Barrier of Distance and Transportation Cost to Access Maternity Services in Rural Bangladesh

Kaji Tamanna Keya[1], Md. Moshiur Rahman[1], Ubaidur Rob[1], Benjamin Bellows[2]

[1] Population Council, Dhaka, Bangladesh
[2] Population Council, Kenya

Introduction

Bangladesh has achieved remarkable success in reducing its maternal mortality ratio (MMR). In 1994, MMR was 590 deaths per 100,000 live births and by 2010, it was dramatically reduced to 194 deaths per 100,000 live births [1]. Much of the decline in MMR is attributed to lower fertility [2]. Although MMR has declined, it remains unacceptably high with more than 7000 mothers estimated to die each year due to childbirth. Antenatal care (ANC) utilization is 71% in Bangladesh, but only 54% of all pregnant women seek ANC from medically trained providers. One in four pregnant women make four ANC visits and 77% of deliveries are conducted at home [1]. The MMR is likely to decrease if pregnant women with potential life-threatening complications are treated successfully in time with adequate emergency obstetric care (EmOC) at health facility [3,4]. In Bangladesh, more than half of women felt complications at any stage in their last pregnancy. The major complications were edema, prolonged labor, severe bleeding and convulsion. But only 29% of women with complications received treatment in a health facility [1].

Bangladesh is predominantly a rural country having around 150 million people and a vast majority of them live under poverty [5].The country has a well-structured health service delivery system from central to the grass root level. The Government offers a three-tier health care service structure for the people living in rural areas, which include domiciliary services, union level institutional services and upazila(sub-district) level institutional services. Union health and family welfare center (UHFWC) provides primarily outpatient services for the rural people and the staff of UHFWC organizes outreach activities; home visit by the community health workers and arrange satellite clinic at the community level. In every upazila, there is an upazila health complex (UHC) and in every district there is a district hospital along with a maternal and child welfare center (MCWC) which is equipped to provide better maternal health care services. Although these government health facilities provide free ANC, delivery and postnatal care (PNC) services, the real out-of-pocket cost of medicines and surgical procedures and transportation cost to reach health facilities negatively affect service utilization among the poor [6,7].

Proper utilization of these health facilities for ANC, delivery and PNC services can reduce maternal mortality and morbidity significantly. However, the utilization of maternity care provided by trained professionals during and after delivery is alarmingly low in Bangladesh. Numerous factors contribute to the utilization of health facility in developing countries at the time of obstetric complication and childbirth. Thaddeus and Maine (1994) have categorized the factors as (1) delay in decision to seek care; (2) delay to arrive at a health facility; and (3) delay to receive adequate care. If these barriers could be overcome, the outcome of the pregnancy would be satisfactory [8]. Thaddeus and Maine have argued that delay in reaching an obstetric medical facility is affected by the availability of transportation, road conditions or cost of transportation. Transportation problem to reach an EmOC health facility is common in developing countries.This problem has been found to contribute to pregnancy related mortalities in Gambia [9], Brazil [10], Ghana, Nigeria and Sierra Leone [8,11,12]. UNFPA reports that lack of transportation to facility is a key component in the "three delays" model of maternal mortality in low-income countries [13].

Distance to a health facility plays a crucial role in health service accessibility. Again, facility having comprehensive emergency obstetric care is important for institutional delivery. A study conducted in rural Zambia showed that facility delivery for a birth within 1 kilometer of a comprehensive health facility are over 10 times higher for a birth whose closest facility is 20 kilometer away or above [14]. A study conducted in

Bangladesh found that longer distance was associated with reduced access to health facilities and lack of transport was a major barrier to increase facility-based health services. The study also found that the number of births attended by a midwife, either in a health facility or at home, decreased by half with an increase of one-kilometer distance from health facility or skilled birth attendant's (SBA's) residence [15]. A recent study revealed that transportation cost was the second major expensive cost after medicine for visiting health facility in Bangladesh. The study showed that for ANC and PNC service utilization, Taka 32 to 68 (US$0.46-US$1) is incurred for round trip transportation from residence to health facility in Bangladesh [16].

Financial aid through voucher could be an option to solve the accessibility problem and to enable the poor to receive maternal health care services from health facility. It is evident that vouchers are beneficial to improve the service utilization in resource constraint countries and this system has already been tested in Nicaragua [17], in India [18], and in China [19]. The findings suggested positive effects among the target group regarding utilization of key preventive health services. Bangladesh has also tested voucher scheme to find the impact on maternal health service utilization. In this regard, a pilot financial incentive project was tested by Population Council to increase maternal health service utilization among poor women of rural areas. The study findings suggested that financial subsidies had increased maternal care of rural areas from trained provider from 50 to 100%, delivery assisted by trained provider from 5.5% to 22%, and the proportion of delivery at health center from 2.3% to 18% [20]. Ahmed and Khan (2011) showed that vouchers are beneficial to decrease socio-economic inequality in maternal health service utilization. The study also revealed that voucher recipients were more likely to receive maternity services from a skilled service provider at an institution [21].Nguyen et al showed that voucher beneficiaries of DSF program spent about Taka 640 (US$ 9.14) less for maternal health service utilization than non-voucher recipients. The study found that the program had increased the use of antenatal, delivery, postnatal and institutional delivery with qualified providers [22].

In Bangladesh, supply-side financing has been the key strategy for increasing the access of poor population to essential health care services. But, evidence showed that maternal health programs have failed to include a large proportion of the poor and vulnerable groups in rural areas of Bangladesh. Because there are demand-side barriers that inhibit women from seeking antenatal care (ANC), delivery, and postnatal care (PNC) services, including lack of information about when or from where to obtain treatment and women's awareness of potentially life-threatening conditions [23].

The cost of providing reproductive health services to low-income populations needs total or partial subsidization. Therefore, alternatives to the traditional 'supply-side' approach, in 2006, the Government of Bangladesh piloted a demand-side financing (DSF) scheme in 21 upazilas. The program was expanded to 33 upazilas in 2007 and to 46 upazilas at the end of 2010 [24]. The program provides transportation cost of Taka 500.00 (US$7.14) from home to the designated health facility, and additional Taka 500.00 (US$7.14) for out-going referral to the district hospital for managing complicated cases (one US$ is equivalent to BDT 70.00 Taka, in 2010, Bangladesh Bank). The selected poor women under DSF scheme receive a package of essential maternal health care services, as well as treatment of pregnancy and delivery related complications. In addition, they receive cash incentive of Taka 2,000.00 (US$28.57) and a gift box of about Taka 500.00 (US$7.14) for availing of safe delivery either in the facility or at home in presence of skilled birth attendant. This program also provides supply side financing to the service providers [25].

Population Council with funding from the Bill and Melinda Gates Foundation has been evaluating the impact of the DSF voucher program in Bangladesh [24]. As a part of the evaluation activities, Population Council conducted a baseline survey in new DSF and non-DSF areas. This article used baseline household information to examine whether distance and transport costs to health facility from residence is associated with access to maternal health care services by rural women.

Methods

Ethics Statement

The Institutional Review Board of Population Council approved the DSF evaluation study (protocol number 484;http://www.biomedcentral.com/1471-2458/11/257)

Study data

This article used baseline household information to examine whether distance and transport costs to health facility from residence is associated with access to maternal health care services by rural women. The baseline study was a cross-sectional survey of married women aged 18-49 years and had given birth in the preceding year the survey. The information was collected from 22 upazilas in Bangladesh [25]. A total of 3300 women were interviewed using a structured questionnaire. The survey was conducted during May-July 2010 to collect information on respondents' socio-economic and demographic characteristics. The survey also collected information regarding service utilization, distances from residence to health facility; its associated travel costs and mode of transport used.

Data analysis

In this study, the focus of the analysis was distance and transportation cost to avail maternal health care services at a health facility. Uni-variate analysis was employed to examine respondent's background characteristics and distance they travelled to utilize maternal health services from health facilities. Bi-variate analysis was employed to examine the association of distance, travel cost and mode of transport. Distance was categorized into three groups; i) 4.0 kilometers or less, ii) 4.1-10.0 kilometer, and iii) above10 kilometer. Travel costs and mode of transport was then cross-tabulated against distance. All transportation costs are presented in Taka.

The distance of the health facility from the respondents' residence was recorded in kilometers. Distances were collected for each of the three ANC visit, delivery, complication management and PNC visit. The respondents who could not report the distance to health facility or received care at home have been excluded from the transportation cost and mode of transportation analyses.

Limitations

The information of distance used in this article was self-reported. To minimize misreporting, the distance information was verified by GPS reading, where required. The women who could not inform their travelled distance, the cases were categorized as could not report distance.

Results

Background information of respondents

More than 80% of women were aged below 30 years and majority of them were Muslim (87%). Nearly all women were currently married (99%) and reported their occupation as housewife (98%). About one-fourth of the women never attended school and only 7% completed higher secondary level education or above. Routine newspaper or magazine reading was quite low. However, 15% of respondents listened to the radio once a week and four out of ten watched television at least once a week. Agriculture, business, and day labor were the most common occupations of their spouse. More than 95% respondent's per day per person family member's income was less than US$1and two-thirds of the respondents reported that their monthly family income was Taka 7000 (US$100) or less.

Table 1. Background characteristics of women and their spouse (in percent)

Background Characteristics	Percentage
Age of respondent	
19 years or below	15.4

Background Characteristics	Percentage
20-24 years	41.4
25-29 years	25.0
30-34 years	12.4
35 years or above	5.8
Mean age of respondents	25.0
Education of respondents	
Never attended school	23.9
Incomplete primary	17.8
Completed primary	13.9
Below secondary	37.0
Secondary or higher	7.4
Mean years of schooling	6.0
Media exposure	
Read newspaper or magazine at least once a week	2.0
Listen to a radio at least once a week	14.8
Watch television at least once a week	40.9
Occupation of husbands	
Agriculture	25.7
Day laborer	16.6
Business	21.1
Service	8.5
Van/rickshaw puller	7.6
Skilled laborer	9.0
Migrant worker	6.5
Others	5.0
Monthly family income (in taka)	
≤4000	30.9
4001-7000	35.6
7001-10000	18.2
>10000	15.4
Could not mention	9.3
Average monthly family income	7667
N	**3300**

Utilization of maternal health care services

Table 2 describes utilization percentage of ANC, complication management, delivery assisted by skilled provider and PNC service. In Bangladesh, ANC statistics record "home-based ANC" in addition to ANC provided at health facility. Findings show that around 72% of women attend at least one ANC consultation with fewer attending for subsequent visits. Nearly one-fourth of women experienced delivery-related complications during their last birth and only one-third of them visited a health facility to seek management care services. The type of complication experienced by women included labor pain for more than 12 hours, excessive vaginal bleeding, less movement of fetus and retained placenta (not shown in Table). Findings also reveal that only about one-fifth of women received PNC either at home or at a health facility in their last pregnancy.

Table 2. Utilization of maternal health care services by the women (in percent)

Service	Total utilization	Utilization at health facility (%)	Utilization at Home (%)
First ANC	71.8	52.8	19.0
Second ANC	53.7	37.5	16.2
Third ANC	39.2	28.0	11.2
Complication management	19.5	7.9	11.6
Delivery assisted by skilled provider	22.3	19.6	2.7
PNC	19.1	10.4	8.7
N	**3300**	**3300**	**3300**

Utilization of maternal health care services by type of facility

Table 3 shows that women used private facilities more than the public health facilities to avail maternal health care services. It is alarming that four-fifth of women said they remained at home during their last delivery. Similarly, only about one-fifth of women received PNC services with nearly half occurring at home.

Table 3. Service utilization by type of facility (in percent)

Place of service	Type of services		
	First ANC	Delivery	PNC
Home	29.0	80.4	47.0
Public health facility	27.0	7.6	13.7
District hospital/Medical College	1.3	2.0	3.0
MCWC	3.0	0.8	1.4
UHC	10.0	4.6	7.5
HFWC	10.2	0.2	1.4
Satellite Clinic	2.5	0.0	0.4
Private health facility	38.0	11.7	38.5
Private hospital/Clinic	33.5	11.7	27.8
Unqualified doctor's home/Chamber	3.0	0.0	7.0
Others(Pharmacy)	1.5	0.0	3.7
NGO	6.0	0.3	0.8
N	**2371**	**3300**	**630**

Utilization of maternal health care services by distances

Findings reveal that, the utilization rate of ANC and PNC service was higher if women required traveling up to 4 kilometers and this proportion decreased when the distance increases. Contrary to ANC service, women had to travel greater distance for delivery and complication management (Table 4).

One-third of women who visited health facility for complication management and delivery care travelled up to 4 kilometers and another one-third could not report the distance to health facility. On average, women travelled 6 kilometers from home to health facility for their ANC and PNC and 8 kilometers for delivery and complication management (Table 4).

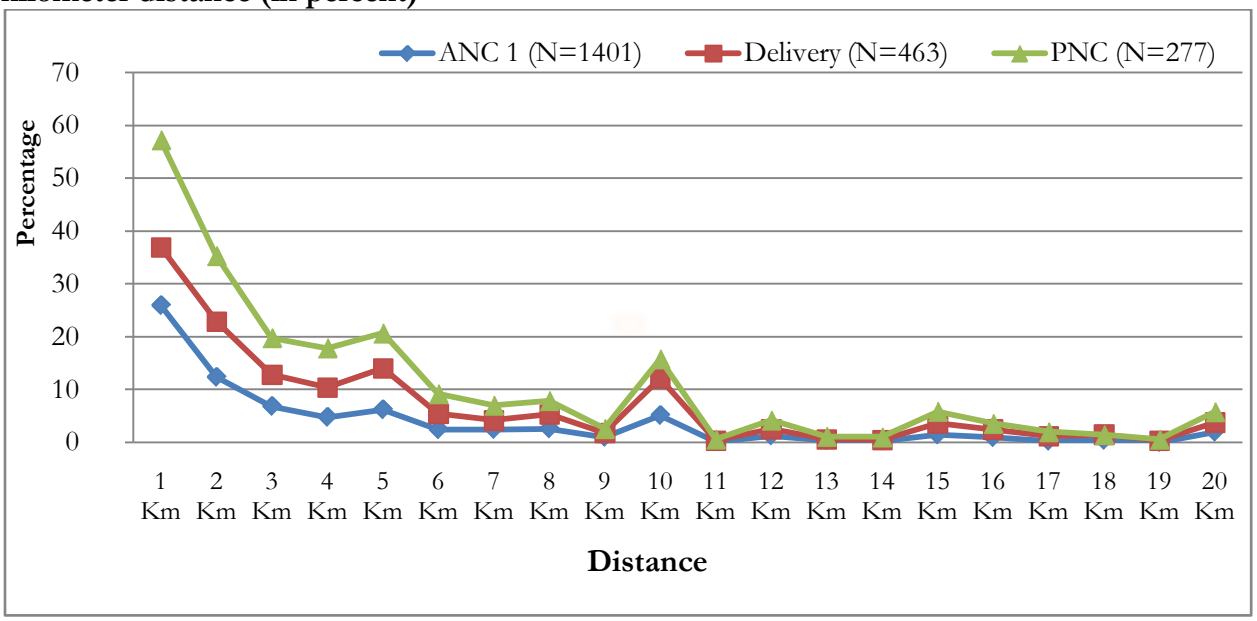
Table 4. Percentage of women received ANC, complications, delivery and PNC services according to distance

Types of services	Up to 4.0 km	4.1-10.0 km	Above 10 km	Cannot recall distance	Average distance	N

1st ANC	50	20	11	19	6 km	1741
2nd ANC	52	20	9	19	6 km	1238
3rd ANC	46	20	12	22	6 km	923
Complication	32	21	15	32	8 km	262
Delivery	33	23	13	31	8 km	668
PNC	47	21	12	20	6 km	344

Figure 1 shows the service utilization for ANC, delivery and PNC service decreases with the increase of distance. The calculation regarding the linear loss of services has excluded extreme values of travel distance above 20 kilometers. The linear loss of service utilization shows almost uniform with an increase of additional one-kilometer distance except digits which are multiplication of 5 kilometers distance where graph shows higher rate of utilization. It is assumed that it might happen due to digit preference by the respondents.

Figure 1.Linear loss of ANC, delivery and PNC service utilization by increase of one additional kilometer distance (in percent)



Mode of transport

Usually women travel to same health facility for ANC and PNC services and use similar types of vehicles. Similarly, it is observed that women visited same facility for delivery and complication management care services. Therefore, mode of transport has been shown only for ANC and delivery care services in Table 5. Findings reveal that "human- powered rickshaw and van" remains the most common transport to travel health facility irrespective the type of services. However, women used motorized vehicles when they required traveling longer distances especially for delivery care services.

Table 5. Mode of transport used in ANC and delivery care services (in percent)

Mode of transport*	First ANC			Delivery		
	Up to 4.0 km	4.1-10.0 km	Above 10 km	Up to 4.0 km	4.1-10.0 km	Above 10 km
Rickshaw/Van(human-powered)	42.8	64.5	66.5	67.7	43.4	35.2
CNG/Baby taxi/Tempu	8.2	24.7	23.4	20.5	42.1	36.3
Micro bus/Car	0.1	1.2	3.7	5.5	11.2	23.1
Bus	1.6	18.9	35.1	0.0	3.3	19.8
Motor cycle/Cycle	1.3	8.1	8.0	0.5	2.0	5.5
Boat/Motor boat	3.6	11.0	26.1	3.2	7.9	11.0
Ambulance	0.0	0.0	0.0	2.3	4.6	5.5
On foot	62.1	34.9	35.1	13.6	9.2	8.8
Others	0.0	0.0	0.0	0.0	0.7	0.0
N	**869**	**344**	**188**	**220**	**152**	**91**

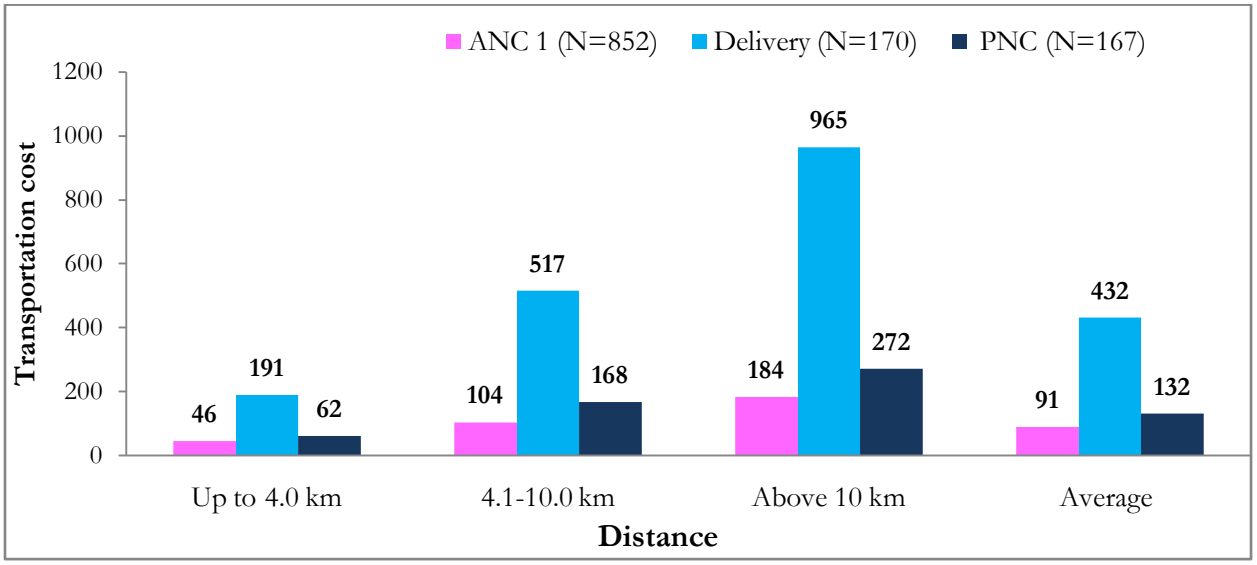
*Multiple responses

Transportation cost by distances

All women who received services during their last pregnancy from a health facility were asked for the round trip transportation costs incurred to receive ANC, delivery and PNC services. Findings revealed that one in ten women were unable to recall the actual transportation cost spent for ANC and PNC services (not shown in Figure 2). On the other hand, the majority of women who visited a health facility for a complicated delivery were accompanied by their family members and a large number of women were unable to report the actual transport costs incurred due to delivery care at health facility. Figure 2 shows an increased trend in transportation cost with the distance travelled regarding ANC, delivery and PNC services. On average, women spent Taka 46 (US$0.66) to travel 4kilometers compared to Taka 184 (US$2.63) to travel above 10 kilometers to avail first ANC check-up (Figure 2). However, analysis shows that on average women spent Taka 91 (US$1.3) for each of first and second ANC visit and Taka 118 (US$1.69) for third ANC visit. In rural areas of Bangladesh, when women receive their third ANC visit, they are actually close to their labor. Due to the reason, they use comparatively improved vehicle instead of walking or using simple transport. It can be assume that the use of improved vehicle or avoiding walk increased their transport cost in their third visit comparing to previous ANC visits.

Findings revealed that on average women spent Taka 191 (US$2.72) to travel 4 kilometers distance but the delivery cost increased drastically with the increase of distance. For instance, the delivery cost increased to Taka 517(US$7.39) for covering 4.1 to 10 kilometers distance and Taka 965(US$13.79) for covering above 10 kilometers distance to seek delivery care services at health facility. Irrespective of travel distance to health facility, the average round trip transportation cost for availing delivery care was Taka 432 (US$6.17). Similarly, analysis showed that the average cost to receive PNC check-up at health facility was Taka 132 (US$1.89). For each additional kilometer distance, on average the transport cost increased by Taka 9 for ANC visit, Taka 31 for delivery service and Taka 8 for a PNC visit from a health facility.

Figure 2. Average transportation cost for first ANC, delivery and PNC according to distance



Discussion

Consistent with other studies, this article found that facility-based use of maternal health care services is very poor in rural Bangladesh. Only half of the women received first ANC service, one-fifth delivery care, one-tenth birth complication management care and one-tenth availed PNC service from a health facility. To receive ANC services, the majority of rural women in Bangladesh usually visit union level health facility that are usually situated nearby to their residence. Thaddeus and Maine's (1994) conceptual framework of the three delays clearly showed that distance and cost are major obstacles to service utilization [5]. On average women traveled six kilometers to reach a health facility for ANC services (about 50% of women received ANC services within four kilometers compared to about 10% women received similar care from more than10 kilometers distance). Similar findings were observed for PNC visits. For deliveries, women traveled on average 8 kilometers to receive service from a health facility.

Only one-fifth of deliveries were conducted in a health facility. Rural women in Bangladesh generally visit a health facility during delivery complication [15]. Gabrysch et al. showed that distance between residence and health institutions are part of first and second delays to avail maternal health care service and had an influence on choice of delivery places [20]. Analysis showed that women who went to a health facility for managing complication and delivery care, more than half of them visited distant health institutions (above 4 km) for both cases compare to ANC and PNC. Comprehensive EmOC services are available only at upazila and district level health facilities that are mostly situated at a greater distance. This article found that the average distance was eight kilometers to receive complication and delivery care services from residence to a health facility. This indicates that large proportion of women visited upazila and a district level health facility or a private health facility which is far from their residence. The findings are similar with the study in rural Zambia where a strong association was found between facility delivery and availability of emergency obstetric care in a distant hospital [20]. On the other hand, women who used health facilities, about one-third women for ANC, 13% for delivery and 58% for PNC did not spend money due to transportation. However, non-paying clients often reach health facilities by walking or by using own or family transport like van, rickshaw or boat. Irrespective of the type of service, the main mode of transportation was human-powered rickshaw/van to cover shorter distance from residence to health facility. As the distance increases, women tend to use motorized vehicles to reach the facility depending on the availability of transport.

For each ANC and PNC visit, the DSF program provides Taka 100 (US$1.4) as transport allowance to poor pregnant women. In the current study, on average a mother needs Taka100 (US$1.4) to avail any ANC

check-up from a health facility. However, this average hid a wide range of costs along a distance gradient. DSF is providing a flat transportation allowance (100 Taka) to the poor pregnant women and it is straightforward to administer; however, the Ministry of Health and Family Welfare ought to consider the variable transport costs faced by clients.

For delivery services, DSF program provides Taka 100 as travel allowance and Taka 500 (US$7.14) if a complication occurs and the mother needs to visit a referral facility. On average women spent Taka 432 (US$6.17) for transportation to a health facility to deliver. Therefore, it is clear that women can visit health facility for ANC service by the given allowance of DSF program but cannot cover the transportation cost for delivery and PNC service. The differences are due to travelled distance and type of transport used. These expenditures were out of pocket, as the DSF program only provides Taka 100 for each visit. Thus the program can address the first delay, decision to seek care and third delay of receiving maternal care from a health facility but addressing second delay to reach a health facility still remains a challenge by the given transportation allowance.

It is observed that although DSF program is providing transportation allowance to poor pregnant women to increase the access to maternal health care services, the allowance is inadequate especially for delivery and PNC services. Furthermore, DSF program was supposed to launch in 2004 but finally launched in 2006 and travel allowance for availing the services was set based on the market price of 2004. Currently, due to increased fuel costs, a major modification on transportation allowance is essential to encourage women to utilize vouchers for maternal health care services. From this analysis, it is apparent that mothers and their households will continue to face some out-of-pocket healthcare-related expenditure during the pregnancy and delivery. Women ought to be encouraged to save money based on their anticipated transportation and related needs. The findings also emphasize a further investigation to revise and reallocate the existing benefits of clients under the DSF program for its smooth implementation.

Abbreviations: ANC, antenatal care; DSF, demand-side financing; EmOC, emergency obstetric care; MMR, maternal mortality ratio; PNC, postnatal care; UHC, upazila health complex

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References

1. NIPORT, MEASURE Evaluation, The University of North Carolina-Chapel Hill, USA, ICDDR,B (2011) Bangladesh Maternal Mortality and Health Care Survey 2010 - Preliminary Results. Dhaka, Bangladesh and Chapel Hill, North Carolina, USA: NIPORT, ICDDR,B, MEASURE Evaluation and the University of North Carolina-Chapel Hill.
2. Jain AK (2011) Measuring the Effect of Fertility Decline on the Maternal Mortality Ratio, Studies in Family Planning, 42: 247-260.
3. Graham WJ, Bell JS, Bullough CH (2001) Can skilled attendance at delivery reduces maternal mortality in developing countries?In: Brouwere VD and Lerberghe WV, editors.Safe Motherhood Strategies: A Review of the Evidence.Studies in Health Services Organization and Policy17, ITG Press, Belgium. Pp. 97-130.
4. Jain AK (2010) JananiSurakshaYojana and the Maternal Mortality Ratio.Economic & Political Weekly 45.

5. BHW (2011)Bangladesh Health Watch Report 2011: Moving Towards Universal Health Coverage, James P. Grant School of Public Health, BRAC University, Dhaka, Bangladesh, 2012.
6. Rob U, Islam MM, Anwar MM, Arifeen A, Talukder MN et al. (2006) Population and development: Pilot research at community level on linkages between reproductive health and poverty.Dhaka, Bangladesh: Population Council
7. Rahman L, Rob U, Ahmed S, Anwar MM, Rahman MM (2006) Voicing the community: A study for the community to identify and prioritize family planning and reproductive health problems. Dhaka, Bangladesh: Population Council.
8. Thaddeus S, Maine D (1994) Too far to walk: Maternal mortality in context. SocSci Med 38: 1091–1110.
9. Mamady C, Sundby J, Vangen S (2005) Maternal mortality in the rural Gambia, a qualitative study on access to emergency obstetric care.Reproductive Health2:3 doi:10.1186/1742-4755-2-3. Available: http://www.reproductive-health journal.com/content/2/1/3
10. Souza AC, Peterson KE, Andrade FM, Gardner J, Ascherio A (2000) Circumstances of post-neonatal deaths in Ceara, Northeast Brazil: mothers' health care-seeking behaviors during their infants' fatal illness.SocSci Med 51: 1675-1693.
11. Mills EJ, Nachega JB, Bangsberg DR, Singh S, Rachlis B, et al. (2006) Adherence to HAART: A Systematic Review of Developed and Developing Nation Patient-Reported Barriers and Facilitators. PLoS Med 3:e438.Available: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1808103/.Accessed: 7 August 2011.
12. Molesworth K (2007) Mobility and health: The impact of transport provision on direct and indirect determinants of access to health services." Kate Molesworth, Swiss Tropical Institute. Available: http://www.mobilityandhealth.org/about/Kate%20Molesworth%20Mobility%20and%20Health%20Paper%20final.pdf.Accessed: 6 August 2011.
13. UNFPA (2008) Reducing Maternal Mortality: The contribution of the right to the highest attainable standard of health.Available: http://www.unfpa.org/webdav/site/global/shared/documents/publications/reducing_mm.pdf. Accessed 15 January, 2012.
14. Gabrysch S, Cousens S, Cox J, Campbell OM (2011) The influence of distance and level of care on delivery place in rural Zambia: A study of linked national data in a geographic information system. PloS Medicine8: e1000394. Available: http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1000394 Accessed: 20 December
15. ICDDR,B (2005) Posting of trained birthing attendants: A comparison of home- and facility-based obstetric care.Health and Science Bulletin 3:11-16.
16. CIET Canada (2000) Service Delivery Survey: second cycle 2000 preliminary findings, completed for the Health and Population Sector Programme, Dhaka.Available:http://www.ciet.org/_documents/200622410411.pdf. Accessed 2 April, 2012.
17. Borghi J, Gorter A, Sandiford P, Segura Z (2005) The cost-effectiveness of a competitive voucher scheme to reduce sexually transmitted infections in high-risk groups in Nicaragua. Health Policy Plan. 20(4):222-31.
18. Bhatia M, Yesudian C, Gorter A, Thankappan KR (2006) Demand side financing for reproductive and child health services in India. Economic and Political Weekly 21 January: 279-294.
19. Kelin D, Zhang K, Tang S (1999) A draft report on a MCHPAF study in China. Available: http://poverty2.forumone.com/library/view/9909/ accessed on 23 October 2006.
20. Rahman M, Rob U, Kibria T (2009) Implementation of Maternal Health Financial Scheme in Rural Bangladesh. Dhaka, Bangladesh: Population Council.

21. Ahmed S, Khan MM (2011) Is demand-side financing equity enhancing? Lessons from a maternal health voucher scheme in Bangladesh. SocSciMed.In Press.doi:10.1016/j.socscimed.2011.03.031.
22. Nguyen HT, Hatt L, Islam M, Sloan NL, Chowdhury J, et al. (2012) Encouraging maternal health service utilization: An evaluation of the Bangladesh voucher program. Social Science & Medicine doi: 10.1016/j.socscimed.2011.11.030.Accessed: 10 February 2012.
23. NIPORT, Mitra and Associates, ORC Macro (2005) Bangladesh Demography and Health Survey Dhaka, Bangladesh: NIPORT, Mitra and Associates and Calverton, Maryland, USA:ORC Macro
24. Rob U, Rahman M, Bellows B (2011) Evaluation of the impact of the voucher and accreditation approach on improving reproductive behaviors and RH status: Bangladesh.BMC Public Health 11: doi:10.1186/1471-2458-11-257.Available at: http://www.biomedcentral.com/1471-2458/11/257.Accessed: 11 February 2012.
25. DGHS (2008) Demand side financing orientation manual. Dhaka, Bangladesh: DGHS, Ministry of Health and Family Welfare