
PUBLIC HEALTH RESEARCH

Out-of-pocket expenditures of Maternity Services at a Tertiary Level Hospitals in Western, Nepal

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ABSTRACT

Received	8 November 2015
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Introduction	Government of Nepal revised free maternity health services “Aama Surakshya Karyakram” since the start of Fiscal Year 2012/13 with specifies the services to be funded, the tariffs for reimbursement and the system for claiming and reporting on free deliveries each month. This study was designed to investigate the amount of money expenditure incurred by families in using apparently free maternity services.
Methods	It was a hospital based cross-sectional study conducted at Manipal Teaching Hospital and Western Regional Hospital. Nepalese women’s were not involved in the family finance and had very little knowledge of income or expenditure. That’s why face to face interviewed among 384 post-partum mothers with their husband or house head of family were conducted at the time of discharge by using a pre-tested semi-structural questionnaire.
Results	The average monthly family income was 19272.4 NRs (189.01 US\$). The median duration of hospital was 4 days (2-19 days). The median patient’s expenditure was equivalent to 13% of annual family income. The average total visible costs was 3887.07 NRs (38.1 US \$). When the average total hidden cost 27288.5 NRs (267.6US \$) was added then the average total maternity care expenditures was 31175.6 NRs (305.76 US \$). Average-cost-per-day was 7167.5 NRs (70.29 US\$). The mean patient's expenditure on the food and drinking, clothes, transport and medicine were equivalent to 53.07%, 9.8%. 7.3% and 5.6% of mean total maternity care expenditure respectively. 5963.7 NRs (58.4 US\$), 7429.3 NRs (72.9 US\$) and 6175.9 NRs (60.6 US\$) were lost earning of women, husband and House head respondents respectively.
Conclusion	A free maternity service in Nepal has high out-of-pocket expenditures and it was more than average monthly income for most families. Therefore, arrange of medicine by the hospital in the free of cost which were not included in essential drug during the hospital stay and at the discharge time. Similarly, arrange for liquid food and hot water as well as clothes for mothers and newly born baby by the hospital to enhance the hospital attendance.
Keywords	Cost-Direct Cost- Indirect Cost- Delivery- Free Maternity Services.

INTRODUCTION

In order to remove financial barriers and improve access to delivery services, the Government of Nepal (GoN) introduced free maternity health services "Aama Surakshya Karyakram" in 2005 had revised since the start of Fiscal Year 2012/13 with specifies the services to be funded, the tariffs for reimbursement and the system for claiming and reporting on free deliveries each month. After revision, *Aama* program has four components: (1) the Safe Delivery Incentive Program (SDIP), a cash incentive scheme, which was initiated in July 2005, (2) free institutional delivery care, which was launched in mid-January 2009, (3) incentive to health worker for home delivery and (4) incentive to women for 4ANC visits in 2011.^{1,2,3}

Study conducted in Kathmandu Nepal shows that the total cost associated with hospital stay varied from NRS 1,200 –20,000 (ranging from €13.40 to €223.10) depending on the length of stay and whether there were complications.⁴ Likewise, study conducted in 8 districts of Nepal (2006) estimated that the cost of normal delivery to be US\$ 71 and a caesarean section US\$ 152.⁵ It shows that price system exists in free maternity services which were also demonstrated by free-market economic theory. It occurs because it consists of individuals engaging in trades with one another.^{6, 7} Similarly, price system associated with free maternity services either directly or indirectly because law of demand and supply shows that if demand increase then price also increase but when supply increase then price of good decrease.⁸ Likewise, the cost of health services and the household's ability to pay for health services (economic factors) were the major obstacles to the utilization of facility-based delivery.⁹ It is one of challenges to the field of public health because if market equilibrium was not seen in the cost of health service then lack of equity on utilization of health services, negative externality, inflation, reduces efficiency of strategies to meet changing demands, reduces fiscal accountability and poor allocation of the resources problems will be seen. Similarly, If the services is priced too low, or provided free of charge, the consumer may perceive it as being low in quality. On the other hand, if the price is too high, some will not be able to afford it.¹⁰ This study may helpful decision makers for ascertain the efficiency by examining their costs. As well as this study help to understand the cost of free maternity services for the equity health service among Have and Have Not.

That's why this study was designed to investigate the amount of money expenditure incurred by families in using apparently free maternity services.

METHODS

The study was a hospital based cross-sectional study was carried out in hospitals viz. Manipal Teaching Hospital (MTH) and Western Regional Hospital (WRH) where Aamma Surukshya Programme has been launched. This study protocol received ethical approval from the Department of Public Health of La Grandee International College. Addition, written permission was taken from each hospitals authority and informed verbal consent was taken from each respondents.

During the hospital stay, post-partum mother's husband and house head were directly involved in payment for care. Similarly, Nepalese women's were not involved in the family finance and had very little knowledge of income or expenditure. That's why 384 post-partum mothers with their husband or house head of family (284 samples from WRH and 100 samples from MTH) at the time of discharge. Required sample from each health institution was calculated through probability proportionate to size sampling technique where as convenient sampling technique was used in-order to women with their husband or house head. Post-partum mothers were excluded if there delivered not at the hospital but admitted for complications.

The data were collected using a pre-tested semi-structure questionnaire with face to face interviews. Costs of maternity services were classified as visible expenses (cost of registration, medicine, medical supplies, laboratory test, video x-ray and birth certificate), hidden expenses (expenses of transportation, food and drinking, communication, laundry, fuel, child care, clothes of baby or women or sleeping bed, lost of earning during the hospital stay and accessories expenses viz. cost of thermos flask, buckets, mug, soap, mat, toothpaste, oil and toilet papers) and loss of earning (opportunity cost) during the hospital stay. Visible expenses of delivery services were reviewed from medical records and receipts of payments. Cost is presented in local currency with US dollar equivalent in parenthesis (prevailing exchanging rate at the time of this study was 101.96 Nepalese rupees to a dollar and this rate was used all through the paper). In this study, average-cost-per-day is calculated by dividing the total cost by the length of stay (LOS).¹¹

$$\text{Average-cost-per-day} = \frac{\text{Average total expenditure on maternity care}}{\text{Average LOS days}}$$

Similarly, lost of earning of the respondents for the delivery period was calculated by the given formula¹²;

$$\text{Lost of earning} = \frac{\text{Previous monthly income (NRs)}}{\text{No. of the days in the Month}} \times \text{Length of stay}$$

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RESULTS

The mean age was 23.69 ± 4.47 years (range 15 years 43 years). Table 1 show that majority 69% (265) of respondents had normal vaginal delivery in the study period followed by c-section delivery 31% (119). The average and median monthly family income were 19272.4 NRS (189.01 US \$) and 15000 NRs (147.1 US\$) respectively. Majority 51.3% (197) of respondents answered that distance between their houses and hospital were equal or less than 15 km

whereas 93.2 % (358) of respondent takes equal or less than 240 minutes to reach the hospital. Mean length of stay in hospital for normal vaginal delivery was 4 days (range 2-13 days) and for c- section was 7 days (range 2- 19 days). The median duration of hospital was 4 days (range 2-19 days). The mean total maternity care expenditures was 31175.6 NRs (305.76 US \$). The median patient's expenditure was equivalent to 13% of annual family income.

Table 1 Distribution of respondents by socio-demographic and delivery related characteristics (n=384)

Characteristics	Number (%)
Age in years	
Mean age = 23.69	
Range = 15- 43	
Religion	
Hindu	315(82)
Buddhist	69 (18)
Educational status of mothers (n = 384)	
Literate	313 (81.5)
Illiterate	71 (18.5)
Educational status of husband (n = 297)	
Literate	275 (92.6)
Illiterate	22 (7.4)
Educational status of house head's (n = 87)	
Literate	55 (63.2)
Illiterate	32 (36.8)
Occupation of mothers (n = 378)	
Unemployment	301 (79.6)
Employment	77 (20.4)
Occupation of husband (n= 295)	
Unemployment	49 (16.6)
Employment	246 (83.4)
Occupation of house head's (n = 88)	
Unemployment	30 (34.1)
Employment	58 (65.9)
Monthly family income	
≤25000 NRs (245.1US \$)	287 (74.7)
>25000 NRs (245.1US \$)	97 (25.3)
Distance between hospital and respondents houses	
≤ 15 km	197 (51.3)
> 15 km	187 (48.7)
Time needed to reach hospital from respondents houses	
≤240 minutes	358 (93.2)
> 240 minutes	26 (6.8)
No of pregnancy	
1 st Time	258 (67.2)
2 nd Time	122 (31.8)
3 rd Time	4 (1)
Modes of delivery	
Normal Vaginal Delivery	265 (69)
C-section	119 (31)
Length of stay	
≤ 5 days	201 (52.3)
> 5 days	183 (47.7)
Mean and Median total maternity care expenditures	31175.6 NRs (305.76 US \$) and 28670
Ranges of total maternity care expenditures	NRs (281.2 US \$)

11575 NRs to 65390 NRs (113.5 US\$ to 641.3 US\$).

Figure in parenthesis shows percentage

101.96 NRS= 1 US \$ *Exchange rates fixed for 17 December, 2014 by Nepal Rastra Bank*

Table 2 shows that the mean expenditures for the normal vaginal delivery without complication was 28514.4 NRs (279.7 US\$) and for the c-section was 37101.9 NRs (363.8 US\$). It shows that expenditures for the c-section were 1.3 times more than normal delivery. 3697.3 NRs (36.3 US\$) and 4309.7 NRs (42.3 US\$) were the mean visible cost of maternity care for normal delivery and c-section respectively. Average total visible cost was 3887.07 NRs (38.1 US \$) which was 12.48% of total average maternity care expenditure. 24817.1 NRs (243.4

US\$) and 32792.2 NRs (321.6 US\$) were the mean hidden cost expenditures seen in normal and c-section delivery respectively. Mean and median total hidden cost were 27288.5 NRs (267.6US \$) and 26500 NRs (259.9 US\$) respectively. Average total hidden cost was 27,288.5 NRs (267.6US \$) which was 87.5% of total average maternity care expenditures. Average total visible cost was equivalent to 14.24 times of average total hidden cost. Average-cost-per-day was 7167.5 NRs (70.29 US\$).

Table 2 Maternity care expenditures by mode of delivery (n=384)

Normal , vaginal delivery without complication			Caesarean section	
Components of care	Mean in NRs	Min-Max. cost	Mean in NRs	Min-Max. cost
A. Visible cost				
Registration cost	79.15	75-500	114.45	75-3200
Cost of medicine	1705.62	500-15500	1870.47	488-13000
Cost of medical supplies	361.97	0-3000	497.49	0-5500
Cost of laboratory test	919.20	0-8476	1129.61	50-12000
Cost of video x-ray	531.32	12200	597.73	0-3000
Cost of birth certificate	100	0-100	100	0-100
Total visible cost:				
NRs	3697.3	1175-17837	4309.7	1263-18778
US\$	36.3 US\$		42.3 US\$	
Mean total visible cost was 3887. 07 NRs (38.1 US \$).				
Median total visible cost was 2425 NRs (23.7 US\$).				
Ranges from 1175 NRs to 18775 NRs (11.5 US\$ to 184.1 US\$).				
B. Hidden cost				
Transport expenses	2192.42	300-10000	2488.95	200-21200
Food and drinking expenses	14840.86	1489-35000	20340.38	5000-34000
Communication expenses	241.70	50-800	305.04	100-1000
Cost for laundry	138.75	0-400	138.66	0-350
Cost for fuel	359.02	0-12300	609.07	0-4000
Cost for child Care	1933.58	500-3500	2447.34	800-1000
Cost for clothes	2739.71	350-8000	3781.47	1100-13000
Accessories expenses *	2371.07	150-18000	2681.31	200-5000
Total hidden cost:				
NRs	24817.1	9300-52500	32792.2	13000-52500
US\$	243.4 US\$		321.6 US\$	

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Mean total hidden cost was 27288.5 NRs (267.6US \$).
 Median total hidden cost was 26500 NRs (259.9 US\$).
 Ranges from 9300 NRs to 52500 NRs (91.2 US\$ to 514.9 US\$).

Total maternity care expenditures

NRs	28514.4	11575- 65390	37101.9	15315-65390
US\$	279.7 US\$		363.8 US\$	

Mean total maternity care expenditures was 31175.6 NRs (305.76 US \$).
 Median total maternity care expenditures was 28670 NRs (281.2 US \$).
 Ranges from 11575 NRs to 65390 NRs (113.5 US\$ to 641.3 US\$).

* Accessories expenses consists cost of given items i.e. thermos flask, buckets, mug, soap, mat, toothpaste, oil and toilet papers.

Note: 101.96 NRS= 1 US \$ Exchange rates fixed for 17 December, 2014 by Nepal Rastra Bank

For normal delivery and c-section, majority of respondents spent mean 1705.62 NRs (16.72 US\$) and 1870.47 NRs (18.34 US\$) for medicine among the visible expenditure on maternity care services. Similarly, among the hidden expenditure on maternity care services 14840.86 NRs (145.55 US\$) and 20340.38 NRs (199.49 US\$) expenditure for food and drinking was majority spent for normal delivery and c-section respectively. The mean

patient's expenditure on the food and drinking, clothes, transport and medicine were equivalent to 53.07%, 9.8%, 7.3% and 5.6% of mean total maternity care expenditure respectively. Likewise, the mean loss of earning of mother, husband and house head were 5,963.7 NRs (58.4 US \$), 7,429.3 NRs (72.9 US \$) and 6,175.9 NRs (60.6 US \$) respectively as shown in Table 3.

Table 3 Lost earning (opportunity cost of time) during delivery period (n=384)

Variable	Mothers	Husbands	House Head's
Mean lost earning	5963.7 NRs (58.4 US \$)	7429.3 NRs (72.9 US \$)	6175.9 NRs (60.6 US \$)
Opportunity cost of time (lost of earning) for	Mean	Median	Range
NVD without complication	8582.2NRs (84.1US\$)	7225.8 NRs (70.8 US\$)	89 NRs - 59225.8NRs (0.8 US\$ - 580.8 US\$)
C-section	8354.04NRs (81.9 US\$)	6967.7NRs (68.33 US\$)	186 NRs – 25161.2NRs (1.8US\$- 246.7 US\$)

DISCUSSION

In this study, the average total visible costs was 3887.07 NRs (38.1 US \$).When the average total hidden cost 27288.5 NRs (267.6US \$) was added then the average total maternity care expenditures was 31175.6 NRs (305.76 US \$). These findings suggest that expenditure of hospital based delivery was found 6 times more due to hidden cost expenditure. This was inconsistent with the study conducted in 8 districts of Nepal⁵ which showed that at a facility the average fee for a normal delivery was 678 NRs (8.97\$) but when, additional charges, opportunity and transport costs were added, the total amount paid exceed 5300 NRs (70\$). This might have been because of price of medicine which are not included in essential drug in the free of cost during the hospital stay and at the discharge time, increase in dollar price, increase of expectation and demand for healthier childbirth, diminished wages of family, poor food quality in hospital, expenses for patient's

visitors and need of more care of newborn baby. Similarly, expenses on various new items were included in the visible cost and hidden cost of maternity services in this study.

In this study, total mean maternity care expenditures for normal delivery was 28514.4 NRs (279.7 US\$) and for the c-section was 37101NRs (363.8 US\$). These findings suggest that expenditure for the c-section was 1.3 times more than normal delivery. The total mean maternity care expenditure for normal delivery and c-section were more from study conducted in conducted in 8 districts of Nepal,⁵ study conducted in Dhaka of Bangladesh¹³ and study conducted in Islamabad of Pakistan.¹⁴ One of the reasons for difference was demand and supply side factors. Higher costs of maternity care expenditure in our study even there was a free maternity services in Nepal showed that such care may well deter women and their families from utilizing emergency obstetric services when they need them; or result in delay in

accessing such services.¹⁴ Similarly concealment was a major finding in the study conducted in a public hospital of Bangladesh¹⁵ which showed that c-sections caused higher patients expenditures compared to normal vaginal deliveries (median \$119 and \$63 respectively) because c-section patients required a longer duration of hospitalization as well as required more medicine. Average-cost-per-day was 7167.5 NRs (70.29 US\$) which was different from the study conducted in a public hospital of Bangladesh¹⁵ which shows that by \$ 2.3 per patients increased expenditures for one days extra hospitalization.

In this study, 1756.71 NRs (17.2 US\$) mean cost of medicine was seen maximum among the visible items in the normal delivery and c-section delivery respectively. Similarly concealment was a major finding in the study conducted in Nigeria¹⁶ drugs and other consumables (such as intravenous cannulae and syringes) (mean 12900N or 80.6 US\$) were the highest expenditure.

Food and drinking expenditure were seen high 14840.86 NRs (145.5 US\$) and 20340.38 NRs (199.49 US\$) in the normal delivery and c-section respectively. Expenditure for clothes (baby or women or sleeping bed clothes) was seen second highest expenditure 2739.71 NRs (26.87 US\$) and 3781.47 NRs (37.08 US\$) in the normal delivery and c-section respectively. Transport expenses was seen fourth highest expenditure 2192.42 NRs (21.5 US\$) and 2488.95 NRs (24.41 US\$) in the normal delivery and c-section respectively. This was inconsistent with a study conducted at government facilities in Bangladesh¹³ which shows transportation expenditure and food expenses were second and third major expenditure of the hospital based delivery respectively. Similarly, expenditure on child care and the feeding of patients were first and second major expenditures of hospital based delivery respectively in the study done in Nigeria.¹⁶ This might have been because of the poor quality of the food supplied by hospital canteen which was believed to lack nutritious ingredients and long duration of patient's relatives in hospital stay. Likewise, majority of patients were obligation to buy food from hotels because of long distance from hospital to the patient's homes. Similarly, in Nepal there was continuous increase in the price of food due to political instability being largely dependent on neighboring country due to its landlocked geography.

The mean opportunity cost of time (loss of earning) for normal delivery and c-section were 8,582.2NRs (84.1US\$) and 8,354.04NRs (81.9 US\$) respectively which shows that loss of earning for pregnant women during delivery was one of the important reasons that contributed to more expenditure even though there was free of costs in the maternity services provided by the health institutions. Unlike in our study, lower opportunity cost was found in a previous study conducted in 8

districts of Nepal⁵ which showed that the opportunity cost of time for normal delivery and c-section delivery in Nepal were 4,92 NRS (6.5US \$) and 1,660 NRS (21.9 US\$) respectively. The difference in opportunity cost between previous study and this study might have been because of quite high numbers of pregnant women's per a day for a delivery, more waiting and consultation time, more travel time and excessive waste of time by pregnant women and their companions for the care of new born baby and pregnant women. In addition, this study was carried in the health institutions of the urban area where individual's opportunity cost seem to be higher than in rural area.

This study does not access the demand-side barriers that affect the cost of free maternity services this was the limitations of this study. It also does not represent the whole maternity services.

CONCLUSION

A free maternity service in Nepal has high out-of-pocket expenditures and it was more than average monthly income for most families. Although free maternity health services "Aama Surakshya Karyakram" was successful program, develop appropriate budgeting for hidden expenses, arrange medicine by the hospital in the free of cost which was not included in essential drug during the hospital stay and at the discharge time also, provide summon vehicles with a radio, travel allowance should be upgrade, arrange for liquid food and hot water as well as clothes for mothers and newly born baby by the hospital, enhance the public-private partnership, developing of community loan fund and increase the study on the health economics were the major recommendation. Likewise, decentralization of appropriate obstetric care facilities to better reach poor and socio-economically underprivileged populations might reduce the burden of costs incurred for pregnant women.

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