

# MANOSHI

working paper

Costs of *MANOSHI*  
Delivery Centres:  
Normal Delivery,  
ANC and PNC

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# TABLE OF CONTENTS

Executive Summary	1
Introduction	3
Objectives	4
Methodology	4
Study Design	4
Source of information and data collection	6
Training of data collectors	7
Research instruments	7
Outcome indicators	8
Analysis	8
Limitations	8
Results	9
Section A: Supply-side Costs of Selected <i>Manoshi</i> Delivery Centres	9
Fixed costs	9
Cost of capital inputs	9
Salary and allowances	10
Refresher training	10
House rent	10
Non-medical consumable supplies	11
Variable costs	11
Financial incentives for field staff	12
Section B: Average cost of normal delivery at selected <i>Manoshi</i> facilities	14
Marginal cost	17
Cost of ANC coverage	18
Cost of PNC coverage	20
Discussion	22
Economic and policy implications	22
Conclusions	24
References	43
Annexure	

## TABLE & FIGURES

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### List of tables

Table 1:	Key outcomes by year	8
Table 2:	Total capital cost	10
Table 3:	Total fixed cost	11
Table 4:	Total variable cost	12
Table 5:	Total costs of selected DCs during 2008, 2009	13
Table 6:	Breakdown of overall total cost (2008, 2009 combined)	13
Table 7:	Average costs of operating Manoshi Delivery Centres during 2008, 2009 at the Kamrangirchar slum	14
Table 8:	Fixed costs directly linked to normal delivery at 7 DCs in 2008 and 2009	15
Table 9:	Variable cost directly linked to normal delivery at 7 DCs and 2009	in 2008 16
Table 10:	Costs directly linked to normal delivery at selected DC sduring 2008, 2009	17
Table 11:	Marginal cost	18
Table 12:	Proportionate fixed cost of ANC	19
Table 13:	Proportionate variable cost of ANC	19
Table 14:	Costs of ANC during 2008 and 2009	19
Table 15:	Proportionate fixed cost of PNC	20
Table 16:	Proportionate variable cost of PNC	21
Table 17:	Costs of PNC during 2008 and 2009	21

### List of figure

Figure 1:	Conceptual framework	6
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## EXECUTIVE SUMMARY

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Since 2006 BRAC has been implementing the *Manoshi* program for maternal, neonatal and child survival in the urban slums of Bangladesh in collaboration with the Melinda Gates Foundation. One of the unique features of the program lies in its ‘Delivery Centres’ located in the urban slums. This economic cost analysis of *Manoshi* Delivery Centres was undertaken to assess efficiency and future sustainability of the intervention considering supply-side perspectives only.

### Objectives

1. Estimate total cost of operating *Manoshi* delivery centres in Dhaka city slums
2. Estimate average cost of providing normal delivery care, antenatal care and postnatal care at *Manoshi* delivery centres.

### Methodology

A combination of bottom-up and top-down costing approach was applied. Seven delivery centres of Kamrangirchar slum in Dhaka city were purposively chosen – where this study was conducted during January – July 2010. All supply-side inputs mobilized by the program for these Centres during 2008 and 2009 were identified, quantified and valued through facility-level inventory, record review and key informant interviews. Based on characteristics of inputs, costs were categorized into fixed costs and variable costs. Total cost was calculated by adding fixed and variable costs for each year and combined. Cost of capital inputs were annualized following standard procedure. Joint costs were apportioned using allocation factors e.g. % staff time spent, % materials or space used to produce an output. Shadow price was considered for item(s) obtained free of charge for the program. The total cost of individual input was calculated multiplying the quantity by price and summing up the results. The average cost of normal delivery conducted at selected facilities was estimated dividing the delivery-related input costs by the number of normal deliveries that took place at those facilities during the reference years. Marginal cost of conducting one more normal delivery was calculated for 2009. Proportionate cost of inputs used in production of ANC and PNC coverage were calculated and allocated to the total number of pregnancies identified to estimate the average cost of ANC and PNC coverage. Necessary approval was obtained from the *Manoshi* Technical Advisory Committee prior to data collection.



## Results

The total cost of operating the selected delivery centres combined for 2008, 2009 was Tk.61, 16,563.33 (USD 89949.43). Proportionate share of fixed cost to the total cost was higher compared to variable cost. Capital cost as initial investment was low.

Average cost per delivery centre per month was Tk. 36,408.00 (USD 535) and average cost per delivery centre per day was Tk. 1213 (USD 18) only. The overall average cost of normal delivery conducted at the selected delivery centres was Tk. 1167.00 (USD 17) during the reference period with Tk. 1296 (USD 19) per normal delivery in 2008 and Tk. 1068 (USD 16) per normal delivery in 2009. The average cost of full ANC coverage was Tk.141.23 (USD 2.07) and that of PNC coverage was Tk.145.02 (USD 2.13) only. The marginal cost was much less than the average cost indicating the average cost would decline further in the future.

Findings of a previously conducted study on willingness to pay (*Manoshi working paper no. 4, 2009*) by the authors have shown that majority of the slum dwellers were willing to pay Tk. 450-750 as a registration fee for Manoshi delivery centres. Relating the current study finding on provider's average cost of conducting normal delivery, ANC and PNC to that of the above-mentioned willingness to pay study, it appears that the Manoshi Delivery Centres have an adequate potential of cost-recovery (around 50%)-if a registration fee between taka 450-750 is introduced in future.

## Conclusion

Average costs of conducting ANC, PNC and normal delivery at the selected Delivery Centres were low. Average cost of normal delivery declined in 2009 compared to 2008 indicating efficiency of the program. Given the marginal cost of 2009; it is expected that the average cost of normal delivery would reduce further in future. Considering the program's average cost of normal delivery ANC and PNC in the context of a previous study on willingness to pay of these slum dwellers, it appears that the Manoshi Delivery Centres have potential of substantial cost recovery through introduction of a registration fee that the majority of the slum dwellers are willing to pay with an arrangement of safety net for the poor.

## INTRODUCTION

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Since 2006 BRAC has been implementing a community-based MNCH program known as “*Manoshi*” for the underserved women, newborns and children living in urban slums. The program is targeted at reducing maternal, neonatal and under five child morbidity and mortality and is supported by the Melinda Gates Foundation for five years. The unique feature of the program lies in its ‘Delivery Centre’s (DC) housed in rented spaces within slums and staffed by a contingent of trained field workers designated as Urban Birth Attendants (UBA), *ShaysthoKormee* (SK), *ShaysthoShebeeka* (SS), and Manoshi Mid-Wives (MMW). Each cluster of DC is locally supervised by Program Organizers (PO) and a Branch Manager of the area. These Centres are provided with all necessary supplies and the workers receive regular refresher training to deliver care effectively. To keep up staff motivation, a performance-based financial incentive system has been introduced. Services of the delivery centres are spread across a wide range of activities beginning with identification/enrolment of pregnancy, ANC, PNC, conducting normal delivery at DCs and newborn care, identification of risk pregnancy or maternal, neonatal complications and facilitated referral to designated hospitals. Besides, home visits, health education and community support mobilization are among the other initiatives taken by the program. As of now, services are rendered entirely free of charges. On top of that financial assistance is extended by the Program to those who need it for referral of complications to higher level facilities. Over the last four years all these efforts have produced impressive outcomes reflected through reduction in maternal and neonatal complications and death in the program areas.

Alongside implementation and scale-up, a wide range of research has been initiated to help management getting evidence-based information on the environment with which it interacts, overcoming barriers and constraints and making plans for future sustainability. One of the crucial areas of sustainability is the financing mechanism in the post-grant period. To explore this important domain of financing strategy the authors have completed a willingness to pay survey that came up with encouraging findings on private demand and willingness to pay (WTP) of slum dwellers for Manoshi Delivery Centres (*Manoshi working paper no.4, May 2009*). To relate these WTP findings with the future potential of alternative financing, it is necessary to know what is being spent by the supply-side and how that spending is linked to the production of current output(s) and outcome(s). Such economic evaluations based on relationships between costs of input, process, output and

outcome can enable us to assess technical/economic efficiency of the program i.e. an input combination that minimizes the cost of producing a given level of output.

Gaining efficiency and sustainability is one of the major challenges of social programs like ‘Manoshi’ for which decision makers and donors often solicit research evidence to illustrate the way forward. By now, the Manoshi program has made necessary investments to enhance its operational efficiency. However, the relationship of these investments to the outputs produced by the Delivery Centres was never evaluated in monetary terms. Moreover, the management is keenly interested in knowing how these Centres could be made financially sustainable in future through cost sharing. In response to these management queries; this cost analysis was undertaken to generate necessary information.

## **OBJECTIVES**

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- Estimate the total cost of operating Manoshi delivery centres in Dhaka city slums
- Estimate the average cost of providing care for normal delivery, antenatal care and postnatal care by the Manoshi delivery centres

## **METHODOLOGY**

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### **Study design**

A mixed method of bottom-up (micro-costing) and top-down (macro-costing) costing approach was applied to identify, quantify and value all inputs that were mobilized by the Manoshi program to operationalize its Delivery Centres (DCs) at Kamrangirchar slum in Dhaka city. The reference period considered for this assessment was 2008 and 2009 and only supply-side perspective was taken into account. Delivery centres of Kamrangirchar slums were purposively selected for staff time for convenience of data collection that was shared with another

ongoing Manoshi study in the same setting. The study was conducted during January-July 2010.

### Study Delivery Centres in Kamrangirchar slum, Dhaka city

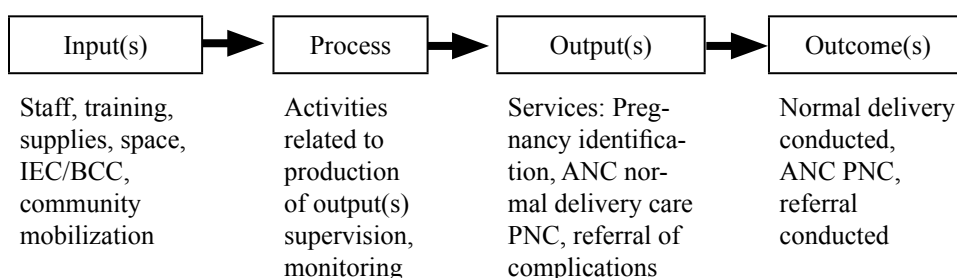
SI	Name of study Delivery Centre
1	Koylargeth Delivery Centre
2	Ashrafabad Delivery Centre
3	Alinagar Delivery Centre
4	Muslimbagh Delivery Centre
5	Nobinagar Delivery Centre
6	Islamnagar Delivery Centre
7	Mominbagh Delivery Centre

Cost of individual inputs was calculated, multiplying the quantity (q) of inputs by corresponding prices (p) in local currency. Total costs (TC) of Manoshi delivery centres, normal delivery conducted at these centres, ANC and PNC care offered by Manoshi field staff were calculated summing up the *fixed cost* (FC) and *variable cost* (VC) i.e.  $TC = FC + VC$ . Input costs that did not change with the outcome were considered as fixed costs while costs that varied with the outcome were considered as variable costs. Costs associated with inputs that had a useful lifetime of one year or more were considered as capital costs. Annualization of capital inputs were done following standard procedure as described below. Joint costs were apportioned for specific outcome(s) using allocation factors e.g. proportion of staff time spent, proportion of floor space or materials used to produce specific output/outcome. Cost of donated goods was estimated by considering shadow price available at alternative source.

Unit cost or average cost (AC) for different outcomes (operating delivery centre, normal delivery, ANC, PNC) was estimated dividing the total cost by the number of outcomes. The main outcomes considered included the number of pregnancies identified, number of normal vaginal deliveries conducted at the selected delivery centres, and number of women who received ANC and PNC care during the reference period.

In addition; marginal cost (MC) of normal delivery for 2009 was calculated to get the additional cost implications for conducting an extra unit of normal delivery at these centres. Given the number of normal deliveries conducted during 2009, the change in variable cost for each 5 additional units of delivery was calculated and added up with the fixed cost to get the total cost. The subsequent difference in total cost was calculated subtracting the total cost from the preceding total cost and then divided the difference by 5 to get the marginal cost per delivery (Samuelson and Nordhaus, McGraw-Hill, 2001).

**Figure1: Conceptual framework**



### ***Annualization of capital items***

Estimated through dividing the current market price of each item by the corresponding annualization factor taken from the standard table (Creess and Parker, WHO, 1994) considering 5% discount rate and individual life time. The life time and current price of capital items were obtained from the provider's and supplier's sources. Capital items included were furniture and fixtures, medical equipment/appliances, linens, basic training and training manuals.

Fixed costs included were monthly staff salary and allowances, house rent, annualized value of capital inputs, cost of refresher training and non-medical consumable supplies. Variable costs included were consumable medical supplies: (average quantity of medicines, medical products used up per case) and performance-based staff incentives. Conversion of local currency into USD was done following the exchange rate of 2009 (1 USD = Tk. 68).

### ***Source of information and data collection***

To gather necessary information, facility level inventory, record review and key informant interviews were conducted. A semi-structured matrix was used for physical inventory of the selected DCs and Kamrangirchar branch office. Service

records corresponding to the reference period were obtained from the Kamrangirchar branch office. Key informant interview was conducted with the Branch Manager and Program Organizer (supervision) of the Kamrangirchar branch office. Based on availability and convenience; two SKs, three UBAs, and three SSs posted at the Kamrangirchar program area were interviewed separately. All cost data related to inputs and processes were finally verified with the program officials of the Manoshi head office. An official approval of the program management was obtained prior to data collection.

### ***Training of data collectors***

Three data collectors (two female and one male) and one field supervisor were assigned to data collection. This team of data collectors went through a 5-day orientation and training at ICDDR, B that included a briefing by the principal investigator on the study background, objective and methodology. The Bengali version of the guideline for key informant interview and voluntary consent form was pretested at Korail slum area. The guideline was finalized based on feedback received from the pre-test.

### ***Research instruments***

A semi-structured matrix was used for physical inventory of the selected DCs and concerned branch office that had four sections: 1) Staff cost showing designation, name and number of staff per delivery centre, monthly salary, allowances and incentives by staff category 2) Cost of supplies: showing list of all materials supplied to each delivery centre with brief description and quantity 3) house rent and utility bills of 2008, 2009 4) other relevant cost information. The relationship of inputs to process, outputs and outcomes were captured through key informant interviews using a guideline. The interview guideline had several sections e.g. 1) Introductory section 2) key assignment of the staff member 3) Time spent by the staff member 4) Pay-allowances and financial incentives of the staff member 5) Training received by the staff member 6) Identification and enrolment of pregnancy 7) Patient management: quantity of materials used per patient for ANC, normal delivery at DC and PNC 8) Referral of complications 9) Supervision and monitoring activities. Table-1 represents the key outcomes achieved during the study period-which have been used for cost calculation as deemed applicable.

***Outcome indicators*****Table 1: Number of key outcomes by year**

Outcomes	2008	2009	Total
1. Number of normal delivery at selected delivery centres	745	968	1,713
2. Number of home delivery	764	660	1,424
3. Number of hospital delivery/referral	348	673	1,021
Sub-total	1,857	2,301	4,158
4. Number of ANC visits (6 times on an average/woman)	11,319	12,454	23,773
5. Number of PNC visits (4 times on an average/woman)	6,684	8,284	14,968

Source: Kamrangirchar Branch office

***Analysis***

Data were entered into spread sheets after necessary editing. The total cost incurred upon the program for operating selected DCs, conducting normal deliveries, ANC and PNC during the reference years were calculated summing up the fixed and variable costs and results were presented by frequency distribution and cross tabulation. Finally, the relationship of costs to the outcomes has been expressed in monetary terms calculating average cost of normal delivery, ANC, PNC and marginal cost of normal delivery.

Allocation factors (i.e. % of staff time spent, % of space and materials used per normal delivery, ANC, PNC) were considered for calculating proportionate cost attributable to normal delivery at Manoshi DC, ANC and PNC.

***Limitations***

Costs incurred upon the program for referral of maternal and neonatal complications were not included here (*separate studies have been conducted on costs of maternal and neonatal referrals*). Costs of investigators and field supervision above Branch Manager and Program Organizer were not included in this calculation.

## RESULTS

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Results have been presented in two sections. **Section-A** illustrates the supply-side total cost and average cost of routine operations of the study delivery centres at Kamrangirchar slum area during 2008, 2009. **Section-B** highlights the relationships between costs and outcomes in terms of average cost per normal delivery conducted at DCs, ANC coverage per pregnancy identified and PNC coverage per delivery reported during 2008 and 2009. In addition, marginal cost of conducting normal delivery at the selected DCs during 2009 has been presented in section B.

### **Section A: Supply-side Costs of Operating Selected *Manoshi* Delivery Centres**

#### ***Fixed costs***

included all input costs that did not vary with the outcomes e.g. annualized value of capital items and basic training, staff salary and allowances, house rent, cost of refresher training and non-medical consumable supplies.

#### ***Cost of capital inputs***

includes cost of material inputs (furniture and fixtures, linens, medical equipment/appliances, non-consumable items, training manuals, BCC materials etc.) and basic training. Table-2 illustrates the aggregated annualized value of the above-mentioned capital items mobilized for the study DCs for 2 years was Tk. 1, 82,842.90 (USD 2688.86) while the annualized value of capital items used for *Manoshi* program at the Kamrangirchar Branch Office during the same period stood at Tk. 29,191.04 (USD. 429.28) (detailed in annexed table-1,2,).

The total accounting cost of basic training of 128 field staff (UBA-14, SK-11, SS-101, MMW-2) at the Training and Resource Centre (TARC) of BRAC was Tk. 3, 60,372.00. Considering two years of useful life time, 5% discounting rate and corresponding annualization factor (1.859) the annualized value of basic training stood at  $(3,60,372 \div 1.859) = \text{Tk.} 1,93,852.60$  for 2008 and 2009 which was  $(1,93,852.60 \times 2) = \text{Tk.} 3,87,705.20$  (USD 5701.54) for the reference period of two years (annexed table-3). Summing up the above-mentioned amounts Table-2 shows the total capital investment during the reference period (2008, 2009) was equivalent to Tk. 5,99,739.14 (USD 8819.68) only. Among these cost components basic training consumed the highest share (65%) of the total capital expenditures



followed by cost of material inputs of delivery centres (30%) and Branch office (5%).

**Table 2: Total capital cost**

Capital inputs	2008 (Tk.)	2009 (Tk.)	Overall total cost (annualized for 2 years)	
			Tk.	USD
Capital items annualized Manoshi Delivery Centres, Kamrangirchar (7)	91,421.42	91,421.45	182,842.90	2,688.86
Capital items annualized Kamrangirchar Branch Office (1)	14,595.52	14,595.52	29,191.04	429.28
Basic training Manoshi field staff (128)	1,93,852.60	1,93,852	3,87,705.20	5,701.54
<b>Total</b>	<b>2,99,869.57</b>	<b>2,99,869.57</b>	<b>5,99,739.14</b>	<b>8,819.68</b>

### ***Salary and allowances***

Field staff under the official payroll at Kamrangirchar included 11 SKs, 14 UBAs, 2 MMWs, 4 POs (supervision) 1 Branch Manager and 1 Caretaker. Staff involvement in the Manoshi program in terms of time spent by UBAs, SKs, MMWs and POs was 100% while that of Branch Manager and Caretaker was 75% - as they were engaged in TB program activities as well. Considering proportionate staff time to Manoshi the total spending for paying salary and allowances was Tk. 29, 95,800.00 (USD 44055.88) (table-3) (annexed table-4) during 2008 and 2009. Allowances were given on monthly basis as TA, DA and phone call charges at a fixed rate to these staff members except Caretaker. SSs were not under the official payroll –but they got performance-based incentives that varied with the number of patients identified, attended and referred.

### ***Refresher training***

The concerned SKs, SSs and UBAs received regular refresher training for which they were given training allowances at a rate of Tk. 80 per month per person. The aggregated cost borne the program for conducting refresher training over the reference period was Tk. 2, 41,920.00 (USD 3557.64) (table-3), (annexed table-5).

### ***House rent***

Hundred percent of the rent was considered for each of the selected seven delivery centres which was equivalent to Tk. 7, 68,000 (USD 11294.11) in aggregate for 2

years. The rent of the Branch Office was allocated according to its proportion of involvement in the Manoshi program (75%), as this office was also engaged in TB control program (25%). As such the proportionate rent of the Branch office taken for two years was Tk. 1,08,000 (USD 1588.23). With this apportioned amount, the total rent paid for the study DCs plus Branch office during the period stood at Tk. 8, 76,000 (USD 12882.35) (table-3), (annexed table-6, 7).

### ***Non-medical consumable supplies***

Included soap, detergent, bleaching powder, toilet cleaner and stationeries (lump-sum) supplied to each DC on monthly basis. The total cost of these supplies was TK. 79,380.00 (USD 1167.35) (table-3), (annexed table-8).

**Table 3: Total fixed cost**

Cost components	2008	2009	Total Cost	
	(Tk.)	(Tk.)	Tk.	USD
Capital inputs (annualized capital items + basic training)	2,99,869.57	2,99,869.57	5,99,739.14	8819.68
Salary- allowances	14,97,900.00	14,97,900.00	29, 95,800.00	44,055.88
Refresher training	1,20,960.00	1,20,960.00	2, 41,920.00	3,557.64
House rent	4,38,000.00	4,38,000.00	8, 76,000.00	12,882.35
Non medical consumables	39,690.00	39,690.00	79,380.00	1,167.35
<b>Total</b>	<b>23,96,419.57</b>	<b>23,96,419.57</b>	<b>47,92,839.14</b>	<b>70,482.90</b>

Table-3 depicts that the proportionate share of staff salary and allowances ranked highest (63%) among all fixed costs followed by house rent (18%), capital inputs (13%), refresher training (5%) and non-medical consumables (2%).

### ***Variable costs***

Included all consumable medical supplies that changed with the number of delivery (average quantity of medicines, medical products used up per case) and performance-based financial incentives. Medical supplies consumed (delivery kit, sanitary napkins, misoposterol tablets, Savlon, vitamin-A capsules, baby wrapping cloths and health card) over the period of 2 years resulted in a total spending of Tk.

1,87,444.19 (USD 2756.53) (annexed table-9). Capsule Vitamin –A was supplied free of cost to the program by the government sources, however; a shadow price of Tk. 1.87 per capsule was considered for cost calculation (price source: Director, IPHN).

### ***Financial incentives for field staff***

Performance-based financial incentives were directly related to completion of tasks assigned to individual staff members (UBAs, SKs, SS) e.g. pregnancy identification, all referrals, presence at delivery and neonatal care, assisting normal delivery at DC, information on home delivery, monthly report compilation, attendance at refresher training, meetings etc. Number of key outcomes and incentive rates were derived from the branch office and verified by the program office later. The cumulative amount of staff incentive paid by the program during the reference period stood at Tk. 11, 36,280 (USD 16710) (annexed table-10).

**Table 4: Total variable cost**

Inputs	2008	2009	Total cost	
	(Tk.)	(Tk.)	Tk.	USD
Consumable medical supplies used up	81,791.83	1,05,652.36	1,87,444.19	2,756.53
Financial incentives for field staff	4,91,790.00	6,44,490.00	11, 36,280.00	16,710.00
<b>Total</b>	<b>5,73,581.83</b>	<b>750142.36</b>	<b>13,23,724.19</b>	<b>19,466.53</b>

Table-4 shows that the spending for paying staff's financial incentive consumed 86% of the total variable cost while only 14% of the total cost went for consumable medical supplies that were used up during the period. It shows there was a rise in cost of consumable medical supplies by 29% and financial incentives for field staff by 31% in 2009 compared to 2008.

Table-5 depicts; summing up all those above-mentioned spending the total cost of selected DCs for 2008, 2009 was Tk. 29,70001.40 and Tk. 31,46, 561.93 respectively with an overall of Tk. 61, 16, 563.00(USD 89949.00). It also depicts that the proportionate share of fixed cost in 2008 was much larger (80.68%) compared to variable cost (19.31%). In 2009 fixed cost consumed 76% of the total cost while variable cost consumed the remaining 24% of the total cost. Overall fixed cost consumed 78% of the total cost compared to 22% of the overall variable cost.

**Table 5: Total costs of selected DCs during 2008, 2009**

Costs	2008 (Tk.)	2009 (Tk.)	Total costs (combined for 2 years)	
			Tk.	USD
Fixed cost	23,96,419.57	23,96,419.57	47,92,839.14	70,482.90
Variable cost	5,73,581.83	7,50,142.36	13,23,724.19	19,466.53
Total	29,70,001.40 (USD 43676.49)	31,46,561.93 (USD 46272.96)	61,16,563.33	89,949.43

Table-6 shows further breakdown of the two years overall total cost into major components. It reflects the total staff cost was Tk. 47, 61, 705.20 (USD 70025.06) which was equivalent to 77.84% of the total cost. Salary and allowances consumed the largest share of the staff cost (63%) and overall total cost (49%) followed by financial incentives (24% and 19% of the staff cost and overall total cost respectively).

**Table 6: Breakdown of overall total cost (2008, 2009 combined)**

Costs components	Total cost		% overall total cost
	Tk.	USD	
<b>a. Staff cost</b>			
Basic training annualized	3,87,705.20	5,701.54	6.33
Salary and allowances	29,95,800.00	44,055.88	48.97
Refresher training	2,41,920.00	3,557.64	3.95
Financial incentives	11,36,280.00	16,710.00	18.57
Subtotal	47,61,705.20	70,025.06	77.84
<b>b. Othercosts</b>			
Capital items annualized	2,12,033.94	3,118.14	3.46
House rent	8,76,000.00	12,882.35	14.32
Non-medical supplies	79,380.00	1,167.35	1.29
Medical consumables	1,87,444.19	2,756.53	3.06
Subtotal	13,54,858.13	19,924.37	22.15
<b>Total</b>	<b>61,16,563.33</b>	<b>89949.43</b>	<b>100</b>

The average cost per Delivery Centre over the total reference period, per year, per month and per day were equivalent to USD 12850, 6425, 535 and 18 respectively (Table 7).

**Table 7: Average costs of operating Manoshi Delivery Centres during 2008, 2009 at the Kamrangirchar slum**

Period	Average Costs per Delivery Centre	
	Tk.	USD
Average cost over the reference period 2008, 2009	8,73,794.76	12,849.91
Average Cost per DC per year	4,36,897.38	6,424.95
Average cost per DC per month	36,408.08	535.41
Average cost per DC per day	1,213.60	17.84

DC = Delivery Centre

### **Section B: Average cost of normal delivery at selected *Manoshi* facilities**

Input costs included here were those that were directly linked to and/or exclusively used for conducting normal delivery at selected 7 delivery centres during 2008 and 2009 separately. Costs shown here was apportioned using allocation factors e.g. for house rent, actual floor space used for delivery purpose was considered and accordingly proportionate rent (50%) was allocated to the cost of normal delivery. Similarly salary, allowances, incentives of the concerned staff members (UBAs and SSs) were allocated proportionate to their time spent and/or output related financial incentives disbursed in 2008 and 2009. Costs of furniture, fixtures bed, linens, medical and non-medical supplies were allocated based on their actual use for normal delivery that took place at the selected DCs during 2008 and 2009. Accounting cost of basic training of 14 UBAs and 101 SSs was annualized dividing the corresponding total training costs by annualization factor 1.859 considering 2 years lifetime at 5% discounting rate (annexed table-3). Salary –allowances and refresher training cost of UBAs and SSs have been derived from annexed table-4, 5 while house rent and cost of non-medical consumables have been calculated using annexed table-6, 7 and 8.

The key outcome considered here was the total number of normal delivery (1713) that took place at the selected DCs during 2008 (745) and, 2009 (968) (table-1 on key outcome indicators). There was 30% increase (rate of change) in conducting normal delivery at these centres in 2009 compared to 2008.

Table-8 depicts the total annualized value of capital items mobilized for normal deliveries at the selected DCs was equivalent to Tk. 40,019.28 (USD 589) with Tk. 20,009.64 (USD 294.25) per year. Item-wise distribution of these costs is shown in annexed table-11. The annual fixed cost was Tk. 7,35,948.88 in 2008 and 2009 with an overall total of Tk. 14,71,897.76. Staff cost related to basic training, refresher training, pay and allowances of UBAs and SSs consumed around 69% of the total fixed cost.

**Table 8: Fixed costs directly linked to normal delivery at study delivery centres in 2008 and 2009**

Cost Components	2008		2009		Total cost	
	Tk	USD	Tk	USD	Tk	USD
Capital items annualized	20,009.64	294.25	20,009.64	294.25	40,019.28	588.50
Basic training annualized: UBA, SS	17,529.24	2,577.85	17,529.24	2,577.85	3,50,588.48	5,155.70
Refresher training UBA, SS	13,440.00	197.64	13,440.00	197.64	26,880.00	395.28
Salary allowances (UBA)	96,960.00	1,425.88	96,960.00	1,425.88	1,93,920.00	2,851.76
House rent (50% of DCs)	2,18,400.00	3,211.76	2,18,400.00	3,211.76	4,36,800.00	6,423.52
Non-medical consumables	1,92,000.00	2,823.52	1,92,000.00	2,823.52	3,84,000.00	5,647.04
Total	19,845.00	291.83	19,845.00	291.83	39,690.00	583.66
Total	7,35,948.88	10,822.73	7,35,948.88	10,822.73	14,71,897.76	21,645.46

Table-9 shows the total variable costs directly linked to conducting 1713 normal deliveries at the selected DCs were Tk. 2,29,363.15 (2008) and Tk. 2,98,018.00 (2009) and much lower compared to fixed cost of the respective years. Among all variable costs, financial incentives for staff consumed the highest share (65%) of the total variable cost.

**Table 9: Variable costs directly linked to normal delivery at study delivery centres in 2008 and 2009**

Cost components & quantity used	Unit cost (Tk.)	Cost				Total Cost	
		2008*		2009**		Tk.	USD
		Tk.	USD	Tk.	USD		
<b>A. Consumable Medical supplies</b>							
Delivery kit (1 kit/pt)	20.00	14,900	219.11	19,360.00	284.70	34,260.00	503.81
Sanitary napkin (1box/pt)	27.00	20,115.00	295.80	26,136.00	384.35	46,251.00	680.15
Misoposterol tablet: (2 tab/pt)	6.00	8,940.00	131.47	11,616.00	170.82	20,556.00	302.29
Vitamin A capsule: (used at DCs only) 2 lac IU/pt	1.87	1,393.15	20.48	1,810.16	26.62	32,03.31	47.10
Savlon antiseptic: (100ml/pt)	15.00	11,175.00	164.33	14,520.00	213.52	25,695.00	377.85
Baby wrapping cloth: (1 yrd./ baby)	30.00	22,350.00	328.67	29,040.00	427.05	51,390.00	755.72
Health card: 1/woman	2.00	1,490.00	21.91	1,936.00	28.47	3,426.00	50.38
<b>Subtotal</b>		80,363.15	1,181.77	1,04,418.00	1,535.53	1,84,781.15	2,717.30
<b>B. Financial incentives (UBA, SS)</b>	100.00	1,49,000.0	2,191.17	1,93,600.00	2,847.05	3,42,600.00	5,038.22
<b>Total:</b>		2,29,363.15	3,372.94	2,98,018.00	4,382.52	5,27,381.00	7,755.52

\* # normal delivery at DC in 2008: 745

\*\*# normal delivery at DC in 2009: 968

Table-10 suggests that overall fixed cost consumed the largest share (74%) of the total cost while variable cost consumed the remaining (26%) of the total cost. The average cost of normal delivery in 2009 (Tk. 1068.00) was less than that of 2008 (Tk. 1296.00) by Tk. 228 per delivery suggesting that the cost of normal delivery declined at a rate 18%.

**Table 10: Costs directly linked to normal delivery at selected delivery centres during 2008, 2009**

Cost category	2008*		2009**		Overall total cost	
	Tk	USD	Tk	USD	Tk	USD
Fixed Cost	7,35,948.88	10,822.77	7,35,948.88	10,822.77	14,71,897.76	21,645.54
Variable Cost	2,29,363.15	3,372.98	2,98,018.00	4,382.61	5,27,381.00	7,755.59
Total Cost:	9,65,312.03	14,195.75	10,33,966.88	15,205.38	19,99,278.76	29,401.13
Average cost per normal delivery	1,296	19.05	1,068	15.70	1,167	17.16

\* # normal delivery at DC in 2008: 745

\*\*# normal delivery at DC in 2009: 968

### Marginal cost

Table-11 depicts the marginal cost of 20 more normal deliveries for the year 2009. Keeping the fixed cost constant; the variable cost changed with each of extra one delivery. Even if no delivery was conducted at DCs the fixed cost would have been constant. We know the fixed cost, variable cost and total cost of 968 normal deliveries of 2009 (table-10).

(The change in variable cost for each 5 extra units of delivery is shown in annexed table-12). Table-11 shows the marginal costs of each additional delivery were less than average cost of delivery in 2009. Lower average cost with rising output indicates efficiency of the program. This finding also suggests that the average cost of normal delivery would reduce further in future –if scaled up.



**Table 11: Marginal cost**

Quantity	Fixed Cost	Variable Cost	Total Cost	Marginal Cost	
				Tk	USD
0	7,35,948.88	0	7,35,948.88	-	-
968*	7,35,948.88	2,98,018.00	10,33,966.88	307.86	4.52
973	7,35,948.88	2,99,557.51	10,35,506.39	307.90	4.52
978	7,35,948.88	3,01,096.86	10,37,045.74	307.87	4.52
983	7,35,948.88	3,02,636.21	10,38,585.09	307.87	4.52
988	7,35,948.88	3,04,175.56	10,40,124.44	307.87	4.52

\*Total number of normal delivery at DCs in 2009 was 968

### Cost of ANC coverage

Service records of Kamrangirchar Branch office (table-1) showed that the total number of ANC visits performed by Manoshi staff (SKs and MMWs) during 2008, 2009 was (11,319 + 12,454 = 23,773) with an average six visits per pregnancy identified. Total number of delivery including those at delivery centres (1713), home (1424) and referral hospitals (1021) during 2008 2009 was 4158. It suggests that each of these woman had received  $(23773 \div 4158) = 5.7$  ANC visits on an average (Table 1 on key outcomes). The rate of increase in ANC coverage was 10% in 2009 compared to 2008.

Inputs mobilized for conducting ANC visits included staff cost (pay and allowances, basic training, refresher training and incentives) proportionate to their time spent in ANC and instruments and other supplies used in ANC activities. Eleven SKs spent 30% of their time in ANC visits and one MMW out of two spent 20% and 50% of her time in ANC and identification of maternal complications respectively. Time spent in ANC by staff members was reported by program officials and supervisors. The instruments and other supplies used included weighing scales, BP machine, stethoscope, measuring tape, thermometer, health card, apron, umbrella, carrying bag, register books and identity card. Shared cost was considered as SK, MMW and some of these supplies were common for both ANC and PNC check-ups. Input costs were organized into proportionate fixed cost and proportionate variable cost to get the total cost per year, overall total cost and average cost of ANC per woman as presented in table- 12, 13, 14.

**Table 12: Proportionate fixed cost of ANC**

Cost components	2008 (Tk.)	2009 (Tk.)	Overall total cost (Tk.)
Capital items (annualized proportionate values)	6,213.28	6,213.28	12,427.00
Basic training (annualized proportionate value) SK-30% MMW-70%	9,900.00 1,050.00	9,900.00 1,050.00	19,800.00 2,100.00
Refresher training (SK-30% of total cost)	3,168.00	3,168.00	6,336.00
Salary allowances (SK- 30%, MMW-70%)	81,180.00 1,89,252.00	81,180.00 1,89,252.00	1,62,360.00 3,78,504.00
<b>Total</b>	<b>2,90763.28</b>	<b>2,90,763.28</b>	<b>5,81,527.00</b>

**Table 13: Proportionate variable cost of ANC**

Cost Components	2008 (Tk.)	2009 (Tk.)	Overall total cost (Tk.)
Health card (50% of total cost)	1,857.00	2,301.00	4,158.00
Stationeries: registers, etc (50% and 55% of total cost)	750.00	825.00	1,575.00
<b>Total</b>	<b>2,607.00</b>	<b>3,126.00</b>	<b>5,733.00</b>

Table-14 suggests that proportionate share of variable cost to the total cost of ANC was nominal compared to fixed cost. The average cost of ANC reduced by Tk. 30 in 2009 compared to that of 2008.

**Table 14: Costs of ANC during 2008 and 2009**

Cost Category	2008 (Tk.)	2009 (Tk.)	Overall total cost (Tk.)
Fixed cost	2,90,763.28	2,90,763.28	5,81,527.00
Variable cost	2,607.00	3,126.00	5,733.00
<b>Total cost</b>	<b>2,93,370.28</b>	<b>2,93,889.28</b>	<b>5,87,260.00</b>
Average cost of ANC/woman	(2,93,370 ÷ 1857) =Tk. 158.00 (USD 2.32)	(2,93,889 ÷ 2301) =TK. 128.00 (USD 2.00)	(5,87,260 ÷ 4158) =Tk. 141.23 (USD 2.07)

## Cost of PNC coverage

Service records of Kamrangirchar Branch office (table-1) showed that the total number of PNC visits performed by Manoshi field staff (SKs and MMWs) during 2008, 2009 was  $(664 + 8,284 = 14,968)$  with an average four visits per delivery identified. Total number of delivery including those at delivery centres (1713), home (1424) and hospital (1021) during 2008 and 2009 was 4158. It suggests that each of these woman had received  $(14968 \div 4158) = 3.59$  PNC visits on an average (Table 1 on key outcomes). The rate of increase in PNC visit was 24% in 2009 compared to 2008.

Inputs mobilized for conducting average 4 PNC visits (after 24 hours, 3<sup>rd</sup> day, 7<sup>th</sup> day and 28<sup>th</sup> day of delivery) included staff cost proportionate to their time spent, and instruments and supplies used in PNC activities. Eleven SKs spent 30% of their time in PNC visits and one MMW out of two spent 50% and 20% of her time in PNC and identification of neonatal complications respectively. Time spent in PNC by staff members was reported by program officials and supervisors. These supplies included Salter scale, weight machine, BP machine, stethoscope, measuring tape, thermometer, capsule vitamin A, health card, apron, umbrella, carrying bag, register book and identity card. Capsule vitamin A was obtained free of cost from Government sources, therefore shadow price of this item was included based on unit price (Tk. 1.87/cap) as suggested by the Director IPHN. Shared cost was considered as SK, MMW and some of these supplies were common for both ANC and PNC check-ups. Input costs were organized into proportionate fixed cost and proportionate variable cost to get the total cost per year, overall total cost and average cost of PNC per woman as presented in table-15, 16, 17.

**Table 15: Proportionate fixed cost of PNC**

Cost components	2008 (Tk.)	2009 (Tk.)	Overall total cost (Tk.)
Capital items (annualized proportionate value)	10,205.28	10,205.28	20,411.00
Basic training (annualized proportionate value) Sk-30% MMW-70%	9,900.00	9,900.00	19,800.00
Refresher training (SK-30% of total cost)	1,050.00	1,050.00	2,100.00
Salary allowances	3,168.00	3,168.00	6,336.00
(SK-30%, MMW-70%)	81,180.00	81,180.00	1,62,360.00
	1,89,252.00	1,89,252.00	3,78,504.00
<b>Total</b>	<b>2,94,755.28</b>	<b>2,94,755.28</b>	<b>5,89,511.00</b>

**Table 16: Proportionate variable cost of PNC**

Cost components	Unit cost (Tk.)	2008 (Tk.)	2009 (Tk.)	Overall total (Tk.)
Cap. Vitamin-A (100%)	1.87	3,472.59	4,302.87	7,775.46
Health card (50% of total cost)	2.00	1,857.00	2,301.00	4,158.00
Stationeries: registers (50% and 55% of total cost)	125	750.00	825.00	1,575.00
<b>Total</b>		<b>6,079.59</b>	<b>7,428.87</b>	<b>13,508.46</b>

Table-17 suggests that proportionate share of variable cost to the total cost of PNC was nominal compared to fixed cost. The average cost of PNC reduced by Tk. 31 in 2009 compared to that of 2008

**Table 17: Costs of PNC during 2008 and 2009**

Cost category	2008 (Tk.)	2009 (Tk.)	Overall total cost (Tk.)
Fixed cost	2,94,755.28	2,94,755.28	5,89,511.00
Variable cost	6,079.59	7,428.87	13,508.46
<b>Total cost</b>	<b>3,00,834.87</b>	<b>3,02,184.15</b>	<b>6,03,019.46</b>
Average cost of PNC/woman	(3,00,834.87 ÷ 1857) =Tk. 162.00 (USD 2.38)	(3,02,184.15 ÷ 2301) =TK. 131.32 (USD 2.00)	(6,03,019.46 ÷ 4158) = Tk. 145.02 (USD 2.13)

## DISCUSSION

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### Economic and policy implications

The uniqueness of the Manoshi program actually lies in its Delivery Centres. As of now, there is no such program inside urban slums offering facility-based delivery, ANC, PNC and facilitated referral with financial support for its residents. It is an innovative model of community-based distribution of a package of maternal and newborn care for the underserved slum women at their closest proximity round the clock. The prime mover of this intervention is a group of semi-qualified health workers with optimal supplies, basic and refresher training, supportive supervision and community support. In addition; a performance-based incentive package is available for this cadre of workers. Up until now; the services are provided free of charges.

Our previous survey on willingness to pay for Manoshi delivery centres (Manoshi working paper no. 4, 2009) revealed that prior to Manoshi program majority of the slum dwellers had to spent Tk.100 - 1000+ for home delivery and 83% of these deliveries were attended by untrained TBAs.

However, the current study shows (table-1) during 2008, 2009, 42% (1713) of normal deliveries were conducted at the selected Manoshi DCs, 34% (1424) at home and 24% (1021) at hospitals or clinics in kamrangirchar area. More importantly; all these 4158 deliveries of 2008 and 2009 at Kamrangirchar slum had received ANC and PNC by the trained workers of Manoshi program. All those hospital deliveries were referred by Manoshi field staff and assisted at referral facility by Manoshi Program Organizer (PO-referral). The key message is that all pregnancies enrolled in 2008 and 2009 at Kamrangirchar were taken care of. Lets' now see how much did it cost to the supply-side.

It is evident from our cost analysis that the Manoshi Delivery Centres were providing essential maternal and neonatal care particularly normal delivery care, ANC and PNC at low unit cost (Tk. 1167, Tk. 141.23 and Tk. 145.02 respectively) (table-10, 14, 17) compared to alternative sources (private clinics, hospitals) in Kamrangirchar areas and has been successful in reducing maternal and neonatal morbidity and mortality. The average cost of normal delivery in 2009 (Tk.1068) was less than that of 2008 (Tk. 1296) by Tk. 228 (table-10). These costs are less than the normal delivery cost of the maternal voucher scheme of the MOHFW (A

rapid assessment of demand-side financing pilot in Bangladesh 2008). For close proximity of the delivery centres and extensive home visit by MMWs and SKs- the beneficiaries did not have to bear any travel cost for ANC, PNC or normal delivery care. Moreover; the marginal cost (table-11) per additional delivery in 2009 (Tk. 307) was much less than the average cost of normal delivery at the Manoshi delivery centres which indicates that the average cost would decline further in future. The above-mentioned achievements at these low unit costs indicate operational and economic efficiency of the Manoshi delivery centres.

Fixed cost consumed the lion's share (78%) of the total cost compared to variable cost (22%) (table-5). This large share of fixed cost was due to the inclusion of cost of staff training, salary and allowances. Capital cost (Tk. 5, 99,739.25) as initial investment was low that took only 10% of the total cost (Tk. 61, 16,563.33).

The cost of input-mix at the delivery centres was relatively cheap compared to other models. Instead of hiring and deploying formally qualified professionals and setting expensive clinics; the delivery centres were staffed with trained health workers particularly UBAs and MMWs and engaging SKs, SSs and MMWs in extensive home visit. Most of the essential medical supplies used (e.g. delivery kits, sanitary napkins, mesoposterol tablets, vitamin- A capsules etc.) were low-cost. However; like many other interventions; staff cost was highest consuming 78% of the total cost (table-6). Other than pay and allowances (which was 49% of the total cost) staff cost included expenses for their basic training, refresher training and financial incentives. The next higher proportion of cost was incurred upon house rent which was 14.32% of the total cost followed by above-mentioned consumable medical supplies taking only 3.06% of the total cost (table-6).

It is interesting to relate the key findings of this cost analysis with that of our previous study on willingness to pay (Manoshi working paper no. 4, 2009.). The previous WTP study has shown that the majority (76%) of the respondents were willing to pay a registration fee for Manoshi Delivery Centres ranging between Tk. 450 to 750 (USD 6.6 - 11), 20% were found willing to pay Tk. 250 – 400 (USD 4 - 6) while only 4% were willing to pay Tk. 100- 200 (USD 1.4- 3). Our costing study has shown that the supply-side average cost of conducting normal delivery at Manoshi Delivery Centres was Tk. 1167 (USD 17) only while for ANC and PNC the average costs were TK. 141.23 (USD 2.07) and 145.02 (USD 2.13)

Considering the findings of these two studies, we would conclude that the Manoshi Delivery Centres have adequate potential of cost sharing – and that could be around 50% - if a registration fee between Tk. 450 to 750 is introduced in future.

## CONCLUSIONS

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- The total cost of operating seven Manoshi Delivery Centres of Kamrangirchar in 2008, 2009 combined was Tk. 61, 16,563.33 (USD 89949.38) - with a spending of Tk. 2970001.40 (USD 43676.49) in 2008 and Tk. 3146561.93 (USD 46272.93) in 2009
- For operating delivery centres proportionate share of fixed cost to the total cost was higher (78%) compared to variable cost (22%) (table-5)
- The capital cost as initial investment was low. Its share of total cost was only 10% (table-2)
- For conducting normal delivery proportionate share of overall fixed cost to the total cost was higher (74%) compared to variable cost (26%) (table-10)
- Average cost per delivery centre per month was Tk. 36,408.10 (USD 535.41) and average cost per delivery centre per day was Tk. 1213 (USD 18) only.
- Provider's overall average cost of conducting normal delivery at the selected Manoshi Delivery Centres during the reference period was Tk. 1167.00 (USD 17). The average cost of normal delivery declined in 2009 (Tk. 1068, USD 16) compared to 2008 (Tk. 1296, USD 19) indicating efficiency of the program.
- Marginal cost of conducting normal delivery in 2009 was (Tk. 308.00, USD 4.52) lower than the average cost indicating that the average cost would decline further with future scaling up of the program.
- Provider's overall average costs of ANC and PNC coverage per woman during the reference period were TK. 141.23 (USD 2.07) and 145.02 (USD 2.13) respectively.
- Considering the findings of the willingness to pay study conducted earlier by the authors and the average cost of normal delivery of this costing study (Tk. 1167), the authors would like to conclude that the Manoshi Delivery Centres have adequate potential of cost sharing (around 50%) - if a registration fee between Tk. 450 to 750 is introduced that the community is willing to pay.

## ANNEXTURE

## SECTION A

Table1: Costs of capital items of selected 7- delivery centres of Kamrangirchar slum: 2008, 2009

Items	Total quantity	Unit price (Tk.)	Replacement cost: (Tk.)	Useful life time	Annualization factor	Annualized cost: (Tk.)	Total cost: (Tk.) (annualized for 2 years)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Delivery bed	14	2,300	32,200	5	4.329	7,438.20	14,876.41
Curtain	84 pc	125	10,500	5	4.329	2,425.50	4,851.00
Steel almirah	7	4,000	28,000	10	7.722	3,626.00	7,252.00
Table	7	1,000	7,000	5	4.329	1,617.00	3,234.00
Chair	21	300	6,300	5	4.329	1,455.30	2,910.60
Plastic sheet	28 pc	135	3,780	5	4.329	873.18	1,746.36
Ceiling fan	14 pc	1,500	21,000	10	7.722	2,719.50	5,439.00
Tube light/accessories	14	250	3,500	3	2.723	1,285.34	2,570.69
Tool	21	100	2,100	5	4.329	485.10	970.20
Display board	7	500	3,500	10	7.722	453.25	906.50
Sign board	7	500	3,500	5	4.329	808.50	1,617.00
Poster	42	150	6,300	10	7.722	815.85	1,631.70
Emergency light	7	1,000	7,000	5	4.329	1,617.00	3,234.00



Items	Total quantity	Unit price (Tk.)	Replacement cost: (Tk.)	Useful life time	Annualization factor	Annualized cost: (Tk.)	Total cost:( Tk.) (annualized for 2 years)
Hurricane	7	150	1,050	5	4.329	242.55	485.10
Pillow	14	200	2,800	5	4.329	646.80	1,293.60
Bed spread	28	200	5,600	3	2.723	2,056.55	4,113.11
Pillow cover	14	100	1,400	3	2.723	514.13	1,028.27
Mosquito net	14	200	2,800	3	2.723	1,028.27	2,056.55
Plastic bowl	7	210	1,470	3	2.723	539.84	1,079.69
Plastic bucket	7	200	1,400	3	2.723	514.13	1,028.27
Waste bin	21	60	1,260	3	2.723	462.72	925.44
Shoe rack	7	400	2,800	5	4.329	646.80	1,293.60
Hanger	7	40	280	3	2.723	102.82	205.65
Wall clock	7	250	1,750	5	4.329	404.25	808.50
Floor mat	14	1,000	14,000	5	4.329	3,234.00	6,468.00
Saucepan	7	250	1,750	5	4.329	404.25	808.50
Pitcher	7	400	2,800	5	4.329	646.80	1,293.60
Aluminum pot	7	250	1,750	5	4.329	404.50	808.50
Cookeries	42	60	2,520	5	4.329	582.12	1,164.24
Calling bell	7	200	1,400	3	2.723	514.13	1,028.27
Plastic drum	7	400	2,800	5	4.329	646.80	1,293.60
Towel	14	150	2,100	3	2.723	771.20	1,542.41
Lock	14	150	2,100	3	2.723	771.20	1,542.41
<b>Sub-total:</b>							<b>81,506.77</b>

Items	Total quantity	Unit price (Tk.)	Replacement cost: (Tk.)	Useful life time	Annualization factor	Annualized cost: (Tk.)	Total cost: (Tk.) (annualized for 2 years)	
<b>Medical appliances and accessories</b>								
Salter scale	21	1,800	37,800	5	4.329	8,731.80	17,463.61	
Ambu bag	7	150	1,050	5	4.329	242.55	485.10	
Mackintos	14	350	4,900	5	4.329	1,131.90	2,263.80	
BP machine	21	1,000	21,000	5	4.329	4,851.00	9,702.00	
Stetho	21	500	10,500	5	4.329	2,425.50	4,851.00	
Apron	128	300	38,400	3	2.723	14102	28,204.00	
Name plate	128	20	2,560	3	2.723	940.13	1,880.26	
Weighing machine	7	1,000	7,000	5	4.329	1,617.00	3,234.00	
Measuring tape	7	10	70	5	4.329	16.17	32.34	
Torch	7	75	525	2	1.859	282.40	564.81	
Gloves	450pc	5	2,250	3	2.723	826.29	1,652.58	
Baby jacket	14	250	3,500	3	2.723	1,285.34	2,570.69	
Thermometer	21	30	630	2	1.859	338.89	677.78	
Bedpan	7	75	525	2	1.859	282.40	564.81	
Training manuals	126pc	150	18,900	5	4.329	4,365.90	8,731.80	
Umbrella SS, SK	112pc	120	13,440	3	2.723	4,935.73	9,871.46	
Carrying bag for SS	101pc	90	9,090	3	2.723	3,338.22	6,676.45	
Carrying bag for SK, MMW	13pc	200	2,600	3	2.723	954.82	1,909.64	
Sub-total:							1,01,336.13	
Total:							TK.91,421.45	TK. 1,82,842.90 (USD 2689.00)

Table 2: Costs of capital items of Kamrangirchar Branch Office

Items	Total quantity	Unit price (Tk.)	Replacement cost: (Tk.)	Useful life time	Annualization factor	Annualized cost: (Tk.)	Total cost: (Tk.) (annualized for 24 months)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Steel Almirah	1	6,000	6,000	10	7.722	777.00	1,554.00
Table	2	6,500	13,000	10	7.722	1,683.50	3,367.00
Chair	16	3,000	48,000	5	4.329	11,088.01	22,176.02
Display board	1	1,200	1,200	10	7.722	155.40	310.80
Ceiling fan	2	1,500	3,000	10	7.722	388.50	777.00
Tube light	2	250	300	3	2.723	91.81	183.62
Plastic bucket	2	200	400	3	2.723	146.89	293.79
Cup saucer etc	12	60	720	3	2.723	264.41	528.82
Total						Tk.14,595.52	Tk. 29,191.05 (USD. 429.28)

**Table 3: Cost of basic training at TARC**

Staff category	No. of staff	Duration	Organization	*Cost/day/staff (Tk.)	Total cost (Tk.)
SK	11	12 days	TARC	250/day/SK	33,000.00
SS	101	18 days	TARC	150/day/SS	2,72,700.00
UBA	14	6 days	TARC	633/day/UBA	53,172.00
Mid-wife	2	3 days	TARC	250/day/MW	1,500.00
Total actual expenditure:					3,60,372.00

\*accounting cost of BRAC's financial database

(Annualized value of basic training has been calculated by dividing total cost by annualization factor: 1.859 at 2 years life time and 5% discounting rate)

Table 4: Staff salary and allowances

Staff category	No. of staff	Actual Salary/ month (Tk.)	Allowances/ month Tk.	Staff salary+ allowances for 2008 (Tk.)	Staff salary + allowances for 2009 (Tk.)	Total salary & allowances for 2 yrs. (Tk.)
SK	11	2,000	TA for meeting:	$2,000 \times 11 \times 12$	$2000 \times 11 \times 12$	=5,41,200
			Tk. 50	= 2,64,000	=2,64,000	
				$50 \times 11 \times 12 = 6,600$	$50 \times 11 \times 12 = 6,600$	
			Subtotal = 2,70,600	Subtotal = 2,70,600		
UBA	14	1,300	-	$14 \times 1,300 \times 12$	$14 \times 1300 \times 12$	=4,36,800
				= 2,18,400	= 2,18,400	
				Subtotal = 2,18,400	Subtotal = 2,18,400	
Mid-wife Sufia Begum, Aklima Begum	2	14,230	TA,DA:500	$14,230 + 500 + 200$	$14,230 + 500 + 200$	=5,40,720
				= 14,930 x 12	= 14,930 x 12	
				= 1,79,160	= 179160	
				$6,600 + 800 + 200$	$6,600 + 800 + 200 =$	
				$= 7,600 \times 12$	$7,600 \times 12 = 91200$	
			Subtotal = 91,200	Subtotal = 2,70,360		
PO Hafizur Rah- man, Saha- nur, Farzana, Mateka	4	11,800	TA,DA:1800 +	$13,800 \times 12 = 1,65,600$	$13,800 \times 12 = 1,65,600$	=11,02,200
				$13,825 \times 12 = 1,65,900$	$13,825 \times 12 = 1,65,900$	
				$9,700 \times 12 = 1,16,400$	$9,700 \times 12 = 1,16,400$	
				$8,600 \times 12 = 1,03,200$	$8,600 \times 12 = 1,03,200$	
				Subtotal = 5,51,100	Subtotal = 5,51,100	
			Phone call:200	Phone call:200		

Staff category	No. of staff	Actual Salary/ month (Tk.)	Allowances/ month (Tk.)	Staff salary+ allowances for 2008 (Tk.)	Staff salary + allowances for 2009 (Tk.)	Total salary & allowances for 2 yrs. (Tk.)
Br. Manager	1	13,760	75% of monthly salary: Mobile call: 300 TA, DA: 1,400	10,320 x 12 = 1,23,840 300 x 12 = 3,600 1,400 x 12 = 16,800 Subtotal = 1,44,240	10,320 x 12 = 1,23,840 300 x 12 = 3,600 1,400 x 12 = 16,800 Subtotal = 1,44,240	=2,88,480
Caretaker	1	4,800	75% of monthly salary:	3,600 x 12 = 43,200 Subtotal = 43,200	3,600 x 12 = 43,200 Subtotal = 43,200	=86,400
Total actual expenditure:				14,97,900.00 (USD 22,027.94)	14,97,900.00 (USD 22,027.94)	29,95,800.00 (USD 44,055.88)

**Table 5: Refresher training cost**

Staff category	No. of staff	Refresher training / month/staff (Tk.)	Refresher training cost 2008 (Tk.)	Refresher training cost 2009 (Tk.)	Total cost for 2 yrs. (Tk.)
SK	11	Tk. 80.00	80 x 11 x 12 = 10,560	80 x 11 x 12 = 10,560	= 21,120
SS	101	Tk.80.00	80 x 101 x 12 = 96,960	80 x 101 x 12 = 96,960	= 1,93,920
UBA	14	Tk. 80.00	80 x 14 x 12 = 13,440	80 x 14 x 12 = 13,440	= 26,880
Total:			Tk. 1,20,960.00	Tk. 1,20,960.00	Tk 2,41,920.00 (USD 3557.64)

**Table 6: House rent of Delivery Centres and Branch Office in Kamrangirchar in 2008**

	Delivery centre	Rent/month (Tk.)	Total in 2008 (Tk.)
1	Koailarghat	5,500.00	66,000.00
2	Ashrafabad	5,500.00	66,000.00
3	Alinagar	5,000.00	60,000.00
4	Muslimbagh	5,000.00	60,000.00
5	Nabinagar	4,000.00	48,000.00
6	Islamnagar	3,500.00	42,000.00
7	Mominbagh	3,500.00	42,000.00
	Subtotal:	32,000.00	3,84,000.00
8	Branch office: 75%	4,500.00	54,000.00
	Total	36,500.00	4,38,000.00

**Table 7: House rent of Delivery Centres and Branch Office in Kamrangirchar in 2009**

Sl.	Delivery centre	Rent/month (Tk.)	Total in 2009 (Tk.)
1	Koailarghat	5,500.00	66,000.00
2	Ashrafabad	5,500.00	66,000.00
3	Alinagar	5,000.00	60,000.00
4	Muslimbagh	5,000.00	60,000.00
5	Nabinagar	4,000.00	48,000.00
6	Islamnagar	3,500.00	42,000.00
7	Mominbagh	3,500.00	42,000.00
Subtotal		32,000.00	3,84,000.00
8	Branch office: 75%	4,500.00	54,000.00
Total		36,500.00	4,38,000.00

Source: Branch office, Kamrangirchar

**Table 8: Costs of non-medical consumable supplies (fixed/month)**

Non-medical supplies	Quantity	Unit price (Tk.)	Cost (Tk.)		Total cost	
			2008	2009	Tk	USD
Soap	2/mon/ DC	15	2x7x12x15 = 2520	2x7x12x15 = 2520	5,040	74.11
Detergent	1kg/ mon/Dc	40	1x40x7x12 = 3360	1x40x7x12 = 3360	6,720	98.82
Toilet cleaner	1/mon/ DC	60	1x60x7x12 = 5040	1x60x7x12 = 5040	10,080	148.23
Bleaching powder	3/mon/ DC	10	3x10x7x12 = 2520	3x10x7x12 = 2520	5,040	74.11
Stationeries (Register khata, pen)	Lump- sum	125	30x7x125 = 26250	30x7x125 = 26250	52,500	772.05
Total			39,690.00	39,690.00	79,380.00	1,167.32



Table 9: Costs of consumable medical supplies (variable costs)

Consumable medical supplies	Quantity 2008+09	Unit price (Tk)	Cost (Tk.)		Total cost	
			2008	2009	Tk	USD
Delivery kit	1kit/pt.	20.00	745 x 20 = 14900	968 x 20 = 19360	34260	503.82
Sanitary napkin	1box/pt	27.00	745 x 27 = 20115	968 x 27 = 26136	46251	680.16
Misoposterol tablet	2 tab/pt	6.00	745 x 2x6 = 8940	968 x 2x6 = 11616	20556	302.29
*Vitamin A capsul	2 lac IU/pt	*1.87	745 x 1.87 = 1393.15	968 x 1.87 = 1810.16	=3203.31 =2662.88	47.10 39.16
Savlon (liquid anti-septic)	100 ml/pt	**15.00	764 x 1.87 = 1428.68	660 x 1.87 = 1234.20	25695	377.86
Baby wrapping cloth	1 yd/baby	30.00	30 x 745 = 22350	30 x 968 = 29040	51390	755.73
Health card	1/mother	2.00	2 x 745 = 1490	2 x 968 = 1936	3426	50.38
Total:			81,791.83	1,05,652.36	1,87,444.01	2,756.50

\* Source of shadow price: Director IPHN, MOHFW \*\*Tk. 150/1000 ml container

Table 10: Staff's financial incentives (variable cost)

Staff category	No. of staff	Incentives/month or per case (Tk.)	Incentives for 2008 (Tk.)	Incentives for 2009 (Tk.)	Total incentives for 2 yrs. (Tk.)
SK	11	Work incentive: Tk. 800 Monthly report: Tk. 80	800 x 11 x 12 = 1,05,600 80 x 11 x 12 = 10,560 Subtotal = 1,16,160	800 x 11 x 12 = 1,05,600 80 x 11 x 12 = 10,560 Subtotal = 1,16,160	= 2,32,320
SS	101	Preg. Identification: Tk.30 Pt. brought to DC: 100 Pt. referred to hosp. 100 Info on home delivery: 30 Neonatal sepsis identified & ref. care: Tk. 100 Presence at delivery & neonatal care: Tk. 100	30 x 1857 = 55,710 100 x 745 = 74,500 100 x 348 = 34,800 30 x 764 = 22,920 100 x 39 = 3,900 100 x 745 = 74,500 Subtotal = 2,66,330	30 x 2301 = 69,030 100 x 968 = 96,800 100 x 673 = 67,300 30 x 660 = 19,800 100 x 145 = 14,500 100 x 968 = 96,800 Subtotal = 3,64,230	= 6,30,560
UBA	14	Per delivery: Tk. 100 Per referral: Tk. 100	100 x 745 = 74,500 100 x 348 = 34,800 Subtotal = 1,09,300	100 x 968 = 96,800 100 x 673 = 67,300 Subtotal = 1,64,100	= 2,73,400
Total			Tk. 4,91,790.00	Tk. 6,44,490.00	11,36,280.00 (USD 16,710.00)

## SECTION B: Costs directly associated with assisting normal delivery

Table 11: Capital items actually used at the selected DCs during normal delivery in 2008, 2009

Inputs	Total quantity actually used	Unit price (Tk.)	Replacement cost (Tk.)	Life time Yrs.	Annualization factor	Annualized cost (Tk.)	Total cost (annualized for 2 yrs.)
Delivery bed: frame & mattress	7 set	2,300	16,100	5	4.329	3719.10	7,438.20
Pillow	7 pc	200	1,400	5	4.329	323.40	646.80
Pillow cover	7 pc	100	700	3	2.723	257.06	514.12
Bed spread	14 pc	200	2,800	3	2.723	1,028.27	2,056.54
Plastic sheet	14 pc	135	1,890	5	4.329	436.59	873.18
Curtain	6 pc	125	750	5	4.329	173.25	346.50
Plastic bowl	7pc	200	1,400	3	2.723	514.13	1,028.26
Plastic bucket	7pc	200	1,400	3	2.723	514.13	1,028.26
Floor mat	7 pc	1,000	7,000	5	4.329	1,617.00	3,234.00
Ceiling fan	7 pc	1,500	10,500	10	7.722	1,359.75	2,719.50
Tube light & accessories	7 pc	250	1,750	3	2.723	642.67	1,285.34
Sub-total						10,585.35	21,170.70

Medical Supplies used									
BP machine	7	1,000	7,000	5	4.329	1,617.00	3,234.00		
Stetho	7	500	3,500	5	4.329	808.50	1,617.00		
Apron	21	300	6,300	3	2.723	2,313.62	4,627.24		
Mackintos	14	350	4,900	5	4.329	1,131.90	2,263.80		
Baby jacket	7	250	1,750	3	2.723	642.67	1,285.34		
Salter scale	7	1,800	12,600	5	4.329	2,910.60	5,821.20		
Sub-total						9,424.29	18,848.58		
Total						TK. 20009.64 (USD 294.25)	TK. 40,019.28 (USD 589)		

Exchange rate of 2009: 1 USD=Tk. 68

Discount rate=5% (Bangladesh Bank)

**Table 12: Changes in variable cost for 20 more additional deliveries in 2009**

Variable inputs	Unit cost (Tk.)	# of additional deliveries	Total variable cost (Tk.)
Delivery kit	20.00	973	19,460.00
Sanitary napkin	27.00	973	26,271.00
Misoposterol tablet	6.00 x2	973	11,676.00
Vitamin-A cap	1.87	973	1,819.51
Savlon	15.00	973	14,595.00
Baby wrapping cloth	30.00	973	29,190.00
Health card	2.00	973	1,946.00
Incentive for UBA, SS	100.00x2	973	1,94,600.00
Subtotal:			2,99,557.51
Delivery kit	20.00	978	19,560.00
Sanitary napkin	27.00	978	26,406.00
Misoposterol tablet	6.00 x2	978	11,736.00
Vitamin-A cap	1.87	978	1,828.86
Savlon	15.00	978	14,670.00
Baby wrapping cloth	30.00	978	29,340.00
Health card	2.00	978	1,956.00
Incentive for UBA, SS	100.00 x2	978	1,95,600.00
Subtotal:			3,01,096.86
Delivery kit	20.00	983	19,660.00
Sanitary napkin	27.00	983	26,541.00
Misoposterol tablet	6.00 x2	983	11,796.00
Vitamin-A cap	1.87	983	18,38.21
Savlon	15.00	983	14,745.00
Baby wrapping cloth	30.00	983	29,490.00
Health card	2.00	983	1,966.00
Incentive for UBA, SS	100.00 x2	983	1,96,600.00
Subtotal			3,02,636.21

Variable inputs	Unit cost (Tk.)	# of additional deliveries	Total variable cost (Tk.)
Delivery kit	20.00	988	19,760.00
Sanitary napkin	27.00	988	26,676.00
Misoposterol tablet	6.00 x2	988	11,856.00
Vitamin-A cap	1.87	988	1,847.56
Savlon	15.00	988	14,820.00
Baby wrapping cloth	30.00	988	29,640.00
Health card	2.00	988	1,976.00
Incentive for UBA, SS	100.00 x2	988	1,97,600.00
Subtotal			3,04,175.56

Table 13: Cost of capital inputs for ANC visits

Inputs	Total quantity	Unit price (Tk.)	Replacement cost (Tk.)	Life time Yrs.	Annualization factor	Annualized cost (Tk.)	% use in ANC activities	Total cost (annul. for 24 months)
Weight machine	7	1,000	7,000	5	4.329	1617	80 (1,293.6)*	2,587.20
BP machine	12	1,000	12,000	5	4.329	2,772	80 (2,217.6)	4,435.20
Stethoscope	12	500	6,000	5	4.329	1,386	80 (1,108.8)	2,217.60
Measuring tape	11+1	10	110	5	4.329	25.4	80 (20.32)	41.00
Thermometer	11+1	30	330	2	1.859	177.51	80 (142)	284.00
Apron	11+1	300	3,600	3	2.723	1,322.07	50 (661)	1,322.00
Identity card	11+1	20	240	2	1.859	129.10	50 (64.55)	129.10
Carrying bag	11+1	200	2,400	3	2.723	881	50 (441)	882.00
Umbrella	11+1	120	1,440	3	2.723	529	50 (264.41)	529.00
Total:							Tk. 6,213.28 (USD 91.37)	Tk12,427.10 (USD182.75)

\*Proportionate annualized cost in taka is shown in parenthesis

Table 14: Cost of capital items for PNC visits

Inputs	Total quantity	Unit price (Tk.)	Replacement cost (Tk.)	Life time Yrs.	Annualization factor	Annualized cost (Tk.)	% use in ANC activities	Total cost (annul. for 24 months)
Weight machine	7	1,000	7,000	5	4.329	1,617	80 (1,293.6)*	2,587.20
BP machine	12	1,000	12,000	5	4.329	2,772	80 (2217.6)	4,435.20
Stethoscope	12	500	6,000	5	4.329	1,386	80 (1,108.8)	2,217.60
Salter scale	12	1,800	21,600	5	4.329	4,989.60	80 (3992)	7,984.00
Measuring tape	11+1	10	110	5	4.329	25.4	80 (20.32)	41.00
Thermometer	11+1	30	330	2	1.859	177.51	80 (142)	284.00
Apron	11+1	300	3,600	3	2.723	1,322.07	50 (661)	1,322.00
Identity card	11+1	20	240	2	1.859	129.10	50 (64.55)	129.10
Carrying bag	11+1	200	2,400	3	2.723	881	50 (441)	882.00
Umbrella	11+1	120	1,440	3	2.723	529	50 (264.41)	529.00
Total							(Tk. 10,205.28) (USD 150.07)	TK.20,411.10 (USD 300.16)

\*Proportionate annualized cost in taka is shown in parenthesis



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