

# BASELINE FINDINGS: SHAHJADPUR INTEGRATED MATERNAL & NEONATAL HEALTH PROJECT



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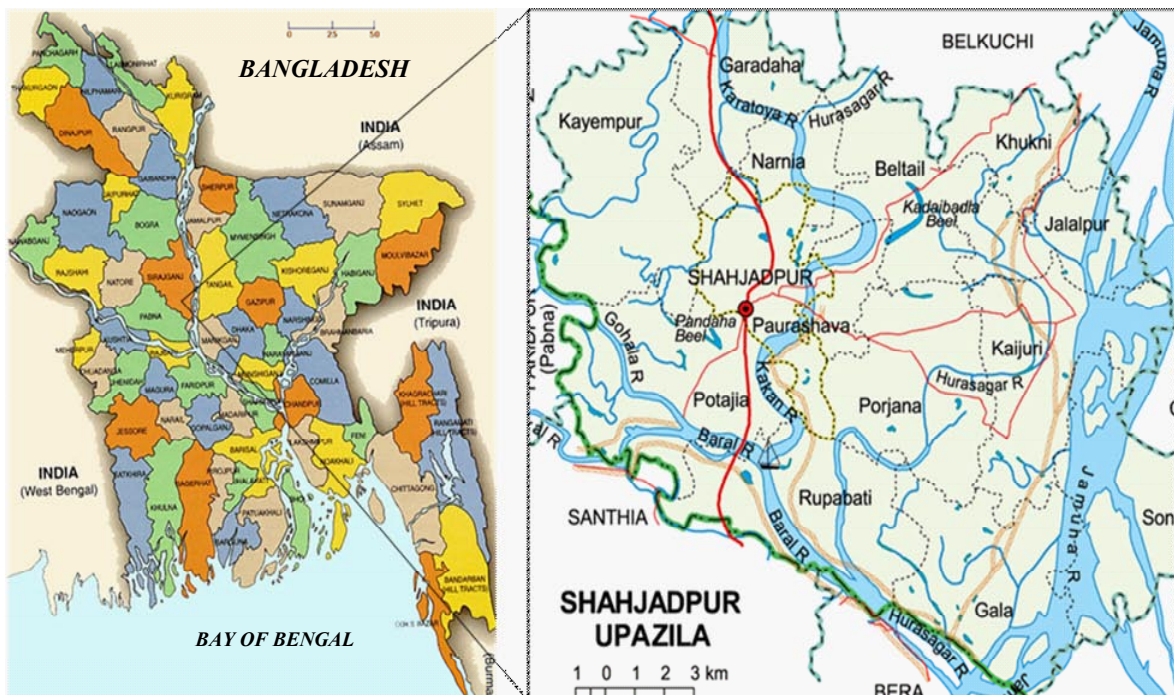


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## BASELINE FINDINGS: SHAHJADPUR INTEGRATED MATERNAL & NEONATAL HEALTH PROJECT



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Cover page: An NGO Community Skilled Birth Attendant (CSBA), after delivery, placing the baby in the excited mother's lap

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**Shahjadpur Integrated Maternal & Neonatal Health study field-team, field project office in the background**

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## Table of Contents

Acknowledgement	i
List of Tables	iv
List of Figures	vi
Executive summary	vii
<b>Chapter 1 Introduction</b>	
Background	1
Community skilled birth attendant	2
Birth preparedness	2
Introduce updated safe delivery-kit at the community	3
Management of postpartum hemorrhage	4
MgSO <sub>4</sub> for management of eclampsia and sever pre-eclampsia	7
Home-based newborn care	7
Community support groups	8
General objective	9
<b>Chapter 2 Methodology</b>	
Study design	10
Study site	10
Quantitative research	10
Community baseline survey	11
Facility audit	14
Monitoring and supervision	14
Data analysis	14

<b>Chapter 3</b>	<b>Results</b>	
	Community baseline survey	15
	Background characteristics of the mothers	15
	Birth preparedness	16
	Care during pregnancy	17
	Antenatal care	18
	Delivery care	20
	Referral pattern of the mothers having delivery complications	22
	Postnatal care	22
	Neonatal care-seeking practices after delivery	23
	Knowledge and utilization of maternal health voucher scheme	25
	Facility audit	29
<b>Chapter 4</b>	<b>Recommendations</b>	31
	References	33
	Annexes	37
	Shahjadpur Integrated MNH Project activities	60
	Acronyms	65

## List of Tables

Table 1	: Mothers by their socio-demographic characteristics by Shahjadpur unions	37
Table 2	: Mothers by their reproductive characteristics by Shahjadpur unions	38
Table 3	: Mother's knowledge on planning for safe delivery by Shahjadpur unions	38
Table 4	: Mothers planning in advance and reasons for not planning in advance for safe delivery by Shahjadpur unions	39
Table 5	: Mothers receiving ANC and number of ANC visits during the last pregnancy by Shahjadpur unions	40
Table 6	: Mothers by place of ANC visit by Shahjadpur unions	40
Table 7	: Mothers having ANC complications by Shahjadpur unions	41
Table 8	: Reasons for not seeking treatment for ANC complications	42
Table 9	: Mothers by types of delivery by Shahjadpur unions	42
Table 10	: Mothers by place of delivery by Shahjadpur unions	43
Table 11	: Mothers place of delivery by asset quintile	43
Table 12	: Mothers delivery care seeking pattern by Shahjadpur unions	44
Table 13	: Mothers having delivery complications by Shahjadpur unions	45
Table 14	: Mothers by referral for delivery complications, referral place and referring person by Shahjadpur unions	46
Table 15	: Mothers receiving PNC services by Shahjadpur unions	47
Table 16	: Mothers having PNC complications by Shahjadpur unions	48
Table 17	: Babies - the very first activity performed after delivery	49
Table 18	: Babies - dried before the expulsion of the placenta	49
Table 19	: Babies - breastfed before the expulsion of the placenta	49
Table 20	: Babies - breathing pattern immediately after birth	49
Table 21	: Babies - assistance required for normal breathing initiation	50
Table 22	: Babies - types of assistance given to initiate normal breathing	50
Table 23	: Babies - types of material used to cut the cord	50
Table 24	: Babies - boiling status of used material to cut the cord	50
Table 25	: Babies - types of materials used to tie the cord	51
Table 26	: Babies - material applied to the cord after tying	51



Table 27 : Babies - types of materials applied to the cord	51
Table 28 : Babies - ever breastfeed status	52
Table 29 : Babies - Colostrums feeding status	52
Table 30 : Babies - time interval between birth and first breastfeeding	52
Table 31 : Babies - exclusive breastfeeding status	52
Table 32 : Babies - illness in the first month	52
Table 33 : Babies - types of illness in the first month	53
Table 34 : Mother's knowledge, sources of knowledge regarding maternal health voucher scheme by Shahjadpur unions	54
Table 35 : Mothers having received maternal health voucher by Shahjadpur unions	55
Table 36 : Mothers having received maternal health voucher by asset quintile	55
Table 37 : Mothers received maternal health voucher by number of their living children	55
Table 38 : Mothers receiving financial benefit (cash incentive) from the maternal health voucher scheme and its use by Shahjadpur unions	56
Table 39 : Mothers received financial benefit against maternal health voucher by delivery place	56
Table 40 : Distribution of health facilities in Shahjadpur sub-district	57
Table 41 : Distribution of health facilities by types by Shahjadpur unions	57
Table 42 : Status of utility service by facility types in Shahjadpur sub-district	57
Table 43 : Distance of NGO & private facilities from UHC in Shahjadpur sub-district	58
Table 44 : Facilities having different components of BEmOC services	58
Table 45 : Facilities having different components of CEmOC	59
Table 46 : Facilities having laboratory services and amenities	59
Table 47 : Facilities having shortage of essential drugs	59

## List of Figures

Figure 1 : Mothers using family planning method by Shahjadpur unions	16
Figure 2 : Types of family planning method used by Shahjadpur unions	17
Figure 3 : Pregnancy care seeking pattern of the respondents by the asset quintile	18
Figure 4 : Services received during ANC visits in different facilities	19
Figure 5 : Advices given during ANC visits	20
Figure 6 : Mothers receiving benefit from the maternal health voucher scheme over period of time	26
Figure 7 : Utilization of skilled care among maternal health voucher benefit receivers and non-receivers	27
Figure 8 : Delivery attended by different types of service providers among receivers and non-receivers of benefits from the maternal health voucher scheme	27
Figure 9 : Place of ANC visit among the recipients of benefits from the maternal health voucher scheme during the last pregnancy	28

## EXECUTIVE SUMMARY

Bangladesh is committed to achieve the Millennium Development Goals (MDGs) 4 and 5 by the year 2015. The health and family planning programme of Bangladesh has made remarkable progress in the last two decades as evident from the decline in fertility rate, infant and child mortality rates. The reduction in maternal mortality in the past 15 years is 22%, right on target towards (MDG) of 75% reduction between 1990 and 2015. However, the Maternal Mortality Ratio (MMR) is still high (320 per 100,000 live births). The most commendable success is in the area of child mortality, as both infant and child mortality rates have dropped from 87 deaths per 1,000 live births (lbs) in 1994 to 65 deaths per 1,000 lbs in 2004. The neonatal mortality rate as of BDHS 2007 is 37 per 1000 lbs.

However, the status of maternal health remains an area of significant challenge in Bangladesh. Although the MMR has declined from 554 deaths per 100,000 lbs in 1990 to 320-400 in 2001, nevertheless, because of the relatively low status of women in Bangladesh and lack of access to reproductive health and family planning services, maternal mortality remains unacceptably high. It is estimated that, approximately 11,000-12,000 maternal deaths occur each year in Bangladesh.

The relationship between poverty and reproductive health in Bangladesh is closely intertwined. To address the needs of the poor, Government with the support of other stakeholders has introduced the Maternal Health Voucher Scheme in selected sub-districts including Shahjadpur.

Studies have shown that low cost evidence-based interventions can be an effective approach to achieve the desired results to reach the MDG 4 and 5 by the year 2015. The present project aims to establish the different low cost evidence-based interventions in a comprehensive way in one sub-district and then to scale up to other sub-districts of Sirajganj district if found feasible.

**Specific aims of the study are:** To test the effectiveness of an integrated evidence-based intervention package in one selected sub-district to

- a) increase utilization of skilled birth care from 18% to 50%
- b) decrease the rich-poor gap in the use of skilled from 6:1 to 2:1
- c) increase met need for obstetric care from 27% to 75%
- d) decrease neonatal mortality from 37/1000 lbs to 20/1000 lbs
- e) improve the quality of care by December 2011

The integrated package focuses on the following evidence-based interventions: Birth and newborn care preparedness counselling, Updated safe delivery-kit, Management of Postpartum Haemorrhage (PPH) through routine implementation of Active Management of Third Stage of Labor (AMTSL), Misoprostol, and safe blood transfusion, Management of eclampsia by introduction of MgSO<sub>4</sub> by Community Skilled Birth Attendants (CSBAs), Home-based essential newborn care by CSBAs, total sub-district coverage by required number of CSBAs and community support groups (CSGs) for sensitizing the mother, family and the community on issues related to maternal and neonatal health. The health interventions are to be channeled through the existing government, NGO and private health system, with the active support of the community.

**Study site:** The study is being implemented in Shahjadpur sub-district of Sirajganj district under Rajshahi division. Sirajganj district is situated on the west of Jamuna river, about 180 km northwest of Dhaka. It consists of nine sub-districts. The population of Sirajganj as of 2001 census is 26,93,814.

**Evaluation methods:** This study will be evaluated using a pre- and post- design with the use of quantitative research method. Finding an ideal control area for this kind of study is very difficult as many sub-districts are having one or the other interventions proposed in the study. An ongoing monitoring system is in place to observe progress in process indicators.

**Quantitative research:** Quantitative research methods are being used to assess the baseline health status and also the effectiveness of the intervention through endline survey.

*a) Community survey* was conducted among 3158 women in Shahjadpur sub-district who delivered 6-months prior to the date of interview. The women were interviewed for their socio-economic-demographic-health status and maternal and neonatal health practices. For selection of subjects simple cluster (equal cluster) sampling technique were employed. All the 'mouzas' (revenue villages) in the sub-district were divided into number of blocks so that each block contains around 3,000 population. This generated about 194 blocks in the estimated 600,000 populations in Shahjadpur sub-district. Out of 194 blocks, 80 blocks were randomly selected for the survey. All women who delivered in the last one year were identified and line listed by door-to-door visits and mothers who delivered in the last six months were interviewed.

*b) Facility audits* in all Government of Bangladesh (GOB), NGO and private hospitals/clinics in the study area were carried out between January-March 2009.

The baseline evaluation included 3158 mothers who gave birth in the last six months prior to the interview. The majority (62.6%) respondents were in the 20 to 29 years age group followed by a sizable portion (22.7%) of mothers below the age of 19 years. The proportion of mothers with no schooling is 36.1% and 45.7% were in the education level 1-7<sup>th</sup> standard. Mothers age at marriage below or equal to 14 years are 27.1%, 15 to 17 years is 44.2 % and 18 years and above is 28.6% and the mean age at marriage is 16.1 years.

Nearly one-fourth of the mothers use different types of family planning methods which included the oral pill 56.5% followed by the injection 27.4% and condom 11.4%. Permanent method of contraception, tubectomy is a mere 1.5%.

Nearly 70% mothers received any antenatal care (ANC) during the last pregnancy, 24% mothers received one ANC, 22.7% two and 13.7% received three ANC. Only 9.3% mothers received four ANC during pregnancy. ANC visit within the first four months was 8.1% and 31% of the mothers attended for the first ANC checkup after eight months of pregnancy. Advice was not given to 13.6% of the mothers during ANC visits. Only 3.1% mothers were told about the danger signs of pregnancy, 0.1% about the danger signs of the neonates, less than 1% about the different components of birth planning, 0.2% about the use of safe delivery-kit and less than 1% were told about maternal health voucher scheme. However 77.2% were told to take nutritious food, 53.6% to drink more than normal water and 49.7% to avoid heavy work. Around 56% of the mothers had complication during ANC period and only 37.7% sought treatment. MBBS doctors treated 39.6% of the cases, village doctors 32.6% followed by homeopathic doctors, nurse/ Family Welfare Visitor's (FWVs), drug sellers, kobiraj and hakims.

Normal vaginal delivery and cesarian section was conducted in (93.6%) and 6% of the mothers. Delivery at home was undertaken in 82.4% of the mothers and the rest 17.6% in health facilities. In 26%, delivery was conducted by a skilled attendant. Of the unskilled attendants, (71.1%) delivery was conducted by the Trained Traditional Birth Attendant (TTBA) and Traditional Birth Attendant (TBA). Cesarean section was high 17.3% in the rich quintile whereas in the poor quintile was 2.4% .The percentage of skilled birth attendant at delivery in the rich quintile was 43.9% compared to 16.2% in the poor quintile. Only 4.8% of the mothers availed postnatal care (PNC).

The very first activity performed after the delivery was cutting of the cord in 73.6% of the babies. Blade was used in 75.6% babies to cut the umbilical cord followed by scissors (17.4%) and materials were boiled before cutting the cord in 55% of the cases. The cord was tied by old thread (41%), new boiled threads (25.8%) and boiled threads from safe delivery-kit (17.5%). In 81.4% of the babies nothing was applied to the cord after tying. Majority (97%) of the babies was not wrapped or dried and was not breastfed before the expulsion of the placenta.

Ninety nine percent have been breastfed after birth irrespective of time of initiation of feeding. Within the first thirty minutes of birth 44.8% of the babies were breastfed, in the next thirty minutes another 25.7% were breastfed, so within the first hour of birth 70.5% of the babies were breastfed. Almost all babies were breastfed and given colostrums.

Mothers (93.5%) were aware of the universal Demand Side Financing (DSF) scheme. 60% (1895) of the mothers received benefits from the DSF scheme in the sub-district. In 12% of mothers, DSF benefits were utilized by mothers who had more than two children. Out of mothers who received DSF, 80.3 % received skilled ANC services whereas delivery was conducted by a skilled attendant in only 32.9% cases.

The facility assessment shows that in Shahjadpur sub-district for ~ 600,000 people there are 28 health facilities, of which 20 are in public sector and 4 each in NGO and private sectors. The Upazila (sub-district) Health Complex (UHC) is the functional comprehensive emergency obstetric care (CEmOC) facility. All the 8 components CEmOC are available in the UHC. Out of 11 Family Welfare Centers (FWCs), 4 are upgraded and the rest 7 are non-upgraded. Delivery services are available only from 1 upgraded and 3 non-upgraded FWCs. There is no FWC in Porjona and Sonatoni unions. There are total 8 rural dispensaries (RDs) in the sub-district. The 4 NGO facilities provide mainly ANC services and only two provide delivery services whereas all the 4 private facilities provide cesarean sections in addition to delivery and other services. Among 6 components of the basic emergency obstetric care (BEmOC), injectable antibiotics, oxytocin and magnesium sulphate ( $MgSO_4$ ) were not available in any of FWCs and most of the NGO facilities.



## CHAPTER ONE

### INTRODUCTION

#### Background

Bangladesh is committed to achieving Millennium Development Goals (MDGs) 4 and 5 to reduce childhood mortality to 50 per 1,000 live births (lbs) and maternal mortality to 143 per 100,000 lbs by 2015. With a current MMR of 320 per 100,000 lbs [1] and 18% skilled attendance at delivery [2], the country is less likely to attain the MDG 5 targets. The majority of deliveries take place at home (>90%) mostly by TBAs and family members, lack of skilled attendants at delivery, poor referral system and the overall met need for obstetric care is only 13% [3]. There is also substantial inequity in the use of skilled attendance at birth; use varies from less than 5% to 30% between the lowest and highest socioeconomic quintiles [4]. Neonatal mortality remains a major barrier in reducing child mortality in Bangladesh. Neonatal mortality rate is unacceptably high (37/1000 lbs) accounting for 40% of childhood mortality [2]. The major causes of maternal mortality (postpartum hemorrhage, eclampsia, infection) and neonatal mortality (birth asphyxia, infection) are preventable [5, 6], and evidence-based low-cost interventions are available [7, 8].

To support the government efforts in attaining the MDG targets on time, ICDDR,B in collaboration with the Ministry of Health and Family Welfare (MoHFW) and other stakeholders including NGOs and the private sector, has initiated this research project which aims to operationalize the available evidence-based low-cost health interventions in an integrated manner. The project is being conducted at Shahjadpur sub-district (covering ~600,000 population) of Sirajganj district, 180 km northwest of Dhaka. A package of integrated evidence-based Maternal and Neonatal Health (MNH) interventions are being provided to Shahjadapur's pregnant women and their newborn including: counselling for pregnant women and their families on birth and newborn care preparedness, updated safe delivery-kit distribution, reinforced management of postpartum hemorrhage - the first major cause of maternal death, reinforced management of eclampsia - the second major cause of maternal mortality, home-based essential newborn care, optimum number of community skilled birth attendants (CSBAs) and formation of community support groups (CSGs). The interventions are to be channelled through the existing government and private health systems. Effectiveness of this integrated MNH intervention package is to be tested in: increasing utilization of skilled birth care (from 18% to 50%); decreasing the rich-poor gap in the use of skilled care (from 6:1 to 2:1); increasing met need for obstetric complications (from 27% to 75%); decreasing neonatal mortality (from 37 to 20 per 1000 lbs); and improving the quality of maternal and newborn care (perceived and technical). The study is to be evaluated with a pre- and post-design including quantitative and qualitative research method. Major activities in the



4-year project are preparatory and orientation activities- 1st year; intervention package delivery- 2nd and 3rd year; research-related activities and monitoring and evaluation- 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year.

This baseline survey is conducted to observe the different status of maternal and neonatal health indicators in the sub-district prior to the actual interventions. This would also help in redefining interventions based on findings at the baseline. This survey is also designed to establish initial conditions against which the effects of a finished project can be compared.

*The following evidence-based interventions have been proposed for the successful implementations of the project:*

### **Community skilled birth attendant (CSBA)**

Today, we know how to prevent and manage pregnancy-related complications and there is increasing recognition that pregnant women should be assisted by a professional health provider with the necessary skills, drugs, supplies, equipment and back-up, particularly during and immediately following childbirth. Skilled attendants—people with midwifery skills, such as midwives and doctors and nurses who have been trained to proficiency in the skills to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and identify, manage or refer complications in the woman and newborn—are best placed to ensure the survival and safety of pregnant women and their infants [9-11]. Whatever their professional title, health professionals functioning as skilled attendants should be able to identify early signs of complications, and offer first line emergency obstetric care (including emergency newborn care) when needed. More recent examples of countries that have successfully lowered maternal mortality, such as Cuba, Egypt, Iran, Jamaica, Bangladesh (albeit only in Matlab sub-district) [12], Thailand, Sri Lanka and Malaysia [13], demonstrated that maternal mortality can be reduced using a variety of different models of care. Furthermore it is clear that such reductions are possible, even when resources are limited. The common feature in all these countries is that they all focus on ensuring that a skilled attendant attends the majority of births. The presence of a skilled birth attendant (SBA) at delivery is recognized as essential to preventing maternal mortality [14, 15]. The study will incorporate 32 new trained CSBAs from the NGO sector which will take the total sub-district CSBs to 62 with the existing 30 government CSBAs. This fulfils the required number of CSBAs for the sub-district taking into consideration one CSBA/10000 population.

### **Birth preparedness**

The birth preparedness program (BPP) is a demand-creation intervention that promotes key messages and behaviour change via inter-personal communication through community health workers and volunteers. Birth preparedness programmes generally address ‘three delays’ to care-seeking for obstetric emergencies—delay in recognition

of problem, delay in seeking care, and delay in receiving care at facility. These delays represent barriers that often result in preventable maternal deaths [16-19].

While there is no universal definition of birth preparedness, many packages that address birth preparedness promote the following: (a) attending four ANC visits during pregnancy; (b) preparation for normal birth by selecting a SBA and place of delivery; (c) preparation of essential items for delivery, such as a clean delivery-kit; (d) knowledge of danger signs for mother and newborn and when to seek help; (e) knowledge of where and to whom to go for help; (f) arranging access to funds and means for emergency transportation and medical care; and, (g) prior identification of blood donors [19]. Birth preparedness, an established concept, is recommended consistently as a best practice; and several studies have demonstrated that it was effective [19-26]. The Mother Care Project included birth-planning interventions and focused on planning for emergencies in six countries (Bolivia, Egypt, Guatemala, Honduras, Indonesia, and Pakistan) through conducting community assessments [19]. Igniting Change! Capacity-Building Tools for Safe Motherhood Alliances was a collection of tools to help focus and strengthen collective efforts that developed a maternal survival toolkit that included standard elements of birth-preparedness but also addressed neonatal care, the need for early postnatal care, and issues surrounding HIV/AIDS [19, 20]. JHPIEGO an affiliate of John Hopkins University, for more than 30 years, has focused on improving the health of women and families in more than 140 countries worldwide has developed tools for improving communication and collaboration among stakeholders to advocate for essential maternal care [21]. The Home-based Life Saving Skills package focuses on the family and community level to increase access to lifesaving care and to decrease delays in reaching referral facilities. The package has been tested in India and Ethiopia with promising results in increasing preventive behaviours and birth preparedness among women fully exposed to the project [22, 23]. A birth-preparedness intervention in Dinajpur, Bangladesh, substantially increased the use-rate of emergency obstetric services; 45% of families in the project area reported that they had access to community-support systems [24, 25]. Similar studies in Nepal and African countries, birth-preparedness was found effective in increasing obstetric knowledge and practices [26].

### ***Introduction of updated safe delivery-kit at the community***

Safe delivery-kits are used in many countries to provide the essential supplies needed for clean deliveries which occur at home [27]. The kit has been effective in preventing maternal and neonatal infections in several countries. These kits, which were designed more than 30 years ago, include soap for hand washing, a plastic sheet to provide a small clean environment, a clean blade for cutting the umbilical cord, a clean string for tying the cord, a piece of gauze for cord care and a small container of disinfectant (savlon). The kits are inexpensive and can be prepared by community-based organizations. Unfortunately, the kits have not kept pace with new findings which suggest that additional supplies and training materials could greatly improve

their effectiveness. Some additional supplies that could be included, include a delivery pad so that excessive hemorrhage can be readily identified, disinfectant to treat the cord, an educational card to help families recognize danger-signs of delivery complications, as well as a check-list for preparation for the delivery.



The revised safe delivery-kit is complement and standardizes the ongoing programs which are known to reduce maternal and neonatal mortality. At a very low cost, it provides the newer interventions to the mother and baby at the time they need it and addresses the needs of mothers who chose to deliver at home. It also provides the supplies needed by midwives who assist these mothers.

### **Management of postpartum hemorrhage (PPH)**

The single most common cause of maternal mortality is obstetric hemorrhage, generally occurring postpartum and accounting for 25—33% of all maternal deaths [26, 28-30]. The rate of death due to PPH varies widely in the developing world. PPH-related mortality rates based on hospital studies are estimated to be 25—30% in India, 43% in Indonesia, and as high as 59% in Burkina Faso, 53% in Philippines, 43% in Indonesia and 25% in Bangladesh [28-30] . The following low-cost interventions are recommended for preventing and managing PPH in low resource countries:

1. Active management of the third stage of labor: Active management of the third stage of labor (AMTSL) can make a significant contribution to the reduction of maternal mortality. The components of AMTSL, as outlined in the November 2003 Joint Statement of the International Confederation of Midwives (ICM) and the International Federation of Gynecology and Obstetrics (FIGO), are: administration of a uterotonic agent (Oxytocin is the drug of choice); controlled cord traction; and uterine massage - after delivery of the placenta. Two randomized controlled trials (RCTs) provided conclusive evidence that AMTSL significantly reduces postpartum

hemorrhage (PPH), decreases blood loss, and decreases the need for blood transfusions [31, 32]. As AMTSL may prevent up to 60% of PPH [31], the annual number of averted deaths is approximately as many as 90,000 globally, as well as a significant number of neonates and infants who are also likely to die in the first year of their lives without mothers, if health providers practiced AMTSL routinely.

AMTSL is promoted by the World Health Organization (WHO), United Nations Children's Fund, United Nations Development Fund (UNDP), FIGO, ICM, and has been readily accepted by many countries and is now included in their national standards and guidelines.

International surveys, including that of Festin et al., [33] and the Prevention of Postpartum Hemorrhage Initiative (POPPHI) global surveys, find that AMTSL is unfortunately not practiced routinely or correctly in many parts of the world. Widespread application of active management in developing countries requires consideration of the costs as well as the storage, distribution, requirements of drugs and supplies, the availability of trained personnel, and the quality of the health facilities. Active management also depends on the availability of uterotonic drugs, syringes, and needles. Long-term storage of oxytocin and ergometrine requires refrigeration, which may be unavailable in some settings. Active management also requires the presence of a skilled attendant at delivery.

Deborah Armbruster of POPPHI project of PATH concluded in her short paper that "AMTSL must be considered a required skill for all skilled birth attendants, and the drugs (preferably oxytocin) and supplies needed to implement the use of uterotonics effectively in AMSTL must be made available for routine use during childbirth wherever it occurs. Organizations working to save and improve the lives of women must focus on addressing the major barriers to optimal practice of AMTSL around the world"[34].

2. Oral Misoprostol as uterotonics: The main cause of PPH is uterine atony which, in the western literature, is estimated to account for 80% to 90% of PPH [35, 36]. A study in rural India analyzing maternal records over a period of 20 years found that uterine atony accounted for only 54% of all PPH-related deaths, suggesting that nearly half (46%) may be due to retained placental fragments, lower genital tract lacerations, and other trauma [37].

Uterotonics, primarily oxytocin in hospital settings are safe and effective for prophylaxis and treatment of atonic PPH, and their use has been associated with relatively minor side effects [37]. However, several barriers exist to successful implementation of oxytocin in low resource settings. It requires refrigeration during storage which is not possible in unelectrified regions and skills for diagnosis of PPH and administration of injectable medications that minimally trained birth attendants may not possess or existing laws may prohibit [39]. Oral misoprostol has the potential to act as an effective uterotonic

agent. It is relatively inexpensive, easy to administer, and has a long shelf life not requiring refrigeration [38, 40-44]. The hospital safety and efficacy of oral misoprostol have been established for prevention of PPH with relatively few side effects [45-52]. A large WHO multi-centre hospital-based study of oral misoprostol (600 mcg) versus intravenous or intramuscular oxytocin (10 IU) given immediately following delivery for prophylaxis of PPH showed misoprostol to be effective in reducing PPH, although it was less effective than oxytocins [50, 53]. Several smaller RCTs have also shown oral or rectal misoprostol to be as effective as intramuscular oxytocins [53]. Recent results from a community based RCT in Gambia showed no difference in PPH rates or mean blood loss between the oral Misoprostol and the oral ergotrate groups [54]. However, no large RCT has been completed to show the efficacy of oral Misoprostol in rural areas served by indigenous health workers [38, 44, 52, 55]. In Tanzania, TBAs performing home deliveries were trained to recognize PPH when 2 Kangas (standard-size locally available cloths) were saturated with blood, and to administer 1000 mcg rectally and transfer to a higher level facility if appropriate. Communities where only the Kanga was used to measure blood loss and Misoprostol was not made available had a referral rate to the nearest health facility of 19%, compared to 2% in the intervention group [56]. A community-based RCT (sample size of 1600 women) in rural India has just been completed comparing 600 mgs of oral Misoprostol to placebo, and similar RCTs in Pakistan and Tibet have been initiated [39].

Misoprostol has already been registered by the Drug Administration Authority (DAA) of Government of Bangladesh for use. Subsequently the DAA has given permission to local manufacturers to market it for prevention and treatment of PPH.

3. Early and accurate measurement of blood loss: One of the most important factors for preventing the negative sequelae of PPH is prompt detection through accurate estimation of blood loss with an easy to use blood collection tool [35-37, 57]. In low-resource settings, novel approaches to PPH assessment must be investigated. In Tanzania, one study found that two Kangas would hold slightly more than 500 ml when completely soaked, providing a convenient unit of measure that could be used for determination of PPH [56]. In a PPH study in rural India, a specially designed blood collection drape was used to estimate postpartum blood loss. This drape has a calibrated collecting pouch attached to a plastic sheet that is placed under the buttocks of the woman immediately after delivery. Estimations of blood loss by visual estimation were 33% less than the drape determination and the correlation between the drape measurement and photospectrometry was 0.92 confirming its accuracy [58]. The birth attendants using the calibrated drape reported that it allowed them to more easily recognize excessive bleeding before onset of physiologic changes that may come too late for intervention. It also allows for more hygienic deliveries. This calibrated drape is currently being used in eight countries with over 5000 deliveries. In Bangladesh a very easy to use standardized mat was tested and found useful in measuring blood loss at the community (personal communication with Dr. M A Quaiyum, ICDDR,B).

### ***MgSO<sub>4</sub> for management of eclampsia and severe pre-eclampsia***

Eclampsia and pre-eclampsia are among the major causes of maternal and perinatal deaths in Bangladesh. Use of MgSO<sub>4</sub> in parental route is now established as gold standard treatment for eclampsia and severe pre-eclampsia worldwide. Management of these conditions, however, needs hospital admission and prompt initiation of treatment followed by maintenance therapy under close monitoring. As more than 90% of deliveries in this country are planned and conducted in home and attended by unskilled providers, prompt referral to nearest hospital is not always feasible. Although MgSO<sub>4</sub> is preferred to be used in intravenous route, an alternative regimen has been shown equally efficacious for treatment of eclampsia and severe pre-eclampsia. This regimen advocates a loading dose of combined intravenous and intramuscular administration followed by four hourly intramuscular maintenance therapies. A study in Bangladesh has shown that administration of a loading dose of MgSO<sub>4</sub> at the community level before referral to hospital improved the maternal and perinatal outcomes of patients with eclampsia and pre-eclampsia at the hospital [59]. Therefore, there is a potential of introducing routine use of loading dose of MgSO<sub>4</sub> for eclampsia and pre-eclampsia patients at the community by community level providers before referral to the nearest hospital interventions.

### ***Home-based newborn care***

Despite significant reduction in overall infant and child mortality in many developing countries during the last decades, neonatal mortality has remained constant, with an estimated 4 million deaths per year worldwide [60-62]. One of the reasons is a lack of access to health care. The neonatal period is inadequately addressed by national and international health programs in developing countries which is equally true for corresponding postnatal period in maternal health-care programs [63]. Referral of sick neonates is recommended in most guidelines for field workers [64-66] but usually not practiced due to lack of accessible facilities and unwillingness of families to take neonates out of the home [67-69]. Most neonatal deaths in developing countries therefore occur at home [70].

Now we know that community-based and home-based newborn care can reduce neonatal mortality and morbidity from a body of research findings in many resource poor settings [71-73]. The recent study conducted in Bangladesh [74] showed that a home-care strategy reduced neonatal mortality by 34 percent. This study adds to the growing body of evidence that home- and community-based strategies can significantly reduce neonatal mortality by improving newborn care including identification and management of newborns illnesses outside of a health-care facility.

The Government of Bangladesh is committed to implementing these evidence-based interventions through the health system [75] to improve maternal and neonatal morbidity and mortality but the majority of these interventions have not yet been effectively operationalized in an integrated manner.

## **Community support groups (CSGs)**

Community Support Groups are being formed to disseminate the important messages of maternal and neonatal health to all sections of the rural population and specially aiming the mothers and more precisely the pregnant mothers and their families. The CSGs are now being formed around the new wards of the unions catering to the need of three to three thousand five hundred populations. Areas where Community Health Clinics (CHC) are functioning no new CSG will be formed but the existing support groups of the CHCs will be strengthened. The social responsibility of the CSGs includes:

- a) Identifying the pregnant mother from the respective community
- b) Assisting pregnant mothers for seeking ANC, delivery care & PNC
- c) Creating awareness on the complication of maternal and neonatal health,
- d) Establishing linkage between the community and the providers (Government, NGO, Private sector)
- e) Establishing friendly and enabling environment within the community with regard to maternal and neonatal health care
- f) Arranging transportation during complication to attend facility
- g) Creating awareness on danger sign during pregnancy and awareness of availability of services provided by facility.

They are the front bearers of the intervention of the project in the dissemination of important messages of maternal and neonatal health, arranging for referral etc. Through the development of CSGs, UNICEF programmes address the first delay (seeking care) and second delay (getting to the health facility) experienced by pregnant women [76]. CSGs and participatory approaches through group sessions and family involvement in care, were especially effective in reducing perinatal deaths [77].

### **General objective**

Improvement of maternal and neonatal health by operationalizing an integrated evidence-based intervention package through strengthening of the health system in Bangladesh.

### **Specific objectives of the study are-**

To test the effectiveness of an integrated evidence-based intervention package in one selected sub-district to

- a) Increase utilization of skilled birth care from 13% to 50%
- b) Decrease the rich-poor gap in the use of skilled care, from 6:1 to 2:1
- c) Increase met need for obstetric care, from 13% to 75%
- d) Decrease neonatal mortality, from the present 37 to 21 per 1000 lbs, and
- e) Improve the quality of care by the end of the study period (December 2011)

The study is being implemented in close and strong collaboration with GOB and other stakeholders at national and local levels by strengthening the existing sub-district health system. In the first phase the intervention is being implemented in one sub-district and will be subsequently scaled-up in the entire district if found successful and feasible. Policy recommendations are to be formulated for national scale-up at the end of the project.



## CHAPTER TWO

### METHODOLOGY

This operations research study is using both quantitative and qualitative methods to evaluate the program at the - facility, community, and family/ individual level. The intervention package is being operationalized in one sub-district in Bangladesh covering about 600,000 people between January 2009 and December 2011. The full intervention package is being implemented for 2 years, 2010 and 2011.

#### **Study design**

This study is being evaluated using a pre- & post- design with the use of quantitative research method. The idea that pre-post design would be the best option for the study design as because finding an ideal control area for this kind of study is very difficult as many sub-districts are having one or the other interventions proposed in this study. It would be very difficult to isolate effect of any single intervention in this situation. Qualitative research methods are being used to inform the development of the intervention package as well as to document the process of implementation. An ongoing monitoring system is in place to observe progress in process indicators.

#### **Study site**

This study is being implemented in Shahjadpur sub-district of Sirajganj district under Rajshahi division. Shirajganj district is lying on the west of Jamuna River and about 180 km northwest of Dhaka. It consists of nine sub-districts. The population size of Sirajganj as of 2001 census is 26,93,814. The research will be implemented in Shahjadpur sub-district with a population around 600,000. The sub-district comprises of thirteen unions and a Municipality. The internal communication of the sub-district is poor and in a few unions the communication is only riverine. During most of the rainy season the communication of the sub-district depends on country made boat. Few credible national and international NGOs serve the sub-district. Farming and weaving are two important profession of the sub-district. It is under the umbrella of universal DSF scheme where all pregnant women with one or no child can avail the scheme during pregnancy irrespective of the economic and social status. The UHC also is the only CEmOC service provider in the sub-district.

#### **Quantitative research**

Quantitative research methods is being used to assess the effectiveness of the intervention through

- a) Community-based survey among women who delivered in the past 6 months;
- b) Facility audits in all GOB, NGO and private hospitals/clinics in the study area.

Pre- and post- interventions survey of each of these quantitative components will be conducted to assess the effectiveness of the intervention package and the present report represents the pre-intervention evaluation of the two quantitative elements.

#### **a) Community baseline survey**

The community baseline survey was conducted among 3158 women who delivered in the 6-month prior to the date of interview in the selected sub-district in the month of November 2008 to March 2009. The women were interviewed for their socioeconomic characteristics including possession of household assets, demographic characteristics, care-seeking patterns for the last pregnancy/delivery/postnatal period, newborn care, perceived quality of care, neonatal outcomes as well as availability and benefit from the maternal health voucher scheme (MHVS).

For selection of subject, simple cluster (equal cluster) sampling technique was employed. All the 'mouzas' (revenue villages) in the selected sub-district was divided into number of blocks so that each block include around 3,000 population. This generated 194 blocks out of total estimated 600,000 populations in Shahjadpur sub-district according to the 2001 census. Out of total 194 blocks, 80 blocks were randomly selected for the community survey.

**Listing:** After finalization of the blocks, identification of the blocks union wise was done and listing of mothers who delivered in the last one year was done. At the time of listing, interviewers only listed the mother within the selected segments who had delivered in the last one year. Total 4611 listing forms had been filled-up by the interviewers.

**Sample size and data collection:** The community survey was conducted with all women (expected 3000) who delivered in the 6-month prior to data collection date before the implementation of the intervention in the selected sub-district. An equal number of women will also be interviewed after 2 years of implementation of intervention. During this time period, to test a reduction of neonatal mortality from 37 to 21 per 1000 lbs with 95% confidence and 80% power, a minimum of 1250 mothers who delivered live born babies are needed to be observed at each point of survey. To cover women who delivered stillbirths (assuming 30/1000 births), a total of 1290 mothers who delivered either a live or still birth will be included. Further inflating the sample size 5% to compensate for non-response a total of 1360 mothers who had delivery outcome (after 28 weeks of gestation) will be required for selection of samples. Considering a design-effect of 2 for cluster sampling - a total of 2720 (approx. 3000) mothers who delivered in the last 6-months were to be interviewed in baseline survey. So for the baseline, considering crude-birth rate of 28.7 per 1,000 populations per year, with a population around 3000 per cluster, about 43 women who delivered live births in the last 6-months were selected in each block. Considering stillbirth rate 30/1000 live births, in each block there was total 44 women who delivered live or still births after 28 weeks of gestation. Thus from eighty blocks total 3158 mothers were selected and interviewed.

Twenty interviewers were recruited by Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies (BIRPERT) on November 1, 2008 and training was arranged and conducted from 3-12 November 2008 in BIRPERT, Dhaka by the project personal as well as trainers from ICDDR,B.



Training of the data collectors in the BIRPERT training room facilitated by ICDDR,B, Dhaka

The nine-day long (3<sup>rd</sup> - 12<sup>th</sup> Nov 2008) baseline survey training was conducted according to a prepared schedule to facilitate the baseline survey at Shahjadpur sub-district. Twenty data collectors attended the training at BIRPERHT, Dhaka on community survey methods, different components of the baseline questionnaire and household line listing. The training focused on information related to maternal and neonatal care and complications, socioeconomic status, ANC, delivery care, PNC, DSE, family planning and Expanded Program on Immunization (EPI). On completion of training, pre-testing of the questionnaire was done in Keraniganj of Dhaka district, Mirzapur of Tangail district and also at project area i.e. Shahjadpur sub-district, Sirajganj.

Finally sixteen data collectors were selected for collection of baseline data for the study at Shahjadpur. Consent forms and guidelines for the baseline questionnaire were developed. All the respondents were required to sign in the consent form prior to the interview. The data collectors were sent to the field site on 14<sup>th</sup> November, 2008 and the 15<sup>th</sup> was allocated for field exercise and feedback at the project area. Data collection for the baseline survey started on 16<sup>th</sup> November 2008. By March 2009, a total of 3158 complete questionnaires from all the 80 segments were collected ending the baseline data collection. Data editing and entry for analysis were done at Reproductive Health Unit (RHU), ICDDR,B using the Oracle 10G and SPSS 11.5 programs. Designing of data collection tools, training of the data collectors and quality control components were with ICDDR, B.

Data collection activities for the baseline survey at Shahjampur sub-district



## **b) Facility audit**

Facility audits for review and assessment were conducted from January to March 2009 in all the GOB, NGO and private health facilities (both basic and comprehensive EmOC) to assess the quality of obstetric and newborn services. These audits included interviews with different types of providers and included 20 public facilities (the Upazila Health Complex (UHC), 11 Family Welfare Centers (FWCs) and 8 Rural Dispensaries (RD)) and 4 facilities each from the private and NGO sectors, and included review of physical resources, adequacy of manpower, availability of equipment, supply of drugs, blood cross-matching and screening facilities, etc. Record keeping systems was also thoroughly reviewed. Met need for obstetric care was assessed as part of the facility audits. Data were extracted from facility records for the 6 months prior to the audit by types of complications and outcomes.

## **Monitoring and supervision**

An effective monitoring and supervision system is placed in the study area by deployment of a field implementation team consisting of Field Research Manager (one), Senior Field Research Officer (one), Field Research Officer (one) and Field Research Supervisors (four). This field team will remain in the field throughout the study implementation period. They will be responsible for monitoring and supervision of the project implementation, establishing CSGs, establishing referral linkage between the community and the EmOC facilities, documenting the process of implementation of different interventions, collecting service statistics from the facility and the providers in the community etc.

## **Data analysis**

Data analysis of the baseline was done in SPSS 11.5 version for windows in PC. Endline data will be compared with that of baseline. Monitoring data would be used for trend analysis. Economic status of the respondents was measured by an asset index derived from household asset using principal component analyses [78]. The assets included durable consumption goods (e.g. table, chair, watch, television, bicycle), housing facilities (e.g. types of toilet, sources of drinking water), housing materials (e.g. types of wall) and land ownership. The asset index was categorized into five ordinal categories.

Multivariate analysis will be done to test the effectiveness of the intervention for 1) increased utilization of skilled care 2) decreased rich-poor gap and 3) decreased neonatal mortality adjusted for possible confounders. For increased utilization of skilled care multivariate logistic regression will be done to estimate and compare the odds ratio for utilization of skilled care at two different survey points considering non-user of skilled care as reference category. For decreased rich-poor multivariate logistic regression will be done to estimate and compare the odds ratio for utilization of skilled care between socioeconomic quintiles at two different survey points considering non-user of skilled care as reference category. For decreased neonatal mortality multivariate logistic regression will be done to estimate and compare the odds ratio of neonatal mortality at two different survey points considering surviving neonates as reference category.

## CHAPTER THREE

### RESULTS

#### *Community baseline survey*

##### *Background characteristics of the mothers*

The community baseline survey was carried out in 3158 mothers who gave birth in the preceding six months from the date of the interview in randomly selected segments of different unions of Shahjampur sub-district. Data collectors from BIRPERT supervised by ICDDR, B and BIRPERT personals completed the data collection in the month of November 2008 to March 2009.

The majority of the mothers interviewed during the baseline are in the 20 to 29 years age group (62.6%) followed by a sizable portion (22.7%) of mothers below the age of 19 years (**Table 1**). Majority 51.2% of the mothers are in the education level 1-8<sup>th</sup> standard. The proportion of mothers with no schooling is 36.1%, with highest proportion of mothers with no schooling in Sonatoni (66.4%), Kaijuri (55.5%) and Gala (54.4%) unions, which are poor performing and far away from the sub-district headquarters. Majority 96.4% of the mothers were Muslims but the Municipality has a small Hindu population of 9.7%. In 32.7% mothers, the total family income is below Tk. 3,000 in the sub-district with the percentage as high as 58.9%, 43.5% in Sonatoni and Gala unions respectively. In total 61.9%, the family income is below Tk. 5,000. Only 11.7% of the mother's family income was more than Tk. 10,000 with the percentage as high as 17.9%, 17.8% and 15.7% in Municipality, Garadah and Kayampur unions respectively and as low as 1.9% and 3.6% in Sonatoni and Gala unions respectively. An equal sub-district representation of mothers in the different asset quintile, and is around 20% in each of the quintiles with union wise variations. Union wise the percentage of mothers in the poor quintiles was highest in Sonatoni (52.3%) and Gala (49.7%) unions, whereas 35.4% and 26.5% of mothers are in the rich quintiles in the Municipality and Potazia union. By profession 94.7% of the mothers are housewife followed by weavers 3.6%.

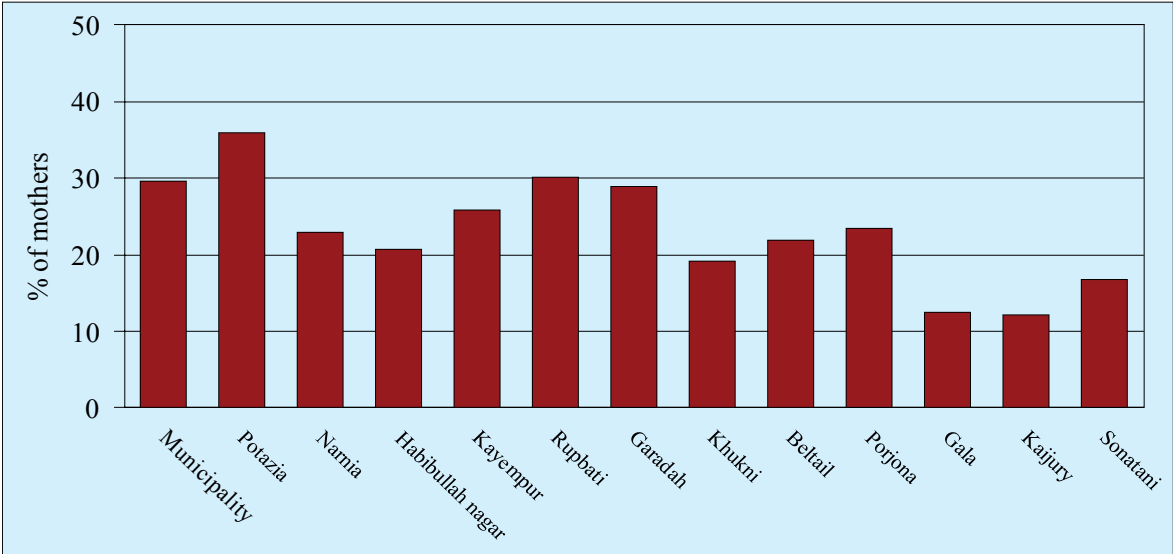
The distance of the health facilities from the mother's residence in the majority cases (73.7%) were less than three kilometers except for Sonatoni union where in 57% of the cases the distance was more than eight kilometers. The distance of the health facility less than 1 kilometer was in 21.8%. Foot, van and rickshaw were the common (86.2%) mode of transport in the sub-district but the mode of transport in Sonatoni was country boat and engine boat (75.7%) as it is located in the Jamuna river. Within half an hour the majority of mothers (60.5%) could reach the facilities except for Sonatoni where the time required to reach a health facility was more than one hour in 88.8% of the cases.

Mothers age at marriage below or equal to 14 years is 27.1%, 15 to 17 years is 44.2% and in Sonatoni union age at marriage was less than 14 yrs in 40.2% of cases. The mean age at marriage for the sub-district is 16.1 years with the lowest mean 15.1 years in Sonatoni union (Table2).

As per the baseline findings and perceived by the mother, the baby delivered was of normal size in 70.6% cases and less than normal and very small accounted for 22.8% of all babies delivered. Around 2% of the babies died during delivery. Fourteen percent of the babies were premature (babies delivered before the 38<sup>th</sup> week of pregnancy), the proportion of premature delivery was nearly 18% in Garadah, Habibullah Nagar, Beltail and Sonatoni unions and lowest in Narnia union (8%). Only 8.7% mothers had the history of single abortion while 0.3% had abortion more than three.

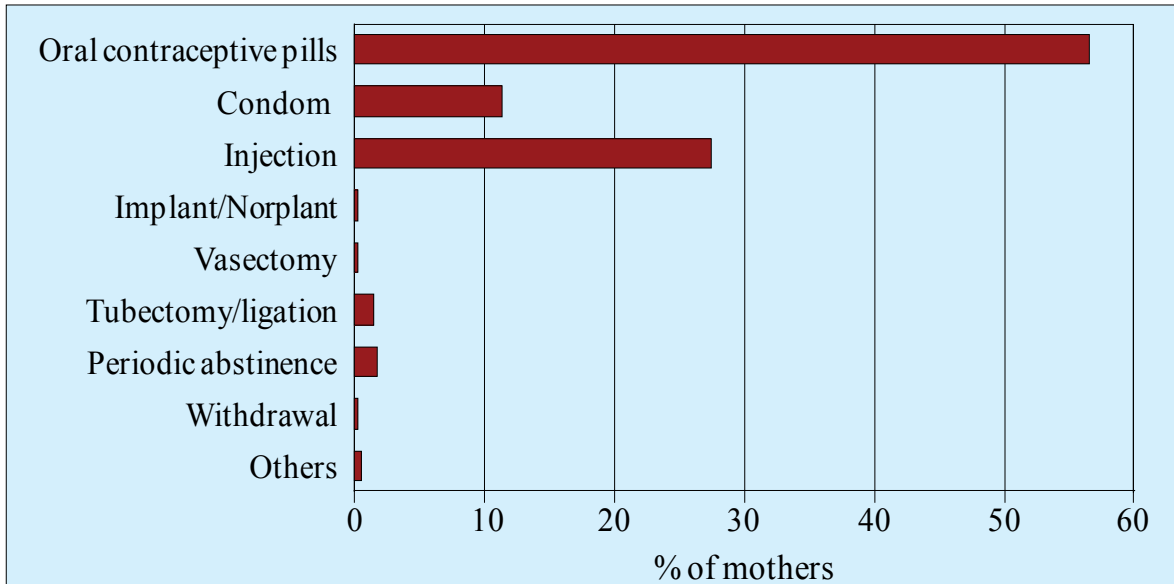
**Birth preparedness**

Around 23.0% of the mothers interviewed acknowledged the use of different family planning methods in the sub-district with union variations at the time of the interview. Mothers of Kaijuri union are the least user (12.2%) followed by Gala (12.4%) and Sonatoni (16.8%) unions (Figure 1). The use of contraceptive method is better in Potazia (35.9%), Rupbati (30.1%) unions and the Municipality (29.5%).



**Figure 1: Mothers using family planning method by Shahjadpur unions**

Among the different contraceptive methods available, the widely used method is the oral pill 56.5% followed by the injection 27.4% and condom 11.4%. Permanent method of contraception, Tubectomy is as low as 1.5%. Surprisingly, injection is high in one of the remote union like Sonatoni (55.5%). Oral contraceptive and condom use is around 16% in Sonatoni (Figure 2).



**Figure 2:** Types of family planning method used by mothers in Shahjadpur sub-district

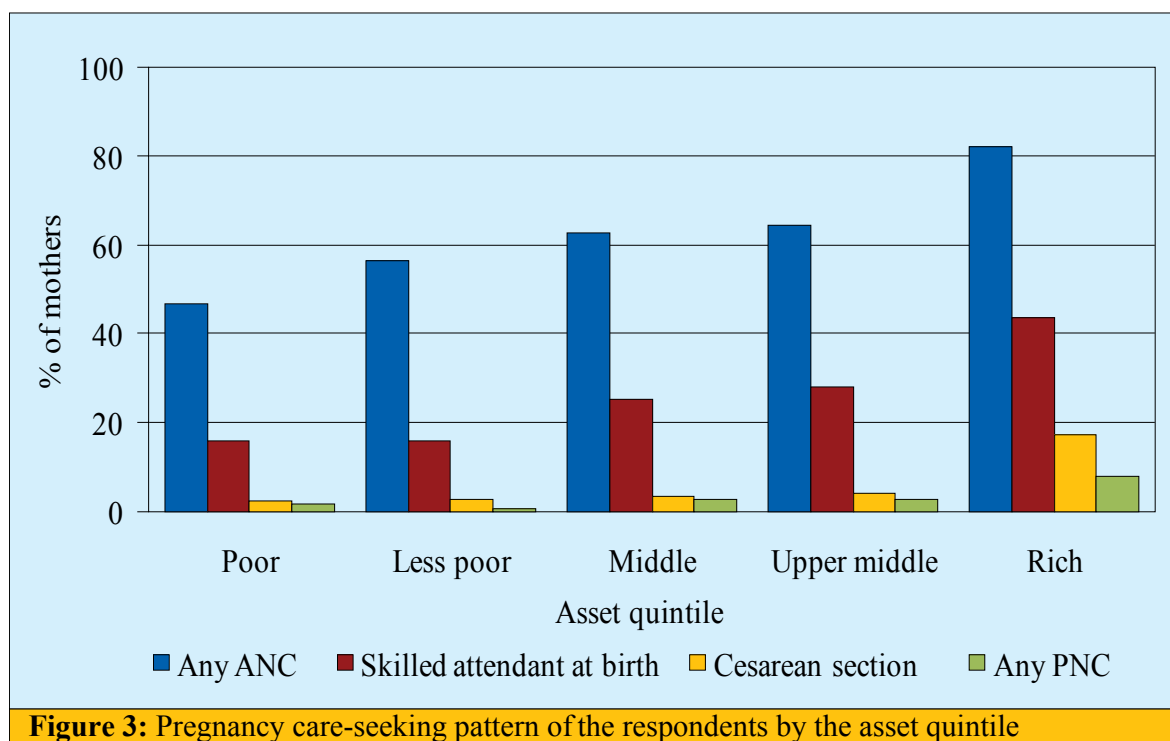
Knowledge on planning for safe delivery was assessed and around 41% of the mothers were found to have knowledge regarding regular ANC visit during pregnancy, 38.1% have knowledge on savings during pregnancy and 15.4% knew of the necessity of health facility selection in advance for safe delivery (**Table 3**). Nearly 31% mothers were not aware of any planning for safe delivery and the situation was severe in Gala, Rupabati and Sonatoni unions and even in Potazia union where other indicators are good. Seven percent (7%) mothers stated that there was no need for planning in advance during pregnancy.

When asked, 53.5% of the mothers acknowledged that they planned in advance for safe delivery and the rest 46.5% did not (**Table 4**). Among the mothers who had not planned in advance during delivery, the main reasons included, mothers not aware about planning in advance (71%), no decision from the family (13.1%) and the lack of money (13.1%). Ignorance regarding planning in advance was very high in Porjona, Potazia, Rupabati and Kaijury union.

### Care during pregnancy

Health care services utilization during pregnancy is better in the rich quintile but progressively falling in the other quintiles. ANC services are utilized around 82.3% and 47.1% in the rich and poor quintiles respectively but PNC is poor in all quintiles including the rich. The rate of caesarian section is high 17.3% in the rich quintile whereas in the poor quintile is 2.4% (**Figure 3**). The percentage of skilled birth attendant at delivery in the rich quintile is 43.9% compared to 16.2% in the poor quintile.





**Figure 3: Pregnancy care-seeking pattern of the respondents by the asset quintile**

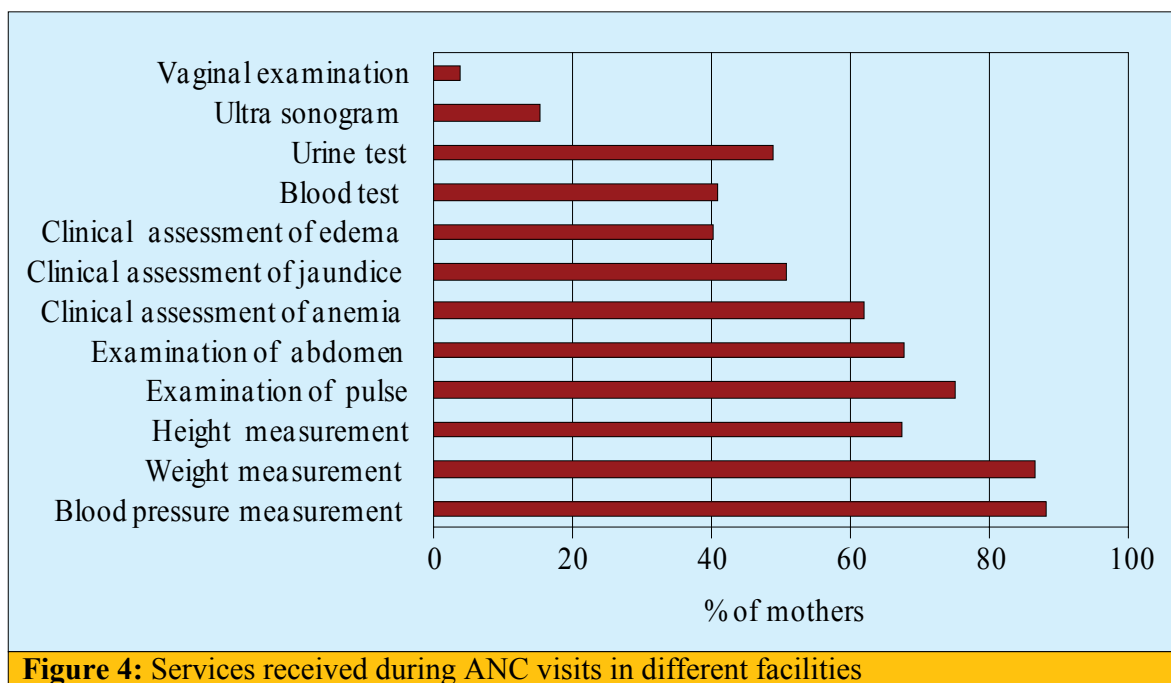
### Antenatal care (ANC)

Any ANC visit during the last pregnancy in the sub-district is nearly 70%. About 24% of the mothers received just one ANC, 22.7% two, 13.7% received three and 9.3% of the mothers received four and more than four ANC visits (Table 5). ANC visits are very high in the Municipality, Narnia, Garadah unions. The percentage of no ANC visit is 81.3% in Sonatoni, 59.1% in Gala, 45.1% in Khukni and 40.7% in Kaijury unions. The timings of the ANC visits in the baseline survey do not tally with the normal visit schedule, the first ANC visit within the first four months was only 8.1% and 31% of the mothers attended for the first ANC checkup after eight months of their pregnancy. In the Municipality the first ANC visit within the first four months is 20%. In Sonatoni union the percentage of any ANC visit is only 18.7% and among those who received ANC, 14% have only one ANC visits and even this visit took place after the 8<sup>th</sup> months of pregnancy. The median gestational age at which the first ANC visit was taken by the mothers for the sub-district is 21 weeks.

The utilization of ANC services was very high in the rich stratum (87.6%) and gradually declining to (54.7%) in the poor groups among all the ANC receivers. In the poor quintile the 4+ ANC visit is only 1.9% whereas in the rich quintiles it was 25.5%.

Majority of the mothers (85.2%) received ANC services at the facilities out of which (57.6%) received ANC service from the UHC (Table 6); other public/private facilities contributed to 10.0%, satellite clinics (Govt.) 4.8% and FWC 6.3% each. At home 13.2% ANC services are provided by the skilled provider.

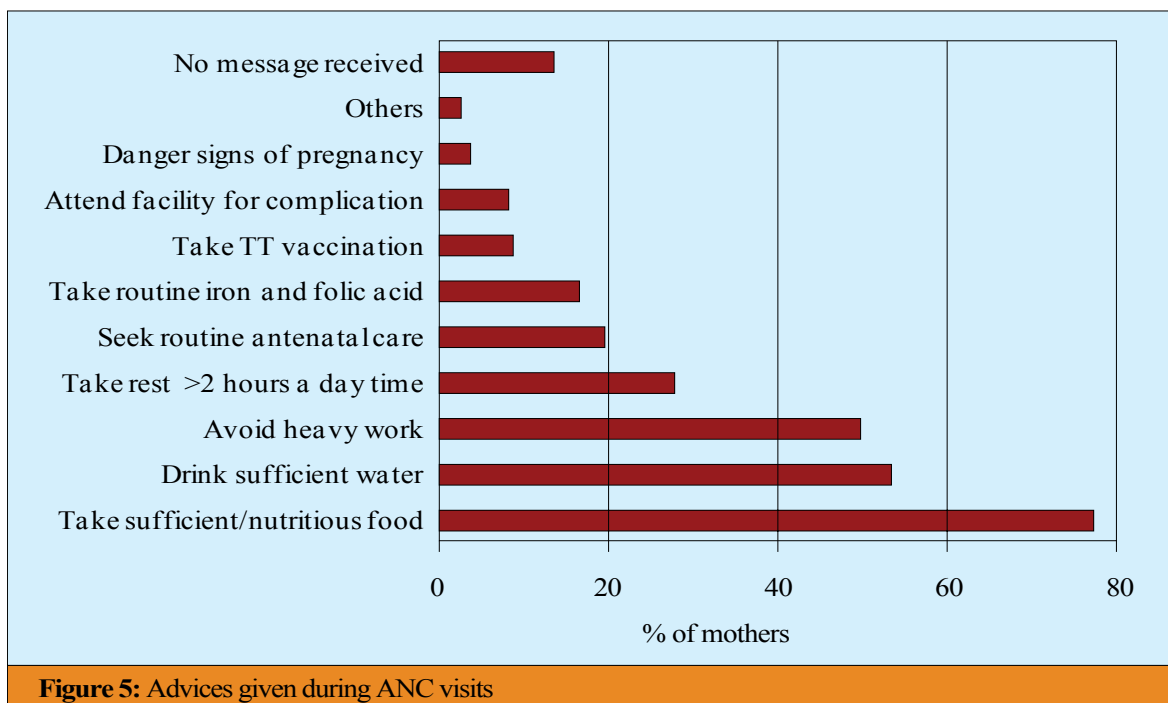
The different services provided to the mothers during their antenatal check up visits at the facilities and at home (**Figure 4**), though all the services are not part of the routine ANC care. Blood pressure was measured in 88% of mothers followed by weight, pulse, height and anemia measurement. Jaundice, edema, blood and urine were tested in less than 50% of the mothers on the day of examination. The rate of ultra sonogram was more in the Municipality and Rupabati and Khukni unions.



No advice was given to 13.6% of the mothers attending ANC sessions (**Figure 5**). The frequency of imparting some important advice to the mothers was very poor, only 3.1% were told about the danger signs of pregnancy, 0.1% about the danger signs of the neonates, less than 1% about the different components of birth planning, 0.2% about the use of safe delivery kit and less than 1% were told about the availability and use of maternal health voucher scheme, importance of breastfeeding and provision of pictorial card of the danger signs of pregnancy. However 77.2% were advised to take nutritious food, 53.6% to drink more than normal water and 49.7% were told to avoid heavy work.

One-third (34.1%) of the mothers did not take any kind of medicine during the ANC period. A sizable 41.6 % of the mothers had iron, 29.3% vitamins but only 2.3% had taken folic acid. Thirteen percent had taken calcium and a sizable number of mothers (27.6%) took various drugs during the pregnancy period.

Around forty four percent of mothers did not experience any complication (as perceived by the mother) during the antenatal period (**Table 7**). Remaining mothers had complication of various types, from mild headache and fever to more severe cases of vomiting and convulsion. Blurring of vision, convulsion, vaginal bleeding, foul



**Figure 5:** Advices given during ANC visits

vaginal discharge and reduced or absent fetal movements are categorized as severe complications and 12.2% of the mothers suffered from these complications. Of the 63.8% mothers who suffered from complication, 67.7% sought treatment. MBBS doctors rendered treatment to 39.6% of the mothers followed by the village doctors who contributed to 32.6%. Next in line were treatment by homeopathic doctors, nurse/FWVs, drug sellers and kobiraj and hakims. Treatments by village doctors were as high as 50% in Sonatoni union.

The reason for not availing treatment for antenatal complications include, did not think treatment necessary in 46.9% followed by lack of money in 29.3% of the cases (Table 8). Social reasons like no permission from the family, does not want to take service from the male doctor, cultural taboos, religious reasons etc. accounted for nearly 18.4% of the cases. Five percent of the mothers were unaware of the services or did not know where to go for the treatment. More than 8% had other reason like didn't know where to go/ transportation problem/ long distance/ lack of quality service/ lack of qualified service provider/ service unavailable/ inadequate drug supply/ inconvenient service hour/ long waiting time/ misbehavior of the health service provider.

### Delivery care

Normal vaginal delivery accounted for 93.9% of all the delivery in the sub-district followed by cesarian section 6% (Table 9). The cesarian section rate was highest (15.7%) in the Municipality followed by 11.0% in Potazia union, 7.9% in Beltail union and 7.8% in Habibullah Nagar union. All the unions with high caesarian section rate are near to the UHC and other private and NGO health service centers. The duration of labor pain was less than 12 hours in 97.7% of the mothers.

Nearly 43.0% of the mothers were given injection in the sub-district during the pregnancy period and among them 78.2% were given at home. At home majority of the injections (61.2%) were provided by village doctors followed by the government CSBAs 6.8% and the TTBA/TBAs accounting for 5.9%. In Sonatoni union 92.6% of the injection was given at home by the village doctors whereas in the Municipality and Potazia union the percentage of injection given at home by the village doctors was 32.8 and 33.3% respectively. Union wise the baseline shows a considerable variation in union wise injection use, 55.4% mothers had an injection in Khukni union, which is the highest and Sonatoni union being the lowest with 25.2%, probably because of lack of both skilled and unskilled provider in Sonatoni. Around 30% of the mothers were given injection by a skilled attendant in the sub-district and the rest 70.5% was given by the unskilled providers and among unskilled provider majority were village doctor (61%).

Delivery was conducted at home in 82.4% of the respondents (**Table 10**) and remaining 17.6% in the health facilities. There is union wise variation too with more than 90% of the delivery being conducted at home in Sonatoni, Kaijuri and Gala unions. Delivery in the facilities was high compared to other unions in the Municipality (38.9%) and Potazia union (37.0%). Facility wise the majority of the delivery in the sub-district was conducted in the UHC (9.2%), followed by the private clinics and doctors' chamber (4.8%). Home and facility delivery also varies in relation to the asset quintiles. Home delivery is above 80.0% in all the asset quintiles except in the rich quintile where it is 66.6% (**Table 11**). The delivery in health facility was highest (33.4%) in the rich quintile with majority of the mothers visiting private clinics and doctors' chamber (14.9%) followed by UHC (11.3%). The table shows higher the asset quintile, higher the facility delivery and vice versa. In Shahjapur sub-district 26.4% of the delivery is conducted by a skilled provider and 73.6% conducted by an unskilled provider (**Table 12**). Out of the total (26.4%) skilled attendant providing services during delivery 10.6% were nurses and FWVs, 8.3% were doctors and 6.6% were existing government CSBAs. The proportion of delivery by skilled attendant is high in the Municipality (46.4%), Potazia (43.2%), Narnia (38.9%) and Habibullah Nagar (36.2%). Delivery by doctors and nurses was high in the Municipality (43.9%) and Potazia union (34.8%). Amongst the unskilled attendants the vast majority of the delivery, 71.1% out of the total 73.6% was conducted by the TBAs and TTBA.

As mentioned earlier delivery conducted by skilled birth attendant is 26.4% in Shahjapur sub-district but variation based on the socioeconomic status of the mothers is seen. Higher the position in the asset quintile better was the use of skilled attendant at delivery and vice versa. In the rich quintile nearly 44% of the mothers used the services of a skilled attendant at delivery but only 16.2% of the mothers in the poor quintile sought for skilled attendant (**Figure 3**). Though the sub-district percentage of mothers visiting a doctor is 8.3% but in the rich quintile it was 22.7%. The utilization of CSBAs is around 6.5% for all the quintiles except 9.2% in the upper middle strata. In the poor and less poor quintile the delivery by the TBAs and TTBA is as high as around 80.0% and gradually falling around 53.4% in the rich quintile.

Around 31.0% of the mothers suffered from complications (as perceived by mother) during delivery. Treatment was sought by 91.6% of the mothers. The complications includes severe headache, fever, excessive bleeding, baby's hand/feet came out first, prolonged labor, retained placenta, ruptured uterus, inversion of the uterus, unconsciousness, obstructed labor and transverse lie. The highest percentage of complication is obstructed labor (pain >12 hours) 41.2% followed by retained placenta 17.2% and vaginal tear 16.0% (**Table 13**). Majority of the complications were managed and treated at home and the main healthcare provider at home is TBA/TTBA followed closely by the village doctors and CSBAs. Facility wise the main sites of treatment are the UHC and private clinic/doctor's chamber. A small proportion of the respondents did not take any treatment and the reasons are mothers didn't feel the need for taking treatment followed by lack of money, no permission from the family, unaware of the services. A small percentage also stated that they didn't want to take treatment from a male doctor, inconvenient service hour and misbehavior of the health service provider.

### **Referral pattern of the mothers having delivery complications**

Amongst the 992 mothers (31.4%) who had complications at the time of delivery only, 5.7% of them were referred for complication management (**Table 14**). Facilities where the maximum referral took place were UHC (40.0%), private clinic/doctors chamber (33.9%), district hospital (16.1%), and NGO static clinic (7.2%). Among the service providers TTBA/TBAs referred most (46.7%), doctors- Nurse/FWV, and village doctors each referred around 13%. A sizable portion of the complications happened in the father's house of the respondents (44.4%) followed by the husband's home (37.8%). Around 9% complications occurred in the UHC. The time required to take decision to transfer the mother to the referred facility was more than an hour in 41.8% of the cases, around half an hour in 32.9% and one hour in 19.9%. Husbands (38.3%), in laws of the respondents (11.1%) were the prime decision makers followed by the parents of the respondents (28.9%) and relatives, friends and neighbors contributing to 9.4% of the decision making.

Majority (82.8%) of the mothers went to the referred place as suggested, 4.4% went to other facilities for the treatment and 12.8% did not go to any facility for receiving treatment for the complications. Around half of the mothers used rickshaw/van to reach the referred facility, 23% reached by ambulance/microbus and 11% by boat/trolley. Other transports used are tempo/CNG/baby taxi (6.7%), foot (5.4%), bus (3.4%), and Nasimon and Karimon (a special locally made motorized vehicle) (2.7%).

### **Postnatal care**

In the sub-district only 4.8% of the responding mother's availed postnatal care (**Table 15**). Out of this 4.8% of mothers who availed PNC care, 2% availed the service in the first seven days, 2.1% availed it between day 8 and 15 days and the rest received PNC after day 15. The first visit in Municipality, Kayempur, and Garadah unions

were within the first seven days after delivery. The majority of mothers, availed PNC services from the private clinic/doctor's chamber (24.5%), followed by UHC and village doctors each (19.2%). CSBAs provided PNC services to 7.3 % of the mothers, nurses/ FWVs provided to 6.0% of the mothers and NGO static clinic to 5.3% of the mothers.

During the PNC visit majority of advices were not imparted by the service providers. Twenty three percent of the PNC care receivers were not given advices at all during the PNC visit. Advice on nutritious food (62.5 %), exclusive breastfeeding (23.0 %), and taking of vitamin A was comparatively better than the other components of the PNC advices. Advices on family planning (3.3%), complementary feeding (1.3%), danger-signs of the postnatal period (3.9%) and where to visit with postnatal complications (6.6%) were very poor. The different services provided to the mothers during the PNC visit were also very poor. Pulse and blood pressure was measured in only 50.0% of the cases. Abdomen examination done in 43.4%, anemia in 36.2% and temperature measured in 36.2% of the mothers. Weight measured in 26.0% and very poor breast examination.

Of the mothers interviewed, 31.9 % suffered from postnatal complications (**Table 16**) out of which 83.9% sought some kinds of treatment either at home or in a static health facility. Most of the mothers took treatment from village doctors (39.2%), private clinics/doctor's chamber (20.9%). There were varied responses for not taking postnatal complication treatment at Shahjampur sub-district. The most important reason was lack of money, cited by 59% of the mothers. Quiet a good number of mothers 28.6%, said that they didn't feel any urgency or necessity to go for management of PNC complications. More than 15% of the mothers stated that they were not given permission by their family and other social reasons also contributed like religious reasons, does not like to take treatment from a male doctor etc, 3.7% of the mothers were unaware of the presence of the service in the sub-district.

### ***Neonatal care-seeking practices after delivery***

As the study aims to improve the neonatal health of the sub-district by the different interventions proposed, a good portion of the questionnaire was devoted to bring in information regarding the present practices regarding neonatal health in the community.

The very first activity performed after the delivery of the baby was cutting of the cord in 73.6% followed by drying of the baby in 9.9% of the cases (**Table 17**). Majority of the babies were not wrapped or dried (**Table 18**) and neither breastfed (97%) before the expulsion of the placenta (**Table 19**). Normal breathing was present in 77.7%, absent in 5.6% of the babies and in 14.2% was breathing slowly (**Table 20**). 23.5% of the neonate required help to initiate normal breathing (**Table 21**). Different activities were performed to initiate breathing, like slapping of the baby in 80.4% of the cases, hanging by the legs (47.2%), rubbing the back of the foot (21.1%), holding

the baby upside down (19.6%), applying warmth to the cord in 3.7% cases (**Table 22**). Blade was used in 75.6% to cut the umbilical cord followed by scissors (17.4%) (**Table 23**) and in 55% of mothers, materials were boiled before cutting the cord (**Table 24**). 71.0% of the babies cord was cut by the TTBA/TBA followed by the nurses 14.5%. The cord was tied by old thread (41.2%), new boiled threads (25.8%) and boiled threads from safe delivery-kit (17.5%) babies (**Table 25**). In 81.5% of the neonates nothing was applied to the cord after tying (**Table 26**). In the 14.8% neonates where something was applied to the cord, 39.9% the materials applied to the cord included antiseptic (Savlon, Dettol, Cream), antibiotics (32.2%), mustard and coconut oil (11.5%). Other materials used included spirit, gentian violet, boric powder, talcum powder and turmeric (**Table 27**). In only 8% of the cases, bath was undertaken immediately after birth. A good proportion (32.4%) of the babies was bathed on the third day of birth and the percentage of bathing the baby any day after wards was (38.1%).

Ninety nine percent of the babies have been breastfed after birth irrespective of time of initiation of feeding, frequency and duration and only 1% did not breastfeed at any point of time after birth (**Table 28**) and 98% babies were given colostrums (**Table 29**). Within the first thirty minutes of birth 44.8% of the babies were breastfed and within the next thirty minutes another 25.7% were breastfed, so within the first hour of birth 70.5% of the babies were breastfed. Eighteen percent were breastfed within the 1<sup>st</sup> day and the rest 11% babies were fed after 2 days or more after birth (**Table 30**). In addition to breast milk other foods like cows/goats milk (25.4%), misri pani (sweet water 11.4%), honey (4%) and other foods were also given as first food. Nothing was given with breast milk in 30.2% of the babies in the first month. In 61.5% cows/goats milk was given, in 6.6% baby or infant formula and other items like honey, misrir pani, sugar water were given. Exclusive breastfeeding, according to the age at the time of interview, was 42.1% (**Table 31**).

Majority of the babies were kept in the bedroom, 2.3% in the kitchen and 7.7% in other rooms. The baby were placed in the floor in 49.4 % of the cases and on bed in 49.9% during the first week. In 91.6% the baby's health was not checked immediately after birth by any medical person. Within the first day, health check up was done in only 15.7% of the babies and in 27.4% it was done within the first week. More than one-third of the mothers did not know if any health check up was done. Among the neonate who received any health check up after birth, MBBS doctors conducted health check up in 37.9% of cases followed by TTBA/TBA 21% and nurses/FWVs in 16.5 % of the cases. Village doctors contributed to 8.5% and CSBAs (government) 5.2%. No advice was given in 15.3% of the mothers during the health check up of the baby. In others advice was given to keep the baby dry 45.6%, exclusive breastfeeding 40.7%, to immunize the child 31.9%, keep the cord clean in 29%.

More than half (55.4%) of the neonate experienced some kind of medical condition during the first month as stated by the mothers (**Table 32**). The common illness in

the first month was cold/cough, fever, difficulty in breathing; jaundice to name a few and almost 92.2% of the mothers sought treatment for the illness (**Table 33**). Nearly half 49.2 % of them had treatment for illness from Homoeopathic doctors/village doctors and MBBS doctors accounting for 26%. Facility wise treatment was taken in private/doctors clinic 60.1%, home 22.3% and 14.3% in NGO static clinics.

### **Knowledge and utilization of maternal health voucher scheme**

Demand side financing (DSF) is an important government intervention to address the maternal and neonatal health care services in Bangladesh and in Shahjadpur DSF is universal - every pregnant mother can avail the benefit from the fund having one or no child irrespective of the socioeconomic status.

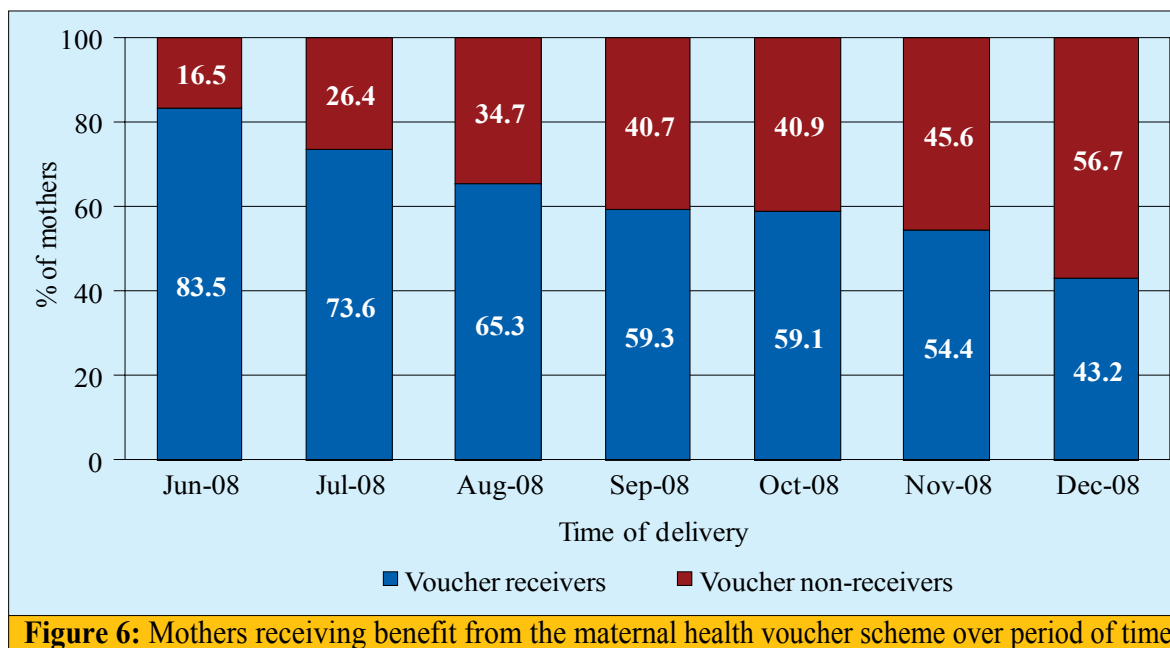
As part of its Health, Nutrition and Population Sector Programme (HNPS), Bangladesh's Ministry of Health and Family Welfare (MoHFW) is implementing DSF maternal health voucher program in 33 sub-districts around the country. The program distributes vouchers to pregnant women entitling them to access free antenatal, delivery, emergency referral, and postnatal care services, as well as providing cash stipends for transportation and cash and in-kind incentives for delivering with a qualified health provider. The program also provides incentives to health care providers for identifying eligible women and providing maternal health services. When initially implemented in August 2006, women identified as extremely poor were eligible for vouchers; in 2008, eligibility was made universal in 9 sub-districts. The objective of the program is to increase the use of qualified birth attendants and mitigate the financial costs of delivery, as part of Bangladesh's efforts to reach MDG 5 and achieve 75% reduction in maternal mortality by 2015.

The baseline shows that 93.5% of the mothers had knowledge regarding the DSF scheme being provided in the sub-district but relatively a lower percentage knew in Sonatoni and Gala unions (**Table 34**). The source of knowledge regarding DSF is diverse and in majority (57.4%) of cases, the sources being relatives/friends/neighbors and in 53.3% the FWAs/FHAs. Government CSBAs were responsible for 17.6% and nurses/FWVs contributed to 10.9% of the responses. But in Habibullah Nagar the CSBAs responses was as high as 45.1% and in Sonatoni the response was 0.0% as there was no CSBA in the union but their role was supplemented by the FWAs/FHAs.

Out of the 3158 mothers interviewed, 60% (1895) received benefits from the DSF scheme in the sub-district (**Table 35**). The most privileged unions in respect to receiving benefits are Habibullah Nagar (78.4%), Potazia (75.1%), Narnia (74.7%), and Porjona (70.8%). The weakest are Sonatoni (24.3%), Gala (34.7%), and Khukni (32.9%).

There is a gradual downward trend in the availability of benefits under the DSF scheme from June 2008 through to December 2008 (**Figure 6**). The best month being June 2008 (83.5%) and the poorest month being December 2008 (43.2%). This was attributed to the delay in availability of DSF fund due to delay in transfer of funds from the center to the sub-district authorities.





**Figure 6:** Mothers receiving benefit from the maternal health voucher scheme over period of time

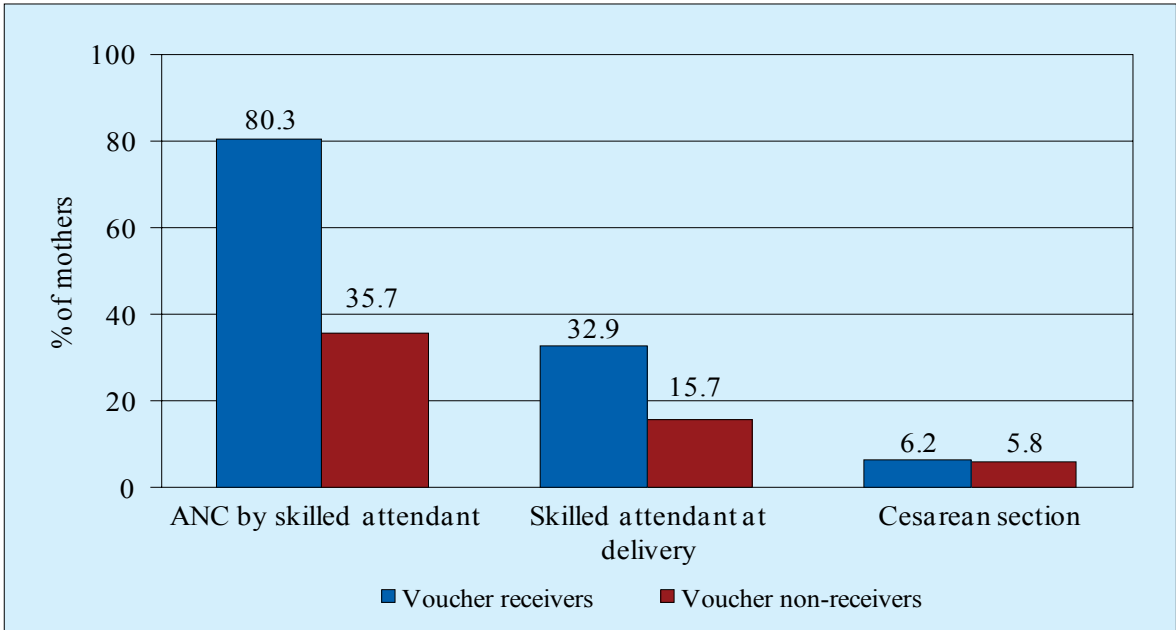
The distribution of mothers receiving DSF benefits in the different socioeconomic status varied between 55% and 65% with the percentage in the rich and poor quintile around 55% (Table 36).

Although the DSF scheme in Shahjampur sub-district is universal but it can only be available to mothers during the first and second pregnancy only. But it is observed that DSF benefits was available to mothers who had three or more child during interview period. Nearly 12% of all the interviewed mothers received the voucher benefits having three or more live children during the interview (Table 37).

Out of the 1894 (60%) mothers who received monetary benefits from the voucher scheme, 80.3% received skilled ANC services whereas it was only 35.7% in non voucher receivers. Of the DSF beneficiaries 32.9% delivery was conducted by a skilled attendant compared to 15.7% in non-receivers (Figure 7). Cesarean section was conducted in 6.2% of the mothers who received the DSF benefits compared to 5.8% in the non-receivers. Comparing both categories, DSF have had some encouraging impact on the use of skilled service during pregnancy.

In 66.6% mothers who received benefits from the DSF scheme, delivery was conducted by TTBA/TBA/FWA/FHA and other unskilled service providers, (Figure 8) compared to 84.2% of the deliveries who did not receive the benefits of the fund. Only 8.6% of the DSF deliveries were conducted by MBBS doctors and 9.1% by the existing government CSBAs and 15.7% by nurses/FWVs and others.

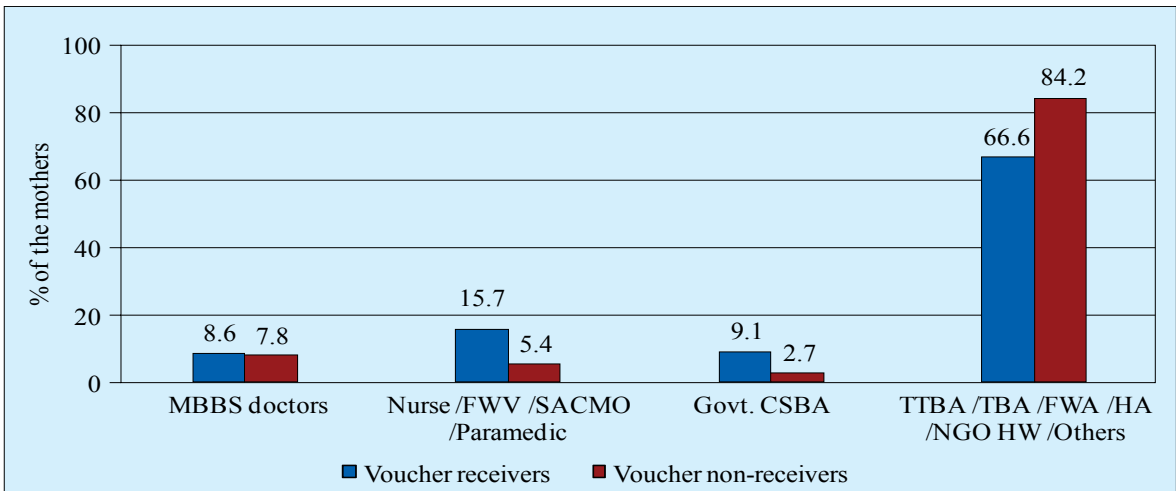
Among the DSF scheme beneficiary 13.1% of the mothers did not receive antenatal care services during pregnancy. But among the rest 86.9%, around (64.2%) received it from the UHC (Figure 9).



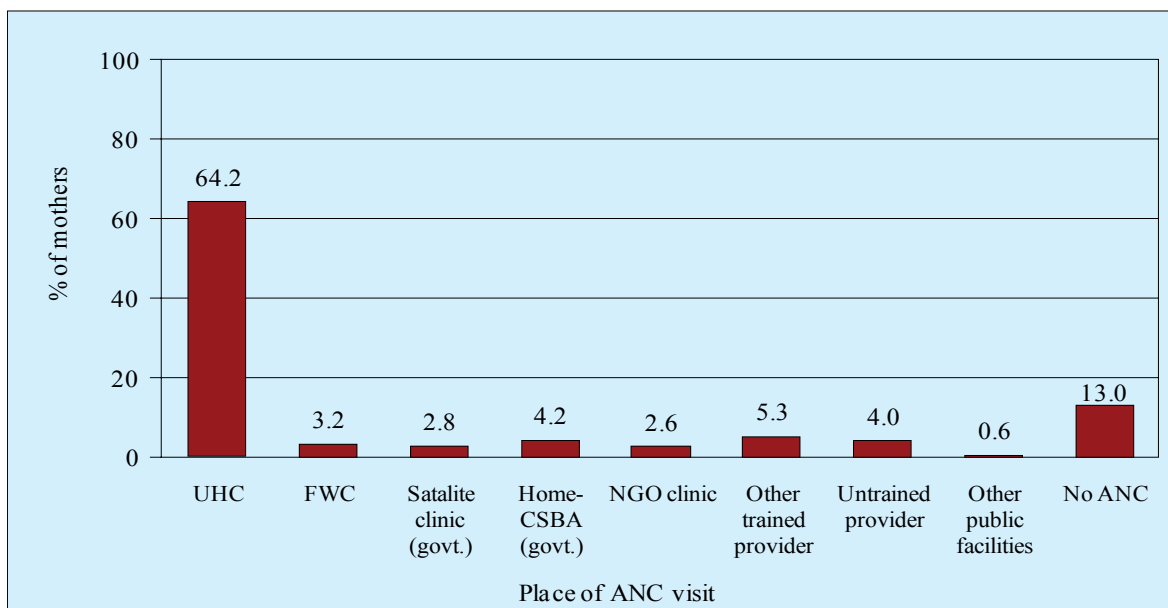
**Figure 7:** Utilization of skilled care among maternal health voucher benefit receivers and non-receivers

A small percentage 3.2% of ANC service was given in the FWC, Satellite clinic (2.8%) and small percentage at places varying from home and other places.

Cash financial benefit under the DSF was received by 39% of the mothers in the sub-district as compared to 61% who did not receive as seen in the baseline. As we see the graph in (Figure 6) from Jun 2008 to Dec 2008, the voucher benefit recipient rate gradually decreased from 84% to 43%. This was attributed to the unavailability of DSF funds from the ministry in time to be disbursed by the sub-district authorities to the beneficiaries. The mothers would get the benefits eventually when the money is received by the local authorities and disbursed. And this period clearly correspondence



**Figure 8:** Delivery attended by different types of service providers among receivers and non-receivers of benefits from the maternal health voucher scheme



**Figure 9:** Place of ANC visit among the recipients of benefits from the maternal health voucher scheme during the last pregnancy

to our baseline time schedule. The total amount received also varied in the sub-district by unions, facility and also individually. Financial benefit from the DSF was better available to mothers in Potazia, Habibullah Nagar, Porjona and Beltail unions, where the percentage was around 50%. Mothers who received less than Tk. 1000 accounted for 22.1%, between Tk. 1001 to Tk. 1999 it was 38.2% and the rest 39.7% received Tk. 2000. In Rupabati, Municipality, Potazia, Narnia unions the distribution was much better and more mothers received Tk. 2000 (**Table 38**).

Regarding the manner this incentive money was spent by the families, it is observed that husband took the money in 22.1% instances, buying nutritious food 15.7%, repay of loan 13.2% and the other reasons like children policy scheme, buy medicine, utensil, ornaments(for -herself , baby), transport cost, giving money to mothers brother, father-in-law accounted for 48.5% of cases (**Table 38**).

The availability of financial assistance from the DSF scheme also varied according to the place of delivery and it varied most in the home delivery. At home delivery it is observed that all mothers were not given equal benefit (**Table 39**). Out of the 163 mothers who received benefits of Tk. 1000, 92.6% delivered at home. Out of the 282 mothers who received between Tk. 1001 to Tk. 1999, 88.3% delivered at home. In the UHC 78.2% of the 293 mothers were paid Tk. 2000 which is the best among all the places of delivery. The payments in the NGOs/private clinics also vary accordingly.

## Facility audit

There are 28 different health facilities in Shahjampur sub-district, where the UHC is the designated CEmOC facility for the sub-district. It has two independent units, the health and family planning departments under the same roof but in the administrative control of two separate directorates, the Directorate General of Health and Family Planning. Each wing providing the essential elements of maternal and neonatal health. There are 11 FWCs under the family planning wing and 8 RDs under the health wing. There are 4 health facilities each in the NGO and private sector. One ambulance each is available in the UHC and NGO PSF (**Table 40**).

All the total 8 facilities in the NGO and private sectors are situated in the Municipality. The UHC is situated in Potazia union, adjacent to the Municipality where no other health and family planning facility exists. In Sonatoni and Porjona union there is no FWC and in Habibullah Nagar there are two FWCs. There is no RD in number of unions but two RDs in Porjona union (**Table 41**). Of the 11 FWCs in the sub-district, 4 are upgraded and the rest 7 are not upgraded. Antenatal, postnatal and family planning services are provided from all the FWCs but delivery services is provided from only one upgraded and 3 non-upgraded FWCs. The 8 RDs provide general health care services to the community.

Uninterrupted power supply is maintained if the central power system fails, by generator/IPS in the CEmOC site at the UHC and all the 4 private facilities, 3 out of 4 NGO facilities and 2 out of the 11 FWCs (**Table 42**). The UHC is situated in Potazia union adjacent to the Municipality and 4 of the private and 3 of the 4 NGO facilities are located within 5 kilometers of the CEmOC facility and the road communications between all these facilities are excellent (**Table 43**) but all these facilities are distant from unions like Sonatoni, Kaijury, Gala.

Out of the 28 health facilities, 20 (except 8 RDs) provided different components of the BEmOC services and few other maternal services. Removal of retained placenta and provision of family planning services were present in 75.0% of the facilities and AMTSL was carried out in 11 of the 20 facilities (**Table 44**). Partograph was used only in 3 facilities and manual removal of placenta and assisted vaginal delivery was performed in 7 facilities. Ambulance was present in 2 facilities including the UHC.

Only the UHC has all the 8 different components of the CEmOC and other health facilities each have some of the components. Cesarean section was available in 5 facilities which included all the four private clinics in addition to the UHC (**Table 45**). Blood transfusion was available in 3 private clinics and the UHC. All private facilities provide IV/IM oxytoxics, IV/IM anticonvulsant and manual removal of placenta. The NGO clinics provide all the antenatal, postnatal and family planning services but no cesarian section services.

Out of the 20 facilities providing different components of the basic care only nine have laboratory facility of varying capacity (**Table 46**). Blood grouping and cross matching was available in 7 facilities. Blood collection bags were present in 4 including the UHC. There was storage facility in 2 private facilities but not in the UHC. The essential drugs injectable antibiotics, injectable oxytocin and  $MgSO_4$  is available in the comprehensive obstetric care facility the UHC but were absent in all the FWCs (**Table 47**). In the NGO facilities the findings were mixed.

The sub-district has one consultant - Gynae and Obs. posted against one post for the consultant the only CEmOC facility. No consultant for Anesthesia against the single position earmarked for the UHC. Though there is an Emergency Obstetric Care (EOC) trained Anesthesiologist against the single post in the UHC as a part of the CEmOC services but the EOC trained obstetrician post is vacant during the time of survey. All the post of 3 EOC trained nurses/paramedics in the UHC is full and in the private sector 6 are present against the post of three. There is one EOC trained laboratory technician in the private sector. In the UHC there are 3 doctors against 7 sanctioned, in the RD one doctor against the sanctioned 5, 7 against 3 in the NGO and 6 against 3 medical officers in the private sector. No senior FWV post sanctioned but against the sanctioned 11 FWVs 8 are posted in the FWCs. SACMOs (Sub-Assistant Community Medical Officers) and MAs (Medical Assistants) status shows 10 present against the sanctioned 11 posts in the FWCs who are all SACMOs and in the RDs 6 MAs are present against the 6 sanctioned posts. The sub-district is short of required staffs as well as the consultants- Gynae & Obs. and anesthesia do not reside in the campus though residence is available for them.

## CHAPTER FOUR

### RECOMMENDATIONS

To improve the quality of health services of the subdistrict by strengthening the UHC, the CEmOC facility at the subdistrict. To fill up the existing vacant posts both in the health and family planning departments in the community and the facilities. To increase EOC trained personals in the facilities so that EOC service can run smoothly, effectively and be available round the clock. To establish a fully fledged blood bank at UHC which can play a great role for management of PPH. To ensure logistics (Emergency medicine, equipment related to EOC services) supply timely. Training of all skilled attendants on birth planning and preparedness, essential newborn care, prevention and management of PPH and management of pre-eclampsia and eclampsia.

To reduce pressure on the UHC, as well as to provide maternal health services nearer to the community, all FWCs should be upgraded to BEmOC facility , strengthened with round the clock service provision for conduction of normal delivery and provision of other relevant services. Strong referral services should be established at all level making the FWCs as the focal point between the community and the UHC. Timely referral and strengthening of the referral health facilities in respect to manpower and logistics.

To ensure regular holding of the satellite clinic according to schedule with proper monitoring and supervision so that pregnant women can receive quality ANC, PNC and newborn care. Initiative by the local health and family planning authority to inform the community and accountability of the activities a must. Regular on the job and structured training of the satellite focal persons on different aspects of maternal and neonatal health.

Improving all health activities including that of maternal and neonatal health in the remote unions of the subdistrict which are very much underperforming. Special activities aimed at those unions can be made to address their immediate needs to bring them closer to the subdistrict status. Improvement of communication, deployment of proper manpower, logistics and establishing proper infrastructure. Private and NGO facilities should be upgraded, equipped and should also be strictly supervised and monitored by the competent authorities.

To bring in all eligible mother under the umbrella of DSF. It could be very easier for eligible mother if they can get voucher booklet at community level rather than UHC. Provision of ANC and other services nearer to the homes is an important issue to be addressed. The eligibility and the criteria set by the scheme should be strictly adhered too. The universal characteristics of the DSF should be stopped and benefits should be provided according to the set socioeconomic criteria as other non universal subdistrict. The flow of funds from the center to the subdistrict should be more regular so that the mothers can avail the benefits in time. The DSF scheme requires strong

supervision, careful monitoring and evaluation at all levels and should be availed by mothers for whom the scheme is meant.

Formation of CSGs all over the sub-district to increase community awareness regarding maternal and neonatal health (MNH). These CSGs should be self sustainable and should be encouraged to take independent initiatives to address maternal and neonatal issues. Birth preparedness initiatives should first empower the household members through community-based programme. To fill up the gap between knowledge and action, the initiative should also focus on arrangement of transport and blood, this might help in limiting the 'second delay'. An extended number of CSGs would encourage pregnant women to use CSBAs, innovative demand side approach can also be accomplished by these CSGs, for example, organizing saving schemes, emergency transport mechanism, blood donor arrangement and intervening the household decision making process.

The TBAs should be included in the community education and mobilization efforts so that they are equipped with proper knowledge, would be able to convey vital information to families and communities and to reduce their harmful practices. Additionally, a strong and positive working relationship is necessary between the TBAs and CSBAs for the smooth delivery of Maternal and Child Health Services. In addition, interventions should also consider the village doctors (VDs) as they are also closely interlinked with TBAs during deliveries.

This result suggests a programme that merely encourages pregnant women to use the referral center was not achieve the outcome in this context. Further innovative programming such as strengthening health facilities is likely to have a major impact on maternal and neonatal care-seeking behaviours. Simple changes that are realistic within the current infrastructural constraints could make the facilities comfortable and this might also promote the service improvement. To improve the performance of the health system various assessments over time was necessary and based on the assessment results, a feedback mechanism is needed for service improvement. The assessment method should document issues to respond to clients' need, strengthen supervision, and improve client counseling.

Certain actions can make the delivery period safer for both the mother and neonate. Since there is no supply of CDKs in the health system, making CDK readily available will be the key to infection prevention. In addition, training on the use of partograph during the labour period would bring a change, particularly in timely recognition of complication and thereby, delay to refer. Ensuring universal access to skilled care depend on the attention to the supply side along with the CSGs activities. To increase the coverage of quality maternal and neonatal health services the number of CSBAs in the subdistrict has to be increased. The required skilled attendants have been trained and deployed in Shahjadpur health systems and demand for appropriate care is expected to increase. Above all there is no alternative to provide refresher training on safe motherhood to the skilled birth attendants.

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# ANNEXES

**Table 1: Mothers by their sociodemographic characteristics by Shahjadpur unions**

Sociodemographic characteristics	% of the mothers											Total n=3158		
	Municipality n=319	Potazia n=181	Narnia n=162	Habibullah Nagar n=232	Kayampur n=319	Rupbati n=153	Garadah n=118	Khukni n=350	Beltail n=329	Porjona n=432	Gala n=193		Kajitry n=263	Sonatoni n=107
<b>Age of mother (in years)</b>														
<=19	16.6	27.6	23.5	24.6	21.9	28.1	21.2	20.3	25.2	25.5	22.8	18.6	21.5	22.7
20-29	69.3	61.9	61.1	61.2	66.1	56.9	62.7	62.6	61.7	60.6	59.1	65.4	56.1	62.6
>=30	14.1	10.5	15.4	14.2	11.9	15.0	16.1	17.1	13.1	13.9	18.1	16.0	22.4	14.8
<b>Years of schooling</b>														
No schooling	23.8	26	27.8	34.5	26.3	29.4	23.7	37.7	25.8	45.1	54.4	55.5	66.4	36.1
1-5	35.4	38.7	38.3	34.1	34.5	27.5	40.7	29.4	35	33.3	32.6	27	24.3	33.1
6-8	16.6	21.5	22.2	19.4	24.5	28.8	23.7	18.6	21.3	14.8	8.8	9.1	9.3	18.1
>8	24.1	13.8	11.7	12.1	14.7	14.4	11.9	14.3	17.9	6.7	4.1	8.4	0.0	12.7
<b>Monthly family income (in Tk.)</b>														
<=3000	23.5	23.2	30.2	28.4	27.6	26.8	24.6	32.3	31.9	39.8	43.5	39.9	58.9	32.7
3001-5000	26.0	30.9	27.2	28.4	27.0	36.6	32.2	29.4	29.5	28.2	32.6	30.0	26.2	29.2
5001-10000	32.6	32.6	27.2	31.9	29.8	26.8	25.4	29.1	25.2	23.4	20.2	19.0	13.1	26.5
>10000	17.9	13.3	15.4	11.2	15.7	9.8	17.8	9.1	13.4	8.6	3.6	11.0	1.9	11.7
<b>Asset quintile</b>														
Poor	7.8	13.3	8.0	15.9	11.6	18.3	11.0	17.7	12.5	25.0	49.7	33.8	52.3	19.9
Less Poor	15.0	12.7	16.0	18.5	18.2	23.5	21.2	18.3	23.4	25.5	21.2	19.4	29.9	20.1
Middle	18.5	25.4	30.9	22.4	21.6	19.6	21.2	21.7	19.8	17.1	10.9	20.5	10.3	20.0
Upper middle	23.2	22.1	23.5	19.4	23.2	22.2	21.2	22.3	23.1	18.5	11.9	14.4	6.5	20.0
Rich	35.4	26.5	21.6	23.7	25.4	16.3	25.4	20.0	21.3	13.9	6.2	11.8	0.9	20.0
<b>Occupation of mother</b>														
Housewife	91.8	98.3	96.9	94.0	97.2	97.4	96.6	95.1	97.0	93.3	95.9	86.3	97.2	94.7
Weaver (Iat sramik)	4.7	0.6	1.9	5.2	0.9	0.7	1.7	2.9	1.5	5.8	2.1	11.4	1.9	3.6
Others	3.5	1.1	1.2	0.8	1.9	1.9	1.7	2.0	1.5	0.9	2.0	2.3	0.9	1.7

**Table 2: Mothers by their reproductive characteristics by Shahjampur unions**

Reproductive characteristics	% of the mothers											Total n=3158		
	Municipality n=319	Potazia n=181	Narnia n=162	Habibullah nagar n=232	Kayempur n=319	Rupbati n=153	Garadah n=118	Khukni n=350	Beltail n=329	Porjona n=432	Gala n=193		Kaijuri n=263	Sonatoni n=107
Mother's age at marriage (in years)														
<=14	27.0	27.6	23.5	23.7	28.5	32.7	15.3	23.4	24.9	29.9	28.0	30.0	40.2	27.1
15-17	36.1	47.0	45.1	44.8	41.4	42.5	44.1	44.0	42.9	50.0	46.1	46.4	45.8	44.2
>=18	37.0	25.4	31.5	31.5	30.1	24.8	40.7	32.6	32.2	20.1	25.9	23.6	14.0	28.6
Mean age at marriage	16.7	16.1	16.3	16.3	16.3	15.9	16.9	16.3	16.3	15.6	16.0	15.8	15.1	16.1

**Table 3: Mother's knowledge on planning for safe delivery by Shahjampur unions**

	% of the mothers											Total n=3158		
	Municipality n=319	Potazia n=181	Narnia n=162	Habibullah nagar n=232	Kayempur n=319	Rupbati n=153	Garadah n=118	Khukni n=350	Beltail n=329	Porjona n=432	Gala n=193		Kaijuri n=263	Sonatoni n=107
Perception on planning for safe delivery*														
Regular ANC	59.6	30.4	63.6	55.2	57.7	33.3	67.8	35.4	33.7	27.1	19.7	29.3	23.4	40.6
Money saved for delivery	59.2	34.3	48.1	44.0	47.0	25.5	53.4	25.4	35.0	30.6	29.0	35.0	33.6	38.1
Transport arrangement in advance	13.5	11.0	4.3	4.3	9.1	6.5	9.3	3.4	4.3	3.7	1.0	6.8	2.8	6.2
Health facility selection in advance	37.3	7.7	32.7	16.8	27.9	11.1	28.0	6.0	12.2	6.0	6.2	8.0	1.9	15.4
No need of planning for safe delivery	5.6	6.1	1.9	6.0	4.4	9.8	5.9	10.0	7.3	6.3	8.8	9.5	9.3	7.0
Don't know	4.7	39.2	7.4	17.7	14.4	49.7	4.2	43.1	34.0	46.8	50.8	39.2	40.2	30.9
Others	11.6	12.2	11.1	13.8	15.0	2.0	8.5	3.7	14.0	11.1	8.3	13.3	15.9	10.9

\* Multiple responses

**Table 4: Mothers who planned in advance and reasons for not planning in advance for safe delivery by Shabjadpur unions**

		% of the mothers												
Municipality		Potazia	Narnia	Habibullah nagar	Kayempur	Rupbati	Garadah	Khukni	Beltail	Porjona	Gala	Kajjiry	Sonatoni	Total
n=319		n=181	n=162	n=232	n=319	n=153	n=118	n=350	n=329	n=432	n=193	n=263	n=107	n=3158
Plan in advance for safe delivery														
Yes	84.0	50.8	85.2	60.3	73.0	32.0	85.6	32.3	48.9	38.0	37.3	47.1	32.7	53.5
No	16.0	49.2	14.8	39.7	27.0	68.0	14.4	67.7	51.1	62.0	62.7	52.9	67.3	46.5
Reasons for not planning in advance*	n=51	n=89	n=24	n=92	n=86	n=104	n=17	n=237	n=168	n=268	n=121	n=139	n=72	n=1468
Didn't know	35.3	80.9	58.3	63.0	55.8	79.8	47.1	70.9	68.5	82.5	73.6	76.3	59.7	71.0
No decision by the family for planning	27.5	12.4	20.8	15.2	23.3	11.5	23.5	11.4	12.5	9.0	14	11.5	11.1	13.1
Lack of money	29.4	2.2	12.5	13.0	11.6	4.8	23.5	10.1	17.3	8.6	16.5	22.3	20.8	13.1
If I plan in advance, it may cause bad luck for me and my baby	3.9	0.0	0.0	1.1	3.5	0.0	0.0	0.4	0.0	0.0	0.0	0.7	0.0	0.5
Others	11.8	5.6	12.5	16.3	11.6	8.7	17.6	15.2	10.7	4.5	9.9	5.0	13.9	9.9

\* Multiple responses

**Table 5: Mothers receiving antenatal care and number of antenatal care visits during the last pregnancy by Shahjampur unions**

	% of the mothers											Total n=3158	
	Municipality n=319	Potazia n=181	Narnia n=162	Habibullah nagar n=232	Kayempur n=319	Rupbati n=153	Garadah n=118	Khukni n=350	Beltail n=329	Porjona n=432	Gala n=193		Kaijuri n=263
ANC during the last pregnancy	92.5	78.5	87.7	81.0	82.1	91.5	54.9	63.2	69.2	40.9	59.3	18.7	69.6
No. of ANC visits													
None	7.5	21.5	12.3	19.0	17.9	8.5	45.1	36.8	30.8	59.1	40.7	81.3	30.4
1	17.2	19.3	22.8	22.0	21.9	28.8	23.7	25.2	29.9	19.7	33.1	14.0	23.8
2	29.8	26.0	32.1	29.3	30.7	26.3	16.3	18.5	24.8	13.5	14.8	4.7	22.7
3	23.8	21.5	15.4	17.2	18.2	18.6	8.0	11.2	10.2	5.7	10.3	0.0	13.7
4+	21.6	11.6	17.3	12.5	11.3	17.8	6.9	8.2	4.4	2.1	1.1	0.0	9.3

**Table 6: Mothers by places of ANC visit by Shahjampur unions**

	% of the mothers											Total n=2197	
	Municipality n=295	Potazia n=142	Narnia n=142	Habibullah nagar n=188	Kayempur n=262	Rupbati n=106	Garadah n=108	Khukni n=192	Beltail n=208	Porjona n=299	Gala n=79		Kaijuri n=156
Place of ANC visit													
UHC	67.1	77.5	71.1	57.4	63.4	73.6	35.4	44.2	52.5	55.7	39.1	75	57.6
FWC	1.0	0.7	3.5	1.1	5.0	0.0	15.1	8.7	7.0	22.8	12.2	5.0	6.3
Satellite clinic (Govt.)	4.4	0.7	2.8	6.4	6.9	4.7	4.7	5.3	4.7	3.8	3.8	5.0	4.8
NGO clinic	9.2	9.9	4.9	9.6	6.9	7.5	1.6	7.7	3.7	2.5	6.4	10.0	6.5
Other public/private	14.6	5.6	4.2	5.9	7.3	6.6	25.0	13.0	6.4	8.9	9.6	5.0	10.0
Home by-													
Skilled provider	2.7	3.5	11.3	17.0	9.5	7.5	16.7	20.2	23.4	5.1	27.6	0.0	13.2
Unskilled provider	1.0	2.1	2.1	2.7	1.1	0.0	1.6	1.0	2.3	1.3	1.3	0.0	1.6

**Table 7: Mothers having ANC complications by Shahjodpur unions**

	% of the mothers													
	Municipality	Potazia	Narnia	Habibullah nagar	Kayempur	Rupbati	Garadah	Khukni	Beltail	Porjona	Gala	Kaijuri	Sonatoni	Total
	n=319	n=181	n=162	n=232	n=319	n=153	n=118	n=350	n=329	n=432	n=193	n=263	n=107	n=3158
No ANC complications	49.5	51.9	40.1	40.1	44.5	24.8	47.5	40.0	45.0	50.0	44.6	43.0	44.9	44.2
Having ANC complications*	n=161	n=87	n=97	n=139	n=177	n=115	n=62	n=210	n=181	n=216	n=107	n=150	n=59	n=1761
Headache	17.4	5.7	9.3	7.2	14.7	12.2	12.9	8.6	14.4	9.7	9.3	6.7	13.6	11
Blurring of vision	5.0	4.6	5.2	10.1	15.3	12.2	8.1	8.1	14.9	6.5	10.3	10	15.3	9.7
High BP	2.5	3.4	1	0.0	0.6	4.3	1.6	1.4	0.0	0.9	0.0	0.0	0.0	1.1
Edema in face/hands/feet	25.5	16.1	25.8	23	24.9	27	19.4	23.8	27.1	22.2	29	24	28.8	24.4
Convulsion	0.0	1.1	1	0.0	0.0	0.9	0.0	1.4	0.0	1.9	1.9	2.0	0.0	0.9
Vaginal bleeding or Excessive bleeding	5.6	10.3	2.1	1.4	2.3	7.8	6.5	2.9	5.5	2.8	0.9	2.7	1.7	3.8
Fever	17.4	11.5	20.6	17.3	13.6	15.7	14.5	22.9	16.6	16.2	18.7	22.7	23.7	17.8
Foul-smelling vaginal discharge	2.5	1.1	0.0	2.9	6.8	8.7	3.2	8.6	3.3	5.1	4.7	6.7	3.4	4.8
Lower abd. Pain	31.1	39.1	35.1	36.0	28.8	49.6	37.1	33.8	27.6	35.2	27.1	32	18.6	33.2
Reduced/Absent foetal movement	3.7	4.6	4.1	6.5	3.4	3.5	3.2	8.1	5	5.6	5.6	3.3	0.0	4.8
ANC severity	6.9	8.8	9.3	12.1	13.8	20.3	11	15.1	15.5	10	10.9	14.1	9.3	12.2
Seeking treatment for ANC complications	74.5	80.5	64.9	71.2	63.3	70.4	67.7	70.5	60.2	66.7	67.3	59.3	72.9	67.7

\* Multiple responses





**Table 10: Mothers by places of delivery by Shahjampur unions**

		% of the mothers												
Municipality		Potazia	Narnia	Habibullah nagar	Kayempur	Rupbati	Garadah	Khukni	Beltail	Porjona	Gala	Kajjiry	Sonatoni	Total
n=319		n=181	n=162	n=232	n=319	n=153	n=118	n=350	n=329	n=432	n=193	n=263	n=107	n=3158
Place of last delivery														
Home	61.1	63.0	76.5	84.5	84.0	78.4	76.3	87.7	84.5	87.7	92.2	93.9	99.1	82.4
Health facilities	38.9	37.0	23.5	15.5	16.0	21.6	23.7	12.3	15.5	12.3	7.8	6.1	0.9	17.6

**Table 11: Mothers by places of delivery by asset quintile**

		% of the mothers				
Place of last delivery		Poor	Less Poor	Middle	Upper Middle	Total
n=629		n=634	n=632	n=632	n=631	n=3158
Home	89.5	89.0	83.9	83.1	66.6	82.4
Health facilities	10.5	11.0	16.1	16.9	33.4	17.6

Table 12: Mothers delivery care seeking pattern by Shahjadpur unions

		% of the mothers													
		Municipality	Potazia	Narnia	Habibullah nagar	Kayempur	Rupbati	Garadah	Khukni	Beltail	Porjona	Gala	Kajjiry	Sonatoni	Total
		n=319	n=181	n=162	n=232	n=319	n=153	n=118	n=350	n=329	n=432	n=193	n=263	n=107	n=3158
Health service provider															
MBBS doctors		21.6	16.0	8.6	9.1	6.6	4.6	12.7	6.0	8.8	5.6	2.6	2.7	0.0	8.3
Nurse/FWV		22.3	18.8	19.8	7.3	11.3	18.3	9.3	8.6	6.7	7.2	5.2	3.8	1.9	10.6
CSBA		1.6	3.9	7.4	19.8	10	5.2	2.5	10.6	7.0	5.1	2.6	2.3	1.9	6.6
Paramedic		0.3	2.8	1.9	0.0	0.3	0.0	2.5	0.3	0.6	0.2	0.0	0.0	0.0	0.5
SACMO/MA		0.6	1.7	1.2	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Skilled attendant		46.4	43.2	38.9	36.2	30.4	28.1	27	25.5	23.1	18.1	10.4	8.8	3.8	26.4
FWA/FHA		0.6	0.0	1.2	0.4	0.0	0.0	0.0	0.0	0.6	0.2	0.0	0.0	0.0	0.3
NGO health worker		0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.3	0.0	0.0	0.4	0.0	0.1
TTBA/TBA		50.5	54.1	58.6	59.9	69	70.6	71.2	72	72.3	80.1	89.1	89.4	91.6	71.1
Village doctor		0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.0	0.0	0.0	0.1
Others		2.5	2.2	1.2	3.4	0.6	1.3	0.8	2.3	3.6	1.4	0.5	1.5	4.7	2.0
Unskilled attendant		53.6	56.9	61	63.7	69.6	71.9	72.8	74.6	76.8	81.9	89.6	91.3	96.3	73.6

Table 13: Mothers having delivery complications by Shahjadr unions

		% of the mothers											
Municipality	Potazia n=181	Namia n=162	Habibullah nagar n=232	Kayempur n=319	Rupbati n=153	Garadah n=118	Khukni n=350	Beltail n=329	Porjona n=432	Gala n=193	Kajjiry n=263	Sonatoni n=107	Total n=3158
No delivery complications	66.8	66.9	62.3	67.7	65.8	70.3	66.6	62.0	72.5	74.6	74.5	84.1	68.6
Having delivery complications*	n=106	n=60	n=61	n=75	n=109	n=35	n=117	n=125	n=119	n=49	n=67	n=17	n=992
Severe headache	5.7	0.0	0.0	5.3	1.8	2.9	0.9	1.6	5.0	0.0	0.0	0.0	2.2
Excessive bleeding/ Retained placenta	11.3	10.0	13.1	10.7	22.9	14.3	17.1	16	18.5	26.5	22.4	47.1	17.2
Baby's hands or feet came first/ Transverse lie	13.2	13.3	6.6	9.3	5.5	20.0	11.1	7.2	13.4	6.1	9.0	0.0	9.5
Prolonged labour (>12 hours)/ Obstructed labor	42.5	48.3	42.6	34.7	40.4	40.0	37.6	41.6	49.6	32.7	34.3	41.2	41.2
Fever	5.7	1.7	1.6	2.7	6.4	2.9	0.0	1.6	2.5	0.0	1.5	0.0	2.6
Ruptured uterus	1.9	0.0	3.3	1.3	1.8	5.7	0.0	1.6	0.8	0.0	0.0	0.0	1.2
Inversion of uterus	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Vaginal tear	9.4	23.3	21.3	10.7	19.3	20.0	12.8	15.2	15.1	12.2	9.0	17.6	16.0
Unconsciousness	3.8	3.3	8.2	9.3	11.9	0.0	12	8.8	12.6	20.4	9.0	29.4	10.4
Others	3.8	2.8	4.9	3.0	5.0	2.5	2.9	3.3	1.2	1.0	3.4	0.0	3.0
Delivery severity	21.6	21	23.5	18.1	21.6	22	20.6	26.1	21.3	18.1	16.7	15.0	20.9
Seeking treatment for delivery complications	95.3	93.3	91.8	78.7	92.7	97.1	94	89.6	95.8	87.8	88.1	88.2	91.6

\* Multiple responses

Table 14: Mothers by referral for delivery complications, referral place and referring person by Shahjapur unions

		% of the mothers													Total
Municipality		Potazia n=181	Narnia n=162	Habibullah nagar n=232	Kayempur n=319	Rupbati n=153	Garadah n=118	Khukni n=350	Beltail n=329	Porjona n=432	Gala n=193	Kajjiry n=263	Sonatoni n=107	Total n=3158	
Referred for delivery complications															
Yes	7.8	7.7	4.9	6.0	7.5	7.2	5.9	4.9	7.9	3.5	5.2	3.4	0.0	5.7	
No	25.4	25.4	32.7	26.3	26.6	26.8	23.7	28.6	30.1	24.1	20.2	22.1	15.9	25.7	
NA (No Complication)	66.8	66.9	62.3	67.7	65.8	66.0	70.3	66.6	62.0	72.5	74.6	74.5	84.1	68.6	
Referring place	n=25	n=14	n=8	n=14	n=24	n=11	n=7	n=17	n=26	n=15	n=10	n=9	n=0	n=180	
MCHs (Pub./Priv.)	0.0	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	1.7	
District hospital	8.0	14.3	25.0	28.6	12.5	36.4	28.6	0.0	11.5	26.7	10.0	22.2	0.0	16.1	
UHC	32.0	50.0	37.5	50.0	37.5	54.5	28.6	11.8	50.0	40.0	70.0	22.2	0.0	40.0	
FWC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.6	
NGO static clinic	4.0	14.3	12.5	7.1	4.2	9.1	0.0	11.8	11.5	0.0	0.0	11.1	0.0	7.2	
Private clinic/ doctors chamber	56.0	21.4	25.0	14.3	33.3	0.0	42.9	70.6	26.9	33.3	10.0	44.4	0.0	33.9	
Others	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	
Referring person															
MBBS doctors	12.0	14.3	12.5	21.4	12.5	18.2	14.3	0.0	11.5	6.7	40.0	22.2	0.0	13.9	
Nurse/FWV	20.0	21.4	12.5	7.1	20.8	18.2	42.9	5.9	7.7	13.3	0.0	0.0	0.0	13.9	
CSBA (public)	0.0	0.0	25.0	21.4	4.2	9.1	0.0	11.8	11.5	6.7	0.0	11.1	0.0	7.8	
CSBA (NGO/private)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.6	
Paramedic	0.0	0.0	0.0	0.0	8.3	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	1.7	
FWA/PHA	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	
TTBA/TBA	52.0	64.3	25.0	35.7	33.3	54.5	28.6	52.9	50.0	60.0	50.0	33.3	0.0	46.7	
Village doctor	8.0	0.0	25.0	7.1	20.8	0.0	14.3	23.5	19.2	0.0	10.0	33.3	0.0	13.3	
Others	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	1.7	

Table 15: Mothers receiving PNC services by Shahjadpur unions

		% of the mothers													
Municipality		Potazia n=181	Namia n=162	Habibullah nagar n=232	Kayempur n=319	Rupbati n=153	Garadah n=118	Khukni n=350	Beltail n=329	Porjona n=432	Gala n=193	Kajjiry n=263	Sonatoni n=107	Total n=3158	
Receiving PNC during last pregnancy		14.1	2.2	5.6	3.0	8.8	4.6	10.2	2.9	4.9	2.1	0.5	0.8	0.9	4.8
No. of days at the time of 1st PNC visit															
No PNC visit		85.9	97.8	94.4	97.0	91.2	95.4	89.8	97.1	95.1	97.9	99.5	99.2	99.1	95.2
1-7 days		5.0	0.6	3.7	0.9	4.4	0.7	7.6	0.9	2.1	0.2	0.0	0.4	0.9	2.0
8-15 days		6.9	0.6	1.9	0.9	3.4	2.6	2.5	1.4	2.1	1.2	0.5	0.4	0.0	2.1
>15 days		2.2	1.1	0.0	1.3	0.9	1.3	0.0	0.6	0.6	0.7	0.0	0.0	0.0	0.8

Table 16: Mothers having PNC complications by Shahjodpur unions

	% of the mothers													Total n=3158
	Municipality n=319	Potazia n=181	Narnia n=162	Habibullah nagar n=232	Kayempur n=319	Rupbati n=153	Garadah n=118	Khukni n=350	Beltail n=329	Porjona n=432	Gala n=193	Kaijiry n=263	Sonatoni n=107	
No PNC complications	78.4	70.7	66.7	70.3	65.5	58.2	72.0	63.4	67.8	67.6	72.0	67.7	61.7	68.1
Having delivery complications*	n=69	n=53	n=54	n=69	n=110	n=64	n=33	n=128	n=106	n=140	n=54	n=85	n=41	n=1006
Severe headache	21.7	1.9	9.3	11.6	9.1	9.4	24.2	8.6	11.3	6.4	16.7	9.4	7.3	10.4
Blurring of vision	17.4	11.3	7.4	13.0	12.7	7.8	15.2	12.5	17.0	16.4	20.4	14.1	14.6	14.0
High BP	1.4	3.8	1.9	1.4	0.9	1.6	0.0	0.8	1.9	1.4	1.9	1.2	0.0	1.4
Convulsion/ swelling of the legs	2.9	0.0	3.7	1.4	0.0	4.7	3.0	3.1	3.8	2.9	5.6	4.7	2.4	2.9
Vaginal bleeding or Excessive bleeding/retained placenta	8.7	9.4	7.4	13.0	12.7	7.8	3.0	10.9	9.4	10.0	20.4	12.9	9.8	10.7
Foul-smelling vaginal discharge with fever/Sepsis/Postnatal infection	5.8	7.5	5.6	4.3	16.4	1.6	9.1	1.6	11.3	3.6	9.3	7.1	4.9	6.8
Inversion of uterus	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Tetanus	1.4	0.0	1.9	0.0	1.8	0.0	3.0	0.8	0.9	0.7	1.9	0.0	0.0	0.9
Wound infection (e.g., wound due to episiotomy/Caesarean section)	7.2	11.3	11.1	2.9	7.3	4.7	12.1	7.0	9.4	6.4	1.9	2.4	0.0	6.5
Mastitis (red and Painful breast)	4.3	1.9	0.0	1.4	0.9	3.1	3.0	6.3	2.8	2.9	0.0	1.2	2.4	2.6
PNC severity	2.8	4.4	4.9	5.6	9.7	6.5	3.4	5.4	7.3	5.6	7.8	7.6	6.5	6.1
Seeking treatment for PNC complications	81.2	83.0	81.5	79.7	90.9	93.8	90.9	88.3	84.9	82.9	70.4	81.2	70.7	83.9

\* Multiple responses

Table 17: Babies - the very first activity performed after delivery	
The very first thing done with the baby	Total n=3100*
Cut Cord	73.6
Placed on Mother's womb	0.2
Left Alone	1.3
Dried	9.9
Wrapped	1.8
Bathed	0.2
Help the baby to Sleep	0.2
Breast Fed	0.4
Others	8.1
Don't Know	4.4

\*58 mother's had still birth

Table 18: Babies - dried before the expulsion of the placenta	
Was the baby dried before the expulsion of the placenta?	Total n=3100*
Yes	5.5
No	85.8
Don't know	2.8
Not applicable (Caesarian section)	5.9

Table 19: Babies - breastfed before the expulsion of the placenta	
Was the baby dried before the expulsion of the placenta?	Total n=2918
Yes	2.5
No	97
Don't know	0.5

Table 20: Babies - breathing pattern immediately after birth	
How was the infant breathing right after birth?	Total n=3100
Breath normally	77.7
Rapid Breathing	1.0
Breath Slowly	14.2
Did not Breath	5.6
Don't know	1.4



**Table 21: Babies - assistance required for normal breathing initiation**

Did baby need any assistance / help for initiation of normal breathing or crying?	Total n=3100
Yes	23.5
No	75.4
Don't know	1.1

**Table 22: Babies - types of assistance given to initiate normal breathing**

What assistance was given to help the baby cry or breath?*	Total n=729
Dried the baby	7.7
Rubbed back or feet	21.1
Hanging of the baby by the legs	47.2
Apply warmth to the cord	3.7
Slapped the baby	80.4
Held the baby upside down	19.6
Don't Know	0.3
* Multiple responses	

**Table 23: Babies - types of material used to cut the cord**

What assistance was given to help the baby cry or breath?*	Total n=3100
Blade	75.6
Bamboo Slice/Basher Tol	1.3
Scissor/Kanchi	17.4
Others	1.9
Don't know	3.9

**Table 24: Babies - boiling status of used material to cut the cord**

Was the item used to cut the cord boiled?	Total n=3100
Yes	55.0
No	34.6
Don't know	10.4

**Table 25: Babies - types of materials used to tie the cord**

What was used to tie the cord?	Total n=3100
Boiled threads from safe delivery-kit	17.5
New Boiled Threads from home	25.8
Old Thread	41.2
Nylon thread/ Net(Jal Buna) thread	1.7
Clip	1.8
Others*	10.2
Don't know	1.8

\* New /black thread

**Table 26: Babies - material applied to the cord after tying**

Was anything applied to the cord immediately after cutting and tying?	Total n=3100
Yes	14.8
No	81.5
Don't know	3.7

**Table 27: Babies - types of materials applied to the cord**

What was applied to the cord?	Total n=459
Antibiotics (powder, cream, ointment etc)	32.2
Antiseptic (Savlon, dettol, cream etc)	39.9
Alcohol/Spirit	3.9
Gentian Violet	1.5
Mustard oil/coconut oil	11.5
Turmeric/HoludarRos/Holudar fuky	0.7
Boric Powder	3.3
Talcom Powder	0.4
Others	6.1
Don't Know	0.4

<b>Table 28: Babies - ever breastfeed status</b>	
Ever breastfeed this baby?	Total n=3100
Yes	99.0
No	1.0

<b>Table 29: Babies - Colostrums feeding status</b>	
Feed shaldudh (colostrums) to the baby?	Total n=3070
Yes	98.0
No	2.0

<b>Table 30: Babies - time interval between birth and first breastfeeding</b>	
How long after birth, breast fed the baby?	Total n=3070
<=10 minutes	6.4
11-30 minutes	38.4
1 hour	25.7
1 day	18.2
2 days	3.9
3 days	5.8
>3 days	1.2
Don't know	0.3

<b>Table 31: Babies - exclusive breastfeeding status</b>	
Exclusive breastfeeding to the baby according to their age	Total n=3070
Yes	42.1
No	57.6
Don't know	0.3

<b>Table 32: Babies - illness in the first month</b>	
Did the baby have any illness within the first month?	Total n=3100
Yes	55.4
No	44.6

**Table 33: Babies - types of illness in the first month**

	Total n=3100
No illness	44.6
Illness	55.4
Sorts of illness within first month?*	n=1717
Poor feeding or unable to suck	2.2
Diarrhea	4.4
Infection¥	7.9
Cold body temperature	0.6
Skin color yellow (Jaundice)	16
Breathing problem¥	15.7
Fever	18.8
Unconsciousness/ convulsions	2.4
Failure to pass urine/ stool	6.9
Cold/Cough	60.9
Others	7.4
<b><i>Seeking treatment for neonatal illness</i></b>	<b>92.2</b>

¥ Infection: Discharge from the umbilicus; redness around the cord; red/ discharging eyes; skin lesion (blisters)

¥ Breathing problem: Baby does not cry; fast breathing; difficult breathing; severe chest indrawing

\* Multiple responses

Table 34: Mother's knowledge, sources of knowledge about maternal health voucher by Shahjampur unions

		% of the mothers													
Municipality		Potazia	Namia	Habibullah nagar	Kayempur	Rupbati	Garadah	Khukni	Beltail	Porjona	Gala	Kaijuri	Sonatoni	Total	
n=319		n=181	n=162	n=232	n=319	n=153	n=118	n=350	n=329	n=432	n=193	n=263	n=107	n=3158	
Having knowledge about maternal health voucher															
Yes	89.0	98.3	95.1	98.3	96.6	99.3	97.5	82.9	96.7	98.6	86.0	97.7	72.0	93.5	
No	11.0	1.7	4.9	1.7	3.4	0.7	2.5	17.1	3.3	1.4	14.0	2.3	28.0	6.5	
Sources of knowledge about DSF*	n=284	n=178	n=154	n=228	n=308	n=152	n=115	n=290	n=318	n=426	n=166	n=257	n=77	n=2953	
CSBA	6.7	3.9	9.9	45.1	10.7	22.4	0.9	16.9	27.9	23.2	4.8	24.5	0.0	17.6	
NGO health worker	5.3	2.2	3.9	0.9	2.3	1.3	6.1	0.7	0.9	0.7	1.8	0.8	0.0	1.9	
Paramedic	0.4	0.6	0.0	0.4	0.6	0.0	0.9	0.3	0.0	0.2	0.6	0.0	0.0	0.3	
Rela./Neigh./Fried.	54.2	50.6	50.0	49.1	51.0	73.7	47.8	58.6	61.6	56.3	72.9	63.8	59.7	57.4	
MBBS doctor	2.8	0.0	0.6	0.0	0.0	0.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.4	
Nurse/ FWV	13.7	9.6	18.8	13.2	5.5	17.8	11.3	5.9	9.4	14.3	7.2	10.5	2.6	10.9	
FWA / FHA	39.1	66.9	46.8	37.7	66.9	76.3	63.5	49.7	48.1	57.3	55.4	42.8	61.0	53.3	
CSG	0.4	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
Others	3.5	0.0	1.3	0.0	0.6	0.7	1.7	0.7	0.6	0.0	0.6	1.6	1.3	0.9	

\* Multiple Responses

**Table 35: Mothers having received maternal health voucher by Shahjadpur unions.**

		% of the mothers												
Municipality		Potazia	Namia	Habibullah nagar	Kayempur	Rupbati	Garadah	Khukni	Beltail	Porjona	Gala	Kajjiry	Sonatoni	Total
n=319		n=181	n=162	n=232	n=319	n=153	n=118	n=350	n=329	n=432	n=193	n=263	n=107	n=3158
Having received maternal health voucher														
Received	67.4	75.1	74.7	78.4	69.6	58.8	66.9	32.9	57.1	70.8	34.7	55.9	24.3	60.0
Not received	32.6	24.9	25.3	21.6	30.4	41.2	33.0	67.1	42.8	29.2	65.3	44.1	75.7	40.0

**Table 36: Mothers having received maternal health voucher by asset quintile**

		% of the mothers				
		Poor	Less poor	Middle	Upper middle	Total
n=629		n=635	n=631	n=631	n=632	n=3158
Having received maternal health voucher						
Received	55.6	63.5	64.2	61.8	54.7	60.0
Not received	44.4	36.5	35.8	38.2	45.3	40.0

**Table 37: Mothers received maternal health voucher by number of living children**

		% of the mothers having no. of living children			
		1	2	>=3	Total
n=1299		n=918	n=861	n=3078*	
Having received maternal health voucher					
Received	65.4	68.2	43.8	60.2	
Not received	34.6	31.8	56.2	39.8	

\* 80 mothers have no live children

**Table 38: Mothers receiving financial benefit (cash incentive) from the maternal health voucher scheme and its use by Shahjampur unions**

% of the mothers																												
	Municipality		Potazia		Namia		Habibullah nagar		Kayempur		Ruphati		Garadah		Khukni		Beltail		Porjona		Gala		Kajjiry		Sonatoni		Total	
	n=215	n=136	n=136	n=121	n=182	n=222	n=90	n=90	n=79	n=115	n=188	n=306	n=67	n=147	n=26	n=1894												
Having got financial benefit using maternal health voucher																												
Yes	22.3	47.8	29.8	48.4	40.5	32.2	30.4	41.7	45.7	54.9	16.4	28.6	11.5	39.0														
No	77.7	52.2	70.2	51.6	59.5	67.8	69.6	58.3	54.3	45.1	83.6	71.4	88.5	61.0														
Amount of financial benefit (in Tk.)																												
<=1000	18.8	4.6	22.2	25.0	18.9	3.4	25.0	33.3	27.9	28.6	18.2	16.7	0.0	22.1														
1001-1999	2.1	27.7	11.1	48.9	46.7	3.4	20.8	43.8	46.5	46.4	36.4	54.8	66.7	38.2														
>=2000	79.2	67.7	66.7	26.1	34.4	93.1	54.2	22.9	25.6	25.0	45.5	28.6	33.3	39.7														
Use of money using maternal																												
Nutritious food	25.0	12.3	13.9	14.8	15.6	31.0	33.3	12.5	15.1	12.5	9.1	14.3	0.0	15.7														
Repay of loan	25.0	6.1	5.6	13.7	8.9	24.1	12.5	6.3	17.5	13.1	9.1	16.7	33.3	13.2														
Husband took	18.8	33.8	22.2	23.9	17.8	10.3	25.0	27.1	22.1	20.8	18.2	19.0	33.3	22.1														
Others*	29.2	47.7	58.3	47.7	57.8	34.5	25.0	52.1	45.3	53.6	63.6	47.6	33.3	48.5														
Don't know	2.1	0.0	0.0	0.0	0.0	0.0	4.2	2.1	0.0	0.0	0.0	2.4	0.0	0.5														

\*Children insurance policy/ buy medicine, utensil, ornaments (for -herself, baby)/ transport cost/ give money to her brother, father-in-law

**Table 39: Mothers received financial benefit against maternal health voucher by delivery place**

	% of the mothers				
	n	Home	Other public facilities	UHC	NGO/ Private
Amount of financial benefit (in Tk.)					
<=1000	163	92.6	0.0	1.8	5.5
1001-1999	282	88.3	1.4	1.8	8.5
>=2000	293	15.4	3.4	78.2	3.1
Total	738	60.3	1.9	32.1	5.7

<b>Table 40: Distribution of health facilities in Shahjadpur sub-district</b>	
Number of facilities	
Public	20
Sub-district Health Complex	1
Family welfare center	11
Rural dispensary	8
NGO	4
Private	4
Total	28

<b>Table 41: Distribution of health facilities by types by Shahjadpur unions</b>						
Number of facilities						
Unions	UHC (HW)	FWC	RD	NGO	Private	Total
Municipality	-	-	1	4	4	9
Potazia	1	-	-	-	-	1
Narnia	-	1	1	-	-	2
Habibullah nagar	-	2	-	-	-	2
Kayumpur	-	1	-	-	-	1
Rupbati	-	1	-	-	-	1
Garadah	-	1	-	-	-	1
Khukni	-	1	1	-	-	2
Betail	-	1	-	-	-	1
Porjona	-	-	2	-	-	2
Gala	-	1	1	-	-	2
Kaijury	-	1	1	-	-	2
Sonatoni	-	-	1	-	-	1
Jalalpur	-	1	-	-	-	1
Total	1	11	8	4	4	28

<b>Table 42: Status of utility service by facility types in Shahjadpur sub-district</b>						
Number of facilities						
Utility service	UHC (HW)	FWC	RD	NGO	Private	Total
Functioning generator/UPS/IPS						
Yes	1	2	0	3	4	10
No	0	9	8	1	0	18
Total	1	11	8	4	4	28



**Table 43: Distance of NGO & private facilities from UHC in Shahjadpur sub-district**

Number of facilities			
Distance (in Km) from UHC	NGO n=4	Private n=4	Total n=8
3	1	2	3
4-5	2	2	4
6-7	1	0	1

**Table 44: Facilities having different components of BEmOC services plus other**

Number of facilities					
Components of BEmOC services plus other	UHC n=1	FWC n=11	NGO n=4	Private n=4	Total n=20
Asst. vaginal delivery	1	2	2	2	7
IV/IM antibiotics	1	1	1	4	7
IV/IM oxytoxics	1	0	2	4	7
IV/IM anticonvulsants	1	0	1	4	6
Manual removal placenta	1	1	1	4	7
Removal of retained products	1	9	2	3	16
AMTSL performed	1	4	2	4	11
Use of partograph	1	0	1	1	3
Provide FP services	1	11	2	1	15
Availability of Ambulance	1	0	1	0	2

<b>Table 45: Facilities having different components of CEmOC services</b>				
Number of facilities				
Components of CEmOC services	Public (UHC) n=1	NGO n=4	Private n=4	Total n=9
Caesarean section	1	0	4	5
Blood transfusion	1	0	3	4
IV/IM antibiotics	1	1	4	6
IV/IM oxytocics	1	2	4	7
IV/IM anticonvulsants	1	1	4	6
Manual removal placenta	1	1	4	6
Asst. vaginal delivery	1	2	2	5
Removal of retained products	1	1	3	5

<b>Table 46: Facilities having laboratory services and amenities</b>				
Number of facilities				
Laboratory services & amenities	Public (UHC) n=1	NGO n=4	Private n=4	Total n=9
Blood grouping & cross matching	1	3	3	7
Blood collection bags	1	0	3	4
Storage facility	0	1	2	3
Microscope	1	1	3	5
Refrigerator	1	3	3	7
Register for recording the events	1	2	2	5
On-call lab technician	0	0	2	2
No. EmOC transfused in	0	0	0	0
Voluntary Donor List	1	0	2	3

<b>Table 47: Facilities having shortage of essential drugs</b>				
Number of facilities				
Shortage of Essential drugs	Public (UHC-HW) n=1	Public (FWC) n=11	NGO n=4	Total n=16
Injectable antibiotics	0	11	1	12
Oxytocin injections	0	11	2	13
Injectable MgSO4	0	11	4	15

## Shahjapur Integrated MNH Project activities



*Inaugural of six-month long CSBAs training of 2 batches of PSF NGO health workers by Director, PHC & Line Director Essential Service Delivery (ESD), DGHS at Tangail FWVTI, a new era in Public-Private Partnership*



*First batch and second batch of PSF NGO health workers trained as CSBAs - after their completion of six months training in front of Tangail and Comilla FWVTI*



*Orientation of PSF NGO health workers selected to be trained as CSBAs on health system and maternal and neonatal aspect of ESD*



*District MNH Committee Meeting, Sirajganj*



*Upazila MNH Committee Meeting, Shahjadpur*



*Local upazila leaders orientation of Shahjadpur sub-district*



*Union leaders orientations of Shahjadpur sub-district*





*Advocacy meeting for the formation of Community Support Group (CSG)*



*Training of CSG Volunteers*

*Meeting of Community Support Group*



*CSG volunteers in a courtyard-session and individual session*



*Union orientations of MAs, SACMOs, HAs, FWAs, AHIs, FPIs, His, VDs, TTBA, TBAs & other traditional healers*



*Training on Essential Newborn Care (ENC)*

*Training on AMTSL & MgSO<sub>4</sub> for the prevention and management of PPH and Eclampsia*



*NGO CSBAs providing maternal and neonatal health services to the pregnant mothers at Shahjadpur sub-district*



*NGO CSBAs on their way to provide services in a remote area*



*NGO CSBA conducting a courtyard-session*



*Sub-district / Upazila Health Complex (UHC), providing CEmOC services*



*A scenic beauty of Jamuna River passing through Shahjampur sub-district*

## ACRONYMS

AMTSL	Active Management of Third Stage of Labor
ANC	Antenatal Care
AusAID	Australian Agency for International Development
BIRPERT	Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies
BNC	Bangladesh Nursing Council
BPP	Birth Preparedness Program
CEmOC	Comprehensive Emergency Obstetric Care
CI	Confidence Interval
CSBA	Community Skilled Birth Attendant
CSG	Community Support Group
DAA	Drug Administration Authority
DFID	Department for International Development, Bangladesh
DGHS	Directorate General of Health Services
DSF	Demand Side Financing
EPI	Expanded Program on Immunization
FGD	Focus Groups Discussion
FIGO	International Federation of Gyneacology and Obstetrics
FP	Family Planning
FPI	Family Planning Inspector
FRM	Field Research Manager
FRO	Field Research Officer
FRS	Field Research Supervisor
FWA	Family Welfare Assistant
FWC	Family Welfare Center
FWV	Family Welfare Visitor
FWVTI	Family Welfare Visitor Training Institute
GOB	Government of Bangladesh
H&FWC	Health and Family Welfare Center
HA	Health Assistant
HI	Health Inspector
ICDDR,B	International Centre for Diarrheal Disease Research, Bangladesh
ICM	International Confederation of Midwives



IDI	In-depth interview
IFA	Iron Folic Acid
IPS	Interrupted Power Supply
KII	Key Informant Interviews
MA	Medical Assistant
MDG	Millennium Development Goal
MgSO <sub>4</sub>	Magnesium Sulphate
MMR	Maternal Mortality Ratio
MNH	Maternal and Neonatal Health
MO	Medical Officer
MOHFW	Ministry of Health and Family Welfare Municipality Pourashava
NGO	Non-Government Organization
OGSB	Obstetric and Gynecological Society of Bangladesh
PNC	Postnatal Care
POPHI	Prevention of Postpartum Hemorrhage Initiative
PPH	Postpartum Hemorrhage
PSF	Palli Shisu Foundation
RD	Rural Dispensaries
RHU	Reproductive Health Unit
RPC	Research Project Consortium
SACMO	Sub-Assistant Community Medical Officer
SAE	Severe Adverse Effect
SBA	Skilled Birth Attendant
SFRO	Senior Field Research Officer
SRS	Simple Random Sampling
TBA	Traditional Birth Attendants
TT	Tetanus Toxoid
TTBA	Trained Traditional Birth Attendant
UFPO	Upazila Family Planning Officer
UHC	Upazila Health Complex
UHFWC	Union Health and Family Welfare Center
UHFPO	Upazila Health & Family Planning Officer
UNDP	United Nations Development Fund
VD	Village Doctors
WHO	World Health Organization



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