



DIRECT COSTS OF MATERNAL HEALTH CARE SERVICES FOR WOMEN LIVING IN URBAN SLUMS-A STUDY IN KOLKATA

Dr. Paramita Banerjee*

*Assistant Professor in Geography, Barasat College, Email: paramita.jnu@gmail.com

INTRODUCTION

Millennium Development Goals (2000) gave thrust to 75 percent reduction in maternal mortality (UN, 2006). India, as a signatory of Millennium Development Goals, couldn't meet the target inspite of reducing maternal mortality rate to 130 per 100,000 live births by the year 2015 (MOHFW, 2010). Reduction of maternal mortality requires a rapid and massive improvement in the maternal health care seeking behaviour of also the upgradation of health system factors including the provision of universal access to antenatal and postnatal care and ensuring safe institutional birth for all women (Gwatkin, Bhuiya & Victora, 2004). The public health facilities are generally found to be overburdened and unable to provide good quality maternal health care, which leads women to seek care from private facilities. For a healthy pregnancy, women have to bear direct costs like, payments for consultations during antenatal care and during child birth. Even where services are officially free, patients often incur certain costs to obtain the care they need. These costs include those of purchasing supplies and drugs in the market because they are unavailable in the facility. Seeking maternal health care from private facilities increases the cost further (Govil *et. Al.*, 2016; Dhar *et.al.*, 2009). Hence out-of-pocket spending on maternal health care imposes a significant financial burden on households (Arif *et al.*, 2006). This paper tries to find out the various components of direct costs incurred by women living in slums of India to avail maternal health care and the determinants of these costs of maternal health care services.

MATERIALS AND METHODS

Study Design: This study was conducted in the slums of Kolkata, the third largest urban agglomeration of India. Four cluster of wards were selected using multi-indicator cluster sampling based on the proportion of the slum population and geographical distribution. Then four slums from each of these clusters selected on a random sampling method. Birth records of the previous one year were collected in these four slums.

Study Population: Information were collected from 413 women, who had given birth during previous one year through interviews using structured questionnaire. Written informed consent was sought from all participants.

Study Duration: The survey or this study was conducted between February and May 2013.

Statistical Analysis: Univariate analyses such as percentage and statistical mean were carried out to study the distribution of the variables. Compare Means method was used to calculate the average costs for every category of each of the predictor variables. and a chi-square test was used to draw conclusions about the population from the sample data. Multiple classification analysis has been used

to find out the determinants of costs of maternal health care separately for antenatal, delivery and postnatal services. Amount of costs are continuous variables, and the determinants are categorical variables. Multiple classification analysis is a covariance technique in which the nature of the effects of predictor variable on the dependent variable is provided and then the adjusted effect is presented for its inter-correlations with other predictors in the analysis. (Mindel, et.al., 1986).

RESULT

Costs of Antenatal Care (ANC)

Total direct cost for ANC was calculated by summing up the cost incurred for all the components of ANC and the registration fees of the facility or fees paid to private doctors. The average direct cost was around ₹903.

The costs of receiving some of the important components of ANC were also collected. Proportion of women who received two Tetanus Toxoid (TT) injections was 80.6 percent and the average cost of TT injections was ₹32. Consumption of Iron and Folic Acid (IFA)/Vitamins/Medicines among was quite low, only 16.5 percent of the women consumed IFA/Vitamins/Medicines for three months and on an average, they spent ₹510 on the TT injections. About 39 percent of them did ultrasonography during their pregnancy with an average cost of ₹450. About 38 percent of them did urine test to be confirmed of their pregnancy and the average cost of urine test was ₹107. Nearly one-third of the women had a blood test and the average cost was around ₹145. The mean amount of fees given to the doctor or the facility to seek ANC, covering all their visits, was ₹57. Total amount of direct cost for ANC borne by these women was calculated using cost for incurring all the components of ANC an also by adding registration fees of the facility or fees paid to private doctors.

Table 1. Average costs of ANC in slums of Kolkata, 2010

Antenatal care Cost	Cost in ₹ (N)
Total cost	903 (381)
Average TT cost	33 (332)
IFA/Vitamins/Medicines average Cost	510 (232)
Ultrasonography average Cost	450 (161)
Urine Test average cost	107 (155)
Blood Test average cost	145 (132)
Average amount of Provider/Registration fees	57 (381)

Costs of Delivery Care

Total amount of delivery costs borne by these women was ₹2495 (Table 2). Average payment made the facility or to the person undertaking for home deliveries was ₹968. Payment made to the facility includes costs such as: registration fees, fees for person undertaking the delivery and fees for using the operation theatre. Cost for buying medicine was ₹1392. Direct cost of delivery was calculated adding costs like, cost given to the facility or to the person (in case of home deliveries), cost of medicine bought from inside and outside the facility.

Table 2. Average costs of delivery in slums of Kolkata, 2010

Delivery care Costs	Cost in ₹ (N)
Total cost	2495(413)
Cost to the health facility	968(413)
Cost of medicines	1392(413)

Costs of Post-Natal Care

Average cost of seeking PNC was ₹180. (Table 3). The cost for seeking PNC was calculated by adding the fees paid to receive the survey, cost of medicines and diagnostics and the cost of treatment for any complication. The Average amount of fees paid to the post-natal service provider was ₹53.

Among those who received PNC, 37.9 percent bought medicines with a mean cost of ₹238. Only 9 percent of them did diagnostic tests for which on an average they bore ₹206.

Table 3. Average costs of post-natal care in slums of Kolkata, 2010

Costs of Post Natal Care	Cost in ₹ (N)
Total cost of receiving PNC	180(140)
Fees paid to service provider	53(140)
Cost of medicine	238(140)
Cost of diagnostic test	206(140)

DETERMINANTS OF COST OF MATERNAL HEALTH CARE

This section of data analyses presents the results of multivariate analysis to show the net effect of each of the background variables on the direct costs after controlling effects of the other socio-economic and demographic variables. As the dependent variable is cost, which is a continuous variable and all the explanatory variables are of categorical types, so multiple classification analysis method has been used to study this relationship with three types of costs for antenatal, delivery and postnatal care. In all the tables of this section, the first column contains all the predictor variables along with their different sub- categories. The second column shows the beta values, which are adjusted correlation coefficients showing strength of relationship between predictor variable and dependant variable after controlling the effect of other predictor variables. In the third column, statistical significance of each of the variables is given. The next two columns show the unadjusted and the adjusted average costs according to each category of all the predictor variables. The last column indicates sample size for each category of all the predictor variables.

For antenatal care, wealth index has the strongest positive relationship with the average direct cost (beta: .326) (Table 4). The adjusted amount of direct cost for high wealth group was ₹348, for medium ₹148 and for low ₹126. Involvement of women in decision making on health care has the second strongest relationship with a beta value of 0.167. The adjusted mean cost was much higher for families where women was not involved in decision making (₹175) than those where women were part of the decision making (₹229).

Table 4. Multiple classification analysis of direct cost per visit of ANC

Variable	Beta	Sig.	Cost		N
			Unadjusted	Adjusted	
Family type	.007	.793			
Nuclear			204	212	135
Joint			212	208	249
Social Group	.024	.289			
Scheduled Caste/tribe			188	199	134
Others			221	215	250
Wealth Index	.326	.000			
Richer			356	348	132
Middle			135	148	127
Poorer			130	126	125
Age group	.000	.812			
15-24			190	209	210
25-45			233	210	174
Educational level	.014	.808			
No education			218	216	98
Eight years			162	205	152
More than eight years			257	210	134
Parity	.089	0.216			

Variable	Beta	Sig.	Cost		N
			Unadjusted	Adjusted	
1			206	193	230
2			232	250	118
3 & above			156	183	36
Involvement of women in decision making on health care	.085	.067			
Yes			164	175	140
No			236	229	244
Have atleast one son	.009	.817			
No			204	213	213
Yes			200	207	207
Place of receiving ANC	.061	.467			
Government			185	199	292
Private			275	242	67
Both government and private			321	244	25
Complication during ANC	.033	.510			
Yes			255	228	83
No			197	204	301

R Square=.146

Direct cost of delivery shows significant association only with wealth status, involvement in decision making, place of delivery and type of delivery (Table 5). Type of delivery has the strongest association with delivery cost with a beta value of .250. The average adjusted cost of a normal delivery was ₹ 523, which is much less than ₹947 for a forceps/caesarean delivery. Place of delivery was the next important determinant of direct cost of delivery (beta: .211). As expected, average per day cost of delivery in a government facility (₹575) was almost half of that for a private facility (₹1111). Contrary to the expectation, average per day direct cost was higher in case of home deliveries (₹891) than that for delivering in a government facility. Like in cost of ANC, wealth status shows significant positive relationship with direct cost of delivery as well. Women with high wealth status spends much more (₹761) than those from medium (₹606) and low (₹564) wealth status groups. Involvement of women in decision making shows a negative relationship with the amount of cost. Those who had involvement in decision making spent much less (₹594) than those who didn't (₹676).

Table 5. Multiple classification analysis of direct cost per day stay at health facility for delivery

Variable	Beta	Sig.	Cost		N
			Unadjusted	Adjusted	
Family type	.101	.145			
Nuclear			750	750	151
Joint			611	588	262
Social Groups	.029	.252			
Scheduled Caste/tribe			582	613	138
Others			702	661	275
Wealth Index groups	.110	.000			
High			947	761	137
Medium			553	606	138
Low			488	564	138
Age groups	.001	.188			
15-24			678	646	222

Variable	Beta	Sig.	Cost		N
			Unadjusted	Adjusted	
25-45			643	644	191
Educational level	.059	.268			
No education			664	589	109
Eight years			513	629	165
More than eight years			837	704	139
Birth Order	.049	.220			
1			733	658	242
2			513	598	133
3 & above			729	728	38
Involvement of women in decision making on health care	.051	.045			
Yes			539	594	155
No			736	676	258
Have atleast one son	.061	.224			
No			769	706	144
Yes			571	609	241
Place of delivery	.211	.000			
Government			539	575	321
Municipality & Private			1176	1111	64
Home			896	891	28
Type of delivery	.250	.000			
Normal			506	523	302
Forceps & C-Section			1087	947	111

R Square=.221

Women who had atleast one son spent ₹ 106 as the direct cost per visit of PNC and those who did not have any son spent ₹ 146 (Table 6). The average adjusted cost of PNC for a normal delivery was ₹ 105, which is much less than ₹ 181 for a forceps/caesarean delivery. Place of receiving PNC had the strongest association with the cost of PNC with a beta value of .480. As expected, average per visit cost of PNC in a government facility (₹ 110) was almost much lower than that in a private facility (₹ 155).

Table 6. Multiple classification analysis of direct cost per visit of PNC

Variable	Beta	Sig.	Cost		N
			Unadjusted	Adjusted	
Family type	.050	.742			
Nuclear			131	137	59
Joint			122	118	80
Social Groups	.041	.459			
Scheduled Caste/tribe			111	115	50
Others			134	132	89
Wealth Index groups	.135	.868			
Richer			131	92	43
Middle			130	127	52
Poorer			116	157	44
Age groups	.104	.642			
15-24			117	107	74

Variable	Beta	Sig.	Cost		N
			Unadjusted	Adjusted	
25-45			136	147	65
Educational level	.119	.461			
No education			133	130	39
Eight years			106	103	61
More than eight years			150	158	39
Birth Order	.162	.330			
1			135	149	90
2			120	88	38
3 & above			74	71	11
Involvement of women in decision making on health care	.045	.652			
Yes			121	116	60
No			130	133	79
Have atleast one son	.133	.071			
No			106	94	55
Yes			139	146	84
Place of receiving PNC	.480	.000			
Government			94	102	74
Private			263	155	40
Type of delivery	.176	.054			
Normal			100	105	101
Forceps & C-Section			195	181	38

R Square=.297

DISCUSSION

The study found out that on an average a married woman living in Kolkata slum paid ₹4405 as direct cost for seeking maternal health care. The cost of ANC and delivery care showed significant positive relationships with wealth status of the women. Women from high wealth group spent more than those from medium and low wealth groups. Interestingly women who were involved in the decision making regarding their own health care, spent significantly less direct costs both for ANC and delivery care than those who were not part of the decision making. This can be explained by the fact that, as for about half of the births, majority of the cost of maternal health care seeking was borne by the maternal grandparents of the child. Women tried to keep the cost as low as possible in order to reduce the economic burden of their parents. As expected, direct cost of seeking ANC and delivery care varied significantly according to place of receiving the service: in government facilities it was lower than that in private facilities. Caesarean and forceps deliveries were costlier than the normal delivery and Even the cost of PNC also varied according to the type of delivery. For women who had any complication during pregnancy both direct and indirect costs increased. This can be attributed to the fact that women who had complications during any time of the childbirth consulted doctors frequently, consumed more medicines, used costlier modes of transport and were more likely to visit private facilities for better quality of care, which resulted in increasing the costs for them.

The study finds that a considerable amount of money is being spent to buy the medicines and diagnostics services from outside the public facilities. To reduce the cost borne by these women availability of free medicines and diagnostics should be ensured in the public hospitals. There is a need for substantial reductions in costs in order to improve the maternal health care seeking behaviour of these women. It is also very much important to enhance the quantity and quality of services by

building more facilities and providing more manpower in the primary health care structures of urban areas to cater the need of fast increasing urban slum population of the developing countries.

REFERENCE

1. United Nations (2006). The Millennium Development Goals Report 2006. UNITED NATIONS NEW YORK.
2. MOHFW (2010). *National health profile of India 2010*. New Delhi: Government of India.
3. Gwatkin DR, Bhuiya A, Victora CG. (2004). Making health systems more equitable. *Lancet*. Oct 2-8;364(9441):1273-80. doi: 10.1016/S0140-6736(04)17145-6. PMID: 15464189.
4. Govil D, Purohit N, Gupta SD, Mohanty SK. (2016). Out-of-pocket expenditure on prenatal and natal care post Janani Suraksha Yojana: a case from Rajasthan, India. *J Health Popul Nutr*. 2016 May 20;35:15. doi: 10.1186/s41043-016-0051-3.
5. Dhar RS, Nagpal J, Sinha S, Bhargava VL, Sachdeva A, Bhartia A. (2009). Direct cost of maternity-care services in South Delhi: a community survey. *J Health Popul Nutr*. 2009 Jun;27(3):368-78. doi: 10.3329/jhpn.v27i3.3379.
6. Arif MS, Miller PC, Munir N & Masood I. 2006. Changes in Knowledge and Behavior of women and Families. *Safe Motherhood Applied Research & Training*. SMART Report 3. Population Council.
7. Mindel, C. H., Wright, R., & Starrett, R. A. (1986). Informal and Formal Health and Social Support Systems of Black and White Elderly: A Comparative Cost Approach. *The Gerontologist*, 6(3), 279-285. Retrieved November 13, 2013, from the Oxford Journals database.