

# **Maternal, Neonatal and Child Health in Selected Northern Districts of Bangladesh: Findings from Baseline Survey 2008**

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## ABBREVIATION

ANC	Antenatal Care
ARI	Acute Respiratory Infection
BCG	Bacillus Calmette-guerin
BDHS	Bangladesh Demographic Health Survey
BHP	BRAC Health Programme
BMRC	Bangladesh Medical Research Council
CSBA	Community Skilled Birth Attendant
DALY	Disability Adjusted Life Years
DED	Deputy Executive Director
DPT	Diphtheria Polio Tetanus
EmOC	Emergency Obstetric Care
ENC	Essential Newborn Care
FP	Family planning
FWA	Family Welfare Assistant
FWC	Family Welfare Center
FWV	Family Welfare Visitor
HPSP	Health and Population Sector Programme
IMR	Infant Mortality Rate
IUD	Intra-Uterine Death
IGVGD	Income Generation for Vulnerable Group Development
LBW	Low Birth Weight
MA	Medical Assistant
MCWC	Maternal and Child Welfare Center
MDG	Millennium Development Goal
MNCH	Maternal, Neonatal and Child Health
MR	Menstrual Regulation
NGO	Non-Governmental Organization
PO	Programme Organizer
PNC	Post-natal Care
RED	Research and Evaluation Division
SACMO	Sub-Assistant Community Medical Officer
SD	Standard Deviation
SK	<i>Shasthya Karmi</i>
SS	<i>Shasthya Shebika</i>
TBA	Traditional Birth Attendant
TT	Tetanus Toxoid
TTBA	Trained Traditional Birth Attendant
TUP	Targeting the Ultra Poor
UHC	<i>Upazila</i> Health Complex
WI	Wealth Index
WHO	World Health Organization



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## ABSTRACT

This population-based cross sectional survey was done in four maternal, neonatal and child health (MNCH) intervention districts (N=4,800 households) and two control districts (N=2,400 households). Data were collected from women identified as having a pregnancy outcome in the previous year or being mother of a child (12-59 months). Analysis focused on descriptive comparison between districts at baseline. Respondents reported the death of one or more children at different ages, the highest number of deaths occurring during the neonatal period. Sixty-six percent respondents in Nilphamari reported current use of a family planning method. Around 15% respondents reported having an abortion, and 3% reported one event of menstrual regulation which occurred mainly in the third month of pregnancy. Seventy-six percent respondents in Nilphamari had at least 4 antenatal visits compared to 18% in other districts. In Nilphamari, BRAC workers were the preferred provider. Regarding birth preparedness, respondents in Nilphamari were more likely to have saved money, bought a delivery kit, arranged emergency transport and pre-arranged an attendant. Respondents in Nilphamari were more likely than others to use skilled birth attendants (21% vs. 16%) for delivery and receive postnatal care from trained providers. In case of complications, majority sought treatment from informal sector due to cost, distance, lack of perceived need for formal provider, and disapproval from family members. Around 50% newborns in Nilphamari received essential newborn care compared to one-third elsewhere. Eighty-eight percent mothers in Nilphamari reported breastfeeding within one hour compared to 71% elsewhere. In all districts, around 10% respondents reported birth asphyxia and 19% neonatal sepsis. For both conditions, respondents in Nilphamari were less likely to seek help from qualified doctors. Around half of the respondents reported that their children under two months suffered from ARI. Results show that the pilot intervention in Nilphamari may have had an effect on MNCH knowledge and practices which can be validated once longitudinal data are available for the new intervention and control districts.

## EXECUTIVE SUMMARY

### INTRODUCTION

BRAC initiated a programme to promote maternal, neonatal and child health (MNCH) in selected districts of northern Bangladesh. These interventions are in addition to the three core BRAC programmes carried out in all districts of Bangladesh, namely micro-finance, health and education. The design of these new interventions has been guided by experience gained through a pilot phase of the research which began in 2006 in Nilphamari district. After an initial survey that provided baseline data, BRAC's Research and Evaluation Division (RED) embarked on a programme to field test new interventions. Data from the baseline survey were used to inform the planning and implementation of these pilot activities during 2007/2008 (Nasreen *et al.* 2007).

BRAC Health Programme (BHP) took a decision to scale up its MNCH interventions in three additional northern districts of Bangladesh, Mymensingh, Rangpur and Gaibandha during the latter part of 2008. The two neighbouring districts of Netrakona and Naogaon, in which no additional MNCH interventions are planned, were also included as control districts. The baseline survey of all the six districts has been completed. Analysis of the survey data allows BRAC to identify and evaluate changes that have occurred in Nilphamari district since 2006 and it provides for future monitoring and evaluation of the planned MNCH interventions.

### METHODS

The survey was cross-sectional, involving random selection at five levels: households within villages, villages within unions, unions within *upazilas* and *upazilas* within districts. Within each household the informant was identified as follows:

- Either, the mother of a young child aged <1 year or a child who had died within the last one year, or a women whose pregnancy was terminated by abortion, intra-uterine death (IUD) or still birth within the last one year.
- Or, a mother of a child aged 12-59 months.

Data were collected using a questionnaire adopted from that used in the recent demographic and health survey (DHS) of Bangladesh, and included socio-demographic characteristics of the household, and the respondent's knowledge and practice of family planning, maternal, neonatal and under-5 child healthcare.

Information on ante-partum, child-birth, post-partum and newborn care was obtained from mothers belonging to the first group. Mothers of the first group who had had abortions, intra-uterine deaths or whose babies had died were not asked about neonatal or child care. Mothers of

children aged 12-59 months were asked about children's immunization, vitamin A intake and their experience of under-5 illnesses and management. Further data were collected from the husbands of the chosen respondent. Health economic data were also collected from a randomly sampled subset of the households.

The sample size was calculated following multi-stage random sampling procedure where each district was considered as a cluster. To ensure the required level of precision in estimating key descriptive statistics, the required sample size was estimated at 1,200 per district, totaling 7,200 across the six districts - 4,800 from intervention and 2,400 from control districts.

Analysis to date has focused on describing and comparing differences between the districts at baseline. Some additional work has seen the development of a wealth index. The comparisons primarily fall under two headings, a comparison of Nilphamari with two years of ongoing interventions with the five new districts without any intervention to date, and a comparison between the three new intervention districts with the two new control districts. In each case, the focus has been on knowledge and practice of antenatal, safe delivery, postnatal, neonatal and child healthcare. Chi-squared tests and Student's t test have been used to assess the statistical significance of differences, if any. Further detailed analysis is planned.

## **KEY FINDINGS**

### **Socioeconomic profile of the respondents**

The mean age of respondents was 24 years in Nilphamari and 25 years in the new intervention and control districts (range 20-34 years). The literacy rate was 51% in intervention districts, 52% in control districts and 47% in Nilphamari. About one-third of the women in the three areas had no education whilst another one-third had some secondary education. There was no difference in mean years of schooling (four years). The proportion of women involved in income generating activities was 16.5% in the new intervention districts compared to 10.9% in Nilphamari and 11.5% in the new control districts ( $p < 0.001$ ).

BRAC membership was 15.8% in Nilphamari, 12.9% in the new intervention districts and 10.5% in the new control districts. Involvement in the Dabi project was most common. Involvement with another NGO ranged from 33.5 to 32.5%. Compared to new intervention districts and Nilphamari, respondents reported land ownership that was some 33% higher in control districts. However, no information is available about the quality of the land, for example, its liability to flooding or fertility. In all the three areas, some 34% of respondents reported at least one family member sought work as a manual labourer. The differences between districts were not statistically significant. Thirty percent of respondents in the new intervention and control districts came from families eligible for BRAC membership, 36.3% in Nilphamari. Across all the six districts, around 97.5% of heads of households were male. The average household size was 5.

In all districts tube-wells were the predominant source of water for drinking and cooking. Sanitary arrangements were highly variable with Nilphamari having the highest rate for water sealed and septic tanks (27.4%) but also the highest rate for no latrines (26%). The most common arrangement in all districts was broken water sealed latrines. Practice on hand-washing after defecation showed that using soap or ash to wash hands was most common, totaling 97.3% in Nilphamari compared to 80.1% elsewhere.

### **Wealth index**

The wealth index has been constructed based on the method used for national demographic and health surveys (DHS). This economic status index was developed and tested in a large number of countries and reflects differences in household income predictive of use of health services and a variety of health outcomes (Gwatkin *et al.* 2000). The index is calculated using a weighted sum of household assets. The resulting scores are then ranked and the sample divided into quintiles from one (poorest) to five (richest).

### **Reproductive history**

Respondents' median age of marriage was 15 years in Nilphamari and control districts and 16 years in intervention districts. Respondents in all districts reported the death of one or more children at different ages, the rates being lowest in Nilphamari. Of the child deaths, the highest number took place during the neonatal period.

### **Family planning**

Sixty-six percent respondents reported that they were currently using a family planning method in Nilphamari. Although higher than the national average of 56% (NIPORT, Mitra Associates, and Macro International Inc. 2007), this rate is consistent with the findings presented in research by Ahmed and Rana (2009) in northern part of Bangladesh. The numbers reporting the use of traditional as opposed to modern methods was very small (4.4% in Nilphamari and 6.5% in baseline districts).

### **Abortion and Menstrual Regulation (MR)**

Around 15% of respondents reported of having an abortion and 3% reported one event of menstrual regulation. Most commonly these occurred in the third month of pregnancy. In the event of complications, seeking treatment (if any) from the informal sector was most common in all areas (60.6% in Nilphamari and 57.2% in baseline districts).

### **Antenatal care**

Some 93% of the respondents in Nilphamari had received some form of antenatal care (ANC) from trained providers compared to 59.7% in other districts. In Nilphamari, BRAC workers were the preferred provider (88.5%). Elsewhere, help was sought equally from BRAC workers, family welfare visitors (FWV) or nurse/paramedics or qualified doctors. These preferences were reflected in the place in which help was provided, primarily in the home in Nilphamari and private or public facilities elsewhere.

### **Birth preparedness**

Some 98% of all respondents reported that they had made some form of preparation for the birth of their child. Those in Nilphamari were more likely to save money (74.8% vs. 52.1%), bought a delivery kit (50.2% vs. 10.4%), arranged emergency transport (74.4% vs. 9.9%), and determined an attendant (91.9% vs. 83.4%).

### **Delivery care**

Respondents in Nilphamari were more likely to call for help from trained providers (51.9% vs. 37.1) and skilled birth attendants (21.1% vs. 16.2%). Use of delivery kits was also much more widespread in Nilphamari, 52.3% compared to 11.4% elsewhere.

### **Postnatal care**

Here too, reported practice in Nilphamari differed dramatically from elsewhere. Over 70% of respondents reported receiving postnatal care (PNC) from trained providers compared to 17.0% elsewhere. More than 78% of the respondents in Nilphamari received at least one PNC visit whereas 75% of the respondents elsewhere received none.

### **Complications during ANC, Delivery and PNC periods**

The reported rate of complications during the antenatal phase was 37.3% in Nilphamari and 46% elsewhere, while complications during delivery were 30.3% in Nilphamari and 30.7% elsewhere, and during the postnatal period 27.4% in Nilphamari and 28% elsewhere. The primary factors for not seeking formal care were identified as cost, perceived lack of need, disapproval from family members, and distance.

### **Inequity in maternity care**

Our findings highlight the wide variation in antenatal, postnatal and safe delivery practices across the quintiles of the wealth index. These were most marked in the new districts and least in Nilphamari.

### **Care of the newborn**

Fifty-five percent of the newborns in Nilphamari received all essential newborn care (ENC). This compared to 33.0% elsewhere. However, for respondents in all districts, only 32% for normal weight babies and 14% for low birth weight babies reported correct bathing practices.

### **Newborn feeding**

Almost 88% of mothers in Nilphamari reported starting breastfeeding within one hour compared to 70.7% elsewhere. Exclusive breastfeeding was reported by 48.6% of respondents in Nilphamari and 31.3% elsewhere. Maintaining exclusive breastfeeding for at least six months was reported by 46.6% in Nilphamari and 31.3% elsewhere.

### **Neonatal illnesses**

In all districts some 10% of the respondents reported birth asphyxia and 19% reported neonatal sepsis. In both conditions, respondents in Nilphamari were less likely to seek help from qualified doctors.

### **Immunization coverage of under-5 children**

Immunization coverage was over 98% in all study districts. We found evidence that complete coverage was achieved earlier in Nilphamari. Immunization cards were more readily available for checking in Nilphamari.

### **Acute respiratory tract infection(ARI) in under-5 children**

In Nilphamari, 54.8% of the mothers reported that their under 2 children suffered from some form of ARI, compared to 48.2% elsewhere. The rates for older children (2-59 months) were 73.9% in Nilphamari and 71.8% elsewhere. In all districts, virtually all mothers (99%) had some knowledge of ARI. The most common symptoms were reported as running nose, cough and fever. Of five ARI danger signs, most respondents were able to identify no more than two.

### **Childhood diarrhoea**

The prevalence of diarrhoea in the three months before the interview was 13% in all districts. The most sought treatment was oral rehydration therapy in all the districts.

### **Other childhood illnesses and health-seeking behaviour of under-5 children**

Other than ARI and diarrhoea, fever (39-50%) was most common disease followed by dysentery (32-40%) and skin diseases (12-20%).

### **CONCLUSION**

Firstly, we note systematic differences between Nilphamari and the other districts now included in the study. These may be evidence that the pilot activities in Nilphamari have already had an effect on knowledge and practice. However, this conclusion can only be made once longitudinal data becomes available for the new intervention and control districts.

Secondly, we note a substantial number of differences between the districts. Other analysis not presented here suggests that such differences also exist within districts and indeed within *upazilas*). It may be that variables such as the wealth index will throw some light on these. There may be other covariates and confounded effects that are not represented in the data. Further analysis of the data will throw light on this. Also, contextual data on the field activities, accessibility and quality of government, NGO and private health services will help. BRAC has already started this process.

Thirdly, the summary statistics presented here may be used to guide the planning and management of the proposed MNCH interventions, so optimizing their impact.

Fourthly, the survey data set will support a number of further analyses that may replicate or extend published research findings relevant to the situation in Bangladesh.

## Introduction

Every year, 200 million women become pregnant worldwide. Although most pregnancies of healthy mothers end with the birth of a live baby, on many occasions childbirth is a time of complications and even death (Khanum *et al.* 2000). Each year globally more than half a million women die from pregnancy related complications (Ronsmans and Graham 2006), four million neonates die (Lawn *et al.* 2005), and 10 million children die under the age of five (WHO 2003). Maternal death and disability are the leading cause of healthy life years lost for women of reproductive age in developing countries, accounting for more than 28 million disability-adjusted life years (DALYs) lost and at least 18% of the burden of disease in these women (World Bank 1993).

More than 90% of the said maternal, neonatal and under-5 child mortality occurs in developing countries. The risk of dying from pregnancy-related complications is highest in sub-Saharan Africa and in South-central Asia. A mother's death carries profound consequences on child survival. In some developing countries, if the mother dies, the risk of death for her under-5 children is doubled or tripled (UNICEF 2007). A child born in a least developed country is almost 14 times more likely to die during the first 28 days of life than one born in an industrialized country (UNICEF 2007). Gains in child survival have continued in rich industrialized nations, where levels of mortality are already low (WHO 2003). The reduction in child mortality has been particularly compelling in certain countries of the Eastern Mediterranean and South-East Asia and Latin America, while that of African countries was more modest.

In Bangladesh, the levels of maternal, neonatal and child mortality and morbidity are unacceptably high compared to other developing countries, with persisting socioeconomic differentials. At present, around 12,000 maternal, 120,000 neonatal and 244,000 under-5 child deaths take place each year (NIPORT, Mitra Associates and Macro International Inc. 2007; UNICEF 2007). Bangladesh is also a poor performer with respect to skilled attendance at birth and essential obstetric care (NIPORT, ORC Macro, John Hopkins University, ICDDR,B 2003). Whatever government health facilities are available at various levels, these are not adequately utilized. Despite slight improvement in the situation over the last decade, the contribution of neonatal mortality in the infant mortality rate has remained almost static during the period. Around 60% of the infant deaths had been among the neonates since late 1980s and this proportion has remained the same in subsequent 10 years (NIPORT, Mitra Associates and Macro International Inc. 2007). However, under-5 mortality has been declining notably. Acute respiratory infection (ARI), diarrhoea, malnutrition, and measles are the common causes for this death (NIPORT, Mitra Associates and Macro International Inc. 2007).



The Government of Bangladesh set its goal to improve reproductive health as per the provision of the Millennium Development Goals (MDG) and is committed to fulfilling this goal by the year 2015. In 2001 it launched the much awaited National Strategy for Maternal Health, aiming at reducing the national maternal mortality ratio (MMR) by focusing on emergency obstetric care (EmOC). The core intervention was taken on the basis of famous “three delays” framework. However, this national plan overlooked the welfare of the newborn and under-5 children (Tinker and Ransom 2002). Recent trends in MMR, the infant mortality rates (IMR) and under five mortality rates suggest that these are declining at a slower pace than had been hoped. The government has now updated its National Health and Population Sector Programme (NHPS) of 1998-2003 with a new implementation plan for 2003-2006 in which it identified maternal, neonatal and child health among five priority areas of Health, Nutrition and Population Sector Programme (HNPS). This allows various players in reproductive health to concentrate on these issues.

Keeping pace with national strategies and MDG targets, BRAC, the largest non-governmental organization (NGO) in Bangladesh, sought to build on more than 30 years of experience in health interventions by launching a comprehensive 5-year maternal, neonatal and child health (MNCH) programme for rural population.

Pilot work for this project began in Nilphamari district in August 2005. The Research and Evaluation Division (RED) of BRAC carried out a baseline survey in Nilphamari in 2006 (Nasreen *et al.* 2007) which provided benchmark information of maternal, neonatal and child health to build the strategies and approaches of intervention and for future evaluation of the project. This revealed limited knowledge of pregnancy-related risks, pregnancy care, delivery care and neonatal care and related practices which urgently need to be addressed. While the rates for immunization coverage and vitamin A intake are satisfactory, many the rates for many other key indicators, for example, tetanus vaccination for pregnant women, are far from satisfactory level.

In 2008 BRAC Health Programme (BHP) decided to scale up its rural MNCH activities in three further districts of northern Bangladesh – Mymensingh, Rangpur and Gaibandha. Two more districts where no MNCH interventions are planned were also identified as control districts, namely Naogaon and Netrakona. The baseline survey in these new districts plus an identical survey in Nilphamari was completed in December 2008. Analysis of this data provides information on the three new intervention districts and two control districts and adds to the available information on the situation in Nilphamari. This will help BRAC to further develop its MNCH interventions. It also provides a baseline for future evaluation of these interventions.

## **OBJECTIVES**

The core objective of the 2008 survey was to describe current knowledge and practice relating to MNCH in Nilphamari and the new intervention and control districts, the specific objectives being as follows:

1. Understand the existing status of women’s knowledge and practices including maternal (ante, intra and postnatal), neonatal and under-5 child healthcare;
2. Explore the state of abortion, complication and management;
3. Assess the prevalence of maternal, neonatal and under-5 child complications;
4. Examine healthcare utilization for maternal, neonatal and under-5 child health complications; and
5. Explore current referral networks for MNCH services.

**Improving maternal, neonatal and child survival: a partnership approach to achieve millennium development goals in Bangladesh**

BRAC first launched its maternal, neonatal and child health (MNCH) initiative in Nilphamari district in August 2005. The programme promotes an integrated service approach and community-based solutions to MNCH problems. It is based on the model addressing three delays with effective proven interventions tested elsewhere. The major interventions were designed towards capacity development of community health human resources, empowerment of women and support groups, provision of MNCH services and development of referral linkages with nearby health facilities. The different cadres of community health workers, *shasthya shebika* (SS) and *shasthya karmi* (SK) in particular are responsible for delivering the services to the community.

- *Capacity development:* All BRAC staff implementing MNCH activities are provided with required trainings which are updated through regular refresher trainings. The SS and SKs receive basic training on maternal neonatal and child health management whereas birth attendants receive training on clean delivery, basic management and referral.
- *Empowerment of women and support groups:* Communities are empowered through social mobilisation and advocacy conducted by BRAC programme organizers (PO), assisted by SKs and SSs. They catalyze discussions on best practice in MNCH, carefully contextualised for different groups, which include pregnant and lactating women, mothers with under-5 children, newly wed women and men, community health workers, unqualified healthcare providers and druggsellers.
- *Delivering services and strengthening demand in the community:* During household visits SKs and SSs are responsible for educating and mobilizing women for family planning, early pregnancy identification and antenatal care, mobilizing women for safe delivery using trained birth attendants, and providing postnatal and neonatal care. The health workers also measure weight of newborn, closely monitor low birth weight babies and provide basic treatment including referral for birth asphxia and neonatal sepsis.
- *Referral and establishing a continuum of MNCH care:* The community health workers are responsible for detecting and referring MNCH emergencies and contacting the POs responsible for referral by mobile phone and issuing a referral slip with a brief description of danger signs and any treatment given. At the same time, they mobilize family members and emergency health committee members to help arrange emergency transport, typically using local drivers pre-selected by the committee. The health workers also accompany the referred person to the appropriate facility. At the facility, the BRAC referral PO arranges immediate care by the doctors and nurses. BRAC health staff and SKs follow up referred cases at the facilities and SSs follow them up at households after their return.

The Nilphamari experience was used develop two new projects in urban and rural areas. The rural one, Improving Maternal, Neonatal and Child Survival (rural) project, was scaled up to Rangpur, Gaibandha and Mymensingh districts starting in February 2008. Thereafter, it is to be expanded to six more districts.

Chapter **2**

# Methods

## STUDY SETTING

The survey was conducted in four districts of Bangladesh. These were Nilphamari, where the pilot MNCH programme started its operation in 2006, and Gaibandha, Rangpur, Mymensingh, where the programme wants to scale up MNCH operations. These are the intervention districts. Two control districts, Naogaon and Netrakona, were also included in the survey (Figure 2.1).

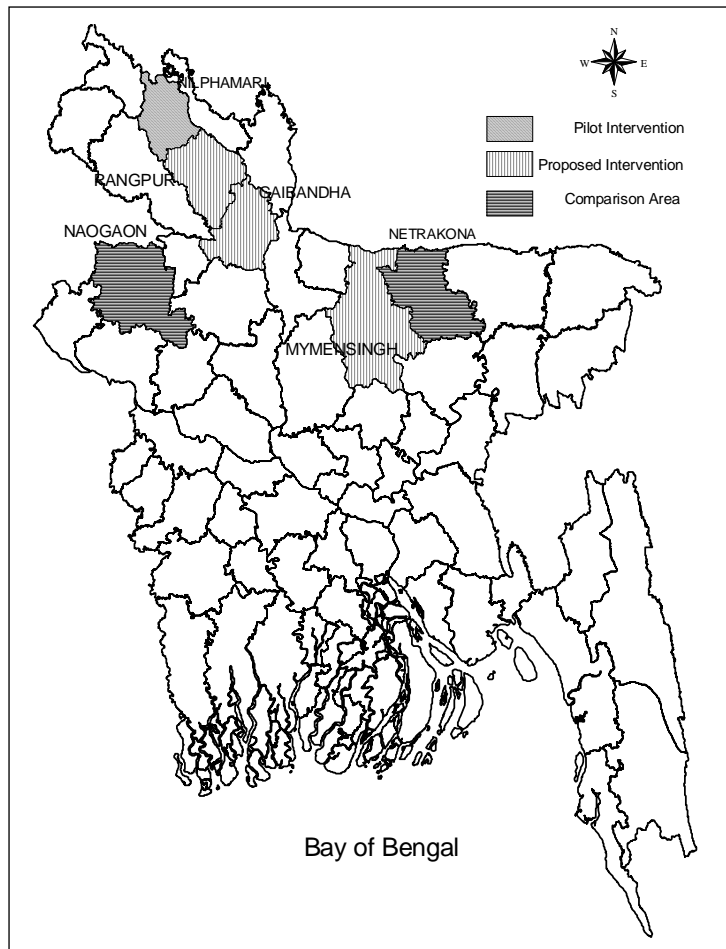
BRAC is active in all these districts supporting its core programmes of micro-finance, health and education. Typical activities include providing beneficiaries with education and skill development training together with social awareness campaigns and a microfinance programme supporting income generating activities.

The new MNCH intervention is being implemented in Nilphamari and will be scaled up to Gaibandha, Rangpur and Mymensingh. No additional MNCH programme will be implemented in Naogaon or Netrakona.

## SAMPLING

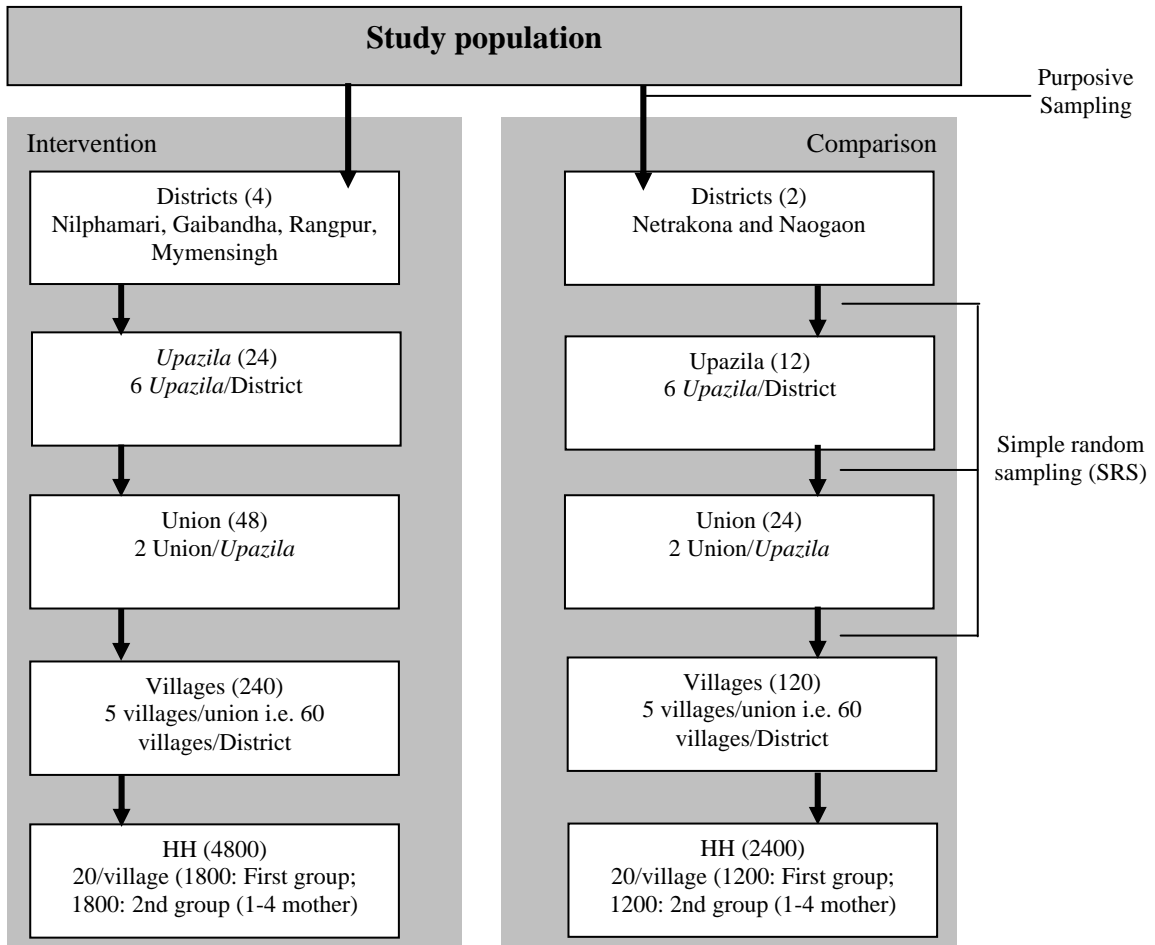
The sampling procedure is summarized in Figure 2.2. At first, six *upazilas* were randomly selected from each district. From each *upazila* two unions were randomly selected and in turn

Figure 2.1 Map of survey areas



from each union five villages were randomly chosen. Household listings of each village were then prepared and used to draw a random sample of 20 households. In villages with more than 1000 households, *paras* were randomly selected to represent the village. Finally, female respondents from each household were identified as falling into one of the two groups, either having a pregnancy outcome in the past year or having a youngest child in the age range 12-59 months.

**Figure 2.2. Summary of the sampling process and resulting sample size**



Overall, within the six districts the sampling process identified 24 *upazilas*, 72 unions, 360 villages and 7,200 respondents- 4,800 from intervention districts and 2,400 from control districts.

**STUDY POPULATION AND SAMPLE SIZE**

The survey focused on the experiences of two groups of community-based married women of reproductive age (15-49 years). The group including mothers with a pregnancy outcome in the past year, defined as having a living child aged less than 1 year or giving birth to a child within the last year who had subsequently died or who had a pregnancy terminated by abortion, intra-uterine death (IUD) or still birth in the last year. The second group included mothers of a youngest child aged 12-59 months.

Calculation of the required sample size was based on the multi-stage random sampling procedure. Each district was considered as a cluster. For 80% power, 5% level of statistical significance, design effect of 1.5, and non-response rate of 3% the required sample size was calculated as 594 in each of the two groups of women in each district. This was rounded up to 600 per group per district giving a total of 1,200 respondents per district, a total of 4,800 from intervention districts and 2,400 from the control districts (Figure 1.2). Where respondents declined to participate, a replacement household was selected at random, ensuring that the full sample size was achieved.

## **SURVEY DESIGN**

Central to the methodology has been a cross-sectional survey involving random selection of households within villages, unions and *upazilas* in each of six districts. The data requirement was identified from the project's log frame. The design of the survey questionnaire was based on that used for the 2007 DHS Survey (NIPORT, Mitra Associates, and Macro International Inc. 2007) and was further developed during a series of meetings between Ipact and MNCH programme personnel. The questionnaire was used to collect information on the following topics:

- Background characteristics, including age, education, occupation, religion, NGO involvement, husband's background characteristics
- Household characteristics including main material for floor, roof, walls, household assets, sanitation and drinking water facility
- Reproductive history including age at marriage and conception, number of children given birth to, child deaths and age at death
- Use of family planning methods
- Maternity care including antenatal, delivery and postnatal care
- Antenatal, delivery, postnatal complications and treatment-seeking behaviour
- Newborn care, complications and their treatment-seeking behaviour
- Vaccinations and childhood illnesses and treatment-seeking behaviour

Information on ante-partum, child-birth, post-partum and newborn care was obtained from mothers belonging to the group of respondents with a pregnancy outcome in the last 12 months. Mothers who have had abortions, IUDs or whose babies had died were not asked about neonatal or child care. Mothers of children aged 12-59 months were asked about children's immunization, vitamin A intake, and their experience of under-5 illnesses and management.

## **STUDY VARIABLES**

The key variables which feature in the findings are summarized as follows.

- **Demographic and socioeconomic status.** Age, literacy, wealth status, involvement in income generating activities, land ownership by the household.
- **Knowledge, practice and decision-making relating to family planning.** Current use of family planning (FP), sources of FP methods, side effects and their management.
- **Reproductive history.** Respondents' age at marriage and at first conception, number of live births, history of child deaths and age of child at death.

- **Antenatal care (ANC).** The number and timing of ANC visits, sources of antenatal check-ups, services received, birth preparedness, complications faced (reported) and resulting management and referral.
- **Delivery care.** Delivery attended by trained birth attendants and cord cutting practices. Complications experienced and resulting help-seeking actions and their outcomes.
- **Postnatal care (PNC).** The number and timing of postnatal check-ups and their sources. Complications faced, their management and outcome.
- **Newborn care.** Essential new born care (ENC), thermal care, initiation of breastfeeding within one hour, newborn feedings, neonatal illness, management and referrals. Management of low birth weight (LBW) babies. Management and outcome of complications included birth asphyxia and neonatal sepsis.
- **Under-5 child care.** Completed immunization against polio, diphtheria, tetanus, tuberculosis, measles and hepatitis-B. Vitamin A consumption on a set campaign day. Recognition of childhood illnesses and their management. Children's nutritional status (stunting, wasting and underweight).
- **Wealth index.** These are commonly used to draw attention to inequities in household income and the association with problems of access to health services and health-related outcomes (Gwatkin *et al.* 2000). The index we developed is similar to that used in the DHS survey. We used data on household assets and characteristics of the house (source of drinking water, sanitation facilities and type of material used for flooring, roof and walls). To form the index we recoded these variables into dichotomous form and used principal components analysis (PCA) (Rustein and Johnson 2004). Each variable was then assigned a weight based on its loading in the first general factor identified in PCA. The resulting score for each household was standardized with a mean of zero and standard deviation of one (Gwatkin *et al.* 2000). Households were then ranked and assigned a score in the range of one to five, those in the first quintile assigned a score of one, those in the second quintile assigned a score of two, etc. A one score identifies the poorest households and a five score identifies the richest households.

Although inequalities in health are widespread within countries, rich and poor alike, from an ethical and human rights perspective, narrowing avoidable disparities in health is imperative (Wirth *et al.* 2006). One of the objectives of the MNCH programme is to provide services to all sectors of the population, with particular emphasis on the poor. We, therefore, developed a wealth index and used it to compare the antenatal, safe delivery and postnatal status of respondents across the five wealth-related groups defined as described above.

- **Trained providers for ANC and PNC** include qualified doctors, nurses, midwives, family welfare visitors (FWV), medical assistants (MA) or sub-assistant community medical officer (SACMO) and BRAC *shasthya karmi* (SK).
- **Trained providers for delivery** include skilled birth attendants (doctors, nurses, paramedics, midwives, FWVs and trained traditional birth attendants (TTBA).

Outcomes of interest include the following:

- Seeking ANC care from a trained provider
- Safe delivery care from a trained provider

- Seeking PNC care from a trained provider
- Providing essential newborn care
- Seeking care from a trained provider for newborn illnesses
- Prevalence of ARI or diarrhoea

## DATA COLLECTION AND QUALITY CONTROL

The 2008 MNCH baseline survey questionnaire was pre-tested in October 2008. Six female educated interviewers received a six-day training following which they went to Gazipur to pretest the questionnaire. The questionnaire was revised based upon feedback received in the field test. Seventy enumerators and six monitors were recruited for household listing and survey. A 10 day training for the baseline survey was conducted which consisted of lectures and role play to facilitate interview skills. Towards the end of the training course, the participants spent two days in field practice followed by review and evaluation. The data were collected during October 2008 and January 2009. The enumerators were divided into 18 groups with four members in each group. Within the four members, one was selected to be a team leader. The six monitors took responsibility of three groups each. The assignment for each group was to complete 12-16 questionnaires per day. The total numbers of respondent surveyed across the six districts is summarized in Table 2.1

**Table 2.1. Number of respondents in the survey**

	Pilot intervention (Nilphamari) N=1200	New intervention districts N=3600	Control districts N=2400
Mother who had an outcome in the past year			
• Mothers of living child aged up to 12 months	511	1484	984
• Mothers with live birth in last year whose child since died	28	69	42
• Mothers whose pregnancy was terminated by abortion/MR/IUD/stillbirth	61	247	174
Mothers of children aged 13-60 months	600	1800	1200

To ensure the quality of data collection, a four-layered monitoring system was developed for each district. The first layer was composed of team leaders who monitored the activities of their respective teams. Their work in turn was cross-checked by the six rotating monitors who interchanged their places at required intervals. Moreover, the whole field activities were controlled and monitored by a field supervisor. Lastly, the researchers at the head office monitored field activities through field visits at regular intervals.

## DATA PROCESSING AND ANALYSIS

All questionnaires were returned to Dhaka for data processing at BRAC head office. Processing included coding of open-ended questions, data entry, and checking inconsistencies found by the computer programme.

Data were analyzed using SPSS version 11. New variables were generated to summarize responses to multiple choice questions, to combine responses to multiple questions and for any required recoding. The bulk of the analysis reported here involved calculation of summary

statistics used in comparing grouped districts. Independent t-tests were used to assess differences between means. The chi-square test was used to assess categorical differences between grouped districts. We also computed a wealth index and identified risk factors for the outcome variables listed above.

#### **ETHICAL APPROVAL**

Ethical approval for impact evaluation was obtained from Bangladesh Medical Research Council (BMRC). Verbal consent was also taken from the participants before every interview.



## Comparison of socio-demographic status across six districts at baseline

This chapter presents information on demographic and socioeconomic characteristics of survey respondents and their husbands including age, religion, educational attainment, employment status and involvement in NGO activities including BRAC. The chapter also describes condition of the households including type of house, water sources, sanitation arrangements, availability of electricity, household assets and ownership of land. The differences in wealth between districts have been identified using an indicator of the household economic status, the wealth index.

### CHARACTERISTICS OF SURVEY RESPONDENTS

The mean age of respondents was 24 years in Nilphamari and 25 years in the other districts. Age ranged from 20 to 34 years (Table 3.1). Respondents in all the areas were predominantly Muslim and currently married (99%). Nilphamari, however, had the largest Hindu minority. Literacy rates of respondents were 51.4% in the new intervention and control districts compared to 47.5% in Nilphamari. In all districts approximately one-third of the women had no education while 28 to 30% had secondary education. There were no differences between districts in mean years of schooling, which averaged just above four years.

The proportion of respondents involved in income generating activities was low in Nilphamari, 10.9% compared to 14.7% ( $p<0.001$ ) in the five other districts. The most common income generating activities were day labour, small businesses and poultry rearing. BRAC membership was highest in Nilphamari (15.8%) compared to 11.9% ( $p<0.001$ ) elsewhere. Respondents in all the areas were primarily involved with the *Dabi* programme. One-third of all the respondents were also members of other NGOs.

Land ownership was highest in the control areas compared to the new intervention districts ( $p<0.001$ ). However, no information is available on the quality of the land. The percentage of households eligible for BRAC membership was highest in Nilphamari (36.3%) compared to 30.6% elsewhere ( $p<0.001$ ).

**Table 3.1. Social and demographic characteristics of respondents (percentages)**

Characteristics	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value	Baseline intervention districts	Baseline control districts	p-value
N	1200	6000		3600	2400	
Age						
≤19 years	17.7	14.2	.000	13.8	14.8	.264
20 – 34 years	76.0	76.9		76.9	76.8	
≥35 years	6.3	9.0		9.4	8.4	
Mean age (SD)	24.39(5.39)	25.53(5.92)	.000	25.73(5.97)	25.23(5.84)	.001
Religion						
Muslim	75.7	92.7	.000	95.2	88.9	.000
Others	24.3	7.3		4.8	11.1	
Marital status						
Married	98.9	98.9	1.000	98.9	99.0	.611
Others	1.1	1.1		1.1	1.0	
(Divorced/separated/widow)						
Literacy						
Can read and write	47.5	51.4	.013	50.8	52.4	.225
Educational status						
No education	35.0	34.3	.246	34.6	33.9	.013
Primary incomplete	17.7	17.2		17.0	17.5	
Primary	11.3	13.1		12.1	14.5	
Secondary incomplete	30.5	28.8		29.0	28.5	
Secondary or higher	5.6	6.6		7.3	5.6	
Mean years of schooling (SD)	4.03(3.67)	4.12(3.70)	.428	4.16(3.76)	4.06 (3.61)	.290
Involved in income earning						
Yes	10.9	14.7	.001	16.5	11.5	.000
No	89.1	85.3		83.1	88.5	
Main occupation						
Housewife	93.4	95.6	.000	96.2	94.6	.001
Business	1.4	1.0		0.8	1.5	
Service	0.9	0.9		0.9	0.9	
Day labourer	3.3	1.0		0.7	1.6	
Skilled labour	0.8	0.4		0.3	0.5	
Poultry rearing	-	1.0		1.1	1.0	
Others	0.1	0.1		.1	0.0	
Member of other NGO	33.4	33.1	.823	33.5	32.5	.401
Amount of Land						
None	1.3	4.9	.000	6.0	3.2	.000
Less than 50 decimal	69.3	60.5		63.3	56.2	
Greater than 50 decimal	29.3	34.7		30.7	40.6	
Sells labour						
Yes	38.2	33.7	.003	33.1	34.6	.228
BRAC eligible						
Yes	36.3	30.6	.000	30.4	30.8	.714
BRAC membership	15.8	11.9	.000	12.9	10.5	.007
Number of group members	189	716		463	253	
Group type*						
TUP	7.4	5.3	.002	1.9	11.5	.000
IGVGD	0	.7		.2	1.6	
Dabi	83.1	71.2		74.7	64.8	
Unnoti	7.9	20.1		20.7	19.0	
Progoti	1.1	1.3		1.3	1.2	
Don't know	.5	1.4		1.1	2.0	

\*TUP- Targeting the ultra poor programme, *Dabi*-Poverty alleviation for poor landless women, *Unnoti*- Micro enterprise development for marginal farmers, *Progoti*-Small enterprise development for businesses, IGVGD-Income generation for vulnerable group development.

## CHARACTERISTICS OF RESPONDENTS' HUSBANDS

The mean age of husbands were 31.9 years in Nilphamari and 33.4 years elsewhere ( $p < 0.001$ ), some seven years older than their wives. The literacy rate of the husbands was around 42-45.0% in all districts, with husbands having a mean of 3.5 to 3.75 years of schooling. Both of these are less than the equivalent rates for the wives. Virtually all the husbands were earning an income during the time of interview, most commonly through farming or day labour. There were statistically significant differences between districts in sources of income.

**Table 3. 2. Social and demographic characteristics of husbands (percentages)**

Characteristics	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value	Baseline intervention districts	Baseline control districts	p-value
N	1,200	6,000		3,600	4,800	
Husband's Age						
$\leq 25$ years	15.5	14.2	.000	14.0	14.5	.884
26 –40 years	75.4	71.7		71.8	71.6	
$\geq 41$ years	9.1	14.1		14.2	13.9	
Mean age (SD)	31.9 (6.53)	33.4(7.36)	.000	33.4 (7.36)	33.3 (7.36)	.460
Literacy						
Can read and write	42.6	45.0	.129	44.8	45.3	.679
Educational status						
No education	44.5	46.5	.000	47.0	45.8	.049
Primary incomplete	16.1	11.3		11.1	11.6	
Primary	12.5	11.8		11.4	12.5	
Secondary incomplete	16.6	17.4		16.8	18.3	
Secondary or higher	10.3	12.1		12.7	11.1	
Don't know	0.1	0.9		1.1	0.6	
Mean years of schooling (SD)	3.56(4.09)	3.74(4.29)	.161	3.75(4.34)	3.73(4.23)	.837
Main occupation						
Farmer	24.0	24.9	.000	21.9	29.3	.000
Other income generating	1.2	1.5		0.9	2.2	
Small business	16.5	17.9		20.2	14.6	
Day labourers	46.6	39.1		39.5	38.6	
Professional	5.5	5.9		5.5	6.5	
Driver (rickshaw/van)	1.7	1.4		1.4	1.5	
Service	4.8	8.2		9.4	6.5	
Others	0.7	1.0		1.2	0.7	

## HOUSEHOLD CHARACTERISTICS

Majority of the households (97%) were headed by men (Table 3.3). The average household size was little over five, slightly lower in the new intervention districts ( $p < 0.05$ ) which also had the highest rate for extended families ( $p < 0.001$ ).

Tube wells were the predominant source of both drinking and cooking water in all the districts. Overall broken water sealed latrines were most common sanitation system in the survey districts. The percentages of households with a improved sanitation facility (water sealed and septic tanks) was, however, highest in Nilphamari (27.4.%) compared to 21.5% elsewhere ( $p < 0.001$ ). Practices of hand washing after defecation revealed that soap and ash were widely used with the rates being highest in Nilphamari ( $p < 0.001$ ).

**Table 3. 3. Household characteristics (percentages)**

Characteristics	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value	Baseline intervention districts	Baseline control districts	p-value
N	1,200	6,000		3,600	2,400	
Sex of household head						
- Male	98.3	97.3	.056	97.2	97.5	0.537
- Female	1.8	2.7		2.8	2.5	
Mean household size (SD)	5.10(2.04)	5.04 (1.98)	.063	4.99(1.95)	5.12(2.03)	.013
Type of family	67.0	68.8	.234	71.9	64.1	.000
- Nuclear	33.0	31.3		28.1	35.9	
- Extended						
Principal type of drinking water						
- Tube well	97.9	98.4	.253	98.5	98.2	.277
- Others	2.1	1.6		1.5	1.8	
Principal type of cooking water	97.3	97.1	.824	97.9	95.9	.000
- Tube well	2.8	2.9		2.1	4.1	
- Others						
Sanitation facility	27.4	21.5	.000	20.8	22.6	.109
- Sanitary (Water seal and septic tank)	34.8	38.6		43.1	31.8	.000
- Broken water seal	11.8	19.2		15.4	25.0	
- Open/pit/hanging	26.1	20.7		20.7	20.6	
- No latrine						
Hand washing after defecation						
- Soap	56.3	47.1	.000	45.2	49.8	.000
- Ash	41.0	33.0		36.9	27.0	
- Mud	2.3	18.8		16.8	21.8	
- Others(water, tube well water, does not wash hand)	0.5	1.2		1.0	1.4	

## WEALTH INDEX

The method used to develop the wealth index is described in Chapter 2. The analysis presented here is based on data from all six districts. The factor scores and their summary statistics are shown in Table 3.4. The percentage of the variance explained by the first principal component is 20%.

From Table 3.5 it is apparent that there are important differences in wealth between districts. Netrakona has proportionally more households in the poorest quintile and fewer in the richest (32.3% and 13.6% respectively), suggesting that this district is poorer than the others. In contrast, Naogaon has relatively fewer households in the poorest quintile and relatively more in the richest (13.8% and 27.5% respectively), suggesting it is richer than the other districts.

**Table 3.4. Summary statistics for variables in the wealth index**

	Mean	Std. Deviation	Factor scores
Has electricity	.2764	.44724	.575
Household assets			
Owns radio	.1263	.33215	.361
Owns television	.2076	.40564	.667
Owns bicycle	.3060	.46085	.521
Owns telephone/mobile	.2892	.45341	.667
Owns refrigerator	.0128	.11232	.255
Owns almira/wardrobe	.3715	.48325	.687
Owns table	.7222	.44793	.590
Owns chair	.7026	.45713	.598
Owns watch/clock	.5264	.49934	.648
Owns sewing machine	.0481	.21390	.179
Owns motor cycle	.0292	.16829	.380
Owns boat/troller	.0022	.04709	.054
Owns rickshaw/van	.0989	.29853	-.120
Main floor material			
Cement/concrete	.0503	.21853	.478
Main roof material			
Tin	.9193	.27238	.237
Concrete/cement	.0053	.07246	.158
Main wall material			
Cement/brick	.1024	.30314	.515
Tin/wood	.2896	.45360	.118
Drinking water			
Tubewell	.9910	.09459	-.015
Sanitation facility			
Pit/open/hanging	.1796	.38387	-.262
Modern toilet	.6046	.48897	.457

**Table 3.5. Distribution of wealth index by district for all 7,200 respondents (percentages)**

District	Wealth quintile				
	Poorest	Second	Middle	Fourth	Richest
Nilphamari	19.5(234)	24.3(292)	20.2(266)	17.4(209)	16.6(199)
Rangpur	16.0(192)	20.2(242)	21.3(255)	19.8(238)	22.8(273)
Mymensingh	16.5(195)	21.5(258)	22.8(274)	21.0(252)	18.2(218)
Gaibandha	21.8(262)	18.9(227)	17.7(212)	20.4(245)	21.2(254)
Naogaon	13.8(166)	15.1(181)	19.4(233)	24.2(290)	27.5(330)
Netrakona	32.3(387)	20.1(241)	16.5(198)	17.6(211)	13.6(163)
Total	20.0(1,439)	20.0 (1,441)	20 (1,438)	20.1 (1,445)	20 (1,437)

## Comparison of maternal, neonatal and child health across the six districts at baseline

This chapter provides information on several aspects of maternal, newborn and child health and includes the respondents knowledge and practice regarding family planning, antenatal care, safe delivery, postnatal care, neonatal and child illnesses and their health-seeking behaviour.

### 4.1 MATERNAL HEALTH

#### Reproductive history

Table 4.1.1 presents information on respondents' reproductive history. The median age at marriage and conception was found to be 15 and 17 years respectively. Around 16.8-17.6% of the households in all the areas reported the death of one or more children ever born. The great majority of these deaths occurred in the neonatal period, the rate being slightly higher in Nilphamari ( $p < 0.01$ ).

**Table 4.1.1. Summary statistics for reproductive history (percentages)**

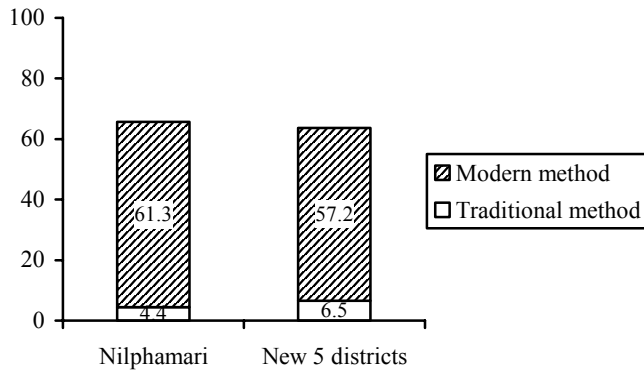
	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	1,200	4,800	
Median age at marriage - years	15	15	
Median age at first conception - years	17	17	
Number of children ever born - mean(SD)	2.35 (1.43)	2.49 (1.63)	.004
Percentage reporting one or more child deaths	16.8	17.6	.497
Number of children who had died	202	1,059	
Age stratification			
- Neonatal	74.3	64.8	.009
- Infant	21.3	25.2	
- 1-2 years	3.0	7.5	
- 3-5 years	5.0	11.0	
- > 5years	3.0	5.1	

## Family planning

### Current use of contraception

Around 65.8% of the respondents in Nilphamari were using a family planning method amongst whom 4.4% reported the use of traditional methods (Figure 4.1.1).

**Figure 4.1.1 Current use of contraception**

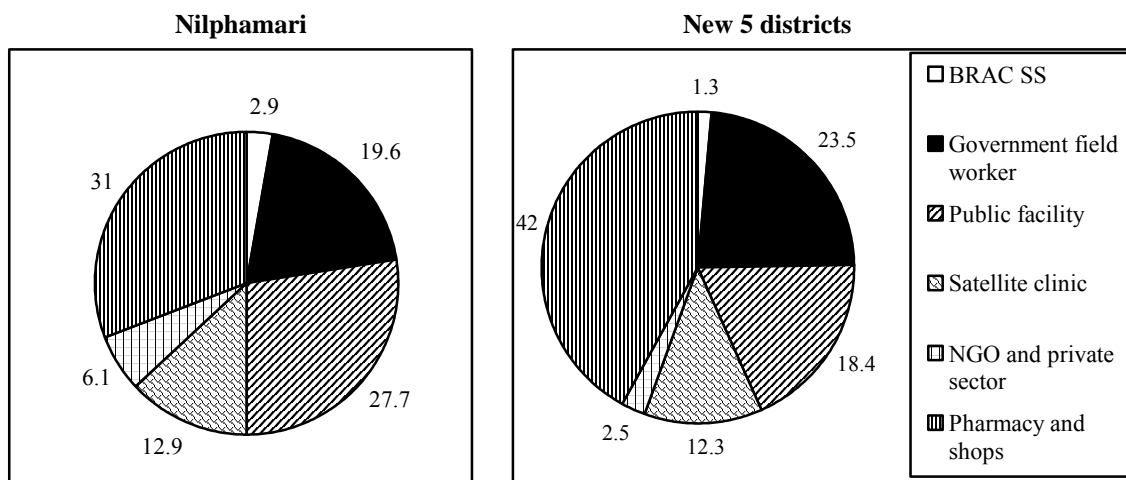


The oral contraceptive pill was the most popular method of contraception, with over one-third of respondents using the method in all the areas (Annex 1.1.1). Other commonly used methods were injectables, norplant and female sterilization. The proportion of respondents reporting the use of male methods, condoms and male sterilization, was very low in all areas (Annex 1.1.1).

### Sources of family planning methods

The sources of the most recent supply of family planning materials were classified into the six categories of BRAC providers, public facilities (including government hospitals, *upazila* health complexes, family welfare centers, maternal and child welfare centers), government fieldworkers, NGO/private sector sources (NGO/private hospitals/clinics, doctors—qualified or traditional, depot holders), satellite clinics and shops or pharmacies. Figure 4.1.2 shows the percentage of current users of modern methods who obtained their method from a specific source.

**Figure 4.1.2 Sources of family planning (modern) methods**



Government field workers, public facilities and the private sector accounted for the great majority of supplies. The developing role of BRAC health workers in Nilphamari is yet to become apparent in the data.

***Reasons for not using any family planning method***

The most common reason cited for not using any family planning method was missed period, accounting for 63.3% in Nilphamari, 55.4% elsewhere (Table 4.1.2).

**Table 4.1.2. Reasons for not using family planning method (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008
N	411	2,178
Reasons for not using any method		
- Not in a partnership (widow/divorced/abandoned/separated/husband disapproved)	4.4	7.3
- Currently pregnant	13.9	13.1
- Missed period	63.3	55.4
- Wants children	10.9	13.2
- Side effects	3.2	5.8
- Others	4.4	5.2

\* Multiple response question

***Family planning decision-making***

Majority of the respondents reported that decision-making regarding the use of family planning methods was joint, with greater percent in Nilphamari (92.6% compared to 86% elsewhere,  $p < 0.001$ ). For details see Annex 1.1.2.

***Side effects of contraception***

Table 4.1.3 presents information on the problems women faced in using their chosen method and action taken to manage those problems. Among women using modern methods, around one-fifth reported experiencing problems, the percentage being higher in Nilphamari. The most common problems reported were dizziness, irregular menstruation, weakness/tiredness and blurry vision. In the great majority of these cases (more than 80%), no action was taken. Table 4.1.3 summarizes the actions that were taken.

**Table 4.1.3. Response to side effects of modern methods (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	736	3,434	
Experiencing side effects	27.4	20.9	.000
N	202	716	
Healthcare for side effects *			
- No action taken	81.7	84.1	
- Self-treatment	9.4	6.3	
- Village doctor	2.0	3.6	
- Qualified doctor	3.0	2.9	
- Others (ate more vegetables, drank more water or milk)	7.4	5.2	

\* Multiple response question



### History of abortion and menstrual regulation

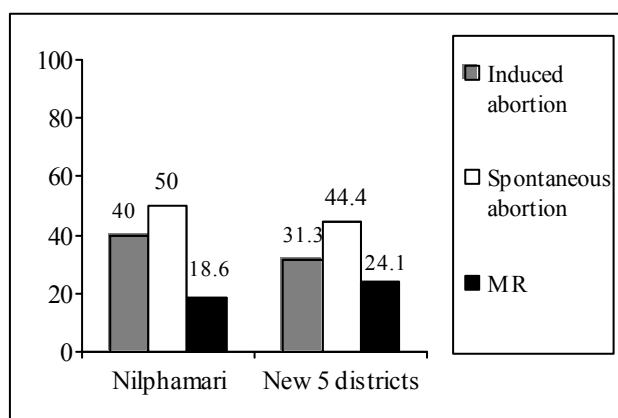
About 11% of women in Nilphamari had experienced an abortion in their lifetime compared to 15% elsewhere ( $p < 0.001$ ). The great majority had just one abortion which was mainly spontaneous. Around 3% of women had menstrual regulation (MR) (Table 4.1.4).

**Table 4.1.4. Respondents' history of abortion and menstrual regulation (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	1,200	6,000	
Ever had abortion	10.5	14.8	.000
Frequency of abortion			
- None	89.5	85.2	.000
- 1	8.8	12.6	
- $\geq 2$	1.7	2.2	
Number of abortions	148	1,050	
- Induced abortions	20.3	25.1	.000
- Spontaneous abortions	79.7	74.9	
N	1,200	6,000	
Ever had MR	3.2	3.1	.831
Frequency of MR			
- None	96.8	97.0	.649
- 1	2.9	2.6	
- $\geq 2$	0.3	0.4	
Total Number of MRs	43	212	

A significant number of women who had experienced abortion or MR also suffered from complications. Figure 4.1.3 shows that the highest rate of complications was among those who had experienced spontaneous abortion (Figure 4.1.3).

**Figure 4.1.3 Complications of spontaneous and induced abortion and of MR**



The most common complications reported were excessive bleeding, abdominal pain and fever with foul smelling discharge. A little more than 85% of those affected had sought treatment, around half from trained providers (qualified doctor, nurse, FWV, MA/SACMO) and the rest from the informal sector (Table 4.1.5). The percentage of respondents seeking treatment from the informal sector was high in Nilphamari.

**Table 4.1.5. Respondents' health seeking behaviour for complications of abortion and MR (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008
Number of abortions with complications	71	432
Number of MRs with complications	8	51
N (Total number of complications)	79	483
Action in response to complications		
- None	10.1	9.7
- Self treatment	0	2.5
- Treatment from healthcare provider	89.8	88.2
N		
Provider of treatment*	71	426
- Village doctor	26.8	37.9
- FWV/MA/SACMO/Nurse	2.8	9.4
- Homeopath	0.0	3.5
- Traditional healer	16.9	6.6
- Qualified doctor	39.4	40.5
- Pharmacist	11.3	4.2
- Others (TTBA/TBA)	5.6	4.9

\* Multiple response question

## Antenatal care

### *Knowledge on importance of antenatal care and birth preparedness*

The analysis of antenatal and delivery care data has been based on mothers who had a live or still birth in the year preceding the survey and did not have an abortion or menstrual regulation or intra-uterine deaths (N of 544 for Nilphamari and 2,611 elsewhere).

The survey found high rates of awareness of the need for antenatal care, the two most commonly cited reasons for such care being early recognition of complications and preparing for safe delivery (Table 4.1.6).

**Table 4.1.6. Respondents' knowledge on need for antenatal care (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	544	2,611	
Knows about antenatal care	99.1	96.7	.003
Importance of receiving antenatal care*			
- For early recognition of complication	42.1	47.8	.000
- For safe delivery	57.0	48.9	

\* Multiple response question

A priority for the BRAC rural MNCH programme is to ensure that pregnant women and their families prepare a birth preparedness plan. This includes identifying an attendant at delivery, saving money, buying a delivery kit, arranging emergency transport.

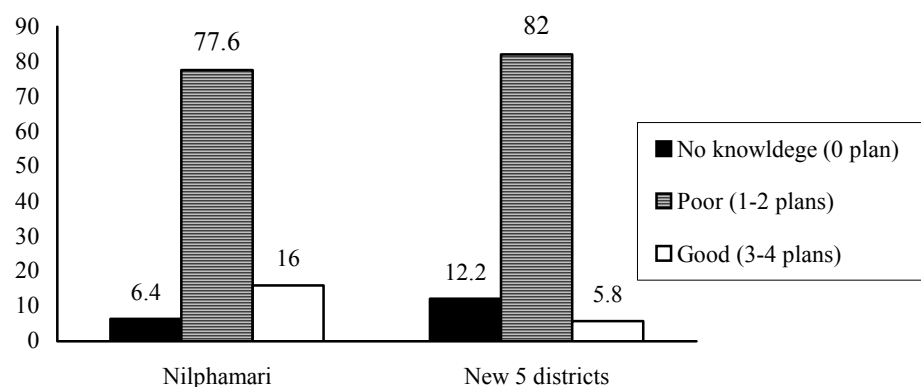
**Table 4.1.7. Respondents' knowledge on birth preparedness (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008
N	544	2,611
Knowledge of preparations during last pregnancy*	1.8	0.3
- Determine attendant at delivery	80.5	74.0
- Save money	50.7	45.8
- Buy delivery kit for home delivery	25.9	9.5
- Arrange transport for emergency	11.3	4.3

\* Multiple response question

Table 4.1.7 presents data from the most recent pregnancy on awareness of key birth preparedness issues. Figure 4.1.4 shows that respondents in Nilphamari showed greater awareness of such key issues.

**Figure 4.1.4 Knowledge on birth preparedness**



### ***Number and timing of antenatal visits***

The survey identified important differences between Nilphamari and other districts in ANC activities. Respondents in Nilphamari were more likely to seek antenatal care from trained providers and have more visits (median five visits compared to two elsewhere) (Table 4.1.8).

As shown in Table 4.1.8, women in Nilphamari tended to arrange visits earlier than that elsewhere. Nine out of 10 women had a first ANC visit in the first or second trimester (median months pregnant at first visit was 4) whereas elsewhere a 39.7% had no ANC visits and only 46.7% had their visit in the first or second trimester. For those who had visits, a median month pregnant at first visit was five in the districts other than Nilphamari.

**Table 4.1.8. Respondents' number and timing of antenatal visits by area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	544	2,611	
Received ANC	97.6	65.3	.000
Number of times ANC received			
- No antenatal care	2.4	34.7	.000
- Once	2.8	18.9	
- Twice	6.3	15.9	
- Thrice	12.7	12.8	
- Four or more	75.9	17.8	
Median no of ANC visits (for those who had a taken ANC) (min.-max)	5 (1-16)	2 (1-32)	
Months of 1st ANC			
- No ANC	2.4	34.7	.000
- 1st trimester	38.6	16.9	
- 2nd trimester	52.6	29.8	
- 3rd trimester	6.3	18.2	
- Don't remember	.2	.3	
Median months of pregnancy at first visit of ANC (min.-max.)	4 (1-9)	5 (1-9)	
Received ANC from medically trained providers <sup>1</sup>	23.2	43.7	.000
Received ANC from trained providers <sup>2</sup>	93.4	59.7	.000

1 Qualified doctor, FWV, nurse, midwife, paramedic

2 Includes BRAC SK in addition to the medically trained providers

### ***Place, provider and services received during ANC visits***

Almost all the respondents in Nilphamari (98%) received antenatal care from any provider compared to 65% elsewhere. Among those with antenatal care, retention of card was significantly higher in Nilphamari than elsewhere ( $p < 0.001$ ) (Annex 1.1.4). In Nilphamari 88.5% of respondents reported at least some visits in their own home by BRAC worker which was 34.1% elsewhere. The most common providers of ANC in the five new districts were government workers, nurses, paramedics and qualified doctors.

The main examinations that were done by those who had received an ANC were pulse examination, blood pressure measurement, checking anaemia, abdominal examination and checking fetal heart beat (Annex 1.1.4). Among those who did not receive ANC, the most cited reason in all areas was that the respondents did not think it was necessary. Lack of money was another reason for which respondents did not seek ANC (Annex 1.1.4).

### ***Other services received during last pregnancy***

**Iron tablet.** Three-fourth of the respondents in Nilphamari had taken iron tablet/syrup during their last pregnancy compared to around 60 % elsewhere ( $p < 0.001$ ) (Annex 1.1.5).

**Tetanus Toxoid (TT) vaccination.** Respondents in Nilphamari reported the highest rates of TT immunization (77.4%). In the five new districts, among the respondents reporting TT immunization 68.1% had received either one or two doses of TT immunization (see Annex 1.1.5).

**Taking rest.** Only 4% of women reported not to take any rest in day time in both Nilphamari and other districts. The rate was slightly higher elsewhere. The most common reason for not taking rest was inability to manage time and heavy load of household works (See Annex 1.1.5).

**Food and heavy works.** Slightly more than half of the respondents in Nilphamari reported eating more than usual during pregnancy, compared to one-third elsewhere ( $p<.001$ ). Similarly, 72.2% had not done any heavy works in Nilphamari, compared to 37.8% elsewhere ( $p<.001$ ) (Annex 1.1.5).

### *Birth preparedness*

Almost all the respondents reported making preparations for the birth of their child (Table 4.1.9). Around one-third of the respondents in Nilphamari mentioned of taking some major preparations (saving money, buying delivery kit, arranging emergency transport and determining a birth attendant) compared to a very negligible amount in the other districts ( $p<.001$ ). Among those that had determined a place a delivery, more than 90% had planned for home delivery. In Nilphamari the most common attendant was a TTBA (44.2%) whereas elsewhere a TBA was preferred ( $p<.001$ )

**Table 4.1.9. Birth preparedness of households (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p- value
N	544	2,611	
All major preparations (determined attendant, saved money, arranged transport and bought delivery kit)	34.7	1.9	.000
- Determined attendant	91.9	83.4	.000
- Saved money	74.8	52.1	.000
- Arranged transport	74.4	9.9	.000
- Bought delivery kit	50.2	10.7	.000
N	530	2521	
Probable place of delivery (For those who had determined a place for delivery)			
- Home	91.5	91.8	.794
- Facility (hospital/clinic etc.)	8.5	8.2	
N	462	2052	
Probable attendant at delivery (For home delivery and those who had determined birth attendant)			
- TTBA	44.2	26.9	.000
- TBA	34.6	66.9	
- <i>Shasthya shebika/karmi</i>	12.6	0.3	
- FWV/Nurse	1.5	1.2	
- Qualified doctors	-	.0	
- Others (relatives, Family welfare assistants -FWA)	7.1	4.7	

## Delivery care

Table 4.1.10 presents data on the place, mode and assistance received at delivery.

**Table 4.1.10. Respondents' place, mode and attendant at delivery (percentages)**

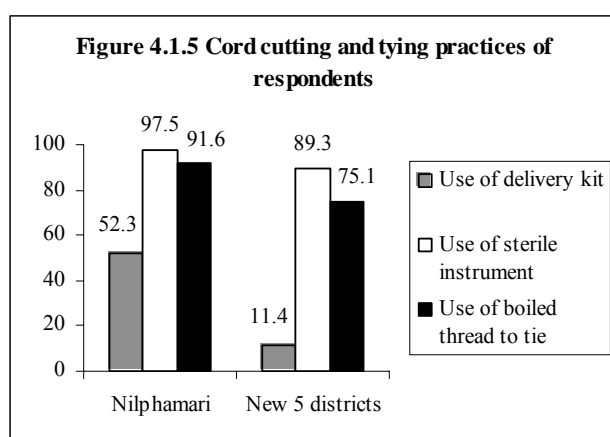
	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	544	2,611	
Place of delivery			
- Home	79.2	84.4	.000
- On the way	0.2	0.7	
- Public facility	12.7	6.9	
- Private facility	7.9	8.1	
Mode of delivery			
- Normal	93.9	91.7	.296
- Episiotomy	1.3	2.2	
- Assisted	0.0	0.1	
- Caesarean	4.8	6.1	
Birth attendants at last delivery			
- Delivery by a skilled birth attendant <sup>1</sup>	21.1	16.2	
- Delivery by all trained provider <sup>2</sup>	51.9	37.1	.000
- Trained TBA	30.3	21.0	
- TBA	26.8	55.2	

<sup>1</sup> Qualified doctor, FWV, nurse, midwife, paramedic

<sup>2</sup> Includes TTBA in addition to the skilled birth attendants

Delivery at home was the most common, 79.2% in Nilphamari and 84.4% elsewhere ( $p < 0.001$ ). The higher rate of deliveries in public or private facilities in Nilphamari (20.6% compared to 15.0% elsewhere) needs further investigation. The great majority of the deliveries were normal (91%). In Nilphamari 21.1% of the deliveries were attended by skilled birth attendants which were 16.2% elsewhere.

## Cord cutting practices



From Figure 4.1.5 (and Annex 1.1.6) it is clear that sterile blades and boiled thread were commonly used for cutting and tying umbilical cord.

In Nilphamari 52.3% reported using a delivery kit. This compared to 11.4% elsewhere ( $p < 0.001$ , Annex 1.1.6).

## Postnatal care

The percentage of women receiving PNC varied dramatically between Nilphamari and other districts (78.1% compared to 25.0%,  $p < 0.001$ ) (Table 4.1.11). Mothers in Nilphamari were more likely to receive an early PNC visit from the BRAC SK for home deliveries (49.2% compared to 0.4%). The median number of PNC visits was also higher in Nilphamari compared to elsewhere. See also Annex 1.1.14.

**Table 4.1.11. Number and timing of postnatal visits (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Received postnatal care	78.1	25.0	.000
- No PNC	21.9	75.0	
- Once	23.0	13.7	.000
- Twice	26.7	3.7	
- Thrice	14.3	1.2	
- Four or more	14.1	6.4	
Median number of PNC visit (for those who had PNC)	2(1-10)	2(1-10)	
Timing of PNC visit			
- No PNC	21.9	75.0	.000
- Within two days of delivery	64.6	17.8	
- 3-6 days of delivery	8.3	1.9	
- 7-41 days of delivery	5.0	5.3	
Received PNC from medically trained provider <sup>1</sup>	17.8	16.4	.000
Received PNC from trained provider <sup>2</sup>	70.3	17.0	.000
N	429	2,185	
PNC by SK for home delivery within 48 hours	49.2	.4	.000

1 Qualified doctor, FWV, nurse, midwife, paramedic

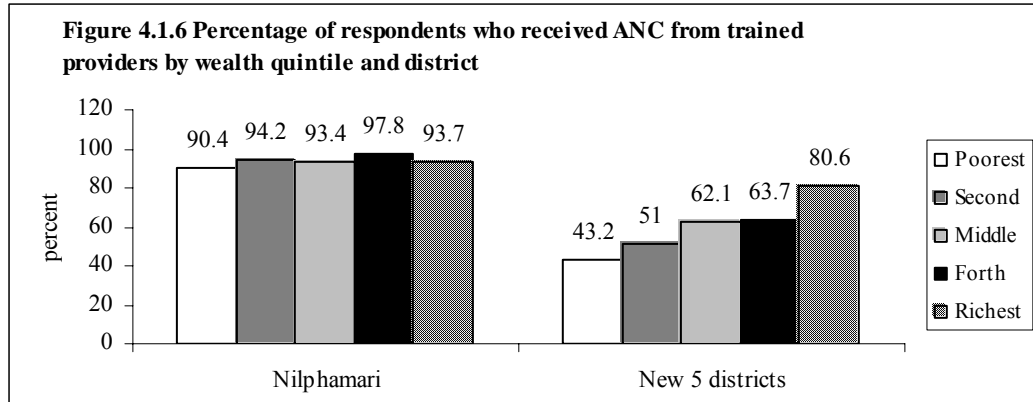
2 Includes BRAC SK in addition to the medically trained providers

The most common services received during PNC in new districts were pulse examination, measurement of blood pressure and checking anaemia (Annex 1.1.7) whereas the respondents in Nilphamari mentioned measurement of newborn weight and helping to breastfeed. A significantly greater number of mothers in Nilphamari also received advices on nutrition, cleanliness, danger signs, family planning and breastfeeding in comparison to the other areas. Intake of vitamin A capsule was also higher in Nilphamari.

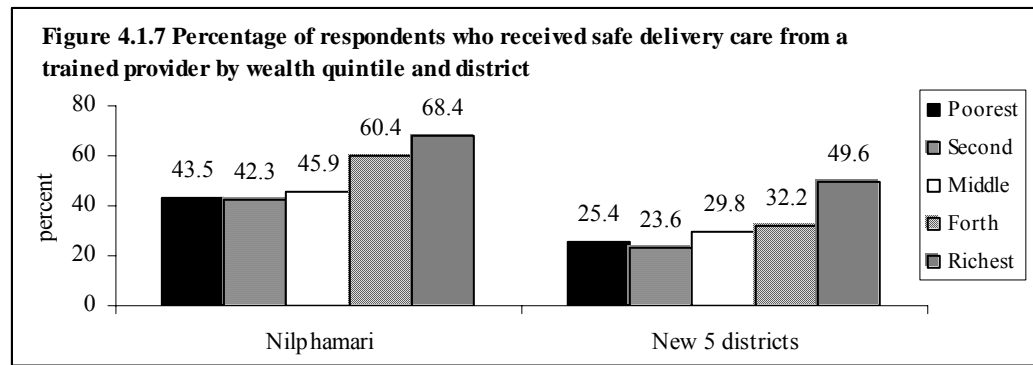
## Identifying wealth-related inequalities in accessing health services

This is an area for further analysis. The focus here is on analyses that compare help-seeking from trained practitioners across groups defined by wealth quintiles. We used regression analysis to assess the relationship between wealth and decisions to seek ANC care from a trained rather than alternative source. The “N” was the same as that in the analyses described earlier (544+2,611) for antenatal and delivery section and (539 + 2,579) for the postnatal section. We found substantial differences between Nilphamari and elsewhere (Figure 4.1.6). This provides evidence of differences in health-seeking. In Nilphamari there is a high rate of seeking from trained providers across all wealth quintiles while elsewhere there is a trend in favour of the rich. Since this is a cross-sectional survey it would be inappropriate to conclude that this is associated with

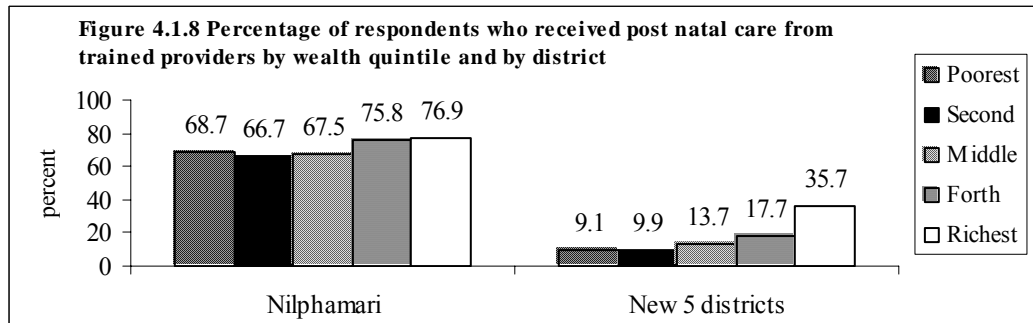
the pilot work in Nilphamari. The longitudinal data due to be collected later in the study may provide more information.



In Nilphamari the difference between wealth quintiles did not reach statistical significance. In contrast, in the other five districts there is a distinct trend ( $p < .0001$ ).



The chart for seeking safe delivery help from a trained provider suggests that wealth has a more limited association with decision-making (Figure 4.1.7). The differences across the quintiles do not reach statistical significance. There appear to be substantial differences in practice between Nilphamari and elsewhere.



The charts for seeking PNC from a trained provider (Figure 4.1.8) are similar to those for seeking ANC. Again there is no statistically significant difference between quintiles in Nilphamari,



however, the differences elsewhere do reach statistical significance ( $p < 0.001$ ). There are dramatic differences between Nilphamari and the other districts.

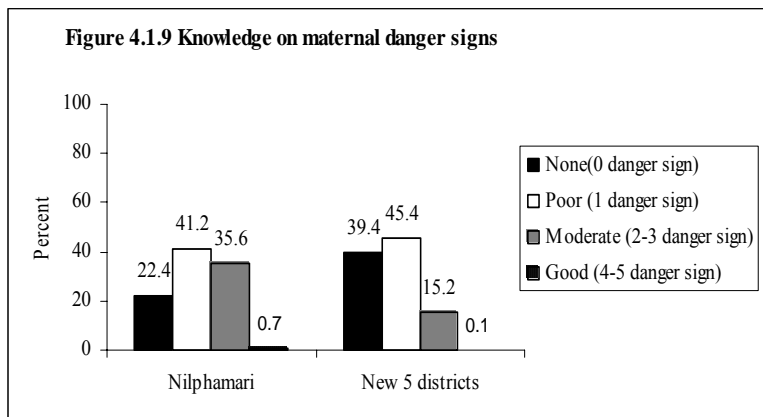
## Maternal complications

### *Knowledge of maternal complications*

Knowledge of complications during pregnancy, during delivery, or after delivery was low among the respondents (Annex 1.1.8). The major complications reported by respondents include oedema, excessive bleeding, high fever, headache, abdominal pain, retained placenta, tetanus. When asked about the source of treatment for maternal complications, the majority of respondents mentioned public facilities such as the district hospital, *upazila* health complex, family welfare centers and maternity centers. The next choice was village doctors followed by qualified doctors. The respondents in Nilphamari (28.4%) also mentioned BRAC workers.

### *Knowledge of five maternal danger signs*

The five danger signs identified in BRAC MNCH interventions are excessive bleeding, eclampsia, convulsion, prolonged labour and high fever with foul smelling discharge.



Respondents of Nilphamari were more aware of danger signs compared to other areas. More respondents in Nilphamari could mention any three-four danger signs compared to the other areas (Figure 4.1.9).

### *Complications during the antenatal period and treatment-seeking behaviour*

The analysis in this and the following two sections focuses on data from women with a pregnancy outcome in the past year. Around 37.3% of women in Nilphamari and 46.0% elsewhere reported complications during the antenatal period (Table 4.1.12). Most common were headaches, blurred vision, edema, abdominal pain, excessive vomiting and weakness (Annex 1.1.10). Among those reporting such complications, only one-fourth sought treatment from a hospital or clinic. For those who did not seek treatment, the two most common reasons were because the respondents felt it was unnecessary or expensive. Decisions for seeking or not seeking care were mostly taken jointly in consultation with either the husband or relations (Annex 1.1.13).

### *Complications during delivery and treatment-seeking behaviour*

Around one-third women in all areas suffered from complications. The most reported complications were prolonged labour, excessive bleeding, headache and blurred vision. The less reported complications included high pressure, malpresentation, hand/leg prolapse, convulsion, perineal tear, etc. (Annex 1.1.11).

The most common source of help recognized by these respondents was any healthcare provider, the percentage being highest in Nilphamari ( $p < 0.005$ ) (Annex 1.1.14). Some 34.8% of the respondents in new districts sought care from medically trained providers. In Nilphamari, 38.8% went to hospital or clinics for treatment compared 34.6 % in other areas (Table 4.1.12).

**Table 4.1.12. Complications faced by respondents and treatment sought at hospital (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	544	2,611	
Complications faced during antenatal period	37.3	46.0	.000
N (Respondents who faced complication)	203	1200	
Treatment received at hospital/clinic	23.6	25.6	.557
N	544	2,611	
Complications faced during delivery	30.3	30.7	.095
N (Respondents who faced complication)	165	790	
Treatment received at hospital/clinic	38.8	34.6	.301
N	539	2,579	
Complications faced during postnatal period	27.1	27.4	.892
N(Respondents who faced complication)	146	706	
Treatment received at hospital/clinic	18.5	15.5	.434

#### ***Complications during the postnatal period and treatment-seeking behaviour***

The most reported complications were severe headache, blurred vision, high fever and abdominal pain (Annex 1.1.12). Treatment-seeking behaviour was similar to that for antenatal or delivery complications. Respondents in Nilphamari were more likely to receive treatment than that elsewhere (Annex 1.1.15). The most preferred sources of treatment were village doctors followed by qualified doctors and majority received allopathic treatment. Only 15.5-18.5% of the respondents in both the areas sought treatment from hospital or clinics (Table 4.1.12).

#### ***Referral for complications faced during antenatal, delivery and postnatal period***

Thirty-seven respondents from Nilphamari and 76 from elsewhere received such referrals (Table 4.1.13). The referral rate was 6.8% in Nilphamari and 2.9% elsewhere ( $p < 0.001$ ). The main sources of referrals in Nilphamari were BRAC workers (35.1%) and qualified doctors (32.4%). Elsewhere qualified doctors (43.2%) and village doctors (30.3%) were the main sources. In Nilphamari referrals were most common to union-based health facilities (43.2%) whereas elsewhere referrals were most common to district hospitals (46.1%). The proportion complying with the referral was 81% in Nilphamari and 71% elsewhere (not significant). Lack of money was one of the reasons mentioned for not availing services in Nilphamari whereas respondents elsewhere considered treatment was unnecessary.

**Table 4.1.13. Referrals for maternal complications (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008
N (Suffered from complication)	322	1693
Referred for complication	11.5	4.5
N (Respondents referred for complications)	37	76
Referred by		
- Village doctor	16.2	30.3
- BRAC worker	35.1	2.6
- FWV/nurse/paramedic	2.7	19.7
- TTBA/TBA	16.2	6.6
- Qualified doctor	32.4	34.2
- Others (homeopath, traditional healer, drug seller, other NGO worker)	2.7	6.6
Place referred to *		
- District Hospital;	29.7	46.1
- UHC/MCWC/FWC	43.2	22.4
- NGO clinic	5.4	1.3
- Private hospital/clinic	18.9	19.7
- Private chamber/pharmacy	5.4	5.8
Treatment sought at referred place	81.1	70.4
N	30	54
Services received at referred place*		
- Counseling	9.7	22.0
- Allopathic medicine	90.3	78.3
- Surgery/c-section/blood transfusion/episiotomy	25.8	18.1
- Others (traditional, homeopathic ultrasonography)	9.7	8.1
N	7	22
Reasons for not going to referred place *		
- Thought treatment was not necessary	-	7.2
- Lack of money/expensive	85.7	45.7
- Too far	-	13.3
- Others(not enough time, none to accompany, religious reasons)	14.3	11.5

\*Multiple response

### **Factors associated with decisions to utilize antenatal, delivery and postnatal care in Nilphamari**

To determine factors associated with utilization of different forms of maternity care, we used bivariate logistic regression analysis to assess the predictive value of selected socio-demographic, economic and reproductive indicators. The results relating to four separate outcomes are presented in Table 4.1.14. More detailed analysis of this data is proposed.

These findings identify the following factors as predictive of the listed outcomes.

1. Predictors of seeking ANC care from a trained provider: Only age at marriage approaches statistical significance.
2. Predictors of safe delivery care: Literacy, educational status, land ownership, wealth, eligibility for BRAC membership and parity show some level of association.

3. Predictors of seeking ANC care from a trained provider: Husband's education and land ownership show some level of association.
4. Seeking professional treatment for delivery complications: Education, literacy, wealth, age at marriage and parity show some level of association.

**Table 4.1.14. Identification of factors predictive of ANC, delivery and PNC help-seeking**

	ANC from trained provider	p-value	Safe delivery	p-value	PNC from trained provider	p-value	Treatment-seeking for delivery Complication	p-value
N	544		544		539		165	
Literacy								
- Can read and write	93.8	1.00	57.2	.002	73.7	.109	45.7	.081
- Can't read and write	93.7		43.9		67.3		32.1	
Educational status								
- No schooling	92.7	.808	43.0	.002	67.2	.214	35.1	.010
- Primary incomplete	95.7		44.8		69.6		20.7	
- Primary	94.5		52.7		75.9		47.4	
- Secondary incomplete	92.9		56.0		69.5		42.3	
- Secondary or higher	96.2		80.8		88.5		87.5	
Literacy (Husband)								
- Can read and write	92.8	.373	57.6	.003	73.7	.130	28.4	.002
- Can't read and write	95.0		44.4		67.7		52.9	
Husband's education								
- No education	92.7	.7000	43.6	.000	66.8	.036	28.6	.002
- Primary incomplete	93.3		42.2		68.5		25.8	
- Primary	93.5		61.0		85.3		51.6	
- Secondary incomplete	94.5		50.5		67.0		39.1	
- Secondary or higher	98.1		76.9		73.1		76.5	
Amount of Land								
- None	100.0	.536	60	.002	80.0	.034	0	.086
- ≤50 decimal	93.1		45.4		67.1		35.3	
- >50 decimal	95.3		62.4		78.4		50.0	
BRAC eligible								
- Yes	94.5	.369	44.2	.028	67.6	.289	33.8	.331
- No	92.6		54.1		72.1		42.3	
Wealth Index								
- Poorest 2 quintile	92.5	.450	42.9	.000	67.1	.310	28.2	.004
- Middle 2 quintile	95.3		52.1		70.4		38.7	
- Richest quintile	93.7		68.4		75.9		62.5	
Reproductive indicators								
Age at marriage								
- ≤17	92.8	.083	48.5	.139	69.1	.246	32.3	.005
- >17	97.3		56.6		75.0		58.5	
Age at conception								
- ≤19	93.7	1.000	49.0	.238	70.3	1.000	36.6	.228
- >19	94.1		56.5		70.2		48.4	
Parity								
- Primiparous	96.2	.172	65.8	.000	73.5	.349	48.5	.050
- Multiparous	92.7		43.8		69.0		32.3	
Child death								
- No	95.3	.655	50.6	.747	70.6	.813	38.3	.842
- Yes	93.4		48.6		69.2		40.6	
Sought ANC(trained provider)								
- Yes			52.0	.001			38.3	.560
- No			23.5				66.7	

## 4.2 NEONATAL HEALTH

### Knowledge of neonatal care

The results presented here are based on data from mothers of a living child born in the preceding year or mothers of children born in the preceding year but have died. There were 539 qualifying mothers in Nilphamari and 2,579 elsewhere.

#### *Essential newborn care*

**Table 4.2.1. Knowledge of essential neonatal care (ENC) actions and of neonatal danger signs (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008
N	539	2,579
Median no. of known ENC actions (range)**	4 (0-5)	3(0-5)
Median no. of known neonatal danger signs (range)	2 (0-6)	2 (0-6)
Place to seek help for any complication*		
- District hospital	62.3	39.0
- UHC/FWC/MCWC	86.1	58.4
- BRAC <i>Shushasthya</i>	2.0	1.9
- Private clinic	6.3	13.2
- Other NGO's	3.5	4.0
Providers of treatment for complications*		
- Qualified doctor	21.2	48.4
- SS	1.1	.2
- SK	3.3	.2
- MA/SACMO	.2	.0
- Village doctor	35.6	37.6
- Traditional/spiritual healer	2.0	1.6
- Homeopath doctor	16.3	8.2
- Pharmacist	.6	2.6
- Others (CSBA/ FWV/paramedics)	0.6	0.7
Knowledge on LBW baby management	39.0	43.1
- Frequent breastfeeding	65.5	69.1
- Proper wrapping (wrapping from head to toe and/or skin to skin contact)	52.7	52.4

\*\*ENC considered 8 practices as mentioned by MNCH programme (wiping baby, checking color of the baby, checking whether the baby is breathing or not, wrapping with clean soft cloth from head to toe, initiate breastfeeding within 1 hour to birth, cutting cord with sterile blade, tying cord with sterile thread).

\* Multiple response question

The median number and range of ENC activities correctly identified in Nilphamari was four (0-5) and elsewhere three (0-5) (Table 4.2.1). Awareness of individual items was mixed. The great majority of respondents from all areas identified wiping the baby with a cloth, wrapping baby with clean soft cloth, cutting cord with sterilized blade, and initiation of breastfeeding within an hour of birth as the major components for ENC.

Knowledge of neonatal complications/danger signs was comparatively poor (Annex 1.2.8), respondents being able to identify a maximum of 2 out of 8 defined by the BRAC MNCH

programme. Among all these complications, fever and hypothermia in Nilphamari, breathing problem in all areas got highest attention. The median number of danger signs correctly identified in Nilphamari was two (0-5) and elsewhere one (0-5) (Table 4.2.1).

### ***Knowledge of the study population on newborn feeding***

**Table 4.2.2. Knowledge of feeding children aged up to 12 months (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Initiation of breastfeeding after birth			
- 1 hour	81.3	72.0	.000
- > 1 hour	14.1	24.4	
- Don't know	4.6	3.6	
Duration of exclusive breastfeeding			
- <6 month	11.5	32.3	.000
- 6 months	84.6	63.2	
- >6 month	3.0	2.6	
- Don't know	.9	1.8	
Time to initiate complementary food			
- ≤6 month	12.1	33.7	.000
- After 6 months	87.0	65.0	
- Don't know	.9	1.3	

Knowledge on initiation of breastfeeding within one hour of birth was found to be higher in Nilphamari than elsewhere (81.3% compared to 72.0%,  $p < 0.001$ ) (Table 4.2.2). Similar findings were also seen in the case of knowledge on exclusive breastfeeding for six months and in initiation of complementary food after six months. The complementary foods identified by respondents included rice, khichuri, suji, sagu, barley, milk (cow/goat/formula) and milk products (Annex 1.2.7).

### **Practice of neonatal care**

#### ***Essential newborn care***

More than half of the respondents in Nilphamari practiced the eight ENC actions compared to only one-third elsewhere (Table 4.2.3). Most widely practiced ENCs were wiping and wrapping the baby with clean soft cloth, cutting and tying cord with sterilized blade and thread, initiation of breastfeeding within one hour of birth (Annex 1.2.9).

**Table 4.2.3. Essential neonatal care received at last delivery (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008
N	539	2,579
Received all 8 ENC actions	55.70	33.0
ENC received from trained provider (Qualified doctor/nurse/FWV/SS)	33.6	21.4
N (Home deliveries)	424	2,168
ENC provided by BRAC trained <i>shasthya shebika</i> (SS) for home delivery	11.8	0.4

Of those who received ENC care, the majority did so at home and mostly from TBAs or TTBAAs. In Nilphamari around 11.8% of service was being provided by the BRAC *shasthya shebikas* (SS).

**Birth weight and thermal care**

Birth weight of a newborn is an important indicator of their state of health. In Nilphamari weight was recorded within 24 hours for around half of the newborns compared to 7.7% elsewhere ( $p < 0.001$ ) (Table 4.2.4).

**Table 4.2.4. Measuring birth weight of a newborn (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
- Weight taken after birth			
- < 24 h	50.1	7.7	0.00
- > 24 hr	16.0	0.9	
- Don't remember	1.9	1.6	
- Weight not recorded	32.1	89.8	
N (weight recorded)	366	264	
Weight			
- <2.5 kg	21.0	15.2	0.00
- >2.5 kg	79.0	84.8	

Table 4.2.5 presents data on thermal care for normal and low birth weight babies. Around half of the respondents in Nilphamari properly maintained the temperature of their normal weight babies compared to only one-fourth in other districts ( $p < .001$ ). On the other hand, 25.7% of the respondents followed all practices in order to maintain the temperature of low birth weight babies in Nilphamari compared to 6.9% in other districts. Shaving hair only after 1 month and delayed bathing for both normal and low birth weight babies was more common in Nilphamari than elsewhere.

**Table 4.2.5. Thermal care for normal and low birth weight baby (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N (normal weight baby)	289	224	
Thermal care for normal weight baby	51.9	25.0	.000
- Wiping baby from head to toe	97.9	99.1	.486
- Wrapping baby from head to toe	94.5	94.2	.934
- Bathing after 3 days	85.4	69.6	.000
- Shaving hair after 1 month	61.6	33.5	.000
N (LBW baby)	74	29	
Thermal care for low birth weight baby	25.7	6.9	.033
- Wiping, wrapping from head to toe	97.3	100.0	.371
- Kangaroo mother care	62.2	55.2	.515
- Bathing after 7 days	51.4	48.3	.779
- Shaving hair after 1 month	62.2	24.1	.001

***Feeding practices of newborn***

Results are shown in Table 4.2.6. Initiation of breastfeeding within one hour was reported by 87.9% of the respondents in Nilphamari and 70.7% elsewhere ( $p < 0.001$ ) (Table 4.2.6).

**Table 4.2.6. Feeding practices of the newborn (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Breast milk given after birth			
- ≤ 1 hour	87.9	70.7	.000
- > 1 hour	10.4	20.0	
- Don't know / Don't Remember	1.7	2.3	
Exclusive breastfeeding	46.6	31.3	
Time for complementary food initiation	43.2	58.4	
- ≤ 6 months	31.9	19.2	
- > 6 months	20.4	18.2	
- Not yet fed	4.5	4.2	
- Don't know			
Children fed complementary foods	405	2,001	
Complementary food given *			
- Cereals	64.9	60.8	.046
- Egg/Meat/Fish	2.2	3.2	
- Fruits and Vegetables	3.5	9.1	
- Milk and Milk products	30.6	33.5	
- Others (water/saline water)	.0	.9	

\* Multiple response question

***Newborn illnesses***

Table 4.2.7 provides information about the two life threatening illnesses that a neonate suffers from, along with the place and provider from where they sought care.

**Table 4.2.7. Prevalence and management of birth asphyxia and neonatal sepsis (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p- value
N	539	2,579	
Faced breathing difficulties during birth (Birth asphyxia)	10.0	10.6	.496
Number with breathing difficulties	54	272	
Care provided by trained care provider (Qualified doctor/nurses/SS/FWV)	72.2	50.4	
Qualified doctor	9.3	23.9	
N	539	2,579	
Neonatal sepsis	19.9	19.4	.409
Number with neonatal sepsis	107	500	
Received treatment for qualified doctor	11.2	24.6	



Around 10% of respondents reported that their neonate experienced breathing difficulties during birth where qualified doctors were regarded as the most popular care providers (Table 4.2.7). The percentages of newborns facing neonatal sepsis were also similar across all districts (around 19%). Seeking care from a trained provider for neonatal sepsis was quite high in other districts compared to Nilphamari. In Nilphamari a large number of populations still preferred homeopath doctors for treatment of neonatal sepsis (Annex 1.2.12).

The other most commonly reported illnesses for neonates were fever, jaundice and pneumonia. When complications arose the most common action was to seek treatment from healthcare provider. Private clinics were preferred (Annex 1.2.13). The small percentage of neonates that faced severe complications were mostly referred by the qualified doctors or to district or *upazila* health complexes. Treatment received from the referred place was most commonly allopathic (Annex 1.2.13). The most common reason for not seeking such help was lack of money.

### Factors associated with neonatal care in Nilphamari

We extended the earlier analysis to identify factors associated with knowledge of all ENC practices and facing neonatal complications (Table 4.2.8).

#### 4.2.8. Associations of neonatal care with different socio-demographic, economic, and maternal factors in Nilphamari districts

	All ENC Received	p value	Complication faced	p value
Mothers' literacy				
- Can't read and write	27.8	.008	32.7	1.00
- Can read and write	72.2		67.3	
Occupation				
- Housewife	97.9	.038	97.8	.037
- Other	2.1		2.2	
Amount of land				
- None	.7	.820	1.0	.174
- Less than 50 decimal	71.8		68.6	
- Greater than 50 decimal	27.5		30.5	
Father's Education				
- Till primary	73.9	.845	77.5	.014
- Above primary	26.1		22.5	
Mothers' age at marriage				
- ≤ 17 years	78.7	.751	82.2	.052
- > 17 years	21.3		17.8	
Mother history of child death				
- No	81.1	.589	77.5	.079
- Yes	18.9		22.5	
Wealth index				
- Poorest 2 quintile	41.2	.009	47.0	.373
- Middle 2 quintile	45.0		40.3	
- Richest	13.7		12.7	

Our analysis found mother's literacy, occupational status and wealth to be associated with receiving ENC. We also found father's education and mother's occupational status to be associated with onset of complications.

### 4.3 UNDER-5 CHILDREN

The analysis presented here is based on data from children aged 1-4 years, a total of 1,111 children from Nilphamari and 5,468 from the other five districts.

#### Socio-demographic characteristics of under-5 children

The characteristics of children are presented in Table 4.3.1. There were no statistical differences in the characteristics between districts. The proportion of underweight, stunting was equal in all areas, however more wasted children were found in the five other districts compared to Nilphamari ( $p < 0.004$ ). A high percentages of moderately to severely underweight (31.1-33.1%), moderate to severely stunted (37.7-38.2%) and wasted (10.6-13.7%) children are seen across all districts (Annex 1.3.1).

**Table 4.3.1. Characteristics of study children (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	1,111	5,468	
Mean age of children in months (SD)	18.8(13.8)	19.1(14.0)	.538
Sex (%)			
- Boy	49.9	50.9	.546
- Girl	50.7	49.1	
Number of siblings			
- Single	33.8	34.1	.013
- 1	35.3	31.2	
- 2+	31.0	34.7	

#### Immunization coverage of the under-5 children

Vaccination coverage was above 98% among 12 to 23 months old children as well as 12-59 months old children in all districts (Annex1.3.2). The, rates for availability of vaccination cards and completed courses were generally marginally higher in Nilphamari than elsewhere (Table 4.3.2). Nilphamari also had higher completion rates for younger children. Satellite clinics, either government or NGO, were the main point from where children were vaccinated in all the study areas.

**Table 4.3.2. Immunization, vitamin A and de-worming (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p- value
Number of children aged up to 24 months	362	1709	
Children with at least one vaccination	99.2	97.8	.093
Card available	77.1	67.9	.002
Children with complete vaccination	86.7	81.7	.021
Completed vaccinations <sup>1</sup>			
- BCG	97.5	96.8	.498
- Polio3	94.5	91.5	.059
- DPT3	93.9	90.8	.052
- Hepatitis-B	91.2	89.6	.367
- Measles	92.8	87.2	.003
Children with no vaccinations	0.8	2.2	
Place of giving immunization*			
- District hospital	1.4	1.0	
- UHC/MCWC/FWC	8.6	10.5	
- NGO/private	4.7	2.2	
- Satellite Clinic	85.2	86.3	
Number of children aged 12-59 months	600	3000	
De-worming	74.0	77.6	.079
Vitamin A on last immunization day	89.0	85.4	.177

1BCG, measles, and three doses each of DPT, Hepatitis-B and polio vaccine (excluding polio vaccine given at birth)

Note: vitamin A consumption considered by mentioning the date (May 8, 2008) when asked

\*Multiple response

### Acute respiratory tract infection (ARI)

#### *Knowledge of ARI*

Virtually all mothers had knowledge of ARI. Most (86-97%) identified running nose and cough as indicators (Annex 1.3.6). In all study areas mothers identified seeking care from a healthcare provider as the best way to manage respiratory problems of their children (Table 4.3.3). More than half of the mothers identified the need to keep the baby warm during any respiratory problem.

**Table 4.3.3. Respondents' knowledge on management of ARI of children aged 0-59 months**

	Nilphamari in 2008 following 2 years of intervention)	Five new districts in 2008
N	1,111	5,468
Knowledge about ARI management*		
- Keep the baby warm according to weather	62.3	57.1
- Keep nose clean	6.1	6.1
- Give paracetamol for fever	1.4	5.8
- Seek care from healthcare provider	94.5	89.7
- Oil massage	1.6	8.2
- Others (feed hot water, cumin seed, homeopath, breast milk, amulet)	.1	.4
- Don't know	.9	1.2

\* Multiple response question

The most frequently identified complications for ARI were rapid breathing, wheezing, high fever and chest in-drawing. Mothers in Nilphamari had better knowledge about treatment facilities for ARI and identified district and upazila hospitals (63.5 and 75.1%). This contrasted with the 55.4-60.0% of mothers who preferred to take their child to the village doctor during ARI. Elsewhere mothers preferred qualified doctors (62.1%) (Annex 1.3.6).

### ***Prevalence of ARI***

Table 4.3.4 shows that about half of the study children aged less than two months suffered from some form of ARI in the two months before the survey. Among older children aged from 2 to 59 months the rate was around 72%. These are high rates for a comparatively short period of time. Children commonly suffered from pneumonia and its severe form.

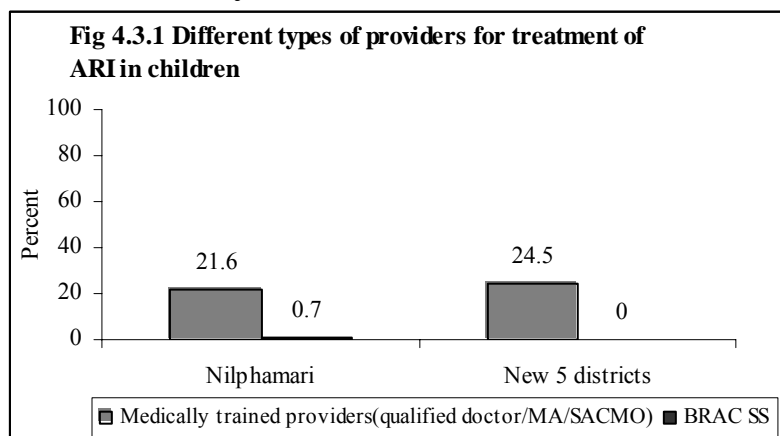
**Table 4.3.4. Prevalence of ARI among children aged up to 2 months (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p- value
Number of children aged up to 2 months	31	110	
Children with any form of ARI <sup>a</sup>	54.8	48.2	.342
Specific symptoms			
- Common cough and cold	6.5	5.5	.166
- Severe pneumonia	9.7	6.4	.526
Number of children aged 3 to 60 months	1,080	5,358	
Children with any form of ARI <sup>a</sup>	73.9	71.8	.089
Specific symptoms			
- Common cough and cold	6.9	7.7	.001
- Pneumonia	15.3	15.1	.856
- Severe pneumonia	11.7	10.4	.209
- Very severe disease	0.0	0.1	

<sup>a</sup>Classified according to the symptoms followed by WHO

Around 85% of respondents sought treatment for ARI. As is apparent from Fig 4.3.1, for those who did seek help we identified some differences in preferred sources between Nilphamari and elsewhere. For more details see Annex 1.3.4.

### ***Treatment received for ARI***



### **Childhood diarrhoea**

#### ***Knowledge of diarrhoea***

Virtually all respondents (99-100%) had knowledge of loose stool more than three times a day as the most common symptom of diarrhoea and its complications (Table 4.3.5). There was also good awareness of readymade saline as the preferred

method of management (96-98%). There was no consistent pattern regarding knowledge of management of diarrhoea between the districts. Respondents from Nilphamari showed greater awareness of recommended feeding during diarrhoea, including the importance of continuing with breastfeeding. For more details see Table 4.3.5.

**Table 4.3.5. Knowledge of diarrhoea in children (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	1,111	5,468	
Knowledge of diarrhoea symptoms*			
- Loose stool for more than 3 times in a days	100.0	99.6	
- Continuous vomiting	11.1	22.1	
- Fever	.1	0.5	
- Others (swelling of abdomen, abdominal pain, distended abdomen)	.4	1.0	
Knowledge about management of diarrhoea*			
- Ready-made saline	97.6	96.8	
- Home-made saline	22.1	48.5	
- Take help from the health provider	67.2	521	
- Others (Zinc syrup, Zinc tablet, rice water, flat rice water, banana, syrup)	17.4	82.6	
- Don't know	0	0	
Has knowledge about diarrhoeal complications	99.9	99.4	
Knowledge about feeding during diarrhoea			
- Usual amount	17.5	11.4	.000
- Less than usual amount	25.6	36.1	
- More than usual amount	56.6	51.8	
- Don't know	.4	.8	
Knowledge about breastfeeding during diarrhoea			
- Yes	89.6	87.3	.078
- No	10.4	12.7	

\* Multiple response question

### *Prevalence of diarrhoea*

Mothers were asked whether their children suffered from diarrhoea in the three months before the survey. A uniform rate around 13% was reported (Table 4.3.6).

**Table 4.3.6. Prevalence of diarrhoea and related feeding practices (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	1111	5468	
Children suffered from diarrhoea in last three months	13.8	13.0	.253
Number of children with diarrhoea	153	710	
Drinks provided during diarrhoea*			
- Ready packet	86.3	85.1	.406
- Home- made saline	13.1	25.1	.005
- Zinc syrup	20.3	28.2	.037
- Zinc tablet	8.5	17.3	.012
- Others(Homeopath, rice water, fruit juice, milk Allopathic medicine, holy water )	8.5	3.9	.124
Breast fed during diarrhoea	91.5	88.3	.368

\* Multiple response question

Note: ORT includes oral rehydration salt packets and home-made saline

Note: Diarrhoea has been defined as more than three loose stools in a day

***Feeding practices during diarrhoea***

Mothers with children aged under-5 years with a recent episode of diarrhoea were asked how much they gave the child to drink and eat during the diarrhoeal episode. Table 4.3.6 shows that feeding saline (ORS) from a ready packet was the most common practice to manage diarrhoea. Use of homemade saline was significantly lower in Nilphamari than elsewhere ( $p < 0.01$ ).

***Treatment behaviour during diarrhoea***

Table 4.3.7 presents data on the treatment of recent episodes of diarrhoea among children aged 0-59 months and the mother's treatment-seeking behaviour. Some 26% of all children with recent diarrhoea took treatment from a trained provider in Nilphamari. Most commonly children were taken to the village doctor for advice or treatment (Annex 1.3.9).

**Table 4.3.7. Treatment of diarrhoea (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
Number of children with diarrhoea	153	710	
Treatment received during diarrhoea	88.2	87.3	.439
Number of children for whom treatment was sought	135	620	
Treatment received from trained providers (qualified doctors, nurses, FWV, FWA, MA/SACMO, BRAC SK/SS)	26.7	32.3	
Treatment received from medically trained providers (Qualified doctors, nurses)	15.6	21.5	
Treatment received from BRAC SK/SS	0.7	0.3	

**Illnesses and treatment-seeking behaviour*****Reported illnesses of study children***

Thirty-seven percent of the mothers identified other diseases affecting their children. Fever was the most common condition, followed by dysentery and skin diseases (Annex 1.3.9).

***Treatment seeking behaviour during other illnesses***

Private practitioners were the most popular place to seek help for common diseases (54.0-54.7%). Local drug sellers or pharmacies (17.5-29.7%), village doctors (33.9-43.5%) and homeopath practitioners (33.6-16.6%) were also popular (Annex 1.3.10).

**Association of child ARI and diarrhoea with different factors**

Table 4.3.8 presents bivariate associations between prevalence of ARI and diarrhoea with socio-demographic, wealth and other potential risk factors. Our analysis found father's schooling, age of child, vitamin A status, and some nutritional variables to be associated with ARI. Similarly, our analysis found mothers and father's literacy, father's education, land ownership, BRAC eligibility, wealth index, and nutritional status to be associated with recent diarrhoea.

**Table 4.3.8. Association of different socio economic, maternal and nutritional factors with prevalence of ARI, diarrhoea in children in Nilphamari**

	Children with ARI (%)	p- value	Children with diarrhoea (%)	p- value
Mothers' literacy				
- Can read and write	73.8	.395	11.3	.014
- Can't read and write	72.9		16.0	
Fathers' literacy				
- Can read and write	74.6	.230	10.8	.008
- Can't read and write	72.4		15.9	
Fathers' schooling				
- Till primary	74.1	.051	14.4	.017
- > primary	66.4		7.1	
BRAC eligibility				
- Yes	75.1	.174	18.5	.000
- No	72.3		11.1	
Land ownership				
None	90.9	.361	18.2	.028
- 1-50 decimal	73.6		15.5	
- >50 decimal	72.1		9.5	
Wealth index				
- Poorest 2 quintile	75.1	.404	17.2	.012
- Middle 2 quintile	72.9		11.5	
- Richest	70.0		10.0	
Age of the child				
- ≤2 months	60.3	.014	3.2	.004
- >3 months	74.1		14.4	
Child's consumption of vitamin A				
- Yes	69.0	.001	12.1	.069
- No	77.6		15.4	
Nutritional status of the child				
- Under weight	74.8	.316	17.5	.036
- Not under weight	73.1		12.9	
- Stunted	75.9	.109	18.4	.003
- Not stunted	72.2		11.8	
- Wasted	80.0	.069	21.0	.033
- Not wasted	72.8		13.5	

## Comparison of maternal, neonatal and child health in new intervention and control districts

This chapter presents information on maternal, neonatal and child health from the new intervention (Mymensingh, Gaibandha and Rangpur) and control districts (Netrakona and Naogaon).

### 5.1 MATERNAL HEALTH

#### Reproductive history

Table 5.1.1 presents information on respondents' reproductive history. Results revealed that the median age at marriage (15-16 years) and conception (17 years) in both the areas is below 18 years i.e., the legal age at marriage. More than half of the women in the two groups have had 1-2 children and the average number of children born to all study intervention areas is around three. Around 19% and 15% of women in intervention and control areas have experienced at least a child death respectively ( $p < .01$ ). The great majority of these deaths occurred during the neonatal period (6-7 out of 10 deaths) followed by infant deaths.

**Table 5.1.1. Respondents' reproductive history according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	3,600	2,400	
Median age at marriage (range)	15.0 (4-30)	16.0 (5-31)	
Median age at first conception	17.0	17.0	
Mean number of children ever born	2.54	2.42	.006
Percentage reporting one or more child deaths	19.3	15.1	.000
N (Number of children who died)	696	363	
Age stratification of dead children			
- Neonatal	63.4	67.5	.198
- Infant	26.3	23.1	.297
- 1-2 yrs	8.8	5.0	.026
- 3-5 yrs	10.6	11.8	.538
- $\geq 5$ yrs	5.6	4.1	.377

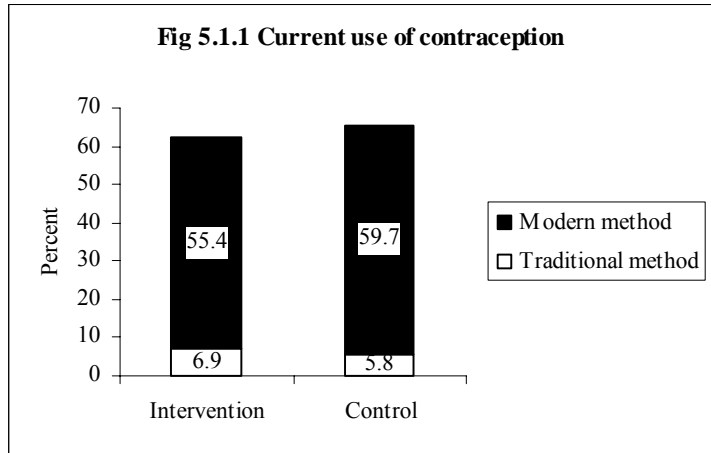


**Family planning**

*Current use of contraception*

On an average 64% of the respondents reported that they were currently using a contraceptive method, with 55-60% using a modern method and 6-7% percent relying on traditional methods (Figure 5.1.1).

Annex 2.1.1 reveals that oral contraceptive pills continued to be the most popular method of contraception, with over one-third of the respondents using the method. Other commonly used methods included injectables (11-14% in both intervention and control areas), norplant and female sterilization. The proportion of male methods, condoms and male sterilization, continued to be very low in both intervention and control areas.

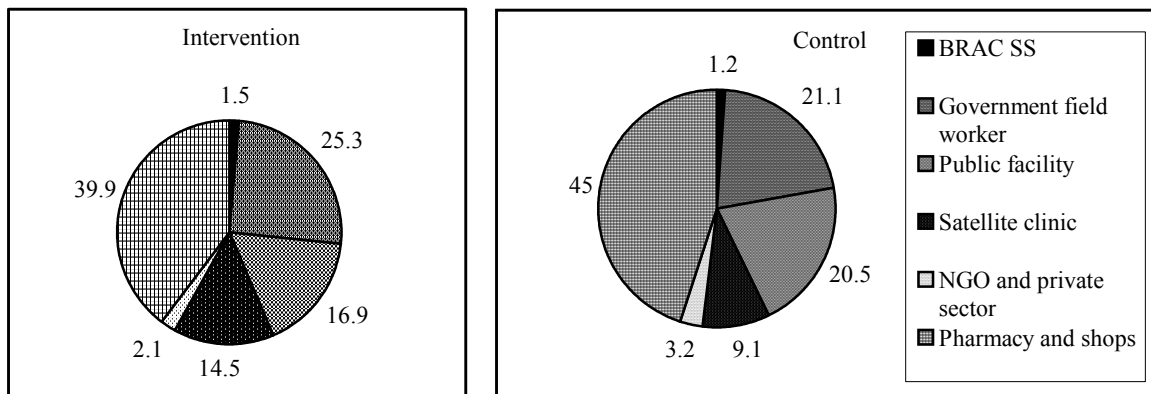


*Source of family planning methods*

The sources of family planning methods (obtained last time) were classified into six major categories: BRAC providers, public facilities (including government hospitals, *upazila* health complexes, family welfare centers, maternal and child welfare centers), government fieldworkers, NGO/private sector sources (NGO/private hospitals/clinics, doctors - qualified or traditional, depot holders), satellite clinics, and shops or pharmacies.

Figure 5.1.2 shows the percentage of current users of modern methods who obtained their method from a specific source. The public sector (government fieldworkers and public facility) was the predominant source of family planning methods (around 40%). A significant percentage of respondents mentioned that they procure family planning methods from pharmacies or shops, the percentage being higher in control districts (45%). Other sources include satellite clinics and NGO or other private sector sources.

**Figure 5.1.2 Sources of family planning methods**



***Reasons for not using any family planning method***

The respondents who mentioned that they were not currently using any methods were asked the reason for doing so. The most common reason was missed period accounting for 57% in intervention areas and 52% in control areas. The next common reasons were being currently pregnant (12-14%), husband's unavailability (8-10%) and side-effects (6-7%) (Table 5.1.2).

***Decision-making***

Majority of respondents reported that decision-making regarding the use of family planning methods was joint, with greater percent in intervention districts. In the control districts, more respondents, however, reported that the decision was solely theirs (Table 5.1.2).

**Table 5.1.2. Reasons for not using contraception and decision-making by area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,352	826	
Reason for not using any method			
- Not in a partnership (widow/divorced/abandoned/separated/husband disapproved)	10.1	8.1	0.009
- Currently pregnant	12.3	14.4	
- Missed period	57.3	52.2	
- Wants children	12.4	14.5	
- Side effects	6.3	7.4	
- Others	1.7	3.4	
N	3,600	2,400	
Decision-making for using/not using FP methods			
- Self	7.5	11.7	.000
- Husband	2.1	5.1	
- Jointly with husband	88.7	81.7	
- Others (Jointly with in-laws, In-laws, SS/SK,TBA/TTBA, FWV/FWA)	1.7	1.2	

***Side effects of contraception***

Among women using modern methods, around one-fifth of the women reported having problems with their methods, the percentage being almost equal in both areas.

**Table 5.1.3. Respondents' experience of side effects among users of modern method and action taken according to area (percentages)**

	Baseline districts	
	Intervention	Control
N	2,000	1,434
Experiencing side effects	20.1	22.0
N	401	315
Healthcare for side effects*		
- No action taken	87.0	80.3
- Self treatment	7.0	5.4
- Village doctor	3.2	4.1
- Qualified doctor	2.0	4.1
- Others (ate more vegetable/drank more water/milk)	2.2	8.9

\* Multiple response question

The most common problem faced includes dizziness, irregular menstruation, weakness/tiredness and blurry vision (Annex 2.1.1). Overall, no action was taken by 80-87% of women who experienced side effects while using any contraceptives in both intervention and control areas. Very few reported to have self-medication and consultation with medical or village doctors (Table 5.1.3).

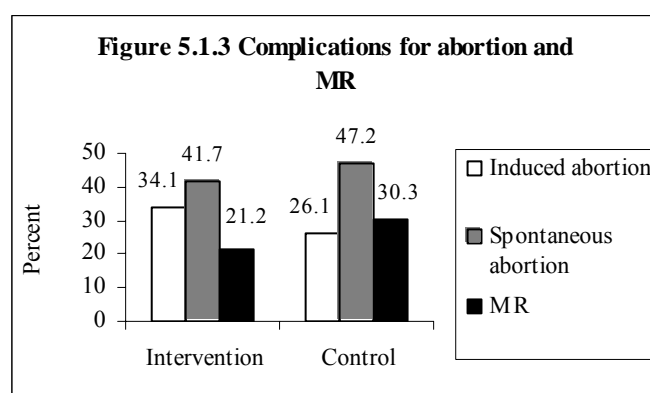
### History of abortion and menstrual regulation (MR)

Around 14-17% of women in the three areas have experienced an abortion in their lifetime (Table 5.1.4). Significant differences were found between the two groups. Among those who have experienced abortion majority (85%) have had one abortion. Results also reveal that majority of the abortions were spontaneous the rate of which is significantly higher in control districts ( $p < .001$ ). Table 5.1.4 shows that 2.6% and 3.4% of respondents have had an MR in their life in intervention and control districts respectively.

**Table 5.1.4. History of abortion and menstrual regulation by area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	3,600	2,400	
Ever had abortion	13.6	16.6	.000
Frequency of abortion			
- None	86.4	83.4	.007
- 1	11.6	14.1	
- $\geq 2$	2.0	2.5	
Number of abortions	574	474	
- Induced abortions	30.7	18.6	.000
- Spontaneous abortions	69.3	81.4	
N	3,600	2,400	
Ever had MR	3.4	2.6	.086
Frequency of MR			
- None	96.6	97.4	.048
- 1	2.9	2.4	
- $\geq 2$	0.5	0.2	
Total Number of MRs	146	66	

Among those who had experienced abortion or MR a substantial percentage suffered from complications (Figure 5.1.3). The main complications reported in both areas include excessive bleeding, abdominal pain, fever with foul smelling discharge. Almost nine out of every 10 women reported that they had sought treatment for these complications. However, around half of the respondents visited trained providers (qualified doctor, nurse, FWV, MA/SACMO) while the rest had gone to the informal sector (Table 5.1.5).



**Table 5.1.5. Health seeking behaviour for complications of abortion and MR (percentages)**

	Baseline districts	
	Intervention	Control
Number of abortions with complications	226	205
Number of MRs with complications	31	20
Total number of complications	257	225
Action in response to complications		
- None	11.7	7.5
- Self treatment	1.9	2.7
- Treatment from healthcare provider	87.2	89.8
N	224	202
Provider of treatment*		
- Village doctor	36.8	39.1
- FWV/MA/SACMO/nurse	12.1	6.4
- Homeopath	4.0	3.0
- Traditional healer	4.5	8.9
- Qualified doctor	42.6	38.1
- Pharmacist	3.6	5.0
- Others (TTBA/TBA)	5.4	4.5

\* Multiple response question

### Antenatal care

Antenatal care (ANC) received by a mother has been assessed by their knowledge on ANC, the number of visits made, the stage of pregnancy at the time of first visit, the type of service provider, and services and information received during pregnancy. The results on ANC are based on data obtained from mothers who have had a live or still birth in the year preceding the survey (N = 1,571 in new intervention districts and 1,040 in control districts).

### *Knowledge on importance of antenatal care and birth preparedness*

The respondents were asked whether they were aware of ANC visits and the importance for doing such check-up. Results show mothers were aware of ANC and the two most commonly cited reasons include early recognition of complications (54% in intervention and 43% in control areas) and safe delivery (46% in intervention and 58% in control areas) (Annex 2.1.3).

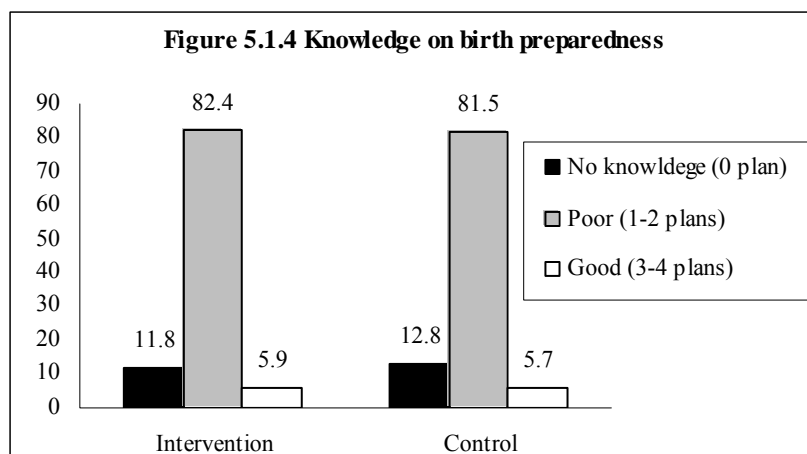
**Table 5.1.6. Respondents' knowledge on birth preparedness according to area (Percentages)**

	Baseline districts	
	Intervention	Control
N	1,571	1,040
Knows about birth preparedness (All four components)	.1	.2
- Determine attendant at delivery	71.2	78.3
- Save money	55.1	31.7
- Buy delivery kit for home delivery	7.1	13
- Arrange transport for emergency	4.2	4.4

\* Multiple response question

The MNCH programme educates the communities on birth preparedness, the components of which include determining attendant at delivery, saving money, buying delivery kit, and arranging emergency transport. Results presented in Table 5.1.6 shows that there is no significant

difference in level of awareness in new intervention and control areas where majority are aware of 1-2 plans (Figure 5.1.4).



**Number and timing of antenatal visits**

No ANC was sought for about 4 and 3 out of 10 births in intervention and control areas respectively. Only 14.8% of the respondents in intervention and 22.2% in control areas mentioned receiving WHO recommended four or more visits. In addition, women seemed to seek ANC rather late in their pregnancy (Table 5.1.7). In both intervention and control areas majority sought care in the second and third trimester (median months pregnant at first visit five).

**Table 5.1.7. Respondents’ number and timing of antenatal visits by area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,571	1,040	
Received ANC	61.8	70.6	0.000
Number of times ANC received			
- No ANC	38.2	29.4	0.000
- Once	19.4	18.1	
- Twice	15.3	16.6	
- Thrice	12.2	13.7	
- Four or more	14.8	22.2	
Median no of ANC visits for those who had taken ANC (range)	2 (1-9)	3 (1-32)	
Months of 1st ANC			
- No ANC	38.2	29.4	0.000
- 1st trimester	14.1	21.2	
- 2nd trimester	29.5	30.3	
- 3rd trimester	17.7	18.9	
- Don’t remember	.4	.2	
Median months of pregnancy at first visit of ANC (min.-max.)	5 (1-9)	5 (1-9)	
Received ANC from medically trained provider <sup>1</sup>	37.7	52.09	.000
Received ANC from trained providers <sup>2</sup>	57.9	62.6	.016

1 Qualified doctor, FWV, nurse, midwife, paramedic, MA/SACMO

2 Includes BRAC SK in addition to the medically trained providers

***Place, provider and services received during ANC visits (from any provider)***

Use of antenatal care from any provider was 60-70 % in both the areas (Annex 2.1.4). Among those who had sought ANC, a significant proportion 45% in intervention and 25% in control areas received the check-up at home. The main providers of ANC in intervention and control districts were government workers, nurse, paramedics and qualified doctors. The main examinations that were done by those who had received an ANC were pulse examination, blood pressure measurement, checking anemia, abdominal exam and checking fetal heart beat. Among the advices received, no significant differences were seen between intervention and control areas.

Among those who did not receive ANC, the most cited reason in all areas was that the respondents did not think it was necessary (65% in intervention areas and 73% in control areas). Lack of money was another reason for which respondents did not seek ANC (Annex 2.1.4).

***Other services received during last pregnancy***

One of the major tasks of the community health workers of the MNCH programme is to provide messages and mobilize women regarding iron intake, tetanus toxoid (TT) immunization, and proper food and resting habits during pregnancy. The results regarding these aspects are shown in Annex 2.1.5.

**Iron tablet.** The percentage of women who took iron tablet in intervention areas was significantly lower than control areas (56% vs. 62%,  $p < .0001$ ).

**TT vaccination.** Only 13-15% women did not receive TT immunization in intervention and control areas. According to the mothers report, among those who had received majority had received either one or two doses of TT in both the areas.

**Resting.** A little more than 60% of the women in the both areas had taken rest for  $\geq$ two hours. The most frequent reason for not taking rest was inability to manage time and heavy household workload.

**Food and heavy works.** Only one-third of respondents in both the areas mentioned eating more than usual food during pregnancy ( $p < .001$ ). Similarly, 54% of the mothers in intervention and 64% in control areas had not done any heavy work during their last pregnancy ( $p < .0001$ ).

***Birth preparedness***

Majority of the respondents mentioned that they had some kind of preparations for the birth of their child (Annex 2.1.6). However, about 2% of the respondents in the areas had saved money, determined a birth attendant, bought delivery kit and arranged emergency transport indicating poor performance (Table 5.1.8). Among those who had determined a place a delivery, nine out of every 10 respondents in both areas mentioned that they had planned for a home delivery and there was no significant difference between them. Most of the respondents who had planned to deliver at home and determined a birth attendant had plans to deliver with the help of a traditional birth attendant (TBA) in intervention and control areas (69 vs. 64%).

**Table 5.1.8. Birth preparedness of households according to area (percentages)**

	Baseline districts		p-value
	Intervention	control	
N	1,571	1,040	
Major preparations (determined attendant, saved money, arranged transport and bought delivery kit)	1.7	2.2	.305
- Determined attendant	79.3	89.6	.000
- Saved money	54.8	48.1	.001
- Arranged transport	8.6	13.0	.000
- Bought delivery kit	10.1	11.6	.202
N	1,513	1,008	
Probable place of delivery (For those who had determined a place for delivery)			
- Home	92.3	91.1	.266
- Facility (hospital/clinic etc.)	7.7	8.9	
N	1,179	873	
Probable attendant at delivery (For home delivery and those who had determined birth attendant)			
- TTBA	24.3	30.4	.040
- TBA	69.3	63.6	
- <i>Shasthya shebika/karmi</i>	0.3	0.3	
- FWV/Nurse	1.0	1.5	
- Others (relatives, FWA)	5.1	4.2	

### Delivery care

The results of delivery care are based on data obtained from mothers who have had a live or still birth in the year preceding the survey (N=1,571 in new intervention districts and 1,040 in control districts). Table 5.1.9 presented data on the place of delivery, mode and assistance at delivery among our surveyed respondents.

Significantly more percentage of delivery took place at home in intervention districts compared to control areas. Similarly, majority of the deliveries in the two areas were normal and attended by either untrained TBAs or trained TBAs. The percentage of deliveries attended by skilled birth attendants (qualified doctors, FWV, nurse, midwife, paramedic) or trained providers (includes TTBA in addition to skilled birth attendants) reflected better practice in the control areas compared to the intervention areas.

**Table 5.1.9. Respondents' place, mode and attendant at delivery according to area (percentages)**

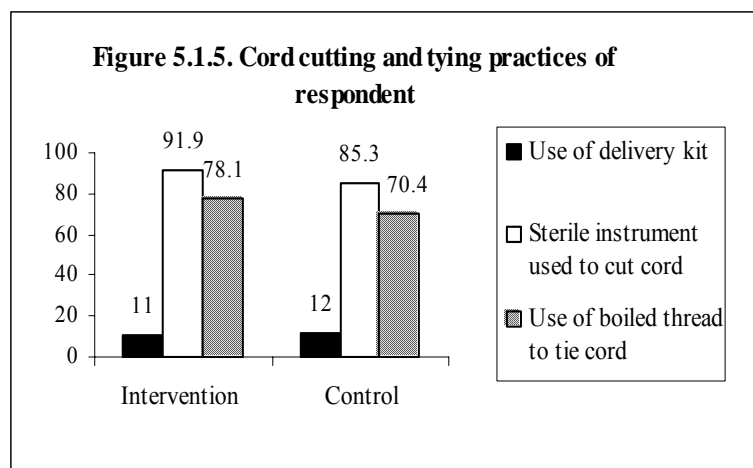
	Baseline districts		p-value
	Intervention	Control	
N	1,571	1,040	
Place of delivery			
- Home	86.1	81.7	.027
- On the way	.6	.8	
- Public facility	6.0	8.1	
- Private facility	7.3	9.4	
Mode of delivery			
- Normal	92.7	90.1	.015
- Episiotomy	2.2	2.1	
- Assisted	.1	-	
- Caesarean	4.9	7.8	
Birth attendants at last delivery			
- Delivery by skilled birth attendant <sup>1</sup>	14.6	18.5	.013
- Delivery by trained provider <sup>2</sup>	33.3	43.0	.000
- Trained TBA	18.8	24.4	.000
- TBA	58.0	51.0	.000

1 Qualified doctor, FWV, nurse, midwife, paramedic

2 Includes TTBA in addition to the skilled birth attendant

### ***Cord cutting practices***

The cord cutting practices of respondents are shown in Figure 5.1.5 with details provided in Annex 2.1.7. Results reveal that the use of sterile blades in intervention areas was also significantly higher than control areas. However, seven out of every 10 respondents in both the areas mentioned using boiled thread which was significantly higher in intervention areas. Only 11-12% was used delivery kit during delivery in both the areas.



### **Postnatal care**

The results on postnatal care are based on data obtained from mothers who have had a live birth only (N=1,553 in new intervention districts and 1,026 in control districts).

Table 5.1.10 shows that very few mothers (1 to 2 out of 10) in intervention and control areas received postnatal care from trained providers (qualified doctors, nurses, midwives, paramedics and SKs). Significant difference was found between the two areas. In intervention and control areas less than one-fifth women received PNC within two days of delivery. The median number



of PNC visits was similar in both the areas. A negligible number of respondents received PNC from SKs within 48 hours (for home deliveries).

**Table 5.1.10. Number and timing of postnatal care according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1553	1026	
Received postnatal care	21.2	30.7	.000
Number of PNC visits			
- No PNC	78.8	69.3	.000
- Once	11.8	16.7	
- Twice	3.5	4.0	
- Thrice	1.0	1.5	
- Four or more	5.0	8.6	
Median number of PNC visits	2(1-10)	2(1-10)	
Timing of PNC visits			
- No PNC	78.8	79.0	.000
- Within two days of delivery	16.0	16.0	
- 3-6 days of delivery	1.9	.9	
- 7-41 days of delivery	3.3	4.1	
- Don't remember	.1	.1	
Received PNC from medically trained provider <sup>1</sup>	13.8	20.3	.000
Received PNC from trained provider <sup>2</sup>	14.4	21.0	.000
N	1343	842	
PNC by SK for home delivery within 48 hours	0.4	0.5	.715

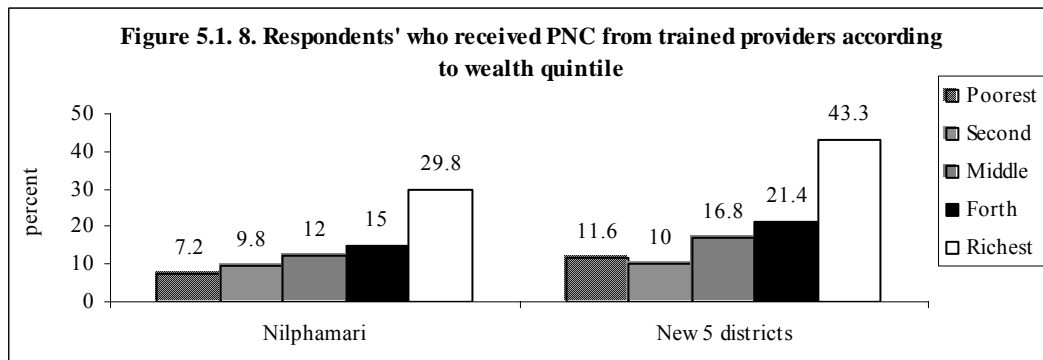
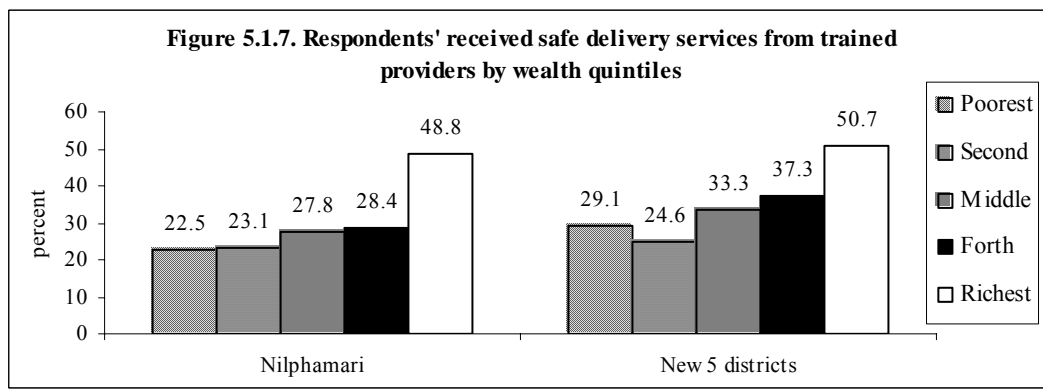
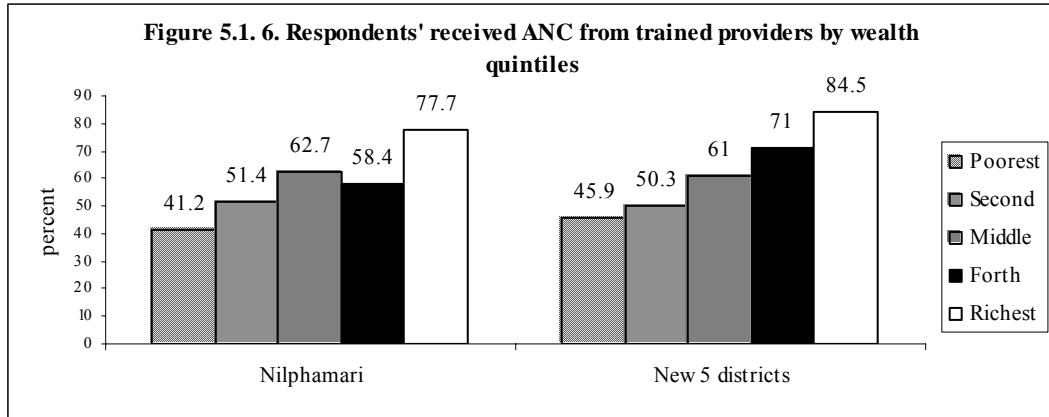
<sup>1</sup> Qualified doctor, FWV, nurse, midwife, paramedic, MA/SACMO

<sup>2</sup> Includes BRAC SK in addition to the medically trained providers

Annex 2.1.8 reveals that the major providers of PNC in intervention and control areas (for those who had received any PNC) were qualified doctors, followed by government providers/nurse/paramedic and village doctors. The most common services received during PNC visits in the two areas were pulse examination, measurement of blood pressure and checking anemia.

### Addressing inequality in delivering health services

This is an area for further analysis. The focus here is on analyses that compare help-seeking from trained practitioners across groups defined by wealth quintiles. We used regression analysis to assess the relationship between wealth and decisions to seek care from a trained rather than alternative source. The “N” was similar to that in the analyses described earlier (1,571+1,040) for antenatal and delivery section and (1,553 + 1,026) for the postnatal section. The results are shown in Figure 5.1.6, 5.1.7 and 5.1.8. Findings reveal that access to antenatal and postnatal care from trained providers and safe delivery practices was not equitable across different wealth groups in intervention and control areas and show a trend that favours the rich. The differences across different wealth quintiles were significant (p<0.001).



**Complications of antenatal, delivery and postnatal period**

In this section, findings on maternal complications are explored in detail. The focus is on women’s knowledge of complications, the frequency of self-reported complications, and treatment-seeking behaviour in relation to the complication during their last pregnancy.

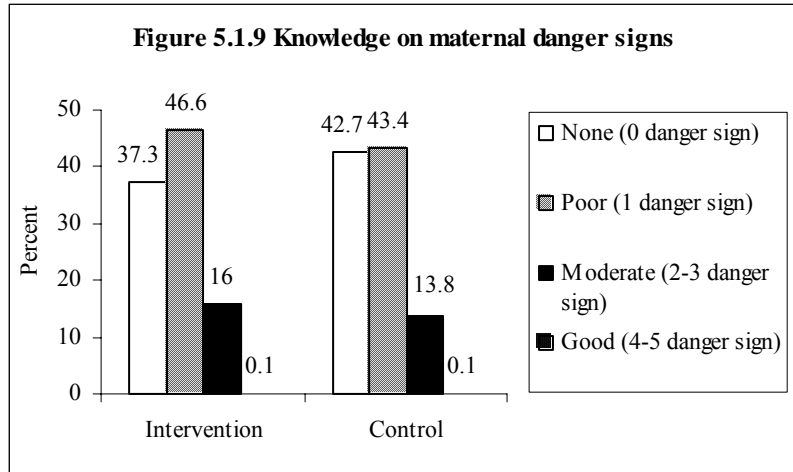
***Knowledge of maternal complications***

Awareness of complications during pregnancy, delivery, or after delivery was low among the respondents (Annex 2.1.9). The major complications reported by respondents include edema, excessive bleeding, high fever, headache, abdominal pain, retained placenta, tetanus. When asked

about the source of treatment for maternal complications, majority of respondents in the three areas mentioned public facilities such as the district hospital, *upazila* health complex family welfare centers and maternity centers. The next choice was village doctors followed by qualified doctors.

**Knowledge of five maternal danger signs**

The focus of the MNCH programme is to provide knowledge on five danger signs include excessive bleeding, eclampsia, convulsion, prolonged labour and high fever with foul smelling discharge during pregnancy, delivery and after delivery. Figure 5.1.9 reveals that majority of the respondents in intervention and control areas had no or poor knowledge of the maternal danger signs.



**Antenatal complication and treatment-seeking behaviour**

This section presents the findings on self-reported maternal health complications faced by the respondents during their last pregnancy. Although there are limitations of self reported complications, these reports are important for understanding their behaviour and treatment-seeking decisions.

Around 45-47% women faced complications during their antenatal period in both the areas (Table 5.1.11). Complications varied according to the areas, but overall the most reported complications were headache, blurred vision, edema, abdominal pain, excessive vomiting and weakness (Annex 2.1.11). Treatment-seeking behaviour was explored for those women who reported the occurrence of complications during their antenatal period (Annex 2.1.14). Results reveal that six out of 10 women in intervention areas sought treatment from a healthcare provider amongst which one-third sought from medically trained providers. The number was much higher in control areas where about half of the women sought assistance from medically trained providers. Among those who faced complications, 21.8% in intervention and 31.1% in control areas sought treatment from a hospital or clinic ( $p < .001$ ) (Table 5.1.11).

For those who did not seek treatment, the two most mentioned reasons were because the respondent felt it was unnecessary or expensive. Decisions for seeking or not seeking care were mostly taken jointly in consultation with either the husband or in laws in both areas (Annex 2.1.14).

**Table 5.1.11. Complications faced by respondents and treatment sought at hospital (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,571	1,040	
Complications faced during antenatal period	45.3	47.0	.378
N (Respondents who faced complication)	711	489	
Treatment received at hospital/clinic	21.8	31.1	.001
N	1571	1040	
Complications faced during delivery	28.8	32.5	.045
N (Respondents who faced complication)	452	338	
Treatment received at hospital/clinic	30.1	40.5	.002
N	1553	1026	
Complications faced during postnatal period	25.0	30.9	.001
N(Respondents who faced complication)	389	317	
Treatment received at hospital/clinic	13.9	18.3	.121

### ***Complications during delivery and treatment seeking behaviour***

Around one-third of the respondents in both the areas suffered from complications during delivery, the most reported were prolonged labour, excessive bleeding, headache and blurry vision. The less reported complications include high pressure, mal-presentation, hand/leg prolapse, convulsion, perinatal tear, etc. (Annex 2.1.12).

Exploration of treatment-seeking behaviour for these respondents shows that about three-fourth sought treatment from any healthcare provider in intervention and control areas (Annex 2.1.15). Around 40 to 50% of the respondents in the areas sought care from medically trained providers. Around 30–40% respondents in intervention and control areas received treatment at a hospital or clinic (Table 5.1.11).

### ***Complications during postnatal period and treatment- seeking behaviour***

Reports of the women reveal that around one-fourth respondents in intervention and one-third respondents in control areas suffered from complications during postnatal period (Annex 2.1.13). Complications varied according to the areas, but overall the most reported complications were severe headache, blurry vision, high fever, abdominal pain, etc.

The treatment-seeking behaviour for postnatal complications was also somewhat similar to the complications faced during other periods of pregnancy and delivery. The most preferred sources of treatment were village doctors followed by qualified doctors and majority received allopathic treatment (Annex 2.1.16). Similarly more respondents in control areas received treatment at a hospital or clinic (Table 5.1.11).

### **Referral for complications faced during antenatal, delivery and postnatal period**

This section presents findings on referral practices followed for respondents who had suffered from complications during pregnancy, delivery or postnatal period and were referred. Among those who had suffered from complications around delivery, 76 respondents from intervention and control areas were referred (Table 5.1.12). Most of the respondents in intervention and control areas were referred by village doctors, qualified doctors or FWV/nurse/paramedics. The respondents in both the areas were referred to places where higher treatment facilities could be

obtained depending on their availability. Lack of money was one of the reasons mentioned for not availing services in intervention areas whereas the respondents in control areas mentioned that they felt treatment was unnecessary.

**Table 5.1.12. Referral practices of household for maternal complications (percentages)**

	Baseline districts	
	Intervention	Control
N (Suffered from complication)	974	719
Referred for complication	4.9	3.9
N (Respondents referred for complications)	48	28
Referred by		
- Village doctor	25.0	39.3
- BRAC worker	2.1	3.6
- FWV/Nurse/paramedic	22.9	14.3
- TTBA/TBA	10.4	0
- Qualified doctor	37.5	28.6
- Others (homeopath, traditional/spiritual healer, drug seller, other NGO worker)	2.1	14.3
Place referred to*		
- District Hospital;	54.2	32.1
- UHC/MCWC/FWC	16.7	32.1
- NGO clinic	2.1	0
- Private hospital/Clinic	22.9	14.3
- Private chamber/pharmacy	8.3	28.6
Treatment sought at referred place	72.9	67.9
N	35	19
Services received at referred place*	22.9	21.1
- Counseling	82.9	73.7
- Allopathic medicine	25.7	10.5
- Surgery/c-section/blood transfusion/episiotomy		
- Others (traditional, homeopathic ultrasonography)	5.7	10.5
N	13	9
Reasons for not going to referred place*		
- Thought treatment was not necessary	7.7	66.7
- Lack of money/expensive	69.2	22.2
- Too far	15.4	11.1
- Others(not enough time, none to accompany, religious reasons)	23.1	-

\* Multiple response question

### **Factors affecting utilization of antenatal, delivery and postnatal care in the new intervention and control districts**

In order to determine factors affecting use of maternity care, a bivariate analysis was performed with a set of socio-demographic, economic and reproductive indicators. Results of the analysis depicted that age, literacy status, educational qualification of the respondents and their husbands, wealth status, amount of land, and BRAC eligibility all were significantly associated with seeking ANC, practicing safe delivery and seeking PNC from a trained provider. Being a housewife, involvement in income earning and BRAC membership were not found to be associated with PNC, safe-delivery and ANC usage respectively. (Table 5.1.13).

**Table 5.1.13. Associated factors affecting utilization for antenatal, delivery and postnatal care**

	ANC from trained provider	p- value	Safe delivery	p- value	PNC from trained provider	p- value	Treatment- seeking delivery Complication	p- value
<b>Age</b>								
- <19 years	65.5	.000	31.0	.185	18.3	.000	39.6	.061
- 20 – 34 years	59.8		32.7		17.8		39.8	
- ≥35 years	42.9		26.5		5.4		23.6	
<b>Literacy</b>								
- Can read and write	69.2	.00	38.9	.000	23.2	.000	49.9	.000
- Can't read and write	49.4		24.2		10.1		23.9	
<b>Educational status</b>								
- No schooling	46.2	.000	24.3	.000	8.9	.000	23.2	.000
- Primary incomplete	57.5		21.9		10.7		24.0	
- Primary	57.1		28.8		17.5		46.1	
- Secondary incomplete	71.4		40.4		22.6		49.2	
- Secondary or higher	88.0		65.7		48.8		68.7	
<b>Literacy (Husband)</b>								
- Can read and write	68.9	.000	40.1	.000	23.7	.000	51.2	.000
- Can't read and write	52.7		25.5		11.8		27.7	
<b>Husband's education</b>								
- No education	51.1	.000	24.8	.000	11.1	.000	26.3	.000
- Primary incomplete	61.0		31.6		16.1		35.1	
- Primary	57.6		29.6		10.7		34.9	
- Secondary incomplete	66.1		36.7		21.5		54.3	
- Secondary or higher	87.2		58.7		44.4		65.5	
- Don' know	66.7		20.8		4.5		14.3	
<b>Occupation</b>								
- Housewife	59.3	.017	31.5	.012	16.7	.054	37.8	.011
- Other	72.6		45.2		25.2		64.0	
<b>BRAC membership</b>								
- Yes	60.0	.949	25.9	.019	10.1	.001	32.5	.276
- No	59.7		32.7		17.8		39.3	
<b>Member of other NGO</b>								
- Yes	61.3	.266	31.0	.499	15.3	.129	34.7	.139
- No	59.0		32.3		17.8		40.5	
<b>Involved in income earning</b>								
- Yes	49.2	.000	29.1	.258	10.5	.001	31.8	.195
- No	61.3		32.3		17.9		39.4	

## 5.2 NEONATAL HEALTH

### Knowledge of the study population on neonatal care

Among the eight messages defined by the MNCH programme on ENC the survey respondents could retain a maximum of five correct messages, with a median of three messages in both intervention and control areas (Table 5.2.1 and Annex 2.2.1). Majority of the respondents in both areas reported wiping, wrapping baby with clean soft cloth, cutting cord with sterilized blade, and initiation of breastfeeding within an hour of birth as the major components of ENC. Similarly, respondents in both intervention and control areas could retain very few out of 14 messages on neonatal danger signs, the median being one message. In addition, around four out of 10 respondents) were aware of what was needed to be done for management of LBW babies (Table 4.2.1). For details on knowledge of LBW babies' management see Annex 2.2.3.

**Table 5.2.1. Knowledge of essential neonatal care (ENC) actions and of neonatal danger signs (percentages)**

	Baseline districts	
	Intervention	Control
N	1553	1026
Median no. of known ENC actions (range)**	3 (0-5)	3(0-5)
Median no. of known neonatal danger signs (range)	1 (0-6)	1 (0-6)
Place to seek help for any complication*		
- District hospital	40.2	37.2
- UHC/FWC/MCWC	49.1	61.9
- BRAC <i>shushasthya</i>	3.1	.2
- Private clinic	16.0	9.0
- Other NGO's	4.1	3.9
Providers of treatment for complications*		
- Qualified doctor	44.4	54.3
- Village doctor	39.5	34.8
- Traditional/spiritual healer	1.8	1.2
- Homeopath doctor	12.6	7.9
- Others (CSBA/ FWV/paramedics/SS/SK/MA/SACMO)	14.4	10.4
Knowledge on LBW baby management	44.8	40.4
- Frequent breastfeeding	69.1	69.0
- Proper wrapping ( wrapping from head to toe and/or skin to skin contact)	52.7	51.9

\*\*ENC considered 8 practices as mentioned by MNCH programme (wiping baby, checking colour of the baby, checking whether the baby is breathing or not, wrapping with clean soft cloth from head to toe, initiate breastfeeding within 1 hour to birth, cutting cord with sterile blade, tying cord with sterile thread).

\* Multiple response question

Table 5.2.2 further reveals that the respondents in control areas were better aware of breastfeeding practices such as initiation of breastfeeding within an hour of birth and duration of exclusive breastfeeding. Cereals (soft rice/*khichuri/suji/sagu/barley*), milk (cow/goat/formula) and milk products were considered as the appropriate complementary food by majority of the respondents (Annex 2.2.5).

**Table 5.2.2. Knowledge of the study population on newborn feeding practices (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1553	1026	
Initiation of breastfeeding just after birth			
- within 1 hour	65.7	81.6	0.00
- within > 1 hour	30.5	15.1	
- Don't know	3.8	3.3	
Duration of babies exclusive breastfeeding			
- <6 month	33.4	30.8	.064
- 6 months	62.1	65.0	
- >6 month	2.3	3.0	
- Don't know	2.3	1.2	
Time of complementary food initiation			
- <6 month	34.7	32.2	.191
- 6 months	63.8	66.9	
- Don't know	1.5	1.0	

### Practices followed for neonatal care

#### *Essential newborn care*

No significant differences were observed in essential newborn cares (ENC) received by respondents in intervention and control areas (Table 5.2.3). Most widely practiced ENCs were wiping and wrapping the baby with clean soft cloth, cutting and tying umbilical cord with sterilized blade and thread and initiation of breastfeeding within one hour of birth (Annex 2.2.7). More than 80% of the respondents in both the areas mentioned that their child received ENC at home mostly by TBAs and TTBA's (Table 5.2.3).

**Table 5.2.3. Essential newborn care for newborns (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Received all essential newborn care (ENC)	29.3	33.8	.074
Place where newborn received ENC*			
- District Hospital	2.4	3.0	.002
- UHC/MCWC/FC	4.6	5.8	
- Private clinic/ hospital	5.2	8.5	
- BRAC <i>shushathya</i> /Other NGO	1.1	.4	
- Home	86.8	82.2	
- Don't know	.0	.2	
ENC received from medically trained providers <sup>1</sup>	13.8	18.9	
ENC received from trained provider (qualified doctor/nurse/ FWV/SS)	15.1	19.8	.002
N	1343	842	
ENC provided by BRAC trained <i>shasthya shebika</i> (SS) for home delivery	.4	.4	

\* Multiple responses

<sup>1</sup> Medically trained providers for ENC considered qualified doctors and nurses



***Birth weight and thermal care***

Table 5.2.4 presents information on birth weight of a newborn. Birth weight was not recorded for more than 80% of the respondents in intervention and control districts. Around 10% of the neonates were found to be of low birth weight in both the areas (for those whose birth weight was recorded).

Wiping and wrapping baby from head to toe was the most commonly practiced methods to maintain temperature of both normal and LBW baby in all the regions (Table 5.2.5). However, proper thermal care was adopted for less than one-third of the respondents in intervention and control areas. This was as low as 13.6% in intervention and 5.6% in control areas for LBW babies. No significant differences were found in the two areas.

**Table 5.2.4. Measuring birth weight of a newborn**

	Baseline districts		p-value
	Intervention	Control	
N	1553	1026	
Newborn's weight taken after birth			
- < 24 h	6.6	9.4	.074
- < 24 hr	.8	1.0	
- Don't remember	5.5	4.9	
- Weight not recorded	87.0	84.8	
N	202	156	
Birth weight of the newborn			
- <2.5 kg	10.9	11.5	.152
- ≥2.5 kg	58.9	67.3	
- Don't remember	30.2	21.2	

**Table 5.2.5. Thermal care for normal and low birth weight baby (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	119	105	
Thermal care for normal weight baby	18.5	32.4	.017
- Wiping from head to toe	98.3	100	.182
- Wrapping from head to toe	91.6	97.1	.207
- Bathing after 3 days	60.5	80.0	.002
- Shaving hair after 1 month	29.4	38.1	.169
N	22	18	
Thermal care for low birth weight baby	13.6	5.6	.613
- Wiping, wrapping from head to toe	95.5	100	1.00
- Kangaroo mother care	50.0	27.8	.203
- Bathing after 7 days	31.8	66.7	.055
- Shaving hair after 1 month	27.3	38.9	.509

***Feeding practices***

Initiation of breastfeeding within one hour of child birth was significantly high in control districts compared to intervention districts ( $p < .001$ ). In addition, practice of exclusive breastfeeding was also substantially higher in control districts compared to intervention districts (Table 5.2.6).

**Table 5.2.6. Feeding practices of the newborn (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Initiation of breastfeeding			
- ≤ 1 hour	51.1	67.0	0.00
- > 1 hour	46.8	30.6	
- Don't know/Don't Remember	2.1	2.4	
N	1,251	792	
Exclusive breastfeeding	21.7	27.7	.002
N	1,553	1,026	
Time for complementary food initiation			
- ≤ 6months	61.3	53.9	.002
- > 6 months	17.3	22.1	
- Not yet fed	17.3	19.7	
- Don't know	4.1	4.3	
N	1,221	780	
Complementary food given*			
- Cereals	56.7	67.2	
- Egg/Meat/Fish	2.2	4.7	
- Fruits and Vegetables	7.5	11.5	
- Milk and milk products	36.1	29.5	
- Others (water/saline water)	1.1	.5	

\* Multiple response question

### *Newborn illnesses*

Table 5.2.7 provides detailed information on the two most life threatening illnesses that neonates face, along with the place and provider from where they sought care. The percentages of neonates facing breathing difficulties during birth (birth asphyxia) were almost alike in intervention and control districts where TBAs/TTBAs and qualified doctors were regarded as the most popular care providers. Percentages of newborns with neonatal sepsis were also same in both the regions. Seeking care from a trained provider for neonatal sepsis was quite high in control districts compared to intervention areas where homeopaths were preferred.

**Table 5.2.7. Prevalence and management of birth asphyxia and neonatal sepsis (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Birth Asphyxia			
Faced breathing difficulties during birth	10.5	10.6	.945
N	163	109	
Care provided by trained care provider (qualified doctor/nurses/SS)	33.7	41.3	.197
Care provided by medically trained providers (qualified doctors)	32.5	40.4	
Care provided by BRAC SS	1.2	0	
N	1,553	1,026	
Neonatal Sepsis	18.3	21.1	.082
N	284	216	
Care provided by medically trained providers (qualified doctor)	19.0	31.9	

\* Multiple response question

Mothers in this survey were also asked to report on the illnesses that their child neonates suffered from in the preceding month. Results reveal that a higher percentage of neonate faced complication in intervention areas compared to control areas. The most common illnesses were fever, jaundice, and pneumonia. Private clinics were the most preferable place and homeopath doctors were the most desired care provider in both intervention and control districts (Annex 2.2.16).

Small percentage of newborns (Annex 2.2.16) that faced severe complications were referred mostly by the qualified doctors to the district hospitals and *upazila* health complexes in both areas where they availed allopathic treatment (Annex 2.2.16). Those who did not report to the referred place mentioned lack of money as the main reason (Annex 2.2.16).

### **Factors associated with neonatal care in new districts**

Our analysis found mother's literacy, occupational status and wealth to be associated with receiving ENC. However, older and literate mothers with more than one children were more likely to seek treatment for neonatal complications (Table 5.2.8).

### 5.2.8. Associations of Neonatal care with different socio-demographic, economic, and maternal factors in new five districts

	All ENC received	p value	Complication faced	p value	Treatment sought from trained provider	p value
Mothers' age						
- < 19 years	21.3	.045	22.3	.005	19.9	.040
- ≥20 years	73.3		71.9		72.5	
Mothers' literacy						
- Can't read and write	25.8	0.00	31.1	.092	34.7	0.00
- Can not read and write	74.2		68.9		65.3	
Mother's educational status						
- Till primary	56.4	0.00	61.3	.012	66.0	0.00
- Above primary	43.6		38.7		34.0	
Mothers' occupation						
- Housewife	95.3	.006	96.8	1.00	96.7	1.00
- Other	4.7		3.2		3.3	
Families amount of land						
- None	5.5	.003	5.9	.004	5.7	.056
- Less than 50 decimal	56.6		64.2		61.8	
- Greater than 50 decimal	37.9		29.9		32.4	
Father's literacy						
- Can't read and write	42.4	0.00	46.4	.192	49.5	0.00
- Can not read and write	57.6		53.6		50.5	
Fathers' education						
- Till primary	66.3	0.00	70.8	.456	73.4	0.00
- Above primary	33.7		29.2		26.6	
Age at marriage						
- ≤ 17 years	76.4	.359	76.0	.080	78.5	.004
- > 17 years	23.6		24.0		21.5	
Age at first conception						
- ≤ 19 years	80.3	.249	81.3	.760	82.4	.009
- > 19 years	19.7		18.7		17.6	
Parity						
- Primiparous	32.4	.002	30.2	.048	26.8	0.00
- Multiparous	67.6		69.8		73.2	
Child ever died						
- No	85.3	.001	81.4	.878	82.0	.192
- Yes	14.7		18.6		18.0	
Wealth index						
- Poorest 2 quintile	32.5	0.00	42.5	.406	43.4	0.00
- Middle 2 quintile	42.5		39.3		39.0	
- Richest	24.9		18.2		17.6	

### 5.3 UNDER-5 CHILDREN

#### Socio-demographic nutritional characteristics of study children

The demographic and nutritional status of the study children are presented in Table 5.3.1. Mean age and proportion of boy and girl child were almost equal in intervention and control areas.

**Table 5.3.1. Characteristics of children by study areas (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	3283	2184	
Mean age of children in months (SD)	19.4(14.1)	18.8(13.8)	.188
N	3280	2184	
Sex (%)			
- Boy	51.8	49.5	.092
- Girl	48.2	50.5	
Number of siblings			
- Single	32.5	36.6	.002
- >1	67.5	63.4	
N	2921	2039	
Nutritional status of the study children			
Height in cm (Mean±SD)	73.2±19.6	74.4±17.1	.021
Weight in kg (Mean±SD)	9.0±3.0	9.0±3.0	.932
*Under weight (Wt-for-age)(%)			
- Normal	67.0	66.9	.795
- Moderate	23.4	23.0	
- Severe	9.6	10.2	
*Stunting (Ht-for-age)(%)			
- Normal	61.1	62.9	.032
- Moderate	24.5	22.7	
- Severe	14.4	14.4	
*Wasting (Wt-for-ht)(%)			
- Normal	86.6	85.9	.019
- Moderate	9.9	10.4	
- Severe	3.5	3.7	

\*Calculated using the new definition: WHO( 2006) growth standards

#### Immunization coverage of the under-5 children

Immunization coverage was almost 98% in all areas among children aged 12-24 months and 12-59 months. Satellite clinics irrespective of government or NGOs were the main point of vaccination in all study areas.

**Table 5.3.2. Immunization, vitamin A and deworming (percentages)**

	Baseline districts		p-value
	Intervention	Control	
Number of children aged up to 24 months	991	718	
Children with at least one vaccination	97.9	97.8	.878
Card available	67.2	68.9	.711
Children with complete immunization	82.5	80.5	.281
Completed vaccinations <sup>1</sup>			
- BCG	97.3	96.2	.227
- Polio3	91.4	91.6	.872
- DPT3	90.9	90.5	.784
- Hepatitis-B	90.1	88.9	.403
- Measles	88.0	86.1	.241
Place of giving immunization*			
- District hospital	1.4	.4	
- UHC/MCWC/FWC	5.2	17.9	
- NGO/private	1.5	3.1	
- Satellite Clinic	92.0	78.5	
Number of children aged 12-59 months	1800	1200	
De-worming	80.0	73.9	.000
Vitamin A on last immunization day	86.9	83.1	.005

<sup>1</sup>BCG, measles, and three doses each of DPT, Hepatitis-B and polio vaccine (excluding polio vaccine given at birth)

Note: vitamin A consumption considered by mentioning the date (May 8, 2008) when asked

\*Multiple response

### Acute respiratory tract infection (ARI)

#### *Mothers' knowledge related to ARI*

Almost all mothers (98-99%) had knowledge of ARI. Majority (89-97%) considered running nose and cough as indicators for ARI. Respondents in both the areas emphasized seeking treatment from healthcare providers as one of the ways of managing ARI in children (Table 5.3.3).

**Table 5.3.3 Respondents knowledge on management of ARI among children aged 0-59 months**

	Baseline districts	
	Intervention	Control
N	3284	2184
Knowledge about ARI management*		
- Keep the baby warm according to weather	52.9	63.4
- Keep nose clean	6.7	5.2
- Give paracetamol for fever	8.1	2.3
- Seek care from healthcare provider	91.1	87.5
- Oil massage	10.3	5.0
- Others (feed hot water, cumin seed, amulet)	.3	.6
- Don't know	1.4	.8

\* Multiple response question

The most frequently identified complications were rapid breathing, wheezing, high fever and chest in drawing. A significant proportion (52.3%-65.2%) of mothers reported that children should be taken to village doctors for treatment. Mothers in control areas were also aware of qualified doctors (69.0%) (Annex 2.3.4).

**Prevalence of ARI**

Table 5.3.4 shows that about half of the study children aged <2 months suffered from some form of ARI in last three months before the survey. This was 68 to 77% for children aged 2–59 months. Children of both the age groups commonly suffered from pneumonia.

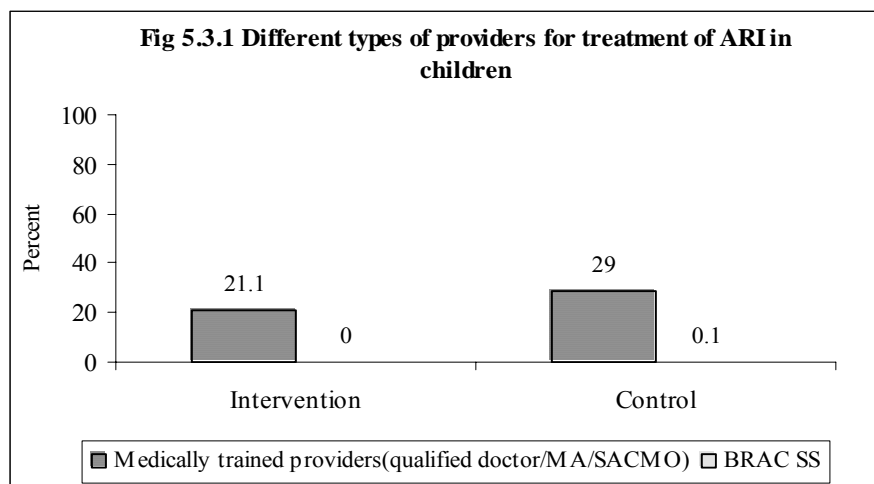
**Table 5.3.4 Prevalence of ARI among children aged 0-59 months**

	Baseline districts		p-value
	Intervention	Control	
N	63	47	
Children under 2 months suffered from any types of ARI	43.5	55.3	.250
Child had suffered from <sup>a</sup>			
- Common cough and cold	3.2	8.5	
- Severe pneumonia	4.8	8.5	
N	3221	2137	
Children of 2-59 month suffered from any types of ARI	68.2	77.2	.000
Child had suffered from <sup>a</sup>			
- Common cough and cold	6.1	10.0	
- Pneumonia	14.0	16.7	
- Severe pneumonia	10	10.9	
- Very severe disease	.1	.1	

<sup>a</sup>Classified according to the symptoms followed by WHO

**Treatment-seeking behaviour for ARI**

Type of providers from whom treatment was sought for ARI varied considerably by study areas (Fig 5.3.1). Use of the government health facilities varied upon the availability at that area (6.1-14.6%) (Annex 2.3.3). Treatment by a medically trained provider was significantly higher in control districts (Figure 5.3.1). On the other hand, village doctors (41.5-50.2%) and homeopath practitioners (10.1-17.6%) were comparatively more popular in all study areas (Annex 2.3.3).



## Childhood diarrhoea

### *Mothers' knowledge related to diarrhoea*

Virtually all respondents identified loose stool for more than three times in a day as a symptom of diarrhoea. There was good awareness of readymade saline (95-98%) as the preferred method of diarrhoea management; however, a significant percentage of respondents also mentioned seeking help from nearest health provider (Annex 2.3.7). Respondents from intervention districts showed greater awareness about the importance of continuing breastfeeding during diarrhoea (Table 5.3.5).

**Table 5.3.5 Knowledge of mothers on diarrhoea of children under 5 years (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	3284	2184	
Knowledge about danger signs of diarrhoea			
-No knowledge	1.2	.6	.000
-Has knowledge			
- Poor	47.6	51.3	
- Adequate	48.1	46.5	
- High	3.1	1.6	
Knowledge about feeding during diarrhoea			
- Usual amount	9.5	14.3	
- Less than usual amount	32.3	42.9	.000
- More than usual amount	57.7	43.1	
- Don't know	.8	.7	
Knowledge about breastfeeding during diarrhoea	89.6	83.8	.000

### *Prevalence of diarrhoea*

Mothers were asked whether their children suffered from diarrhoea in last three months before the survey. A significantly higher percentage of respondents in intervention areas (15%) suffered from diarrhoea compared to control areas (9.9%) (Table 5.3.6).

**Table 5.3.6 Prevalence of diarrhoea among study children and feeding practices (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	3284	2184	
Children suffered from diarrhoea in last three months	15.0	9.9	.000
N	493	217	
Children treated with ORT	88.4	90.8	.432
Drinks provided during diarrhoea*			
- Ready packet	84.3	84.3	.732
- Home- made saline	23.7	28.1	.379
- Zinc syrup	27.2	30.4	.447
- Zinc tablet	16.8	18.4	.339
- Others(Homeopath medicine, fruit juice, rice water, milk, Allopathic medicine, holy water )	4.3	3.2	.679
Breast-fed during diarrhoeal period	88.0	88.0	.589

\*Multiple responses

Note: ORT includes oral rehydration salt packets and home-made saline

Note: Diarrhoea has been defined as more than three loose stools in a day



***Feeding practices during diarrhoea***

Mothers with children aged under five years with a recent episode of diarrhoea were asked what they gave to the child to drink during the diarrhoeal episode. Table 5.3.6 shows that feeding saline (ORS) from a ready packet was the most common practice to manage diarrhoea in all study areas. There was no significant difference in the two areas.

***Treatment seeking-behaviour during diarrhoea***

Annex 2.3.8 presents data on the treatment of recent episodes of diarrhoea among the children aged 0-59 months and the mother's treatment-seeking behaviour. Majority of the children (27.4-40.1%) were taken to the village doctors for advice or treatment of diarrhoea. Almost equal portion of the children from both intervention and control areas took treatment from medically trained health providers during the last diarrhoeal episode (Table 5.3.6).

**Table 5.3.6 Treatment of diarrhoea (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	493	217	
Treatment received during diarrhoea	88.8	83.9	.086
N	438	182	
Treatment received from trained providers (qualified doctors, nurses, FWV, FWA, MA/SACMO, BRAC SK/SS)	17.1	20.2	
Treatment received from medically trained providers (qualified doctors, nurses)	16.9	19.9	
Treatment received from BRAC SK/SS	.2	.3	

***Other illnesses of study children***

Mothers were also asked whether their children suffered from any diseases other than diarrhoea and respiratory tract infections in the last three months preceding the survey. Fever (48-52%) was the most common disease mentioned by the respondents in all study areas followed by dysentery (30-33%) and skin diseases (9-16%) (Annex 2.3.9).

***Treatment-seeking behaviour during other illnesses***

Private chamber (45-61%) was the most popular place from where children obtained treatment for common diseases. Local drug sellers, village doctors (40-46%) and homeopath practitioners (19.5-21.1%) were also popular (see Annex.2.3.10.)

***Associations of under-5 health status with different factors***

Table 5.3.7 presents bivariate associations between prevalence of ARI and diarrhoea with socio-demographic, wealth and other potential risk factors. Our analysis found age, literacy, BRAC membership, BRAC eligibility, land ownership, wealth index, vitamin A consumption, and some nutritional indicators to be associated with ARI. Similarly, literacy status of parents, BRAC membership and wealth index were found to be associated with prevalence of diarrhoea.

**Table 5.3.7 Associations of child ARI and diarrhoea with different socio-demographic, economic, nutritional and maternal factors in five new study districts**

	Children with ARI	p- value	Children with diarrhoea	p- value
Respondents' age				
- 19 years	76.3	.000	13.7	.729
- 20 – 34 years	71.4		12.8	
- ≥35 years	62.6		13.6	
Mothers' literacy				
- Can read and write	69.2	.007	14.9	.001
- Can't read and write	72.5		12.0	
Fathers' literacy				
- Can read and write	73.7	.383	15.2	.012
- Can't read and write	72.5		9.8	
Fathers' schooling				
- Till primary	71.2	.379	14.1	.000
- > primary	71.7		10.4	
Respondents' BRAC membership				
- Yes	74.4	.001	14.6	.011
- No	70.0		12.3	
Respondents' BRAC eligibility				
- Yes	72.0	.003	14.0	.228
- No	66.7		12.9	
Land ownership				
- None	72.5	.042	11.9	.018
- 1-50 decimal	72.5		14.0	
- >50 decimal	69.3		11.3	
Wealth index				
- Poorest	72.3	.034	15.2	.000
- Middle	72.1		12.9	
- Richest	68.3		12.9	
Sex of the children				
- Boy	72.4	.047	13.0	.487
- Girl	70.3		13.0	
Age of the child				
- ≤2 months	65.4	.008	1.5	.000
- >2 months	71.8		13.7	
Child's consumption of vitamin A				
- Yes	68.1	.000	11.0	.000
- No	74.5		14.9	
Nutritional status of the child				
- Under weight	71.3	.289	15.9	.000
- Not under weight	72.1		11.6	
- Stunted	74.2	.080	14.8	.002
- Not stunted	71.5		11.9	
- Wasted	70.4	.039	16.2	.005
- Not wasted	72.8		12.5	

## Discussion

This report extracts baseline information on maternal, neonatal and under-5 health status of Nilphamari district, the newly selected districts for MNCH scale-up-Mymensingh, Gaibandha and Rangpur and the two control districts of Netrakona and Naogaon. Results are discussed on all aspects of maternal, neonatal and under-5 health. Comparisons have been between the new intervention and control districts and between Nilphamari and the other five districts, assessing the evidence for change in Nilphamari, where appropriate.

### MATERNAL HEALTH

#### Family planning

Although the rates of family planning are higher (above 57%) than the national average of 56% (NIPORT, Mitra Associates and Macro International Inc. 2007), they are consistent with the findings presented in research done by Ahmed and Rana (2009) in northern part of Bangladesh. The method mix is, however, similar to national trends and those found in other surveys (Ahmed and Rana 2009; NIPORT, Mitra and Associates and Macro International Inc. 2007). Family planning is the key not only to reduce fertility but also to reduce maternal mortality. It prevents unwanted pregnancies and unsafe abortions. It affects the composition of child bearing, the age and parity of pregnant women and the time between pregnancies (Glasier *et al.* 2006). However, family planning rates have been quite stagnant over the past few decades in Bangladesh. The major reasons are not lack of awareness but concerns and negative attitudes towards some methods, particularly the permanent methods. Our findings are also consistent with this and show that the permanent methods continue to play minor role. Moreover, a significant percent of women have been found to report side effects of the family planning methods. Hence, proper behaviour change communication (BCC) activities must be undertaken to remove negative perceptions of permanent methods and on appropriate management of side effects.

#### Abortion and menstrual regulation

It is known that women worldwide, when faced with an unwanted pregnancy, seek abortions regardless of whether the procedure is safe or legal. The actual number of menstrual regulation (MR) and abortions being performed in Bangladesh is unknown. However, some estimates can be obtained from hospital-based studies. Each year, about 2.8% of all pregnancies undergo MR and about 1.5% undergoes induced abortion usually provided by untrained paramedics or ill-trained doctors working within very limited resources (Nasreen *et al.* 2007). Another study by Singh *et al.* (1997) indicates that the abortion rate in Bangladesh is 26-30 per 1,000 live births with overall

rate of hospitalization for abortion of 2.4 per 1,000 live births. About 75% of these complications are due to unsafe abortion and the remainder due to MR. Induced abortion other than MR is estimated to have a complication rate of about 40% and a hospitalization rate of about 20% (Nasreen *et al.* 2007). The rural MNCH baseline survey also reported high rates of abortion (ever) and MR (ever) (abortions 10.5% in Nilphamari and 14.8% in baseline districts) with majority of them occurring in the third month of pregnancy. In addition, complications faced by the respondents were also high, the majority of those seeking treatment relying on the informal sector. These statistics indicate a need to educate women on available services of abortion and the management of complications together with strategies that prevent unwanted pregnancy such as family planning.

### **Antenatal care**

Antenatal care is regarded as one of the core components of routine maternal and child health services, and receives the largest allocation of budgetary resource in many developing countries (Gay *et al.* 2003). Any effect on reducing maternal mortality, which has been challenged, is secondary to its primary contribution to improving maternal health and health-seeking behaviour including birth preparedness (Campbell and Graham 2006; Carolli *et al.* 2001). The results of the BRAC rural MNCH survey for 2008 reveal that antenatal care coverage (at least one visit) from a trained provider is quite high in Nilphamari (93.4%). The rates of antenatal care from trained providers (59.7%) for the other five districts is similar to the national figure for Bangladesh as well as those of similar countries of the world (Abou-Zahr and Wardlaw 2001). In addition, in Nilphamari the number of antenatal visits now stands at four or more (75.9) which is much higher than the national average. While this is an encouraging finding, what is discouraging is the fact that women still continue to seek care late in their pregnancy. This does not allow enough time for essential diagnosis and treatment regimens, and they continue to be at risk of anaemia and STIs (Abou-Zahr and Wardlaw 2003). While these figures do not inform us of the quality of care, it does inform us that women are able and willing to seek for antenatal care. Early antenatal care provides increased opportunities to provide them information and services that can help improve maternal health and the health of infants.

### **Delivery care**

A general trend in assistance at childbirth shows a slow but unmistakable movement towards professionalism in Nilphamari. Compared to previous surveys done in Nilphamari, there has been around 10% increase in the use of trained providers. Since most professional assistance is provided in health facilities, there is a parallel rise in the number of births in such facilities. However, in the five other districts the baseline survey suggests reliance on trained assistance (37.2%) and facility deliveries is lower (15%) than that in Nilphamari (51.4% and 20.6%) and these rates are consistent with the national average (NIPORT, Mitra and Associates and Macro International Inc. 2007). Similar findings have also been observed with cord cutting and tying practices which are part of safe delivery practices. The higher rates in Nilphamari are consistent with the aims of the pilot MNCH programme that has been going on in that district since 2006. Analysis of the longitudinal data to be collected in Nilphamari and other intervention and control districts over the next four years will allow us to assess the contribution of the MNCH programme to any improvement in antenatal coverage. There is ample evidence that improved antenatal coverage increases skilled attendance at birth and promotes safe delivery practices (Abou-Zahr and Wardlaw 2003). However, given the preponderance of home deliveries every attempt should still be made to ensure that they are attended by trained attendants.

Although facility deliveries are increasing, the dependence on the private and NGO sector for delivery care is increasing. This finding is consistent with that found in Nilphamari (Rafi and Nasreen 2008) and nationally (NIPORT, Mitra and Associates and Macro International Inc. 2007). With the expansion of the private sector and low quality and unresponsive services provided by the public sector (Nasreen *et al.* 2006) in Bangladesh, utilization of the private sector will further increase. Hence, a mechanism needs to be set up to financially protect the poor and improve the quality of care both in the public and private sector.

### **Postnatal care**

Postnatal care plays a significant and undiminished role in improving maternal health and preventing maternal and neonatal death, especially in the 2 days postpartum (Campbell and Graham 2006; Koblinsky *et al.* 2006). The use of skilled attendant at birth should guarantee that care in the immediate postpartum period is available. Evidence however, shows that seven out of ten women who do not give birth in a facility are not currently receiving postnatal care, with around 80% of women not receiving care in Bangladesh, Columbia and Egypt (Koblinsky *et al.* 2006, NIPORT, Mitra and Associates and Macro International Inc. 2007). Findings of our baseline survey in intervention and control districts are similar to these trends. However, results also show that around half of the respondents in Nilphamari received postnatal care within two days after delivery from BRAC *shasthya karmi* (49.2%) indicating encouraging performance.

### **Maternal complications and referral**

Reviews of options for reduction of maternal mortality have argued persuasively that sufficient emergency obstetric care both at health centre (basic) and referral hospital (comprehensive) are essential requirements for treatment of maternal complications and reduction of a substantial proportion of maternal mortality and near-miss events (Paxton *et al.* 2005; Fillipi *et al.* 2006). However, the success of emergency obstetric care is dependent on a number of factors especially access without delay for women presenting with complications (Thaddeus and Maine 1994). Efforts to support an emergency obstetric care strategy in programme such as the MNCH programme have mostly focused on raising families' awareness of danger signs with information, education and communication on instituting birth preparedness and facilitating referral. Assessment of information, education and communication (IEC) interventions suggest that this method is not particularly effective at reducing delays, partly because danger signs messages are complex (Stanton 2004). The survey results reveal that less women have retained knowledge of five primary danger signs in Nilphamari compared to other areas.

Mothers' reports reveal that a considerable proportion of them suffered from maternal complications during antenatal, delivery and postnatal period. The findings are somewhat similar to the findings of maternal mortality survey 2001. What is troubling is the fact that a significant proportion of women sought care from the informal sector (village doctors, traditional healers, pharmacists, homeopaths). The baseline survey revealed four major factors for not accessing formal care or going to the referral centre – cost, perceived lack of need, disapproval from family members and distance.

Referral is another aspect of quality maternal care and should aid access to appropriate care especially in resource poor settings. One approach that is being tried by the rural MNCH programme is to train the field level workers (*shasthya shebika, karmi* and birth attendants) to recognize complications and refer the complicated cases to appropriate facilities as early as possible. Although, BRAC workers in Nilphamari have made significant number of referrals compared to other districts, findings from this survey are not conclusive enough to judge the

quality and timeliness of such referrals. Models for effective referral systems have been developed but few assessments of referral interventions exist in other parts of the world (Murray *et al.* 2001). Besides, for the programme to be successful there must also be a combination of effective referral and a functioning infrastructure to refer to.

### **Inequity in maternity care**

Inequities in access to health services exist in all countries and regions. The evidence that poorer groups within developing countries use less healthcare and for poor-rich inequalities in maternity care and maternal mortality is pervasive (Houweling *et al.* 2007). There is no doubt that reducing poor rich inequalities in maternity care is essential for achieving the MDG for maternal health. Hence, a section of the report has also tried to provide some information on poor rich inequalities in receiving antenatal, postnatal and delivery care and the effect of MNCH intervention on such inequality.

Our results highlight the wide variation in use of antenatal, postnatal and safe delivery across different wealth quintiles in intervention and control areas. However, results in Nilphamari show a more equitable access to antenatal and postnatal care. This may be due to the fact that a large number of outreach BRAC health workers are ensuring home-based antenatal and postnatal care. However, we also found that wealth-related differences in safe delivery practices persist. We identify several possible reasons for this. Firstly, childbirth may be associated with strong cultural meanings because of which poorer, uneducated women may prefer traditional birth attendants or relatives (Thaddeus and Maine 2004). Secondly, patriarchal norms and involvement of other members of the family may prevent spending on mothers' health (Thaddeus and Maine 2004; Ensor and Cooper 2004). Cost of delivery care can also be an important barrier for the poor to access safe delivery practices and costs of complications can have a severe catastrophic impact on household budgets (Borghi *et al.* 2006). There is some evidence that shows costs is less of a barrier to seeking antenatal care compared to delivery care (Prata *et al.* 2004). Hence, there needs to be innovative strategies to achieve health to all.

### **NEONATAL HEALTH**

This section would explore knowledge and practices of essential newborn care (ENC). We found current practice to be consistent with the exhibited level of knowledge, greater awareness of ENC in Nilphamari being matched with improved neonatal care than compared to elsewhere. While this suggests the early interventions have had some effect in building awareness about correct practices, there is still much variability and a need for further improvement in awareness and practice among the targeted peoples.

#### **Essential newborn care (ENC)**

Care received in the early postnatal period is essential to ensure that a newborn remains healthy and gets a strong start. Immediate and early postnatal interventions have the potential to change the child mortality scenario significantly in Bangladesh (Uzma *et al.* 2006). Carrying out the ENCs meticulously can make the postnatal period safer for newborns. In this respect our findings are encouraging. We found that around 55.7% of the newborns in Nilphamari received all ENC. This is a high rate compared to the other districts (33%), demonstrating that ENC intervention approach by BRAC has notably modified the practices of newborn care in the pilot intervention district.

Newborn care sought from a medically trained provider is another required criterion for safe infancy (Knippenberg *et al.* 2005). It is desirable that newborn is examined by a qualified and competent care provider immediately after birth. A study conducted in Indian rural areas found that 65% of neonates received care from an untrained provider immediately after birth (Darmstadt *et al.* 2006). In our study we regarded qualified doctor, nurse, family welfare visitor (FWV) and *shasthya shebika* (SS) as trained providers for ENC. As in earlier studies (Baqui *et al.* 2006), we found that 33.6% of the respondents in Nilphamari district seek care from a trained provider. This is a significantly higher rate than in the intervention (15.1%) and control (19.8%) districts. We found that in the case of home deliveries, care sought from BRAC's SS was highest in Nilphamari (11.8%). As the programme develops, we expect this rate to increase to a more satisfactory level. To achieve this, MNCH programme can build further awareness in the intervention areas by providing the message to mass people that contact with an appropriately trained health provider is the key to newborn's health and survival.

### **Thermal care**

Keeping the neonates warm is regarded to be one of the most important ways of reducing neonatal deaths that occur during the first 24 hours (Tinker *et al.* 2006). Again, since majority of the deaths occur among LBW babies, postnatal care should include extra care for LBW newborns. Our thermal care result shows percentages for wiping and wrapping baby from head to toe immediately after birth in terms of both normal and low birth weight baby is extremely appreciable (91-100%). Supportive literature suggests that this is the most common message about newborn care communicated to pregnant mothers and care providers (Baqui *et al.* 2006). As such this care is well practiced. Using baby jacket to keep the LBW babies warm is regarded to be another essential element and this is provided free of cost by the BRAC MNCH programme in their intervention areas for a certain period of time. However, use of a baby jacket was found to be negligible in Nilphamari district (1.3%), the only place where it is provided. A probable reason cited by the BRAC SSs is that mothers and relatives strongly reject the idea of using a baby jacket that has been used before as it is regarded not to be fresh. The strong cultural notion of purity and impurity requires bathing and shaving the newborn immediately after birth. This is accepted as a common and essential part of neonatal care. As delivery fluid and blood are understood to be polluted the baby is considered to be in an impure state until it is bathed and shaved (Barnett 2007). In our study in all the three regions a small percentage of respondents reported to have adopted proper bathing practices for their newborns (bathing after 3 days in terms of normal weight baby and 7 days in terms of LBW babies; defined by the BRAC MNCH programme). This has increased the chances for unsafe bathing after birth, giving the impression of a believer of the above mentioned trend. However, there is evidence that the scenario for shaving practice is different with people of Nilphamari adopting good practice. Nevertheless, BRAC MNCH programme needs to work harder to improve practice by modifying the traditional perceptions.

### **Newborn feeding**

Feeding practices play a pivotal role in determining the optimal development of infants (NIPORT, Mitra Associates and Macro International Inc. 2007). Poor breastfeeding and infant feeding practices have adverse consequences for the health and nutritional status of neonates and infant (Save the children, 2006). Studies from India and other South Asian countries have indicated that women commonly wait several days after birth to begin breastfeeding, avoid giving colostrum or supplement breastfeeding with other foods or liquids (Baqui *et al.* 2006). According to Bangladesh demographic and health survey (2007) this practice is widely observed in Bangladesh. However, in our survey we found that the newborn were mostly provided with colostrum rather than any other prelacteal feeding. This was true in all districts, but particularly

in intervention districts (54%). Hopefully the MNCH programme will be able to improve this over time.

The World Health Organization (WHO) guidelines from 1998 recommended that, postnatal care for all newborns should include immediate and exclusive breastfeeding. Therefore, knowledge of mothers about the benefits and other aspects of initiation of early breastfeeding are important. In that case our study revealed that more than half the respondents are quite knowledgeable about initiation of breastfeeding within one hour in Nilphamari (81.3%) compared to the intervention (65.7%) and control (81.6%) districts. Again UNICEF and WHO recommended that children be exclusively breast-fed during the first six months of life and be given solid complementary food beginning with the seventh month of life. In both the cases we found, though Nilphamari is in a better position than intervention and control areas, but there is still room for improvement. BRAC MNCH programme will seek to promote this change by adopting the culturally appropriate BCC strategies.

### **Neonatal danger signs and illness**

It is desirable that a newborn be examined by a qualified and competent care provider immediately after birth. Proper knowledge of danger signs of the neonate within 7 days of delivery and immediate medical care can prevent more than 50% of neonatal deaths (Syed *et al.* 2007). One study conducted in rural Bangladesh shows that mothers were aware of at least two neonatal danger signs that require immediate medical care (Syed *et al.* 2006). Our study had a similar finding where the majority of mothers were aware of no more than 2 danger signs (fever and pneumonia) among the 14 identified by the BRAC MNCH programme. This was true in all six districts. It appears that promotion of such issues will take time and intensive efforts. Thus the approach adopted to promote knowledge on these danger signs in the communities will be revisited.

Cultural barriers and traditions as well as poverty and lack of information prevent mothers from accessing health services during neonatal illness where the major newborn killer is infection (52%) followed by birth asphyxia (11%) and neonatal sepsis (21%) (UNICEF 2009). In our all the study areas birth asphyxia was reported for around 10% and neonatal sepsis around 19% of the newborn. These are the two major neonatal illnesses. We found that the percentage seeking treatment for birth asphyxia from a trained provider (as defined before) including from BRAC-trained SS was highest in Nilphamari. However, the percentage seeking treatment for neonatal sepsis from a trained provider was highest in the new control districts. This difference may be related to literacy or wealth status and a related increase in the level of awareness. Active communication of the caregivers with the respected newborn's mother and their family members can play a crucial role in order to improve the situations in other study areas.

In general by reviewing the findings from Nilphamari, the first intervention district of the BRAC MNCH programme, we conclude that there is some early evidence that programme interventions have been able to promote improved practice in providing babies with warm environment, initiating early breastfeeding and ensuring improved management of infections. However, there is still much scope for improvement.

### **UNDER-5 HEALTH**

This section provides benchmark information on mothers' knowledge regarding under-5 diseases, especially for ARI and diarrhoea, prevalence of these two diseases and mothers' health-seeking behaviour for under-5 illnesses in six districts in Bangladesh.



**Acute respiratory tract problem: knowledge and practice during an episode of ARI**

Almost half of the children suffered from different types of ARI in all the areas covered in baseline survey of MNCH in 2008. The percentage was highest in the older group (2-59 months) which contradicts the national figures. This may be due to the three months recall period that had not been captured in case of younger group (<2 months).

Symptoms of ARI reported by the mothers reflect their knowledge. However, the retention of the knowledge was not sufficient when the numbers of messages are large. In case of knowledge dissemination to families and communities with targeted messages and information, programme should be careful as it relies on the recognition of danger signs by caretakers and if necessary, subsequent contact with health services (Piechulek *et al.* 2003).

Knowledge of mothers about the symptoms of ARI and appropriate health-seeking actions was not reflected in their practice when their children became ill. Still a large portion of the children were taken to non-formal health providers to treat respiratory problems. However, mothers were aware of the proper treatment place for ARI. Previous study findings revealed that the non-formal healthcare providers are popular particularly for ARI in the community because they know about the symptoms associated with ARI; their practice is in close proximity, 24 hours service, less costly and flexible payment system (ICDDR,B 2003). Gap between knowledge and practice about treatment of diarrhoea and other common under-5 diseases were also present in all study areas. The possible cause for this maybe that the health system support for integrated management of childhood illnesses (IMCI) rarely reach adequate level in Bangladesh (Arifeen 2005).

Maternal knowledge level about the clinical signs and preventive measures of ARI and diarrhoea has improved in Nilphamari districts. Sometimes retention of knowledge in the mother about child health went down with the volume of knowledge. However, care givers still were not able to take their children to the proper treatment places and richer people were more likely to avail the services of trained healthcare providers than the poor. Poverty, unavailability of resources and delivery strategies of health system might be the main reasons of the under use of trained healthcare facilities in rural settings (Tulloch 1999). As a result a significant portion of the children suffered from ARI even in Nilphamari after 3 years of intervention.

**Diarrhoea among children: improvement in the prevalence and knowledge on diarrhoeal management and care giver's treatment-seeking behaviour**

Awareness raising and educational activities help prevent childhood diarrhoea (Piechulek *et al.* 2003). We found the prevalence of diarrhoea in the three months preceding the survey to be quite low in all study areas compared to the prevalence of ARI. Our results show that village doctors played an important role as healthcare providers in all areas. We also found that the type of providers from whom help was sought for diarrhoeal illness varied considerably by location. This has previously been reported (Larson *et al.* 2006). NGO services are widespread in Bangladesh, nevertheless fewer than 1% children were taken to the NGO healthcare providers for diarrhoeal treatment. Possible explanation for low use of NGO sectors could be the selection of rural survey sites where by chance alone, drugs are more simply and efficiently obtained through private providers, etc. (Larson *et al.* 2006). The most common practice of rehydration during diarrhoea is oral rehydration therapy. Ready packet of saline was widely used for this purpose in all study districts. The universal campaign of ORS reflected on the knowledge and practice of the community in all study districts. Moreover, use of zinc syrup and tablet was comparatively higher in baseline (syrup 27.2% and tablet 16.8%) and control (syrup 30.4% and tablet 18.4%) districts

compared to Nilphamari (syrup 20.3% and tablet 8.5%). It might be helpful for the programme to promote zinc syrup or tablet during diarrhoeal episode.

### **Other situations of under-5 health status**

Under nutrition percentage has been observed to be lower in Nilphamari in terms of underweight, stunting and wasting compared to the national averages (NIPORT, Mitra Associates and Macro International Inc., 2007). Better knowledge regarding breastfeeding, complementary feeding and child care during diarrhoea reflects the effect of MNCH programme in Nilphamari. The proportion of wasting due to acute poor nutrition and underweight, either acute or chronic, was significantly lower in Nilphamari compared to other districts, which may be a positive effect of BRAC MNCH intervention in the last three years. Fever followed by dysentery and skin disease was the most common disease of under-5 children irrespective of the area, which is also similar to that in other parts of the country (NIPORT, Mitra Associates and Macro International Inc. 2007). For a high percentage of children with such conditions treatment was sought from non-formal healthcare providers, including homeopaths, village doctors, TBAs and traditional healers. This maybe for the same reasons of low cost and proximity as found for ARI and diarrhoea.

### **PROGRAMMATIC IMPLICATIONS**

The main aim of rural MNCH programme is to improve the health of mother, neonate and child and contribute to the attainment of MDG 4 and 5. With this aim in mind the programme has scaled up its activities in three more districts of Bangladesh based on the success of its pilot initiatives in Nilphamari.

The 2008 rural MNCH baseline survey was conducted not only to provide benchmark information to be used for MNCH programme evaluation but also to identify gaps and understand the factors behind current maternal and child healthcare practices.

#### **Maternal health**

1. The rural MNCH programme needs to focus more on educating the people on misconceptions of the permanent methods of family planning and management of side effects. Men must be particularly involved in the education process.
2. As yet the rural MNCH programme has not taken into account abortion care services as one of their intervention components. The rate of abortion (ever) and the consequent complications faced due to the abortion has been found to be quite high. Hence, there is a need to integrate abortion care services (specially providing knowledge, management, and referral of complications) with existing MNCH interventions.
3. Although the baseline rates of ANC are encouraging, few women made their first visit in the first trimester of pregnancy. There exists a greater need to promote ANC and PNC as an integral part of a total care package during pregnancy, delivery and postnatal period.
4. The survey found that majority of deliveries take place at home with the help of untrained TBAs. These findings indicate that a substantial effort is needed to improve deliveries with skilled attendant either at home or in facilities and decrease harmful practices.
5. The level of knowledge of study population must be increased to ensure improved management and appropriate response to complications throughout pregnancy, delivery and postnatal periods. Proper programmatic action is required to improve knowledge of all family

and community members. Innovative efforts (such as group discussion, role playing, etc.) are also necessary to educate families.

6. The rural MNCH baseline survey shows that women still prefer to seek care from informal health providers. There are several reasons for these two of which may be the inability of programme personnel to reach grassroots people and cost. Hence, the programme needs to find out the best available alternatives to ensure that people get proper services. One such option might be to train informal health providers on modern methods of basic ANC, delivery, PNC, identification of risks of pregnancy and process of referral. These informal health providers will then play a supplementary role and strengthen the coverage of service delivery.
7. A strong referral system needs to be operational from the community level to the upper tier of health facilities. The rural MNCH programme has already established such referral system with district, private and medical college hospitals. It has also engaged a pool of trained professionals in referral i.e. POs/SKs/TBAs/SSs at the community level, included provision of emergency transportation, cell phone for prompt communication, etc. Studies must be undertaken to specifically evaluate process of referral and fill in loopholes (if any) and make it more efficient in giving the timely needed services.
8. A supportive supervisory system needs to be developed and followed-up to ensure the quality of service delivery and to develop functional MIS at different level. A full system of MIS would facilitate decision-making and assessment by staff at the upper tier.

### **Neonatal health**

Further efforts are required to reduce newborn mortality through promoting essential newborn care and ensuring new policies and methods are integrated into existing health programmes. To ensure sustained improvements some of the key proposals are as follows.

1. To increase the level of awareness among respondents for ENC and seeking care from a trained and competent care provider better health promotion activities must be adopted.
2. BRAC MNCH programme needs to ensure coverage of newborn care by skilled and trained service provider when required. Training of personnel in newborn care management and ensuring postnatal visits can be effective strategies to promote ENC practice.
3. To increase the availability of ENC services local advocacy efforts are also needed. In this respect policy-makers and healthcare professionals must be informed about the benefits of strengthening and expanding ENC and also the importance of focusing on early neonatal period which is the key time to improve health and survival of newborns.

### **Under-5 children**

1. Brief messages should be disseminated to increase knowledge retention in community. Frequent household visit of health workers can be helpful to transfer the knowledge into the practice.
2. Programme should emphasize on improving the health-seeking behaviour of the community especially for ARI of under-5 children by strengthening health system support parallel to awareness rising in the community. However, a substantial improvement in health services can happen only in the context of appropriate political structures and policies.

3. Including the informal healthcare providers at advocacy level can increase the utilization of health system support and early diagnosis thereby preventing under-5 disease prevalence and ensuring treatment support by avoiding delay.

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# Annexures

## ANNEX 1. COMPARISON BETWEEN NILPHAMARI AND FIVE NEW BASELINE DISTRICTS

### ANNEX 1.1 MATERNAL HEALTH

#### Annex 1.1.1. Respondents' use of contraception according to area (percentages)

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	1200	6000	
Currently using any family planning (FP) method	65.8	63.7	.187
Any modern method			.000
- Pill	38.1	38.5	
- Injection	15.4	12.4	
- Condom	1.3	2.1	
- Intra-uterine device	.8	.6	
- Norplant	2.3	1.4	
- Ligation	2.7	1.9	
- Vasectomy	.7	.4	
Any traditional method		5.2	
- Periodic abstinence	3.2	.9	
- Withdrawal	.5	.3	
- Others	.8		

#### Annex 1.1.2. Decision-making for use of contraceptives according to area (percentages)

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	1200	6000	
Decision-making for using FP methods			.000
- Self	3.8	9.3	
- Husband	1.7	3.3	
- Jointly with husband	92.6	85.8	
- Others (Jointly with in-laws, In-laws, SS/SK, TBA/TTBA, FWV/FWA)	1.8	1.5	

#### Annex 1.1.3. Complications faced by respondents for abortion/MR according to area (percentages)

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	30	264	
Complications faced (induced abortion)	40.0	31.4	.410
N	118	786	
Complications (spontaneous abortion)	50.0	44.4	.322
N	43	212	
Complications faced (MR)	18.6	24.1	.440



**Annex 1.1.4. Place, provider and services received during antenatal period according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	544	2,611	
Received ANC (from any provider)	97.6	65.3	.000
N	531	1705	
Has ANC card	53.9	11.4	
Provider of ANC*			
- Village doctor	.6	5.5	
- BRAC worker (SK)	88.5	34.1	
- FWV/Nurse/Paramedic	27.5	35.3	
- Traditional healer/Homeopath	.4	2.4	
- Qualified doctor	12.1	39.1	
- Others(TBBA/TBA/FWA/pharmacist)	2.1	3.6	
- Don't know	6.8	.5	
Examinations done during last pregnancy			
- Pulse examination	96.2	87.6	
- Blood pressure	98.5	91.2	
- Weight measurement	67.4	81.6	
- Height measurement	42.6	36.1	
- Anemia	89.6	81.5	
- Blood test	22.0	24.6	
- Urine test	35.4	46.5	
- Abdominal exam	97.4	90.3	
- Fetal heart beat	90.6	65.0	
- Ultra sonogram	12.4	24.8	
Advices received during last pregnancy			
- Advice on TT vaccination	97.0	72.1	
- Advice on dietary intake	98.7	87.6	
- Advice on resting	98.3	88.1	
- Advice on Iron folic acid intake	98.7	84.9	
- Advice on breastfeeding	96.6	48.3	
- Advice on not doing heavy works	96.0	74.0	
- Advice on doing ANC	96.9	70.0	
- Advice on cleanliness	93.2	56.9	
- Advice on contacting the birth attendant or SS	92.8	32.6	
- Advice on complications	93.8	46.2	
- Advice of birth place	93.8	40.6	
- Advice on birth attendant	92.8	36.5	
- Advice on saving money	94.5	34.6	
- Advice on buying delivery kit	86.8	17.9	
- Advice on keeping cloth for wrapping and wiping the neonate	94.0	35.4	
- Advice on buying misoprostol tablet	58.9	3.3	
- Advice on preparing a transport	84.7	11.8	
- Advice on keeping the phone number of health worker	92.3	13.5	
- Advice on fixing a blood donor	49.2	5.9	
- Advice on taking to a hospital for emergency	86.3	33.8	
N	13	906	
Reasons for not receiving ANC*			
- Not aware of ANC	7.7	4.4	
- Did not think it was necessary	69.2	69.1	
- Due to lack of money	15.4	29.6	
- Others (religious reasons, husband mother in law disapproved, too far etc)	7.7	9.9	

\*Multiple response question

**Annex 1.1.5. Other services received by the respondents during the antenatal period according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	544	2,611	
Took iron tablet during last pregnancy	76.5	58.6	.000
Received TT vaccination during last pregnancy			
- Yes	77.4	68.1	.008
- No	9.9	13.4	
- Had completed dose earlier	12.7	18.3	
- Don't remember/know	0.0	.2	
N	421	1,777	
Number of TT injections			
- 1	57.5	50.3	.000
- 2	31.6	39.1	
- 3	10.5	8.8	
- >4	0.5	.9	
N	544	2,611	
Hours of rest taken during day-time			
- None	3.7	4.3	.000
- < 2 hours	43.2	34.4	
- >=2 hours	53.1	61.4	
N	20	111	
Reasons for not taking rest at day-time*			
- Could not manage time	75.0	79.3	.699
- Mother-in-law did not allow	0.0	1.8	
- Had lots of work	25.0	18.9	
N	544	2,611	
Hours of rest taken during night-time			
- None	0.2	.3	.000
- < 8 hours	16.6	41.7	
- >=9 hours	83.2	58.0	
Mean hours of rest taken during night (SD)	9.41(1.03)	8.73 (1.25)	
Food intake during pregnancy			
- More	55.7	32.1	.000
- Equal	27.2	32.8	
- Less	17.1	34.8	
- Don't remember	0.0	.3	
Heavy work during pregnancy			
- Yes	27.8	42.1	.000
- No	72.2	37.8	
- Don't remember	0.0	.2	
Decision-making for antenatal cares			
- Self	13.1	18.3	.000
- Husband	1.5	3.4	
- Jointly with husband	46.7	63.5	
- Jointly with in-laws	17.3	9.0	
- In-laws	1.1	.9	
- Parents/ other natal relatives	2.4	3.2	
- Others (SS/SK/TBA/TTBA/FWV)	18	1.7	

\*Multiple response question

**Annex 1.1.6. Respondents' cord cutting practices according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	432	2,220	
Use of delivery kit	52.3	11.4	.000
N	430	2,208	
Person who cut the umbilical cord			
- TTBA	40.5	23.0	.000
- TBA	35.3	52.8	
- Relatives/neighbor	10.5	10.6	
- Mother herself	1.6	10.5	
- Others (FWV/CSBA/SS/village doc/traditional healer)	11.9	2.7	
- Don't know	.2	.4	
Instrument used to cut off the umbilical cord			
- Delivery kit blade	52.6	8.3	.000
- Sterile (new and boiled)	44.9	81.0	
- Not sterile	1.9	5.7	
- Blade washed with savlon/heated	0	1.4	
- Others (bamboo split, scissors, chopper)	0.2	1.6	
- Don't know /can't recall	0.5	2.0	
Median waiting time before cutting cord (mins)	15.0	20.0	
Instrument used to tie the umbilical cord			
- Thread (boiled)	91.6	75.1	.000
- Thread (not boiled)	7.0	20.5	
- Others	-	.4	
- Don't know/ can't recall	1.4	4.0	
N	544	2,611	
Decision-making for delivery			
- Self	6.4	9.6	.000
- Husband	1.5	4.0	
- Jointly with husband	36.4	48.4	
- Jointly with in-laws	29.6	17.8	
- In-laws	2.2	1.6	
- Parents/natal relatives	10.7	17.1	
- Others (SS/SK/TBA/TTBAFWV/FWA)	13.2	1.5	

**Annex 1.1.7. Place, provider and services received by the respondents in the postnatal period according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Received postnatal care (from any provider)	78.1	25.0	.000
N	421	645	
Place for receiving PNC*			
- District hospital;	2.1	11.9	
- UHC/MCWC/FWC	13.1	20.0	
- NGO clinic	3.3	4.3	
- Private hospital/Clinic;	5.0	23.1	
- Private chamber;	1.4	14.1	
- Home	83.1	29.5	
Provider of PNC*			
- BRAC worker	77.2	3.3	
- Qualified doctor	9.3	51.8	
- FWV/Nurse/paramedic/CSBA	23.0	36.4	
- TTBA/TBA	24.2	.9	
- Village doctor	2.9	31.2	
- Others(traditional healer/homeopath/nutrition worker)	1.2	2.0	
Services received during PNC			
- Pulse examination	77.0	88.4	
- Blood pressure	75.1	82.2	
- Anaemia	73.6	79.1	
- Measuring newborn weight	86.7	37.1	
- Measuring mothers height	19	17.2	
- Help to breast feed	70.8	41.2	
- Provide Vitamin A/Iron tablet	55.8	47.9	
- Given advice on nutrition	78.9	55.5	
- Given advice on cleanliness	86.7	52.2	
- Given advice on nutrition	76.2	34.9	
- Given advice on danger signs	73.4	32.7	
- Given advice on Family planning	76.0	20.2	
- Given advice on breastfeeding	86.7	45.6	
N	539	2,579	
Vitamin A capsule intake	38.4	33.4	
Decision-making for PNC			
- Self	16.9	22.1	
- Husband	2.8	4.4	
- Jointly with husband	40.3	49.9	
- Jointly with in-laws	20.6	10.6	
- In-laws	.4	.9	
- Parents/natal relatives	8.3	4.2	
- Others (SS/SK/TBA/TTBAFWV/FWA)	10.8	1.0	

\*Multiple response question

**Annex 1.1.8. Respondents' knowledge on maternal complications according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008
N	539	2,579
Awareness of complications*		
- High blood pressure	9.5	16.0
- Oedema	49.5	50.1
- Convulsion	35.6	27.5
- Excessive bleeding	67.5	57.9
- Mal position	14.7	9.0
- High fever	52.7	28.7
- Severe headache	55.3	45.0
- Blurred vision	48.2	40.6
- Reduced/absent foetal movement	8.3	12.3
- Lower abdominal pain	47.1	64.3
- Anaemia	12.1	12.3
- Excessive vomiting	14.5	19.1
- Tetanus	22.1	21.4
- Retained placenta	36.2	40.1
- Perinatal tear	5.4	7.7
- Others	5.9	12.6
- Don't know	.9	2.5
Place and provider of treatment *		
- District hospital	73.1	57.2
- Govt facility (UHC/FWC/MCWC)	85.5	74.8
- NGO clinic	10.6	10.9
- Private clinic and hospital	9.3	25.4
- Qualified doctor	28.4	24.8
- BRAC worker	17.3	1.5
- Govt field worker	2.0	1.8
- Village doctor	48.6	54.9
- Homeopath	9.6	5.0
- Drug seller	1.1	4.0
- Others(TTBA/TBA/traditional/spiritual healer )	4.1	2.5
- Don't know	.2	.9

\*Multiple response question

**Annex 1.1.9. Respondents' knowledge on maternal danger signs according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Knowledge on danger signs*			
- Excessive bleeding	67.5	57.9	.000
- Convulsion	35.6	27.5	.000
- Prolonged labour and malposition	14.8	19.5	.003
- Oedema, severe headache, blurry vision	85.3	79.4	.002
- High fever and foul smelling discharge	53.4	30.1	.000

\*Multiple response question

**Annex 1.1.10. Complications face by the respondents during antenatal period according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	544	2,611	
Complications faced Complications*	37.3	46.0	.000
- High blood pressure	2.6	5.1	
- Oedema	12.1	14.0	
- Convulsion	.6	1.3	
- Excessive bleeding	2.2	2.1	
- Mal position	1.5	2.8	
- High fever	8.5	11.5	
- Severe headache	11.9	15.7	
- Blurred vision	9.9	14.6	
- Reduced/absent foetal movement	2.4	3.0	
- Lower abdominal pain	12.5	23.4	
- Anaemia	9.9	9.8	
- Jaundice	1.8	1.7	
- Excessive vomiting	5.9	9.7	
- Tetanus	-	.1	
- Others	2.8	2.8	

\*Multiple response question

**Annex 1.1.11. Complications faced by the respondents during delivery according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	544	2,611	
Complications faced Complications*	30.3	30.7	.095
- Substantial bleeding	4.2	7.4	
- High fever	4.8	4.7	
- High pressure	1.7	3.2	
- Blurry vision	5.3	6.8	
- Severe headache	4.4	5.4	
- Mal presentation	1.8	4.2	
- Prolong labour	9.2	11.0	
- Retained placenta	2.4	2.9	
- Ruptured uterus	-	.3	
- Cord prolapse	-	.2	
- Hand/leg prolapsed	.9	1.0	
- Cord around neck	1.1	1.3	
- Convulsion	.9	1.3	
- Mother fainted	1.8	3.9	
- Perineal tear	.7	.6	
- Still birth	.9	1.3	
- Obstructed labour	5.3	7.7	
- Low or absent abdominal pain	5.5	1.1	
- Others	1.1	1.5	

\*Multiple response question

**Annex 1.1.12. Respondents' faced complications during postnatal period according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Complications faced complications*	27.1	27.4	.892
- Severe headache	8.7	9.5	
- Blurry vision	8.2	10.6	
- High pressure	1.3	3.4	
- Excessive bleeding	3.3	6.5	
- Offensive discharge	.9	1.7	
- High fever	7.4	7.9	
- Retained placenta	2.4	2.4	
- Convulsion	.9	1.9	
- Abdominal pain	12.2	12.4	
- Jaundice	2.0	.9	
- Tetanus	.4	.1	
- Oedema	1.7	1.8	
- General weakness	1.7	1.6	
- Others	1.9	1.8	

\*Multiple response question

**Annex 1.1.13. Treatment seeking behaviour for antenatal complications according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	203	1,200	
Action taken for complications			
- None	30	25.9	
- Self treatment	4.4	3.8	
- Treatment from HCP	65.5	70.3	
N	61	311	
Reason for not taking any action*			
- Thought treatment was not necessary	73.8	50.8	
- Lack of money/expensive	24.6	46.9	
- Others (Husband/mother-in-law disapproved)	1.6	6.4	
N	203	1,200	
Place of treatment*			
- No treatment	30	25.9	
- Self treatment	4.4	3.8	
- District Hospital	4.9	5.0	
- UHC/ /MCWC	11.8	12.8	
- FWC/Satellite clinic	3.9	5.3	
- Private hospital/Clinic;	4.4	3.4	
- NGO clinic	30.0	39.1	
- Private chamber/Pharmacy;	16.7	8.7	
- Home	26.9	73.1	
Provider of treatment*			
- No treatment	30	25.9	
- Self treatment	4.4	3.8	
- Village doctor	19.2	19.8	
- BRAC health worker (SK/SS)	4.9	1.3	
- Govt health worker (FWV/FWA/MA/SACMO)	4.4	2.5	
- Homeopath	11.8	8.3	
- Traditional healer	3.0	1.6	
- Qualified doctor	26.1	35.8	
- Drug seller	2.0	2.3	
- Nurse/Paramedic/CSBA	0	2.9	
- Others (TTBA/TBA/Other NGO worker)	2.5	.4	
Treatment received*			
- No treatment	30	25.9	
- Self treatment	4.4	3.8	
- Counseling;	24.6	11.8	
- Allopathic medicine	48.8	61.2	
- Traditional treatment	3.0	2.0	
- Homeopathic medicine	11.8	8.5	
- Referred	6.4	3.1	
- Others	1.5	.8	
Decision-making for seeking/not seeking care for complications			
- Self	15.8	16.1	.000
- Husband	3.4	7.3	
- Jointly with husband	50.2	56.9	
- Jointly with in-laws	20.7	11.1	
- In-laws	2.5	1.3	
- Parents/natal relatives	5.4	7.0	
- Others (SS/SK/TBA/TTBAFWV/FWA)	2.0	.4	

\*Multiple response question



**Annex 1.1.14. Respondents' treatment seeking behaviour for delivery complications according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	165	790	
Action taken for complications			
- None	11.5	22.2	.005
- Self treatment	5.5	3.4	
- Treatment from HCP	83.0	74.4	
N	19	175	
Reason for not taking any action*			
- Felt treatment was unnecessary	47.4	61.1	
- Lack of money/expensive	42.1	37.1	
- Others	10.5	12.6	
N	165	790	
Place of treatment*			
- No treatment	11.5	22.2	
- Self treatment	5.5	3.4	
- District Hospital;	5.5	6.8	
- UHC/MCWC/FWC	26.7	12.3	
- NGO clinics	1.2	2.2	
- Private hospital/Clinic;	5.5	13.2	
- Private chamber;	4.2	7.0	
- Home	40.0	33.0	
Provider of treatment*			
- No treatment	11.5	22.2	
- Self treatment	5.5	3.4	
- Village doctor;	30.9	28.6	
- BRAC Worker	4.2	.1	
- FWV/ MA SACMO	7.9	3.3	
- Homeopath;	1.8	2.5	
- Qualified doctor	26.7	30.4	
- Nurse	4.2	4.4	
- Others (TTBA/TBA/traditional/spiritual healer)	7.3	4.6	
Treatment received*			
- No treatment	11.5	22.2	
- Self treatment	5.5	3.4	
- Did not receive any treatment;	1.2	.6	
- Counseling;	16.4	6.6	
- Allopathic medicine	84.2	70.1	
- Traditional	4.8	2.0	
- Homeopathic medicine;	1.8	2.8	
- Surgery /c-section;	7.9	9.7	
- Referred	15.2	4.2	
- Others	1.2	4.4	
Decision-making for seeking or not seeking care for complications			
- Self	4.8	5.9	.000
- Husband	2.4	10.5	
- Jointly with husband	40.0	35.7	
- Jointly with in-laws	33.9	21.0	
- In-laws	3.6	2.8	
- Parents/natal relatives	9.1	21.1	
- Others (SS/SK/TBA/TTBAFWV/FWA)	6.1	2.9	

\*Multiple response question

**Annex 1.1.15. Respondents' treatment seeking behaviour for postnatal complications according to area (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	146	706	
Action taken for complications			
- None	14.4	19.7	.147
- Self treatment	2.7	4.8	
- Treatment from HCP	82.9	75.5	
N	21	139	
Reason for not taking any action*			
- Felt treatment was unnecessary	52.4	38.8	
- Relatives disapproved	9.5	10.1	
- Lack of money/expensive	33.3	53.2	
- Others (Religious reasons, Too far, could not manage time)	4.8	3.6	
N	146	706	
Place of treatment*			
- None	14.4	19.7	
- Self treatment	2.7	4.8	
- District hospital;	2.7	3.7	
- UHC/MCWC/FWC	11.0	6.5	
- NGO clinic	1.4	.8	
- Private hospital/Clinic;	3.4	5.0	
- Private chamber/Pharmacy;	27.4	30.5	
- Home	37.0	29.0	
Provider of treatment*			
- None	14.4	19.7	
- Self treatment	2.7	4.8	
- Village doctor;	34.5	39.3	
- BRAC health worker	5.5	.6	
- Homeopath	7.6	4.4	
- Qualified doctor	21.4	22.4	
- Drug seller.	8.3	6.1	
- Others (FWV/TTBA/TBA/traditional healer)	5.5	2.7	
Treatment received*			
- None	14.4	19.7	
- Self treatment	2.7	4.8	
- Counseling	26.7	9.3	
- Allopathic medicine	71.2	68.7	
- Homeopathic medicine;	8.2	5.0	
- Referred	1.4	1.4	
- Others (traditional, put hair in mouth, removed placenta manually, blood transfusion)	2.7	2.4	
Decision-making for seeking or not seeking care during postnatal period			.028
- Self	6.8	11.9	
- Husband	4.8	9.3	
- Jointly with husband	50.7	47.6	
- Jointly with in-laws	21.9	14.3	
- In-laws	1.4	2.3	
- Parents/natal relatives	11.6	13.6	
- Others (SS/SK/TBA/TTBAFWV/FWA)	2.7	1.0	

\*Multiple response question

**ANNEX 1.2 NEONATAL HEALTH****Annex 1. 2.1. Knowledge of the study population on essential newborn care (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Need for ENC	99.8	99.5	.492
Maximum Correct Knowledge on ENC			
- no knowledge	.2	5	.000
- any 1 correct knowledge	1.9	3.2	
- any 2 correct knowledge	17.4	20.6	
- any 3 correct knowledge	20.0	28.7	
- any 4 correct knowledge	22.1	25.2	
- any 5 correct knowledge	38.4	21.9	
ENC knowledge			
- have no knowledge	.2	.5	.000
- have moderate knowledge	61.4	77.6	
- have maximum 5 knowledge	38.4	21.9	

**Annex 1.2.2. Knowledge of the study population on neonatal danger signs (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008
N	539	2,579
Neonatal danger signs *		
- Unable to suck breast milk	10.6	11.9
- Infected umbilicus	15.6	13.6
- Lethargic	3.0	3.5
- Red eye/dust/fungus in eye	3.7	3.0
- Jaundice over 14 days	41.2	22.1
- Fever and Hypothermia/shivering	76.3	65.4
- Skin infection	21.3	7.9
- Fast breathing/ breathing problem /pneumonia	52.1	67.8
- Convulsion	11.1	6.2
- Chest in drawing	27.6	14.3
- Distended abdomen	.2	.5
- Severe Vomiting	13.4	15.6
- Diarrhoea	28.6	21.2
- Measles/Pox	1.3	3.3
- Others	.9	1.4
- Don't know	3.0	10.5

\*Multiple response question

**Annex 1.2.3. Health care providers for essential new born care (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008
N	539	2,579
Place where newborn received ENC		
- District hospital	3.0	2.6
- UHC/MCWC/FWC	11.3	5.1
- BRAC <i>shushasthya</i>	.6	.3
- Private clinic/hospital	4.3	6.5
- Other NGO	1.1	.5
- Home	79.4	85.0
- Don't know	.6	.1
Person who provided ENC *		
- Qualified doctor/Nurses	18.0	15.9
- FWA/ FWV	4.1	.9
- TTBA	31.4	21.3
- TBA	28.4	52.0
- SS	9.3	.3
- SK	1.5	.2
- Relatives / Neighbours	17.8	33.0
- Mother herself	.4	.6
- Village doctor	.6	.4
- Others (husband/ CSBA)	.4	.2
- Don't know	1.1	.3

\* Multiple responses

**Annex 1.2.4. Knowledge of the study population on care for normal weight baby (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Birth weight of a normal baby			
- Correct knowledge	72.7	41.6	0.00
- Incorrect knowledge	27.3	58.4	
Cares for a normal weight baby*			
- Wiping baby with clean dry cloth	75.0	79.0	
- Wrapping with clean soft cloth including head	73.1	77.2	
- Not applying anything on the umbilicus	3.0	5.1	
- Bathing after 3 days	28.9	14.2	
- Shaving hair after 1 month	26.7	5.5	
- Go to hospital for any complications	22.8	19.6	
- Breastfeeding	3.0	1.5	
- Don't know / Incorrect knowledge	5.4	8.4	
Correct knowledge on care for normal \weight baby			
- no knowledge	5.0	7.3	0.00
- 1 correct knowledge	14.7	12.2	
- 2 correct knowledge	39.9	57.3	
- 3 correct knowledge	26.7	19.3	
- 4 correct knowledge	13.7	4.0	
Correct knowledge on normal weight baby - Median (range)	2 (0-4)	2 (0-4)	
Knowledge on care for normal weight baby			
- have no knowledge	5.0	7.3	0.00
- have moderate knowledge	81.3	88.8	
- have maximum 4 knowledge	13.7	4.0	

\* Multiple responses

**Annex 1.2.5. Knowledge of the study population on care for low birth weight (LBW) baby (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Need for care for low birth weight baby	88.5	83.5	.003
Care for low birth weight baby*			
- Breastfeed within one hour of birth	39.9	31.9	
- Frequent breastfeeding (after half an hour)	65.5	69.1	
- Feed expressed milk if the baby cannot suckle	10.4	18.6	
- Cover from head to toe with soft clean cloth	47.3	46.2	
- Keep the baby in contact with mother's skin	9.6	18.2	
- Not applying anything on the umbilicus	.9	1.4	
- Bath after 7 days	30.4	7.7	
- Shave hair after a month	28.6	4.9	
- Use baby jacket	1.5	.9	
- Go to hospital for any complications	21.3	25.3	
- Providing heat to the baby (sun ray/ cottons)	.4	.3	
- Don't know / Incorrect knowledge	11.7	17.8	
Maximum correct knowledge on care for low birth weight baby			
- No knowledge	11.5	16.5	.000
- 1 knowledge	8.2	7.6	
- 2 knowledge	26.3	30.7	
- 3 knowledge	29.1	29.4	
- 4 knowledge	16.7	11.6	
- 5 knowledge	8.2	4.2	
Mean no. of correct knowledge on care for low birth weight baby (range)	3 (0-5)	2(0-5)	.000
Knowledge on care for low birth weight baby			
- No knowledge	11.5	16.5	.000
- Moderate knowledge	80.3	79.3	
- Maximum 5 knowledge	8.2	4.2	

\* Multiple responses

**Annex 1.2.6. Knowledge of respondents on thermal care for normal and low birth weight baby (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Thermal care for normal weight baby	75.0	79.0	.039
- Wrapping from head to toe	73.1	77.2	.044
- Wiping from head to toe	28.9	14.2	0.00
- Bathing after 3 days	26.7	5.5	0.00
- Shaving hair after 1 month			
Correct knowledge on thermal care for normal weight baby - Median (range)	2 (0-4)	2 (0-4)	
Thermal care for low birth weight baby			
- Wrapping from head to toe	47.3	46.2	.669
- Skin to skin contact with mother	9.6	18.2	0.00
- Bathing after 7 days	30.4	7.7	0.00
- Shaving after 1 month	28.6	4.9	0.00
- Using baby jacket	1.5	.9	.242
Correct knowledge on thermal care for low birth weight baby - Median (range)	1 (0-4)	1(0-4)	

**Annex 1.2.7. Knowledge of the respondents on newborns feeding (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
First food to be given to the newborn just after delivery *			
- Colostrum	82.6	57.8	
- Honey	14.3	44.7	
- Water (saline/glucose/hot/cold)	13.7	34.3	
- Other milk (cow/goat/ formula)	2.8	6.3	
- Others (Mustard oil, Black pepper)	.2	1.1	
- Don't know	.6	.4	
Types of complementary food to be given first *			
- Cereals (soft rice/khichuri/suji/sagu/barley)	91.5	95.8	
- Egg/fish/meat	25.4	18.9	
- Fruits & Vegetables	36.7	34.4	
- Milk and milk products	52.7	48.9	
- Pulses	.6	0.0	
- Don't know	.4	.3	

\* Multiple responses

**Annex 1.2.8. Knowledge of the study population on neonatal complications (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Need for treatment during neonatal complication	97.0	88.7	.000
Maximum correct knowledge on neonatal complications			
- no knowledge	6.3	16.9	.000
- 1 knowledge	34.7	42.7	
- 2 knowledge	38.2	28.4	
- 3 knowledge	15.8	9.7	
- 4 knowledge	4.6	1.7	
- 5 knowledge	.4	.5	
- 6 knowledge	.0	.1	
Knowledge on neonatal complications			
- No knowledge	6.3	16.9	.000
- Moderate knowledge	93.3	82.5	
- Maximum 6 knowledge	.4	.6	

**Annex 1.2.9. Practice followed in terms of ENC (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Received ENC	99.4	99.1	.039
ENC Cares Received			
- Wiping by with clean dry cloth	97.6	98.3	.287
- Checking color of baby	75.1	70.0	.019
- Checking whether breathing or not	82.9	85.4	.164
- Checking whether crying or not	83.1	82.4	.709
- Wrapping from head to toe	93.9	87.4	0.00
- Initiate breastfeeding within one hour of birth	74.0	63.0	0.00
- Cutting cord with sterilized blade	95.4	88.4	0.00
- Tying cord with sterilized thread	90.5	76.0	0.00
- No ENC Received	.6	.1	.039

**Annex 1.2.10. Bathing and shaving practice (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Newborn bathed for the first time			
- 1st day	13.7	49.2	.000
- 2 - 3 days	26.5	20.9	
- 4 - 7 days	43.2	14.0	
- more than 7 days	13.2	13.1	
- Others (yet not bathed/don't remember)	3.3	2.8	
Newborn shaved for the first time			
- ≤ 1 month	35.6	80.7	.000
- >1 month	56.6	14.9	
- Others (Don't remember/Still not shaved)	7.8	4.4	

**Annex 1.2.11. Feeding of the newborn (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	539	2,579	
Pre-lacteal feeding of the newborn			
- Colostrum	75.1	42.4	.000
- Breast milk (after expressing Colostrum)	.9	1.9	
- Honey	6.7	21.4	
- Water	10.4	25.1	
- Other milk (cow/goat/formula)	6.3	7.5	
- Others (Mustard oil/distilled/warm water)	.0	.7	
- Don't know	.6	.9	

**Annex 1.2.12. Prevalence and management of neonatal illness (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	54	272	
Birth Asphyxia			
Types of problem			
- Did not cry	79.6	57.7	.010
- Could not breathe	55.6	66.9	.237
- Slow breathing	57.4	70.6	.143
- blue baby	35.2	27.9	.237
- baby died	14.8	4.0	.008
Care provided			
- Wipe the body with clean cloth	85.2	82.0	.846
- Tap the feet	75.9	47.4	0.00
- Wrap the baby with clean cloth	83.3	68.8	.059
- Clean the mouth and nostrils	63.0	55.5	.319
- Mouth to mouth breathing	48.1	42.6	.142
- Take the baby to the hospital	11.1	18.4	.345
- No care given	.0	.4	1.00
- Others	13.0	8.8	.319
N	107	500	
Neonatal Sepsis			
Types of problem			
- Could not suck milk	72.9	74.4	.808
- Became lethargic or unconscious	45.8	42.2	.519
- Chest in drawing	52.3	60.2	.159
- Convulsion	10.3	9.2	.716
- Suffered from fever / Hypothermia	86.0	87.0	.754
Care provided			
- Allopath	22.4	50.6	0.00
- Homeopath	70.1	39.8	0.00
- Went to the hospital	3.7	3.8	.088
- Others (traditional healers/ <i>Kobiraz</i> )	6.5	2.2	.026
- No treatment taken	.9	.8	1.00



**Annex 1.2.13. Treatment seeking for neonatal complications (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008
N	13	79
Reason for not taking any action *		
- Could not manage time	0.00	6.1
- Thought it was not necessary	76.9	72.2
- Husband/mother-in-law disapproved	0.00	3.8
- No one to accompany	0.00	2.5
- Lack of money	23.1	19.0
N	315	1,179
Decision for seeking / not seeking care during complication *		
- Self	2.5	6.4
- Husband	1.6	5.4
- Jointly with husband	62.5	59.4
- Jointly with in-laws	24.8	14.3
- Parents and natal relatives	7.6	14.3
- Others (TBA/TTBA/SS/SK/Qualified doctor)	1.0	.3
N	295	1,062
Place of treatment *		
- District hospital	3.4	5.8
- UHC/MCWC/FWC	6.4	7.0
- BRAC shushasthya/Other NGOs	1.0	.9
- Private clinic	64.1	63.1
- Home	22.4	18.5
- Others (satellite clinic/ pharmacy)	2.7	4.8
Treatment received *		
- No treatment	1.0	.5
- Counselling	30.2	7.3
- Allopathic	32.2	59.2
- Homeopathic	69.2	41.2
- Referred	7.1	5.4
- Others	4.4	5.5

\*Multiple response question

**Annex 1.2.14. Referrals for complications (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	21	57	
Treatment sought at the referred place	85.7	82.5	1.00
N	18	47	
Treatment received at the referred place *			
- Consultation	11.1	10.6	
- Allopath	100.0	85.1	
- Homeopath	0.00	8.5	
- Others (traditional healers)	5.6	8.5	
N	3	10	
Reasons for not taking treatment from referred place *			
- Couldn't find time	0.00	10.0	
- Thought treatment was not necessary	33.3	10.0	
- Lack of money	66.7	90.0	

\*Multiple response question

**ANNEX 1.3 UNDER 5 CHILDREN****Annex 1.3.1. Proportion of under nutrition in Nilphamari and five different study areas (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	992	4,960	
Under weight (Wt-for-age)			
Moderate to severe	31.1	33.1	.251
N	992	4,960	
Stunting (Ht-for-age)			
Moderate or severe	37.7	38.2	.406
N	991	4,945	
Wasting (Wt-for-ht)			
Moderate or severe	10.6	13.7	.004

**Annex 1.3.2. Immunization of children aged 12-59 months (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	600	3,000	
Children with 12-59 months at least one vaccination	99.2	98.1	.040
Card available	71.8	59.7	.000
Complete vaccination status	70.7	74.0	.088
Completed dose of vaccine			
- BCG	98.2	96.9	.084
- Polio3	94.5	90.6	.002
- DPT3	94.2	90.0	.001
- Hepatitis-B	76.5	80.6	.022
- Measles	91.0	88.0	.037

**Annex 1.3.3. Children faced problems during ARI (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008
N	815	5,468
Problems faced due to ARI*		
- Cough	70.9	69.7
- cold	63.0	64.2
- Fast breathing	22.2	25.7
- Unable to feed child	11.1	12.9
- Condition deteriorated	9.7	10.5
- Abnormally sleepy	2.7	4.5
- Wheezing breathing sound	26.6	23.5
- Fever	55.6	54.4
- Hypothermia	1.9	2.9
- Chest in drawing	19.9	12.9
- Convulsion	1.7	1.0
- Frequent vomiting	5.6	4.2

\*Multiple response question

**Annex 1.3.4. Children received treatment for ARI (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	815	3,902	
Received treatment for ARI	85.8	84.7	.243
N	699	3,306	
Place of treatment for ARI*			
- District Hospital	2.6	2.6	
- FWC/MCWC/UHC)	10.4	7.0	
- Private clinic/hospital	2.1	2.4	
- NGO (BRAC <i>shushasthya</i> , other NGO clinics)	.4	.8	
- Satellite clinic	.1	.5	
- Home	11.6	6.2	
- Private chamber/Pharmacy	76.4	82.7	
Provider of treatment*			
- Qualified doctor	18.0	23.9	
- MA/SACMO	3.6	.7	
- BRAC SS	.7	.0	
- Drug seller	6.7	16.5	
- Village doctor	38.6	46.5	
- Traditional/spiritual healer	.9	1.0	
- Homeopath	36.2	14.4	
- FWV/FWA/Nurse/paramedics/other NGO worker/TTBA/TBA)	.7	2.7	

\*Multiple responses

**Annex 1.3.5. Children suffered from diseases other than diarrhoea and ARI in study areas (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	1,111	5,468	
Children suffered from any other diseases	37.1	37.2	.495
N	412	2,028	
Children suffered from*			
- Fever	39.3	50.2	
- Skin disease	19.9	24.4	
- Dysentery	40.0	32.0	
- Mouth ulcer	18.7	13.6	
- Worm infestation	7.3	2.7	
- Infection (nose, eye, teeth, ear)	8.0	3.6	
- Others (burning, rickets, leg pain, abdominal pain, bone problem, measles)	3.6	2.7	

\*Multiple responses

**Annex 1.3.6. Knowledge of mothers on ARI of children with 0-59 months (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	1,111	5,468	
Has knowledge about ARI	99.1	99.0	.473
Mothers knowledge about ARI symptoms*			
- Running nose	95.8	96.3	
- Cough	86.6	91.6	
- Fever	49.6	55.6	
- Fast breathing	27.2	34.4	
- Others (pneumonia, chest pain, convulsion, breathing problem, refuse breast milk, vomiting)	.7	1.0	
Has knowledge about ARI danger sign of ARI	98.9	97.8	.007
Knowledge about complications*			
- Rapid breathing	58.1	75.0	
- Stop eating	19.4	24.7	
- Condition deteriorated	20.8	26.4	
- Abnormally sleepy	1.4	4.6	
- Wheezing sound of breathing	51.1	55.9	
- High fever	51.8	40.6	
- Hypothermia	4.3	4.5	
- Chest indrawing	70.7	45.8	
- Convulsion	5.6	5.8	
- Frequent vomiting	7.5	7.3	
- Don't know	1.2	2.5	
Knowledge about treatment-seeking place*			
- District hospital	63.5	47.9	
- <i>Upazila</i> hospital	75.1	59.0	
- MCWC/FWC	12.5	9.5	
- Private clinic/hospital	5.6	15.9	
- Other NGO clinic/BRAC shushasthya	4.3	5.4	
Knowledge about treatment-seeking provider*			
- Qualified doctor	25.7	62.1	
- SS/SK	3.5	.5	
- Village doctor	55.4	60.0	
- Traditional healer	2.5	2.7	
- Homeopath	32.6	15.3	
- Drug seller	3.0	7.6	
- Others (home, FWV,FWA,MA/SACMO, paramedics, TBA,TTBA)	.6	1.0	

\*Multiple responses

**Annex 1.3.7. Prevalence of Diarrhoea among study children (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	1,111	5,468	
Complications faced during diarrhoea*			
- Loose stool >3 times in a day	12.7	12.4	.424
- Loose stool more than 3 days	7.4	7.7	.771
- Vomiting	7.8	7.8	.485
- Fever	10.8	8.2	.018
- Depressed eye	8.5	7.6	.193
- Depressed fontanelle	4.5	4.5	.902
- Eagerly drunk water	6.7	5.1	.094
- Unable to eat normal diet	4.7	2.4	.000
- Loose abdominal skin	4.1	4.0	.903
- Became irritable	7.5	4.2	.000
- Lethargic	3.5	4.0	.629
- Not urinating within 24 hours	1.0	.2	.000

\* Diarrhoea has been defined as more than three loose stools in a day

**Annex 1.3.8. Treatment of diarrhoea by areas (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	135	620	
Treatment received during diarrhoea	88.2	87.3	.884
Place of treatment*			
- Govt' health facilities (District Hospital, <i>Upazila/Thana</i> health complex; FWC)	15.4	12.0	
- Private health facilities (BRAC <i>Shushasthya</i> , private hospital/Clinic, Other NGO clinic)	63.1	60.9	
- Pharmacy	10.8	23.7	
- Home	11.5	6.4	
- Others (private chamber)	1.5	4.0	
Provider of treatment*			
- Qualified doctor	15.6	21.5	
- FWV/FWA/ MA/SACMO	9.6	2.9	
- BRAC SS /BRAC SK	.7	.3	
- Nurse	.7	1.5	
- Pharmacist/Drug seller	11.9	18.9	
- Village doctor	43.7	51.1	
- Traditional healer	1.5	1.9	
- Homeopath	20.0	9.5	

\*Multiple responses

**Annex 1.3.9. Treatment of other illnesses of under five children (percentages)**

	Nilphamari in 2008 (following 2 years of intervention)	Five new districts in 2008	p-value
N	412	2,032	
Received treatment	85.8	84.7	.243
Place of treatment*			
- Govt' facilities (District Hospital, UHC, MCWC, FWC)	13.0	8.8	
- Non govt' facilities (BRAC <i>Shushasthya</i> , Private hospital/Clinic, Other NGO clinic)	1.4	3.2	
- Private chamber	54.0	54.7	
- Pharmacy	17.5	29.5	
- Home	17.2	8.8	
N	354	1,741	
Provider of treatment*			
- Qualified doctor	15.3	18.3	
- FWV/ FWA, MA/SACMO	4.2	2.6	
- BRAC SS/SK	2.0	.5	
- TBA	10.2	21.5	
- Village doctor	33.9	43.5	
- Traditional healer, Spiritual healer	4.5	2.5	
- Homeopath	33.6	16.6	
N	412	2,032	
Decision taken for the treatment of the child by			
- Mother alone	8.7	9.6	
- Both father and mother	2.7	5.1	
- Jointly with in-laws family	71.1	75.0	
- Jointly with mother's family	15.0	8.4	
- Others	2.4	2.0	

\*Multiple responses

## ANNEX 2. COMPARISON BETWEEN BASELINE INTERVENTION AND CONTROL DISTRICTS

### ANNEX 2.1 MATERNAL HEALTH

#### Annex 2.1.1. Distribution of respondents by use of contraception according to area (percentages)

	Baseline districts		p-value
	Intervention	Control	
N	3,600	2,400	
Currently using any family planning (FP) method	62.4	65.6	
- Any modern method			0.000
- Pill	36.3	41.7	
- Injection	13.6	10.6	
- Condom	1.8	2.5	
- Intra-urine device	.4	.7	
- Norplant	1.8	.8	
- Ligation	1.1	3.1	
- Vasectomy	.4	.3	
Any traditional method			
- Periodic abstinence	5.7	4.5	
- Withdrawal	.9	.9	
- Others	.3	.4	
N	2,000	1,434	
Experiencing any side-effects	20.1	22.0	.173
Side effects*	12.7	13.2	
- Dizziness	7.3	4.8	
- Irregular menstruation	4.2	4.7	
- Weakness/tired	.5	.7	
- Anorexia in food	1.1	1.0	
- Blurry vision	.8	2.5	
- Back pain	.4	.3	
- Excessive bleeding	.8	2.9	
- Others			
N	3,600	2,400	
Decision-making for using FP methods			
- Self	7.5	11.7	.000
- Husband	2.1	5.1	
- Jointly with husband	88.7	81.7	
- Others (Jointly with in-laws, In-laws, SS/SK, TBA/TTBA, FWV/FWA)	1.7	1.2	

\*Multiple response question

#### Annex 2.1.2. Distribution of respondents by complications of abortion/MR according to area (percentages)

	Baseline districts		p-value
	Intervention	Control	
N	176	88	
Complications faced (induced abortion)	34.1	26.1	.085
N	398	386	
Complications (spontaneous abortion)	41.7	47.2	.000
N	146	66	
Complications faced (MR)	21.2	30.3	.153

**Annex 2.1.3. Respondents knowledge on antenatal care (percentages)**

	Baseline district		p-value
	Intervention	Control	
N	1,571	1,040	
Knows about antenatal care	96.0	97.8	0.013
N	1,508	1,017	
Importance of receiving antenatal care*			
- For early recognition of complication	54.1	42.5	0.000
- For safe delivery	45.9	57.5	

\*Multiple response question



**Annex 2.1.4. Distribution of respondents households by place, provider and services received during antenatal period according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,571	1,040	
Received ANC (from any provider)	61.8	70.6	0.000
N	971	734	
Has ANC card	13.8	8.2	0.000
Provider of ANC*			
- Village doctor	4.1	7.4	
- BRAC worker	43.8	21.3	
- FWV/Nurse/Paramedic	30.3	42.0	
- Traditional healer/Homeopath	1.2	4.0	
- Qualified doctor	37.2	41.7	
- Others(TTBA/TBA/FWA/pharmacist)	2.6	4.9	
- Don't know	.7	.3	
Examinations done during last pregnancy			
- Pulse examination	85.7	90.2	
- Blood pressure	90.2	92.5	
- Weight measurement	83.3	79.3	
- Height measurement	41.9	28.5	
- Anemia	79.9	83.5	
- Blood test	24.7	24.4	
- Urine test	44.6	48.9	
- Abdominal exam	89.9	90.7	
- Fetal heart beat	62.2	68.7	
- Ultra sonogram	23.8	26.2	
Advices received during last pregnancy			
- Advice on TT vaccination	72.5	71.5	
- Advice on dietary intake	86.2	89.5	
- Advice on resting	87.6	88.8	
- Advice on Iron folic acid intake	85.0	84.7	
- Advice on breastfeeding	49.3	47.0	
- Advice on not doing heavy works	74.1	74.0	
- Advice on doing ANC	71.7	67.8	
- Advice on cleanliness	57.3	56.4	
- Advice on contacting the birth attendant or SS	34.3	30.4	
- Advice on complications?	46.9	44.5	
- Advice of birth place	40.2	41.0	
- Advice on birth attendant	36.7	36.1	
- Advice on saving money	38.3	29.7	
- Advice on buying delivery kit	19.9	15.4	
- Advice on keeping cloth for wrapping and wiping the neonate	38.3	31.6	
- Advice on buying misoprostol tablet	3.7	2.7	
- Advice on preparing a transport	12.1	11.4	
- Advice on keeping the phone number of health worker	14.1	12.8	
- Advice on fixing a blood donor	5.8	6.1	
- Advice on taking to a hospital for emergency	32.8	35.0	
N	600	306	
Reasons for not receiving ANC*	3.2	4.6	0.016
- Not aware of ANC	64.7	72.9	
- Did not think it was necessary	24.8	18.6	
- Due to lack of money	7.3	3.9	
- Others (religious reasons, husband mother in law disapproved, too far etc)			

\*Multiple responses

**Annex 2.1.5. Other services received by respondents during antenatal period according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,571	1,040	
Took iron tablet during last pregnancy	56.3	62.2	0.000
Received TT vaccination during last pregnancy			
- Yes	71.6	62.7	0.055
- No	12.5	14.7	
- Had completed dose earlier	15.7	22.3	
- Don't remember/know	0.2	0.3	
N (Received TT vaccination)	1,125	652	
Number of TT injections			
- 1	46.1	57.5	0.000
- 2	41.4	35.1	
- 3	10.5	6.1	
- >4	1.0	0.6	
N	1,571	1,040	
Hours of rest taken during day-time			
- None	2.9	6.3	0.012
- < 2 hrs	36.8	30.7	
- >=2 hrs	60.3	63.0	
Mean hours of rest taken during day	2.08+1.26	1.95+1.14	0.000
N	45	66	
Reasons for not taking rest at day-time*			
Could not manage time	71.1	84.8	0.631
Mother-in-law did not allow	4.4	0.0	
Had lots of work	24.4	15.2	
N	1,571	1,040	
Hours of rest taken during night-time			
- None	0.3	0.3	0.000
- < 8 hours	32.9	55.7	
- >=9 hours	66.8	44.0	
Mean hours of rest taken during night	8.99+1.13	8.33+1.33	0.000
Food intake during pregnancy			
- More	31.1	33.7	0.000
- Equal	31.3	35.0	
- Less	37.2	31.2	
- Don't remember	0.4	0.2	
Heavy work during pregnancy			
- Yes	45.9	36.3	0.000
- No	54.0	63.5	
- Don't remember	0.1	0.2	
Decision-making for Antenatal cares			
- Self	19.0	17.2	.023
- Husband	2.4	5.0	
- Jointly with husband	64.1	62.7	
- Jointly with in-laws	9.0	9.0	
- In-laws	.9	.9	
- Parents/ other natal relatives	2.9	3.7	
- Others	1.8	1.5	

\*Multiple response question

**Annex 2.1.6. Birth preparedness of respondents according to area (percentages)**

	Baseline districts		p-value
	Intervention	Baseline	
N	1,571	1,040	
Any preparations	97.1	98.2	.095
N	1,525	1,021	
Preparations during last pregnancy			
- Determined place of delivery	99.2	98.7	
- Determined attendant at delivery	81.7	91.3	
- Saved money	56.5	49.0	
- Bought delivery kit for home delivery	10.4	11.9	
- Arranged clean cloth for wiping and wrapping baby after birth	93.2	91.8	
- Bought misoprostol tablet	0.8	1.6	
- Arranged transport for emergency	8.9	13.2	
- Had emergency phone no. of health worker	8.6	12.5	
- Determined blood donor	1.6	3.0	
- Others	7.8	2.0	

**Annex 2.1.7. Respondents' households cord cutting practices according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N (Deliveries conducted at home/on the way)	1,362	858	
Use of delivery kit	11.0	12.0	.660
N	1,353	855	
Person who cut the umbilical cord			
- TTBA	19.1	28.2	.000
- TBA	51.4	56.0	
- Relatives/neighbour	10.9	10.4	
- Mother herself	15.5	2.5	
- Others (FWV/CSBA/SS/village doctor/traditional healer)	2.7	2.5	
- Don't know	.4	.5	
Instrument used to cut off the umbilical cord			
- Delivery kit blade	8.2	8.5	.000
- Sterile (new and boiled)	83.7	76.8	
- Not sterile	3.8	8.8	
- Blade washed with savlon/heated	1.3	1.5	
- Others (bamboo split, scissors, chopper)	1.2	2.2	
- Don't know /can't recall	1.9	2.1	
Median waiting time before cutting cord (mins)	20.0	20.0	
Instrument used to tie the umbilical cord			
- Thread (boiled)	78.1	70.4	.001
- Thread (not boiled)	17.7	24.9	
- Others	.4	.4	
- Don't know/ can't recall	3.8	4.3	
N	1,571	1,040	
Decision-making for delivery			
- Self	9.2	10.1	.000
- Husband	2.9	5.7	
- Jointly with husband	53.3	40.9	
- Jointly with in-laws	18	17.6	
- In-laws	1.5	1.9	
- Parents/natal relatives	13.5	22.5	
- Others (SS/SK/TBA/TTBAFWV/FWA)	1.6	1.3	

**Annex 2.1.8. Place, provider and services received by respondents in the postnatal period according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Received postnatal care (from any provider)	21.2	30.7	.000
N	330	315	
Place for receiving PNC*			
- District hospital;	12.7	11.1	
- UHC/MCWC/FWC	20.9	20.3	
- NGO clinic	5.8	1.6	
- Private hospital/Clinic;	21.5	24.8	
- Private chamber;	12.4	15.9	
- Home	30.6	28.3	
Provider of PNC*			
- BRAC worker	3.0	3.5	
- Qualified doctor	50.6	53.0	
- FWV/Nurse/paramedic/CSBA	40.3	32.4	
- TTBA/TBA	-	1.9	
- Village doctor	32.1	30.2	
- Others(traditional healer/homeopath/nutrition worker)	2.4	1.6	
Services received during PNC			
- Pulse examination	88.2	88.6	.619
- Blood pressure	81.8	82.5	.612
- Anaemia	77.9	80.3	.415
- Measuring newborn weight	37.9	36.2	.315
- Measuring mothers height	17.9	16.5	.825
- Help to breast feed	44.5	37.8	.074
- Provide Vit A/Iron tablet	40.3	55.9	.000
- Given advice on nutrition	47.9	63.5	.000
- Given advice on cleanliness	46.7	58.1	.004
- Given advice on nutrition	34.2	35.6	.742
- Given advice on danger signs	33.9	31.4	.503
- Given advice on Family planning	22.4	17.8	.169
- Given advice on breastfeeding	47.3	43.8	.385
- Others			
N	1,553	1,026	
Vitamin A capsule intake	28.7	40.5	.000
Decision-making for PNC			
- Self	22.6	21.2	.000
- Husband	3.9	5.3	
- Jointly with husband	52.7	45.6	
- Jointly with in-laws	10.2	11.1	
- In-laws	.7	1.1	
- Parents/natal relatives	9.2	14.1	
- Others (SS/SK/TBA/TTBAFWV/FWA)	.7	1.6	

\*Multiple response question

**Annex 2.1.9. Respondents' knowledge on maternal complications according to area (percentages)**

	Baseline districts	
	Intervention	Control
N	1,553	1,026
Awareness of complications*		
- High blood pressure	13.5	19.9
- Oedema	55.8	41.5
- Convulsion	28.7	25.8
- Excessive bleeding	55.2	62.0
- Mal position	21.2	15.6
- High fever	31.1	25.0
- Severe headache	43.8	46.9
- Blurred vision	44.6	34.6
- Reduced/absent foetal movement	13.7	10.1
- Lower abdominal pain	64.5	64.1
- Anaemia	12.4	12.1
- Excessive vomiting	19.1	19.2
- Tetanus	22.0	20.5
- Retained placenta	47.8	28.5
- Perineal tear	8.2	6.8
- Others	16.0	7.4
- Don't know	2.1	3.0
Place and provider of treatment *		
- District hospital	59.6	53.6
- Govt facility (UHC/FWC/MCWC)	71.3	80.1
- NGO clinic	13.1	7.7
- Private clinic and hospital	30.0	18.5
- Qualified doctor	63.0	70.2
- BRAC worker	1.8	1.0
- Govt field worker	1.6	2.1
- Village doctor	58.8	49.0
- Homeopath	6.2	3.1
- Drug seller	3.3	5.0
- Others(TTBA/TBA/traditional/spiritual healer)	3.0	1.9
- Don't know	1.2	.3

\*Multiple responses

**Annex 2.1.10. Respondents' knowledge on maternal danger signs according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Knowledge on danger signs*			
- Excessive bleeding	55.2	62.6	.001
- Convulsion	28.7	25.8	.126
- Prolonged labour and malposition	21.6	16.3	.001
- Oedema, severe headache, blurry vision	82.2	75.1	.000
- High fever and foul smelling discharge	33.1	25.5	.000

\*Multiple responses

**Annex 2.1.11. Respondents' complications during antenatal period according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,571	1,040	
Complications faced	45.3	47.0	.378
Complications*			
- High blood pressure	3.2	7.9	.000
- Oedema	14.6	13.2	.328
- Convulsion	1.0	1.8	.084
- Excessive bleeding	2.4	1.8	.409
- Mal position	2.5	3.2	.396
- High fever	11.5	11.4	1.00
- Severe headache	15.8	15.6	.913
- Blurred vision	14.4	14.8	.821
- Reduced/absent foetal movement	2.9	3.3	.561
- Lower abdominal pain	24.1	22.5	.370
- Anaemia	9.7	9.9	.893
- Jaundice	1.7	1.8	1.00
- Excessive vomiting	8.9	11.0	..092
- Tetanus	.2	-	.281
- Others	2.4	3.4	.143

\*Multiple responses

**Annex 2.1.12. Complications faced during delivery according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,571	1,040	
Complications faced	28.8	32.5	.045
Complications*			
- Substantial bleeding	6.0	8.8	.008
- High fever	3.8	5.6	.033
- High pressure	2.1	4.3	.001
- Blurry vision	5.9	7.7	.077
- Severe headache	4.6	6.3	.050
- Mal presentation	3.3	5.1	.025
- Prolong labour	10.8	11.2	.749
- Retained placenta	3.4	2.4	.161
- Ruptured uterus	.4	.1	.156
- Cord prolapse	.1	.2	.653
- Hand / leg prolapsed	1.0	1.1	1.00
- Cord around neck	1.1	1.4	.592
- Convulsion	1.1	1.5	.590
- Mother fainted	4.1	3.8	.838
- Perineal tear	.4	.8	.301
- Still birth	1.2	1.3	.858
- Obstructed labour	7.4	7.9	.651
- Low or absent abdominal pain	1.3	.9	.446
- Others	1.0	1.9	.038

\*Multiple responses

**Annex 2.1.13. Complications faced during postnatal period according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Complication faced	25.0	30.9	.001
Complications*			
- Severe headache	7.6	11.4	.001
- Blurry vision	9.2	12.0	.025
- High pressure	1.6	5.1	.000
- Excessive bleeding	5.7	7.4	.083
- Offensive discharge	1.5	1.8	.631
- High fever	7.5	8.3	.454
- Retained placenta	2.1	2.7	.355
- Convulsion	1.9	2.0	.772
- Abdominal pain	11.8	13.0	.426
- Jaundice	.8	1.0	.831
- Tetanus	.1	.1	1.00
- Oedema	1.0	2.5	.004
- General weakness	1.2	1.9	.176
- Others	1.6	1.9	.644

\*Multiple responses

**Annex 2.1.14. Distribution of respondents by treatment seeking antenatal complications behaviour according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	711	489	
Action taken for complications			
- None	31.5	17.8	.000
- Self treatment	3.8	3.7	
- Treatment from HCP	64.7	78.5	
N	224	87	
Reason for not taking any action*			
- Thought treatment was not necessary	50	52.9	
- Lack of money/expensive	48.2	43.7	
- Others (Husband/mother-in-law disapprove,)	5.8	8.0	
N	711	489	
Place of treatment*			
- No treatment	31.5	17.8	
- Self treatment	2.7	3.7	
- District Hospital	8.0	6.3	
- UHC/ /MCWC	11.7	18.8	
- FWC/Satellite clinic	2.4	4.7	
- Private hospital/Clinic;	9.3	5.2	
- NGO clinic	4.3	5.5	
- Private chamber/Pharmacy;	55.7	56.5	
- Home	13.7	10.7	
Provider of treatment*			
- No treatment	31.5	17.8	
- Self treatment	27	3.7	
- Village doctor	19.3	20.7	
- BRAC health worker	1.1	1.4	
- Govt health worker (FWV/FWA/MA/SACMO)	1.8	3.5	
- Homeopath	7.7	9.0	
- Traditional healer	1.5	1.6	
- Qualified doctor	32.3	40.9	
- Drug seller	1.1	3.9	
- Nurse/Paramedic/CSBA	2.4	3.7	
- Others (TTBA/TBA/Other NGO worker)	.1	.8	
Treatment received*			
- No treatment	30.0	30.0	
- Self treatment	4.4	4.4	
- Counselling;	15.6	6.3	
- Allopathic medicine	55.8	68.9	
- Traditional treatment	2.1	1.8	
- Homeopathic medicine	8.2	9.0	
- Referred	3.4	2.9	
- Others	1.4	-	
Decision-making for seeking/not seeking care for complications			
- Self			
- Husband	17.9	13.3	.141
- Jointly with husband	6.9	8.0	
- Jointly with in-laws	57.5	56.0	
- In-laws	10.0	12.7	
- Parents/natal relatives	1.4	1.0	
- Others (SS/SK/TBA/TTBAFWV/FWA)	6.0	8.4	
	.3	.6	

\*Multiple response question



**Annex 2.1. 15. Percent distribution of respondents by treatment seeking behaviour delivery complications according to area (percentages)**

	Baseline districts		p-value
	Baseline intervention	Control	
N	452	338	
Action taken for complications			
- None	21.7	22.8	.790
- Self treatment	3.8	3.0	
- Treatment from HCP	74.6	74.3	
N	98	77	
Reason for not taking any action			
- Felt treatment was unnecessary	63.3	55.8	.594
- Lack of money/expensive	30.6	37.7	
- Others	6.1	6.5	
N	452	338	
Place of treatment			
- No treatment	21.7	22.8	.007
- Self treatment	3.8	3.0	
- District Hospital;	6.4	7.4	
- UHC/MCWC/FWC	10.2	15.1	
- NGO clinics	2.9	1.2	
- Private hospital/Clinic;	10.4	16.9	
- Private chamber;	8.2	5.3	
- Home	36.5	28.4	
Provider of treatment*			
- No treatment	21.7	22.8	.001
- Self treatment	3.8	3.0	
- Village doctor;	34.3	21.0	
- BRAC Worker	.2	0	
- FWV/ MA SACMO	3.8	2.7	
- Homeopath;	1.8	3.6	
- Qualified doctor	27.4	34.3	
- Nurse	3.3	7.1	
- Others(TTBA/TBA/traditional/spiritual healer)	3.8	5.6	
Treatment received*			
- No treatment	21.7	22.8	
- Self treatment	3.8	3.0	
- Did not receive any treatment;	1.1	-	
- Counseling;	10.4	1.5	
- Allopathic medicine	79.6	57.4	
- Traditional	3.3	.3	
- Homeopathic medicine;	2.0	3.8	
- Surgery /c-section;	7.7	12.4	
- Referred	4.6	3.6	
- Others	2.9	6.5	
Decision-making for seeking or not seeking care for complications			
- Self	4.6	7.7	.001
- Husband	11.1	9.8	
- Jointly with husband	40.0	29.9	
- Jointly with in-laws	22.8	18.6	
- In-laws	2.9	2.7	
- Parents/natal relatives	16.6	27.2	
- Others (SS/SK/TBA/TTBAFWV/FWA)	2.0	4.1	

\* Multiple responses

**Annex 2.1. 16. Distribution of respondents by treatment seeking behaviour for postnatal complications according to area (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	389	317	
Action taken for complications			
- None	21.9	17.0	.267
- Self treatment	4.9	4.7	
- Treatment from HCP	73.3	78.2	
N	85	54	
Reason for not taking any action			
- Felt treatment was unnecessary	43.5	31.5	
- Relatives disapproved	8.2	13.0	
- Lack of money/expensive	49.4	59.3	
- Others (Religious reasons, Too far, could not manage time)	3.5	3.7	
N	389	317	
Place of treatment			
- None	21.9	17.0	.017
- Self treatment	4.9	4.7	
- District Hospital;	3.9	3.5	
- UHC/MCWC/FWC	3.9	9.8	
- NGO clinic	1.5	-	
- Private hospital/Clinic;	4.9	5.0	
- Private chamber/Pharmacy;	29.3	31.9	
- Home	29.8	28.1	
Provider of treatment			
- None	21.9	17.0	.407
- Self treatment	4.9	4.7	
- Village doctor;	40.7	37.5	
- BRAC health worker	.5	.6	
- Homeopath	4.4	4.4	
- Qualified doctor	19.1	26.5	
- Drug seller	5.7	6.6	
- Others (FWV/TTBA/TBA/traditional healer)	2.8	2.5	
Treatment received*			
- None	21.9	17.0	
- Self treatment	4.9	4.7	
- Counseling	14.9	2.5	
- Allopathic medicine	66.3	71.6	
- Homeopathic medicine;	5.1	4.7	
- Referred	1.5	1.3	
- Others (traditional, put hair in mouth, removed placenta manually, blood transfusion)	2.3	2.5	
Decision-making for seeking or not seeking care during postnatal period			
- Self	11.3	12.6	.975
- Husband	10.0	8.5	
- Jointly with husband	47.6	47.6	
- Jointly with in-laws	14.9	13.6	
- In-laws	2.1	2.5	
- Parents/natal relatives	13.1	14.2	
- Others (SS/SK/TBA/TTBAFWV/FWA)	1.0	.9	

\*Multiple response question

**ANNEX 2.2 NEONATAL HEALTH****Annex 2.2.1. Knowledge of the study population on essential newborn care (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Need for ENC	99.5	99.3	.428
Maximum Correct Knowledge on ENC			
- no knowledge	.5	.7	0.00
- any 1 correct knowledge	2.8	3.7	
- any 2 correct knowledge	18.9	23.1	
- any 3 correct knowledge	29.1	28.0	
- any 4 correct knowledge	23.8	27.2	
- any 5 correct knowledge	24.9	17.3	
ENC knowledge			
- have no knowledge	.5	.7	0.00
- have moderate knowledge	74.7	82.0	
- have maximum 5 knowledge	24.9	17.3	

**Annex 2.2.2. Knowledge of the study population on care for normal weight baby (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Birth weight of a normal baby			
- Correct knowledge	37.7	47.4	0.00
- Incorrect knowledge	62.3	52.6	
Cares for a normal weight baby*			
- Wiping baby with clean dry cloth	74.4	86.1	
- Wrapping with clean soft cloth including head	75.9	79.2	
- Not applying anything on the umbilicus	6.0	3.7	
- Bathing after 3 days	14.3	14.1	
- Shaving hair after 1 month	6.0	4.7	
- Go to hospital for any complications	21.2	17.1	
- Breastfeeding	1.7	1.1	
- Don't know / Incorrect knowledge	10.6	5.2	
Maximum correct knowledge on care for normal \weight baby			
- no knowledge	9.7	3.5	0.00
- 1 correct knowledge	12.0	12.4	
- 2 correct knowledge	52.8	64.0	
- 3 correct knowledge	21.6	15.9	
- 4 correct knowledge	3.8	4.2	
Correct knowledge on normal weight baby - Median (range)	2 (0-4)	2 (0-4)	
Knowledge on care for normal weight baby			
- have no knowledge	9.7	3.5	0.00
- have moderate knowledge	86.5	92.3	
- have maximum 4 knowledge	3.8	4.2	

\*Multiple response question

### Annex 2.2.3. Knowledge of the study population on care for low birth weight (LBW) baby (percentages)

	Baseline district		p-value
	Intervention	Control	
N	1,553	1,026	
Need for care for low birth weight baby	81.8	86.2	.003
Care for low birth weight baby *			
- Breastfeed within one hour of birth	33.7	29.1	
- Frequent breastfeeding (after half an hour)	69.1	69.0	
- Feed expressed milk if the baby cannot suckle	19.6	17.2	
- Cover from head to toe with soft clean cloth	45.4	47.5	
- Keep the baby in contact with mother's skin	18.4	17.9	
- Not applying anything on the umbilicus	1.8	.8	
- Bath after 7 days	7.6	7.8	
- Shave hair after a month	5.4	4.2	
- Use baby jacket	1.2	.5	
- Go to hospital for any complications	21.6	30.9	
- Providing heat to the baby (sun ray/ cottons)	.5	.1	
- Don't know / Incorrect knowledge	19.4	15.3	
Maximum correct knowledge on care for low birth weight baby			
- No knowledge	18.3	13.8	
- 1 knowledge	7.0	8.4	0.00
- 2knowledge	29.2	33.1	
- 3 knowledge	28.5	30.7	
- 4 knowledge	11.7	11.5	
- 5 knowledge	5.3	2.4	
Correct knowledge on care for low birth weight baby - Median (range)	2(0-5)	2(0-5)	
Knowledge on care for low birth weight baby			
- have no knowledge	18.3	13.8	0.00
- have moderate knowledge	76.4	83.7	
- have maximum 5 knowledge	5.3	2.4	

\*Multiple response question

### Annex 2.2.4. Knowledge of the study population on thermal care for normal and low birth weight (LBW) baby (percentages)

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Thermal care for normal weight baby			
- Wiping, wrapping from head to toe	62.1	29.9	0.00
- Bathing after 3 days	14.3	14.1	.954
- Shaving hair after 1 month	6.0	4.7	.158
Correct knowledge on thermal care for normal weight baby - Median (range)	1 (0-3)	1 (0-3)	
Thermal care for low birth weight baby			
- Wiping, wrapping from head to toe	45.4	47.5	.313
- Skin to skin contact with mother	18.4	17.9	.794
- bathing after 7 days	7.6	7.8	.880
- shaving after 1 month	5.4	4.2	.193
- Using baby jacket	1.2	.5	.061
Correct knowledge on thermal care for low birth weight baby - Median (range)	1(0-4)	1(0-4)	

**Annex 2.2.5. Knowledge of the study population on newborns feeding (percentages)**

	Baseline districts	
	Intervention	Control
N	1,553	1,026
First food to be given to the newborn just after delivery *		
- Colostrum	54.7	62.5
- Honey	55.1	28.9
- Water (saline/glucose/hot/cold)	40.3	25.1
- Other milk (cow/goat/ formula)	9.6	1.3
- Others (Mustard oil , Black paper)	1.4	.6
- Don't know	.4	.5
Types of complementary food to be given first *		
- Cereals (soft rice/ <i>khichuri</i> / <i>suji</i> / <i>sagu</i> /barley)	94.3	98.0
- Egg/fish/meat	18.4	19.7
- Fruits & vegetables	34.5	34.3
- Milk and milk products	54.8	40.0
- Pulses	.0	.0
- Don't know	.5	.2

\*Multiple response question

**Annex 2.2.6. Knowledge of the study population on neonatal complications (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Need for treatment during neonatal complication	88.7	90.6	.131
Maximum correct knowledge on neonatal complications			
- no knowledge	17.1	16.8	.090
- 1 knowledge	41.0	45.3	
- 2 knowledge	29.8	26.3	
- 3 knowledge	9.4	10.0	
- 4 knowledge	2.0	1.3	
- 5 knowledge	.7	.2	
- 6 knowledge	.1	.1	
Knowledge on neonatal complications			
- have no knowledge	17.1	16.8	.282
- have moderate knowledge	82.2	82.9	
- have maximum 6 knowledge	.8	.3	

**Annex 2.2.7. Practice followed in terms of ENC (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Received ENC	100.0	99.8	.158
ENC Cares Received			
- Wiping baby with clean dry cloth	98.1	98.5	.738
- Checking color of baby	69.3	71.2	.010
- Checking whether breathing or not	86.0	84.4	.173
- Checking whether crying or not	81.5	83.7	.190
- Wrapping from head to toe	84.7	91.5	0.00
- Initiate breastfeeding within one hour of birth	51.1	67.0	0.00
- Cutting cord with sterilized blade	89.6	86.5	0.00
- Tying cord with sterilized thread	77.3	73.9	.008
- No ENC Received	.0	.2	.158
N	22	18	
Other cares for low birth weight baby			
- Breastfeed within one hour of birth	50.0	66.7	.348
- Frequent breastfeeding ( after half an hour)	63.6	61.1	1.00
- Feed expressed milk if cannot suckle	68.2	33.3	.055
- Not applying anything on the umbilicus	50.0	33.3	.348
- Go to hospital for any complications	36.4	22.2	.491

**Annex 2.2.8. Bathing and shaving practice (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Newborn bathed for the first time			
- 1st day	57.6	36.4	0.00
- 2 - 3 days	20.4	21.7	
- 4 - 7 days	12.2	16.9	
- more than 7 days	7.2	21.9	
- Others (yet not bathed / don't remember)	2.6	3.1	
Newborn shaved for the first time			
- ≤ 1 month	84.9	74.4	0.00
- > 1 month	11.1	20.5	
- Others (Don't remember / Still not shaved)	3.9	5.2	

**Annex 2.2.9. Feeding practices of the newborn (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
Pre-lacteal feeding of the newborn			
- Colostrum	35.3	53.2	.000
- Breast milk (after expressing Colostrum)	1.8	2.1	
- Honey	25.4	15.5	
- Water	27.4	21.7	
- Other milk (cow/goat/formula)	8.7	5.7	
- Others (Mustard oil / distilled / warm water)	.8	.5	
- Don't know	.6	1.3	

**Annex 2.2.10. Prevalence and management of neonatal illness (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	163	109	
Birth Asphyxia			
Types of problem*			
- Did not cry	51.5	67.0	.034
- Could not breathe	70.6	61.5	.163
- Slow breathing	72.4	67.9	.188
- blue baby	27.6	28.4	.989
- baby died	5.5	1.8	.063
Care provided			
- Wipe the body with clean cloth	84.0	78.9	.466
- Tap the feet	47.9	46.8	.258
- Wrap the baby with clean cloth	70.6	66.1	.089
- Clean the mouth and nostrils	58.9	50.5	.118
- Mouth to mouth breathing	42.3	43.1	.635
- Take the baby to the hospital	17.8	19.3	.582
- No care given	.6	.0	.599
- Others	6.7	11.9	.105
N	284	216	
Neonatal Sepsis			
Types of problem*			
- Could not suck milk	73.9	75.0	.436
- Became lethargic or unconscious	41.2	43.5	.334
- Chest in drawing	59.9	60.0	.466
- Convulsion	7.7	11.1	.129
- Suffered from fever/Hypothermia	86.3	88.0	.337
Care provided			
- Allopath	41.2	63.0	0.00
- Homeopath	47.5	29.6	0.00
- Went to the hospital	2.5	5.6	.071
- Others (traditional healers)	2.5	1.9	.444
- No treatment taken	1.4	.0	.103

\*Multiple response question

**Annex 2.2.11. Other neonatal illness (percentages)**

	Baseline districts	
	Intervention	Control
N	47	32
Reason for not taking any action*		
- Could not manage time	8.5	3.1
- Thought it was not necessary	68.1	78.1
- Husband/mother-in-law disapproved	2.1	6.3
- No one to accompany	2.1	3.1
- Lack of money	23.4	12.5
N	685	494
Decision for seeking/not seeking care during complication*		
- Self	6.6	6.1
- Husband	4.5	6.7
- Jointly with husband	59.3	59.5
- Jointly with in-laws	15.6	12.6
- Parents and natal relatives	13.7	15.4
- Others (TBA/TTBA/SS/SK/Qualified doctor)	.3	.2
N	612	450
Place of treatment *		
- District hospital	5.4	6.4
- UHC/MCWC/FWC	3.9	11.1
- BRAC <i>Shushasthya</i> /Other NGOs	.8	1.1
- Private clinic	64.1	61.8
- Home	21.6	14.4
- Others (satellite clinic/ pharmacy)	4.6	5.1
Treatment received *		
- No treatment	.5	.4
- Counselling	9.6	4.0
- Allopathic	47.7	74.9
- Homeopathic	52.0	26.7
- Referred	3.8	7.6
- Others	6.7	3.8

\* Multiple responses

**Annex 2.2.12. Referrals for complications (percentages)**

	Baseline districts	
	Intervention	Control
N	23	34
Treatment sought at the referred place	87.0	79.4
N	20	27
Treatment received at the referred place *		
- Consultation	20.0	3.7
- Allopath	7.5	92.6
- Homeopath	15.0	3.7
- Others (traditional healers)	10.0	7.4
N	3	7
Reasons for not taking treatment from the referred place *		
- Couldn't find time	.0	14.3
- Thought treatment was not necessary	.0	14.3
- Lack of money	100.0	85.7

\* Multiple responses



**Annex 2.2.13. Knowledge of the study population on newborn care (percentages)**

	Baseline districts	
	Intervention	Control
N	1,553	1,026
Essential newborn care*		
- Wiping baby with clean dry cloth	90.0	92.6
- Checking color of baby	22.9	18.5
- Checking whether the baby is breathing or not	42.2	26.9
- Checking whether the baby is crying or not	32.5	20.9
- Wrapping with clean soft cloth including head	49.4	53.0
- Initiate breastfeeding within one hour of birth	31.2	30.7
- Cutting cord with sterilized blade	49.2	49.6
- Tying cord with sterilized thread	30.4	37.1
- Don't know	3.3	4.9
Median no. of correct knowledge on ENC(range)	3 (0-5)	3(0-5)
N	1,553	1,026
Neonatal danger signs*		
- Unable to suck breast milk	11.5	12.4
- Infected umbilicus	14.9	11.5
- Lethargic	2.8	4.6
- Red eye/dust/fungus in eye	2.5	3.7
- Jaundice over 14 days	25.7	16.7
- Fever and Hypothermia/shivering	67.3	62.6
- Skin infection	6.0	10.8
- Fast breathing/ breathing problem /pneumonia	70.5	63.7
- Convulsion	6.2	6.0
- Chest in drawing	17.1	10.0
- Distended abdomen	.5	.6
- Severe Vomiting	14.8	16.8
- Diarrhoea	24.1	16.9
- Measles/Pox	5.0	.9
- Others	.8	2.3
- Don't know	11.3	9.5
Median no. of correct knowledge on neonatal danger signs (range)	1 (0-6)	1 (0-6)
Place and provider to seek help for any complication*		
- District hospital	40.2	37.2
- UHC/FWC/MCWC	49.1	61.9
- BRAC <i>Shushasthya</i>	3.1	.2
- Private clinic	16.0	9.0
- Other NGO's	4.1	3.9
- Qualified doctor	44.4	54.3
- Village doctor	39.5	34.8
- Traditional/spiritual healer	1.8	1.2
- Homeopath doctor	12.6	7.9
- Others (CSBA/ FWV/paramedics/SS/SK/MA/SACMO/pharmacist)	14.4	10.4

\* Multiple responses

**Annex 2.2 14. ENC provided by different healthcare providers (percentages)**

	Baseline districts	
	Intervention	Control
N	1,553	1,026
Person who provided ENC*		
- Qualified doctor / Nurses	13.8	18.9
- FWA/ FWV	1.1	.7
- TTBA	19.4	24.2
- TBA	54.3	48.5
- SS	.3	.3
- SK	.3	.0
- Relatives / Neighbours	37.0	27.0
- Mother herself	.8	.3
- Village doctor	.6	.2
- Others (husband/ CSBA)	.2	.1
- Don't know	.3	.5

\*Multiple response question

**Annex 2.2.15. Management of birth asphyxia and neonatal sepsis (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	163	109	
Care provider for birth asphyxia*			
- SS	1.2	.0	.044
- TBA	23.9	26.6	
- TTBA	11.7	11.9	
- FWV	.0	.9	
- Neighbours	4.3	9.2	
- Qualified doctor/nurse	32.5	40.4	
- Village doctor	21.5	9.2	
- Homeopath doctor	4.3	.9	
- Others ( <i>Pir fakir</i> /taking medicine)	.6	.0	
- Don't know	.011`	.9	
N	284	216	
Care provider for neonatal sepsis*			
- None	3.9	6.5	
- SS	.0	.5	
- SK	.0	.0	
- TBA/TTBA	4.6	1.4	
- FWV	.4	1.9	
- Neighbours	4.2	3.7	
- Homeopath doctors	47.5	27.3	
- Qualified doctor	19.4	33.8	
- Village doctor	19.4	24.5	
- Mother herself	.0	.5	
- Don't remember	3.2	1.4	
- Others (MA/SACMO/FWA/Paramedics/Medicine seller)	6.7	3.7	

\* Multiple responses

**Annex 2.2.16. Other neonatal illness and referrals (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,553	1,026	
No complication faced	55.9	51.9	.048
Complications Faced*	44.1	48.1	.319
- Poor suckling or feeding	15.1	16.6	.169
- Infected umbilicus	2.8	3.8	.005
- Lethargic	5.6	8.5	.762
- Red eye/dust/fungus in eye	1.9	1.7	.001
- Jaundice for 14 days	7.8	4.6	.305
- Shivering/ low temperature	3.5	2.7	.001
- Blisters/Skin lesions	7.0	10.7	.267
- Fever	27.9	30.0	0.00
- Pneumonia	13.3	21.8	1.00
- Convulsion	2.0	2.0	.001
- Chest in drawing	9.0	13.3	.385
- Distended abdomen	2.4	3.0	.002
- Severe vomiting	2.9	5.4	.882
- Diarrhoea	1.9	1.8	.106
- Others	1.3	.6	
N	685	494	
Action taken for complications			
- None	6.9	6.5	.402
- Self treatment	3.8	2.4	
- Sought treatment from healthcare provider	89.3	91.1	
N	612	450	
Healthcare provider *			
- Village Doctor	21.1	29.3	
- SS/SK	.2	.2	
- Homeopath Doctor	50.0	23.3	
- Qualified doctor/nurse/paramedics	22.2	39.6	
- Others (TBA/TTBA/FWA/FWV/CSBA/ Traditional healer)	6.9	7.6	
Referred for Complication	3.8	7.6	.008
N	23	34	
Referred by healthcare provider *			
- Village doctor	17.4	32.4	
- SS/SK	.0	5.9	
- Homeopath	17.4	11.8	
- Qualified doctor/Nurse/Paramedics	56.5	41.2	
- Others (FWV/TBA/TTBA/Traditional healer/MA/SSACMO)	8.7	8.8	
N	23	34	
Place referred to *			
- District hospital	43.5	41.2	
- (UHC/FWC/MCWC)	4.3	14.7	
- BRAC <i>Shushasthya</i> /other NGO)	.0	2.9	
- Private clinic	.0	38.2	
- Home	52.2	2.9	

\* Multiple responses

**ANNEX 2.3 UNDER 5 CHILDREN****Annex 2.3.1. Proportion of under nutrition by different study areas (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	2,921	2,039	
Under weight (Wt-for-age)			.128
Moderate or severe			
N	2,921	2,039	
Stunting (Ht-for-age)			
Moderate or severe	38.9	37.1	.099
N	2,912	2,033	
Wasting (Wt-for-ht)			
Moderate or severe	13.4	14.1	.257

**Annex 2.3.2. Immunization of children aged 12-59 months by areas (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	1,800	1,200	
Children with at least one vaccination	97.9	98.3	.445
Card available	57.7	62.8	.018
Complete vaccination status	72.8	75.9	.055
Completed dose of vaccine			
- BCG	96.8	96.9	.898
- Polio3	89.8	91.9	.049
- DPT3	89.1	91.3	.042
- Hepatitis-B	79.3	82.6	.025
- Measles	88.7	87.1	.191

**Annex 2.3.3. Treatment of ARI by areas (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	2,226	1,676	
Received treatment for ARI	84.8	84.7	.510
N	1,887	1,419	
Place of treatment for ARI*			
- District Hospital	2.5	2.8	
- FWC/MCWC/UHC	3.6	11.6	
- Private hospital/clinic	2.4	2.5	
- NGO (BRAC <i>shushasthya</i> , other NGO clinics)	1.1	.5	
- Satellite clinic	.3	.7	
- Home	5.5	7.1	
- Private chamber/Pharmacy	86.9	77.1	
Provider of treatment*			
- Qualified doctor	20.2	28.1	
- MA/SACMO	1.4	4.0	
- BRAC SS	.0	.1	
- Drug seller	15.4	18.1	
- Village doctor	50.2	41.5	
- Traditional/spiritual healer	.8	.11	
- Homeopath	17.6	10.1	
- FWV/FWA/Nurse/ paramedics/other NGO worker/TTBA/TBA)	1.6	4.0	

\*Multiple response question

**Annex 2.3.4. Knowledge of mothers on ARI of children 0-59 months (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	3,284	2,184	
Has knowledge about ARI	98.8	99.3	.127
N	3,246	2,168	
Mothers knowledge about ARI symptoms*			
- Running nose	96.8	95.5	
- Cough	93.3	89.2	
- Fever	65.4	41.0	
- Fast breathing	37.6	29.7	
- Others (pneumonia, chest pain, convulsion, breathing problem, refuse breast milk, vomiting)	1.3	.6	
N	3,284	2,184	
Has knowledge about ARI complications	97.5	98.3	.060
Knowledge about complications*			
- Rapid breathing	74.8	75.2	
- Stop eating	22.3	28.4	
- Condition deteriorated	26.3	26.4	
- Abnormally sleepy	5.0	4.1	
- Wheezing sound	57.6	53.3	
- High fever	46.5	31.7	
- Hypothermia	5.5	2.9	
- Chest in drawing	49.0	41.1	
- Convulsion	6.8	4.3	
- Frequent vomiting	8.3	5.8	
- Don't know	2.6	2.2	
Knowledge about treatment-seeking*			
- District hospital	48.8	46.6	
- <i>Upazila</i> hospital	54.4	66.0	
- MCWC/FWC	8.3	11.1	
- Private clinic/hospital	19.9	10.0	
- Other NGO clinic/BRAC <i>shushasthya</i>	6.3	4.2	
- Qualified doctor	57.5	69.0	
- SS/SK	.6	.4	
- Village doctor	65.2	52.3	
- Traditional healer	3.0	2.3	
- Homeopath	20.3	8.0	
- Drug seller	6.3	9.5	
- Others (home, FWV,FWA,MASACMO, paramedics, TBA,TTBA)	.9	1.0	

\*Multiple responses

**Annex 2.3.5. Children faced different problems during ARI (percentages)**

	Baseline districts	
	Intervention	Control
N	2,226	1,676
Problems faced*		
- Cough	66.3	74.9
- cold	60.4	69.9
- Fast breathing	23.7	28.8
- Unable to feed child	10.7	16.4
- Condition deteriorated	9.2	12.4
- Abnormally sleepy	4.0	5.4
- Wheezing breathing sound	21.5	26.4
- Fever	53.9	55.2
- Hypothermia	2.9	2.8
- Chest in drawing	12.6	13.4
- Convulsion	1.0	1.1
- Frequent vomiting	4.1	4.3

\*Multiple response question

**Annex 2.3.6. Knowledge about diarrhoea (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	3,284	2,184	
Knowledge about diarrhoea	99.7	99.8	1.000
Knowledge about diarrhoeal symptoms*			
- Loose stool for more than 3 times in a days	99.7	99.6	
- Continuous vomiting	21.1	23.7	
- Fever	.2	.2	
- Others (abdominal pain, distended abdomen)	.5	.6	
Knowledge about management of diarrhoea*			
- Ready-made saline	97.6	95.5	
- Home-made saline	47.6	49.8	
- Take help from the health provider	55.3	47.7	
- Others (Zinc syrup, Zinc tablet, rice water, flat rice water, banana syrup)	25.7	16.0	
- Don't know	.3	.4	
Has knowledge about diarrhoeal complications	99.1	99.7	.015

\*Multiple response question

**Annex 2.3.7 Complication faced by children during diarrhoea by areas (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	3,284	2,184	
Children suffered from diarrhoea in last three months	15.0	9.9	.000
Complications faced during diarrhoea*			
Loose stool >3 times in a day	12.3	9.6	.000
Loose stool more than 3 days	9.1	5.7	.000
Vomiting	8.8	6.2	.000
Fever	9.1	6.9	.006
Depressed eye	8.4	6.5	.009
Depressed fontanel	4.6	4.4	.660
Eagerly drunk water	5.0	5.2	.696
Unable to eat normal diet	2.6	2.2	.451
Loose abdominal skin	4.0	4.1	.697
Became irritable	4.4	4.0	.551
Lethargic	4.1	3.8	.448
Not urinating within 24 hours	.4	.0	.042

\*Multiple response question

**Annex 2.3.8. Treatment of diarrhoea in different areas (percentages)**

	Baseline districts	
	Intervention	Control
N	438	182
Place of treatment*		
- District hospital	9.4	18.7
- UHC/FWC)	2.3	4.4
- Private health facilities(BRAC <i>Shusasthya</i> , private hospital/Clinic, Other NGO clinic)	62.6	52.7
- Pharmacy	6.6	22.5
- Home	6.6	8.2
- Others (Private chamber)	.9	0.5
Treatment received from*		
- Qualified doctor	14.7	15.5
- Family welfare visitor/family welfare assistant/MA/SACMO	1.2	3.5
- BRAC SS /BRAC SK	.2	.3
- Nurse	1.0	.9
- Pharmacist/Drug seller	15.2	9.5
- Village doctor	40.1	27.4
- Traditional healer	1.4	1.3
- Homeopath	8.7	2.8

\*Multiple responses

**Annex 2.3.9. Children suffered from diseases other than diarrhea and ARI in study areas (percentages)**

	Baseline districts		p-value
	Intervention	Control	
N	3,284	2,184	
Children suffered from any other diseases	37.6	36.5	.441
N	1,231	797	
Children suffered from*			
- Fever	51.8	47.8	
- Skin disease	9.2	15.7	
- Dysentery	33.1	30.1	
- Mouth ulcer	12.1	15.8	
- Worm infestation	2.8	2.5	
- Any types of infection (nose, eye, teeth, ear)	3.6	3.6	
- Others (burning, ricket, leg pain, abdominal pain, bone problem, measles)	2.8	2.5	

\*Multiple responses

**Annex 2.3.10. Treatment of other illnesses by areas (percentages)**

	Baseline districts	
	Intervention	Control
N	1,231	797
Received treatment	85.8	85.8
N	1,057	684
Place of treatment*		
- Govt. facilities(District Hospita,IUHC, MCWC, FWC)	5.9	13.5
- Non govt. facilities (BRAC <i>Shusasthya</i> , Private hospital/Clinic, Other NGO clinic)	2.6	4.1
- Private chamber	61.0	45.0
- Pharmacy	27.8	32.0
- Home	7.7	10.7
N	1,057	684
Provider of treatment*		
- Qualified doctor	15.1	23.1
- FWV/ FWA, MA/SACMO	1.4	4.8
- BRAC SS /SK	.3	.7
- Traditional birth attendant	20.8	22.7
- Village doctor	46.0	39.8
- Traditional healer, Spiritual healer	2.2	3.1
- Homeopath	19.5	21.1
- Others (home, traditional healer)	.6	.1
N	1,234	798
Decision taken for the treatment of the child by		
- Mother alone	9.9	9.1
- Both father and mother	3.2	7.9
- Jointly with in-laws family	76.3	73.2
- Jointly with mother's family	8.8	7.8
- Others	1.9	2.1

\*Multiple responses