



ORIGINAL ARTICLE

Are Free Maternity Services Completely Free of Costs?

Jeevan Acharya*

La Grandee International College, Pokhara University, Pokhara, Nepal.

Received: November 7, 2015
Revised: November 11, 2015
Accepted: November 11, 2015

KEYWORDS:

cost,
delivery,
free maternity services,
Nepal

Abstract

Objectives: The Government of Nepal revised free maternity health services, “Aama Surakshya Karyakram”, beginning at the start of Fiscal Year 2012/13, which 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 monetary expenditure incurred by families using apparently free maternity services.

Methods: Between August 2014 and December 2014, a hospital-based cross-sectional study was conducted at Manipal Teaching Hospital and Western Regional Hospital. Nepalese women were not involved with family finances and had very little knowledge of income or expenditures. Therefore, face-to-face interviews with 384 postpartum mothers with their husbands or the head of the family household were conducted at the time of discharge by using a pre-tested semi-structural questionnaire.

Results: The average monthly family income was 19,272.4 NRs (189.01 US\$), the median duration of hospital stay was 4 days (range, 2–19 days), and the median patient expenditure was equivalent to 13% of annual family income. The average total visible cost was 3,887.07 NRs (38.1 US\$). When the average total hidden cost of 27,288.5 NRs (267.6 US\$) was added, then the average total maternity care expenditure was 31,175.6 NRs (305.76 US\$), with an average cost per day of 7,167.5 NRs (70.29 US\$). The mean patient expenditure on food and drink, clothes, transport, and medicine was equivalent to 53.07%, 9.8%, 7.3%, and 5.6% of the mean total maternity care expenditure, respectively. The earnings lost by respondent women, husbands, and heads of household were 5,963.7 NRs (58.4 US\$), 7,429.3 NRs (72.9 US\$), and 6,175.9 NRs (60.6 US\$), respectively.

Conclusion: The free maternity service in Nepal has high out-of-pocket expenditures, and did not represent a system completely free of costs. Therefore, arrangements should be made by hospitals free of cost to provide medicine that is not included as essential during the hospital stay and at discharge time. Similarly, arrangements for liquid, food, and hot water, as well as clothes for mothers and newborns, should be made by the hospital in order to enhance hospital attendance.

*Corresponding author.

E-mail: lifejeevanvida@gmail.com (J. Acharya).

1. Introduction

In order to remove financial barriers and improve access to delivery services, the Government of Nepal introduced free maternity health services, “Aama Surakshya Karyakram”, in 2005 that were revised at the start of Fiscal Year 2012/13, specifying the services to be funded, the tariffs for reimbursement, and the system for claiming and reporting on free deliveries each month. After revision, the *Aama* program had four components: 1) the Safe Delivery Incentive Program (SDIP), a cash-incentive scheme that was initiated in July 2005; 2) free institutional delivery care, which was launched in mid-January 2009; 3) incentives for health workers for home delivery; and 4) incentives for women for 4 ANC visits in 2011 [1–3].

Free-market economic theory demonstrated that free-market economies consist of a pricing system based on individuals engaging in trades with one another [4,5]. Similarly, price systems influence utilization of free maternity services, either directly or indirectly, because the law of supply and demand indicates that if demand increases, then prices also increase, but when supply increases, then the price of goods decreases [6]. A study was conducted in Kathmandu, Nepal, showing that the total cost associated with hospital stays varied from NRs 1,200–20,000 (ranging from €13.40 to €223.10), depending on the length of the stay and whether there were complications [7]. Likewise, a study conducted in eight districts of Nepal in 2006 estimated that the cost of normal newborn delivery was US\$ 71, while a cesarean section (C-section) cost US\$ 152 [8]. Studies from a large public hospital in Bangladesh [9] showed that free maternity services imposed median total per-patient expenditures of \$65 (range \$2–\$350), equivalent to 7% (range 0.04% to 225%) of annual household income. Likewise, in the study conducted in Lao People’s Democratic Republic [10], health care expenses for delivery care services were significantly higher for cesarean sections (270 US\$) than for vaginal delivery (59 US\$). These results indicated that external costs still exist in free maternity services. The cost of health services and the ability of household to pay for health services (economic factors) were the major obstacles in the utilization of facility-based delivery [11].

Lack of equity in utilization of health services, negative externality, inflation, reductions in the efficiency of strategies to meet changing demands, reductions in fiscal accountability, and poor allocation of resources are problems that will be seen if market equilibrium does not exist. Similarly, If the services are priced too low or provided free of charge, the consumer may perceive it as being low in quality. However, if the price is too high, some will not be able to afford the service at all [12]. Therefore, this is a public health

challenge that prompted design of this study to investigate the amount of monetary expenditure incurred by families using apparently free maternity services.

2. Materials and methods

Between August 2014 and December 2014, a hospital-based cross-sectional study was carried out in Manipal Teaching Hospital (MTH) and Western Regional Hospital (WRH), where the “Aamma Surakshya” Program has been launched. This study protocol received ethical approval from the Department of Public Health of La Grande International College. Additionally, written permission was obtained from each hospital authority, and informed verbal consent was obtained from each respondent. The respondents were also ensured that the participation was voluntary and that they could leave at any point during the 20-min interview.

During the hospital stay, the husband of the post-partum mother and/or the head of the household was directly involved in payment for care. Similarly, Nepalese women were not involved in the family finances, and had very little knowledge of income or expenditure. This was why 384 post-partum mothers were interviewed with their husband or head of the household (284 samples from WRH and 100 samples from MTH) at the time of discharge. Samples from each health institution were calculated using probability-proportionate-to-size sampling techniques, which were conveniently utilized in order to allow women to be interviewed with their husband or head of household. Post-partum mothers were excluded if their delivery did not occur at the hospital, but were admitted for complications.

The data were collected using a pre-tested semi-structured questionnaire with face-to-face interviews. Costs of maternity services were classified as visible expenses (cost of registration, medicine, medical supplies, laboratory tests, video X-ray, and birth certificate), hidden expenses (expenses of transportation, food and drink, communication, laundry, fuel, child care, clothes for the baby or mother, bed linens, loss of earnings during hospital stay, and accessory expenses, i.e., costs of thermos flasks, buckets, mugs, soap, mats, toothpaste, oil, and toilet paper), and loss of earnings (opportunity cost) during the hospital stay. Visible expenses of delivery services were reviewed from medical records and receipts of payments. Cost was presented in local currency with US dollar equivalents (the prevailing exchange rate at the time of this study was 101.96 Nepalese rupees to 1 US dollar, with this rate used throughout the study). Here, the average cost per day was calculated by dividing the total cost by the length of stay (LOS) [13].

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

Similarly, loss of earnings by the respondents during the delivery period was calculated by the following formula [14]:

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

3. Results

The mean age of the respondents was 23.69 ± 4.47 years (range, 15–43 years). Table 1 shows that the majority (69%; 265) of respondents mothers experienced normal vaginal delivery during the study period, with the remaining delivering by C-section (31%; 119). The average and median monthly family income were 19,272.4 NRs (189.01 US\$) and 15,000 NRs (147.1 US\$), respectively. The mean length of stay in the 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 stay was 4 days (range 2–19 days), and the mean total maternity care expenditure was 31,175.6 NRs (305.76 US\$), resulting in a median patient expenditure equivalent to 13% of annual family income.

Table 2 shows that the mean expenditures for normal vaginal delivery without complications were 28,514.4 NRs (279.7 US\$), and for C-section were 37,101.9 NRs (363.8 US\$). This shows that expenditures for the C-section were 1.3-fold higher relative to those for a normal delivery. The mean visible cost of maternity care for a normal delivery and a C-section was 3,697.3 NRs (36.3 US\$) and 4,309.7 NRs (42.3 US\$), respectively, and the average total visible cost was 3,887.07 NRs (38.1 US\$), which was 12.48% of the total average maternity care expenditure. The mean hidden cost expenditures seen for normal and C-section deliveries were 24,817.1 NRs (243.4 US\$) and 32,792.2 NRs (321.6 US\$), respectively, and the average total hidden costs were 27,288.5 NRs (267.6 US\$), which was 87.5% of total average maternity care expenditures. The average total visible costs were equivalent to 14.24-times the average total hidden cost, and the average cost per day was 7,167.5 NRs (70.29 US\$).

For normal delivery and C-sections, the majority of respondents spent a mean of 1,705.62 NRs (16.72 US\$) and 1,870.47 NRs (18.34 US\$), respectively, for medicine among the visible expenditures on maternity care services. Similarly, among the hidden expenditures on maternity care services, 14,840.86 NRs (145.55 US\$) and 20,340.38 NRs (199.49 US\$) were

spent on food and drink, constituting the majority spent during a normal delivery and C-section, respectively. The mean patient expenditure on food and drink, clothes, transport, and medicine was equivalent to 53.07%, 9.8%, 7.3%, and 5.6% of the mean total maternity care expenditure, respectively. Likewise, the mean loss of earnings to the mother, husband, and/or head of household was 5,963.7 NRs (58.4 US\$),

Table 1. Distribution of respondents by sociodemographic and delivery-related characteristics ($n = 384$).

Characteristics	N (%)
Age (y)	
Mean = 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 head of household ($n = 87$)	
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 head of household ($n = 88$)	
Unemployment	30 (34.1)
Employment	58 (65.9)
Monthly family income	
$\leq 25,000$ NRs (245.1 US\$)*	287 (74.7)
$> 25,000$ NRs (245.1 US\$)*	97 (25.3)
Distance between hospital and respondent house	
≤ 15 km	197 (51.3)
> 15 km	187 (48.7)
Time needed to reach hospital from respondent house	
≤ 240 min	358 (93.2)
> 240 min	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 d	201 (52.3)
> 5 d	183 (47.7)

*101.96 NRS = 1 US\$ (Exchange rates fixed for 17 December, 2014 by Nepal Rastra Bank). NR = Nepalese rupee; US = United States.

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

Components of care	Normal vaginal delivery without complication		Cesarean section	
	Mean in NRs*	Min–Max cost in NRs*	Mean in NRs*	Min–Max cost in NRs*
A. Visible cost				
Registration cost	79.15	75–500	114.45	75–3,200
Cost of medicine	1,705.62	500–15,500	1,870.47	488–13,000
Cost of medical supplies	361.97	0–3,000	497.49	0–5,500
Cost of laboratory test	919.20	0–8476	1,129.61	50–12,000
Cost of video X-ray	531.32	12,200	597.73	0–3,000
Cost of birth certificate	100	0–100	100	0–100
Total visible cost:				
NRs	3,697.3	1,175–17,837	4309.7	1,263–18,778
US\$	36.3		42.3	
Mean total visible cost was 3,887.07 NRs (38.1 US\$).				
Median total visible cost was 2,425 NRs (23.7 US\$).				
Ranges from 1,175 NRs to 18,775 NRs (11.5 US\$ to 184.1 US\$).				
B. Hidden costs				
Transport expenses	2,192.42	300–10,000	2,488.95	200–21,200
Food and drinking expenses	14,840.86	1,489–35,000	20,340.38	5,000–34,000
Communication expenses	241.70	50–800	305.04	100–1,000
Cost for laundry	138.75	0–400	138.66	0–350
Cost for fuel	359.02	0–12,300	609.07	0–4,000
Cost for child Care	1,933.58	500–3,500	2,447.34	800–1,000
Cost for clothes	2,739.71	350–8,000	3,781.47	1,100–13,000
Accessories expenses †	2,371.07	150–18,000	2,681.31	200–5,000
Total hidden cost:				
NRs	24,817.1	9,300–52,500	32,792.2	13,000–52,500
US\$	243.4 US\$		321.6 US\$	
Mean total hidden cost was 27,288.5 NRs (267.6 US\$).				
Median total hidden cost was 26,500 NRs (259.9 US\$).				
Ranges from 9300 NRs to 52,500 NRs (91.2 US\$ to 514.9 US\$).				
Total maternity care expenditures				
NRs	28,514.4	11,575–65,390	37,101.9	15,315–65,390
US\$	279.7		363.8	
Mean total maternity care expenditures was 31,175.6 NRs (305.76 US\$).				
Median total maternity care expenditures was 28,670 NRs (281.2 US\$).				
Ranges from 11,575 NRs to 65,390 NRs (113.5 US\$ to 641.3 US\$).				

*101.96 NRs = 1 US\$ (Exchange rates fixed for 17 December, 2014 by Nepal Rastra Bank); †Accessories expenses consists cost of given items, i.e., thermos flask, buckets, mug, soap, mat, toothpaste, oil, and toilet paper. NR = Nepalese rupee; US = United States.

7,429.3 NRs (72.9 US\$), and 6,175.9 NRs (60.6 US\$), respectively, as shown in Table 3.

4. Discussion

In this study, the average total visible cost of delivery was 3,887.07 NRs (38.1 US\$). When the average total hidden cost of 27,288.5 NRs (267.6 US\$) was added, then the average total maternity care expenditure was 31,175.6 NRs (305.76 US\$). These findings suggested that expenditures for hospital-based deliveries were 6-times more costly due to hidden-cost expenditures. This was inconsistent with the study conducted in eight districts of Nepal [8], showing that at one facility, the average fee for a normal delivery was 678 NRs (8.97 US\$), but when other charges, such as opportunity and

transport cost, were added, the total amount paid exceeded 5,300 NRs (70 US\$). This might have been due to the price of medicine, which was not included in the essential drugs that were free during the hospital stay and at the discharge time. These additional costs impacted the price, the expectation and demand for healthier childbirth, diminished family wages, poor food quality in hospital, expenses for patient visitors and, the need for care of a newborn baby. Similarly, expenses on various new items were included in the visible and hidden costs of maternity services in this study.

In this study, total mean maternity care expenditures for normal delivery was 28,514.4 NRs (279.7 US\$), and for C-sections was 37,101 NRs (363.8 US\$). These findings suggested that expenditure for the C-section was 1.3-fold higher than that for a normal delivery. The total mean maternity care expenditure for normal

Table 3. Lost earnings (opportunity cost of time) during delivery period ($n = 384$).

Variable	Mothers	Husbands	Head of household
Mean lost earnings	5,963.7 NRs (58.4 US\$)	7,429.3 NRs (72.9 US\$)	6,175.9 NRs (60.6 US\$)
Opportunity cost of time (loss of earnings) for NVD without complication	Mean 8,582.2 NRs (84.1 US\$)	Median 7,225.8 NRs (70.8 US\$)	Range 89 NRs–59225.8 NRs (0.8 US\$–580.8 US\$)
C-section	8,354.04NRs (81.9 US\$)	6,967.7NRs (68.33 US\$)	186 NRs–25161.2 NRs (1.8 US\$–246.7 US\$)

NR = Nepalese rupee; NVD = natural vaginal delivery; US = United States.

delivery and C-section was greater than that reported in studies conducted in the eight districts of Nepal [8], in Dhaka of Bangladesh [15], and in Islamabad of Pakistan [16]. One of the reasons for the difference was supply-and-demand factors. The higher costs of maternity care observed in our study, even in the presence of free maternity services in Nepal, showed that such costs may deter women and their families from utilizing emergency obstetric services when they need them, or result in delay in accessing such services [16]. Similarly, concealment was a major finding in the study conducted in a public hospital in Bangladesh [9], which showed that C-sections caused higher patient expenditures compared to normal vaginal deliveries (median 119 US\$ and 63 US\$, respectively), because C-section patients required a longer duration of hospitalization, as well as more medicine. The average cost per day was 7,167.5 NRs (70.29 US\$), which was different from the study conducted in a public hospital in Bangladesh [9], which showed a 2.3 US\$ per patient increase in expenditures for 1 day of extra hospitalization.

In this study, the 1,756.71 NRs (17.2 US\$) mean cost of medicine was seen as the highest among the visible costs associated with normal and C-section deliveries, respectively. Similarly, concealment was a major finding in the study conducted in Nigeria [17], which showed that drugs and other consumables (mean 12,900 N or 80.6 US\$) were the highest expenditures.

Food and drink expenditures were also high [14,840.86 NRs (145.5 US\$) and 20,340.38 NRs (199.49 US\$)] for the normal and C-section deliveries, respectively. Costs associated with clothes (sleeping bed clothes for babies or women) were seen as the second highest expenditure [2,739.71 NRs (26.87 US\$) and 3,781.47 NRs (37.08 US\$)] for normal and C-section deliveries, respectively. Transport expenses were the fourth highest expenditure at 2,192.42 NRs (21.5 US\$) and 2,488.95 NRs (24.41 US\$) for normal and C-section deliveries, respectively. This was inconsistent with a study conducted at government facilities in Bangladesh [15], showing that transportation expenditures and food expenses were the second and third major expenditures associated with hospital-based deliveries, respectively.

Similarly, expenditures on child care and the feeding of patients were the first and second highest expenditures associated with hospital-based deliveries, respectively, in the study done in Nigeria [17]. This might have been due to the poor quality of the food supplied by the hospital, which was believed to lack nutritious ingredients, and the long duration housing required by patient relatives during the hospital stay. Likewise, the majority of patients were obliged to buy food from hotels due to the distance between the hospital and the home of the patient. Similarly, in Nepal there was a continuous increase in the price of food due to political instability that was largely dependent upon the neighboring country and its landlocked geography.

The mean opportunity cost of time (loss of earnings) for normal and C-section deliveries was 8,582.2 NRs (84.1 US\$) and 8,354.04 NRs (81.9 US\$), respectively, which showed that loss of earnings by pregnant women during delivery was one of the important contributors to higher expenditures, even though maternity services provided by the health institutions were free of costs. Unlike our study, lower opportunity costs were observed in a previous study conducted in eight districts of Nepal [8], showing that the opportunity cost of time for normal and C-section deliveries was 4,920 NRS (6.5 US\$) and 1,660 NRS (21.9 US\$), respectively. The difference in opportunity cost between the previous study and ours might be due to the high numbers of pregnant women admitted per day, their increased waiting and consultation times, additional travel time, and excessive time wasted by pregnant women and their companions waiting for care.

Demand-side barriers that affect the cost of free maternity services were not address, which constitutes a limitation of this study. It also did not represent the entirety of the maternity services available.

5. Conclusion

Although free maternity health service, “Aama Surakshya Karyakram”, was a successful program in Nepal, it continues to have high out-of-pocket expenditures,

making it a system not completely free of costs. Some recommendations for the enhancement of such a system include developing appropriate budgeting for hidden expenses, arranging for medicine not included as essential drugs during the hospital stay and at the time of discharge time to be administered by the hospital free of charge, providing vehicles with a radio, offering upgraded travel allowances, arranging for liquid, food, and hot water, as well as clothes provided by the hospital for mothers and newborn babies, enhancing public-private partnerships, developing community loan funds, and increasing the study of health-related economics.

Conflicts of interest

The authors have no conflicts of interest to declare.

Acknowledgements

We are grateful to Department of Public Health of La Grandee International College, Pokhara for academic guidance and logistical support.

References

1. Karkee R, Lee AH, Binns CW. Why women do not utilize maternity services in Nepal: a literature review. *WHO South East Asia J Public Health* 2013 Jul–Dec;2(3–4) [Internet]. Available from: [http://www.searo.who.int/publications/journals/seajph/seajphv2n\(3-4\)p135.pdf](http://www.searo.who.int/publications/journals/seajph/seajphv2n(3-4)p135.pdf) [accessed 22.08.14].
2. Nepal Millennium Development Goals Progress Report 2013: Government of Nepal, National Planning Commission, United Nations Country Team Nepal. 2013 [Internet]. Available from: <http://www.npc.gov.np/new/uploadedFiles/allFiles/mdg-report-2013.pdf> [accessed 22.08.14].
3. Department of Health Services (DoHS) (Nepal). *Annual Report: Department of Health Services 2069/70 (2012/2013)*. Kathmandu, Nepal: DoHS/MoHP; 2014.
4. Simoens S. Health economic assessment: a methodological primer. *Int J Environ Res Public Health* 2009 Dec;6(12):2950–66.
5. Dolinar RO. Free-market economics. *Pharmexec.com*; 2004 [Internet]. Available from: <http://www.pharmexec.com/free-market-economics> [accessed 24.08.15].
6. Mills A, Gilson L. *Health economics for developing countries: a survival kit*. London, UK: London School of Hygiene and Tropical Medicine; 1988. 130 p.
7. Simkhada P, Van Teijlingen ER, Sharma G, et al. User costs and informal payments for care in the largest maternity hospital in Kathmandu, Nepal. *Health Sci J* 2012;6(2):317–34.
8. Borghi J, Ensor T, Neupane BD, et al. Financial implications of skilled attendance at delivery in Nepal. *Trop Med Int Health* 2006 Feb;11(2):228–37.
9. Khan SH. Free does not mean affordable: maternity patient expenditures in a public hospital in Bangladesh. *Cost Eff Resour Alloc* 2005;3(1). <http://dx.doi.org/10.1186/1478-7547-3-1>.
10. Douangvichit D, Liabsuetrakul T, McNeil E. Healthcare expenditure for hospital-based delivery care in Lao PDR. *BMC Res Notes* 2012 Jan;5. <http://dx.doi.org/10.1186/1756-0500-5-30>.
11. Mohanty SK, Srivastava A. Out-of-pocket expenditure on institutional delivery in India. *Health Policy Plan* 2013 May;28(3):247–62.
12. Jha N. Social marketing in health: developing country's perspective. *J Obstet Gynaecol India* 2013;8(2):1–4 [accessed 01.11.14].
13. Cost Per Patient Day Equivalent in District Hospitals. Health Systems Trust; 2015 [Internet]. Available from: <http://www.hst.org.za/news/cost-patient-day-equivalent-district-hospitals> [accessed 24.08.15].
14. How to calculate loss of pay based on absence hrs in case of Positive Time. SAP; 2012 [Internet]. Available from: <https://scn.sap.com/thread/3143624> [accessed 24.08.15].
15. Nahar S, Costello A. The hidden cost of 'free' maternity care in Dhaka, Bangladesh. *Health Policy Plan* 1998 Dec;13(4):417–22.
16. Khan A, Zaman S. Costs of vaginal delivery and Caesarean section at a tertiary level public hospital in Islamabad, Pakistan. *BMC Pregnancy Childbirth* 2010 Jan;10. <http://dx.doi.org/10.1186/1471-2393-10-2>.
17. Adamu AN, Adamu H, Isa AY, et al. Expenditure on emergency obstetric care in a federal tertiary institution in Nigeria. *J Women's Health Care* 2013 Jan;2(4). <http://dx.doi.org/10.4172/2167-0420.1000134>.