	1,548	27,315	27,315	27,315
Q2	33.2	59.3	26.1*** [0.022] (<0.001)	32.8	52.7	19.8*** [0.031] (<0.001)	9.6*** [0.033] (0.004)	17.7*** [0.036] (<0.001)	0.9 [0.039] (0.828)
Number of women	2,447	1,381	3,828	892	600	1,492	27,315	27,315	27,315
Q3	41.5	69.2	27.7*** [0.018] (<0.001)	41.1	64.9	23.8*** [0.032] (<0.001)	8.3** [0.035] (0.018)	11.8*** [0.037] (0.002)	3.8 [0.040] (0.354)
Number of women	2,802	1,586	4,388	649	465	1,114	27,315	27,315	27,315
Q4	48.9	73.3	24.4*** [0.018] (<0.001)	51.6	70.1	18.5*** [0.032] (<0.001)	9.0*** [0.032] (0.005)	12.9*** [0.034] (<0.001)	3.5 [0.037] (0.360)
Number of women	2,909	1,592	4,501	589	538	1,127	27,315	27,315	27,315
Q5	58.9	83	24.1*** [0.016] (<0.001)	65.7	87.0	21.3*** [0.029] (<0.001)	7.8** [0.033] (0.017)	9.5*** [0.035] (0.006)	5.4 [0.038] (0.158)
Number of women	3,040	1,734	4,774	530	376	906	27,315	27,315	27,315
Difference Q5-Q1							***6.1*** [0.043] (0.155)	1.2 [0.048] (0.808)	8.9* [0.050] (0.075)
Number of women	***13,618***	***7,510***	***21,128***	***3,541***	***2,646***	***6,187***	***27,315***	27,315	27,315

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

Table A14. By SES Quintile: PPFP adoption within first year of birth among MW who had a live birth in the last 15 months preceding the survey, 2019 baseline (B) and 2023 endline (E) surveys, difference (E-B), and DID impact estimates

	MaMoni Intervention Area			Comparison Area			*DID Impact[a] (from full model)* [SE] (p-value)	*DID Impact[a] By MaMoni area*	
	B	E	Diff (E-B) [SE] (p-value)	B	E	Diff (E-B) [SE] (p-value)		High (6 districts) [SE] (p-value)	Low (4 districts) [SE] (p-value)
PPFP adoption within first year of birth	40.4	41.0	0.6 [0.010] (0.532)	51.7	49.4	-2.3 [0.017] (0.173)	2.8 [0.019] (0.130)	1.6 [0.020] (0.414)	4.2* [0.022] (0.053)
Number of women	11,119	6,059	17,178	2,928	2,126	5,054	22,232	*22,232*	*22,232*
By Quintile:									
Q1	41.1	42.9	1.8 [0.022] (0.415)	50.3	54.9	4.7 [0.031] (0.138)	-2.5 [0.038] (0.506)	-2.5 [0.044] (0.569)	-2.5 [0.041] (0.544)
Number of women	1,972	966	2,938	726	517	1,243	22,232	22,232	22,232
Q2	41.6	46	4.4** [0.021] (0.032)	52.4	49.7	-2.7 [0.031] (0.374)	7.1** [0.036] (0.049)	1.7 [0.041] (0.679)	13.0*** [.042] (0.002)
Number of women	2,008	1,104	3,112	738	489	1,227	22,232	22,232	22,232
Q3	43.3	43.9	0.6 [0.019] (0.751)	52.8	46.4	-6.4* [0.036] (0.077)	7.3* [0.040] (0.068)	9.1** [0.042] (0.032)	5.1 [0.046] (0.273)
Number of women	2,280	1,284	3,564	544	373	917	22,232	22,232	22,232
Q4	40.5	38	-2.5 [0.018] (0.168)	49.1	45.6	-3.5 [0.036] (0.325)	0.8 [0.040] (0.836)	-1.1 [0.043] (0.806)	3.5 [0.046] (0.439)
Number of women	2,362	1,295	3,657	483	439	922	22,232	22,232	22,232
Q5	36.2	35.7	-0.4 [0.017] (0.806)	54.2	48.7	-5.5 [0.040] (0.166)	4.6 [0.044] (0.287)	4.6 [0.045] (0.301)	4.5 [0.049] (0.366)
Number of women	2,497	1,410	3,907	437	308	745	22,232	22,232	22,232
Difference Q5-Q1							***7.1*** [0.057] (0.210)	7.2 [0.063] (0.256)	7.1 [0.064] (0.270)
Number of women	***11,119***	***6,059***	***17,178***	***2,928***	***2,126***	***5,054***	***22,232***	22,232	22,232

Note: "B" stands for the 2019 baseline survey, "E" stands for the 2023 endline survey, and "Diff(E-B)" stands for the difference between the endline and baseline values of the indicator. Significance tests of the difference of means (endline minus baseline) were conducted with significance levels as: * 10% significance, ** 5% significance, and ***1% significance.

NOTE: Program impact estimates obtained using difference-in-differences (DID) models among all observations in the baseline and endline surveys. All DID estimations control for individual woman's characteristics (age at birth, education, religion, parity), household's socioeconomic status in asset quintiles, and fixed effects at the district level. Robust standard errors were obtained by clustering at the cluster level and are shown in parentheses. * 10% significance, ** 5% significance,

Appendix B. Supplementary Figures

Figure S1: Difference in receiving any ANC among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates

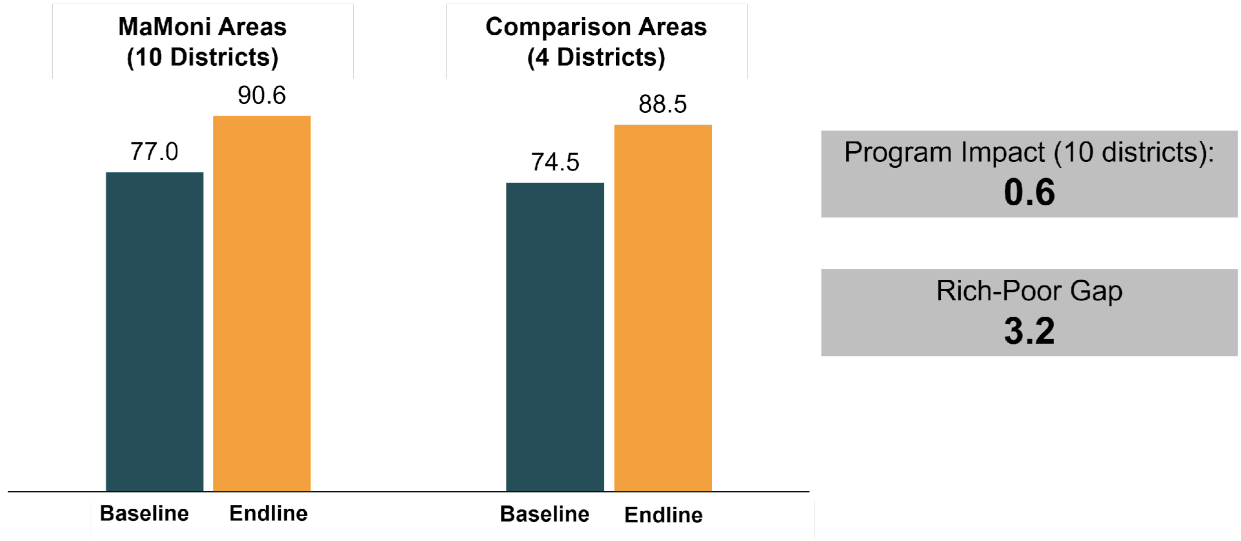


Figure S2: Difference in receiving any ANC among married women who had a live birth in the last 15 months preceding the survey in High Intensity and Low Intensity MaMoni areas versus comparison areas over time and DID impact estimates

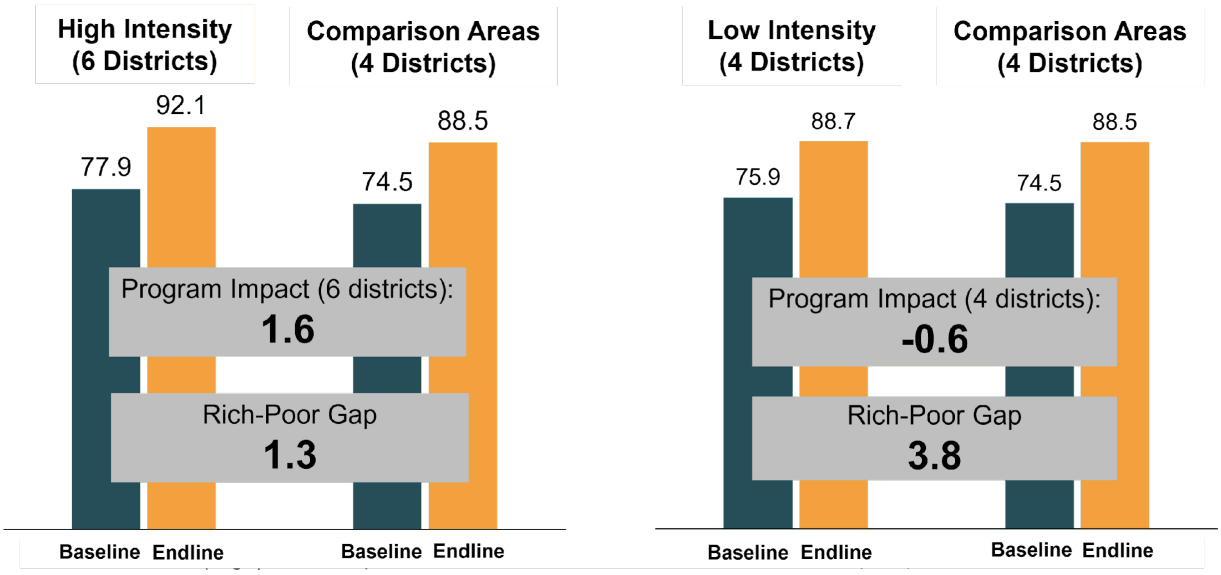


Figure S3: Difference in receiving at least one ANC from medically trained provider among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates

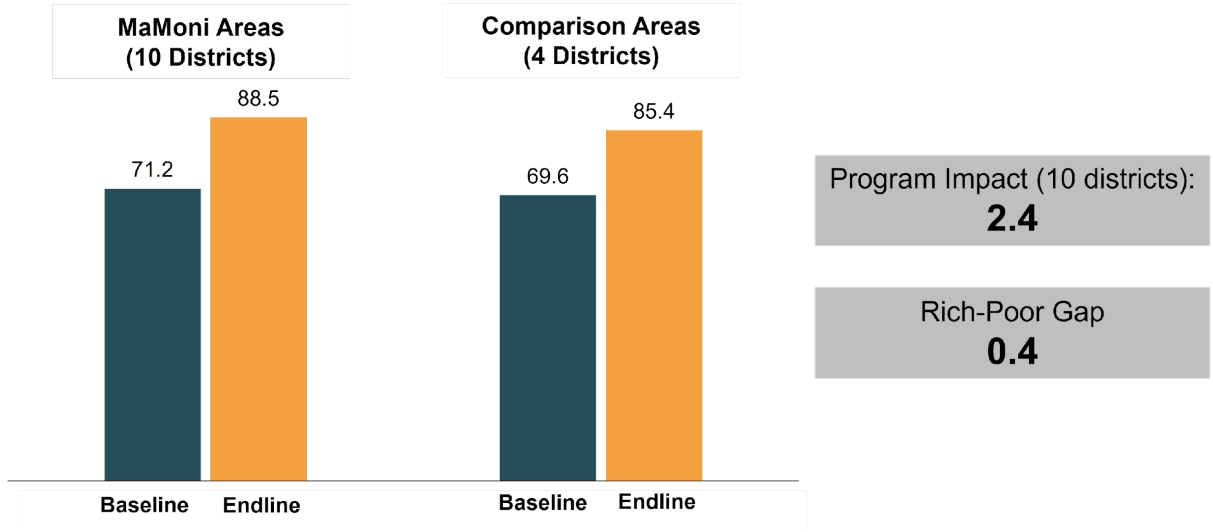


Figure S4: Difference in receiving at least one ANC from medically trained provider among married women who had a live birth in the last 15 months preceding the survey in High Intensity and Low Intensity MaMoni areas versus comparison areas over time and DID impact estimates

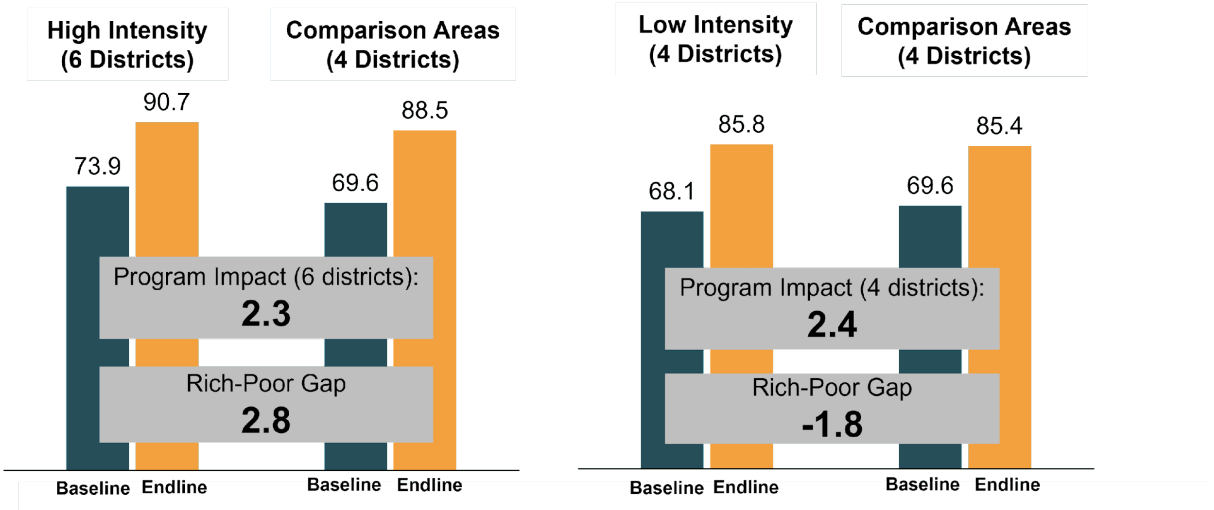


Figure S5: Difference in receiving all five components of ANC at least once among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates

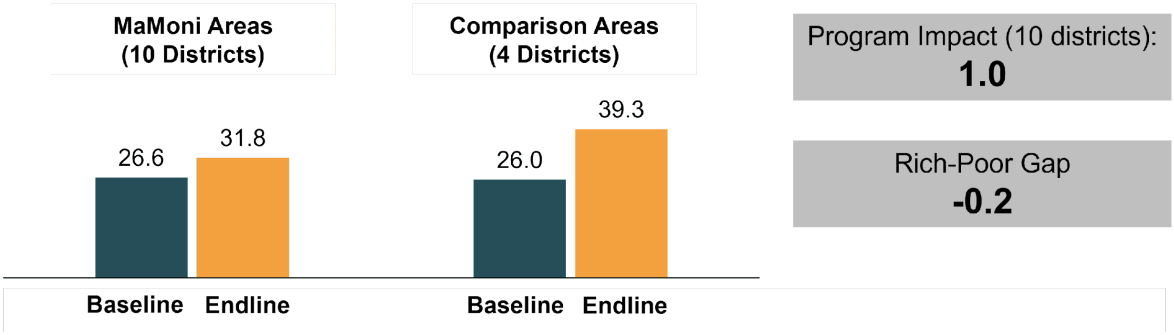


Figure S6: Difference in delivery at any health facility among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates

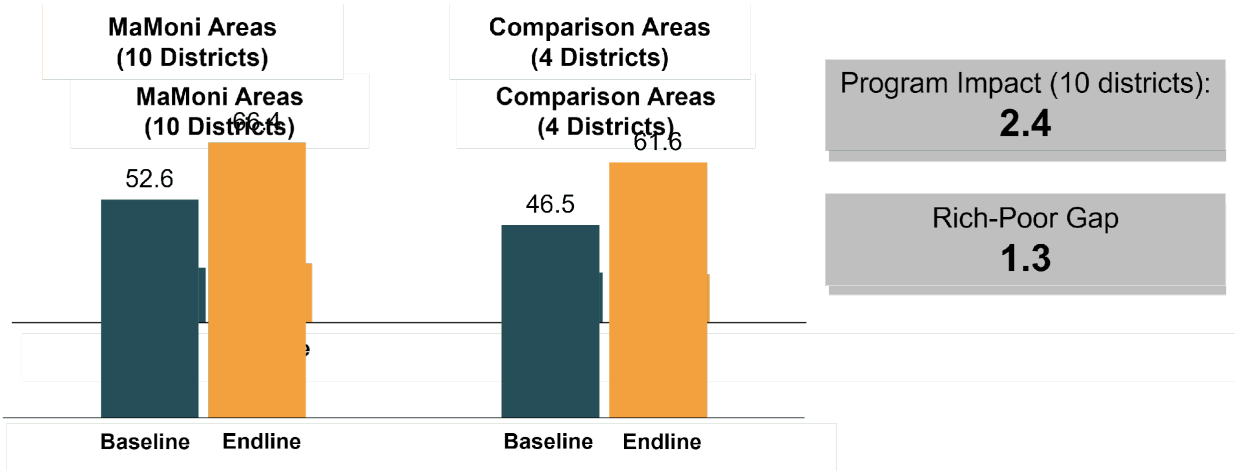


Figure S7: Difference in delivery at public facility among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates

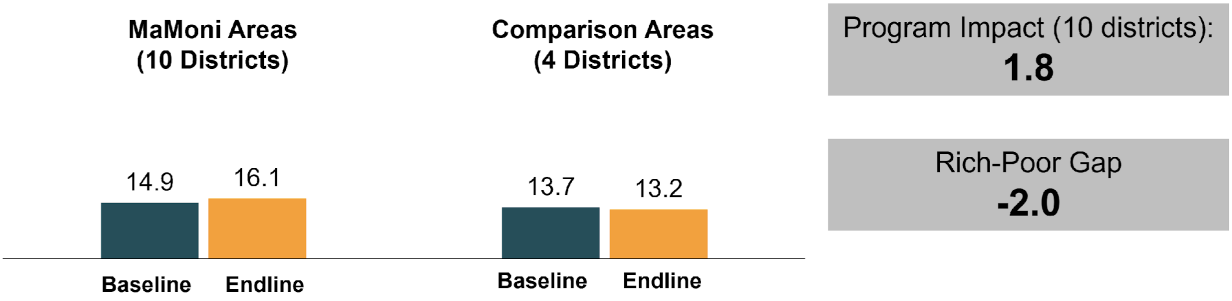


Figure S8: Difference in delivery by a skilled birth attendant among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates

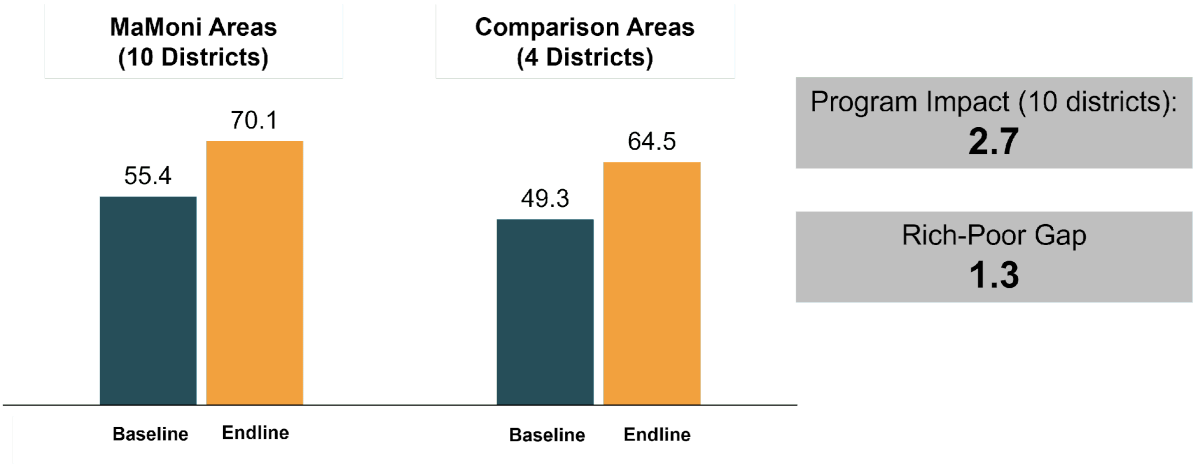


Figure S9: Difference in use of misoprostol in home deliveries married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates

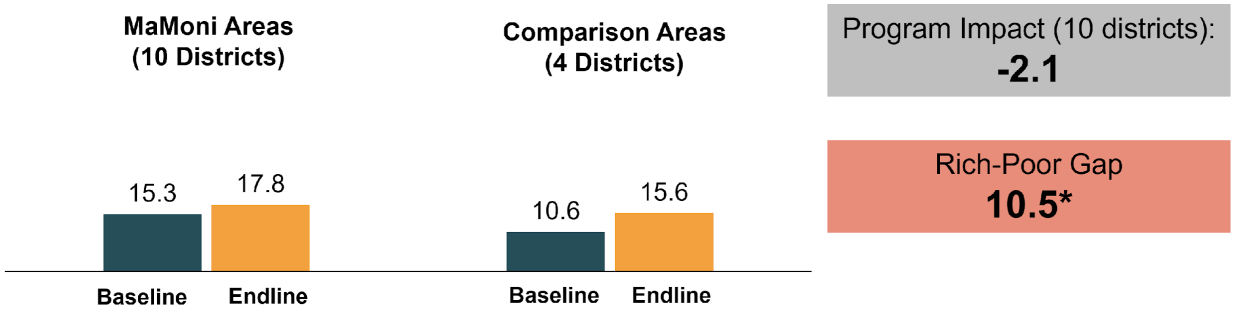


Figure S10: Difference in use of misoprostol in home deliveries married women who had a live birth in the last 15 months preceding the survey in High Intensity and Low Intensity MaMoni areas versus comparison areas over time and DID impact estimates

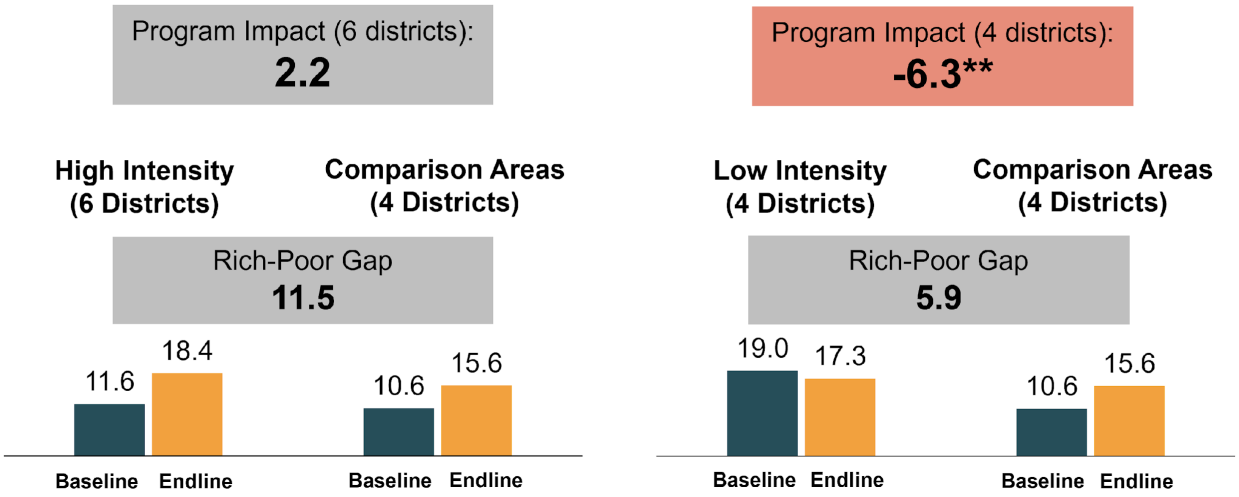
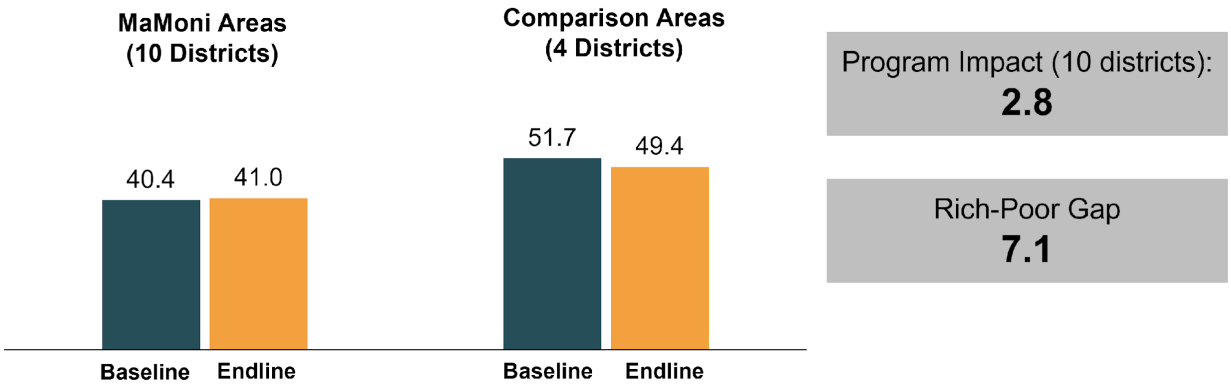
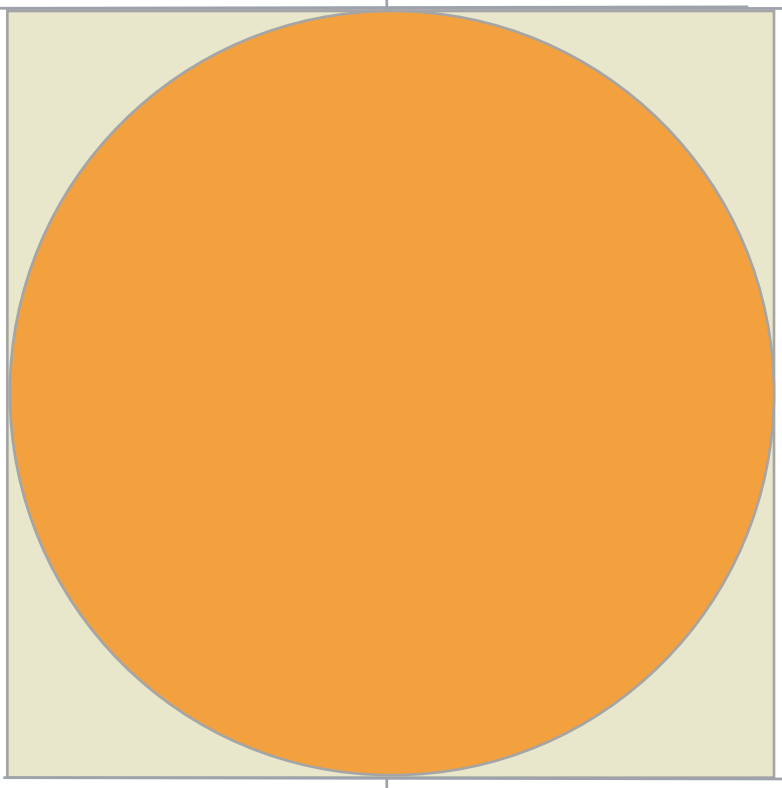


Figure SII: Difference in postpartum modern family planning among married women who had a live birth in the last 15 months preceding the survey in MaMoni versus comparison areas over time and DID impact estimates





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