

MANOSHI

working paper

Cost of behavior
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An MNCH program in
urban slums of Dhaka,
Bangladesh

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EXECUTIVE SUMMARY

Costing is a major activity to define future service packages, plan payment methods and measure the efficiency of the healthcare system. Maternal, neonatal and child health (MNCH) services are of high importance in Bangladesh for meeting MDGs (4 and 5). Several MNCH programs have been initiated in Bangladesh and for some of them costs of services have been estimated. However, the cost of behavior change communication (BCC), which is considered to be an integral part of MNCH, has not been rigorously estimated in Bangladesh. *Manoshi*, a MNCH program has been operating in urban slums of all city corporation areas by BRAC since 2007. BCC key messages in *Manoshi* are delivered through thirteen sub-channels within three broader categories of channels.

The objective of this current study is to estimate the costs of BCC interventions through 13 sub-channels separately. Pregnant women, their husband and community people in the urban slums of Dhaka city, where *Manoshi* program is being implemented, has been investigated.

The study is conducted during November, 2010 to April, 2011 in urban slums of Dhaka City where *Manoshi* program is being implemented. Micro-costing approach is utilized for calculating unit cost using primary and secondary sources. Primary data is collected through interview of service-providers and managers, observation of group counseling and mass media events and informal group meeting. Information on magnitude of services provided is taken from secondary sources. The cost of BCC tools per exposed is calculated.

BCC cost of FFC is 2.94 BDT for pregnancy identification; 3.02 BDT for pregnancy confirmation; 11.24 BDT for antenatal care; 18.10 BDT for delivery care and 20.83 BDT for post natal care. Cost of group counseling is 22.31 BDT for EDD meeting (women in later-stage pregnancy); 13.74 BDT for Women Support Group meeting; 16.92 BDT for MNCH committee meeting; and 6.62 BDT for spouse forum meeting. Mass media cost is 9.42 BDT for folksong; 26.27 BDT for street drama, 0.40 BDT for TV-broadcasting and 2.61 BDT for billboard. We found that BCC intervention channel, group counseling costs highest per exposed (59.63 BDT or US\$ 0.82), followed by face-to-face counseling (56.13 BDT or US\$ 0.77) and mass media (38.83 BDT or US\$ 0.53).

The costs per exposed through 13 BCC sub-channels are found. The cost per exposed vary significantly across BCC intervention channels. Some of the inputs appear as the cost drivers, namely, personnel, BCC materials and refreshment costs. However, the major cost drivers vary across different channels and sub-channels. The cost per exposed can be used for estimating total costs of BCC interventions in ongoing and future projects, planning the cost containment and resource allocation across different BCC sub-channels.

INTRODUCTION

Costing is a major activity to define future service packages, plan payment methods and measure the efficiency of the healthcare system (Hsiao and Shaw, 2007). Maternal, neonatal and child health (MNCH) services are of high importance in Bangladesh for meeting MDGs (4 and 5). Different service packages, like antenatal care (ANC), delivery care, post-natal care (PNC), new born care, child care are offered to the target population. Behavior change communication (BCC) is considered to be an integral part of these services for bringing people to safe practices by building awareness. Costs of some selected services for several MNCH programs have been calculated (Sarowar et al., 2010; Borghi et al., 2006; Levin et al., 1999). However, the cost of BCC intervention is not done rigorously considering its components (like, BCC during ANC, PNC, delivery, and counseling) separately earlier in any MNCH studies in Bangladesh.

In the last decades, a good number of MNCH programs have been initiated in Bangladesh targeting different populations like, rural, urban. *Manoshi*, a MNCH program is being implemented since 2007 by BRAC in urban slums of Bangladesh where BCC intervention is one important component. The services of *Manoshi* are free of cost to recipients, which imply that the sustainability is a challenge for the program. A financial strategy needs to be developed for the sustainability of the program and for this purpose cost estimation of the services is inevitable. Due to lack of evidence-based knowledge about cost of BCC interventions and its determining factors, this study intends to estimate the cost of BCC intervention in *Manoshi*, disaggregated into relevant cost components.

In section 1, introduction explains the rationale of the study as well as the objective. The description of the *Manoshi* MNCH program, focusing BCC intervention is narrated in section 2. In section 3, the method of cost calculation is described, followed by the results in section 4. The discussion is located in section 5. The concluding remarks are presented in section 6 and the study ends with a list of references in section 7.

BCC intervention in *Manoshi* program

BRAC, a leading NGO of Bangladesh, has been delivering maternal, neonatal and child health (MNCH) services since 2007 through a community-based health intervention, under “*Manoshi*” program in selected urban slums of all city-corporation areas in Bangladesh. This program aims at reducing maternal and child mortality in urban slums. BCC intervention is one of its components, which intends to develop awareness about MNCH in the target audience. *Manoshi*, therefore, has developed BCC messages and identified message delivery channels. The target audience of BCC interventions is new couples (newly married woman and her husband), eligible couples (married woman of reproductive age, 15-49 years having at least one pregnancy experience and her husband), pregnant women and their husband, lactating mothers and their family members as well as community members.

The community health volunteers *Shasthya Sebika* (SS), community health workers *Shasthya Karmi* (SK) and, Program Organizers (PO) are directly involved with delivering BCC interventions. The following table presents the key BCC messages.

Table 1. Key messages included in BCC intervention of *Manoshi*

1. At least 3 antenatal check-ups are needed during pregnancy
2. Eat more food and drink more water and liquids during pregnancy
3. Keep sound mind and take proper rest during pregnancy
4. Ensure that deliveries take place at a delivery centre (birthing hut)
5. Use proper family planning methods after 42 days of delivery of the baby
6. Use clean pad after delivery and keep the birth passage dry and clean
7. Family members should take care of pregnant and lactating mothers
8. Inform BRAC health workers immediately if any danger signs develop with the mother
9. Wrap the whole body of the baby with clean cloths and always keep the baby warm
10. Initiate colostrums feeding
11. Keep the umbilical stump dry and bathe the newborn at least after seven days from birth
12. Inform BRAC health workers immediately if there is any danger sign of neonate
13. Ensure exclusive breast feeding for up to six months
14. Start complementary feeding from the seventh month of the baby
15. Immunize the baby against seven infectious diseases
16. Use oral re-hydration solution (ORS) for diarrhea
17. If the baby has rapid breathing, chest in-drawing, respiratory problem or any other danger sign inform BRAC health workers immediately.
18. Pregnancy related danger signs (examples, excessive bleeding, convulsion)
19. Danger signs for new born and under 5 children (examples, rapid breathing, lethargy, convulsion)

BCC messages are delivered through 13 different ways which can be categorized into three broader channels, namely, “Face-To-Face Counseling (FFC)”, “Group Counseling (GC)” and “Mass Media (MM)”. In the following table, the channels and their sub-channels are described.

Table 2: Description of the BCC interventions

Channels	Sub-channels	Description
Face-to-Face counseling (FFC)	<ul style="list-style-type: none"> • Pregnancy identification • Pregnancy confirmation • Antenatal care • Delivery • Post-natal care 	Community Health Workers provide FFC to the target audience with selected BCC messages during their regular field visits and when providing antenatal, delivery, postnatal, neonatal and child care.
Group counseling (GC)	<ul style="list-style-type: none"> • Expected date of delivery (EDD) meeting • Women support group (WSG) meeting • Maternal, neo-natal and child health (MNCH) meeting • Spouse forum meeting 	Program has formed groups with different community people, i.e., 7-9 month pregnant women for EDD meeting; community women for WSG meeting, community influential people for MNCH meeting and pregnant women with their husband for spouse forum meeting. Through this joint effort, the program intends to build awareness among community people.
Mass media (MM)	<ul style="list-style-type: none"> • Folksong • Street drama 	<p>Program hires a folksong team to organize this event in the intervention areas. The BCC messages are being provided through the artist of the team by singing folksong. This event is usually organized between October to April to avoid rainy time and at least once per year in each BRAC delivery centre (Birthing Hut).</p> <p>Program hires a street drama team to organize this event in the intervention areas. The BCC messages are being delivered through the artist of the team. This event is usually organized between October to April to avoid rainy time and at least once per year in each BRAC delivery centre (Birthing Hut).</p>

Channels	Sub-channels	Description
	<ul style="list-style-type: none"> • TV-spot 	A one minute TV-spot is being broadcasted to the community through the video channel of local cable-TV connection. Usually, it is being shown 10-12 times each day during broadcasting of movies.
	<ul style="list-style-type: none"> • Billboard 	Program has established a number of billboards in the mostly visible areas beside the streets in the city so that targeted audience may get the information and aware of maternal and child health.

As we observe, the channels for delivering BCC messages are different and require different types of inputs to operate. For instance, while the face-to-face counseling involves SS and SK, the TV-spot requires involvement of cable-TV service providers. Moreover, different channels may reach different magnitude of audience. While the former one reaches smaller number of audience, the later covers a larger population. The cost per exposed thus can be affected by the number of audience reached by each BCC channel or sub-channel.

METHODS AND MATERIALS

The cost of BCC channels is calculated considering the provider's perspective. The cost is limited to implementation level, which means that all costs, which are related to the inputs at field level for reaching the target audience with BCC messages, are captured in this study. BRAC *Manoshi* BCC channels can be divided into three broad categories, namely, "Face-To-Face Counseling (FFC)", "Group Counseling (GC)" and "Mass Media (MM)". In FFC, BRAC staffs deliver BCC messages related to pregnancy, safe delivery, neonatal and child health issues. GC is conducted to different groups of target audiences including pregnant women, husbands and their adult family members. In GC, information related to safe delivery, introduction of birthing huts (delivery centre) and its utility, information about birth preparedness are provided. In *Manoshi* BCC intervention MM is utilized to build awareness among larger community people. In order to calculate the cost of above BCC sub-channels and channels of *Manoshi*, we employ the

methodologies, discussed below in five sub-sections including study area and population, costing approach, cost components, inputs in BCC interventions and data collection procedures.

Study area and population

This study is carried out in the urban slums in Dhaka, where *Manoshi* program is being implemented since 2007. New couples (newly married woman and her husband), eligible couples (married woman of reproductive age, 15-49 years having at least one pregnancy experience and her husband), pregnant women and their husband, lactating mothers and their family members as well as community members who are targeted by *Manoshi* BCC interventions are included in the study population. The study has been carried out during November, 2010 to April, 2011.

Costing approach

Micro-costing

The study uses ‘micro-costing’ method for calculating cost of inputs related to *Manoshi* BCC interventions. Micro-costing is a meticulous, bottom-up and more detailed approach (Sarowar et al., 2010). Micro costing, which is time consuming, can be used where the accuracy of resource measurement is important and data collection is feasible in an economically sensible way (Khan, 2008). Since, we have available information about inputs and cost from implementing organization (BRAC) and the market values (whenever applicable), we apply here cost calculation from providers’ point of view using the micro-costing approach. Each component of resources (inputs) used (e.g. staff time, BCC materials, etc.) and the unit price of related inputs is needed. The calculation of total cost requires the quantities of resources to be multiplied by the prices (unit cost) of those resources considering what degree of detailed will be available on the costs (Drummond et. al., 2003). The following equation is thus applied for calculating the cost of each service i.e., sub-channel specific BCC intervention.

$$\text{Cost of BCC intervention} = \sum (\text{Quantity of any input} \times \text{unit price of that input})$$

Calculation of cost per BCC exposed

Calculating cost per exposed through each BCC sub-channel is of interest in this study. The cost for exposing each individual is calculated by dividing the total cost of each BCC sub-channel with the estimated number of participants or people

targeted by that specific channel. An average number of participants or target population of sub-channels was taken by direct observation of the research team members and available secondary data. Cost per exposed by each channel is thus calculated by adding up the costs per exposed by all sub-channels which belong to the same channel.

Cost components of the program

The cost items are classified into “recurrent cost items” and “capital cost items”. “Inflation-adjusted discount rate” is used for considering time differentials. All these concepts are described below.

Recurrent cost

Regular cost incurred repeatedly for any service (here, BCC information delivery) within a year is considered as “recurrent cost”. BCC materials, refreshment, salary of BRAC personnel etc. are the examples of recurrent cost items. Unit costs of recurrent items are collected by interviewing BRAC personnel who were involved in supplying those items. The prices have then been cross-checked from field level staff. As for example, refreshment during group counseling costs 15 BDT for each participant. A portion of salary is assigned to BCC tools for personnel who are actively participating for arranging BCC counseling sessions. It needs to be clarified here that the training cost is included for those staffs who are directly involved in service delivery. The training cost of supervisors who generally gives very negligible portion of his/her time to the activity is not included in the total cost.

Capital cost

According to Drummond et al. (2008), capital costs or assets are usually invested at a bulk amount and used over time. Some capital items like fan, clock, cabinet, mat, board, curtain, and register book and sign board have been used to decorate venue of group counseling. Different life times are supposed for different capital items. For instance, five year life time is considered for ceiling fan, cabinets etc. Life time for clock is considered to be two years, sign board to be one year.

Discounting and annuitization

Capital items are annualized for their respective functional lifetime and inflation adjusted discounting rate. For annuitization, we consider 3% discounting rate following the recommendation of Gold et al, (1996). Then this rate was adjusted

for average inflation rate 7.96% for 2008-2011 (Bangladesh Bank). The inflation adjusted discount rate has thus been calculated to 11.2% ($1.030 \times 1.0796 = 1.112$ or 11.2 percent). Using this discounting rate, cost per year of every capital items is calculated by using the following equation:

$$E = K \left(1 + \frac{1}{(1+r)} + \frac{1}{(1+r)^2} + \dots \right)^{-1}$$

Where, K = Purchasing price, r = Inflation adjusted discounting rate and E = Equivalent yearly cost.

In calculating the staff training cost, a 54-month project period is applied since the BCC intervention started July 2007 (6 months later than the start of *Manoshi* program period) and will be continuing till end of 2011.

Fixed and variable costs

The cost components of the program can be separated into fixed and variable costs. The costs which do not change with increase in number of persons exposed by BCC are considered to be the fixed costs. On the other hand, the variable costs changes with increase in number of persons exposed.

Inputs in BCC interventions

The inputs generally used in BCC interventions are staff time, BCC materials, logistic and supply, supervision, capital items, product contractual with external organizations etc. In table 3 a list of inputs are presented.

For calculating the costs of sub-channels, we require more information than presented in table 3 for developing precision for transforming inputs and activities into costs. Ten minutes are allocated to BCC message delivery during all sub-channels in FFC except pregnancy identification, which takes 5 minutes. However, the total time for these events varies between 5 and 24 minutes. The staff time has been transformed into costs using average salary of the relevant staffs.

Time allocation to BCC message delivery is generally higher in GC sub-channels. The duration of EDD meeting is 90 minutes and half of this time period is devoted to BCC messages delivery. Duration of each of WSG and MNCH meetings is 45 minutes, of which 15 minutes are allocated for BCC message delivery. A

Spouse Forum meeting lasts for 45 minutes, where 10 minutes go to BCC message delivery. Staffs are even involved for communicating the prospective mothers, their husbands or relatives and community people so that they attend the meeting. Moreover, for calculating the cost per exposed the number of participants is used. The refreshment cost in the meeting is fixed at 15 BDT per participant.

Table 3: Inputs used in different sub-channels of BCC interventions

Channels	Sub-channels	Inputs
Face-to-Face counseling (FFC)	<ul style="list-style-type: none"> • Pregnancy identification • Pregnancy confirmation • Antenatal care • Delivery • Post-natal care 	Staff time (SS, SK), staff training, logistic and supply, BCC materials (poster, sticker), and supervision (PO), venue rent.
Group counseling (GC)	<ul style="list-style-type: none"> • Expected date of delivery (EDD) meeting • Women support group (WSG) meeting • Maternal, neo-natal and child health (MNCH) meeting • Spouse forum meeting 	Staff time (SK, PO, MMW, BM), staff training, logistic and supply, BCC materials (poster, sticker, flip chart), supervision, refreshment, capital items (table, chair, clock, stethoscope, umbrella etc.), rent of birthing hut (delivery centre).
Mass media (MM)	<ul style="list-style-type: none"> • Folksong • Street drama • TV-spot • Billboard 	<p>Folksong team (contract out), banner, leaflets, badge, rope, communication.</p> <p>Street drama team (contract out), leaflets, communication.</p> <p>Production of TV program, CD, broad casting, communication.</p> <p>Billboard set up (contract out)</p>

Most of the activities in MM are contracted out to external organizations. However, some of the activities like, communication with the external organizations cost time of BRAC staff, which is included in the cost calculation. BRAC hires both folksong and street drama team for conducting the sessions. For each session a sum of 1,200 BDT for folksong and 5,000 BDT for Street drama are paid to the respective team. Leaflets are distributed among the audiences and cost of leaflets

is included in the calculation. The time allocated by BRAC personnel to the events is transformed into cost and included in the cost calculation. Costs of items, like banners, badge and rope are included in the cost calculation of folksong session, but not that of street drama as the cost for these items are already included in the amount paid to the hired team. On average 150 and 200 people attend Folksong and Street Drama session respectively.

The TV spot (one minute advertisement) is produced by an advertisement firm and broadcasted through the video channels of local satellite cable connection. The production cost is spent once for entire program period (54 months) to the advertisement firm and the broadcasting costs are paid monthly to the cable connection providers. The number of exposed audience has been estimated by using data from *Manoshi* regional office, demographic structure of the country and the proportion of exposed according to previous studies of *Manoshi* program. In the study area, the total population is 3,250,592, of which 68 percent is considered to be adults and half of them are in each sex, based on national demographic structure (World Bank, 2010). Sixty nine percent of females (Sarker et al., 2011) and 30 percent of males are assumed to be exposed to TV spot. The total cost of TV spot is divided by the exposed audience for calculating the cost per exposure. Billboard production and setup have been contracted out to a firm and a total sum of money is paid to the firm annually. Twelve billboards have been set up in different areas. The total population of those areas is 112,920 of which 68 percent are adults. A report (Sarker et al. 2011) on BCC exposure of Manoshi found that 25 percent of pregnant mothers were exposed by billboard, poster and leaflets during a one month period. Information on billboard exposure of general population separately for a 6-month period is not available. Considering the report mentioned above, we assume that 50 percent of adult population in the catchment area were exposed by billboard. The estimated number of exposed people has then been used for calculating the cost per exposed by billboard.

Data collection

Data on inputs and prices are found from both primary and secondary sources. Primary data are obtained by interviewing the BRAC staffs who are involved in implementing BCC tools. Data on contractual agreement, training cost, salary, capital items, and related costs are collected from the primary source. We observed different types of counseling sessions (like, women support group, spouse forum) to document duration of session, use of BCC materials, staff types and

time involved, number of participants, and capital items used in the sessions. We observed also different mass media events i.e. folksongs, drama. Apart from primary data collection, we obtained data from the secondary sources. We found data of SS training cost, performance of community health workers (like, number of pregnant cases identified, number of ANC, PNC, delivery from completed studies of the *Manoshi* project (Alam et al., 2010; Alam et al., 2009). For validation, the information from several personnel among areas and local and head-office was cross-checked.

RESULTS

In this section, the total cost per exposed of BCC channels, separated into three broad categories, i.e. for face-to-face counseling, group counseling and mass media as well as their sub-categories, is presented.

Cost of face-to-face counseling

The cost per exposed through FFC is presented in table 4. The cost for one single exposed of pregnancy identification event is 2.94 BDT. Monthly fixed and variable costs per birthing hut are calculated to 33.60 and 81.25 BDT. Since, SS are responsible for pregnancy identification, cost of SS training (31.06 BDT) and salary (50.00 BDT) and moreover, cost for logistics and supplies (2.55 BDT) are included in the total cost per exposed. Further, the cost (31.25 BDT) for time allocated by PO who supervises FFC services once a month is incorporated into the total cost.

Cost per BCC exposure during pregnancy confirmation is estimated to be 3.02 BDT and exposure for BCC during each antenatal and postnatal visit is 11.24 BDT and 20.83 BDT respectively. During delivery of a pregnant woman SS and SK both are supposed to be present. The BCC cost per exposure during delivery is calculated to be 18.10 BDT. If a mother is exposed by all recommended services (including 3 ANC and 2 PNC), the estimated total cost per exposed is 82.04 BDT (US\$ 1.12). It should be noted that the BCC materials are distributed only once per exposed during ANC and PNC periods.

Table 4: Cost per exposed of sub-channels in face-to-face counseling

Cost components	Inputs	Face-to-face sessions					
		Pregnancy Identification	Pregnancy confirmation	ANC	Delivery	PNC	
Fixed cost item	Staff training	SS	31.06			19.11	
		SK		15.93	15.93	15.93	15.93
	Logistic & supply	SS	2.55			1.57	
		SK		6.55	6.55	6.55	6.55
	Venue				8.33		
Total fixed cost		33.60	22.47	22.47	51.49	22.47	
Variable cost item	BCC materials	Poster		56.00		16.00	
		Sticker		25.20		7.20	
	Personnel	SS	50.00			49.23	
		SK		60.90	22.44	12.82	6.41
	Supervision	PO	31.25	31.25	31.25	31.25	
Total variable cost		81.25	92.15	134.89	93.30	60.86	
Total cost		114.85	114.62	157.36	144.79	83.33	
Number of exposed per birthing hut		39	38	14	8	4	
Total Cost per exposed in BDT (US\$ ¹⁾)		2.94 (0.04)	3.02 (0.04)	11.24 (0.15)	18.10 (0.25)	20.83 (0.29)	

Note: ¹⁾ One US dollar corresponds to 73 BDT is applied throughout the text if else is not mentioned.

Cost of group counseling

The total BCC related costs for each type of group counseling are presented in table 5. The estimated cost per BCC exposure of different group counseling sessions, i.e. Expected Date of Delivery (EDD) meeting, Women Support Group (WSG) meeting, MNCH meeting and Spouse Forum (SF) meeting are 22.31 BDT, 13.79 BDT, 16.92 BDT and 6.62 BDT respectively.

Table 5: Cost per exposed of sub-channels in group counseling

Cost components	Inputs		Group sessions			
			EDD	WSG	MNCH	SF
Fixed cost item	Staff training	SS	0.17	0.06		
		SK	0.11	0.04	0.04	0.03
		MMW	0.61			
		PO	0.19	0.06	0.06	0.02
		BM	0.09	0.03	0.01	0.01
	Capital		1.02	0.34	0.34	0.23
	Venue rent		4.17	1.39	1.39	0.93
Total fixed cost			6.37	1.92	1.84	1.21
Variable cost item	BCC materials	Poster	0.50	0.50	1.00	0.50
		Sticker	0.35	0.35	0.70	
		Flip chart	22.22	22.22	44.44	
	Personnel	SK	7.21	2.40	2.40	1.60
		PO	43.27	14.42	14.42	4.81
		MMW	27.04			
	Refreshment	BM	6.01	6.01	18.03	6.01
			150.00	60.00	50.00	50.00
	Communication	SS	4.12	2.06	2.06	1.60
		SK	0.64	0.43	0.43	0.43
Total variable cost			261.37	108.40	133.49	64.95
Total cost for BCC per session			267.73	110.31	135.33	66.16
Number of participants in a session			12	8	8	10
Cost per exposed BCC in BDT (US\$)			22.31 (0.31)	13.79 (0.19)	16.92 (0.23)	6.62 (0.09)

Among all GC sessions, the highest cost per session (BCC) is observed in the EDD meeting, while the lowest is found in Spouse Forum meeting.

Cost for mass media campaigning

The total cost for folksong and street drama has been calculated to 1,414 BDT and 5,253 BDT respectively. The number of audiences is 150 and 200 in each session respectively. The cost per exposed is thus calculated to be 9.42 BDT and 26.27 BDT by the respective mass media channels. TV spot costs a total sum of 73,063 BDT and 182,358 individuals have been exposed by this channel, which means that the cost per exposed is 0.40 BDT. Billboard costs 100,053 BDT in total and exposes 38,393 individuals. It means that the cost per exposed is 2.61 BDT. The cost per exposure of different mass media channels are presented in the table below.

Table 6: Cost per exposed for sub-channels in mass media sessions

Cost components	Inputs		Mass media			
			Folksong	Street drama	TV-spot	Billboard
Fixed cost item	Hiring /Contract out		1200.00 ¹⁾	5000.00 ¹⁾	70000.00 ²⁾	100000.00 ³⁾
	Production cost			9.14	3009.63	
	Arrangement items	Banner	1.23			
		Badge	2.96			
	Rope	0.16				
Total fixed cost			1204.36	5009.14	73009.63	100000.00
Variable cost item	BCC materials	Leaflet	105.00	140.00		
		Personnel				
		SS	7.69	7.69		
		SK	4.81	4.81		
		PO	28.85	28.85		
		MMW	18.03	18.03		
	BM	36.06	36.06			
	RM	8.81	8.81	52.88	52.88	
Total variable cost			209.25	244.25	52.88	52.88
Total cost			1413.61	5253.39	73062.51	100052.88
Total no of participants			150.00	200.00	182358.00	38392.80
Cost per exposed (BDT)			9.42	26.27	0.40	2.61
(US\$)			(0.13)	(0.36)	(0.01)	(0.04)

¹⁾Per show, ²⁾Broad casting through cable TV, ³⁾Display per year

Table 7 summarizes the total cost per exposed by three categories of mass media channels (FFC, GC and MM) by summing up the costs of each channel within the same categories. These costs are applicable if an individual is exposed by each and every sub-channel within the respective broad category of channels.

Table 7: Total cost per exposed in different BCC channels (in BDT and US\$)

BCC Channel	Total cost per exposed	
	BDT	US\$
Face-to-face counseling	56.13	0.77
Group counseling	59.63	0.82
Mass media	38.83	0.53

The highest cost per exposed is observed in GC, followed by FFC and MM.

DISCUSSION

BCC interventions in *Manoshi* are being given through 13 sub-channels, which are divided into three broader channel categories. FFC counseling is considered as the primary types of intervention through which most of the mothers in *Manoshi* go. All five sub-channels within FFC are essential for exposure to mothers. Any single sub-channel within FFC is not considered to be a complete BCC intervention separately. It is, therefore, important to notice that FFC is a complete set and the total cost of FFC should be considered in economic planning of an MNCH program. The total average cost per exposure is estimated to be 82.04 BDT (US\$ 1.12), which includes one event of pregnancy identification (2.94 BDT) and confirmation (3.02 BDT), three ANC's (11.24 BDT each), one delivery (18.10 BDT) and two PNC's (20.83 BDT each). It should be noticed that the BCC materials are distributed only once per exposed during ANC and PNC periods. In total FFC cost for BCC exposure, Personnel cost covers the largest proportion (32.8%), followed by supervision cost (25.4%), staff training cost (18.5%), BCC materials cost (17.0%) logistic and supply cost (4.9%) and venue rent (1.4%). It is important to note that low cost personnel are involved in FFC sessions, which keep the cost lower.

Among the FFC sessions, PNC costs highest. PNC is normally received by less number of mothers which drives the cost up. BCC cost during delivery is found to be next largest FFC session. The cost comes mainly from the longer time involvement of SS during delivery. SS accompany the mother during whole period of delivery and along with other services provide BCC messages. Out of BCC cost per exposed through ANC, poster and sticker costs cover the major portion. Cost for BCC intervention during pregnancy identification is low since the time length of delivering BCC messages is very short in this sub-channel.

In the Group Counseling sessions, almost similar messages are delivered to prospective mothers, their husband and community people. Group counseling is thus complementary interventions in that sense that it reminds the prospective mothers about the BCC materials delivered during pregnancy identification, confirmation, ANCs and PNCs. In addition, husbands and relatives get BCC messages which may increase awareness in people surrounding the pregnant women. The highest cost per exposed is observed in EDD meeting (22.31 BDT), followed by MNCH (16.92 BDT), WSG (13.79 BDT) and Spouse Forum meeting (6.62 BDT).

The highest cost of GC is found in EDD meeting. It is explained by involvement of relatively higher salaried personal during the whole 90 minute session where half of the time is spent on delivering BCC information. WSG and MNCH meetings are also similar in number of participants, staff involvement and duration of the BCC message delivery. The difference in cost between WSG and MNCH meetings can be explained by involvement of higher salaried personnel and lower frequency of arrangements of the later type. WSG meeting is held every month whereas MNCH meeting is organized one in every two month period. The cost of spouse forum meeting is smallest among all GC sessions because of least number of BCC materials used and shortest duration of BCC event.

Among four types of mass media sub-channels, namely folksong, street drama, TV-spot and billboard street drama costs highest (26.27 BDT), followed by folksong (9.42 BDT), billboard (2.61 BDT) and TV-spot (0.40 BDT). Folksong and street drama are by nature held targeting a specific small community compared with TV-spot and billboard. While the former two sub-channels cost higher due to lower possibility of exposure, the latter two cost much less because of exposure to large number of population. However, folksong costs less since the cost of hiring folksong team is much less (1,200 BDT) than that of street drama team (5,000 BDT). TV-spot costs naturally less because of possibility for higher number of people to be exposed.

This study intends to cover the costs at implementation level, which means the cost at upper-level, like central management, planning is not included. However, personnel in implementation level give most time to BCC intervention. The cost at upper level thus may not be very high.

Calculation of BCC intervention at such a disaggregated level is not found in other studies in Bangladesh. It is thus first of its kind. A number of costing of service delivery studies have been carried out. Methodologically, this current study is similar to other costing studies (*Sarowar et al., 2010; Levin et al., 1999*) though the other studies calculated the costs of services like, pregnancy-related healthcare, family planning program implementation in Bangladesh. *Hutchinson et al. (2006)* undertook a cost-effectiveness analysis of national health communication program in rural Bangladesh. In that study, cost for BCC intervention through mass media (like, radio, Billboard) was calculated for the smiling sun health communication program in Bangladesh for period 2001-2003. They found that the cost per Billboard for ANC related message delivery is US\$ 823.48 or 45,291 BDT (1 US\$ = 55 BDT in year 2003). The Billboard was estimated to be watched by 2,601 people on average each year, which means that the cost per exposed was 17.4 BDT (or 40.1 BDT at price level of 2011). We, however, find the cost per billboard exposure is 2.61 BDT. The smaller cost in our study can be partially explained by exposure to higher number of people in urban slums in comparison with lower exposure in the study area of *Hutchinson et al. (2006)*. In another cost-effectiveness study, *Kincaid et al. (2006)* calculated the cost for TV-program on family planning. They found that the cost per person for TV exposure was \$ 0.06 or 3.3 BDT (or 8.44 BDT at price level of 2011) in year 2000-2001. We found a lower cost per exposed by TV-spot (0.40 BDT). It may be partly explained by the broad casting cost through local cable TV operator by *Manoshi*, which is cheaper than a national TV broadcasting in the Philippines. Moreover, it is likely that higher numbers of people are exposed in highly populous urban slums in Bangladesh, compared to the Philippines.

CONCLUDING REMARKS

The cost per exposed vary significantly across BCC intervention channels. Some of the inputs appear as the cost drivers, namely, personnel, BCC materials and refreshment costs. However, the major cost drivers are different in different channels and sub-channels. The BCC costs of sub-channels can be useful for planning and predicting the total cost of the BCC intervention in current and future projects. This information can be used even for planning cost containment of BCC interventions as well as planning resource allocation between sub-channels by comparing the cost in relation to the impact (measured by increased knowledge and better practice of MNCH program). In that case, cost-effectiveness analysis needs to be done. It is important to note that the sub-channels may be substitutive and complementary which should be assessed by analyzing the content of each sub-channel.

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