

## **MANOSHI: Community Health Solution in Bangladesh**

**Maternal, neonatal and under-five children health  
service indicators in slums of Narayanganj City  
Corporation- A baseline survey 2012**

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## Abbreviations

ANC	Antenatal Care
ARI	Acute Respiratory Infection
BCG	Bacille Calmette–Guérin
BDHS	Bangladesh Demographic Health Survey
BHP	BRAC Health Programme
CHW	Community Health Worker
CPR	Contraceptive Prevalence Rate
CSBA	Community Skilled Birth Attendant
DC	Delivery Care
DPT	Diphtheria, Pertussis and Tetanus.
EmOC	Emergency Obstetric Care
ENC	Essential Newborn Care
FP	Family Planning
Hib	Haemophilus influenzae type B vaccine
HPNSDP	Health Population and Nutrition Sector Development Program
IUD	Intra Uterine Death
IYCF	Infant and Young Child Feeding
LBW	Low Birth Weight
MDG	Millennium Development Goal
MMR	Maternal Mortality Ratio
MNCH	Maternal, Neonatal and Child Health
MR	Menstrual Regulation
NBW	Normal Birth Weight
NC	Neonatal Care
PNC	Postnatal Care
RED	Research and Evaluation Division
SBA	Skill Birth Attendant
SD	Standard Deviation
SK	<i>Shasthya kormi</i>
SS	<i>Shasthya shebika</i>
TBA	Traditional Birth Attendant
TTBA	Trained Traditional Birth Attendant
UNICEF	United Nation Children Emergency Fund
WHO	World Health Organization

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# Executive summary

## Introduction

Increase in the number of inhabitants in urban slums has become a challenge on the health system of Bangladesh for tackling maternal and under-five child morbidity and mortality. To address this engaging issue, BRAC implemented a community based essential maternal, neonatal and child health (MNCH)-care service package programme, called MANOSHI in 2007. The programme targeted the slums in six city corporations of Bangladesh through the community health workers (CHWs) called BRAC *Shasthya Kormis* (SK) (Ahmed *et al.* 2010; Afsana and Rohde 2011; Afsana 2010). For reducing illness and deaths of mothers, newborn and children, the MANOSHI programme scaled up its activities in the slums of Narayanganj City Corporation (NCC) during May 2011. The study aimed to generate baseline data on maternal and under-five child health needs in terms of prevailing knowledge, prevalence of complications, healthcare service utilisation and referral network in the slums of NCC for assessing the impact of the programme. This was, a cross-sectional study conducted during June-July 2012. A total of 47 slums were selected randomly from the intervention area. Ten slums from Narsinghdi Sadar Municipality (NSM) were selected as comparison. Two groups of married women with reproductive age between 15-49 years were selected in this study from both areas. The first group (Group 1) consisted of mothers with five different types of pregnancy outcomes preceding one year of interview. The second group (Group 2) consisted of mothers each with a child aged 12-59 months. The total sample size was 2400. A pre-structured questionnaire was used for data collection.

## Results

The average age of women was 25 years, the median age at first marriage was 16-17 years and age at first conception was 17-18 years in both slums. The proportion of under-five child death was higher in the slums of comparison area compared to the slums in the intervention area (6.5% vs. 10.7%;  $P=0.000$ ). About 12% women in the intervention area experienced abortion in their lifetime. Although, only 5% women had gone through one or more menstruation regulation (MR) process in both areas, more respondents in the comparison slums had complications after MR compared to respondents in the intervention slums (29.6% vs. 75%;  $P=0.000$ ). More than half of the respondents who had complications after MR, sought treatment from an MBBS doctor (66.7% vs. 52.1%).

Contraceptive prevalence rate (CRP) was higher among the respondents in the intervention slums compared to the comparison slums (68.9% vs. 59.8%;  $P=0.000$ ). However, use of modern contraceptive methods by married adolescent girls was similar in both areas (68.4% vs. 58.1%;  $P=0.164$ ). In addition, very few men and women used permanent FP methods.

In the intervention slums, 43% women received four or more ANC visits from medically trained providers<sup>1</sup> (MTPs) compared to 20% women in the comparison slums. Only 3.0% respondents from intervention slums received four or more ANC visit by BRAC SK. It was found that receiving four or more ANCs from the MTP was significantly associated with the socioeconomic status, literacy and educational status in the

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<sup>1</sup> Medically trained providers include MBBS doctor, FWV, nurse, paramedic

intervention slums. In the intervention slums, 36.2% women had all the three birth plans for the previous delivery (determining place, attendant and saving money). Among the women who had birth plans, 55.8% preferred home as delivery place and most of them preferred either trained traditional birth attendants (TTBA) (41.3%) or traditional birth attendants (TBA) (41.3%) for their delivery. In the case of comparison slums a similar trend was observed for the birth plans.

In the intervention slum, 53.5% of the deliveries were conducted at home and 56.3% deliveries were assisted by skilled providers. However, a significantly lower proportion of women in the comparison area had skilled provider assisted delivery ( $P=0.000$ ). In the intervention slums, urban birth attendants (UBAs) assisted only 2.8% deliveries. On the other hand, TBA assisted 23.1% deliveries. This proportion was significantly higher in the comparison slums (37.0%;  $P=0.000$ ). The majority of respondents had normal delivery (57.3% vs. 67.1%) followed by cesarean section (31.6% vs. 26.9%) and episiotomy (11.1% vs. 6.0%). Cutting cord with a sterile blade (92% vs. 78%;  $P=0.000$ ) and tying with sterile thread (80.7% vs. 58.5%;  $P=0.008$ ) were higher in the intervention slums compared to the comparison slums.

The proportion of women who received PNC within 48-hours from MTP was 44% in the intervention slums. However, in case of home delivery this proportion was 5.9%. In the comparison area, health-seeking behaviour regarding PNC was similar as in the intervention area. In addition, in the intervention slums, 4% women, who choose home delivery, received PNC within 48-hours from BRAC SK. Findings further revealed that PNC was associated with educational status and higher socioeconomic status.

The study found that mothers had poor knowledge on maternal danger signs. In the intervention area, 58.0% women and 62.1% in the comparison slums had one or more maternal danger signs<sup>2</sup> during pregnancy or delivery or postnatal period. Most of the mothers went to the nearest referral centre (MBBS doctor's chamber; village doctor's chamber; homeopath doctor's chamber; hospital or clinic) for treatment.

Though women had poor knowledge on essential newborn care (ENC), around one-third newborn received ENC services. In the intervention slums, 21.4% normal weight neonates received proper thermal care while it was 14.7% in the comparison slums. Moreover, 2.3% low birth weight (LBW) babies in the intervention area received appropriate thermal care, while none of the LBW babies received it in the comparison slums.

There was an existing gap between knowledge on infant and young child feeding (IYCF) and practice of it. In the intervention slums 48% mothers fed colostrum as prelacteal food and 51% mothers fed breast milk within one-hour after birth. Moreover, in the intervention slums only 20.5% children were exclusively breast-fed. In the comparison area, breastfeeding practice was more or less similar to the intervention area.

During delivery, 8.7% neonates in the intervention slums had birth asphyxia while it was 10.9% in the comparison slums. Prevalence of sepsis in the intervention and comparison area was 39% and 42.5% respectively. In the intervention area, qualified doctors treated most of the birth asphyxia and neonatal sepsis.

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<sup>2</sup> Maternal danger signs include, 1. Excessive bleeding/retained placenta, 2. Convulsion, 3. Prolonged labour/hand or leg prolapsed, 4. Edema/Severe headache/ blurred vision, 5. High fever with foul smelling discharge during pregnancy

In the intervention area and comparison area 84.8% and 93.5% children respectively received complete vaccination ( $P=0.001$ ). In addition, 85.6% and 93.2% children in the intervention and comparison slums respectively received measles vaccine.

Prevalence of different types of ARI, such as common cough and cold; pneumonia and severe pneumonia, among children aged <2 months, was 12 % while it was 6.1% among children aged  $\geq 2$  months in the intervention area. Prevalence of ARI in the comparison slums was similar to that in the intervention slums. Furthermore, most of the children received treatment from qualified doctors for management of ARI.

In the intervention slums, prevalence of diarrhoea among under-five children was 6.3. About 87% of them received Oral Rehydration Saline (ORS) at the onset of diarrhoea and three-fourth of the children continued breastfeeding during diarrhoea. Although, care seeking behaviour at the onset of diarrhoea was similar in both areas, prevalence of diarrhoea was significantly lower in the comparison area ( $P=0.000$ ).

Fever was prevalent among children followed by dysentery, mouth ulcer and skin diseases. Most of the children in both areas received treatment by non-medically trained providers for these illnesses.

In the intervention slums, 29% mothers knew about 'BRAC Delivery Centre'. About 52% of them mentioned about NGO health centre, while 90.1% mothers in the comparison slums frequently mentioned about private clinics for their preferred mode of delivery and facility in their locality. Most of them cited that they were satisfied with good behaviour of staff of the health facility, availability of medicine, healing of illness, low cost; short waiting time for treatment and neat and clean environment.

### **Conclusion and recommendation**

The study identified gaps in some indicators of maternal health services, such as early motherhood, family planning, ANC, skilled birth attendants and PNC. Major problems were that most of the home deliveries were assisted by unskilled attendants as well as the proportion of PNC was negligible in this regard. Furthermore, maternal knowledge on ENC, thermal care for the LBW babies, initiation of breastfeeding within one-hour after birth and vaccination coverage was minimal. In the intervention slums, coverage of BRAC SK has to be improved, not only to facilitate maternal health service indicators but also to improve under-five child health.



## Introduction

Bangladesh has achieved substantial success in reducing under-five child mortality. However, the level of neonatal and maternal mortality remains uncertain (Bhutta *et al.* 2010). Utilisation of maternal, neonatal, and under-five-children health services are still very poor across the various urban slums in Bangladesh (NIPORT 2014). In urban slum, poor people migrated from rural to urban area. Slums have abject housing conditions, densely populated and have limited urban facilities (NIPORT 2014). Besides, slum-dwellers have limited access to health services even though urban area has its own health system. Thus, these people become an additional burden on the health system of the country. Therefore, it is urgent to address maternal and under-five child health problems of slum communities to reduce inequality between slum and non-slum areas. This would in turn facilitate achieve Millennium Development Goals (MDG) four and five.

The prevailing gap, in the use of maternal and neonatal health situation and health services, between slum and non-slum households in Bangladesh, indicates an urgent need for health intervention for the inhabitants of slums. Slum-dwellers are more likely to give birth at home than the inhabitants of urban non-slum areas (88% vs. 54%; NIPORT 2013). Besides, they are less likely to have a lower tendency to utilise maternal health services such as use of family planning methods (58% vs. 63%), antenatal visit by medically trained providers (MTP) (62% vs. 85%), skilled assistance at delivery (18% vs. 56%) and post-partum visit within 48-hours (13% vs. 42%). Earlier studies in Dhaka slums showed that majority of the neonatal deaths occur within seven days after birth (Khatun *et al.* 2012). Major causes of neonatal deaths were birth asphyxia, sepsis and birth trauma, while postpartum haemorrhage and eclampsia were major direct causes of maternal death (Khatun *et al.* 2012). These deaths are preventable and curable if they are detected early and referred to the relevant facility. However, slums dwellers are poor and they use cheap, easily accessible, and available informal sectors for seeking care at the onset of complications (Chowdhury *et al.* 2012). In addition, their social beliefs lead them to seek treatment from unskilled health providers like traditional birth attendants and unqualified allopathic practitioners (Chowdhury *et al.* 2012; Wahed *et al.* 2010). Sometimes these practitioners administrate wrong treatment to save lives that are often contrary to the current recommendations of the World Health Organization (WHO) and could be harmful for both the mother and newborn (Wahed *et al.* 2010).

Another growing concern is the health of under-five children in urban slum of Bangladesh. A recent urban survey report showed that in the slums one in eighteen children dies before reaching to the fifth birthday and the under-five mortality rate is 57 per 1,000 live births (NIPORT 2013). Earlier studies showed that slum-women have wrong perceptions about ARI and diarrhoea and inappropriate treatment practices (Larson *et al.* 2009; Stewart *et al.* 1994, NIPORT 2013) and these morbidities are the major causes of under-five mortality (BDHS 2012). Slum-children are more prone to diarrhoeal illness due to contamination caused by *V. cholerae*, which turns fatal unless a proper treatment is not received. Moreover, they suffer from severe dehydration more often than children from non-slum areas (Ferdous *et al.* 2014). Besides, malnutrition, lower immunisation rate and high incidence of measles exacerbate the situation of a child (Ferdous *et al.* 2014). To some extent low vaccination coverage, TT immunisation of mothers and personal cleanliness appear to be associated with child mortality in the slums areas (Hussain *et al.* 1999). Therefore, the prevailing situation in slum areas is a barrier to reducing under-five child mortality in urban areas in Bangladesh and exhibits

the failure of the government and non-government efforts in achieving universal immunisation and maternal healthcare services.

The situation demands health intervention for slum-dwellers with appropriate service components and delivery strategy. In order to reduce maternal and under-five child morbidity and mortality, BRAC implemented a cost-effective, community based essential MNCH-care service package, called MANOSHI, in 2007, targeting urban slums of six city corporations of Bangladesh through a cadre of community health workers (CHWs) called *Shasthya shebika* and *Shasthya kormi* (Ahmed *et al.* 2010; Afsana and Rohde 2011; Afsana 2010). This integrated comprehensive programme provides a continuum of care from pregnancy to postpartum care of children until five years addressing the major causes of maternal, newborn and child disease and death (Ahmed *et al.* 2010; Nahar *et al.* 2011). The success of MONOSHI in reducing neonatal mortality; increasing facility delivery including cesarean section; initiation of breastfeeding and decreasing referral delays in urban slums of Dhaka encourages scaling up this intervention at the national level with similar settings (Afsana and Rohde 2011; Nahar *et al.* 2011).

MANOSHI has been scaled up in the slums of NCC since May 2011. We conducted a survey on the slum populations of NCC and Narsindi Sadar Municipality (NSM). Results, of this survey, will help to understand the existing knowledge and health seeking behaviour of mothers in slum communities. This survey will provide initial guidelines to programme, on which ground healthcare services should be emphasised for achieving the programme goals and will also help to assess the impact of programme after the end of its implementation. Hence, this study aimed to explore the current knowledge and practice relating to maternal, neonatal, and child health among mothers residing at slums in the intervention areas.

The specific objectives are:

- To understand the existing knowledge and practices of mothers regarding maternal (ante, intra and postnatal), neonatal (birth asphyxia, neonatal sepsis) and under-five healthcare (Diarrhoea, acute respiratory tract infection (ARI))
- To assess the prevalence of maternal, neonatal (birth asphyxia, neonatal sepsis) and under-five children complications (Diarrhoea and ARI)
- To examine healthcare utilisation for maternal, neonatal and under-five child complications and immunisation practices of under-five children
- To explore the current referral network for MNCH services.

# Methodology

## Study design

The MANOSHI programme was implemented in all slums of the Narayanganj city corporation (NCC) through its branch offices in Siddirganj, Bondor, Fatullah and Sadar. The current investigation was a community-based cross-sectional study conducted during June and July 2012 to compare results from two NCC sub-districts, Sadar and Bandar with those from comparable slums outside the MANOSHI programme. The slums of Narsingdi sadar municipality (NSM) were selected as comparison.

## Study areas

The NCC consists of two *upazilas*, Sadar and Bandar. There were 94 slums in NCC (43 slums in Sadar sub-district and 51 slums in Bandar sub-district). The NSM is adjacent to NCC where BRAC-MNCH programme was not implemented, but BRAC-Health Nutrition and Population Program (HNPP) was in place. There were ten slums in NSM and all of them were included as comparison slums. There were 35 facilities/institutions (government hospitals, private clinics and NGO clinics) in the NCC and 31 in the NSM (Annexure 2). The literacy rate was 64.7% in the NCC and 61.9% in the NSM (BBS, 2011). The degree of poverty was similar in both areas.

## Sample size and study populations

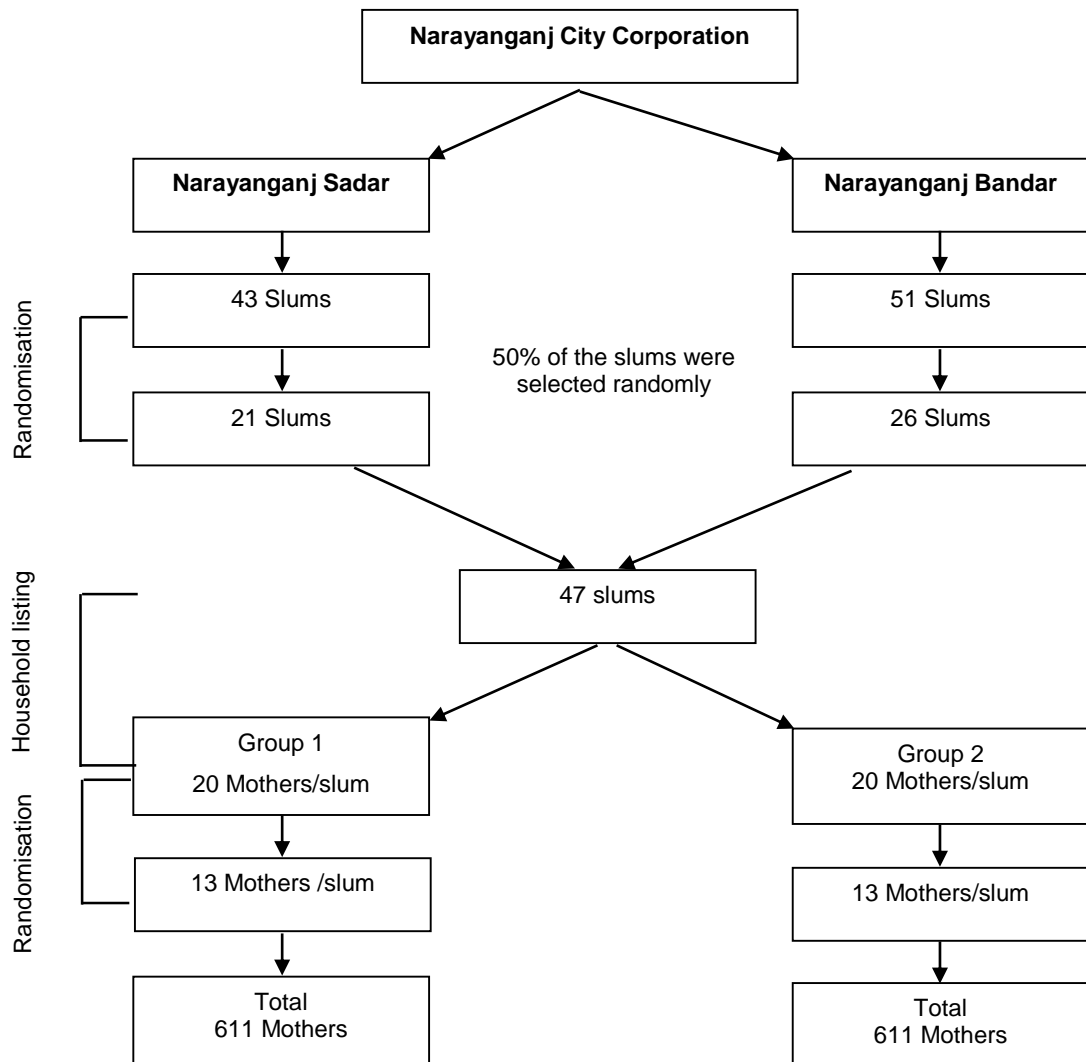
The presence of different health service indicators of women described in the Urban Health Survey 2006 (NIPORT 2006) meant that data from 600 women (from both the NCC and NSM) with a pregnancy outcome within the previous year and 600 women (from both the NCC and NSM) with a under-five child would be required to have 80% statistical power, 5% level of significance, 1.5 times inter cluster correlation (ICC), and 1.5% non-response rate. A house-to-house survey (household listing) was conducted ten days prior to interviews to identify eligible mothers (married women aged 15-49 years). The following types of pregnancy outcomes were included in the group 1: 1) infants aged under 12 months, 2) abortion, 3) menstrual regulation (MR), 4) stillbirth, and 5) intra-uterine death (IUD). Abortion has been defined as loss of a fetus with a gestational age of less than 28-weeks. MR has been defined as loss of a fetus within three-months by an MTP. Stillbirth has been defined as delivery of a dead fetus with a gestational age of 28-weeks or more based on the date of the last menstrual period. IUD has been defined as death of fetus before delivery after 28-weeks of gestational age. The second group (Group 2) consisted of mothers with a child aged 12-59 months. Mothers, who had more than one under-five child, were included in the group based on the age of the last living child. On the other hand, mothers, who had under-five children along with an unsuccessful pregnancy outcome preceding one year of interview, were also included in group-1.

## Randomisation and sampling

A computer generated random number was used to select 47 slums from the NCC intervention area. The scheme used to identify the relevant women is outlined in Figure 1. Thirteen mothers were selected randomly for interview from the first 20 eligible mothers identified for each group and a total of 1217 respondents in the intervention

area were interviewed. Of these, 566 women had a living child under-one year of age, six had a child under-one who had died within a year of the interview and there were 13 abortions, 16 MRs, four stillbirths, two IUDs and 610 mothers with a child between 12-59 months.

**Figure 1. Randomisation and Sampling of Narayananj City Corporation (intervention area)**

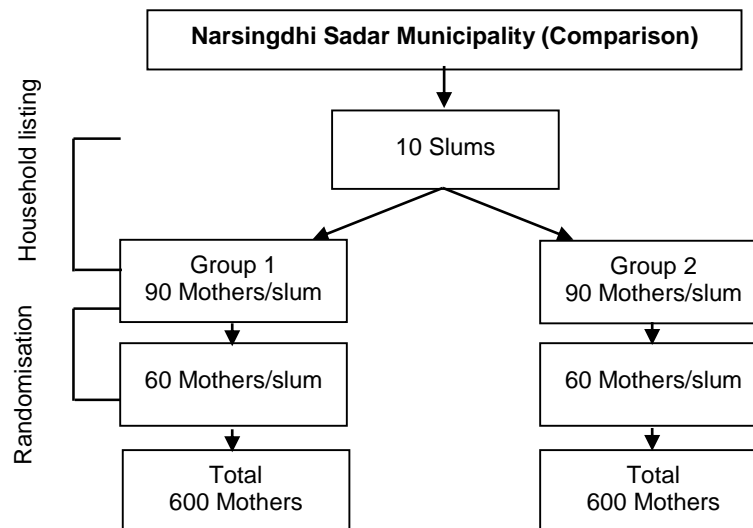


Ninety eligible women were identified from each NSM comparison site as outlined in Figure 2. A total of 1197 women were interviewed, out of which 519 had at least one living child aged below one year, twelve women had a child who died before one year and there were 48 abortions, ten MRs, four stillbirths, six IUDs and 598 mothers with a child between 12- 59 months.

The eligible mothers were informed about the study during house-to-house surveys and formal consent was obtained from them. Several approaches were followed in order to reduce the non-response rate. First, efforts were made to convince the household heads of the importance of the interviews, a step that facilitated responses from the mothers. Second, working mothers were asked to provide a time for the interview that was

convenient to them. Finally, in case of failure to obtain information from a mother, another respondent was selected from the household survey list (even though she was not randomly assigned).

**Figure 2. Randomisation and Sampling of Narsingdhi Sadar Municipality (comparison area)**



### Questionnaire development and data collection

A pre-structured questionnaire was used for the interview. Previous questionnaires of the Bangladesh Demographic Health Survey 2007 (BDHS 2007) and the MANOSHI endline survey (Alam *et al.* 2011) were taken into consideration during development of the survey tool. The contents of the questionnaire were reviewed and modified to reflect the objective of the current MANOSHI baseline survey. Further modifications were made after pre-test were carried out by the field enumerators. Face-to-face interview was conducted for data collection.

The questionnaire had the following sections:

- Demographic characteristics
- Migration history
- NGO involvement and exposure to mass media
- Reproductive history (number of pregnancy, abortion and MR)
- Knowledge and practice on family planning
- Knowledge and practice on antenatal care (ANC), delivery care (DC) and postnatal care (PNC)
- Knowledge on delivery and neonatal danger signs
- Essential neonatal care (NC)
- Infant and young child feeding (IYCF) practice
- Under-five child health
- Perception on local delivery facilities including BRAC's birthing hut

All respondents were not asked to respond to all the sections. Only mothers with a child aged less than one year were asked all the sections. However, mothers whose babies died within one year were not asked about IYCF and under-five child health. Mothers who had MR, abortion, IUD and stillbirth were not asked about DC, PNC, NC, IYCF and under-five child health. However, they had to answer additional questions about DC. Mothers of group-2 were not asked about family planning, ANC, DC, PNC, NC and danger signs.

### **Organisation of field work**

Twenty-four female interviewers and four male field supervisors were selected based on their prior experience in the MNCH survey. They received comprehensive training for nine days, followed by field practice and reporting feedback for two days. The mode of training consisted of lectures, mock interviews, and written exams. The interviewers were then divided into two groups, each headed by two field supervisors for the different intervention and comparison areas. Each data form was checked once by another interviewer and then cross-checked by the respective supervisor. Two field operation officers and an investigator team were based at the study sites for monitoring performance of the field staff to ensure quality. They checked on the spot and re-interviewed 10% of mothers within two days of the original interview, as well as randomly checked the data forms. In case of any doubt, inconsistency, or incompleteness, they re-interviewed the respondents. Every day after data collection, regular meetings between the field staff and the investigators held at the local BRAC office to address any problem arising in the field and for sharing any new experience.

### **Outcome variables**

The outcome variables were, current use of contraceptive, contraceptive use by married adolescent girls, antenatal care, birth preparedness, skilled assistance at delivery, postnatal care, neonatal care, neonatal illness, vaccination coverage, treatment during diarrhoea and ARI, feeding practices of under five children. ,

### **Ethical clearance**

The BRAC Research and Evaluation Division (RED) ethical review committee approved the proposal. Written consent was obtained from each of the respondents prior to the interview and informed verbal consent was obtained where necessary (e.g., when participants were unable to read).

### **Statistical analysis**

SPSS for Windows software (version 17) was used for statistical analysis. Baseline characteristics were compared between intervention and comparison area. All the categorical variables were analysed by chi-square ( $\chi^2$ ) test and the result was expressed as percentage and the number with the P-value of chi-square ( $\chi^2$ ) test. Analysis of normal data of continuous variables was done by Student's *t*-test and the results were shown as Mean $\pm$ SD with P-value. The skewed or non-normal continuous variables were tested with Mann-Whitney U non-parametric test and data was shown as Median (Range). Poverty, household asset and characteristics including household construction materials, water, sanitation and fuel supply were used to construct the wealth index in the current study. All the indicators were converted into dichotomous variables. Factor analysis was used to assign weighting values to indicator variables.

## Results

### Socio-demographic status of the respondents

Table 1 and Table 2 show the socio-demographic characteristics of the respondents and their husbands respectively. Most of the respondents in both areas were in age between 20-30 years and their mean age was 25 years (Table 1). Majority of the respondents were Muslim and 99% of them were married. Although, there was a significant difference in the educational status between the areas ( $P= 0.006$ ), most of the mothers did not complete secondary education. Their mean year of schooling was five and 12% of them were involved in income generating activities.

**Table 1. Socio-demographic characteristics of the respondents**

Study Variables	Intervention n= 1217	Comparison n = 1198	P-value
Age, % (n)*			
<=19 yrs	11.8 (143)	13.0 (156)	0.529
20-34 yrs	81.9 (997)	80.1 (960)	
≥ 35 yrs	6.3 (77)	6.8 (82)	
Mean Age, in year (Mean±SD)	25.03±5.17	25.15±5.27	0.571
Religion, % (n)*			
Muslim	94.2 (1146)	92.7 (1110)	0.134
Hindu	5.8 (71)	7.3 (88)	
Marital status, % (n)*			
Married	99.2 (1207)	98.5 (1180)	0.066
Divorced	0.2 (3)	0.1 (1)	
Separated	0.5 (6)	0.8 (9)	
Widow	0.1 (1)	0.7 (8)	
Literary			
Can read and write, % (n)*	63.0 (767)	61.6 (738)	0.471
Year of schooling, in year, [Median (Range)]***	5.0 (0.0- 16.0)	5.0 (0.0- 16.0)	0.179
Mean year of schooling, (Mean±SD)**	5.2 ± 3.6	5.01 ± 3.8	0.187
Educational status, % (n)*			
No education	21.4 (262)	25.8 (309)	0.002
Primary incomplete	15.4 (188)	15.9 (191)	
Primary complete <sup>a</sup>	16.9 (207)	14.0 (168)	
Secondary incomplete	37.5 (458)	32.7 (392)	
Secondary complete <sup>b</sup> or Higher	8.8 (107)	11.7 (140)	
Involve in earning, % (n)*	12.4 (151)	12.5 (150)	0.933
Main occupation, % (n)*			
Housewife	89.4 (1088)	93.3 (1118)	0.001
Others <sup>c</sup>	10.6 (129)	6.7 (80)	

\*Chi-square test

\*\* Student's *t* test

\*\*\*Mann Whitney U test

Intervention- Narayananj City Corporation

Comparison- Narsingdhi Sadar Municipality

<sup>a</sup> Primary complete defined as completing grade 5

<sup>b</sup> Secondary complete define as completing grade 10

<sup>c</sup> Day labourer, skilled labourer, garment's labourer, handy craft, service, small business, beggar, maid servant, tailor, tuition

Only married women were asked about their husband's socio-demographic characteristics. Thus, the number of husbands was not the same as the number of respondents. We obtained information from 1207 and 1180 husbands from the intervention and comparison slums respectively. Mean age of the husbands was 32 years (Table 2). Similar to the respondents, majority of the husbands were Muslims. About 62-64% of the husbands could read and write. Their mean year of schooling was five and most of them were employed. A significant difference was found in year of schooling of the husbands between the areas (P=0.006). Even, their types of occupation were varied between the study areas (P= 0.000).

**Table 2. Socio-demographic characteristics of the respondents' husband**

Study Variables	Intervention n=1207	Comparison n = 1180	P-value
Age, % (n)*			
<=25 yrs	15.2 (182)	16.4 (193)	0.724
26-40 yrs	76.0 (917)	74.8 (883)	
≥ 41 yrs	8.9 (107)	8.8 (104)	
Mean Age, in year (Mean±SD)**	31.95 ± 6.40	32.03 ± 6.52	0.761
Religion, % (n)*			
Muslim	94.2 (1137)	92.5(1092)	0.103
Hindu	5.8 (70)	7.5 (88)	
Literary			
Can read and write, % (n)*	64.4 (777)	62.6 (739)	0.375
Year of schooling, in year, [Median (Range)]***	5.0 (0.0- 16.0)	5.0 (0.0- 16.0)	0.317
Mean year of schooling, in year (Mean±SD)**	5.43 ± 4.01	5.31 ± 4.38	0.507
Educational status, % (n)*			
No education	23.3 (279)	27.8 (326)	0.006
Primary incomplete	13.0 (155)	13.1 (153)	
Primary complete <sup>a</sup>	17.6 (211)	15.9 (186)	
Secondary incomplete	31.9 (381)	26.4 (306)	
Secondary complete <sup>b</sup> or Higher	14.2 (170)	16.8 (197)	
Involve in earning, % (n)*	99.9 (1206)	99.7 (1176)	0.171
Main occupation, % (n)*			
Day labourer	15.2 (184)	24.8 (293)	0.000
Skilled labourer	9.4 (113)	8.7 (103)	
Garments worker	14.7 (177)	0.1 (1)	
Service	15.3 (185)	19.2 (227)	
Small business	25.0 (302)	23.4 (276)	
Living abroad	5.1 (62)	4.8 (57)	
Others <sup>c</sup>	15.2 (184)	18.9 (223)	

\*Chi-square test

\*\* Student's *t* test

\*\*\*Mann Whitney U test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

<sup>a</sup> Primary complete defined as completing grade 5

<sup>b</sup> Secondary complete define as completing grade 10

<sup>c</sup> Rickshaw driver, driver (bus /truck), handy craft, beggar, tailor, disable, night guard, tuition, maker, boatman, bus helper, unemployed, village doctor, dalal, business, advocate, singer,

Table 3 illustrates the household characteristics of the respondents in the intervention and comparison slums. Most of the families were nuclear (70%) and headed by a male family member. A higher proportion of slum dwellers in the intervention slums was using tap water, sanitary latrine and soap after defecation compared to slum dwellers in the



comparison area. Wealth index, revealed that, the proportion of the poorest and the richest quintile was comparable among slums in both areas.

**Table 3. Household characteristics of the respondent**

Study Variables	Intervention n= 1217	Comparison n = 1198	P- value
Type of the family, % (n)*			
Nuclear	67.7 (824)	70.1 (840)	0.201
Extended	32.3 (393)	29.9 (358)	
Sex of the household head, % (n)*			
Male	94.2 (1146)	93.8 (1124)	0.723
Female	5.8 (71)	6.2 (74)	
Mean household size, (Mean±SD)**	4.83±1.89	4.85±1.81	0.751
Source of drinking water, % (n)*			
Tap inside home	55.9 (680)	7.9 (95)	0.000
Tap outside home	19.1 (232)	0.5 (6)	
Tube well	25.1 (305)	91.6 (1097)	
Source of cooking and household work water, % (n)*			
Tap inside home	57.4 (699)	14.9 (178)	0.000
Tap outside home	17.0 (207)	1.3 (16)	
Tube well	22.4 (272)	83.1 (996)	
Pond/tank/ tube well water	2.5 (30)	0.2 (2)	
River's water	0.7 (9)	0.5 (6)	
Sanitation facility, % (n)*			
Sanitary (water seal & septic tank)	27.7 (337)	32.1 (385)	0.000
Ring slab ( with water seal)	36.4 (442)	40.4 (484)	
Ring slab ( without water seal)	27.5 (334)	32.2 (385)	
Others	8.4 (102)	2.2 (26)	
Substances used for hand washing after defecation, % (n)*			
Soap	91.2 (1110)	82.6 (989)	0.000
Tube well water	2.2 (27)	7.7 (92)	
Tap water	5.4 (66)	1.6 (19)	
Others	1.2 (14)	8.2 (98)	
Wealth quintile, % (n)			
Poorest	18.7 (227)	21 (251)	0.433
Second	19.9 (243)	20.3 (243)	
Middle	19.9 (243)	19.6 (235)	
Fourth	20.1 (244)	20.5 (245)	
Richest	21.4 (260)	18.7 (224)	

\*Chi-square test

\*\* Student's t test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

In the intervention slums, nearly all the respondents born in present residing slums (Table 4). On the contrary, most of the respondents of comparison slums, had born in villages and migrated to the survey slums due to marriage. About 88%, 1.5%, and 7% of the respondents watched television, listened to radio and read newspapers respectively. The largest part of the respondents was a member of ASHA NGO. Involvement with the BRAC microfinance programme was 8.7% in the intervention and 13.4% in comparison slums.

**Table 4. Migration history and NGO involvement of the respondent**

Study Variable	Intervention n= 1217	Comparison n = 1198	P-value
Place of birth, % (n)*			
City corporation	45.2 (550)	2.8 (33)	0.000
District town	17.6 (214)	37.0 (443)	
Other town	3.3 (40)	2.0 (24)	
Village	33.9 (413)	58.3 (698)	
Duration of living at present dwelling, [Median (Range)]***	5.00 (0.0 -32.0)	5.00 (0.0 -35.0)	0.422
Reason for changing previous place, % (n)*			
For searching job	10.8 (131)	6.6 (79)	0.000
For earning more	7.2 (88)	7.1 (85)	
For working	4.9 (60)	7.2 (86)	
Family matter	10.1 (123)	12.5 (150)	
For marriage	27.7 (337)	36.2 (434)	
Other reasons	2.7 (33)	4.6 (55)	
Do not change the place	36.6 (445)	25.8 (309)	
Watch television, % (n)*	88.8 (1081)	87.1 (1044)	
Listen radio, % (n)*	1.5 (18)	1.7 (20)	0.707
Read news paper, % (n)*	6.5 (79)	7.6 (91)	0.289
Involve with NGO, % (n)*	28.8 (351)	33.3 (399)	0.018
Types of NGO, % (n) ‡			
Grameen Bank	3.3 (11)	5.8 (23)	
BRAC	8.7 (29)	13.4 (53)	
ASHA	44.3 (148)	52.8 (209)	
Bureau Bangladesh	6.9 (23)	2.0 (8)	
Shakti Foundation	8.7 (29)	4.8 (19)	
Palli Unnayan	3.6 (12)	4.3(17)	
SSS	1.8 (6)	5.8 (23)	
Other NGOs	28.4 (95)	23.2 (92)	

\*Chi-square test

\*\*\*Mann Whitney U test

‡ Multiple responses possible

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

## Maternal health

### *Reproductive history of the respondents*

Early marriage and motherhood among women was prevalent (Table 5). The total number of live birth, stillbirth and IUD was comparable between respondents in the intervention and comparison slums. However, under-five child death was higher in the comparison compared to intervention slums (6.5% vs. 10.7%; P=0.000).

**Table 5. Reproductive history of the respondent**

Study Variable	Intervention n= 1217	Comparison n = 1198	P-value
Median age at first marriage, in year	17.0	16.0	
Median age at first conception, in year	18.0	17.0	
Average number of child ever born (Mean ± SD)**	1.97 ± 1.15	2.19 ± 1.31	0.000
Experienced one or more still birth, % (n)*	2.3 (28)	3.1 (37)	0.232
Experience one or more IUD, % (n)*	2.3 (28)	2.3 (27)	0.938
Experienced one or more child deaths, % (n)*	6.9 (84)	11.8 (141)	0.000
Experienced one or more under 5 child deaths, % (n)*	6.5 (79)	10.7 (128)	0.000
Number of child died	108	183	
Age stratification of child death, % (n)*			
0-7 days	30.6 (33)	39.9 (73)	0.110
8-28 days	13.0 (14)	20.2 (37)	0.116
29 – 364 days	20.4 (22)	16.4 (30)	0.392
1-4 years	21.3 (23)	16.4 (30)	0.295
5 years and more	14.8 (16)	12.6 (23)	0.587

\*Chi-square test

\*\* Student's *t* test

\*\*\*Mann Whitney U test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

Although, only 12-14% of the mothers experienced abortion, most of them had spontaneous abortion (93.8% vs. 84.3%; P=0.003; Table 6).

**Table 6. History of abortion**

Study Variable	Intervention	Comparison	P-value
N	1217	1198	
Percentage women ever had abortion, % (n)*	12.1 (147)	14.0 (168)	0.156
Month of pregnancy , in month (Mean±SD)**	3.42±1.28	3.36±1.28	0.636
N	147	168	
Frequency of abortion, % (n)*			
One	84.4 (124)	78.9 (132)	0.562
Two	11.6 (17)	14.9 (25)	
Three	3.4 (5)	6.0 (10)	
Four	0.7 (1)	0.6 (1)	
Total number of abortion among the women, N	177	216	
Type of abortion, % (n)*			
Spontaneous	93.8 (166)	84.3 (182)	0.003
Induced	6.2 (11)	15.7 (34)	

\*Chi-square test

‡ Multiple responses possible;

Intervention- Narayanganj City Corporation;

Comparison- Narsingdhi Sadar Municipality

Complications after abortion were irrespective of induced and spontaneous abortion including high fever, excessive bleeding and abdominal pain (Table 7). Although, more women in the comparison slums sought treatment against complications, treatment from an MBBS doctor was higher in the intervention slums (76.3% vs. 48.0%; Table 7).

**Table 7. Complication during abortion and its management**

Study Variable	Intervention	Comparison	P-value
N	177	216	
Any complication faced after abortion, % (n)*	68.9 (122)	85.2 (184)	0.000
Any complication faced, % (n)*			
N	11	34	
After induced abortion	54.5 (6)	70.6 (24)	0.327
N	166	182	
After spontaneous abortion	69.9 (116)	87.9 (160)	0.000
N	122	184	
Types of complications, % (n) ‡			
High fever	20.5 (25)	21.7 (40)	
Excessive bleeding	80.3 (98)	75.0 (138)	
Abdominal pain	48.4 (59)	73.9 (136)	
Others <sup>a</sup>	5.7 (7)	23.5 (43)	
Action taken for complications, % (n) *			
Did nothing	18.0 (22)	6.0 (11)	0.000
Self-treatment	5.2 (7)	1.1 (2)	
Treatment from HCP	76.2 (93)	92.9 (171)	
N	22	11	
Reason for not taking any treatment, % (n) ‡			
Thought treatment was not necessary	86.4 (19)	54.5 (6)	
Others <sup>b</sup>	13.6 (3)	63.7 (7)	
N	93	171	
Treatment provider of abortion complication, % (n) ‡			
MBBS doctor	76.3 (71)	48.0 (82)	
Nurse	7.5 (7)	5.8 (10)	
Village doctor	7.5 (7)	25.1 (43)	
Drug seller	7.5 (7)	18.7 (32)	
Others <sup>c</sup>	8.6 (8)	8.2 (14)	
N	93	171	
Place of treatment for abortion complication, % (n) ‡			
Govt. hospital	19.4 (18)	19.3 (33)	
At home	12.9 (12)	20.5 (35)	
Private clinic	35.5 (33)	21.1 (36)	
Private chamber	24.7 (23)	7.0 (12)	
Pharmacy (drug seller)	4.3 (4)	28.1 (48)	
Others <sup>d</sup>	4.3 (4)	7.6 (12)	

\*Chi-square test

‡ Multiple responses possible;

Intervention- Narayanganj City Corporation;

Comparison- Narsingdhi Sadar Municipality

<sup>a</sup> Vomiting, foul smelling discharge and dizziness

<sup>b</sup> Husband disapproval and lack of money

<sup>c</sup> Homeopath doctor, Spiritual healer, traditional healer and FWV

<sup>d</sup> Other NGO clinic and MCWC

About 5% of the respondents had gone through one or more MR process (Table 8). More respondents in the comparison slums had complications, including high fever, excessive bleeding and abdominal pain after MR compared to respondents in the intervention slums (29.6% vs. 75%; P=0.000; Table 8). About half of the respondents sought treatment from an MBBS doctor against complications after MR (66.7% vs. 52.1%; Table 8).

**Table 8. Complications of the respondent during MR and management**

Study Variable	Intervention n= 1217	Comparison n = 1198	P-value
Percentage of women ever experience MR, % (n)	5.3 (65)	4.6 (55)	0.396
N	1217	1198	
Frequency of MR, % (n)*			
None	94.7 (1152)	95.4 (1143)	0.666
One	4.8 (58)	4.2 (50)	
≥ Two	0.6 (7)	0.4 (5)	
N	78	61	
Month of pregnancy, in month (Mean±SD)**	2.32±0.47	2.20±0.40	0.096
N	78	61	
Any complication faced after MR, % (n)*	26.9 (21)	75.4 (46)	0.000
N	21	46	
Types of complications faced after MR, % (n) ‡			
High fever	28.6 (6)	41.3 (20)	
Abdominal pain	42.9 (9)	80.4 (37)	
Excessive bleeding	57.1 (12)	52.2 (24)	
Others <sup>1</sup>	19.0 (4)	6.5 (3)	
N	21	46	
Action taken after MR complications, % (n)*			
Did nothing	9.5 (2)	0.0 (0)	0.002
Self-treatment	14.3 (3)	0.0 (0)	
Treatment from HCP	76.2 (16)	100.0 (46)	
N	16	46	
Place of treatment for MR complication, % (n) ‡			
Govt. hospital	5.6 (1)	32.6 (15)	
Private hospital/clinic	66.7 (12)	17.4 (8)	
Others <sup>2</sup>	27.8 (5)	50.0 (23)	
N	16	46	
Treatment provider for MR complication, % (n) ‡			
MBBS doctor	66.7 (12)	52.1 (25)	
Nurse	16.7 (3)	35.4 (17)	
Others <sup>3</sup>	18.8 (3)	13.1 (6)	

\*Chi-square test

\*\* Student *t* test

‡ Multiple responses

<sup>1</sup> Vomiting and foul smelling discharge<sup>2</sup> MCWC, home, private chamber, BRAC delivery centre (n=2), Pharmacy and other NGO clinic<sup>3</sup> Village doctor, BRAC SK (n=1) and drug seller

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### **Family planning**

Prevalence of using modern family planning (FP) methods by the couples (contraceptive pill, condom, injection, intrauterine device, norplant, ligation, vasectomy) were higher in the intervention slums compared to the comparison slums (68.9% vs. 59.8%; P=0.000; Table 9). Use of modern contraceptive methods by adolescent married girls were comparable between the areas (68.4% vs. 58.1%). Main reason for not using any family planning method was amenorrhea after delivery. They were obtaining contraceptives from local pharmacy. About 67% of the respondents in the intervention slums complained about side effects of FP method. Vertigo/dizziness, irregular menstruation and vomiting were prevalent among the respondents in both areas. However, only 19.9% of the respondents in the intervention and 24.1 % in the comparison slums sought treatment for the problems.

**Table 9. Family planning practices**

Study Variable	Intervention	Comparison	P-value
N	1217	1198	
Couple currently using any family planning method, % (n)*	72.3 (880)	66.4 (796)	0.002
Currently using modern FP method <sup>a</sup> , % (n)	68.9 (839)	59.8 (716)	0.000
Proportion of each method			
Pill	35.1 (427)	36.1 (433)	0.000
Injection	17.0 (207)	12.6 (151)	
Condom	10.5 (128)	5.8 (69)	
Intrauterine device	1.1 (13)	0.2 (2)	
Implant	2.1 (26)	1.6 (19)	
Female sterilisation	2.5 (31)	2.8 (33)	
Male sterilisation	0.6 (7)	0.8 (9)	
Any traditional method, % (n)	3.4 (41)	6.7 (80)	
N	880	796	
Family planning methods used by, % (n)*			
Husband	17.7 (156)	12.4 (99)	0.003
Wife	82.3 (724)	87.6(697)	
N	607	599	
Married adolescent girls giving birth % (n)*	10.0 (61)	11.5 (69)	0.411
N	143	156	
Current use of FP method by married adolescent girls, % (n)*	71.3 (102)	62.8 (98)	0.118
Current use of modern FP method <sup>a</sup> by married adolescent girls, % (n)*	67.8 (97)	57.7 (90)	0.070
N	337	402	
Reason for not using family planning methods, % (n)*			
Not in a partnership (widowed/divorced/abandoned/separated)	21.7 (73)	16.7 (67)	0.093
Currently pregnant	19.0 (64)	16.4 (66)	
Did not menstruate after delivery	40.9 (138)	46.8 (188)	
Wants children	4.7 (16)	9.2 (37)	
Menstruation irregularities	3.0 (10)	2.0 (8)	
Others	8.6 (29)	7.2 (29)	
Source of FP methods, %(n) ‡			
Government hospital	9.1 (76)	17.2 (123)	
Pharmacy	52.3 (439)	52.2 (374)	
Satellite clinic	9.2 (77)	8.2 (59)	
NGO clinic (not from BRAC)	11.0 (99)	10.7 (77)	
Others	18.5 (155)	11.7 (84)	

\*Chi-square test; ‡ Multiple responses possible;

Intervention- Narayananj City Corporation; Comparison- Narsingdhi Sadar Municipality;

<sup>a</sup> Contraceptive pill, condom, injection, intra uterine device, norplant, ligation, vasectomy;

<sup>b</sup> Age between 15-19 years

### ***Pregnancy identification***

The average month of pregnancy identification was 2.3 and most of the pregnancies were identified by the mothers themselves (Anexure 3).

### ***Antenatal care (ANC)***

Respondents in both the areas had comparable knowledge on the importance of the ANC. They considered the requirement of ANC for safe delivery (37.2% vs. 26.6%), to

know the condition of the fetus (35.2% vs. 29.1%) and early recognition of complications (32.6% vs. 26.6%).

Despite equal knowledge on importance of ANC during pregnancy, more respondents in the intervention slums received at least one ANC visit compared to respondents in the comparison slums (86.3% vs. 60.3%;  $P=0.000$ ; Table 10). Moreover, receiving four times ANC from MTPs<sup>3</sup> was also higher among the respondents in intervention slums compared to comparison slums (42.8% vs. 20.2%). Only 3.0% of respondents from intervention and 0.2% respondents in comparison slums received four or more ANC from BRAC SK. Significantly higher number of respondents in the intervention slums started ANC during the first trimester (51.3% vs. 27.7%;  $P=0.000$ ) while, most of the respondents in the comparison slums started their first ANC from the second trimester.

**Table 10. Antenatal care (ANC) practices by the respondents**

Study Variable	Intervention	Comparison	P-value
N	607	599	
Received at least one ANC, % (n)*	86.3(524)	60.3 (361)	0.000
Received at least four ANC, % (n)	54.4 (330)	24.2 (145)	0.000
N	524	361	
Median number of ANC visits, (Range)	4.0 (1.0-10.0)	3.0 (1.0-10.0)	0.000
Period of first ANC, % (n)*			
1 <sup>st</sup> trimester	51.3 (269)	27.7 (100)	0.000
2 <sup>nd</sup> trimester	36.5 (191)	46.5 (168)	
3 <sup>rd</sup> trimester	12.2 (64)	25.8 (93)	
Median month of pregnancy at 1 <sup>st</sup> ANC visit, (Range)***	3 (1- 9)	5 (2-9)	0.000
N	607	599	
Received at least one ANC from medically trained provider, % (n)* <sup>a</sup>	79.7 (484)	56.8 (340)	0.000
Received at least one ANC from trained provider, % (n)* <sup>b</sup>	82.9 (503)	56.8 (340)	0.000
Received at least one ANC from BRAC SK, % (n)*	9.4 (57)	0.8(5)	0.000
N	607	599	
Received at least four ANC from medically trained provider, % (n) * <sup>a</sup>	42.5 (258)	20.2 (121)	0.000
Received at least four ANC from trained provider, % (n)* <sup>b</sup>	47.6 (289)	21.0 (126)	0.000
Received at least four ANC from BRAC SK, % (n)*	3.0 (18)	0.2 (1)	0.000

\*Chi-square test

\*\*\*Mann Whitney U test ;

<sup>a</sup> Medically trained providers includes qualified doctor, nurse, FWV and paramedic

<sup>b</sup> Trained providers includes BRAC SK in addition to the medically trained providers

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### **Birth preparedness**

Three major preparations need to be completed during pregnancy for ensuring safe delivery, such as, determination of place, birth attendants for delivery and saving money for emergency. The respondents were ranked according to their knowledge on birth preparedness. Three or more knowledge was stratified as good while one or two were stratified as moderate and no knowledge was stratified as poor. A greater number of

<sup>3</sup> Medically trained providers includes MBBS doctor, FWV, nurse, paramedic

respondents in the intervention slums had good knowledge on birth preparedness compared to respondents in the comparison slums (86.5% vs. 84.5%; P= 0.010; Annexure 5). However, only 36.2% of the respondents in the intervention slums had good practice of birth preparedness (Table 11). Most of the respondents determined birthplace before delivery and their major choice was home as delivery place, followed by private clinics, while few women wanted to go to government hospital. About 50% of the women wanted to stay at home during delivery and preferred TBA for delivery assistance.

**Table 11. Practice of the respondents on birth preparedness**

Study Variable	Intervention	Comparison	P-value
N	607	599	
Had all major birth plans (place, attendant and saved money), % (n)*	36.2 (220)	35.4 (212)	0.758
Individual birth plans, % (n)*			
Determined place	91.4 (555)	87.6 (525)	0.032
Determined attendant	68.9 (418)	73.8 (442)	0.059
Saved money	53.0 (322)	44.2 (265)	0.002
Arranged transport	4.6 (28)	7.3 (44)	0.045
Bought delivery kit for home delivery	4.8 (29)	4.3 (26)	0.716
Fixed doctor	12.4 (75)	8.8 (53)	0.048
Knew emergency phone number of BRAC SK or other healthcare provider	13.2 (80)	15.0 (90)	0.357
Number of respondents who had determined a place, N	555	525	
Probable place of delivery, % (n)*			
Home	55.8 (339)	65.3 (391)	0.000
Govt. hospital	6.9 (42)	5.8 (35)	
Private hospital	21.9 (133)	10.4 (62)	
MCWC	0.3 (2)	5.7 (34)	
Other facilities <sup>a</sup>	15.0 (91)	12.9 (77)	
Number of respondents who fixed home for delivery, N	339	391	
Person fixed for home delivery, % (n)*			
TTBA	41.3 (140)	20.7 (81)	0.000
TBA	41.0 (139)	65.0 (254)	
Nurse	6.2 (21)	4.1 (16)	
Relatives/ neighbour/ friend	10.0 (34)	9.5 (37)	
Other providers <sup>b</sup>	1.5 (5)	0.8 (3)	
Number of respondents who had birth preparedness, N	555	525	
Decision maker of birth preparedness, % (n)*			
Respondent	4.1 (23)	5.5 (29)	0.114
Jointly with husband	55.9 (310)	50.7 (266)	
Jointly with in laws	14.1 (78)	18.7 (98)	
With parents	20.4 (113)	21.1 (111)	
Other healthcare providers <sup>c</sup>	5.6 (31)	4.0 (21)	

\*Chi-square test; Intervention- Narayanganj City Corporation; Comparison-Narsingdhi Sadar Municipality

<sup>a</sup> BRAC delivery Centre, other NGO clinic and MBBS doctor's private chamber

<sup>b</sup> UBA, BRAC SK, MBBS doctor

<sup>c</sup> Husband of the respondent, BRAC SS, TTBA, MBBS doctor



## Delivery care

Information on delivery care was obtained from respondents who had live or stillbirth. Although there was a significant difference in delivery care practice, similar trend was apparent in both areas (Table 12). About half of the deliveries were conducted at home (46.9% vs. 56.3%;  $P=0.000$ ), by MTPs (56.3% vs. 45.4%;  $P=0.000$ ). In the intervention slums, 2.8% deliveries were conducted by urban birth attendants (UBA), a cadre of BRAC. The majority of respondents had normal delivery followed by C-section and episiotomy. Information on cutting and tying cord was collected only from mothers who had home delivery. Remarkably, a higher proportion of neonatal cords was cut by a sterile blade (91.9% vs. 77.7%;  $P=0.000$ ) and tied by sterile thread in the intervention slums compared to the comparison slums (80.7% vs. 58.5%;  $P=0.008$ ).

**Table 12. Delivery care practices of the respondents**

Study Variable	Intervention	Comparison	P-value
N	576	535	
Place of delivery, % (n)*			
Govt. hospital	9.0 (52)	10.7 (57)	0.000
MCWC	0.3 (2)	8.6 (46)	
At home	46.9 (270)	56.3 (301)	
Private hospital	36.8 (212)	24.3 (130)	
BRAC delivery centre	2.8 (16)	0.0 (0)	
Other NGO clinic	4.2 (24)	0.2 (1)	
N	576	535	
Mode of delivery, % (n)*			
Normal	57.3 (330)	67.1 (359)	0.001
Episiotomy	11.1 (64)	6.0 (32)	
C-section	31.6 (182)	26.9 (144)	
N	576	535	
Birth attendant during last delivery, % (n)*			
Medically trained provider <sup>a</sup>	53.5 (308)	45.4 (243)	0.007
Trained provider <sup>b</sup>	56.3 (324)	45.4 (243)	0.000
TTBA	16.5 (95)	11.0 (59)	0.000
Untrained TBA	23.1 (133)	37.0 (198)	0.000
UBA	2.8(16)	0.0 (0)	0.000
Number of home delivery, N	270	301	
Cutting cord with sterile blade <sup>c</sup> , % (n)*	91.9 (248)	77.7 (234)	0.000
Tying cord with sterile thread <sup>c</sup> , % (n)*	80.7 (218)	58.5 (176)	0.008

\*Chi-square test

<sup>a</sup> Includes qualified doctor, FWV, nurse

<sup>b</sup> Includes qualified doctor, nurse, FWV, UBA

<sup>c</sup> Estimated only for home delivery

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

## Postnatal care (PNC)

Information on postnatal care was obtained from the mothers who had live birth during the previous one year of survey. Receiving PNC within 48-hours after delivery from an MTP was satisfactory in the survey areas (44.4% vs. 39.5%; Table 13). It seemed that achievement of receiving at least one PNC from MTP within 48 hours obtained through institutional delivery. As in the case of home delivery, only 5.9% of the mothers received PNC visit from MTPs within 48 hours in the intervention slums compared to 4.3% in the comparison. In addition, in the intervention slum 4% of mothers who had home delivery received PNC within 48-hours from BRAC SK.

**Table 13. Postnatal Care (PNC) practices by the respondents**

Study Variable	Intervention	Comparison	P-value
N	572	531	
Received at least one PNC, % (n)*	62.1 (355)	48.2 (256)	0.001
Received at least three PNCs, % (n)*	37.1 (212)	31.3 (166)	0.043
Median number of PNC visits, (Range)***	4.0 (1.0 -12.0)	4.0 (1.0 -10.0)	0.40
N	572	531	
Period of receiving first PNC visits, % (n)*			
No PNC visit	37.9 (217)	51.8 (275)	0.000
Within 2 days after delivery	52.1 (298)	42.6 (226)	
3-6 days after delivery	2.6 (15)	2.1 (11)	
7-41 days after delivery	7.3 (42)	3.6 (19)	
N	572	531	
Received at least one PNC from medically trained provider <sup>a</sup> , % (n)*	52.3 (299)	43.1 (229)	0.002
Received at least one PNC from trained provider <sup>b</sup> , % (n)*	56.1 (328)	43.1 (29)	0.000
N	572	531	
Received at least one PNC from medically trained provider <sup>a</sup> within 48 hours, % (n)*	44.4 (254)	39.5 (210)	0.103
Received at least one PNC from trained provider <sup>b</sup> within 48 hours % (n)*	47.9 (274)	39.5(210)	0.005
Number of home delivery, N	270	301	
Received at least one PNC from medically trained provider <sup>a</sup> within 48 hrs, % (n)*	5.9 (16)	4.3 (13)	0.383
Received at least one PNC from trained provider <sup>b</sup> within 48 hrs, % (n)*	8.5 (23)	4.7 (14)	0.039
Received at least one PNC from BRAC SK within 48 hrs, % (n)*	4.1 (11)	0.0 (0)	0.000

\*Chi-square test

\*\*\*Mann Whitney U test

<sup>a</sup> Qualified doctor, FWV, nurse<sup>b</sup> Includes BRAC SK in addition to the medically trained provider

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

**Maternal danger signs**

Excessive bleeding/retained placenta, convulsion, prolonged labour/hand or leg prolapsed, edema/severe headache/ blurred vision and high fever with foul smelling discharge during pregnancy, delivery and postnatal period are harmful and fatal. These symptoms are called danger signs for a mother. The mothers who had a live birth or any other birth outcome (abortion, MR, stillbirth, IUD), preceding one year of survey, were asked about knowledge, prevalence and treatment seeking behaviour on maternal danger signs. Knowledge on maternal danger signs was ranked based on number of maternal danger signs. Most of the mothers had poor knowledge on maternal danger signs (52.4% vs. 62.4%; P=0.000; Table 14). Most of the mothers in both survey areas cited that due to maternal danger signs mother should go to hospital.

**Table 14. Knowledge of the respondents on maternal danger signs**

Study Variable	Intervention	Comparison	P-value
N	607	599	
Knew about any of the maternal danger signs <sup>a</sup> , % (n)*	98.0 (595)	98.0 (587)	0.974
N	607	599	
Knowledge on maternal danger signs, % (n)*			
None (0)	2.0 (12)	2.0 (12)	0.000
Poor (1-2)	52.4 (318)	62.4 (374)	
Moderate (3)	35.3 (214)	31.1 (186)	
Good (4-5)	10.4 (63)	4.5 (27)	
Median number of knowledge on Maternal danger signs, Median (Range)***	1 (0-4)	1 (0-4)	0.000
N	607	599	
Know what to do when danger signs identified, % (n) *	98.8 (600)	98.3 (589)	0.447
N	600	589	
Knew about the actions after identification of maternal danger signs, % (n) ‡			
Know/ have BRAC referral mobile number	4.0 (24)	1.7 (10)	
Know to go to hospital	92.5 (555)	97.8 (576)	
Know to go to clinic	3.8 (23)	0.2 (1)	
Know to go to doctor	9.5 (57)	5.9 (35)	
Know to go to BRAC delivery centre	0.7 (4)	0.0 (0)	

\*Chi-square test

\*\*\* Mann Whitney U test

‡ Multiple responses possible

<sup>a</sup> Maternal danger signs includes, 1. Excessive bleeding/retained placenta, 2. Convulsion, 3. Prolonged labour/hand or leg prolapsed, 4. Edema/Severe headache/ blurred vision, 5. High fever with foul smelling discharge during pregnancy

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

In the intervention slums, 58.0% respondents compared to 62.1% in comparison slums had one or more danger signs<sup>4</sup> during pregnancy, delivery or postnatal period (Table 15). Edema, severe headache and blurred vision were more common danger signs among the respondents in both areas. Proportion of women with edema was also high while few mothers had convulsion. Mothers in the comparison area had more excessive bleeding compared to mothers in the intervention area (12.9% vs. 19.2%; P=0.003). More than half of mothers who had maternal danger signs sought treatment. Most of the mothers went to the nearest health facility (MBBS doctor's chamber; village doctor's chamber; homeopath doctor's chamber; hospital or clinic) for treatment.

<sup>4</sup> Maternal danger signs include, 1. Excessive bleeding/retained placenta, 2. Convulsion, 3. Prolonged labour/hand or leg prolapsed, 4. Edema/Severe headache/ blurred vision, 5. High fever with foul smelling discharge during pregnancy

**Table 15. Practice of the respondents on maternal danger signs**

Study Variable	Intervention	Comparison	P-value
N	607	599	
Faced maternal danger signs <sup>a</sup> at last pregnancy, % (n)*	58.0 (352)	62.1 (372)	0.145
N	607	599	
Individual maternal danger signs <sup>a</sup> faced by mothers, % (n)*			
Excessive bleeding/ Retained placenta	12.9 (78)	19.2 (115)	0.003
Convulsion	4.4 (27)	3.5 (21)	0.403
Prolonged labour/ Hand or leg prolapsed	16.6 (101)	11.4 (68)	0.008
Edema / Severe headache/ Blurred vision	46.3 (281)	52.8 (316)	0.025
High fever with foul smelling discharge	0.3 (2)	0.8 (5)	0.248
N	352	372	
Action taken on recognising maternal danger signs, % (n)‡			
No action taken	10.2 (36)	13.2 (49)	
Seek help to BRAC staffs	3.7 (13)	0.3 (1)	
Seek help from facility ( public/ private)	79.3 (279)	61.8 (230)	
Others <sup>b</sup>	16.5 (58)	31.7 (118)	

\*Chi-square test

‡ Multiple responses possible

<sup>a</sup> Maternal danger signs includes, 1. Excessive bleeding/retained placenta, 2. Convulsion, 3. Prolonged labour/hand or leg prolapsed, 4. Edema/Severe headache/ blurred vision, 5. High fever with foul smelling discharge during pregnancy

<sup>b</sup> Includes village doctor, drug seller, traditional haler, spiritual healer, homeopath doctor, FWV, TBA, nurse

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### **Maternal complications**

More than 65% of the respondents in both areas faced one or more complications<sup>5</sup> during their pregnancy (Table 16; Annexure 6). About half of the respondents in both slums went to the hospital or clinic for treatment (53.6% vs. 53.4%). However, maximum number of respondents received treatment from MTP (72.2% vs. 60.3%; P= 0.000).

In the intervention slums 47% mothers and in the comparison slums 52% faced complications<sup>6</sup> during their delivery (Table 16; Annexure 8). However, proportion of women who went to hospital at the onset of any complication was higher in the intervention slums compared to comparison slums (P=0.000). Still, 25% women in the intervention slums stayed at home at the onset of complications.

During the postnatal period, 25.0% of mothers in the intervention and 41.2% in comparison had one or more complications<sup>7</sup> (P=0.000; Table 16; Annexure 10). Their

<sup>5</sup> Maternal complications during antenatal period include 1. High blood pressure; 2. Edema; 3. Convulsion; 4. Excessive bleeding; 5. Mal position; 6. High fever; 7. Severe headache; 8. Blurred vision; 9. Abortion/miscarriage; 10. Reduced or absent of fetal movement; 11.Lower abdominal pain; 12. Anemia; 13. Jaundice; 14. Excessive vomiting; 15.Tetanus; 16.IUD

<sup>6</sup> Maternal complications during delivery include 1. Excessive bleeding; 2. High fever; 3. High blood pressure; 4. Blurred vision; 5. Severe headache; 6. Abnormal position; 7. Prolonged labour; 8. Retained placenta; 9. Ruptured uterus; 10. Cord prolapsed; 11.Hand/leg prolapsed; 12. Cord around neck; 13. Convulsion; 14. Fainted; 16. Perineal tear; 17. Still birth; 18.Obstructed labour

<sup>7</sup> Maternal complications during postnatal period include 1. Severe headache; 2. Blurred vision; 3.High blood pressure; 4. Excessive bleeding; 5. Foul smelling discharge; 6.High fever; 7.Convulsion; 8. Lower abdominal pain; 9. Jaundice; 10.Tetanus; 11.Edema; 12.Retained placenta

tendency of going to hospital was low rather they preferred treatment at home during the postnatal period.

**Table 16. Maternal complications faced and treatment seeking behaviour for such complications**

Study Variable	Intervention	Comparison	P-value
N	607	599	
Complication faced during antenatal period, % (n)	65.7 (399)	67.8 (406)	0.451
N	399	406	
Treatment received at hospital/ clinic, % (n)	53.6 (214)	53.4 (217)	0.958
Received treatment from medically trained provider for antenatal complications, % (n)	72.2 (288)	60.3 (245)	0.000
N	576	535	
Complication faced during delivery period, % (n)	46.9 (270)	52.1 (279)	0.079
N	270	535	
Treatment received at hospital/ clinic, % (n)	74.8 (202)	59.9 (167)	0.000
Received treatment from medically trained provider for delivery complications, % (n)	76.7 (207)	62.0 (173)	0.000
N	576	535	
Complication faced during postnatal period, % (n)	25.0 (143)	41.2 (219)	0.000
N	143	219	
Treatment received at hospital/ clinic, % (n)	46.2 (66)	33.3 (73)	0.014
Received treatment from medically trained provider for postnatal complications, % (n)	56.6 (81)	42.5 (93)	0.008

\*Chi-square test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### **Referral information due to complications**

About 63-69% mothers had maternal complications during their entire pregnancy, delivery and postnatal period (Annexure 12). However, referral to facility was only 8.8% and 4.3% in the intervention and comparison slums respectively (P=0.011). MBBS doctors (47.1% vs. 44.4%) referred most of the complicated cases. In addition, village doctors, BRAC SK and nurses contributed to referring complicated cases to the facility. In the intervention slums, most cases were referred to government hospitals (50% vs. 27.8%), while in the comparison slums most cases were referred to private clinics (38.2% vs. 50%). In the intervention slums 11.8% and in the comparison slums 22.2% respondents revealed a tendency of ignoring suggestions of doctors and they did not go to the referred places as they thought that treatment was unnecessary (50.0% vs. 20.0%). In the intervention slums, the reason for not going to facilities was not financial constrain rather distance was a major obstacle. Among the mothers who had complications during delivery, one-third in the intervention and half in the comparison slums had caesarean section at the referral places (36.7% vs. 50.0). The proportion of blood transfusion was higher in the comparison slums compared to the intervention (3.1% vs. 21.4%). Other treatment were common in both the survey areas.

### **Neonatal Health**

#### **Knowledge on Essential Newborn Care (ENC)**

Prevention measures including hygienic cord care; thermal comparison (including drying and wiping, skin-to-skin and delayed bathing); early and exclusive breastfeeding

and immunisation, are known as Essential Newborn Care (ENC)<sup>8</sup>. Information on newborn care was sought from respondents who had a live birth and child death preceding one year of survey. Most of the respondents knew about one or more ENC<sup>6</sup> (98.6% vs. 99.6%; Table 17).

Their knowledge was ranked into three categories. The 'poor' category consisted of one-two knowledge components, while three-four components was ranked as 'moderate' and five was ranked as 'good'. Findings revealed that only few mothers had good knowledge on ENC. Nevertheless, one-third of the mothers knew how to manage low birth weight (LBW) babies. Most of the mothers cited that LBW babies should be fed breast milk frequently (66.3% vs. 82.9%; P=0.000). However, only 37.9% and 38.6% mothers in the intervention and comparison slums respectively mentioned that LBW babies should be wrapped properly with clothes (Table 17).

**Table 17. Knowledge on essential new born care (ENC) according to birth weight by the respondents**

Study Variable	Intervention	Comparison	p-value
N, (Number of children born in last one year)	572	531	
Knew about any of the essential new born care (ENC) <sup>a</sup> , % (n)*	98.6 (564)	99.6 (529)	0.074
Median number of known ENC actions, (Range)***	3.0 (0.0-5.0)	3.0(0.0-5.0)	0.000
ENC knowledge status % (n)*			
None (0)	1.4 (8)	0.4 (2)	0.000
Poor (1-2)	47.0 (269)	37.7 (200)	
Medium (3-4)	46.3 (265)	49.0 (260)	
Maximum 5 knowledge	5.2 (30)	13.0 (69)	
Knowledge of LBW baby management, % (n) (frequent breastfeeding and proper wrapping at a time), % (n)*	34.1 (195)	35.6 (189)	0.601
Frequent breastfeeding	66.3 (379)	82.9 (440)	0.000
Wrapping from head to toe with cloth	37.9 (217)	38.6 (205)	0.819

\*Chi-square test;

\*\*\*Mann Whitney U test

<sup>a</sup> ENC includes – 1.Wiping the baby; 2. Wrapping with clean clothes; 3. Initiation of breastfeeding within one hour after birth; 4.cutting cord with sterile blade and 5. Tying cord with sterile thread

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### **Practice on Essential Newborn Care (ENC)**

Practice in ENC seemed better than knowledge of mothers. In the intervention slums, 35.5% and in the comparison slums 40.7% newborn babies received all the ENCs (P=0.076; Table 18). All the care components were better than initiation of breastfeeding after one-hour of birth. Half of the newborn babies received ENC from trained providers (55.9% vs. 46.5%; P=0.002).

<sup>8</sup> ENC includes 1. Wiping the baby with dry clothes; 2. Wrapping with clean clothes; 3. Initiation of breastfeeding within one hour after birth; 4. Cutting cord with sterile blade; and 5. Tying cord with sterile thread

**Table 18. Essential neonatal care (ENC) practice of the respondents during their last delivery**

Study Variable	Intervention	Comparison	P-value
N	572	531	
Received all ENC <sup>a</sup> actions by neonates, % (n)*	35.5 (203)	40.7 (216)	0.076
Actions taken, % (n)*			
Wiping	97.9 (560)	99.6 (529)	0.029
Warping with cloth	72.7 (416)	91.3 (485)	0.000
Initiation of breast-milk within one hour after birth	58.0 (332)	61.6 (327)	0.312
Cutting cord by sterile blade	83.2 (476)	79.5 (422)	0.269
Tying cord with sterile thread	76.4 (437)	69.1 (367)	0.008
ENC received by trained providers (qualified doctor/ nurse/FWV/SS), % (n)*	55.9 (320)	46.5 (247)	0.002
Number of home deliveries, n	270	301	
ENC provided by BRAC SS for home delivery, %(n)*	0.4 (1)	0.3 (1)	0.939

\*Chi-square test

<sup>a</sup> ENC includes – 1.Wiping the baby; 2. Warping with clean clothes; 3. Initiation of breastfeeding within one hour after birth; 4.cutting cord with sterile blade and 5. Tying cord with sterile tread

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### ***Thermal care for normal and low birth weight baby***

Birth weight of about 57% newborn in the intervention and 67.6% newborn in the comparison slums was not recorded (Table 19). Seventeen per cent of the children in the intervention slums and 14% children in the comparison slums were low birth weight (LBW) (Table 19).

**Table 19. Measuring birth weight of newborn**

Study Variable	Intervention	Comparison	P-value
N	572	531	
Weight taken after birth, % (n)*			
Within 48 hrs	38.6 (221)	29.4 (156)	0.003
>48 hrs	0.0 (0)	0.0 (0)	
Don't remember when weight was measured	5.8 (33)	4.9 (26)	
Weight was not recorded	55.6 (318)	65.7 (349)	
N (number of neonates whose weight was recorded)	254	182	
Weight observed, %(n)			
<2.5 kg	17.3 (44)	14.3 (26)	0.394
≥2.5 kg	82.7 (210)	85.7 (156)	

\*Chi-square test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

We analysed the thermal care information of children only whose birth weight was recorded. Thermal care for normal birth weight (NBW) baby and LBW baby is not similar. For NBW baby thermal care comprises wiping with clean dry cloth; bathing one or after three days and shaving hair after one month. On the other hand, thermal care of LBW baby includes wiping, kangaroo mother care/use of baby jacket, bathing once every seven days and shaving hair after one month. Only 21.4% and 14.7% NBW newborn in the intervention and comparison slums respectively received all three thermal cares together (Table 20). Very few LBW babies in the intervention slums received all four thermal cares together while not a single LBW baby in the comparison slums received it (2.3% vs. 0.0%). Although, all the newborn irrespective of birth weight were wiped with dry clean clothes, other recommend thermal cares were not applied properly except frequent breastfeeding. In the intervention slums for LBW babies, use of baby jacket or kangaroo mother care was only 19% and bathing after seven days was 25%. Even, shaving the hair of neonates after one-month was practiced by only 20.5%. Regarding thermal care of LBW babies in the comparison slums had more or less similar practices.

**Table 20. Thermal care for normal babies and LBW babies**

Study Variable	Intervention	Comparison	P-value
N, (Number of normal weight babies)	210	156	
Thermal care for normal weight baby <sup>a</sup> , % (n)*	21.4 (45)	14.7 (23)	0.104
Wiping baby with clean dry cloth, % (n)*	98.1 (206)	99.4 (155)	0.319
Bathing on or after 3 days, % (n)*	71.0 (149)	64.1 (100)	0.165
Shaving hair after one month, % (n)*	30.0 (63)	19.9 (100)	0.028
N, (Number of LBW babies)	44	26	
Thermal care for LBW baby <sup>b</sup> , % (n)*	2.3 (1)	0.0 (0)	0.439
Wiping baby with clean dry cloth, % (n)*	97.7 (43)	100.0 (26)	0.439
Kangaroo mother care/used baby jacket, % (n)*	19.2 (5)	7.1 (1)	0.307
Bathing on or after 7 days, % (n)*	25.0 (11)	26.9 (7)	0.859
Shaving hair after one month, % (n)*	20.5(9)	38.5(10)	0.102
Special care for LBW babies (frequent breastfeeding and proper wrapping at a time), % (n)*	45.5 (20)	46.2 (12)	0.955
Frequent breastfeeding, % (n)*	80.8 (21)	92.9 (13)	0.307
Proper wrapping, % (n)*	56.8 (25)	46.2 (12)	0.388

\*Chi-square test

<sup>a</sup>Wiping the baby, bathing on or after 3 days, shaving hair after one month at a time

<sup>b</sup>Wiping the baby, kangaroo mother care, bathing after 7days, shaving hair after 1 month at a time

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

## Feeding practice of newborn and infants (0-12 months)

### Knowledge

Knowledge on prelacteal feeding, initiation of breastfeeding, exclusive breastfeeding (EBF) and time of initiation of complementary feeding was found to be very promising among the respondents in both areas (Annexure 13). Most of the mothers mentioned about colostrums as prelacteal feeding followed by honey, sugar/mere water, normal water and mustard oil. The largest part of the mothers referred that baby should be fed breast milk within one-hour after birth (74.7% vs. 78.3%) and breastfeeding should be continued until six-months of age (91.8% vs. 86.6%). In addition, they also stated that, after six-months of age complementary feeding should be started (66.5% vs. 81.4%; P=0.000). Furthermore, 75% mothers in both the areas mentioned about semolina (suji)/rice powder/barley and mashed *Khichuri*<sup>9</sup> (Roy *et al.* 2008), as complementary food for the babies.

<sup>9</sup> *Khichuri* is a local food. Details of *Khichuri* published elsewhere (Roy *et al.* 2008).



## Feeding practice

Although 96-98% mothers in both study areas fed colostrums after birth (Table 21), only 48-51% mothers fed colostrums as prelacteal feeding (Annexure 14). Despite good knowledge on breastfeeding, 51.2% mothers in the intervention slums initiated breast milk within one-hour after birth (Table 21). Moreover, 20.5% of them continued EBF<sup>10</sup> up to six-months after birth (Table 21); Annexure 14). Breastfeeding practice was similar in both areas. However, more children in the comparison slums, started feeding complementary food in proper age (during 6 months), compared to children in the intervention slums (31.5% vs. 44.7%; P=0.000). Semolina (suji)/rice powder/barley; *Khichuri*; cow's milk; baby formula; rice and fruits were widely fed as complementary food in both areas (Annexure 14).

**Table 21. Feeding practices of the newborn and infants**

Study Variable	Intervention	Comparison	P-value
N	566	519	
Fed colostrums immediately after birth, % (n)*	96.3(546)	98.1 (509)	0.107
N	566	519	
Breastfeeding initiation immediately after birth, %(n)*			
≤1 hr	51.2 (290)	53.8 (279)	0.026
>1 hr	48.6 (275)	44.7 (232)	
Don't know/don't remember	0.2 (1)	1.5 (8)	
N <sup>a</sup>	493	446	
Exclusive breastfeeding up to six months, % (n)*	20.5 (101)	23.5 (105)	0.258
N (Number of children aged 0-5 months)	191	183	
Exclusive breastfeeding among the children aged 0-5 months on the basis of 24hrs recall	47.6 (91)	48.6 (89)	0.848

\*Chi-square test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

<sup>a</sup>Children aged below six (<6) months and whose mothers could not remember period of EBF were excluded from the analysis ( Intervention = 73 and Comparison =73)

In order to analyse '24- hour recall data' under-two children were categorized by age in month. In the intervention slums, proportion of EBF was 47.6% among the infants age 0-5 months (Annexure 15 &16) while proportion of breastfeeding and complementary feeding together was 68.7% among the children aged 6-8 months (Annexure 15 & 16). In the comparison slums similar feeding pattern was observed among the under-two children.

## Newborn illness

### Birth asphyxia

Birth asphyxia was broadly defined by the World Health Organization (WHO) in 1997 as the clinical description of a newborn who 'fails to initiate and sustain breathing at birth' (WHO 1997). In the context of Bangladesh, at community level birth asphyxia can be recognised by three symptoms/signs such as, 1) no respiration; 2) no cry; 3) gasping respirations with long pauses in between (MoHFW 2009). About 8.7% mothers in the intervention slums reported that their newborn had one or more symptom of birth asphyxia, while 10.9% mothers in the comparison slums also reported similar symptoms of newborn (Table 22). In the intervention area, most of the birth asphyxia cases

<sup>10</sup> Exclusive breastfeeding (EBF) defined as feeding only breast milk to infants until six months of age

received treatment from qualified doctors compared to that in the comparison slums (80.0% vs. 37.9%; P=0.000).

**Table 22. Birth asphyxia after birth and its' management**

Study Variable	Intervention	Comparison	P-value
Birth asphyxia			
N	572	531	
Faced breathing difficulties during birth (birth asphyxia <sup>a</sup> ), % (n)*	8.7 (50)	10.9 (58)	0.223
N	50	58	
Sought treatment from trained care provider <sup>b</sup> , % (n)*	84.0 (42)	63.8 (37)	0.018
Care provided by qualified doctor, % (n)*	80.0 (40)	37.9 (22)	0.000
Care provided by BRAC SS/SK, % (n)*	---	---	---

\*Chi-square test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

<sup>a</sup> Birth asphyxia defined as presence of no cry or the breath was absent or slow, weak or gasping

<sup>b</sup> Qualified doctor, nurse, FWV, BRAC SS, BRAC SK, UBA

### Neonatal sepsis

According to the National Neonatal Health Strategy and Guidelines for Bangladesh (MoHFW 2009), presence of the following any of seven symptoms is classified as simple clinical criteria for neonatal sepsis. The symptoms are, 1) sucking reduced or stopped; 2) drowsy or unconscious or lethargic; 3) chest in-drawing; 4) convulsion; 5) fever; 6) hypothermia and 7) fast breathing (MoHFW 2009). These sepsis cases were identified considering the presence of any of the seven signs reported by mothers. Prevalence of neonatal sepsis was 38.8% in the intervention and 42.5% in comparison slums (P=0.171; Table 23). Fever was reported commonly by mothers in both areas (26.4% vs. 29.0%). In addition, more children in the intervention slums received treatment from qualified doctor (70.3% vs. 48.0%; P=0.000) and MTPs<sup>11</sup> (78.8% vs. 67.6%; P=0.007) for neonatal sepsis compared to comparison slums.

**Table 23. Neonatal sepsis and its' management**

Study Variable	Intervention	Comparison	P-value
Prevalence of neonatal sepsis, % (n)*	38.8 (222)	42.5 (225)	0.229
Individual symptom of sepsis, % (n)			
Could not suckle	12.1 (69)	12.2 (65)	0.928
Lethargic	4.4 (25)	6.2 (33)	0.170
Chest in-drawing	8.4 (48)	8.3 (44)	0.950
Convulsion	1.7 (10)	2.1 (11)	0.695
Fever	26.4 (151)	29.0 (154)	0.334
Hypothermia	2.8 (16)	4.3 (23)	0.168
Fast breathing	0.0	0.0	
N, (Number of neonates with sepsis)	222	225	
Received treatment from MTPs <sup>a</sup> , % (n)*	78.8 (175)	67.6 (152)	0.007
Received treatment from qualified doctor, % (n)*	70.3 (156)	48.4 (109)	0.000
Received treatment from BRAC SS/SK, % (n)*	---	---	---

\*Chi-square test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

<sup>a</sup> Includes qualified doctor and nurse/paramedics, FWV

<sup>11</sup> Medically trained providers include qualified doctor, nurse, FWV, paramedic

## Neonatal danger signs

Almost all the mothers knew about one or more neonatal danger signs in both the survey areas (96.3% vs. 99.4%; P=0.000; Table 24). The knowledge on neonatal danger signs was ranked into three categories. The 'poor' category consisted of one-two while, the 'moderate' and 'good' categories consisted of three-five and six-eight neonatal danger signs respectively. None of the mothers had good knowledge on neonatal danger signs. However, maximum women knew about the measures against neonatal danger signs.

**Table 24. Knowledge of the respondents on neonatal danger signs**

Study Variable	Intervention	Comparison	P-value
N, (Number of children born in last one year)	572	531	
Knew about any of the Neonatal danger signs <sup>a</sup> , % (n)*	96.3 (551)	99.4 (528)	0.000
Knowledge on neonatal danger signs, % (n)*			
None (0)	3.7 (21)	0.6 (3)	0.000
Poor (1-2)	45.8 (262)	58.9 (313)	
Moderate (3-5)	50.5 (289)	40.5 (215)	
Good (6-8)	0.0 (0)	0.0 (0)	
Median knowledge on neonatal danger, (Range)***	3 (0-4)	2 (0-4)	0.000
N, (Number of mothers who knew about any of the neonatal danger signs)	551	528	
Know what to do when neonatal danger signs identified, % (n)*			
Should know the BRAC referral mobile number	2.5 (14)	1.7 (9)	0.342
Have to go to hospital	87.3 (481)	96.8 (511)	0.000
Have to go to clinic	2.2 (12)	0.2 (1)	0.003
Have to go to doctor	15.8 (87)	18.9 (100)	0.172
Have to go to BRAC delivery centre	0.2 (1)	0.0 (0)	0.327

\*Chi-square test

\*\*\*Mann Whitney U test

<sup>a</sup> Neonatal danger signs include- 1. Cannot suckling milk; 2. Hypothermia; 3. Chest in-drawing; 4. Infection in eyes; 5. Unconsciousness/lethargic status of children; 6. Convulsion; 7. Umbilical infection; 8. Frequent vomiting

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

About 35% children had one or more neonatal danger signs (Table 25). Prevalence of hypothermia was highest (20.6% vs. 20.5%), followed by could not suck breast milk (10.8% vs. 10.0%) and breathing difficulties or chest in drawing (9.8% vs. 7.2%). Most of the respondents sought treatment from public and private facilities (73.1% vs. 63.0%). In addition, in the intervention slums 26.4% respondents and in the comparison slums 42.5% sought treatment from village doctor, homeopath doctor, spiritual healer, traditional healer, drug seller and FWV (Table 25). Only 5% respondents did nothing against neonatal danger signs.

**Table 25. Practice of the respondents for neonatal danger signs**

Study Variable	Intervention	Comparison	P-value
N	572	531	
Had one of the neonatal danger signs <sup>a</sup> of last child of the respondents, % (n)*	35.1 (201)	34.1 (181)	0.713
N	572	531	
Danger signs faced by children, % (n)*			
Couldn't suckle breast milk	10.8 (62)	10.0 (53)	0.526
Fever or hypothermia	20.6 (118)	20.5 (109)	0.583
Breathing difficulties or chest in drawing	9.8 (56)	7.2 (38)	0.294
Swelling, redness/pus formation of eye	3.5 (20)	3.4 (18)	0.994
Lethargic/senseless	4.2 (24)	5.5 (29)	0.326
Convulsion	0.7 (4)	0.8 (4)	0.580
Umbilical infection/ Eruption of body	5.4 (31)	4.1 (22)	0.360
Swelling of abdomen/ Severe Vomiting	6.3 (36)	4.7 (25)	0.303
N	201	181	
Action taken after recognition of danger signs, % (n) ‡			
Did nothing	5.0 (10)	5.5 (10)	
Seek help to BRAC staffs	-	-	
Help from facility ( public/ private)	73.1 (147)	63.0 (114)	
Others <sup>b</sup>	26.4 (53)	42.5 (77)	

\*Chi-square test

<sup>a</sup> Neonatal danger signs include- 1. Cannot suckling milk; 2. Hypothermia; 3. Chest in-drawing; 4. Infection in eyes; 5. Unconsciousness/lethargic status of children; 6. Convulsion; 7. Umbilical infection; 8. Frequent vomiting

<sup>b</sup> Village doctor, homeopath doctor, spiritual healer, traditional healer, drug seller, FWC, FWV

‡ Multiple responses possible

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

## Under five child health

### ***Vaccination***

Information on vaccination of under-five children of the respondents was obtained from all the mothers with living children. However, only the children aged 12-59 months were considered for analysis. We assumed during 12 months of age children might have completed all doses of vaccine. Information was collected based on availability of vaccination card and in case of unavailability mothers were asked whether their children had received all vaccines or not. In the intervention slums, 62% mothers could show vaccination cards compared to 49.3 % mothers in the comparison slums (Table 26). In the intervention slums, almost all the children received at least one vaccine while 75.2% children received all the vaccines<sup>12</sup>. From the total number of children who had vaccination cards, 84.8% were fully immunised and of those whose cards were not available, 64.0% received it. Regarding complete vaccination, proportion of children in the comparison slums was higher than that of the intervention slums either for the children with card or without card. Even coverage of measles vaccination was 84.1% and 90.2% in the intervention and comparison slums respectively (P=0.002). Coverage of deworming tablet was 61% in the intervention and 72% in the comparison slums (P=0.006). In addition, vitamin A capsule coverage seemed satisfactory in both the areas (88.4% vs. 90.7%).

<sup>12</sup> BCG, measles, 3 doses of DPT or Pentavalent and polio vaccine (excluding polio vaccine given at birth)

**Table 26. Vaccination, Vitamin A supplementation coverage and deworming practice of children aged 12-59 months**

Study Variable	Intervention	Comparison	P-value
N, (Number of children 12-59 months)	610	599	
Children with at least one vaccination, % (n)*	97.9 (597)	99.2 (594)	0.063
N, (Number of children with at least one vaccination)	597	594	
Card available, % (n)*	61.8 (369)	49.3 (293)	0.000
N, (Number of children 12-59 months)	610	599	
Children with complete vaccination <sup>a</sup> , % (n)*	75.2 (459)	72.5 (434)	0.269
Children with individual vaccination, % (n)*			
BCG	97.9 (597)	99.0 (593)	0.114
Polio 3	87.0 (531)	79.5 (476)	0.000
DPT 3 <sup>b</sup>	84.4 (515)	79.4 (476)	0.025
Hepatitis B	83.6 (510)	78.1 (468)	0.015
Measles	84.1 (513)	90.2 (540)	0.002
Penta 3	56.1 (342)	34.9 (209)	0.000
Children with complete vaccination <sup>a</sup> , % (n)*	75.2 (459)	72.5 (434)	0.269
Card available			
BCG	60.5 (369)	48.9 (293)	0.000
Polio 3	56.9 (347)	48.4 (290)	0.003
DPT 3 <sup>b</sup>	56.6 (345)	48.2 (289)	0.004
Hepatitis B	56.1 (342)	48.2 (289)	0.007
Penta 3	56.1 (342)	34.9 (209)	0.000
Measles	51.8 (316)	45.7 (274)	0.035
Complete vaccination	51.3 (297)	45.6 (326)	0.053
Mothers' report			
BCG	37.4 (228)	50.1 (300)	0.000
Polio 3	30.2 (184)	31.1 (186)	0.738
DPT 3 <sup>b</sup>	27.9 (170)	31.2 (187)	0.225
Hepatitis B	27.5 (168)	29.9 (179)	0.368
Penta 3	0	0	0
Measles	32.3 (197)	44.4(266)	0.000
Complete vaccination	23.9 (146)	26.9 (161)	0.267
N, (Number of children at least one vaccination)	597	594	
Place of immunisation, % (n) ‡			
Government hospital	9.5 (57)	3.4 (20)	
Satellite clinic	67.0 (400)	84.2 (500)	
NGO clinic	13.4 (80)	9.9 (59)	
Municipal office	8.7 (52)	2.9 (17)	
Others <sup>c</sup>	3.3 (20)	3.0 (18)	

\*Chi-square test

- BCG, measles, 3 doses of DPT or pentavalent and polio vaccine (excluding polio vaccine given at birth)
- Information on three doses of DTP & Penta together
- Includes MCWC, home, private clinic, FWC
- Last immunisation day was mentioned as June 9, 2012 while asking for vitamin A capsule intake

‡ Multiple responses possible

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### **Prevalence of ARI**

Mothers were asked about the incidence of ARI of their last living child during two weeks preceding the interview. Prevalence of different form of ARI among children aged <2 month, was 11.8 % and 5.9% in the intervention and comparison slums, respectively (P=0.393; Table 27). All of them had suffered from common cough and cold only.

Prevalence of ARI among the children aged  $\geq 2$  months was 6.1% in the intervention and 7.8% in the comparison slums. Most of them had common cough and cold (5.5% vs. 5.8%;  $P=0.763$ ) and very few of them had very severe pneumonia<sup>13</sup> (0.2% vs. 1.8%;  $P= 0.000$ ).

**Table 27. Prevalence of ARI among the children aged 0-59 months**

Study Variable	Intervention	Comparison	P-value
Number of children aged <2 months, N	34	34	
Prevalence of ARI	11.8 (4)	5.9 (2)	0.393
Specific symptoms of ARI, % (n)			
Common cough and cold <sup>a</sup>	11.8 (4)	5.9 (2)	0.393
Pneumonia <sup>b</sup>	--	--	--
Sever Pneumonia <sup>c</sup>	--	--	--
Very severe pneumonia <sup>d</sup>	--	--	--
Number of children aged $\geq 2$ months , N	1142	1084	
Prevalence of ARI	6.1 (69)	7.8 (84)	0.120
Specific symptoms of ARI, % (n)			
Common cough and cold <sup>a</sup>	5.5 (63)	5.8 (63)	0.763
Pneumonia <sup>b</sup>	0.4 (4)	0.2 (2)	0.451
Sever Pneumonia <sup>c</sup>	--	--	--
Very severe pneumonia <sup>d</sup>	0.2 (2)	1.8 (20)	0.000

\*Chi-square test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

a. Cough and cold together

b. Cough and cold accompanied with first breathing

c. Cough, cold and first breathing accompanied with chest in-drawing

d. Cough, cold, first breathing and chest in-drawing, accompanied with could not suckle or eat, wheezing sound during breathing, breathing problem, convulsions, dizziness, fever, hypothermia

In the intervention slums 73.6% children compared to 86.2% children in the comparison slums received treatment for ARI ( $P= 0.033$ ; Table 28). Out of the total number of under-two months children who had cough and cold 50% of them received treatment from qualified doctors and rest of them received treatment from drug sellers and homeopath doctors (Table 28).

In the intervention slums, children aged more than two-months, who had cough, and cold 42.2% received treatment from qualified doctor, while those who had very severe pneumonia<sup>14</sup> 50% received treatment from similar practitioners. Regarding treatment of ARI comparison slums had similar trend as intervention slums.

<sup>13</sup> Cough, cold, first breathing and chest in-drawing, accompanied with could not suck or eat, wheezing sound during breathing, breathing problem, convulsions, dizziness, fever, hypothermia

<sup>14</sup> Cough, cold, first breathing and chest in-drawing, accompanied with could not suckle or eat, wheezing sound during breathing, breathing problem, convulsions, dizziness, fever, hypothermia

**Table 28. Management of ARI**

Study variable	Intervention	Comparison	P-value
N, (Number of children had ARI symptoms)	73	87	
Received treatment for ARI, % (n)	72.6 (53)	86.2 (75)	0.032
Place of treatment , % (n) ¥			
Government hospital	7.5 (4)	29.3 (22)	
Private hospital	37.7 (20)	13.3 (10)	
Private chamber	3.8 (2)	9.3 (7)	
Pharmacy	41.5 (22)	10.7 (8)	
Homeo doctor's chamber	5.7 (3)	24.0 (18)	
Others <sup>1</sup>	5.7 (3)	21.3 (16)	
N, (Number of <2 months children had ARI symptoms)	2	2	
Treatment provider <2 months age infants for common cough and cold , % (n) ¥			
MBBS doctor	50.0 (1)	50.0 (1)	
Others <sup>2</sup>	50.0 (1)	50.0 (1)	
N, (Number of ≥2 months children had ARI symptoms)	45	51	
Treatment provider months age infants for common cough and cold , % (n) ¥			
MBBS doctor	42.2 (19)	29.4 (15)	
Dug seller	28.9 (13)	13.7 (7)	
Village doctor	20.0 (9)	33.3 (17)	
Homeopath doctor	4.4 (2)	9.8 (5)	
Others <sup>3</sup>	8.8 (4)	15.7 (8)	
N, (Number of children with symptoms of very severe pneumonia)	2	20	
Treatment provider ≥2 months age infants for very severe pneumonia , % (n) ¥			
MBBS doctor	50.0 (1)	85.0 (17)	
Village doctor	50.0 (1)	5.0 (1)	
Drug seller	0.0 (0)	10.0 (2)	
Others <sup>4</sup>	0.0 (0)	15.0 (3)	
N	2	20	
Treatment by medically trained provider <sup>5</sup> , % (n)*	50.0 (1)	85.0 (17)	0.221

\*Chi-square test

¥ Multiple responses possible

<sup>1</sup>Other NGO clinic and place of traditional healer;

<sup>2</sup>Drug seller and homeopath doctor

<sup>3</sup>Traditional healer, spiritual healer, paramedics & mother herself;

<sup>4</sup>Nurse, traditional healer and homeopath doctor;

<sup>5</sup>MBBS doctor and Nurse

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

## Prevalence of Diarrhoea

Mothers were asked about the incidence of diarrhoea during the last two-weeks preceding interview. In the intervention slums, prevalence of diarrhoea was 6.3% and 87% of them took ORS, 13.5% received zinc syrup and 14.9% received zinc tablet (Table 29). Prevalence of diarrhoea was significantly lower (3.3%) in the comparison area. Although, in the comparison slums, proportion of receiving ORS at the onset of diarrhoea was similar to the intervention slums, proportion of intake of zinc syrup and zinc tablet was higher. About three-fourth of the children was fed breast milk during diarrhoea (75.7% vs. 70.3%). In both areas, more respondents were inclined to receive treatment from non-medically trained providers such as drug sellers, village doctors, traditional healers, homeopath doctors. Still, 38.8% children in the intervention and 47.2% in the comparison slums received treatment against diarrhoea from MTPs.

**Table 29. Prevalence and management of diarrhoea among the children aged 0-59 month preceding two weeks of interview**

Study variable	Intervention	Comparison	P-value
N, (Number of children with 0-59 months of age)	1176	1118	
Prevalence of Diarrhoea, % (n)*	6.2 (73)	3.4 (38)	0.002
N	73	38	
Types of liquid provided during diarrhoea, % (n)*			
ORS (packet saline)	86.3 (63)	86.8 (33)	0.937
Homemade saline	5.5 (4)	21.1 (8)	0.012
Zinc syrup	13.7 (10)	23.7 (9)	0.185
Zinc tablet	15.1 (11)	10.5 (4)	0.507
Zinc+ORS	34.2 (25)	47.4 (18)	0.178
Continued breastfeeding during diarrhoea	76.7 (56)	71.1 (27)	0.567
N	73	38	
Treatment received during diarrhoea, % (n)*	90.4 (66)	97.4 (37)	0.179
N	66	37	
Place of treatment, % (n) †			
Government hospital	13.6 (9)	21.6 (8)	
Private clinic	4.5 (3)	5.4 (2)	
Private chamber of MBBS doctors	19.7 (13)	16.2 (6)	
Pharmacy	39.4 (26)	8.1 (3)	
At home	7.6 (5)	18.9 (7)	
Homeopath doctor's chamber	4.5 (3)	13.5 (5)	
Others <sup>a</sup>	7.5 (5)	2.7 (1)	
N	66	37	
Treatment provider of diarrhoea, % (n) †			
Medically trained provider <sup>b</sup>	40.9 (27)	48.6 (18)	
Others <sup>c</sup>	74.2 (49)	56.8 (21)	

\*Chi-square test

† Multiple responses possible

ORS – Oral rehydration saline

Zinc +ORS =Packet ORS along with zinc tablet or zinc syrup

<sup>a</sup> Other NGO clinic, traditional healer

<sup>b</sup> Qualified doctor, nurse, paramedic and FWV

<sup>c</sup> Drug seller, village doctor, traditional healer, homeopath doctor, mother herself and relatives

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality



### Prevalence of other diseases

The prevalence of other diseases was recorded for the last three months preceding the interview. Prevalence of fever was highest and common among the children in both the areas (68.3% vs. 70.0%; Table 30). The next common morbidity was dysentery followed by mouth ulcer and skin disease. Most of the children who suffered from these diseases, received treatment from non-MTPs.

**Table 30. Prevalence and management of other illness among the children aged 0-59 months and management**

Study Variable	Intervention	Comparison	P-value
N, (Number of children with 0-59 months of age)	1176	1118	
Children suffered from other illness during last 3 months of interview, % (n)	73.6 (866)	74.6 (834)	0.601
Types of other illness, % (n)			
Fever	68.3 (803)	70.0 (783)	0.363
Skin disease	2.4 (28)	1.5 (17)	0.137
Dysentery	9.9 (116)	9.7 (109)	0.927
Mouth ulcer	3.2 (38)	3.1 (35)	0.891
Worm infestation	1.4 (16)	2.9 (32)	0.012
Eye infection	0.6 (7)	0.4 (4)	0.411
Otitis media	1.3 (15)	0.4 (4)	0.015
N, (Number of children with had any types of illness)	866	831	
Treatment received, % (n)*	96.3 (834)	96.4 (801)	0.926
N, (Number of children who received treatment)	834	801	
Treatment provider, % (n) ‡			
Medically trained provider <sup>a</sup>	46.3 (386)	35.2 (282)	
Others <sup>b</sup>	61.9 (516)	72.2 (578)	

\*Chi-square test

‡ Multiple responses possible

<sup>a</sup> Qualified doctor, nurse

<sup>b</sup> Drug seller, village doctor, traditional healer, spiritual healer, homeopath doctor, paramedics, BRAC SK, mother herself, TBA, relatives

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### Perception on local delivery facility

Respondents were asked about local delivery facilities. Most of the mothers in the intervention slums knew about the nearest delivery facility compared to mothers in the comparison slums (66.6% vs. 19.4%; P=0.000; Annexure 19). As it was the starting phase of MANOSHI programme in the intervention slums only 29% of the respondents knew about BRAC “delivery centre” as a place of delivery. However, 51.6% of the respondents in the intervention slums mentioned about other NGO clinics as delivery places.. In the case of comparison slums most of the respondents frequently mentioned private clinics as local delivery places (90.1%) (Annexure 19). Respondents were asked about reasons of satisfaction or disappointment with services provided by a health facility. Most of them said that they would be satisfied with good behaviour of the staff of a health facility (88.1% vs. 79.6%); availability of medicine (71.0% vs. 50.5%); healing of illness (53.3% vs. 55.8%); low cost (32.7% vs. 27.1%); short waiting time for treatment (36.8% vs. 30.0%) and neat and clean environment (17.6% vs. 13.0%). On the other

hand, bad behaviour (85.9% vs. 80.9%); unavailability of medicine (71.4% vs. 50.5%); long waiting time for treatment (46.6% vs. 44.4%); and higher cost (26.9% vs. 27.2%) were the reasons for disappointment with a health facility.

## Discussion

Notwithstanding the poor health systems in Bangladesh in term of maternal and under-five child health, social determinants are major constraints in receiving services from health facilities by poor communities. In this circumstance, the MANOSHI programme will address these issues and constraints toward achieving MDG 4 and 5. The present study aimed to explore the existing status of maternal, under-five child morbidity, mortality, and their health seeking behaviour in slums at the Narayanganj City Corporation. This report will help to identify appropriate strategies and achieve optimum return on investment in the MANOSHI programme.

### ***Socio-demographic status***

Trend of adolescent motherhood seems to be higher in the slums at both the intervention and comparison areas. Early motherhood could be a proxy for short stature, low BMI and greater probability of inadequate weight gain during pregnancy (Alam 2000). Furthermore, early motherhood could be associated with poor maternal outcomes, including pregnancy complications and maternal mortality (Raj *et al.* 2010). In addition, adolescent age of mothers was found to be associated with risk of neonatal mortality; preterm delivery; stillbirth; low birth weight (Alam 2000; Black *et al.* 2012; Kamal 2011, Raj *et al.* 2010; Trussell *et al.* 1983) and poor health outcomes of infants (Finlay *et al.* 2011). We found that, most of the children had died during their neonatal period. Therefore, it can be predicted that there might be an association between neonatal death and teenage motherhood (Alam 2000). Provision of family planning method should be encouraged among the adolescents for reducing fertility. Indeed, we found most of the adolescent mothers were using modern FP methods after termination of pregnancy. Still, their children are at a high risk of morbidity and mortality.

### ***Abortion and MR***

The proportion of mothers who had abortions was higher than MR in the last one year preceding the interview. In an earlier study negative correlation was found between higher CPR and higher abortion rate (Westoff 2005). Perhaps the mothers did not properly use access, availability and contact to get family planning services. As a result, unintended pregnancy might have been terminated by abortion with the assistance of traditional healer or homeopath doctors or quack. This could be suicidal for the mothers, as abortion performed in an unhygienic environment increased risk of maternal mortality (Hurt *et al.* 2008; Singh, 2006). However, we found that the proportion of spontaneous abortion was alarming. The long-term effect of induced abortion was studied (Throp *et al.* 2003). However, consequence of spontaneous abortion remains a challenge, as this event has not been reported properly.

Although, the proportion of induced abortion seems very low in this study, there might be information bias or misclassification. The main problem is that, in Bangladesh abortion is restricted by law and mothers might not provide authentic information about termination of unintended pregnancy. In contrast to abortion, MR policy has been adapted as part of the government FP programme even though the state religion of Bangladesh is Islam. Although women are suffering from complications as a result of abortion or MR, they are still largely unwilling to use modern methods and lack access

to such services. Therefore, better contraceptive service and preconception counseling are urgent in the MANOSHI programme areas for prevention of unintended pregnancy and reduction of abortion related maternal mortality (Chowdhury *et al.* 2009).

### ***Prevalence of contraceptives***

Contraceptive Prevalence Rate (CPR) in the intervention area (72%) seems higher compared to the nationally representative estimate (61%) (BDHS 2013). The present survey was conducted in an urban setting that could be a reason for higher CPR among the respondents. Likewise in the nationally representative data we also found a higher use of pill and fewer use of men and women sterilisation (BDHS 2013). In the intervention slums, more women faced physiological problems and most of them were not seeking any treatment for the complications. Persistent physiological problem might lead to discontinuation of FP method by the users (Fox 2001) and would increase unintended pregnancy. Hence, the provision of an appropriate FP method is urgently needed for both men and women in the slums.

### ***Antenatal care (ANC)***

Apparently, a higher proportion of respondents in the intervention slums, received only one ANC compared to comparison slums and nationally representative data (BDHS 2013; BMMS 2012). It could be due to the urban infrastructure of intervention slums than the comparison slums (BDHS 2013; Koblinsky *et al.* 2008; Simkhada *et al.* 2008). Time of their first ANC visit became major concern in this regard. Half of the mothers in the intervention slums received their first ANC during their second and third trimester, which point to the fact that unless facing complications they might not go to a health facility. The proportion of women visiting a health-centre at least four-times during pregnancy is being used as an indicator to monitor progress towards achievement of the MDG 5 (Mathai 2011). According to the target (50%) of the Health, Population, and Nutrition Sector Development Program (HPNSDP) 2011-2016 (BDHS 2013), it seems that in the intervention area (47%) this indicator is progressing towards the national target.

Consistent with other studies, we observed that, higher number of ANC visits were associated with higher socioeconomic status and those who completed five or more years of formal education (Elo 1992; Koblinsky *et al.* 2008; Simkhada *et al.* 2008). One out of five women in the poorest quintile received four times ANC visits. Even, both birth preparation and skilled assisted delivery found unsatisfactory among the poor of current study. Impact of ANC check-ups on skilled assisted delivery was only revealed among non-poor group of this study (Bloom *et al.* 1999; Koblinsky *et al.* 2008; Yanagisawa *et al.* 2006; Stanton *et al.* 2007; WHO, 2003). This meant that, programme needed to be more active to improve number of ANC visit among this disadvantaged group for management of risk pregnancy.

### ***Skilled birth attendants***

Presence of skilled birth attendants (SBA) is very important for safe delivery, as well as for reducing maternal and neonatal death. In Bangladesh, most deliveries take place at home; nevertheless, the success of using MTP was possible only due to hospital delivery (BDHS 2013). Slum dwellers prefer that deliveries are done at home with assistance of non-MTP (Fronczak *et al.* 2007). This is consistent with the current study as a good proportion of deliveries were conducted by TBAs. MDG 5 A is targeted for 90% of births in low and middle-income countries to have an SBA by 2015 (UN, 1999).

It is not necessary that for receiving services of an SBA, pregnant women have to be shifted to hospital. Rather, in the context of Bangladesh the community SBA services have to be made available. At the same time SBA service recipients should be aware of the importance of saving life. In Bangladesh, it was found that CSBA programme had limited action in the community although the programme was continuing for a decade (BMMS 2010). In the intervention slums, BRAC urban birth attendants (UBA) and MANOSHI midwives (MMW) are working. With respect to increasing services of UBA and MMW in the community, mobility of the BRAC SK or SS is essential. These frontline health workers usually introduce BRAC delivery centres and maternity centres to pregnant women during ANC visits.

Similar to other Bangladeshi studies we found inequities in the use of MTPs (Annexure 21) during delivery between the richest and the poorest in intervention slums, (Anwar *et al.* 2008). Hence, the poorest women in the intervention slums need to be encouraged to conduct their deliveries at the BRAC delivery centres otherwise optimum return from building delivery centres in the intervention slums will not be achieved.

### ***Postnatal care***

The significance of PNC within 48 hours after delivery by MTPs for reducing of maternal and neonatal death is well established (Rocomparisonans *et al.* 2006; Baqui *et al.* 2009). We found that about 44% of the mothers received PNC within 48 hours in the intervention slums where the national target is 50% (BDHS 2013). There is no doubt that target of PNC was achieved through institutional delivery. However, in case of home delivery this indicator is very alarming and indicate the requirement of a PNC visit by BRAC SK within 48 hours.

Likewise ANC visits, the poorest women are also deprived from receiving PNC within 48 hours by MTPs. Among slum community women tend to deliver at home by unskilled attendants who usually use potentially harmful birthing practices, which increase the risk of postpartum morbidity and mortality (Fronczak *et al.* 2007). Furthermore, many feeding problems and treatable infectious disease are present among newborn at around three days old (Baqui *et al.* 2006; Bang *et al.* 2005c; Freeman *et al.* 2005). Treating these maternal and neonatal complications would not be possible with these types of caregivers. In the intervention slums, BRAC SKs are providing PNC visit and they are able to identify complications and refer them to the facility for treatment. Still, mothers should be advised for a PNC by an MTP during ANC visit by BRAC SK.

### ***Maternal danger signs***

The respondents in the intervention area had knowledge gap on maternal danger signs and only a few of them knew about all the six maternal danger signs. Still, lack of awareness on maternal danger signs persists among women in Bangladesh and they do not know about the most deadly condition of women during pregnancy, delivery and postpartum period. A Bangladeshi study found that women recognised prolonged/obstructed labour and tetanus as more fatal than eclampsia and excessive bleeding (Koblinsky *et al.* 2008). A delay in the recognition of maternal danger signs of pregnancy/labour or access to EmOC could increase the probability of perinatal (Jammeh *et al.* 2011) and maternal mortality (Chowdhury *et al.* 2007; Chowdhury *et al.* 2009). We found that very few mothers knew about the BRAC referral mobile number so, that in case of danger signs they could go to the BRAC referral centres. Therefore,

to utilise BRAC provided services pregnant women should be well informed about maternal danger signs and services provided by BRAC.

During the entire pregnancy, delivery and postpartum period edema, severe headache and blurred vision most common among mothers. However, during the delivery prolonged labour was prevalent (Annexure 8). Although, they cited that due to danger signs mothers should go to government hospital, most of the mothers went to private facility. Seeking treatment for maternal complications did not vary across the socioeconomic groups (Annexure 23). Therefore, awareness on recognition of maternal complication should be built not only among the poor but also among the rich in the intervention slums.

In respect to this, community awareness is also required to transfer mothers to a health facility in case of complication. MANOSHI programme was previously effective in reducing first and second delay, not the third delays in accessing EmOC (Nahar *et al.* 2011). Hence, an effective referral service must be confirmed for achieving the goal of MANOSHI in the intervention area.

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

Mothers had poor knowledge on all the five ENC except breastfeeding. In the intervention slums, half of the delivery was conducted at home and assisted by TBA, which could be an obstacle to newborn survival (Upadhyay *et al.* 2012<sup>a</sup>). We found that sterile blade was used for cutting the cord, but the proportion of tying the cord with sterile thread was lower at home delivery, which increased risk of both cord infection and puerperal sepsis (Darmstadt *et al.* 2009; Mosha *et al.* 2005). Furthermore, only one-third of the children received all ENCs in the intervention area. Among them only 57% received ENC from trained providers. It is crucial to receive WHO guided ENC from trained healthcare providers for reducing perinatal death (Baqui *et al.* 2009; Bhutta *et al.* 2008; Garces *et al.* 2012). Therefore, the existing health workers should receive training on ENC. It needs to be ensured that the newborn will receive all the ENC from the health workers timely.

### ***Thermal care of LBW babies***

Prevalence of LBW is highest in Bangladesh compared to other countries (36%) (WHO 2005). However, we found only, 14-17% of the children were LBW. Not all the respondents were able to provide information on birth weight of their children. Hence, we estimated the proportion of LBW from children whose mothers who could recall their birth weight and gestational age during delivery. Moreover, we had few chances to confirm birth weight of the children. Thus, miss-classification of LBW and NBW could exist might be existed in the study.

Initiation of breastfeeding immediately after birth and thermal care is essential for reducing morbidity and mortality among LBW babies (Conde-Agudelo *et al.* 2011; Thakur *et al.* 2012). Events for management of LBW baby were not satisfactory in the intervention slums. We found that, mothers had poor knowledge on identification of LBW and their management. This might affect newborn care of LBW babies consequently increase risk of death. Hence, the programme must be concerned about identification of LBW through weighing them within 48 hours of birth; identification of barriers to optimal home care practices; confirmation of newborn care services in the facility; and scaling up breastfeeding.

### ***Breastfeeding and complementary feeding practice among under two children***

In spite of good knowledge of mothers on initiation of breastfeeding, EBF and complementary feeding, the respondents did not properly practice these. From retrospective questionnaire, we found that only 20.5% mothers in the intervention area fed exclusive breast milk up to six months according to the recommendations of the World health organization (WHO 2003). This estimate is contradictory to the BDHS estimate where it has been shown that 63% of infants aged 0-5 months are exclusively breast fed (BDHS 2013). We identified several reasons for this difference. First, '24 hours recall' method was used in the national demographic health survey for estimating current feeding practice and the population was within six months of age. On the other hand, EBF of the current study was estimated from retrospective data and collected from mothers whose children were more than six months of age. While we estimated EBF from '24 hours recall' data we found that only 43% of the children aged 0-5 months were exclusively breastfed, which was also lower than the BDHS estimate. Both the retrospective and "24 hours recall interview" cannot assure validity of EBF. Moreover, the single '24 hrs dietary recall' in earlier national survey was not a valid estimate. For validity of "24 hours dietary recall" it is necessary to conduct a number of interviews repeatedly (Willett 1998). Second, the population in our study is from the slums that never represents the whole population. However, the proportion of EBF in the current study is higher than another study that was conducted in urban slums of Bangladesh (Haider *et al.* 2010). Authors of earlier studies identified that poor interaction between health workers and beneficiaries was responsible for low rate of EBF (Haider *et al.* 2010). Thus, the BRAC SK needs to receive proper training on breastfeeding and how to promote mothers for appropriate breastfeeding as well as IYCF.

### ***Birth asphyxia***

Birth asphyxia was found as a major cause of neonatal death in developing countries including Bangladesh (Chowdhury *et al.* 2010; Mercer *et al.* 2006; Velaphi *et al.* 2007). Prevalence of birth asphyxia in the intervention slums (8.7%) seems higher than other developing countries such as South Africa (Hall *et al.* 1996) and Nigeria (Kinoti 1993). WHO estimated that 3% of the approximately 120 million infants born every year in developing countries develop birth asphyxia and require resuscitation (WHO, 1998). We collected information on symptoms of birth asphyxia retrospectively from mothers. Mothers were not trained like health workers. Moreover, during the event of birthing process mothers might not be in that situation that they could explain the situation properly. On the other hand, mothers in both areas might be more aware of birth asphyxia that they could describe and the prevalence became higher. Thus, the figures of birth asphyxia do not confirm valid estimation. In India (Bang *et al.* 2005<sup>a</sup>), 14% of mild birth asphyxia and 4.3% of severe birth asphyxia were confirmed by health workers by using similar clinical tools of birth asphyxia which we had used in our study. Therefore, to get a valid estimation of birth asphyxia, it is required to interview the birth attendants.

Inappropriate labour process (Bari *et al.* 2002), such as, superfluous administration of oxytocics augment labour (Bang *et al.* 2005<sup>a</sup>) which could be associated to neonatal death from birth asphyxia. On the other hand, obstructed labour is another cause of birth asphyxia (Javed *et al.* 2007). It is also associated with prolonged labour, poor placental function of any cause, prematurity, cord prolapse or compression, placental abruption, severe meconium aspiration, congenital cardiac or pulmonary anomalies and birth trauma (MoHFP 2009). We found that in case of home delivery, if mothers faced

any complication, they sought seek treatment from the drug seller or village doctor. For most of the cases, these providers gave saline along with an injection for facilitating the delivery process. The injection might be oxicotic and harmful for neonates. Furthermore, in case of any delivery complication neonatal death could be possible due to household and transport-related delays (Upadhyay *et al.* 2012<sup>b</sup>). Therefore, for prevention of death related to birth asphyxia, mothers should be promoted seeking assistance from SBA or MNCH outreach or primary care facilities with basic obstetric care delivery.

### ***Neonatal sepsis***

The prevalence of neonatal sepsis in this study was higher. Severe fever (>101°F or 38.3°C) and hypothermia (<95.5° F or 35.3°C) had a substantial agreement with neonatal illness compared to moderate fever and hypothermia when identified by the community health worker in rural Bangladesh (Darmstadt *et al.* 2009a). In this study mothers reported historically about fever and it was not possible for us to know the exact body temperature onset of fever of the infants. Perhaps, more infants had moderate fever, however, during interview mothers exaggerated about fever during neonatal period, which increased the prevalence of neonatal sepsis.

In addition, the prevalence of other symptoms reported in this study was higher than another Bangladeshi study where trained community health workers reported the symptoms (Baqui *et al.* 2009b). Definitely, reporting of trained community health workers would be more precise than lay respondents. However, these community health workers had few limitations of screening these symptoms when it was substantiated by physicians (Darmstadt *et al.* 2009a).

Sepsis causes about 20% death of neonates in Bangladesh (Chowdhury *et al.* 2010). Earlier study in Bangladesh found that trained community health workers were capable to recognise the signs of illness and home treatment of them was effective in low resource settings (Baqui *et al.* 2009b; Baqui *et al.* 2009c). Thus in the programme area the BRAC SK needs to receive extensive training on neonatal sepsis and identification and monitoring process need to ensure postnatal care visits by BRAC SK during the first month of life.

### ***Vaccination coverage***

Coverage of all vaccines together among the children aged 12-59 months was worse than the national coverage (BDHS, 2032). We did not find vaccination card of all the children. In this regard, we asked the mother about vaccines. Perhaps these children received all the vaccines but few mothers could provide information properly. Moreover, we observed that few mothers were careless about immunisation and after going to a facility, twice or thrice they stopped going for further vaccine. Thus, both could be reason of low coverage of measles vaccine, consequently reduced the coverage of all vaccines. The HPNSDP has set target of 90% coverage of measles vaccine by the age of 12-months by 2016 (BDHS, 2013). Therefore, to reach the target in the programme area mothers should be instructed about the importance of vaccination.

### ***Prevalence ARI***

Prevalence ARI in the study was comparable with national prevalence (35%) (BDHS 2013). Incidence of ARI varied in different season (BDHS 2013). In respect to ARI, seeking treatment was promising for infants aged <2 months as mothers were going to qualified doctors. However, for the children aged ≥2 months seemed careless as most



of them sought treatment from another provider instead of qualified doctors. The HPNSDP 2011-2016 target of 50 per cent of children (0-59 months) with pneumonia would be receiving antibiotics (BDHS 2013). We recorded information, whether children were receiving treatment or not at the onset of ARI, but not about antibiotics. That is why, it is difficult for us to interpret whether they were receiving antibiotics or not. It was found that, the administration of Hib vaccine might have an effect on reduction of incidence of ARI (Azziz-Baumgartner *et al.* 2012) and EBF could reduce mortality related to the ARI (Arifeen *et al.* 2001). Therefore, vaccination coverage and EBF need to be promoted for prevention of the incidence of ARI.

### ***Prevalence of diarrhoea***

Prevalence of diarrhoea was not so high. Diarrhoea varies seasonally (Hashizume *et al.* 2008). However, ORS or homemade saline was widely fed to the children at the onset of diarrhoea, which was higher than the BDHS estimate (BDHS 2013). Use of zinc supplementation at the onset of diarrhoea was not as the satisfactory as use of ORS. It revealed that during diarrhoea more mothers sought treatment from drug seller, village doctor, homeopath doctor and traditional healers than MTPs. Either the mothers were not prescribed to feed zinc supplementation or this might be unaffordable to them. The effect of zinc supplementation for under-five children's health in reducing both the incidence and episodes of diarrhoea is well known (Larson *et al.* 2008; Baqui *et al.* 2002; Roy *et al.* 2007). WHO/UNICEF recommended that all children with an acute diarrhoeal illness should be treated with zinc, regardless of aetiology (WHO/UNICEF, 2004). Hence, mothers in the intervention slums required to inform about the importance and use of zinc supplementation during diarrhoea.

### ***Prevalence of other diseases***

Likewise, ARI and diarrhoea, fever is not seasonal and could occur all year-round (BDHS 2007). We observed high prevalence of fever indicating children were more prone to malaria or other acute infection (BDHS 2007). Exposure to the malaria parasite not only results in bouts of high fevers among children, but also increases the risk of malnutrition, anaemia, mortality (Ehrhardt *et al.* 2006) and could be an obstacle to cognitive development (Fink *et al.* 2006) among under-five children. Therefore, in case of frequent fever, the qualified doctors should treat children.

### ***Limitations***

This survey was a cross-sectional study and we collected information on maternal, neonatal and child health status and care services at one point of time. Moreover, we intended to collect information on indicators of MNCH by using the recall method. Therefore, overestimation, under estimation and miss-classification might persist in some of the indicators due to information and recall bias. For reducing recall bias we asked to show records of some information. For instance, ANC card, birth card, test report and immunisation card etc. Moreover, we used a standardised questionnaire and the interviewers were asked to motivate the mother with good behaviour before starting interview. We selected respondents residing at slums, and this community had special characteristics and could only be compared with other slums. Hence, the obtained result might not be representative of the entire nation. It was difficult for us to select a comparison site comparable to slums in the NCC. Nevertheless, the NSM is adjacent to Narayanganj and both areas had similar health programmes. Still, the NCC is more urban than the NSM. We did randomisation for selecting the slums in the intervention

area, thus we might generalise this report for all the slums. The second randomisation was conducted among the respondents for reducing possible confounders. For improving data collection quality, comprehensive training was conducted among the field enumerators and the supervisory team was always present at the study sites for monitoring their activities.

## Conclusion and programmatic implications

In order to reduce maternal and under-five child morbidity and mortality in the slums of NCC, evidence based strategies of continue care services need to be delivered. The strategies that are most likely to be effective in increasing coverage of comprehensive FP services; quality of ANC; knowledge on birth preparedness; PNC visits for home delivery; identification of complications; treatment seeking for complications; assistance of the SBA and more facility delivery with an EmOC need to be scaled up. Thermal care for the neonates, management of LBW; identification of birth asphyxia and sepsis; initiation of breastfeeding within one-hour of birth; EBF; vaccination coverage and seeking treatment at the onset of morbidity need to be widen. Numbers of programmatic implications are as follows,

### Maternal health

1. Adolescent motherhood has been found predominant among the interventions slums. Programme need to emphasise on expanding modern family planning methods for reducing adolescent motherhood and increasing birth spacing. Regarding the effective use of family planning methods, the detrimental effect of adolescent motherhood for both mother and children needs to be conveyed to the women of the programme area.
2. The rate of abortion has been found higher in the intervention area. One of the causes of maternal death is abortion and more than half of the women faced complications after abortion in the programme area. Prevention of unplanned pregnancy and appropriate treatment against pregnancy complications could reduce abortion. Thus, along with family planning, preconception health counseling, women's knowledge on pregnancy and abortion related complication need to be improved.
3. So far, we found that in the programme area ANC visit was in progress toward MDG 5. However, the poorest women are still far behind from the target. Therefore, the programme needs to give emphasis to reach the most disadvantaged people who really do not have money to receive ANC services from the facility.
4. Still, mother's knowledge of birth planning was not good. Birth planning could avoid unexpected situations during pregnancy and delivery. Thus, mothers' knowledge on birth preparedness needs to be improved.
5. Proportion of institutional delivery was higher in the programme area. However, among the mothers who delivered at home tend to receive services from untrained providers which is a barrier to achieve the target of MDG 5B. Provision of services of MMW and UBA needs to be increased. In this regard, mothers need to go to the 'BRAC delivery Centre'. At the same time, health providers can facilitate their services at the home of the service recipients.
6. As we found in the case of home delivery very few mothers received PNC, coverage of PNC visits by the SK needs to be increased. Although, the BRAC SK cannot

provide treatment as a physician does, at least they can identify complications of both mother and newborn and send them to referral places.

7. Although for pregnancy complication most of the mother received treatment from a qualified doctor, which was lower for antenatal and postnatal complications compared to delivery complications. Thus, maternal knowledge on antenatal and postnatal complications and treatment seeking behaviour needs to be improved.

### **Neonatal health**

1. Mother's knowledge on ENC and thermal care of LBW needs to be improved.
2. Programme needs to emphasise on recording birth weight especially for home delivery.
3. Despite good knowledge on feeding practice, malpractice existed. During pregnancy, mothers need to be counseled on colostrum feeding, exclusive breastfeeding and continuing breastfeeding up to two years of life.
4. Mother's knowledge on identification of birth asphyxia and neonatal sepsis and management of both complications need to be improved. In this regard, coverage of UBA and PNC visit of BRAC SK needs to be increased.

### **Under-five child health**

1. The HPNSDP target is 50% ARI cases of under-five children would treated with antibiotic. Although 50% of the children with all types of ARI received treatment by qualified doctors, another 50% went to untrained providers. Therefore, mother's knowledge and practice of recognising and managing ARI have to be improved.
2. Use of ORS for diarrhoea was satisfactory. However, use of zinc tablet at the onset of diarrhoea was not as good as ORS. The significance of zinc for reduction of the episode of diarrhoea and for improving the nutritional status need to inform the mothers by the BRAC SK.
3. Immunisation coverage in the programme area was worse than the national coverage. Programme's effort is needed here for encouraging mothers for full vaccination. The programme can also work during national immunisation day for increasing coverage of vitamin A capsule and deworming tablet.

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## Annexure

### Annexure 1. Number of the subjects in two groups identified in each district

Group		Intervention (n)	Comparison (n)
1	Women with a under-one live child	566	519
	Women with a death child	6	12
	Women with abortion	13	48
	Women with MR	16	10
	Women with Still birth	4	4
	Women with IUD	2	6
2	Women with a child aged 12-59 months	610	599
Total number		1217	1198

### Annexure 2. Available facility and the services provided around the slums

Study Variable	Intervention	Comparison	P-value
Number of facility found during survey period	35	31	
Types of the facility, % (n)*			
Government hospital	11.4 (4)	6.5 (2)	0.124
Private clinic	71.4 (25)	90.3 (28)	
NGO clinic	17.1 (6)	3.2 (1)	
Services provided, % (n)*			
Government hospital	4	2	
Out patient	100.0 (4)	100.0 (2)	---
In patient	100.0 (4)	100.0 (2)	---
Antenatal care	100.0 (4)	100.0 (2)	---
Delivery care	100.0 (4)	100.0 (2)	---
Postnatal care	100.0 (4)	100.0 (2)	---
Immunisation	75.0 (3)	50.0 (1)	0.233
Birth comparison	100.0 (4)	100.0 (2)	---
Private hospital	25	28	
Out patient	100.0 (25)	100.0 (28)	---
In patient	100.0 (25)	78.6 (22)	0.014
Antenatal care	100.0 (25)	82.1 (23)	0.026
Delivery care	100.0 (25)	75.0 (21)	0.007
Postnatal care	100.0 (25)	75.0 (21)	0.007
Immunisation	0.0 (0)	7.1 (2)	0.588
Birth comparison	100.0 (25)	60.7 (17)	0.000
NGO clinic	6	1	
Out patient	83.3 (5)	100.0 (1)	0.659
In patient	50.0 (3)	100.0 (1)	0.350
Antenatal care	100.0 (6)	100.0 (1)	---
Delivery care	100.0 (6)	100.0 (1)	---
Postnatal care	100.0 (6)	100.0 (1)	---
Immunisation	83.3 (5)	100.0 (1)	0.659
Birth comparison	83.3 (5)	100.0 (1)	0.659

\*Chi-square test

### Annexure 3. Identification of pregnancy

Study Variable	Intervention n= 607	Comparison n = 599	P-value
Month of pregnancy identification, Mean±SD**	2.35±0.74	2.37±0.76	0.592
Pregnancy identify by, % (n)*			
Respondent herself	65.6 (398)	63.8 (382)	0.009
Husband of the respondent	1.3 (8)	1.0 (6)	
BRAC SK	0.2 (1)	0.4 (2)	
MBBS doctor	16.0 (97)	12.0 (72)	
Nurse	4.9 (30)	4.8 (29)	
Family member	6.1 (37)	9.2 (55)	
Paramedics	3.1 (19)	3.2 (19)	
Village doctor	1.8 (11)	4.8 (29)	
Others <sup>1</sup>	1.0 (6)	0.9 (5)	

\*Chi-square test

\*\*Student t test

<sup>1</sup>FWV, TTBA, Traditional healer, NGO worker, Homeopath doctor

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### Annexure 4. Knowledge of the respondents on Antenatal Care (ANC)

Study Variable	Intervention	Comparison	P-value
N	611	599	
Knows about ANC, % (n)*	99.2 (602)	99.2 (594)	0.983
Knowledge on importance of receiving ANC, % (n) ‡			
For early recognition of complication	22.6 (136)	26.6 (158)	
For safe delivery	37.2 (224)	54.5 (324)	
To know position of the baby	15.1 (91)	17.7 (105)	
To know whether the child is okay	35.2 (212)	29.1 (173)	
To know mother and baby's wellness	4.0 (24)	4.2 (25)	
To know the sex	0.7 (4)	0.3(2)	

\*Chi-square test

‡ Multiple responses possible

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### Annexure 5. Knowledge of the respondents on birth preparedness

Study Variable	Intervention	Comparison	P-value
N	607	599	
Had knowledge on birth preparedness, % (n)*	98.8 (600)	100.0 (599)	0.000
Range of birth preparedness knowledge, % (n)*			
No knowledge (0 plan)	1.2 (7)	0.0 (0)	0.010
Moderate knowledge ( 1-2 plans)	12.4 (75)	15.5 (93)	
Good knowledge (≥3 plans)	86.5 (525)	84.5 (506)	
Knowledge on individual birth plans, % (n)*			
Place	82.8 (497)	78.5 (470)	0.056
Birth attendant	67.3 (404)	48.7 (292)	0.000
Save money	59.7 (358)	46.7 (280)	0.000

\*Chi-square test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### Annexure 6. Complications of the respondent during antenatal period

Study Variable	Intervention n= 607	Comparison n = 599	P-value
N	607	599	
Had complication, % (n)*	65.7 (399)	67.8 (406)	0.451
N	607	599	
Faced individual complications, % (n)*			
High blood pressure	5.9 (36)	4.2 (25)	0.164
Edema	23.7 (144)	22.4 (134)	0.577
Convulsion	1.3 (8)	0.5 (3)	0.136
Excessive bleeding	2.8 (17)	5.3 (32)	0.025
Mal-position	4.6 (28)	5.3 (32)	0.560
High fever	13.0 (79)	12.9 (77)	0.934
Severe headache	21.9 (133)	22.4 (134)	0.848
Blurred vision	13.7 (83)	20.0 (120)	0.003
Reduced or absent of fetal movement	6.4 (39)	5.7 (34)	0.584
Lower abdominal pain	31.8 (193)	32.4 (194)	0.826
Anaemia	8.2 (50)	9.2 (55)	0.561
Jaundice	4.3 (26)	3.0 (18)	0.236
Excessive vomiting	24.5 (149)	29.2 (175)	0.067
Tetanus	0.7 (4)	0.8 (5)	0.723
IUD	0.3 (2)	1.2 (7)	0.090

\*Chi-square test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

## Annexure 7. Management of complications during ANC period

Study Variable	Intervention	Comparison	P-value
N	399	406	
Action taken for complications, % (n)*			0.000
No treatment	15.3 (61)	20.4 (83)	
Self-treatment	3.8 (15)	0.2 (1)	
Treatment from HCP	81.0 (323)	79.3 (322)	
N	61	83	
Reason for not taking any treatment, % (n) ‡			
Thought treatment was not necessary	77.0 (47)	55.4 (46)	
Lack of money	16.4 (10)	39.8 (33)	
Husband's disapproval	4.9 (3)	14.5 (12)	
Others <sup>a</sup>	3.2 (2)	3.6 (3)	
N	323	322	
Place of treatment, % (n) ‡			
Govt. hospital	18.0 (58)	21.1 (68)	
BRAC Delivery Centre	1.2 (4)	0.0 (0)	
At home	5.0 (16)	9.6 (31)	
MCWC	0.3 (1)	17.4 (56)	
Private hospital	32.2 (104)	25.8 (83)	
Private chamber of MBBS doctor	25.1 (81)	9.3(30)	
Drugs' shop	4.3 (14)	12.7 (41)	
Other NGO clinic	14.9 (48)	5.0 (16)	
Others <sup>b</sup>	2.7 (10)	6.8 (22)	
N	323	322	
Provider of treatment, % (n) ‡			
MBBS doctor	83.6 (270)	72.7 (234)	
Nurse	4.6 (15)	4.0 (13)	
Drug seller	3.4 (11)	7.8 (25)	
Homeopath doctor	1.2 (4)	6.2 (20)	
BRAC SK	4.0 (13)	0.0 (0)	
Village doctor	4.0 (13)	12.1 (29)	
Other <sup>c</sup>	3.1 (10)	1.8 (6)	
N	323	322	
Types of treatment received, % (n) ‡			
Counseling	90.7 (293)	59.3 (191)	
Allopathic medicine	83.0 (268)	81.7 (263)	
Injection	5.3 (17)	5.6 (18)	
Saline	6.8 (22)	4.0 (13)	
Referred to other place	2.8 (9)	1.6 (5)	
Ultrasono	5.6 (18)	13.7 (44)	
Blood test	2.5 (8)	2.8 (9)	
Urine test	2.5 (8)	1.2 (4)	
Other treatment <sup>d</sup>	2.4 (8)	7.4 (24)	
N	399	406	
Decision maker for the taking/ not taking treatment for complications during antenatal period, % (n) ‡			
Respondent	9.0 (36)	8.9 (36)	
Husband of the respondent	6.0 (24)	3.0 (12)	
Jointly with husband	57.4 (229)	57.1 (232)	
Jointly with in laws	12.0 (48)	16.0 (65)	
Only in laws	1.0 (4)	3.7 (15)	
Parents	14.5 (58)	11.6 (47)	

\*Chi-square test;

<sup>a</sup> Could not manage time & far from location

<sup>b</sup> Satellite clinic, FWC and Homeopath doctors chamber

<sup>c</sup> traditional healer, FWV, Paramedic, BRAC SS

<sup>d</sup> Exorcise evil spirit, chanted water, amulet, homeopath medicine

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### Annexure 8. Complications of the respondent during delivery

Study Variable	Intervention n= 576	Comparison n = 535	P-value
N	576	535	
Had complication during delivery, % (n)*	46.9 (270)	52.1 (279)	0.079
Faced individual complications, % (n) *			
Excessive bleeding	5.6 (32)	7.7 (41)	0.156
High fever	2.6 (15)	4.3 (23)	0.120
High blood pressure	5.6 (32)	4.5 (24)	0.416
Blurred vision	9.9 (57)	15.3 (82)	0.006
Severe headache	8.5 (49)	9.9 (53)	0.420
Abnormal position	14.2 (82)	6.9 (37)	0.000
Prolonged labour	16.7 (96)	24.9 (133)	0.001
Retained placenta	1.9 (11)	1.1 (6)	0.285
Ruptured uterus	-	-	-
Cord prolapsed	-	-	-
Hand/leg prolapsed	0.9 (5)	0.7 (4)	0.823
Cord around neck	0.2 (1)	0.2 (1)	0.958
Convulsion	1.9 (11)	1.1 (6)	0.285
Fainted	1.7 (10)	2.1 (11)	0.696
Perineal tear	2.4 (14)	2.1 (11)	0.674
Still birth	1.2 (7)	0.4 (2)	0.118
Obstructed labour	16.8 (97)	12.0 (64)	0.021

\*Chi-square test

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### Annexure 9. Management of complication during delivery

Study variable	Intervention	Comparison	P-value	
N, (Number of mothers who had complication )	270	279		
Action taken for complications, % (n)*				
No treatment	3.3 (9)	10.4 (29)	0.000	
Self-treatment	1.9 (5)	0.0 (0)		
Treatment from HCP	94.8 (256)	89.6 (250)		
N (Number of mothers who did not sought treatment)	9	29		
Reason for not taking any treatment, % (n)*				
Thought treatment was not necessary	66.7 (6)	41.4 (12)	0.610	
Lack of money	22.2 (2)	41.4 (12)		
Husband/mother in law's disapproval	11.1 (1)	6.9 (2)		
None to accompany	0.0 (0)	6.9 (2)		
Lack of money	20.0 (2)	41.4 (12)		
Long distance of HCF	0.0 (0)	3.4 (1)		
N, (Number of mothers who received treatment)	256	250		
Place of treatment, % (n)*				
Govt. hospital	14.7 (37)	16.4 (41)	0.000	
BRAC <i>delivery centre</i>	2.7 (7)	0.0 (0)		
At home	21.1 (54)	34.0 (85)		
MCWC	0.8 (2)	13.6 (34)		
Private hospital	52.7 (135)	34.4 (86)		
Others <sup>a</sup>	8.3 (21)	1.6 (4)		
Provider of treatment, % (n) ¥				
Village doctor	9.0 (23)	25.2 (63)		
MBBS doctor	68.8 (176)	54.0 (135)		
Nurse	42.6 (109)	45.2 (113)		
UBA	2.0 (5)	0.0 (0)		
BRAC SK	3.1 (8)	0.0 (0)		
Drug seller	1.2 (3)	2.4 (6)		
Others <sup>b</sup>	8.2 (21)	3.6 (9)		
Types of treatment received, % (n) ¥				
Counseling	81.3 (208)	31.2 (78)		
Allopathic medicine	75.0 (192)	58.4 (146)		
C-section	41.0 (105)	37.6 (94)		
Injection	78.1 (200)	88.4 (221)		
Saline	64.8 (166)	78.8 (197)		
Referred	0.8 (2)	1.6 (4)		
Episeotomy	13.7 (35)	8.8 (22)		
Others <sup>c</sup>	5.1 (13)	6.0 (15)		
N, (Number of mothers who had complication )	270	279		
Decision maker for the taking/ not taking treatment for complications during antenatal period, % (n)*				
Respondent	1.1 (3)	2.9 (8)	0.014	
Husband of the respondent	7.4(20)	3.6 (10)		
Jointly with husband	44.4 (120)	39.0 (109)		
Jointly with in laws	16.7 (45)	19.7 (55)		
Only in laws	1.1 (3)	3.9 (11)		
Paternal/ natal relatives	27.8 (75)	28.3 (79)		
Others <sup>d</sup>	1.5 (5)	2.6 (7)		

\*Chi-square test; † Multiple responses possible; <sup>a</sup> Private chamber, pharmacy, other NGO clinic; <sup>b</sup> TBA, TTBA, homeo doctor, traditional healer, spiritual healer, FWV; <sup>c</sup> Blood received, Chanted oil/ water, Exorcise evil spirit, amulet, homeopathic medicine, removed placenta by hand (n=1), stitch; <sup>d</sup> BRAC SK (n=3, Intervention), TTBA, TBA;

Intervention- Narayanganj City Corporation  
Comparison- Narsingdhi Sadar Municipality

#### Annexure 10. Complications of the respondent during postnatal period

Study Variable	Intervention	Comparison	P-value
N	572	531	
Had complication during delivery, % (n)*	25.0 (143)	41.2 (219)	0.000
Types of complications, % (n)*			
Severe headache	5.4 (31)	14.5 (77)	0.000
Blurred vision	7.0 (40)	16.0 (85)	0.000
High blood pressure	1.9 (11)	2.6 (14)	0.426
Excessive bleeding	5.1 (29)	10.7 (57)	0.000
Foul smelling discharge	0.5 (3)	1.1 (5)	0.264
High fever	5.4 (31)	10.0 (53)	0.004
Convulsion	1.9 (11)	2.4 (13)	0.550
Lower abdominal pain	14.2 (81)	26.6 (141)	0.000
Jaundice	0.7 (4)	0.4 (2)	0.467
Tetanus	0.2 (1)	0.2 (1)	0.958
Edema	1.7 (10)	4.0 (21)	0.027

\*Chi-square test

Intervention- Narayanganj City Corporation  
Comparison- Narsingdhi Sadar Municipality



**Annexure 11. Management of complications of the respondent during postnatal period**

Study Variable	Intervention	Comparison	P-value
N, (Number of mothers who had complications)	143	219	
Action taken for complications, % (n)			0.000
No treatment	8.4 (12)	14.6 (32)	
Self-treatment	15.4 (22)	0.9 (2)	
Treatment from HCP	76.2 (109)	84.5 (185)	
N, (Number of mothers who did not receive treatment)	12	32	
Reason for not taking any treatment, % (n)*			
Had no time	0.0 (0)	3.1 (11)	
Thought treatment was not necessary	50.0 (6)	37.5 (12)	
Lack of money	0.0 (0)	6.3 (2)	
Husband's disapproval	50.0 (6)	46.9 (15)	
Long distance of HCF	0.0 (0)	6.3 (2)	
N, (Number of mothers who receive treatment)	109	185	
Place of treatment, % (n) ‡			
Govt. hospital	18.3 (20)	13.5 (25)	
BRAC <i>delivery centre</i>	0.9 (1)	0.0 (0)	
At home	18.3 (20)	23.8 (44)	
MCWC	0.0 (0)	8.1 (15)	
Private hospital	36.7 (40)	17.8 (33)	
Private chamber	13.8 (15)	9.2 (17)	
Drugs' shop	14.7 (16)	29.2 (54)	
Other NGO clinic	6.4 (7)	0.5 (1)	
Provider of treatment, % (n) ‡			
Village doctor	17.4 (19)	30.3 (56)	
BRAC SK	2.8 (3)	0.5 (1)	
MBBS doctor	72.5 (79)	43.8 (81)	
Nurse	13.8 (15)	11.9 (22)	
Drug seller	9.2 (10)	17.8 (33)	
Other <sup>1</sup>	1.8 (2)	2.2 (4)	
Types of treatment received, % (n) ‡			
Counseling	91.7 (100)	44.3 (82)	
Allopathic medicine	93.6 (102)	93.5 (173)	
Injection	15.6 (17)	12.4 (23)	
Saline	11.9 (13)	14.6 (27)	
Referred	3.7 (4)	0.5 (1)	
Others <sup>2</sup>	5.4 (6)	0.5 (1)	
N, (Number of mothers who had complications)	143	219	
Decision maker for the taking/ not taking treatment for complications during antenatal period, % (n) *			0.023
Respondent	3.5 (5)	8.2 (18)	
Husband of the respondent	8.4 (12)	3.2 (7)	
Jointly with husband	51.7 (74)	47.5 (104)	
Jointly with in laws	6.3 (9)	12.8 (28)	
Only in laws	0.7 (1)	2.3 (5)	
Paternal/ natal relatives	29.4 (42)	26.0 (57)	

\*Chi-square test;

‡Multiple responses possible;

<sup>1</sup>BRAC SS, TBA, TTBA, homeo doctor;

<sup>2</sup>Homeopath medicine, stitch, cutting off stitch, cleaning of stitch area  
HCP= Healthcare Provider; Intervention- Narayanganj City Corporation  
Comparison- Narsingdhi Sadar Municipality

## Annexure 12. Referrals for maternal complications

Study Variable	Intervention n= 607	Comparison n = 599	P-value
N	607	599	
Had maternal complications,% (n)*	63.9 (388)	69.4 (416)	0.042
N	388	416	
Respondents referred for maternal complication, % (n)*	8.8 (34)	4.3 (18)	0.011
N (respondents referred for complications)	34	18	
Referred by, n (%) ¥			
Village doctor	8.8 (3)	33.3 (6)	
BRAC health worker <sup>a</sup>	20.5 (7)	0.0 (0)	
TBA	2.9 (1)	0.0 (0)	
TTBA	5.9 (2)	0.0 (0)	
MBBS Doctor	47.1 (16)	44.4 (8)	
Nurse	11.8 (4)	27.8 (5)	
Homeopath doctor	0.0 (0)	5.6 (1)	
FWV	2.9 (1)	0.0 (0)	
N (respondents referred for complications)	34	18	
Place referred to, % (n) ¥			
Government hospital	50.0 (17)	27.8 (5)	
MCWC	0 (0)	16.7 (3)	
Private clinic	38.2 (13)	50.0 (9)	
Private doctor chamber	2.9 (1)	11.1 (2)	
Pharmacy	0.0 (0)	5.6 (1)	
Other NGO clinic	5.9 (2)	0.0 (0)	
Sought treatment at referral place, % (n)*	88.2 (30)	77.8 (14)	0.320
Not sought treatment at referral place, % (n)*	11.8 (4)	22.2 (4)	
N	30	14	
Services at referral place, % (n) ¥			
Counseling	76.7 (23)	35.7 (5)	
Allopathic medicine	83.3 (25)	64.3 (9)	
Blood transfusion	3.3 (1)	21.4 (3)	
Caesarean section	36.7 (11)	50.0 (7)	
Injection	73.3 (22)	71.4 (10)	
Saline	73.3 (22)	57.1 (8)	
Episiotomy	13.3 (4)	0.0 (0)	
Stitch	3.3 (1)	7.1 (1)	
N	4	4	
Reason for not going to referral place, % (n) ¥			
Could not manage time	0.0 (0)	20.0 (1)	
Thought treatment was not necessary	50.0 (2)	20.0 (1)	
Lack of money	0.0 (0)	60.0 (3)	
Far from locality	50.0 (2)	0.0 (0)	

\*Chi-square test

¥ Multiple response possible

<sup>a</sup> UBA, BRAC SS, BRAC SK

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### Annexure 13. Knowledge of the respondents on breastfeeding and complementary feeding

Study Variable	Intervention n= 1151	Comparison n = 1110	P-value
First feeding immediately after delivery, % (n) ¥			
Colostrums	68.2 (802)	66.7 (746)	
Honey	34.6 (400)	31.2 (438)	
Water	5.5 (65)	3.6 (40)	
Water with sugar or misree	13.0 (153)	15.7 (176)	
Mustered oil	2.2 (36)	4.3 (48)	
Breastfeeding initiation immediately after birth, %(n)*			
Within 1 hr	74.7 (879)	78.3 (875)	0.138
After 1 hr	21.6 (254)	18.4 (206)	
Don't know	3.7 (43)	3.2 (37)	
Duration of exclusive breastfeeding, % (n)*			
<6 months	7.1 (84)	11.4 (128)	0.000
6 months	91.8 (1080)	86.6 (968)	
>6 months	0.1 (1)	1.1 (12)	
Don't know	0.9 (11)	0.9 (10)	
Time for starting complementary feeding, % (n)*			
1-6 <sup>th</sup> month	33.2 (390)	17.9 (200)	0.000
7 <sup>th</sup> month	66.5 (782)	81.4 (910)	
>7 <sup>th</sup> month	0.1 (1)	0.4 (4)	
Don't know	0.3 (3)	0.4 (4)	
Type of food during starting of complementary feeding, % (n) ¥			
Suji/rice powder/ barli	75.6 (889)	76.7 (858)	
Egg	34.9 (410)	30.5 (251)	
Mashed banana	15.6 (184)	22.5 (251)	
Mashed <i>khichuri</i>	75.4 (887)	82.1 (921)	
Cow's milk	48.6 (571)	37.2 (416)	
Baby formula	18.5 (218)	15.3 (171)	
Fruit/ fruit juice	35.2 (414)	42.0 (470)	
Soft rice	3.3 (39)	2.3 (26)	
<i>Firni</i>	6.5 (77)	1.1 (16)	
Fish	3.1 (37)	8.1 (91)	
Others <sup>1</sup>	6.7 (79)	16.4 (184)	

\*Chi-square test

¥Multiple response possible

<sup>1</sup>Hen's liver, vegetables, rice, noodles, meat

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

#### Annexure 14. Feeding practice of the newborn and infants

Study Variable	Intervention	Comparison	P-value
N	1176	1118	
First food given immediately after delivery, % (n)			
Colostrums	48.3 (568)	51.2 (572)	0.000
Honey	19.0 (224)	20.9 (234)	
Water with sugar or misree	14.5 (171)	16.4 (183)	
Water	6.5 (77)	0.6 (7)	
Lactogen	4.8 (56)	2.0 (22)	
Others <sup>1</sup>	5.4 (64)	6.4 (72)	
Don't know	1.4 (16)	2.5 (28)	
Feed colostrums, % (n)	96.3 (1133)	97.6 (1091)	0.084
N	1170	1083	
Time for initiation of breast milk in hr, Median (Range) <sup>***</sup>	1.0 (0.02-192.0)	1.0 (0.02-192.0)	0.365
N	1099	1142	
Duration of exclusive breastfeeding in months, Median (Range) <sup>***</sup>	4.0 (0.3- 8.0)	5.0 (0.03-8.0)	0.000
N	1176	1118	
Duration of exclusive breastfeeding, % (n)			
<6 months	62.4 (734)	57.8 (646)	0.067
6 months	365 (31.0)	35.4 (396)	
Don't know/ still breast feed	6.5 (77)	6.8 (76)	
N	1152	1116	
Time of starting complementary feeding, % (n) <sup>*</sup>			
1-6 <sup>th</sup> month	53.4 (615)	32.5 (363)	0.000
7 <sup>th</sup> month	31.5 (363)	44.7 (499)	
Don't know	15.1 (174)	22.8 (254)	
N	1013	932	
Type of food during starting of complementary feeding, % (n) <sup>¥</sup>			
Suji/rice powder/ barli	69.2 (701)	65.7 (612)	
Egg	10.3 (104)	29.8 (278)	
Mashed banana	3.2 (32)	17.7 (165)	
Mashed <i>khichuri</i>	29.8 (30.2)	55.7 (519)	
Cow's milk	31.1 (315)	30.2 (281)	
Baby formula	34.6 (350)	29.9 (269)	
Fruit/ fruit juice	5.9 (60)	24.5 (228)	
Rice or soft rice	12.7 (128)	26.4 (246)	
Sugar	11.1 (112)	28.2 (263)	
Biscuits	4.5 (46)	16.8 (157)	
<i>Misri</i>	16.5 (167)	5.0 (47)	
Others <sup>2</sup>	103.7 (1050)	74.5 (694)	

\*Chi-square test

\*\*\*Mann Whitney U test

<sup>1</sup>Mustered oil, cow's milk, goat's milk, glucose water, chili, hot water, breast milk after extracting colostrums

<sup>2</sup> *Firmi*, water, cake, potato, *semai*, *sondesh*, fish, liver, bread, goat's milk, tinned milk, nutritious food, saline, *misri*, salt, cerelac, horlics

¥Multiple response possible

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

### Annexure 15. Breastfeeding status by age in intervention slums (24 hour recall)

Per cent distribution of children under two years by breastfeeding status and the percentage currently breastfeeding, according to age in month

Age in months	Per cent distribution of youngest children under two living with their mother by breastfeeding status						Total	Percentage currently breastfeeding	Number of youngest children under two years
	Not breastfeeding	Exclusively breastfed	Breast-feeding consuming plain water only	Breast-feeding and consuming non-milk liquids <sup>a</sup>	Breast-feeding and consuming other milk	Breast-feeding and consuming complementary food			
0-1	5.6 (1)	66.7 (12)	16.7 (3)	0.0 (0)	11.1 (2)	0.0 (0)	100.0	94.4 (17)	18
2-3	2.6 (2)	67.1 (51)	3.9 (3)	1.3 (1)	18.4 (14)	6.6 (5)	100.0	97.4 (74)	76
4-5	6.2 (6)	28.9 (28)	6.2 (6)	3.1 (3)	23.7 (23)	32.0 (31)	100.0	93.8 (91)	97
6-8	10.4 (17)	4.3 (7)	6.1 (10)	1.8 (3)	8.6 (14)	68.7 (112)	100.0	89.6 (146)	163
9-11	12.2 (22)	0.0 (0)	0.6 (1)	2.8 (5)	5.0 (9)	79.6 (144)	100.0	87.8 (159)	181
12-17	16.1 (19)	0.0 (0)	0.8 (1)	3.4 (4)	5.9 (7)	73.7 (87)	100.0	83.9 (99)	118
18-23	19.2 (24)	0.0 (0)	0.0 (0)	2.4 (3)	4.0 (5)	74.4 (93)	100.0	80.8 (101)	125
0-3	3.2 (3)	67.0 (63)	6.4 (6)	1.1 (1)	17.0 (16)	5.3 (5)	100.0	96.8 (91)	94
0-5	4.7 (9)	47.6 (91)	6.3 (12)	2.1 (4)	20.4 (39)	18.8 (36)	100.0	95.3 (182)	191
6-9	10.7 (25)	3.0 (7)	4.7 (11)	2.1 (5)	6.9 (16)	72.5 (169)	100.0	89.3 (208)	233
12-15	12.8 (10)	0.0 (0)	1.3 (1)	3.8 (3)	2.6 (2)	79.5 (62)	100.0	87.2 (68)	78
12-23	17.7 (43)	0.0 (0)	0.4 (1)	2.9 (7)	4.9 (12)	74.1 (180)	100.0	82.3 (200)	243
20-23	22.1 (19)	0.0 (0)	0.0 (0)	1.2 (1)	4.7 (4)	72.1 (62)	100.0	77.9 (67)	86

Breastfeeding status referred to a '24-hour' period (yesterday and last night). Children who are classified as breastfeeding and consuming plain water only consumed no liquid or solid supplements. The categories

Not breastfeeding

Exclusively breastfeeding: feeding only breast milk

Breastfeeding and consuming plain water: breastfeeding along with plain water

Breastfeeding and consuming non-milk liquids/juice: Breastfeeding with juice, juice drink, clear broth or other liquids and also water

Breastfeeding and consuming other milk: Breastfeeding and other milk

Breastfeeding and consuming complementary feeding: breastfeeding with other solid and semisolid food

<sup>a</sup> Non-milk liquid : Juice, juice drink, clear broth or other liquids

## Annexure 16. Breastfeeding status by age in comparison slums (24 hour recall)

Per cent distribution of children under two years by breastfeeding status and the percentage currently breastfeeding, according to age in month

Age in months	Per cent distribution of youngest children under two living with their mother by breastfeeding status						Total	Percent- age currently breast- feeding	Number of youngest children under two years
	Not breast- feeding	Exclu- sively breastfed	Breast- feeding consuming plain water only	Breast- feeding and consuming non-milk liquids	Breast- feeding and consuming other milk	Breast- feeding and consuming compleme ntary food			
0-1	0.0 (0)	80.0 (20)	8.0 (2)	0.0 (0)	12.0 (3)	0.0 (0)	100.0	100.0 (25)	25
2-3	1.7 (1)	65.0 (39)	5.0 (3)	3.3 (2)	21.7 (13)	3.3 (2)	100.0	98.3 (59)	60
4-5	6.1 (6)	30.6 (30)	10.2 (10)	5.1 (5)	25.5 (25)	22.4 (22)	100.0	93.6 (92)	98
6-8	6.7 (9)	3.0 (4)	7.4 (10)	0.7 (1)	11.9 (16)	70.4 (95)	100.0	93.3 (126)	135
9-11	9.4 (15)	0.0 (0)	1.9 (3)	3.8 (6)	3.8 (6)	81.3 (130)	100.0	90.6 (145)	160
12-17	11.5 (14)	0.8 (1)	3.3 (4)	1.6 (2)	3.3 (4)	79.5 (97)	100.0	88.5 (108)	122
18-23	14.0 (14)	0.0 (0)	2.0 (2)	1.0 (1)	2.0 (1)	81.0 (81)	100.0	86.0 (86)	100
0-3	1.2 (1)	69.4 (59)	5.9 (5)	2.4 (2)	18.8 (16)	2.4 (2)	100.0	98.8 (84)	85
0-5	3.8 (7)	48.6 (89)	8.2 (15)	3.8 (7)	22.4 (41)	13.1 (24)	100.0	96.2 (176)	183
6-9	7.1 (13)	2.2 (4)	6.0 (11)	1.1 (2)	9.8 (18)	73.8 (135)	100.0	92.9 (170)	183
12-15	12.5 (11)	1.1 (1)	4.5 (4)	2.3 (2)	4.5 (4)	75.0 (66)	100.0	87.5 (77)	88
12-23	12.6 (28)	0.5 (1)	2.7 (6)	1.4 (3)	2.7 (6)	80.2 (178)	100.0	87.4 (194)	222
20-23	16.4 (12)	0.0 (0)	1.4 (1)	0.0 (0)	2.7 (2)	79.5 (58)	100.0	83.6 (61)	73

Breastfeeding status referred to a '24-hour' period (yesterday and last night). Children who are classified as breastfeeding and consuming plain water only consumed no liquid or solid supplements. The categories

Not breastfeeding

Exclusively breastfeeding: feeding only breast milk

Breastfeeding and consuming plain water: breastfeeding along with plain water

Breastfeeding and consuming non-milk liquids/juice: Breastfeeding with juice, juice drink, clear broth or other liquids and also water

Breastfeeding and consuming other milk: Breastfeeding and other milk

Breastfeeding and consuming complementary feeding: breastfeeding with other solid and semisolid food

\*Non-milk liquid : Juice, juice drink, clear broth or other liquids

**Annexure 17. Percentage of children age 12-23 months who received specific vaccines at any time before the survey, by source of information (vaccination card or mothers' report)**

Study Variable	Intervention	Comparison	P-value
N, (Vaccination card available)	369	293	
Children with complete vaccination , % (n) <sup>*a</sup>			
BCG	100.0 (369)	100.0 (293)	---
Polio 3	94.0 (347)	99.0 (290)	0.001
DPT 3 <sup>b</sup>	93.5 (345)	98.5 (289)	0.001
Hepatitis B	92.7 (342)	98.6 (289)	0.000
Penta 3	92.7 (342)	71.3 (209)	0.000
Measles	85.6 (316)	93.2 (273)	0.001
Complete vaccination	84.8 (316)	93.5 (274)	0.001
N, (Card was not available)	228	301	
Children with complete vaccination , % (n) <sup>*a</sup>			
BCG	100.0 (228)	99.7 (300)	0.384
Polio 3	80.7 (184)	61.8 (180)	0.000
DPT 3 <sup>b</sup>	74.6 (170)	62.1 (187)	0.002
Hepatitis B	73.7 (168)	59.9 (179)	0.001
Measles	86.4 (197)	88.0 (265)	0.575
Complete vaccination	64.0 (146)	53.2 (160)	0.012

\*Chi-square test

- a. BCG, measles, 3 doses of DPT or pentavalent and polio vaccine (excluding polio vaccine given at birth)
- b. Information on three doses of DTP, Penta 3 also included
- c. Last immunisation day was mentioned as June 9, 2012 while asking for vitamin A capsule intake

¥ Multiple responses possible

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

**Annexure 18. Hand washing practice of the respondent during last 24 hrs of interview**

Study Variable	Intervention n=1176	Comparison n=1118
N	1176	1118
Washed hand during last 24 hrs, % (n)	100.0 (1176)	100.0 (1118)
Substance used for hand washing, % (n) ‡		
Mud	4.8 (57)	4.3 (48)
Ash	2.7 (32)	2.2 (25)
Soap	87.0 (1023)	90.6 (1013)
Only water	27.1 (319)	91.8 (1026)
Events of hand washing, % (n) ‡		
Washing hand after coming from latrine	96.9 (1140)	94.9 (1061)
Washing hand after cleaning child's feces	59.4 (699)	41.0 (458)
Washing hands before preparing food for the child	38.8 (456)	38.8 (434)
Washing hands before feeding child	46.3 (544)	49.1 (549)
Washing hands after feeding child	36.4 (428)	45.4 (508)
Method followed for washing before preparing food for the child, % (n) ‡		
Washed hands only by water	57.8 (680)	77.0 (861)
Washed hands by water and soap	34.3 (403)	34.3 (383)
Washed utensils by water	19.0 (224)	41.9 (469)
Washed utensils by dish washer and water	50.8 (597)	42.2 (472)
Cleaned the feeding place	17.1 (201)	11.4 (127)
Did nothing	2.0 (23)	3.5 (39)
Method followed for washing before feeding the child, % (n) ‡		
Washed hands only by water	55.2 (649)	78.3 (875)
Washed hands by water and soap	37.3 (439)	23.8 (266)
Washed utensils by water	18.5 (218)	45.7 (511)
Washed utensils by dish washer and water	49.7 (585)	26.7 (299)
Cleaned the feeding place	21.1 (248)	12.5 (140)
Washed baby's hand by soap and water	7.0 (82)	5.1 (57)
Covered the food	23.3 (274)	20.8 (233)
Did nothing	1.4 (17)	4.5 (50)
Method followed for washing after feeding the child, % (n) ‡		
Washed hands only by water	62.3 (733)	70.2 (785)
Washed hands by water and soap	17.5 (206)	16.6 (186)
Washed utensils by water	17.9 (210)	36.5 (408)
Washed utensils by dish washer and water	40.6 (478)	21.0 (235)
Cleaned the feeding place	24.2 (285)	11.6 (130)
Washed baby's hands and face	62.9 (740)	68.3 (764)
Washed baby's hands with soap	3.1 (36)	3.8 (42)
Did nothing	4.0 (47)	6.4 (71)

‡Multiple responses possible

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality



### Annexure 19. Perception of the respondents on local health facility

Study variable	Intervention n= 1216	Comparison n = 1200	P-value
N	1216	1200	
Knows about Healthcare centre for women health and delivery placed at locality , % (n)*	66.6 (810)	19.4 (233)	0.000
Types of the healthcare centre, % (n) ‡			
BRAC delivery Centre	28.6 (232)	0.0 (0)	
Private clinic	30.5 (247)	90.1 (210)	
NGO health centre	51.6 (418)	8.6 (20)	
Private chamber	39.1 (317)	2.1 (5)	
FWC	3.6 (29)	0.0 (0)	
Government hospital	4.2 (34)	0.4 (1)	
Reasons for satisfaction on health centre, % (n) ‡			
Good behave	88.1 (1072)	79.6 (954)	
Availability of medicine	71.0 (364)	50.5 (605)	
Do not have to wait for long	36.8 (448)	30.0 (359)	
Healing	53.3 (649)	55.8 (668)	
Answer the question of the patient	9.5 (116)	10.9 (131)	
Cost within limit	32.7 (398)	27.1 (325)	
Neat and clean	17.6 (214)	13.0 (156)	
Friendly attitude	4.8 (58)	6.3 (76)	
Reasons for dissatisfaction on health centre, % (n) ‡			
Misbehave	85.9 (1045)	80.9 (969)	
Unavailability of medicine	71.4 (869)	50.5 (605)	
Have to wait for long	46.6 (567)	44.4 (532)	
Higher cost	26.9 (327)	27.2 (326)	
Do not answer the question of the patient	7.4 (90)	10.1 (124)	
Dirty	14.8 (180)	9.0 (108)	
unfriendly attitude	5.0 (61)	4.2 (50)	
Not healing properly	20.2 (246)	29.6 (355)	
Service demand of the respondents from a BRAC delivery centre, % (n) ‡			
Free treatment/delivery	24.4 (198)	39.9 (93)	
Free medicine	11.1 (90)	1.7 (4)	
Delivery centre in the locality	58.4 (473)	60.1 (140)	
Treatment by an qualified doctor	5.8 (47)	3.0 (7)	
Treatment of all kind of disease	14.8 (120)	0.0 (0)	
Facility for caesarean section	2.6 (21)	0.0 (0)	

\*Chi-square test

‡Multiple responses possible

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

**Annexure 20. Identification of factors predictive of receiving four or more ANC from trained providers<sup>1</sup> by the respondents**

Factors % (n)*	Intervention N=607			Comparison N=599		
	<4 or no ANCs	≥4 ANCs	P-value	<4 or no ANCs	≥4 ANCs	P-value
Educational status.						
Primary incomplete	68.8 (150)	31.2 (68)	0.000	87.3 (259)	12.7 (96)	0.000
Primary or higher	43.2 (168)	56.8 (221)		72.9 (214)	27.1 (31)	
Can read and write						
Yes	42.6 (166)	57.4 (224)	0.00	73.3 (280)	27.0 (103)	0.00
No	70.0 (152)	30.0 (65)		88.9 (193)	11.1 (24)	
Husband can read and write						
Yes	46.2 (183)	53.8 (213)	0.000	72.2 (278)	26.7 (107)	0.000
No	63.6 (131)	36.4 (75)		88.9 (188)	11.1 (19)	
Read news paper						
Yes	17.1 (7)	82.9 (34)	0.000	50.0 (25)	50.0 (25)	0.000
No	54.9 (311)	45.1 (255)		81.6 (448)	18.4 (101)	
Listen to radio						
Yes	27.3 (3)	72.7 (8)	0.092	40.0 (2)	60.0 (3)	0.032
No	52.9 (315)	47.1 (281)		79.3 (471)	20.7 (123)	
Watch TV						
Yes	50.7 (277)	49.9 (269)	0.015	77.8 (406)	22.2 (116)	0.063
No	67.2 (41)	32.8 (20)		87.0 (67)	13.0 (10)	
Wealth index						
Poorest	72.8 (83)	27.2 (31)	0.000	95.9 (117)	4.1 (5)	0.000
Second	64.5 (71)	35.5 (39)		80.3 (102)	19.7 (25)	
Middle	52.4 (65)	47.6 (59)		85.3 (93)	14.7 (16)	
Fourth	43.2 (54)	56.8 (71)		73.2 (90)	26.8 (33)	
Richest	33.6 (45)	66.4 (89)		60.2 (71)	39.8 (47)	
Age of first marriage						
≤17 yrs	55.1 (205)	44.9 (167)	0.092	83.2 (351)	16.8 (71)	0.000
>17 yrs	48.1 (113)	51.9 (122)		68.9 (122)	31.1 (55)	
Age of first conception						
≤19 yrs	57.0 (253)	43.0 (191)	0.000	81.5 (391)	18.5 (89)	0.003
>19 yrs	39.9 (65)	60.1 (98)		68.9 (82)	31.1 (37)	
Death of the child						
None	51.6 (294)	48.4 (276)	0.117	78.2 (412)	21.8 (115)	0.117
One or more	64.9 (24)	35.1 (13)		84.7 (61)	15.3 (11)	

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

\*Chi-square test

<sup>1</sup> Includes qualified doctor, FWV, nurse, MMW, TTBA/MMW/UBA

**Annexure 21. Identification of factors predictive safe delivery (delivery by trained birth attendants)**

Factors % (n)*	Delivery by trained birth attendants					
	Intervention N=576			Comparison N=535		
	No	Yes	P-value	No	Yes	P-value
<b>Educational status</b>						
Primary incomplete	40.8 (84)	59.2 (122)	0.000	56.7 (119)	43.3 (91)	0.000
Primary or higher	18.9 (70)	81.1 (300)		34.8 (113)	65.2 (212)	
<b>Can read and write</b>						
Yes	18.9 (70)	81.1 (301)	0.000	35.3 (123)	64.7 (225)	0.000
No	41.0 (84)	59.0 (121)		58.3 (109)	41.7 (78)	
<b>Husband can read and write</b>						
Yes	22.5 (84)	77.5 (290)	0.003	34.6 (119)	65.4 (225)	0.000
No	34.0 (67)	66.0 (130)		58.4 (108)	41.6 (77)	
<b>Read news paper</b>						
Yes	9.8 (4)	90.2 (37)	0.011	22.7 (10)	77.3 (34)	0.004
No	28.0 (150)	72.0 (385)		45.2 (222)	54.8 (269)	
<b>Listen to radio</b>						
Yes	27.3 (3)	72.7 (8)	0.968	20.0 (1)	80.0 (4)	0.290
No	26.7 (151)	73.3 (414)		43.6 (231)	56.4 (299)	
<b>Watch TV</b>						
Yes	23.4 (121)	76.6 (396)	0.000	41.8 (196)	58.2 (273)	0.050
No	55.9 (33)	44.1 (26)		54.5 (36)	45.5 (30)	
<b>Wealth index</b>						
Poorest	46.2 (49)	53.8 (57)	0.000	61.5 (54)	38.5 (40)	0.000
Second	34.6 (37)	65.4 (70)		52.2 (59)	47.8 (54)	
Middle	24.6 (29)	75.4 (89)		53.1 (52)	46.9 (46)	
Fourth	21.4 (25)	78.6 (92)		29.1 (32)	70.9 (78)	
Richest	10.9 (14)	89.1 (114)		22.7 (25)	77.3 (85)	
<b>Age of first marriage</b>						
≤17 yrs	30.2 (106)	69.8 (245)	0.019	49.1 (183)	50.9 (190)	0.000
>17 yrs	21.3 (48)	78.7 (177)		30.2 (49)	70.2 (73)	
<b>Age of first conception</b>						
≤19 yrs	29.6 (123)	70.4 (293)	0.013	46.6 (201)	53.4 (230)	0.002
>19 yrs	19.4 (31)	80.6 (129)		29.8 (31)	70.2 (73)	
<b>Death of the child</b>						
None	25.7 (139)	74.3 (401)	0.037	43.0 (203)	57.0 (269)	0.649
One or more	41.7 (15)	58.3 (21)		46.0 (29)	54.0 (34)	
<b>Sought 4+ ANC's from trained providers<sup>1</sup></b>						
<4 ANC's	44.4 (128)	55.6 (160)	0.000	50.0 (205)	50.0 (205)	0.000
≥4 ANC's	9.0 (26)	91.0 (262)		21.6 (27)	78.4 (98)	

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

\*Chi-square test

<sup>1</sup> Includes qualified doctor, FWV, nurse, MMW, TTBA/MMW/UBA

**Annexure 22. Identification of factors predictive of receiving PNC from medically trained providers within 48 hours**

Factors % (n)*	PNC by trained birth attendants					
	Intervention N=572			Comparison N=531		
	No	Yes	P-value	No	Yes	P-value
Educational status						
Primary incomplete	73.9 (150)	26.1 (53)	0.000	73.4 (152)	26.6 (55)	0.000
Primary or higher	45.5 (168)	54.5 (201)		52.2 (169)	47.8 (155)	
Can read and write						
Yes	46.2 (171)	53.8 (254)	0.000	53.8 (186)	46.2 (160)	0.000
No	72.8 (147)	27.2 (55)		73.0 (135)	27.0 (50)	
Husband can read and write						
Yes	46.9 (175)	53.1 (198)	0.000	53.6 (184)	46.4 (159)	0.000
No	72.2 (140)	27.8 (54)		72.5 (132)	27.5 (50)	
Read news paper						
Yes	22.0 (9)	72.0 (32)	0.000	31.8 (14)	68.2 (30)	0.000
No	58.2 (309)	41.8 (222)		63.0 (307)	37.0 (180)	
Listen to radio						
Yes	30.0 (3)	70.0 (7)	0.100	40.0 (2)	60.0 (3)	0.347
No	56.0 (315)	44.0 (247)		60.6 (319)	39.4 (207)	
Watch TV						
Yes	52.9 (272)	47.1 (242)	0.000	58.3 (271)	41.7 (194)	0.007
No	79.3 (46)	20.7 (12)		75.8 (50)	24.2 (16)	
Wealth index						
Poorest	77.9 (81)	22.1 (23)	0.000	83.5 (86)	16.5 (17)	0.000
Second	64.2 (68)	35.8 (38)		64.6 (73)	35.4 (40)	
Middle	55.6 (66)	44.1 (52)		60.4 (58)	39.6(38)	
Fourth	49.6 (58)	50.4 (59)		50.5 (55)	49.5 (54)	
Richest	35.4 (45)	64.6 (82)		44.5 (49)	55.5 (61)	
Age of first marriage						
≤17 yrs	59.7 (209)	40.3 (141)	0.013	65.9 (244)	34.1 (126)	0.000
>17 yrs	49.1 (109)	50.9 (113)		47.8 (77)	52.2 (84)	
Age of first conception						
≤19 yrs	60.0 (249)	40.0 (166)	0.001	63.4 (272)	36.6 (157)	0.004
>19 yrs	43.9 (69)	56.1 (88)		48.0 (49)	52.1 (53)	
Death of the child						
None	55.5 (298)	44.5 (239)	0.849	60.0 (281)	40.0 (187)	0.599
One or more	57.1 (20)	42.9 (15)		63.5 (40)	36.5 (23)	
Sought 4+ ANC's from trained providers <sup>1</sup>						
<4 ANC's	75.5 (216)	24.5 (70)	0.000	67.7 (275)	32.3 (131)	0.000
≥4 ANC's	35.7 (102)	64.3 (184)		36.8 (46)	63.2 (79)	

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

\*Chi-square test

<sup>1</sup> Includes qualified doctor, FWV, nurse, MMW, TTBA/MMW/UBA

**Annexure 23. Identification of factors predictive of treatment seeking for delivery complications**

Factors % (n)*	Seeking treatment for delivery complications					
	Intervention N=270			Comparison N=279		
	No	Yes	P-value	No	Yes	P-value
<b>Educational status</b>						
Primary incomplete	8.5 (7)	91.5 (75)	0.101	16.5 (17)	83.5 (86)	0.011
Primary or higher	3.7 (7)	96.3 (181)		6.8 (12)	93.2 (164)	
<b>Can read and write</b>						
Yes	3.2 (6)	96.8 (180)	0.031	7.8 (15)	92.2 (178)	0.032
No	9.5 (8)	90.5 (76)		16.3(14)	83.7 (72)	
<b>Husband can read and write</b>						
Yes	3.2 (6)	96.8 (180)	0.059	7.8 (14)	92.2 (166)	0.050
No	8.6 (7)	91.4 (74)		15.3 (15)	84.7 (83)	
<b>Read news paper</b>						
Yes	4.0 (1)	96.0 (24)	0.779	4.5 (1)	95.5 (21)	0.349
No	5.3 (13)	94.7 (232)		10.9 (28)	89.1 (229)	
<b>Listen to radio</b>						
Yes	0.0 (0)	100.0 (7)	0.531	50.0 (1)	50.0 (1)	0.065
No	5.3 (14)	94.7 (249)		10.1 (28)	89.9 (249)	
<b>Watch TV</b>						
Yes	5.0 (12)	95.0 (230)	0.622	9.5 (24)	90.5 (229)	0.121
No	7.1 (2)	92.9 (26)		19.2 (5)	80.8 (21)	
<b>Wealth index</b>						
Poorest	10.9 (5)	89.1 (41)	0.321	24.4 (11)	75.6 (34)	0.012
Second	4.7 (2)	95.3 (41)		8.8 (5)	91.2 (52)	
Middle	5.4 (3)	94.5 (53)		11.1 (6)	88.9 (48)	
Fourth	4.8 (3)	95.2 (60)		6.7 (4)	93.3 (56)	
Richest	1.6 (1)	98.4 (61)		4.8 (3)	95.2 (56)	
<b>Age of first marriage</b>						
≤17 yrs	7.3 (12)	92.7 (152)	0.049	13.5 (26)	86.5 (167)	0.012
>17 yrs	1.9 (2)	98.1 (104)		3.5 (3)	96.5 (83)	
<b>Age of first conception</b>						
≤19 yrs	6.4 (12)	93.6 (176)	0.179	11.9 (26)	88.1 (193)	0.122
>19 yrs	2.4 (2)	97.6 (80)		5.0 (3)	95.0 (57)	
<b>Death of the child</b>						
None	5.5 (14)	94.5 (240)	0.335	10.0 (25)	90.0 (224)	0.577
One or more	0.0 (0)	100.0 (16)		13.3 (4)	86.7 (26)	
<b>Sought 4+ ANC's from trained providers<sup>1</sup></b>						
<4 ANC's	9.3 (10)	90.7 (97)	0.012	13.2 (27)	86.8 (177)	0.010
≥4 ANC's	2.5 (4)	97.5 (159)		2.7 (2)	97.3 (73)	

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

\*Chi-square test

**Annexure 24. Association of different socioeconomic factors with the use of modern family planning methods**

Factors % (n)*	Using modern FP methods					
	Intervention N=880			Comparison N=796		
	No	Yes	P-value	No	Yes	P-value
<b>Educational status</b>						
Primary incomplete	5.9 (19)	94.1 (301)	0.174	8.9 (29)	91.1 (297)	0.367
Primary or higher	3.9 (22)	96.1 (523)		10.9 (51)	89.1 (419)	
<b>Can read and write</b>						
Yes	4.1 (23)	95.9 (534)	0.327	10.8 (53)	89.2 (438)	0.376
No	5.6 (18)	94.4 (305)		8.9 (27)	91.1 (278)	
<b>Husband can read and write</b>						
Yes	3.4 (19)	96.6 (539)	0.020	9.7 (47)	90.3 (436)	0.710
No	6.8 (22)	93.2 (300)		10.5 (33)	89.5 (280)	
<b>Read news paper</b>						
Yes	6.9 (4)	93.1 (54)	0.403	15.8 (9)	84.2 (48)	0.135
No	4.5 (37)	95.5 (785)		9.6 (71)	90.4 (668)	
<b>Listen to radio</b>						
Yes	11.1 (1)	88.9 (8)	0.356	16.7 (3)	83.3 (15)	0.345
No	4.6 (40)	95.4 (831)		9.9 (77)	90.1 (701)	
<b>Watch TV</b>						
Yes	4.5 (35)	95.5 (746)	0.482	9.4 (66)	90.6 (638)	0.080
No	6.1 (6)	93.9 (93)		15.2 (14)	84.8 (78)	
<b>Wealth index</b>						
Poorest	4.0 (7)	96.0 (167)	0.827	8.8 (14)	91.3 (146)	0.503
Second	5.2 (9)	94.8 (165)		11.4 (19)	88.6 (147)	
Middle	5.8 (10)	94.2 (161)		7.4 (12)	92.6 (151)	
Fourth	3.4 (6)	96.6 (172)		12.7 (22)	87.3 (151)	
Richest	4.9 (9)	95.1 (174)		9.7 (13)	90.3 (121)	
<b>Age of first marriage</b>						
≤17 yrs	5.2 (29)	94.8 (534)	0.356	9.7 (56)	90.3 (520)	0.618
>17 yrs	3.8 (41)	96.2 (305)		10.9 (24)	89.1 (196)	
<b>Age of first conception</b>						
≤19 yrs	4.8 (32)	95.2 (634)	0.717	9.3 (60)	90.7 (584)	0.157
>19 yrs	4.2 (9)	95.8 (205)		13.2 (20)	86.8 (132)	
<b>Death of the child</b>						
None	4.4 (36)	95.6 (782)	0.187	10.0 (71)	90.0 (637)	0.953
One or more	8.1 (5)	91.9 (57)		10.2 (9)	89.8 (79)	

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

\*Chi-square test

**Annexure 25. Association of different socioeconomic factors with the use of modern family planning methods by married adolescent girl**

Factors % (n)*	Using modern FP methods by married adolescent girls					
	Intervention N=102			Comparison N=98		
	No	Yes	P-value	No	Yes	P-value
<b>Educational status</b>						
Primary incomplete	2.7 (1)	97.3 (36)	0.438	12.2 (5)	87.8 (36)	0.216
Primary or higher	6.2 (4)	93.8 (61)		5.3 (3)	94.7 (54)	
<b>Can read and write</b>						
Yes	6.3 (4)	93.7 (59)	0.390	6.6 (4)	93.4 (57)	0.456
No	2.6 (1)	97.4 (38)		10.8 (4)	89.2 (33)	
<b>Husband can read and write</b>						
Yes	4.6 (3)	95.4 (62)	0.859	5.5 (3)	94.5 (52)	0.268
No	5.4 (2)	94.6 (35)		11.6 (5)	88.4 (38)	
<b>Read news paper</b>						
Yes	0.0 (0)	100.0 (9)	0.476	0.0 (0)	100.0 (4)	0.543
No	5.4 (5)	94.6 (88)		8.5 (8)	91.5 (86)	
<b>Listen to radio</b>						
Yes	0.0 (0)	100.0 (1)	0.820	33.3 (1)	66.7 (2)	0.106
No	5.0 (5)	95.0 (96)		7.4 (7)	92.6 (88)	
<b>Watch TV</b>						
Yes	5.4 (5)	94.6 (88)	0.476	7.1 (6)	92.9 (78)	0.366
No	0.0 (0)	100.0 (9)		14.3 (2)	85.7 (12)	
<b>Wealth index</b>						
Poorest	0.0 (0)	100.0 (30)	0.301	9.1 (3)	90.9 (30)	0.715
Second	5.0 (1)	95.0 (19)		13.0 (3)	87.0 (20)	
Middle	10.0 (2)	90.0 (18)		4.8 (1)	95.2 (20)	
Fourth	11.1 (2)	88.9 (16)		0.0 (0)	100.0 (11)	
Richest	0.0 (0)	100.0 (14)		10.0 (1)	90.0 (9)	
<b>Age of first marriage</b>						
≤17 yrs	5.0 (5)	95.0 (95)	0.746	8.2 (8)	91.8 (90)	-
>17 yrs	0.0 (0)	100.0 (2)		-	-	
<b>Age of first conception</b>						
≤19 yrs	4.9 (5)	95.1 (97)	-	8.2 (8)	91.8 (90)	-
>19 yrs	-	-		-	-	
<b>Death of the child</b>						
None	5.0 (5)	95.5 (96)	0.820	8.2 (8)	91.8 (89)	0.764
One or more	0.0 (0)	100.0 (1)		0.0 (0)	100.0 (1)	

Intervention- Narayanganj City Corporation  
 Comparison- Narsingdhi Sadar Municipality  
 \*Chi-square test

**Annexure 26. Association of different socioeconomic factors with having all birth plans**

Factors % (n)*	Having all birth plans					
	Intervention N=607		P- value	Comparison N=599		P-value
	Yes	No		Yes	No	
<b>Educational status</b>						
Primary incomplete	35.3 (77)	64.7 (141)	0.723	31.4 (77)	68.6 (168)	0.091
Primary or higher	36.8 (143)	63.2 (246)		38.1 (135)	61.9 (219)	
<b>Can read and write</b>						
Yes	37.4 (146)	62.6 (244)	0.413	37.2 (142)	62.8 (240)	0.227
No	34.1 (74)	65.9 (143)		32.3 (70)	67.7 (147)	
<b>Husband can read and write</b>						
Yes	34.8 (138)	65.2 (258)	0.334	39.0 (150)	61.0 (235)	0.021
No	38.8 (80)	61.2 (126)		29.5 (61)	70.5 (146)	
<b>Read news paper</b>						
Yes	36.6 (15)	63.4 (26)	0.962	32.0 (16)	68.0 (34)	0.600
No	36.2 (205)	63.8 (361)		35.7 (196)	64.3 (353)	
<b>Listen to radio</b>						
Yes	18.2 (2)	81.8 (9)	0.209	40.0 (2)	60.0 (3)	0.829
No	36.6 (218)	63.4 (378)		35.4 (210)	64.6 (384)	
<b>Watch TV</b>						
Yes	36.6 (200)	63.4 (346)	0.554	34.9 (182)	65.1 (340)	0.483
No	32.8 (20)	67.2 (41)		39.0 (30)	61.0 (47)	
<b>Wealth index</b>						
Poorest	31.6 (36)	68.4 (78)	0.205	32.0 (39)	68.0 (83)	0.240
Second	37.3 (41)	62.7 (69)		37.8 (48)	62.2 (79)	
Middle	38.7 (48)	61.3 (76)		43.1 (47)	56.9 (62)	
Fourth	43.2 (54)	56.8 (71)		35.0 (43)	65.0 (80)	
Richest	30.6 (41)	69.4 (93)		29.7 (35)	70.3 (83)	
<b>Age of first marriage</b>						
≤17 yrs	37.4 (139)	62.6 (233)	0.469	36.3 (153)	63.7 (269)	0.495
>17 yrs	34.5 (81)	65.5 (154)		33.3 (59)	66.7 (118)	
<b>Age of first conception</b>						
≤19 yrs	37.8 (168)	62.2 (276)	0.178	36.5 (175)	63.5 (305)	0.273
>19 yrs	31.9 (52)	68.1 (111)		31.1 (37)	68.9 (82)	
<b>Death of the child</b>						
None	36.7 (209)	63.3 (361)	0.395	34.5 (182)	65.5 (345)	0.235
One or more	29.7 (11)	70.3 (26)		41.7 (30)	58.3 (42)	
<b>Sought 4+ ANC's from trained providers<sup>1</sup></b>						
Yes	38.7 (123)	61.3 (195)	0.190	33.4 (158)	66.6 (315)	0.049
No	33.6 (97)	66.4 (192)		42.9 (54)	57.1 (72)	

Intervention- Narayanganj City Corporation  
Comparison- Narsingdhi Sadar Municipality

\*Chi-square test

<sup>1</sup> Includes qualified doctor, FWV, nurse, MMW, TTBA/MMW/UBA



**Annexure 27. Association of different socioeconomic and maternal factors with receiving all essential newborn care**

Factors % (n)*	Received all newborn care					
	Intervention N=572			Comparison N=531		
	Yes	No	P-value	Yes	No	P-value
Educational status						
Primary incomplete	41.9 (85)	58.1 (118)	0.018	37.2 (77)	62.8 (130)	0.192
Primary or higher	32.0 (118)	68.0 (251)		42.9 (139)	57.1 (185)	
Can read and write						
Yes	32.7 (121)	67.3 (249)	0.059	42.5 (147)	57.5 (199)	0.246
No	40.6 (82)	59.4 (120)		37.3 (69)	62.7 (116)	
Husband can read and write						
Yes	34.3 (128)	65.7 (245)	0.367	40.1 (73)	58.9 (202)	0.825
No	38.1 (74)	61.9 (120)		41.1 (141)	59.9 (109)	
Read news paper						
Yes	29.3 (12)	70.7 (29)	0.388	40.9 (18)	59.1 (26)	0.974
No	36.0 (191)	64.0 (340)		40.7 (198)	59.3 (289)	
Listen to radio						
Yes	10.0 (1)	90.0 (9)	0.089	60.0 (3)	40.0 (2)	0.377
No	35.9 (202)	64.1 (369)		40.5 (213)	59.5 (313)	
Watch TV						
Yes	34.8 (179)	65.2 (335)	0.323	41.3 (192)	58.7 (273)	0.446
No	41.4 (24)	58.6 (34)		36.4 (24)	63.6 (42)	
Wealth index						
Poorest	36.5 (38)	63.5 (66)	0.371	40.8 (42)	59.2 (61)	0.353
Second	40.6 (43)	59.4 (63)		33.6 (38)	66.4 (75)	
Middle	32.2 (38)	67.8 (80)		38.5 (37)	61.5 (59)	
Fourth	39.3 (46)	60.7 (71)		45.9 (50)	54.1 (59)	
Richest	29.9 (38)	70.1 (89)		44.5 (49)	55.5 (61)	
Age of first marriage						
≤17 yrs	35.7 (125)	64.3 (225)	0.888	39.2 (145)	60.8 (225)	0.290
>17 yrs	35.1 (78)	64.9 (144)		44.1 (71)	55.9 (90)	
Age of first conception						
≤19 yrs	35.7 (148)	64.3 (268)	0.888	39.9 (171)	60.1 (258)	0.431
>19 yrs	35.0 (55)	65.0 (102)		44.1 (45)	55.9 (57)	
Death of the child						
None	36.3 (195)	63.7 (342)	0.107	40.6 (190)	59.4 (278)	0.919
One or more	22.9 (8)	77.1 (27)		41.3 (26)	58.7 (37)	
Sought 4+ ANC's from trained providers <sup>1</sup>						
Yes	40.2 (115)	59.8 (171)	0.018	41.9 (170)	58.1 (236)	0.313
No	30.8 (88)	69.2 (198)		36.8 (46)	63.5 (79)	

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

\*Chi-square test

<sup>1</sup> Includes qualified doctor, FWV, nurse, MMW, TTBA/MMW/UBA

**Annexure 28. Association of different socioeconomic and maternal factors with birth asphyxia managed by trained providers**

Factors % (n)*	Birth asphyxia managed by trained providers					
	Intervention N=50			Comparison N=58		
	No	Yes	P-value	No	Yes	P-value
<b>Educational status</b>						
Primary incomplete	17.6 (4)	82.4 (19)	0.820	41.7 (10)	58.3 (14)	0.467
Primary or higher	15.2 (8)	84.8 (28)		32.4 (11)	67.6 (23)	
<b>Can read and write</b>						
Yes	12.1 (4)	87.9 (29)	0.297	30.8 (12)	69.2 (27)	0.217
No	23.5 (4)	76.5 (13)		47.4 (18)	52.6 (17)	
<b>Husband can read and write</b>						
Yes	18.5 (5)	81.5 (22)	0.599	21.9 (7)	78.1 (25)	0.018
No	13.0 (3)	87.0 (23)		52.0 (13)	48.0 (12)	
<b>Read news paper</b>						
Yes	0.0 (0)	100.0 (6)	0.254	33.3 (1)	66.7 (2)	0.915
No	18.2 (8)	81.8 (62)		36.4 (20)	63.6 (35)	
<b>Listen to radio</b>						
Yes	0.0 (0)	100.0 (1)	0.659	--	--	--
No	16.3 (8)	83.7 (41)		16.0 (8)	84.0 (42)	
<b>Watch TV</b>						
Yes	13.6 (6)	86.4 (61)	0.217	32.7 (16)	67.3 (33)	0.189
No	32.7 (16)	67.3 (33)		55.6 (5)	44.4 (4)	
<b>Wealth index</b>						
Poorest	37.5 (3)	62.5 (5)	0.510	23.1 (3)	76.9 (10)	0.121
Second	11.1 (1)	88.9 (8)		62.5 (10)	37.5 (6)	
Middle	12.5 (2)	87.5 (14)		36.4 (4)	63.6 (7)	
Fourth	11.1 (1)	88.9 (8)		23.1 (3)	76.9 (10)	
Richest	12.5 (1)	87.5 (7)		20.0 (1)	76.9 (4)	
<b>Age of first marriage</b>						
≤17 yrs	18.2 (6)	81.8 (27)	0.558	40.4 (19)	59.6 (28)	0.167
>17 yrs	11.8 (2)	88.2 (15)		18.2 (2)	81.8 (9)	
<b>Age of first conception</b>						
≤19 yrs	13.5 (5)	86.5 (32)	0.418	40.0 (20)	60.0 (30)	0.133
>19 yrs	23.1 (3)	76.9 (10)		12.5 (1)	87.5 (7)	
<b>Death of the child</b>						
None	17.0 (8)	83.0 (39)	0.436	37.2 (16)	62.8 (27)	0.788
One or more	0.0 (0)	100.0 (3)		33.3 (5)	66.7 (10)	
<b>Sought 4+ ANC's from trained providers</b>						
Yes	30.8 (8)	69.2 (18)	0.003	40.9 (18)	59.1 (26)	0.187
No	0.0 (0)	100.0 (24)		21.4 (3)	78.6 (11)	
<b>Delivered by trained providers</b>						
Yes	0.0 (0)	100.0 (36)	0.000	0.0 (0)	100.0 (29)	0.000
No	57.1 (8)	42.9 (6)		72.4 (21)	27.6 (8)	

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

\*Chi-square test

<sup>1</sup> Includes qualified doctor, FWV, nurse, MMW, TTBA/MMW/UBA

**Annexure 29. Association of different socioeconomic and maternal factors with neonatal sepsis managed by qualified doctors**

Factors % (n)*	Neonatal sepsis managed by qualified doctor					
	Intervention N=104			Comparison N=114		
	No	Yes	P-value	No	Yes	P-value
<b>Educational status</b>						
Primary incomplete	8.3 (3)	91.7(33)	0.350	51.9 (27)	48.1 (25)	0.077
Primary or higher	14.7 (10)	85.3 (58)		35.5 (22)	64.2 (40)	
<b>Can read and write</b>						
Yes	14.5 (10)	85.5 (59)	0.388	37.1 (26)	62.9 (44)	0.112
No	8.6 (3)	91.4 (32)		52.3 (23)	62.9 (44)	
<b>Husband can read and write</b>						
Yes	10.1 (7)	89.9 (62)	0.308	39.7 (29)	60.3 (44)	0.611
No	17.1 (6)	82.9 (29)		44.7 (17)	55.3 (21)	
<b>Read news paper</b>						
Yes	12.5 (1)	87.5 (79)	1.000	16.7 (19)	83.3 (5)	0.181
No	12.5 (12)	87.5 (84)		44.4 (48)	55.6 (60)	
<b>Listen to radio</b>						
Yes	0.0 (0)	100.0 (2)	0.589	50.0 (1)	50.0 (1)	0.840
No	12.7 (13)	87.3 (89)		42.9 (48)	57.1 (64)	
<b>Watch TV</b>						
Yes	12.9 (12)	87.1 (819)	0.718	40.6 (41)	59.4 (60)	0.151
No	9.1 (1)	90.0 (10)		61.5 (8)	38.5 (5)	
<b>Wealth index</b>						
Poorest	45.5 (5)	54.5 (6)	0.012	56.3 (18)	43.8 (91)	0.145
Second	13.0 (3)	87.0 (20)		54.5 (12)	45.5 (10)	
Middle	7.7 (2)	92.3 (24)		34.5 (10)	65.5 (19)	
Fourth	4.8 (1)	95.2 (20)		30.0 (6)	70.0 (14)	
Richest	8.7 (2)	91.3 (21)		27.3 (3)	72.7 (8)	
<b>Age of first marriage</b>						
≤17 yrs	10.9 (7)	89.1 (57)	0.542	44.7 (38)	55.3 (47)	0.525
>17 yrs	15.0 (6)	85.0 (34)		37.9 (11)	62.1 (18)	
<b>Age of first conception</b>						
≤19 yrs	14.3 (11)	85.7 (66)	0.352	45.6 (45)	54.4 (49)	0.283
>19 yrs	7.4 (2)	92.6 (25)		33.3 (8)	66.7 (16)	
<b>Death of the child</b>						
None	13.4 (13)	86.6 (84)	0.300	41.8 (38)	58.2 (53)	0.599
One or more	0.0 (0)	100.0 (7)		47.8 (11)	52.2 (12)	
<b>Sought 4+ ANC's from trained providers</b>						
Yes	19.2 (10)	80.8 (42)	0.038	46.7 (42)	53.3 (48)	0.124
No	5.8 (3)	94.2 (49)		29.2 (7)	70.8 (17)	
<b>Delivered by trained providers</b>						
Yes	8.6 (6)	91.4 (64)	0.082	29.8 (14)	70.2 (23)	0.017
No	20.6 (7)	79.4 (27)		52.2 (35)	47.8 (32)	

Intervention- Narayanganj City Corporation  
 Comparison- Narsingdhi Sadar Municipality  
 \*Chi-square test

**Annexure 30. Association of different socioeconomic and maternal factors with management of ARI by medically trained providers**

Factors % (n)*	ARI managed by medically trained providers					
	Intervention N=73			Comparison N=87		
	Yes	No	P-value	Yes	No	P-value
<b>Educational status</b>						
Primary incomplete	21.2 (7)	78.8 (26)	0.195	31.4 (11)	68.6 (24)	0.305
Primary or higher	35.0 (14)	65.0 (26)		42.3 (22)	57.7 (30)	
<b>Can read and write</b>						
Yes	34.1 (15)	65.9 (29)	0.216	38.2 (21)	61.8 (34)	0.950
No	20.7 (6)	79.3 (23)		37.8 (12)	62.5 (20)	
<b>Husband can read and write</b>						
Yes	31.9 (15)	68.1 (32)	0.424	44.2 (23)	55.8 (29)	0.096
No	23.1 (6)	76.9 (20)		26.5 (9)	73.5 (25)	
<b>Read news paper</b>						
Yes	40.0 (2)	60.0 (3)	0.565	80.0 (4)	20.0 (1)	0.046
No	27.9 (19)	72.1 (49)		35.4 (29)	64.6 (53)	
<b>Listen to radio</b>						
Yes	50.0 (1)	50.0 (1)	0.501	50.0 (1)	50.0 (1)	0.722
No	28.2 (20)	71.8 (51)		37.6 (32)	62.4 (53)	
<b>Watch TV</b>						
Yes	30.3 (20)	69.7 (46)	0.373	40.5 (30)	59.5 (44)	0.231
No	14.3 (1)	85.7 (6)		23.1 (3)	76.9 (10)	
<b>Wealth index</b>						
Poorest	6.7 (1)	93.3 (14)	0.003	33.3 (7)	66.7 (14)	0.109
Second	11.1 (2)	88.9 (16)		20.0 (3)	80.0 (12)	
Middle	40.0 (8)	60.0 (12)		33.3 (5)	66.7 (10)	
Fourth	25.0 (2)	75.0 (6)		64.7 (11)	35.3 (6)	
Richest	66.7 (8)	33.3 (4)		36.8 (7)	63.2 (12)	
<b>Age of first marriage</b>						
≤17 yrs	29.2 (14)	70.8 (34)	0.917	44.1 (26)	55.9 (33)	0.087
>17 yrs	28.0 (7)	72.0 (18)		25.0 (7)	75.0 (21)	
<b>Age of first conception</b>						
≤19 yrs	30.2 (16)	69.8 (37)	0.662	37.9 (25)	62.1 (41)	0.986
>19 yrs	25.0 (5)	75.0 (15)		38.1 (8)	61.9 (13)	
<b>Death of the child</b>						
None	28.6 (20)	71.4 (50)	0.858	37.8 (28)	62.2 (46)	0.966
One or more	33.3 (1)	66.7 (2)		38.5 (5)	61.5 (8)	

Intervention- Narayananj City Corporation

Comparison- Narsingdhi Sadar Municipality

\*Chi-square test

<sup>1</sup> Includes qualified doctor, nurse, MMW, paramedics

**Annexure 31. Association of different socioeconomic and maternal factors with management of Diarrhoea by medically trained providers**

Factors % (n)*	Diarrhoea managed by trained providers <sup>1</sup>					
	Intervention N=73			Comparison N=38		
	Yes	No	P-value	Yes	No	P-value
<b>Educational status</b>						
Primary incomplete	30.4 (7)	69.6 (16)	0.464	41.2 (7)	58.8 (10)	0.464
Primary or higher	39.5 (17)	60.5 (26)		50.0 (10)	50.0 (10)	
<b>Can read and write</b>						
Yes	44.2 (19)	55.8 (24)	0.071	47.6 (10)	52.4 (11)	0.815
No	21.7 (5)	78.3 (18)		43.8 (7)	56.3 (9)	
<b>Husband can read and write</b>						
Yes	45.2 (19)	54.3 (23)	0.047	47.1 (8)	52.9 (9)	0.877
No	20.8 (5)	79.2 (19)		44.4 (8)	55.6 (10)	
<b>Read news paper</b>						
Yes	25.0 (1)	75.0 (3)	0.626	0.0 (0)	100.0 (29)	0.180
No	37.1 (23)	62.9 (39)		48.6 (17)	51.4 (18)	
<b>Listen to radio</b>						
Yes	0.0 (0)	100.0 (1)	0.446	--	--	--
No	36.9 (24)	63.1 (41)		45.9 (17)	54.1 (20)	
<b>Watch TV</b>						
Yes	40.0 (22)	60.0 (33)	0.170	54.8 (17)	45.2 (14)	0.014
No	18.2 (2)	81.8 (9)		0.0 (0)	100.0 (6)	
<b>Wealth index</b>						
Poorest	11.1 (1)	88.9 (8)	0.113	55.6 (5)	44.4 (4)	0.462
Second	15.4 (2)	84.6 (11)		14.3 (1)	85.7 (6)	
Middle	50.0 (8)	50.0 (8)		50.0 (2)	50.0 (2)	
Fourth	45.5 (5)	54.6 (6)		57.1 (4)	42.9 (3)	
Richest	47.1 (8)	63.6 (42)		50.0 (5)	50.0 (5)	
<b>Age of first marriage</b>						
≤17 yrs	40.9 (18)	59.1 (26)	0.278	44.4 (12)	55.6 (15)	0.763
>17 yrs	27.3 (6)	72.7 (16)		50.0 (5)	50.0 (5)	
<b>Age of first conception</b>						
≤19 yrs	34.0 (16)	66.0 (31)	0.538	43.8 (14)	56.3 (18)	0.498
>19 yrs	42.1 (8)	57.9 (11)		60.0 (3)	40.0 (2)	
<b>Death of the child</b>						
None	35.9 (23)	64.1 (41)	0.684	43.8 (14)	56.3 (18)	0.498
One or more	50.0 (1)	50.0 (1)		60.0 (3)	40.0 (2)	

Intervention- Narayanganj City Corporation

Comparison- Narsingdhi Sadar Municipality

\*Chi-square test

<sup>1</sup> Includes qualified doctor and nurse

### Annexure 32. Summary of results

Indicators	Intervention	Comparison
Reproductive indicators		
Median age (years) at marriage	17	16
Median age (years) of first conception	18	17
Mean number of children ever born	1.97±1.15	2.19±1.31
Percentage reporting one or more child deaths (ever)	6.9 (84)	11.8 (141)
Percentage reporting one or more abortions (ever)	12.1 (147)	14.0 (168)
Percentage reporting one or more MR (ever)	5.3 (65)	4.6 (55)
Contraceptive prevalence rate		
Any method, % (n)	72.3 (880)	66.4 (796)
Any modern method, % (n)	68.9 (839)	59.8 (716)
Pill	35.1 (427)	36.1 (433)
Injectables	17.0 (207)	12.6 (151)
Condom	10.5 (128)	5.8 (69)
Intrauterine device	1.1 (13)	0.2 (2)
Implant	2.1 (26)	1.6 (19)
Female sterilisation	2.5 (31)	2.8 (33)
Male sterilisation	0.6 (7)	0.8 (9)
Any traditional method, % (n)	3.4 (41)	6.7 (80)
Contraceptive use among married adolescent		
Percentage of currently married adolescent girls (age 15-19 yrs) using modern contraceptive method	73.8 (58)	63.4 (59)
Antenatal coverage and birth preparedness		
Percentage of live and still births in the last year for which women received at least one ANC from medically trained provider	79.7 (484)	56.8 (340)
Percentage of live and still births in the last year for which women received at least one ANC from trained provider	82.9 (503)	56.8 (340)
Percentage of live and still births in the last year for which women received four ANC from medically trained provider	42.5 (258)	20.2 (121)
Percentage of live and still births in the last year for which women had a birth preparedness plan (determined place, determined attendant and saved money)	47.6 (289)	21.0 (126)
Skilled assistance at delivery		
Percentage of births attended by a skilled birth attendant	56.3 (324)	45.4 (243)
Postnatal care		
Percentage of live births where mother received PNC from a medically trained provider	52.3 (299)	43.1 (229)
Percentage of live births where mother received PNC from a trained provider	56.1 (328)	43.1 (229)
Percentage of live births where mother received PNC from a trained provider within 48 hrs of delivery (for home delivery only)	5.9 (16)	4.3 (13)
Percentage of live births where mother received PNC from BRAC SK within 48 hrs of delivery (for home delivery only)	4.1 (11)	0.0 (0)

(Continued Annexure 32.....)

(---- Annexure 32 continued)

Indicators	Intervention	Comparison
Neonatal care		
Received essential newborn care	35.5 (203)	40.7 (216)
ENC provided by BRAC SS for home delivery	0.4 (1)	0.3 (1)
Initiation of breastfeeding within one hour of birth	58.0 (332)	61.6 (327)
Neonatal illness		
Birth asphyxia	8.7 (50)	10.9 (58)
Neonatal sepsis	39.0 (223)	42.5 (225)
Vaccination coverage		
BCG	97.9 (597)	99.0 (593)
Polio 3	84.1 (513)	79.3 (475)
DPT 3	84.4 (515)	79.4 (476)
Hepatitis B	83.6 (510)	78.1 (468)
Measles	84.1 (513)	90.2 (540)
Penta 3	56.1 (342)	34.9 (209)
All vaccines received by the children aged 12-59 months		
Treatment for diarrhoea		
Percentage of under-five children with diarrhoea treated with ORS	86.3 (63)	86.8 (33)
Treatment of ARI		
Management of severe pneumonia by medically trained provider	50.0 (1)	85.0 (17)
Breastfeeding		
Percentage of children exclusively breast fed	32.0 (352)	35.3 (368)
Demographic indicators		
Mean age (SD)	25.03±5.17	25.15±5.27
Mean year of schooling	5.2±3.6	5.01±3.8
Involved in income generating activities	12.4 (151)	12.5 (150)
Sanitation and hygiene practice		
Percentage of households with sanitary latrines (water sealed and septic tanks)	27.7 (337)	32.1 (385)
Hand washing with soap after defecation	91.2 (1110)	82.6 (989)