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# MANOSHI
working paper

## Assessing the *MANOSHI* Referral System

### Addressing Delays in Seeking Emergency Obstetric Care in Dhaka's Slums
Dhaka

Morsheda Banu
Shamsun Nahar
Hashima-E-Nasreen

BRAC Research & Evaluation Division

icddr,b
KNOWLEDGE FOR GLOBAL LIFESAVING SOLUTIONS

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# EXECUTIVE SUMMARY

Maternal deaths continue to be one of the leading causes of death among women of childbearing age in Bangladesh. Like other health indicators, the burden of maternal mortality is heaviest among the poor, especially in urban slums. Recognizing this persistent problem among the poor in urban slum of Dhaka city, in 2007, BRAC established delivery centres (birthing huts) under a maternal, neonatal and child health (MNCH) programme named *MANOSHI* for safe delivery and timely access to appropriate emergency obstetric care services whenever needed.

The objective of the study was to understand and evaluate the role of BRAC delivery centres[1] on the overall referral process, specifically focusing on factors that contribute to the delays that hinder availing timely treatment, and ways to go about reducing the delays.

A cross sectional comparative study was carried out from October 2008 to January 2009 in slum areas of Dhaka city using the quantitative method. The sample consisted of 450 mothers with history of obstetric complications, and referred either from both delivery centres or from home to formal healthcare centres. Data were collected through personal interviews using a pre-tested questionnaire. Frequency distribution, chi-square, *t-test* and bi-variate analysis, and Mann-Whitney test were also performed.

The first delay was more prolonged, and was significantly higher compared to the second and the third delays, which demonstrates delayed decision making to seek care as the most important factor contributing to delays in accessing *emergency medical obstetric care* (EmOC). The study revealed that 73.3% of the women from home delayed decision making to seek care compared to 66.2% who were referred from delivery centres. The median time required to make decision was five hours at the delivery centre and 9.7 hours at home. To reach the nearest facility was 1.16 hours from the delivery centre and 1.8 hours from home. Women referred from the delivery centre received treatment in 1.2 hours, and those who were referred from home received treatment in 1.3 hours.

[1] Delivery Centres are the formal names for BRAC "Birthing Huts" for MNCH care. For more information about the delivery centres, please refer to, *The "Birthing Hut" Facilities of MANOSHI: A Two-Part Paper, Exploring the Inception and Post-Inception Phases of Urban Delivery Centres of Dhaka*, Marufa Aziz Khan & Syed Masud Ahmed, *MANOSHI* Working Paper No 7, October 2009

Furthermore, in life-threatening illnesses, time required to make decision for referral to a higher facility was as short as 0.33-0.87 hours, while in high risk maternal complications, the median delay was several times longer (1-4.2 hours). The median times for making the decision among women referred from the delivery centre were significantly shorter (p=0.000) than those who were referred from home for both life-threatening and high-risk conditions, indicating that the ability to judge the graveness of complications of pregnancy by the BRAC health workers helped reduce the time to make decisions for seeking EmOC. The findings of the study revealed that of women who sought treatment for life-threatening complications, around 64% reached the facility within an hour, almost 80% received treatment in less than an hour, and the median time to receive treatment was half an hour. These findings suggest that accessing facilities and getting treatment are not a problem in urban areas of Bangladesh; the issue has to do with delayed decision-making to seek care.

The main reason for delaying the decision to transfer women was the fear of medical interventions, complications arising at mid-night, traditional thinking, lack of money and inability to recognize the severity of illnesses irrespective of place of referral. Among these, the most striking fact was that the median delay regarding each factor was remarkably higher in the case of community referral. The decision-maker was considered to have a significant impact on delay. Husband was the prime decision-maker (48% and 51%) and in 20% of the cases relatives made the decision.

The socioeconomic and obstetric indicators had no influence on the second and third delays. While comparing the first delay between two groups, it was observed that the delay was significantly higher in community referrals among multiparous women (p=0.000, p=0.017). This can be due to the fact that as adult women with previous delivery experiences they were reluctant to seek care from the facility. Income generation of the women had a significant impact on reducing delay as well (p=0.001).

The mean cost of delivery including normal and caesarean delivery remained in the range between BDT[2] 1000 and BDT 5000 (US$ 14.5-72.4), but it was found that the delivery related expenses significantly (p=0.000) increased in the case of

[2] BDT, Bangladeshi Taka, the national currency for Bangladesh

women who had been referred from home than by the delivery centre. The higher delivery related expenses among cases referred from home due to higher percentage (35%) of caesarean sections were found in this group. When the first delay was analyzed with *MANOSHI* financial assistance (for medicines, blood and transport), findings showed that irrespective of the place of referral, women who received assistance from *MANOSHI*, took significantly less time implementing the decision (p=0.012). The financial assistance was given more to women who were referred by the delivery centre and the outcome of pregnancy was better among them. The study also tried to find out the roles of referral facilities on the third delay and the results showed that women who were referred to Dhaka Medical College Hospital (DMCH) required more time compared to other facilities; this may be due to the fact that the tertiary-level hospital has more administrative formalities before the women can receive treatment. The presence of referral Programme Organizers (POs) did not reduce time taken for receiving treatment than those who were not attended by POs. Researchers' personal observations during data collection in the hospital showed that the POs were mostly engaged with mothers who were in severe life-threatening situations. The difference in time taken for receiving treatment between the two groups was only three minutes. This indicates that the presence of POs was influential in accelerating the rate of getting treatment in the hospital. If the POs were not present in the hospital, the time taken for receiving treatment would be more for those who were and were not directly assisted by the POs. It points out that direct assistance and their presence in the hospital is equally vital.

The first delay was found to be the most important barrier to accessing EmOC in both delivery centres and home referred cases, and the husband was the prime decision-maker. It can be concluded that to reduce delays in decision making and quick transferring to hospitals, *MANOSHI* delivery centres have been playing an important role. Still there is room to improve the situation in the community. Decision-makers play a crucial role in the family and this has a great impact on delays in seeking care. There is a need to educate the community people about 'pregnancy-related danger-signs' and emergency preparedness so that they can recognize the crisis early and can make the appropriate decisions promptly to transfer the patient to the appropriate level of facilities.

# INTRODUCTION

Rapid urbanization makes women highly vulnerable because of poor hygiene and over-crowding, lack of basic amenities such as water and sanitation, and low availability and use of formal health services including maternity care (UN[3] 2004, Asghar 1999). In developing countries, the urban poor exhibit poorer outcome compared to those in rural areas (Fotso *et al*. 2008, NIPORT, Measure Evaluation, ICDDR,B, ACPR 2008). The burden of maternal mortality is especially heavy in urban slums of developing countries (Ziraba *et al*. 2009a, AbouZahr 2003, Magadi *et al*. 2001).

In Bangladesh, Dhaka alone has 21 million slum people (Ahsan *et al*. 2008) where maternal health status is very poor (NIPORT, Measure Evaluation, ICDDR,B, ACPR 2008, Ziraba *et al*. 2009b). Although women are living in close proximity to facilities with skilled care, 70% of them in urban slum give birth at home with no medically trained providers (Fronczak *et al*. 2007). The World Health Organization (WHO) estimated that 15% of all pregnancies may develop life-threatening complications, which are unpredictable and require special care (Ali *et al*. 2005, Islam *et al*. 2005). Reduction in the number of maternal deaths requires timely access to effective, affordable and appropriate *emergency obstetric care* (EmOC) services when complications arise (Biswas *et al*. 2005).

Delay in accessing EmOC facilities during life-threatening condition is one of the contributing factors of high maternal mortality in developing countries. This delay has been well described as it has been occurring at three levels: delay in making decision to seek care, delay in arriving at a health facility and delay in receiving adequate treatment (Killewo *et al*. 2006, Josiah *et al*. 1998, APHRC and the World Bank 2006, De Costa *et al*. 2009). Consequently, great gains can be made in maternal health by ensuring that women with pregnancy related complications can be quickly referred to a facility where they can receive high-quality obstetric care (Murray and Pearson 2006). The majority of maternal deaths can be prevented by the recognition of obstetric complications, and use of appropriate emergency referral procedures, including efficient and well-equipped transport facilities, and by promoting timely and adequate care (Parkhurst and Rahman 2007, Murray and Pearson 2006, Josiah et al. 1998). Referral is a

[3] UN: United Nations

process by which a health worker transfers the responsibility of care either temporarily or permanently to another health professional or social worker to the community (Akande 2004). An effective referral system ensures a close relationship among all levels of the health system and helps to ensure that people receive the best possible care closest to home (WHO 2008).

In January 2007, BRAC initiated intensive health interventions to improve maternal and child death and reduce diseases under a maternal, neonatal and child health Maternal, Neonatal and Child Health (MNCH) programme called *MANOSHI*, which is customized for the urban poor. It provides special emphasis on clean and safe delivery through easily accessible delivery centres located in slum communities, identification of maternal complications, and appropriate case management through referral linkages between community and tertiary care facilities (*MANOSHI* 2007).

*MANOSHI* has facilitated the development of a close partnership with the tertiary level facilities to ensure the quality of care and to avert deaths from obstetric emergencies and neonatal and child health complications. Most maternal cases with complications are referred to Dhaka Medical College Hospital (DMCH) and other private and NGO health facilities (memoranda of understanding has been signed) where commitment to provide quality emergency services to referred cases at fixed low prices has been made. The referral facilities were selected based on criteria that include accessibility, availability of services (24 hours), provision of comprehensive EmOC (caesarean sections, blood transfusion, management of eclampsia), management of neonatal (birth asphyxia, neonatal sepsis, complications of low-birth weight babies) and child health complications (diarrhoeal complications, severe pneumonia) and low cost. The referral linkages of BRAC are facilitated by arranging transport, communication, and financial assistance and by ensuring case management at the facilities. The community health workers (CHWs), Urban Birth Attendant (UBA), Shasthya Sebika (SS) and Shasthya Kormi (SK) are responsible for detecting problems, arranging transport and referring maternal complications both from the delivery centres at the slum, and directly from the community with a referral slip, as soon as a complication is diagnosed. Referral programme organizer (PO) at the tertiary facility waiting to receive the referred women and CHWs communicate with referral PO by cell phone. PO directly supervises the process and CHWs at the

community. Furthermore, the referred women are provided with full or partial reimbursement according to their economic status (BRAC 2008).

Despite the importance given to the referral systems in preventing maternal mortality by reducing delays, relatively little research has addressed the necessary components of an effective referral system or the ways in which such systems affect the poorest and most socially excluded (Murray 2006). The present study aimed to know the number of issues relating to the effective functioning of the referral system, including whether the referral system of *MANOSHI* is reducing delays in availing of EmOC services.

# OBJECTIVES

## General objective

To assess the role of BRAC delivery centres' process of referral to tertiary healthcare centres, and guidance provided on how to reduce delays.

## Specific objectives

- Measure the time required for,
    - making the decision (first ($1^{st}$) delay),
    - reaching the facility (second ($2^{nd}$) delay), and,
    - getting treatment (third ($3^{rd}$) delay) at the referral centres.
- Compare the delays among women referred from the delivery centres and the community.
- Explore the factors relating to these three delays
- Identify the role of *MANOSHI* referral system in reducing the three delays

# METHODOLGY

## Study Design

This cross-sectional comparative study was carried out during October 2008 to January 2009. The study explored the role of delivery centres' referral system in addressing the first, second and third delays in receiving EmOC and case management. The study employed a quantitative research technique focusing on the socio demographic status of respondents, reproductive and birth history, obstetric complications, the three delays in the referral system and factors associated with these delays, cost of delivery and outcomes of delays.

## Study Area

The study was carried out in the slums of Dhaka city, where BRAC has delivery centres. In total 238 delivery centres in all slum areas of Dhaka city (Gulshan, Khilgaon, Badda, Mothertek, Dhanmondi, Mohammadpur, Mirpur, Pallabi, Jatrabari, Shampur, Sabujbag, and Kamrangir Char) were included to get complicated referred cases.

## Study Population

The study targeted the women who had history of obstetric complications (prolonged/obstructed labour, excessive bleeding, pregnancy induced hypertension, pre-Eclampsia, Eclampsia, puerperal sepsis, abortion related complications, mal-position, retained placenta etc) during pregnancy and child birth. The obstetric complications referred from delivery centres of *MANOSHI* working area were the study group, and cases referred from the community to the referral hospitals during October to December 2008 were taken as the comparison group.

## Sampling

The required sample size for the study was calculated with 90% statistical power and 95% confidence interval using the formula for two sample comparisons of proportions. According to the Bangladesh Maternal Health Services and Maternal Mortality Survey 2001, approximately 64% of women in Bangladesh faced first

delay in deciding to seek care and it required about six hours. Assuming that this proportion be reduced to 48% by the presence of *MANOSHI*, the estimated sample included 213 complicated obstetric cases for each group. Considering the non-response rate of 5%, the total sample rounded to 450, with approximately 225 for each group. The sample included all referred obstetric complicated cases from the different registrars of delivery centres.

## Development of Tools & Training

A structured questionnaire was developed to collect all relevant information from the study participants. The first part of the questionnaire collected information on socio demographic characteristics and reproductive history, and the second part collected data on maternal complications, illness recognition, referral process and the three delays of seeking EmOC care. The questionnaire was pre-tested in a slum not in the study area, and the appropriateness of languages, sequencing of questions and time needed to complete the questionnaire were assessed. The questionnaire was finalized after feedback from field-testing. The study team comprised of 15 educated and experienced female field workers and three monitors who received a five-day intensive training, consisting of lectures, mock interviews, role-play and field practice at the community level.

## Data Collection & Quality Control

All the field workers worked in one slum at a time and they were divided into three groups to collect data from separate catchment areas of delivery centres for security reasons and also, as some slums were very scattered. At first, 225 referred cases were selected from the register book of the delivery centre and another group who were referred from home were selected from the community referral register and identified with the help of a key informant (SS/ SK/ UBA/ PO). To ensure the quality of data, a three-layered monitoring system was developed. Three rotating monitors supervised the field enumerators at different places in the slum and for spot-checking a field manager from the head office visited the slum area on a regular basis. Furthermore, a medical doctor and an anthropologist supervised the field activities through regular field-visits.

## Calculation of the "Three Delays"

The study explored the status of three delays and the associated factors with these delays. The three delays were calculated while taking into consideration the Life threatening complications of pregnancy and its median time was taken as a cut-off point i.e. median time >1 hour was considered as delay and <1 hour was taken as not delay.

- 1st delay (time in decision-making) was the interval between recognition of the complication to starting for the facility to seek care.
- 2nd delay (time in arrival at the facility) was the interval between starting for the facility and reaching it (time needed for acquiring transport included)
- 3rd delay (time in receiving treatment) was the interval between reaching the facility and the time the treatment was received.

## Life-Threatening and High-Risk Complications

Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies (Akther et al. 1996) classified the maternal complications into life-threatening and high-risk obstetric complications. The same classification was adopted in this study.

- Haemorrhage, Eclampsia, and retained placenta with haemorrhage are considered to be life threatening
- Prolonged/obstructed labour, pre-Eclampsia, pregnancy-induced hyper-tension (PIH), and sepsis are taken as high-risk obstetric complications.

## Data Analysis

Separate analysis was done to measure delay using the SPSS (version 11.5). Statistical analysis frequency distribution, chi-square, t-test, Mann-Whitney test and bivariate statistical test were performed where appropriate.

# RESULTS

The results include a brief profile of socio demographic characteristics, reproductive and obstetric history of the study population, which is followed by key findings on reported obstetric complications, three delays and associated factors and the role of *MANOSHI* in reducing delays

## Socio-demographic and "selected" Reproductive Characteristics

### *Socio-demographic Characteristics*

Overall age distribution showed that the majority (74%) of the respondents were aged 20-35 years and women who were referred from home were more than two years older than the comparison group. Younger women (aged <19 years) were referred from the delivery centre more than from home. The respondents were predominantly Muslim and currently married.

Of the women who were referred from the delivery centre, more were able to read and write. However, the mean years of schooling in both the groups were the same. Around 12% of the women were involved in income generation, mostly domestic workers. Women referred from home had twice as many women involved in income generation as those who were referred from the delivery centres.

### *Literacy and Occupation of the Husbands*

67% of the husbands in this study could read and write and one-fourth had no schooling. A significantly higher mean year of schooling was observed among women referred from home. 95% were involved in some type of employment, and only 5% was unemployed. Examples included van/rickshaw puller, CNG driver, security guard, lift man, office clerk and small trader (Table 2).

**Table 1: Characteristics of study population (%)**

| | Referred from DC | Referred from home | Total | P value |
|---|---|---|---|---|
| Age (years) | | | | |
| ≤ 19 | 30.2 | 13.3 | 21.8 | |
| 20 - 35 | 65.8 | 82.7 | 74.2 | |
| > 35 | 4 | 4 | 4 | |

| | | | | |
|---|---|---|---|---|
| Mean age (±SD) | 23.0 (5. 5) | 25.18 (5.8) | | 0.000 |
| Religion | | | | |
| Islam | 98.2 | 98.2 | 98.2 | |
| Others | 1.8 | 1.7 | 1.8 | |
| Marital status | | | | |
| Married | 99.1 | 97.3 | 98.2 | |
| Separated | 0.9 | 2.7 | 1.8 | |
| Literacy | | | | |
| Can read & write | 60.4 | 50.2 | 55.3 | 0.037 |
| Educational status | | | | |
| No schooling | 27.1 | 28.5 | 27.8 | |
| Class 1-5 | 39.6 | 39.4 | 39.5 | |
| Class 6–10 | 28.4 | 24.4 | 26.5 | |
| SSC and above | 4.8 | 7.8 | 6.3 | |
| Mean year of schooling (±SD) | 4.17 (3.3) | 4.09 (3.6) | | 0.795 |
| Involved in income generation | 8.4 | 16.4 | 12.4 | 0.015 |
| N | 225 | 225 | 450 | |

* SD=Standard deviation; DC=Delivery centre; SSC=Secondary School Certificate

**Table 2: Characteristics of husbands (%)**

| Characteristics of Husbands | Referred from DC | Referred from home | Total | P value |
|---|---|---|---|---|
| Literacy | | | | |
| Can read and write | 65.3 | 68.9 | 67.1 | 0.483 |
| Educational Qualification of husband | | | | |
| No schooling | 28.8 | 23.5 | 26.3 | |
| Class 1-5 | 31 | 26.8 | 28.9 | |
| Class 6–10 | 26.6 | 28.5 | 27.5 | |
| SSC | 7.2 | 10.4 | 8.8 | |
| HSC and above | 6.4 | 10.8 | 8.5 | |
| Mean years of schooling (±SD) | 4.76 (4.0) | 5.75 (4.2) | | 0.012 |
| Husband's occupation | | | | |
| Rickshaw/van puller/driver | 28.9 | 25.3 | 27.1 | |
| Service | 25.3 | 9.3 | 27.3 | |

| | | | |
|---|---|---|---|
| Small trader | 23.1 | 19.6 | 21.3 |
| Daily wedge earner/day labourer | 14.7 | 17.8 | 16.2 |
| Unemployed | 4.4 | 5.7 | 5.3 |
| Agriculture | 3.6 | 2.3 | 2.9 |
| N | 225 | 225 | 450 |

* SD=Standard deviation; DC=Delivery centre; HSC=Higher Secondary Certificate; SSC=Secondary School Certificate

### *Reproductive History*

Around 50% of the women were primigravida. The mean number of children ever born among both the groups was two. Grand multiparty was higher among women who were referred from home (21%) than among women who were referred from the delivery centre (16%). A significant difference of mean birth interval was observed between the groups (Table 3).

**Table 3: Distribution of respondents by parity and birth interval (%)**

| Reproductive status | Referred from DC | Referred from home | Total | P value |
|---|---|---|---|---|
| Parity | | | | |
| None | 0.0 | 0.4 | 1.2 | |
| 1 | 53.8 | 44.0 | 48.9 | |
| 2–3 | 30.2 | 34.7 | 32.4 | |
| 4-5 | 9.3 | 15.6 | 12.4 | |
| >5 | 6.7 | 5.3 | 6.0 | |
| Mean number of children ever born (±SD) | 2.13 (1.7) | 2.32 (1.7) | | 0.231 |
| N | 225 | 225 | 450 | |
| Birth interval (years) between index pregnancy and the last child/last pregnancy | | | | |
| ≤ 2 | 9.3 | 4.9 | 7.1 | |
| 3–5 | 17.8 | 16.4 | 17.1 | |
| >5 | 72.9 | 78.7 | 75.8 | |
| Mean years of birth interval (± SD) | 4.6 (2.7) | 6.4 (3.6) | | 0.000 |
| N | 104 | 124 | 228 | |

* Primigravida were not included in analysis of birth interval; SD=Standard deviation; DC=Delivery centre

### *Obstetric History*

Approximately one-fourth of women had experienced child death and 13% had history of stillbirths. The proportion of stillbirth and infant death was almost similar in both the groups. Around 26% had previous history of abortion or pregnancy loss. Of women who had experienced abortion, around 14% had induced abortion and 12% had spontaneous abortion (Table 4).

**Table 4: Distribution of respondents by past history of child death and abortion (%)**

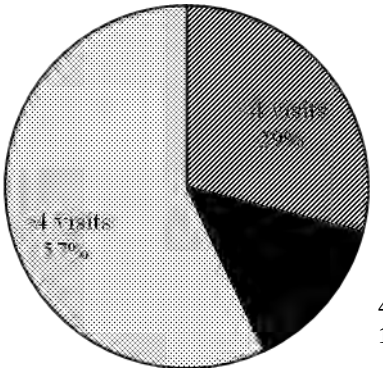
| History of child death | Referred from DC | Referred from home | Total |
|---|---|---|---|
| No death | 73.8 | 75.7 6 | 74.2 |
| Still-birth | 12.0 | 13.0 | 12.7 |
| Infant death | 11.0 | 10.0 | 10.6 |
| Death between 2-5 years | 1.8 | 0.5 | 1.4 |
| Child death >5 years | 1.4 | 0.9 | 1.1 |
| Previous history of abortion | | | |
| No history of abortion | 77.3 | 70.6 | 74.0 |
| Induced abortion | 12.4 | 15.1 | 13.7 |
| Spontaneous abortion | 10.2 | 14.2 | 12.2 |
| N | 225 | 225 | 450 |

* DC=Delivery centre

## History of Index Pregnancy and Referral for Emergency Obstetric Care (EmOC)

This section explored the history of antenatal check-up and obstetric complications at different stages of pregnancy of the index pregnancy.

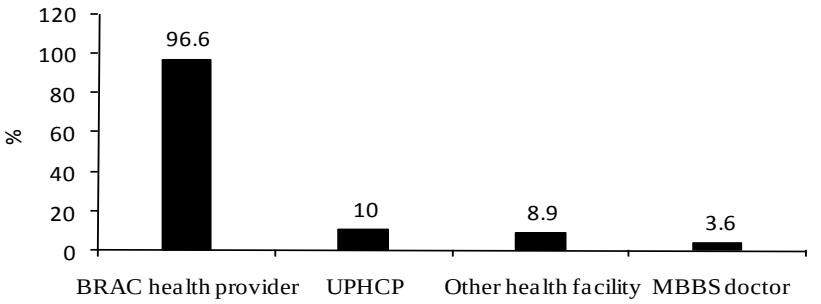
**Figure 1: Antenatal care practices during pregnancy**




## *Antenatal Check-up*

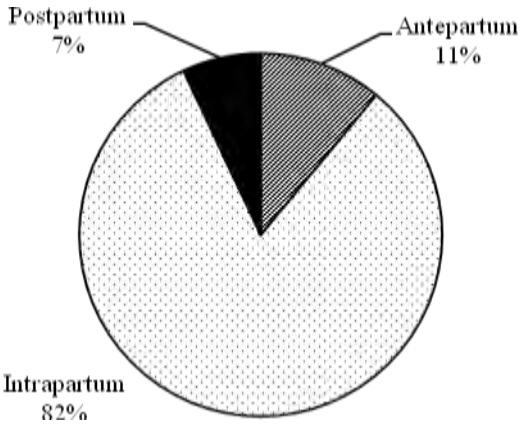
Figure 1 shows that all the women received *antenatal care* (ANC). Of them 57% women had more than 4 ANC visits and the majority received ANC by BRAC health providers. One tenth of the respondents visited Urban Primary Health Care Project (UPHCP) (Figure 2).

**Figure 2: Places and person visited for ANC**




* Multiple responses; ANC = Antenatal care; UPHCP = Urban primary health care project

**Figure 3: Time of appearance of obstetric complications**




## *Types and Numbers of Complications at different stages of Pregnancy and Childbirth*

Figure 3 shows the distribution of maternal complications during pregnancy, delivery and post-delivery period of the index pregnancy. The findings revealed that most respondents (82%) experienced obstetric complications during delivery rather than ante partum and postpartum periods. When the number of obstetric complications per woman was analyzed, it was observed that 85% had at least one single complication. Of those, haemorrhage (5.1%) in antepartum period, prolonged/obstructed labour (47%) in intra-partum, and retained placenta after delivery (3.8%) were the major complications. Fifteen percent of the women had multiple complications and the mean number of complications per woman was 1.15. However, 29% had other complications which included pregnancy induced hypertension (PIH) (12.7%), haemorrhage (6.6%), pre-Eclampsia (4%), Eclampsia (4.2%), and mal-presentation (1.6%)

**Figure 4: Distribution (%) of respondents by reported number of complications**

| No. of obstetric complications | Referred from DC | Referred from Home | Total |
|---|---|---|---|
| 1 complication | 84.4 | 85.3 | 84.9 |
| 2 - 3 complications | 15.6 | 14.6 | 15.1 |
| Mean complications per women | 1.15 | 1.15 | |
| N | 225 | 225 | 450 |

The obstetric complications of the index pregnancy were grouped into life-threatening and high-risk complications. The findings revealed that overall almost a quarter of the women had life-threatening complications and remaining women had high-risk complications. Of the life threatening complications, haemorrhage and among the high-risk complications, prolonged or obstructed labour constituted the highest proportion of all complications. Comparing the two groups, more women from the community were referred for life-threatening complications. This indicated that in this group, women or the family members failed to recognize the severity of the conditions during pregnancy (Table 5).

**Table 5: Distribution of referred women by type of complications (%)**

| Types of complications | Women referred from | | |
|---|---|---|---|
| | Delivery centre | Home | Total |
| Single life-threatening complications | | | |
| Haemorrhage | 6.2 | 16.9 | 11.6 |
| Eclampsia | 2.2 | 6.1 | 4.1 |
| Multiple life-threatening complications | | | |
| Haemorrhage with PIH/PET/breech presentation | 1.8 | 3.6 | 2.7 |
| Eclampsia, haemorrhage/PIH | - | 2.2 | 1.1 |
| Retained placenta with haemorrhage | 4.9 | 2.7 | 3.8 |
| Retained placenta with PET | 1.8 | - | 0.9 |
| Single high-risk complications | | | |
| Prolonged/Obstructed labour | 60.4 | 32.0 | 46.2 |
| Pre-Eclampsia | 1.3 | 6.7 | 4.0 |
| Pregnancy induced hypertension | 7.2 | 18.2 | 12.7 |
| Multiple high-risk complications | | | |
| Prolong labour with PIH/PET/breech presentation | 13.8 | 10.7 | 12.2 |
| Sepsis | 0.4 | 0.9 | 0.7 |
| N | 225 | 225 | 450 |

*PET=pre-eclampsia; PIH=pregnancy induced hypertension

### *Identification of Complications and Referral to Tertiary Facility*

At the delivery centres, most (59%) of the complications were first recognized by the urban birth attendants, which reflects that deliveries were mainly attended by them, and a few complications were identified by *MANOSHI Midwife* (MMW) during supervision in the community. A major (62%) portion of maternal illnesses was self-recognized (Table 6).

**Table 6: Persons who identified the maternal complications (%)**

| Complication identified at DC | Person | Complication identified at home | Person |
|---|---|---|---|
| UBA | 59.1 | Self | 61.8 |
| SK | 30.7 | Relatives | 24.4 |
| MMW | 10.2 | Mother | 10.7 |
| | | Mother in law | 3.1 |
| N | 225 | | 225 |

*****DC=Delivery centre; UBA=Urban birth attendant; SK=Shasthya kormi; MMW=*MANOSHI* mid-wife

**Table 7: Places of referral and transports used by respondents (%)**

| Referred places | Referred from DC | Referred from home | Total |
|---|---|---|---|
| DMCH | 62.2 | 57.3 | 59.8 |
| UPHCP | 36.0 | 30.7 | 33.3 |
| ICMH | 0.9 | 5.8 | 3.4 |
| Private clinic | 0.9 | 6.2 | 3.5 |
| N | 225 | 225 | 450 |

*DC=Delivery centre; DMCH=Dhaka medical college hospital; ICMH=Institute of child and mother health; UPHCP=Urban primary health care project.

### *Referral Places and Transport*

Table 7 shows the place of referral for *emergency obstetric care* (EmOC). Once a complication was recognized in the community, the women first informed the BRAC *community health workers* (CHWs) and were then referred to the assigned EmOC facilities. The *MANOSHI* CHWs referred cases from both delivery centre and home mostly to DMCH (60%) and then to Urban Primary Health Care Project (UPHCP). A few referred went to Institute of Child and Mother Health (ICMH) and private clinics. The majority of referral patients used CNG[4] auto-rickshaw (62%) and rickshaw (36%) to reach the facility. Only a few (2%) used ambulances as transport (Table not shown).

### *Escort during Referral*

The findings revealed that 80% of the women referred from delivery centres were accompanied by BRAC health providers followed by relatives. Approximately 61% of the referral cases from home were accompanied with relatives only. It was also observed that most women

[4] CNG: Compressed Natural Gas

were accompanied by relatives instead of their husbands, mother, or mother-in-law at the time of referral (Table 8).

**Table 8: Accompanying persons at the time of referral (%)**

| Accompanied person | Referred from DC | Referred from home |
|---|---|---|
| BRAC health provider with relatives | 81.3 | 39.1 |
| Relatives only (husband, mother, mother-in-law, other relatives) | 18.7 | 60.9 |
| N | 225 | 225 |

* DC=Delivery centre

## The "Three Delays" and associated Factors

### *The "Three Delays"*

Table 9 shows that higher percentage of women had experienced the first delay that were referred from home (73.3%) than women who had been referred from delivery centres (66.2%). Conversely the percentages of women who had the second and the third delays were referred from delivery centres, compared to women referred from home (65.3% and 19.1%; 58.7% and 15.1%).

**Table 9: Emergency obstetric care by using the 'three delays' model (%)**

| Three level of delays | Referred from | | Total |
|---|---|---|---|
| | Delivery centre | Community/home | |
| Time (hours) taken for decision to seek care | | | |
| ≤1 | 33.8 | 26.7 | 30.2 |
| 1-2 | 12.0 | 8.4 | 10.2 |
| 3-4 | 13.8 | 8.0 | 10.9 |
| >4 | 40.4 | 56.9 | 48.7 |
| Time (hours) taken to reach facility | | | |
| ≤1 | 34.7 | 40.4 | 37.6 |
| 1-2 | 47.1 | 36.9 | 42.0 |
| 3-4 | 13.8 | 15.1 | 14.4 |
| >4 | 4.4 | 7.6 | 6.0 |
| Time (hours) taken to receive treatment | | | |
| ≤1 | 80.9 | 84.9 | 82.9 |
| 1-2 | 18.2 | 14.2 | 16.2 |
| 3-4 | 0.9 | 0.9 | 0.9 |
| >4 | - | - | - |
| N | 225 | 225 | 450 |

### *Median Time for the "Three Delays"*

Median time was used for the three delays and the Mann-Whitney test was performed to test for significance. The findings showed that of women who were referred from the community, respondent's family members took a significantly longer time to make decisions in seeking care. The median time required to make a decisions to seek care was 9.7 hours for women who were referred from home compared to 5 hours for women who were referred from the delivery centres. However, the median time to reach the facility and receiving treatment were almost same in both groups. (Table 10)

**Table 10: Time (hours) taken for events of the "three delays"**

| Three levels of delay | Median time (hrs) taken for events | | p value |
|---|---|---|---|
| | Delivery centre | Home | |
| Making decision to seek care (n=313)* | 5.0 | 9.7 | 0.000 |
| Reaching the facility (n=256)* | 1.6 | 1.8 | 0.051 |
| Receiving treatment (n=61)* | 1.3 | 1.2 | 0.371 |

* Median time among those who made delay

### *First Delay in different Types of Complications*

Table 11 shows the analysis of types of complications and the time taken in decision making process to seek EmOC. Time taken for all complications varied according to places of referral. The median times for making decisions among women referred from delivery centres for life-threatening and high-risk conditions were significantly shorter than that of those who were referred from home. Since there was no significant difference between the second and the third delay between the groups, no analysis was done with these delays and types of complications.

**Table 11: Complication wise time distribution for decision-making to seek EmOC by place of referral**

| Complications | Median time (hours) for decision-making process to seek care | | |
|---|---|---|---|
| | Delivery centre | Home | P value |
| Life-threatening complications | | | |
| • Eclampsia | 0.3 | 2.9 | |
| • Haemorrhage | 0.9 | 2.3 | |
| • Retained placenta with haemorrhage | 0.6 | 2.2 | |
| • Haemorrhage with PIH/PET/breech presentation | 0.6 | 3.5 | |
| Median time (hours) | 0.9 | 2.3 | 0.002 |
| High-risk complications | | | |
| • Pre-Eclampsia | 4.2 | 6.6 | |
| • Prolonged/Obstructed labour | 3.5 | 11.3 | |
| • Prolong labour with PIH/PET/breech presentation | 2.8 | 5.2 | |
| • Pregnancy induced hypertension (PIH) | 1.0 | 2.0 | |
| • Sepsis | 0.41 | 7.0 | |
| Median time (hours) | 2.8 | 7.5 | 0.000 |
| N | 225 | 225 | |

*EmOC=Emergency obstetric care; PET=pre-eclampsia; PIH=pregnancy induced hypertension

**Table 12: Persons involved in decision-making (%)**

| Decision maker | Referred from DC | Referred from home |
|---|---|---|
| Husband | 48.0 | 51.1 |
| Family member | 20.0 | 21.33 |
| Self | 19.6 | 11.1 |
| Other relatives and neighbour | 11.6 | 16.88 |
| N | 225 | 225 |

* DC=Delivery centre

## *Decision-making in Seeking Care*

The findings revealed that in both groups, husbands were the prime decision-makers (48% and 51%). One-fifth of the women from the delivery centres and one in ten women from home decided to seek care during emergency by themselves (Table 12).

**Table 13: Reasons for delay in making decision for seeking care and time (hours) taken to seek care**

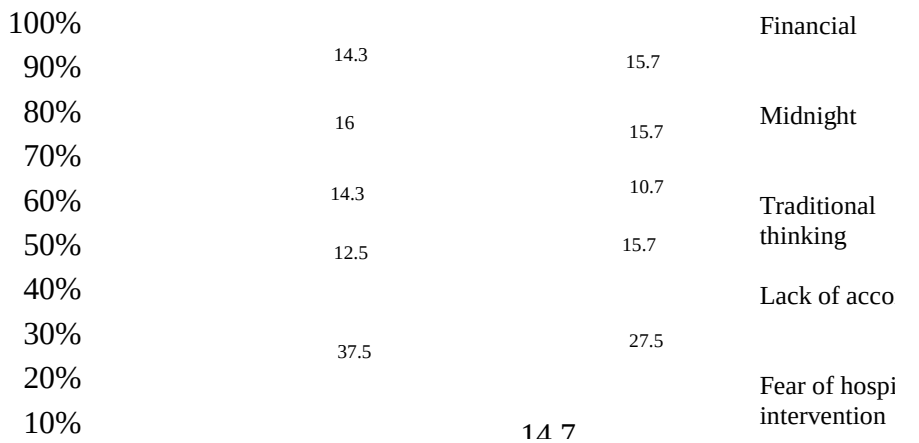
| Reasons for delay in making decision | Median time (hours) for making decision to seek care (1st delay) | |
|---|---|---|
| | Referred from DC | Referred from home |
| Midnight | 5.8 | 11.0 |
| Financial problem | 5.7 | 7.5 |
| Fear of medical intervention | 3.5 | 6.0 |
| Traditional thinking | 2.8 | 3.5 |
| Failed to recognize graveness of illness | 2.8 | 3.0 |
| Lack of accompanied person | 2.2 | 3.0 |
| N | 225 | 225 |

* DC=Delivery centre

## *Median Times to Decide Seeking Care*

The results of the study revealed that the first delay was mainly influenced by the time of referral (at midnight) and financial problems in both groups. Comparative analysis regarding the reasons for delay and the time taken in making the decision to seek care showed that women who had been referred from delivery centres took less time to decide compared to women referred from home (Table 13).

**Figure 5: Reasons for delay in decision-making for seeking care by place of referral**



### *Causes of Delay in Decision-making*

Fig 4 shows the main reason for delay in making the decision to shift women by place from where they were referred. In both the groups, on average, one-third mentioned fear of medical intervention as the main cause. Another important reason mentioned was the inability to judge the graveness of complications, which was found among 14.5% of those who were referred from home and was 5.4% in cases referred from delivery centres. Almost a similar proportion of women in both the groups mentioned lack of money and complications arising at midnight. Traditional belief or conservativeness was also one of the reasons for delay in making the decision to seek care; the highest (14.3%) percentage was also notable among women who were referred from the delivery centres.

### *Factors associated with the "Delays"*

The relationship between three delays; the socioeconomic, reproductive and obstetric indicators; and, the person involved in decision-making was examined as well. It was found that in cases of the second and the third delays no factor except age of mother was associated with place from which they were referred. However, in the case of the first delay, age of the mother and multi-parity were significantly associated with the place from where women were referred. Income-generation activities of women had a significant impact on decision-making. Among women who were involved in income generating activities, a few of them delayed in making the decision to go to referral centres. Other distal factors such as education, ANC visits, history of death of children, period of complication, and decision maker had no significant influences on the 1$^{st}$ delay (Table 14).

**Table 14: Factors associated with three delays**

| | 1st delay | | | 2nd delay | | | 3rd delay | | |
|---|---|---|---|---|---|---|---|---|---|
| | DC | Home | p | DC | Home | p | DC | Home | p |
| Age >19 years | 67.8 | 87.8 | 0.000 | 70.9 | 85.2 | 0.007 | 70.6 | 92.6 | 0.05 |
| Education 0-5 y | 64.4 | 68.9 | 0.471 | 70.1 | 71.3 | 0.891 | 64.7 | 81.5 | 0.16 |
| Do not earn an income | 94.0 | 81.7 | 0.001 | 91.0 | 82.8 | 0.062 | 94.1 | 81.5 | 0.22 |
| Husband's education 0-5 y | 58.4 | 53.0 | 0.364 | 58.2 | 51.6 | 0.316 | 67.6 | 51.9 | 0.29 |
| No history of child death | 76.0 | 79.1 | 0.215 | 69.4 | 77.9 | 0.156 | 82.4 | 77.8 | 0.75 |
| <4 ANC visits | 28.2 | 31.1 | 0.621 | 28.4 | 29.5 | 0.891 | 23.5 | 40.7 | 0.174 |
| Multiparous | 40.9 | 54.9 | 0.017 | 50.0 | 58.2 | 0.21 | 47.1 | 48.1 | 1.00 |
| Period of complication | | | | | | | | | |
| Antepartum | 11.4 | 14.6 | - | 12.7 | 15.6 | - | 14.7 | 14.8 | - |
| Intrapartum | 85.9 | 79.9 | - | 82.1 | 74.6 | - | 82.4 | 70.4 | - |
| Postpartum | 2.7 | 5.5 | - | 5.2 | 9.8 | - | 2.9 | 14.8 | 0.268 |
| Decision maker | | | | | | | | | |
| Husband and relatives | 81.2 | 80.5 | 0.887 | 82.8 | 77.0 | 0.275 | 88.2 | 74.1 | 0.19 |
| N | 225 | 225 | - | 225 | 225 | - | 225 | 225 | - |

*p = p value; DC=Delivery centre; ANC=Antenatal check-up

## Role of *MANOSHI* in Reducing the "Three Delays"

To reduce the delay in accessing EmOC, *MANOSHI* provided financial support for buying medicines, blood, and shared transport costs during referral. Besides this, they also convinced the family to seek care on time, arranged transport and accompanied to hospital as a way of social support.

**Table 15: Areas where *MANOSHI* provided assistance (%)**

| Areas of *MANOSHI* assistance | Referred from DC | Referred from home |
|---|---|---|
| Financial support | | |
| Bought medicines | 84.4 | 61.3 |
| Arranged blood | 6.7 | 8.4 |
| Paid for transport | 14.7 | 21.8 |
| Social support | | |
| Convinced family to seek care | 44 | 64.4 |
| Accompanying to hospital | 52 | 31.6 |
| Arranged transport | 13.3 | 4.4 |
| Did not help | 3.1 | 3.1 |
| N | 225 | 225 |

*Multiple responses considered; DC=Delivery centre

### *MANOSHI Aid in Accessing EmOC*

BRAC assisted all women with pregnancy complications regardless of their place of referral. Comparatively, in the case of buying medicines, accompanying to hospital, and arranging transport, BRAC assisted more, those referred from home than from delivery centres. On the other hand in case of convincing the family to seek care, financing and arranging blood, BRAC assisted referred cases from home more than delivery centre referrals (Table 15).

### *Delivery related Expenses*

The average cost of delivery was between the range BDT 1001 and 5000 (equivalent to US$ 14.5–72.3) among those who were referred from the delivery centres (59%) while in home referrals, (53%) costs increased by more than BDT 5000 (>US$ 72.3). When we compared the mean expenditure of delivery among these two groups, the results showed a significantly higher expenditure in home referrals. The mean expenses shared by BRAC in both the cases were around

BDT 2500 (US$ 36.12) and 57%-65% of the respondents were assisted by BRAC ranging from BDT 1001 to 5000. Very few were given more than BDT 5000 (Table 16).

**Table 16: Total cost of delivery and cost shared by BRAC (%)**

| Delivery expenditure (Tk) | Referred from DC | Referred from home | p value |
|---|---|---|---|
| <500 | 1.3 | 1.8 | |
| 501– 000 | 3.1 | 3.1 | |
| 1001–5000 | 59.1 | 41.8 | |
| >5000 | 36.4 | 53.3 | |
| Total | 100 | 100 | |
| Mean expenditure (±SD) | 2108.41 (2814.9) | 4428.16 (5347.4) | 0.000 |
| Cost shared by BRAC (Tk) | | | |
| <500 | 9.3 | 23.6 | |
| 501–1000 | 13.8 | 9.3 | |
| 1001–5000 | 65.8 | 57.3 | |
| >5000 | 11.1 | 9.8 | |
| Mean cost shared by BRAC (±SD) | 2532.62 (2016.4) | 2582.28 (2814.8) | 0.830 |
| N | 225 | 225 | |

*SD=Standard deviation; DC=Delivery centre; (1 US$ = 69.1 BDT, current date July 2009)

## *Role of MANOSHI Referral Service in Reducing the "Delays"*

*MANOSHI* financial assistance in addressing three delays was examined irrespective of the place from where women were referred. The finding depicted that women who received financial assistance from BRAC took less time in making the decision to seek care. The difference in time required in the 1st delay between the groups was statistically significant (Table 17).

**Table 17: *MANOSHI* financial assistance in reducing three delays for receiving EmOC services**

| Stages of delays | Received *MANOSHI* assistance for EmOC Median time taken (hours) | | |
|---|---|---|---|
| | Yes | No | p value |
| Decision for seeking EmOC | 6.3 | 9.6 | 0.012 |
| Reaching facility | 1.8 | 1.8 | 0.771 |
| Receiving treatment | 1.3 | 1.4 | 0.296 |

| | | |
|---|---|---|
| N | 387 | 63 |

* EmOC=Emergency obstetric care

### *Role of Referral Facility & PO's presence in reducing the "third delay"*

The results showed that women who were referred to DMCH[5] required more time than other facilities and the difference in mean time was significant. To accelerate the treatment in the EmOC facility especially for DMCH, referral POs were appointed and the results show that the presence of POs did not have any significant influence in reducing the third delay (table 18).

**Table 18: Place of delivery and presence of PO in reducing 3rd delay**

| | Mean time (hour) taken for receiving treatment | |
|---|---|---|
| | Mean | P value |
| Place of referral | | |
| DMCH (n=269) | 0.64 | 0.003 |
| UPHCP (n=143) | 0.53 | |
| Others (n=38) | 0.46 | |
| Referral POs at DMCH | | |
| Present (n=119) | 0.64 | 0.549 |
| Absent (n=147) | 0.67 | |

* Mean time was taken as data is normally distributed; DMCH=Dhaka medical college hospital; UPHCP=Urban primary health care project; POs=Programme organizers.

### *Outcome of Pregnancy*

Table 19 shows that the outcomes in terms of maternal deaths were four times more and stillbirths were surprisingly twice more in the group of women who were referred from home.

**Table 19: Outcomes of index pregnancy (%)**

| Outcome | Referred from DC | Referred from home | Total |
|---|---|---|---|
| Live birth | 94.2 | 88 | 91.1 |
| Maternal death | 0.4 | 1.8 | 1.1 |
| Still birth | 4.0 | 9.3 | 6.7 |
| Neonatal death | 0.9 | 0.9 | 0.9 |
| N | 225 | 225 | 450 |

* DC=Delivery centre

[5] DMCH: Dhaka Medical College

# DISCUSSION

Delays in seeking EmOC facilities during life-threatening obstetric complications are significant determinants of high maternal mortality in Bangladesh. It is well documented that access to timely care is crucial. It was evident that delays in seeking care by the pregnant women occurred essentially at three levels: delay in making decision to seek care, delay in arrival at a health facility, and delay in receiving treatment at a facility. These were identified as first, second, and third delays respectively. The present study attempted to recognize the factors relating to these three delays and the role of *MANOSHI* referral system in reducing them.

The findings indicated that the first delay was longer compared to the second and third delays which eventually demonstrated delayed decision to seek care as the most important factor contributing to delay in accessing EmOC. Further, the first delay was more prominent among those who had been referred from home compared to who were referred from the delivery centres. The median delay between recognizing complications and deciding to seek care was significantly ($p=0.000$) higher in case of home referrals (9.7 hours), while the median delay for the delivery centre referrals was 5 hours. This finding was similar with findings from other studies documented in Bangladesh (Ganatra *et al*. 1998, NIPORT, ORC Macro, John Hopkins University, ICDDR,B 2003, and Koeing *et al*. 2007). In the present study, the time to reach a facility was 1.6 and 1.8 hours for delivery centre and home referrals respectively which is quite similar to a study in Matlab, Bangladesh where the median time to reach a facility was 1.33 hours (Killewo *et al*. 2006). In the current study, in case of life threatening conditions, the time required to make decision was 0.33-0.87 hours while in case of high risk maternal complications, the median delay was several times higher (1.0-4.2 hours). The median time for making decision among women referred from delivery centres was significantly ($p=0.000$) shorter than that of those who were referred from home for both life-threatening and high-risk conditions, indicating that the ability to judge the severity of complications of pregnancy by the BRAC health workers helps reduce the time to make decision to seek EmOC. These findings were comparable with findings from studies by Killewo (2006), and NIPORT, ORC Macro, John Hopkins University, ICDDR,B 2003. The present study has shown that women who sought treatment for life-threatening complications, around 64% reached the facility within an hour and almost 80% received treatment before an hour. This suggested that accessing facilities and

getting treatment were not a problem in urban Bangladesh, but rather the problems were concentrated in terms of delay in decision-making to seek care as supported by the findings from Bangladesh Maternal Health Services and Maternal Mortality Survey 2001 (NIPORT, ORC Macro, John Hopkins University, ICDDR,B 2003).

The experience of complications which were considered an important issue to be examined included prolonged/obstructed labour as the most commonly reported complication in the Bangladesh Maternal Health Services and Maternal Mortality Survey 2001 (16.3%) and Bangladesh Urban Health Survey 2006 (11.7%) (NIPORT, ORC Macro, John Hopkins University, ICDDR,B 2003, NIPORT, Measure Evaluation, ICDDR,B, ACPR 2008). In the present study, 47% of the women were referred for this complication. This discrepancy might be based on the fact that the community health providers referred many labour cases deliberately to avoid any kind of risk. The incidence of retained placenta was found to be 1.9%, 3% and 2.8% as seen in different studies of developing countries (Owolabi *et al*. 2008a, MacLeod and Rhode 2004, NIPORT, ORC Macro, John Hopkins University, ICDDR,B 2003). The present study also elicited similar findings; the major complication following delivery was the retained placenta (3.8%). However, ante-partum haemorrhage (5.1%) was the main reason for referral during pregnancy in this study which was quite similar with Owolabi's study (Owolabi *et al*. 2008b).

The study elucidated that the main reason for delay in taking decision to transfer women was the fear of medical interventions and other reasons were complications that arose at midnight, traditional thinking, lack of money and inability to recognize the graveness of illness irrespective of the place of referral. Of these, the most worrisome fact was that the median delay regarding each factor was remarkably higher in case of women referred from home. Study from different developing countries made wide discussions regarding much similar findings of the current study (Killewo *et al*. 2006, Cham *et al*. 2005, Josiah *et al*. 1998). The discussions essentially indicated that most delays were multi-causal and that the community people were not aware of danger-signs of pregnancy and, therefore, not at all prepared for emergency.

The decision-maker was considered to have a significant impact on aforementioned delays and in most cases the male partner played the key role in

terms of decision-making during the course of illness (APHRC[6] and the World Bank 2006, Afsana and Rashid 2000). The present study observed that the husband was the prime decision-maker (48% for delivery centre and 51% for home referral) and in 20% of the cases, relatives made the decision to seek care. The findings from studies on different African countries also reflected similar images (Urassa *et al*. 1997, Odimegwu *et al*. 2005).

The socioeconomic and obstetric indicators had no influence on the second and third delays. While comparing the 1st delay between the two groups, it was observed that the delay was significantly higher in home referral among adult multi-parous women (p=0.000, p=0.017). This could be because adult women with previous delivery experiences were reluctant to seek care from a facility. Women who were not involved in income-generating activities made delay in the case of delivery centre referrals (0.001). A study in Nigeria showed that parity had an influence on delay in the use of maternity care (Owolabi *et al*. 2008b). The result of various studies based in Bangladesh (Barkat *et al*. 1997), Pakistan (Shamshad 2008), Nepal (Thapa *et al*. 2000), and Nigeria (Odimegwu *et al*. 2005) showed that education, ANC visits, complication period, and decision-maker had an influence on the first delay; however the present study did not find any significant influence. In this regard, further study needs to be conducted to explore the reasons.

The mean cost of delivery including normal and caesarean section ranged between BDT 1275 to 4703 (US$ 31.9- 117.5). Results of studies on cost of maternity care (Nahar and Costello 1998, Afsana and Rashid 2000, Afsana 2004) showed that although the government services were subsidized, costs eventually escalated owing to the expenditure for direct treatment costs such as medicines, laboratory investigations, and blood transfusion, as well as indirect costs, e.g. combined expenses on travel, food, and hiring of an aya. The experience in the present study was quite similar but it was found that the delivery related expenses significantly (p=0.000) increased in case of women who had been referred from home than by the delivery centre. When the first delay was analyzed with *MANOSHI* financial assistance (for medicines, blood and transport), the findings exhibited that irrespective of the place of referral, among women who received assistance by *MANOSHI*, the delay to take decision significantly (p=0.012)

[6] African Population and Health Research Centre

lowered. The mean delivery expenses shared by BRAC in both the cases were around BDT 2500 (US$ 36.12). Studies in India (De Costa *et al*. 2009) and Nepal (Rana *et al*. 2009) elicited that providing financial incentives had an influence on safe motherhood programme effort on EmOC services.

The financial assistance was found to be more with women who were referred by the delivery centres and the outcome of pregnancy was better among them. This was confirmed by comparing the two groups in terms of maternal deaths and stillbirths and both of these grave outcomes were found to be surprisingly more in the groups who were referred from home. The study also tried to find out the role of referral facilities and the presence of PO at DMCH. The result showed that women who were referred to DMCH required slightly more time compared to other facilities; this could be because the tertiary-level hospital had more formalities before receiving treatment. The presence of referral POs did not reduce time taken for receiving treatment compared to those who were not attended by the POs. Observation during data collection in the hospital showed that the POs were mostly engaged with mothers who had severe life-threatening situations. The difference in time taken for receiving treatment between the two groups was only three minutes. If the POs were not present in the hospital, the time taken for receiving treatment would be more among this group compared to those who were directly assisted by the POs. This indicated that the presence of POs had an influence in getting treatment at the hospital quickly. It points out that direct assistance from the POs was not only essential but their presence in the hospital at the time of receiving treatment was very vital.

# LIMITATIONS

BRAC *MANOSHI* intervention is serving all the slum areas of Dhaka city and one of the objectives was to identify the role of *MANOSHI* referral system in reducing three delays. A comparison group referred from the community had been selected. However, it was found that even this group had received assistance from *MANOSHI*. In order for the comparison group to be valid, the selected group must not get any assistance from the programme.

- Time calculation, furthermore was entirely based on the reporting by women and attendants who were very close to the women. As a result some recall bias could not be avoided.
- No relationship was analyzed between the wealth quintile and the delays as the wealth index was not included in the study questionnaire.
- It was observed that several families tended to use more than one facility when they decided to seek EmOC. As a whole, such strategies are complex and may influence the first delay.

# CONCLUSIONS & RECOMMENDATIONS

The first delay appeared to be the most important barrier to accessing EmOC in both the groups. It was observed that the husband and other decision-makers played an enormous role in making the decision to seek care. Apprehensions regarding medical intervention were due to lack of money, traditional believes, and complications arisen at mid night and failure to recognize the graveness of illness. The positive impact of delivery centres and financial assistance helped in reducing the first delay. Indeed, the appropriateness of the referral should also be studied. Since health workers received incentives for a successful referral, this may have a confounding effect on both demand-side and supply-side, i.e. demand for referral and actual referral. Therefore, incentive programme should be monitored intensely to know their effectiveness. It has been observed that despite the presence of PO in DMCH, the women required more time in receiving treatment and this area needed further investigation. It can be concluded that to reduce delays in decision making and transfer to hospitals, *MANOSHI* delivery centres have been playing an important role but still there is room to improve the aforementioned situation in the community.

**Recommendations**

1. Decision-makers have a crucial role in the family and this has a great impact on delays in seeking care. So there is a need to educate the community people on ‘pregnancy-related danger-signs’ and emergency preparedness so

that they can recognize the crisis early and can make decision promptly to transfer the patient to the appropriate level of facilities.

2. Although in the community, women and family members were informed about emergency preparedness and danger-signs of pregnancy but this study did not find such impact in terms of seeking care among women who were referred from the home. This area needs to be further explored and effective measures must be taken to improve the situation.
3. The Findings of the study showed that women who were not directly assisted by the POs took slightly more time for receiving treatment than the other group. However the difference was only three minutes and it was expected that those who were not directly assisted by the POs would take more time than those who were directly assisted. It gives the impression that direct assistance and their presence in the hospital are equally vital. This area also needs further study.

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