Costs and Outcomes of Caesarean Section Procedures in Public, Private and NGO Health Care Facilities in Bangladesh

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SECTION 1: INTRODUCTION

In Bangladesh, the current level of maternal mortality is around 5.5 per 1000 live births, which is 150 times greater than the level in developed countries[1]. Major causes of death include hemorrhage, abortion, eclampsia, puerperal sepsis and obstructed labour.[2] From the obstetric labour many women, who do not die, suffer from various types of short and long term illness and disability and babies who initially survive the death of the mother, seldom reach their first birthday. Due to these disabilities, women not only suffer physically, but may in many cases also lose their position in the family and in society[3]. To avoid complications and give relieve from obstructed labour a cesarean section (c-section) is often carried out. Aside from reasons of avoiding complications in delivery, a mother's reasons for preferring a c-section to vaginal delivery are twofold[4]. One is fear of pain during labour and delivery. It seems that a c-section will allow the woman to deliver with no pain at all, provided good and strong analgesics are administered. The other is the concept that a C-section allows the woman to keep the anatomy and physiology of the vagina and perineum intact, while a vaginal delivery will produce some loss of normal coital function.

In the past 30 years, the incidence of caesarean section has increased considerably. Much of this increase is justified; but some inexcusable, either because the patient demands the operation, or the doctor takes the 'easy way out'. In Australia and Britain, the incidence is about 10 to 15 per cent; in the USA it seems to be about 16 to 20 per cent. Part of the reason for the higher rate in the USA is that most American obstetricians believe that once a caesarean section has been performed on a patient, all subsequent deliveries should be by c-section. In Bangladesh, the minimum acceptable level of caesarean sections at any facility is that they should account for not less than 5% nor more than 15% of all births in the population[5]. In fact, the proportion of

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[1] Ministry of Health and Family Welfare, "Status report on Bangladesh third and fourth population and health project for World Bank review", Dhaka. October, 1992.

[2] BIRPERHT, "A Report on Baseline Survey for Assessment of Emergency Obstetric Care services in Bangladesh", Dhaka, 1995

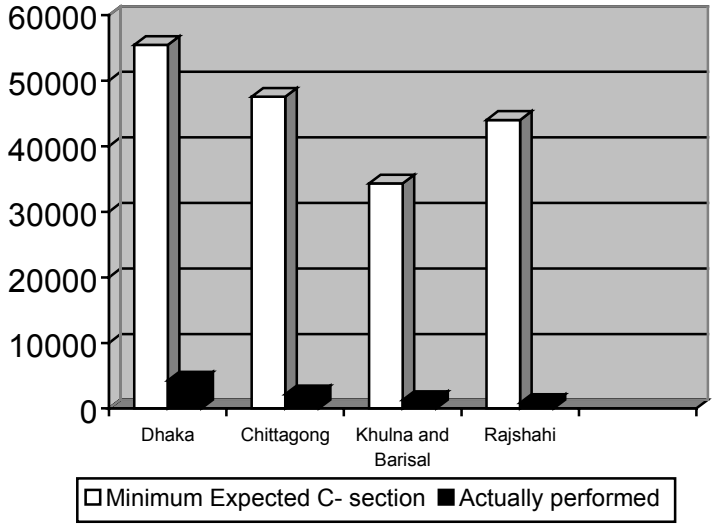
[3] BPHC-URC (B), "Role of NGOs in provision of Safe Motherhood", Dhaka, 1997.

[4] Faundes, A and Cecatti, J G, "Which policy for caesarian sections in Brazil/ an analysis of trends and consequences", *Health Policy and Planning*; 8(11): 33-42.

[5] .Maine, D., Victoria Ward and Abdel Hadi El Tahir, 1993. "Meeting the community half way-Programming guidelines for the reduction of

caesarean sections in different divisions falls way short of the 'minimum expected level' (see figure 1)[2].

Figure 1: Numbers of Expected and Actual of Caesarean Cases at Different Facilities by Division



Source: BIRPERHT, 1995.

The same BIRPERHT report addresses the numbers of receiving emergency obstetric care through the three delays model. This model concentrates on the time interval from the time that a woman can be recognised as having a complication in pregnancy and the time when she gets medical care for that complication. If she gets help in time, she will live. If she does not, she may well die or be prematurely injured[6]. The three kinds of delay are: delay in deciding to seek medical care; delay in reaching a medical facility where adequate care is available; and delay in receiving care at that facility. These are attributed to socio-economic status including women's and educational status, the illness characteristics, distance, transport and roads to the facility as well as the cost and quality of care.

Among the priorities of Bangladesh's Fifth Health and Population Programme (HAPP5) is reproductive health care, including the assurance of safe delivery care. As part of HAPP-5, it is

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maternal mortality" in BIRPERHT, "A Report on Baseline Survey for Assessment of Emergency Obstetric Care services in Bangladesh", Dhaka, 1995

[6] UNICEF and OGSB, "Emergency Obstetric Care: Interventions for the reduction of maternal mortality" 1993.

planned that emergency obstetric care (EOC) will be made available at the Thana level to increase availability and reduce delays in access. As long as the necessary inputs, including skilled personnel, are put in place, it appears that, in terms of cost to the provider, delivery of EOC at this level will be feasible. However, to date, in looking at prioritisation of these activities, consumer costs have not been considered and provider costs are not available in detail. Although, in theory, health care in public facilities is provided free of charge, in reality, the patient is faced with many costs, including payments to obtain drugs, to improve access and services offered, for transport and to cater for those friends and relatives that are in attendance. These costs can become prohibitively expensive or force the patient and her family into debt.

In the latter half of 1996, the Health Economics Unit (HEU), with support of the Canadian International Development Agency (CIDA), carried out a clinical health economics survey of patients to assess the full economic costs and cost-effectiveness of surgical procedures in three types of health care facilities. The procedure chosen for this survey was the caesarean section, which has timely relevance for the HAPP5, bearing in mind the new EOC strategy. This report presents the results of the study, aimed at describing the pattern of consumer expenditures and providers' cost for the procedure as well as an overview of the outcomes of and procedures used for c-sections. The report is set out as follows; Section 1 is the introduction; Section 2 provides background information and states the aims of the report; Section 3 gives an overview of the study design; while Section 4 presents survey findings; Finally, Section 5 concludes the report with a discussion and a set of preliminary recommendations.

SECTION 2: BACKGROUND OF THE STUDY

In 1995, the Health Economics Unit embarked on a financial analysis of the Myemensingh Medical College Hospital. The preliminary findings of this study suggested a possible overuse of strong antibiotics, particularly for prophylaxis purposes. At this point, it was decided, with the support of CIDA, to explore the issue further and carry out an in-depth analysis of surgical procedures, comparing different 'types' of health care providers. For the study, three facilities – one public, one NGO and one private–for profit were chosen. The HEU study then aimed to explore the cost-effectiveness of caesarean section procedures in these secondary and tertiary facilities.

In the study, patient cohorts from the public, private and NGO facilities were surveyed. Socio-economic information about each patient, outcomes and full economic costs were collected. An existing consumer cost study[7] points out the considerable cost burden of secondary and tertiary care, even in public hospitals where services are supposed to be provided free. Thus it was important to measuring the full economic costs[8] of the activity, requiring information on both provider outlays and consumer expenditures. The HEU study therefore set out to explore:

- Generalised estimates of average consumer expenditures for c-section patients treated during the study period.
- Provider costs per procedure at 3 types of facilities.
- Socio-economic characteristics of the patient cohorts
- Case mix of the patient cohorts
- Outcomes of the c-section for the patient cohorts
- Indicators of quality

[7] Begum, Sharifa, *Health Poverty Interface Study* (BIDS, 1995).

[8] Full economic costs can be defined as the opportunity cost or the value of sacrifice of giving up alternative opportunities when a choice is made to use resources in a particular way.

SECTION 3: METHODOLOGY AND STUDY DESIGN

The cost analysis of c-section patients was a nine-month case-control study. The patient sample consisted of those who sought admission for C-section at a tertiary care public hospital, a leading private care hospital and an NGO hospital.

3.1 Procedure selection and rationale

The procedure selected for clinical study and cost analysis at the three facilities was based upon the both clinical and cost criteria [9]. The procedure chosen was pregnancy terminating in either elective or emergency caesarean section.

3.2 Cohort Selection

Cohorts of research subjects chosen for inclusion in the study included one cohort at the public hospital, one at the private hospital and one at the NGO hospital. The cohort sizes are shown in table 1, below.

Table 1: C-Section Cohort Sizes at Each Facility

MMCH (Public)	Monowara (Private)	LAMB (NGO)
99	80	30

4.1.a. Public Facility

The public hospital selected for the study is Mymensingh Medical College Hospital (MMCH), a tertiary hospital attached to the Mymensingh Medical College and providing a full range of emergency surgical facilities. The HEU has conducted a full financial analysis of MMCH[10] as well as a baseline survey of the MMCH to examine the impact of cost-recovery through user-fees[11]. The institution provides the required services and meets other basic criteria. In addition, it provides a significant number of C-sections through its emergency obstetric and gynecological

[9] Health Economics Unit "Consumer costs of caesarean sections in public, private and NGO health care facilities in Bangladesh", HEU research paper no.7, March 1998.

[10]Health Economics Unit, "Myemensingh Medical College Hospital: financial analysis (FY1994-5)" HEU research paper no. 6, forthcoming.

[11]Health Economics Unit, "Mobilising resources through hospital user fees in Bangladesh: a report on quality and ability to pay", HEU research paper 4, August 1996

wards.

4.1.b. Private Facility

The private facility chosen for this study, Monowara Hospital, is a 60-bed clinic. It provides outpatient, accident and emergency services, a fully equipped and modern operating theatre, investigative services, including radiology and pathology, clinical dietary services, central sterilisation and supply departments and an ambulance service. It also offers the services of a High Dependency Unit and pharmacy for the patients. Inpatient treatments include major medical and surgical specialities.

4.1.c. NGO Facility

The NGO facility selected was the Lutheran Aid to Medicine Bangladesh (LAMB) Hospital in Parbatipur, Dinajpur District. This 45 bed hospital provides both outpatient and inpatient services, with a focus on maternal and child health. C-sections form the majority of surgeries carried out. Of all deliveries in 1996, the complicated delivery rate was 61.5% and the c-section rate was 18%[12].

3.3 Survey Design

The analysis consisted of several components. A comprehensive set of 14 of questionnaires was designed to assess full economic costs, facility quality, socio-economic, cultural and reproductive background of the patient and mother and baby outcomes. The list of questionnaires is provided in annex 1. During hospitalisation, periodic interviews were used to determine expenditure items such as the bed charge, food, transport and drug costs borne by patients, patient's reproductive history and socio-economic background. Investigators completed questionnaires on facility environment and clinical outcomes for each patient. In the post operative period, a follow up household interview was held six weeks after discharge, by an HEU-trained team. A final, follow up household interview was carried out for patients attending MMCH and Monowara, twenty weeks after discharge. Due to difficulties of access, this final follow up was not possible for the 30 LAMB patients. Both consumer expenditures and mother

[12] World Mission Prayer League, Annual Report, 1996

and baby outcomes were charted during this follow up period.

Interviews were conducted by medical students (MMCH), junior residents (Monowara) and trained interviewers (LAMB), under the direction of HEU and the principal investigator (PI) of the HEU study.

The estimation of provider costs involved the collection of direct and indirect provider cost information allocated to each patient. These were collected using the same questionnaire and the same team. Additional information was collected from each facility through interviews with the directors and administrative staff.

As part of the study, a set of questionnaires were given to experts, in the field of gynaecology and obstetrics, maternal and child health/ family planning, public health and population and paediatrics, to investigate contributory factors to case mix, facility quality and outcome. They ranked the contributory factors in order of their importance.

3.4 Cost data collected

3.4.a. Consumer expenditures

Consumer expenditure information was collected on bed charges and operating expenses, supply expenditures (including medicines), food expenses, charges for laboratory services and other investigations and any transport expenses incurred. At Monowara and LAMB, all charges are officially sanctioned by the institution. At MMCH, there are sanctioned fees for admission, some sanctioned bed charges, and official charges for investigations and ambulance services. By asking the patients for the expenses incurred it is believed that the survey captured both the sanctioned and most of the unofficial 'service' charges, commonly paid in Bangladesh. However, some of these latter charges may not have been identified in the survey.

The consumer expenditures were analysed according to income group, to give an impression of affordability. The patients were classified into income groups based on their own assessment of the monthly household income. An analysis of consumer surplus, exploring the relationship between willingness and ability to pay was not within the scope of the current survey.

Further information was also obtained on days of work and resultant income lost by the patient, for calculation of the opportunity cost of the C-section. However, due to the low numbers of income earning mothers in the sample and ambiguities in the patient responses, these indirect costs have not been included in the analysis. Further details of the consumer cost analysis are provided elsewhere [13].

3.4.b. Provider costs

Provider cost was divided into recurrent and capital cost per patient. Recurrent costs were classified according to:

a) Overhead cost;
b) Cost of surgical materials and supplies;
c) Drug cost; and
d) Medical staff cost.

Capital costs were split into building and equipment costs. Records at the different providers, for the collection of overhead item costs, lacked uniformity. For example, it was found that at LAMBS, building maintenance, car maintenance and furniture costs were included under the 'others' line item, whereas at MMCH 'others' includes machinery maintenance, car maintenance, furniture, water, printing and stationery. At Monowara, 'others' includes machinery maintenance, car maintenance, furniture, water, printing, stationery and telephone costs (see annex 2). It was therefore not possible to obtain a detailed breakdown of overhead costs for comparison.

Per patient provider costs for each facility were calculated by allocating overhead costs and equipment costs using hospital area and numbers of patients. Capital costs were annualised using a depreciation rate of 5%. SPSSwin and Microsoft Excel were used for data analysis while MSWord was used to write the report.

[13] Health Economics Unit, "Consumer costs of caesarean sections in public, private and NGO health care facilities in Bangladesh", HEU research paper 7, June 1998.

SECTION 4: FINDINGS

4.1 Issues Related To Reproductive Health

This section deals with the issues pertaining to the various aspects of reproductive health, which are likely to have affected patient and baby outcome. The followings are included:

- elective/emergency
- indication for C-section
- number of past pregnancies
- previous labour experience
- number of living children
- incision used for C-section

4.1.a. Elective/emergency

In LAMBS, 20 per cent of the C-sections were performed as elective, in MMCH and Monowara; these figures were 34 per cent and 31 per cent respectively. This finding supports a separate study [15], where 25 per cent of the caesarean were planned in advance (see figure 2). However, when describing the case mix in terms of elective and emergency cases one must be aware of the clinic policy. For example, at LAMB's the policy is not to perform c-sections unless a severe emergency arises. This policy is more restrictive than that of in Bangladesh in general and it is likely that at Monowara and Mymensingh, the definition of a situation where an 'emergency' c-section is required is less restrictive.

4.1.b. Indication for C-section

The questionnaire identified the six most important reasons for c-section as no progress of labour, foetal-pelvic disproportion, previous caesarean section, abnormal presentations, foetal distress and placenta previa. Figure 3 shows that in Monowara, about 41 per cent of the patients had had a c-section before, whereas in MMCH, this is around 16 per cent and in LAMBS, no one had this indication for C-section. So we can not generalise according to the rule 'after a

caesarean, always a caesarean'[14]. At LAMBS, 60 per cent patients' problems were identified as 'others', which included eclampsia, PET and multiple complication. This figure is 46.0 and 37.5 per cent for MMCH and Monowara respectively. Interviews with the surgeon at LAMB's indicated a disproportionately high number of eclampsia patients. A concern was expressed that eclampsia appeared to be a condition related to socio-economic issues but as yet no direct cause has been established and no cure aside from pregnancy termination is available.

Patients were asked of their knowledge of any problems in their present pregnancy. It is surprising to note from figure 4, that most (87, 77 and 86 per cent in LAMBS, MMCH and Monowara respectively) of the patients' present problems were identified as 'not sure of any' although they were to have c-section procedure and the investigators had identified problems. This may indicate a severe information gap between patient and doctor but reflects common practise in Bangladesh where doctors frequently consult directly with the patients' relatives and leaving the patient ill-informed concerning their condition.

4.1.c. Previous pregnancies

The number of previous pregnancies and previous labour experience are seen as possible influences on the outcome of a current delivery. As can be seen from figure 5, out of 30 patients at LAMB's the average number of previous pregnancies is 1.6. This figure is 1.8 for MMCH (99 patients) and 1.6 at Monowara. Except the case of Monowara, most of the respondents, 57% at LAMB's and 55.5% at MMCH, had normal vaginal delivery for previous pregnancies - see figure 6. In the private hospital (Monowara), about 70 per cent patients had had c-section experience before.

4.1.d. Number of living children

According to expert opinion, the number of living children was also said to have some effect on the outcome but was not expected to influence it greatly. In figure 7, it is noted that the average number of living children for each patient is 2.2 for LAMBS, 2.9 for MMCH and 1.2 for

[14] Faundes, A and J. G.Cecatti, Which policy for caesarian sections in Brazil? An analysis of trends and consequences. *Health Policy and Planning*, 8 (1): 33-42.1993

Monowara. About 50% of women from LAMBS and from MMCH have only one child; the figure is 66% for Monowara.

4.1.e. Incision used for C-section

As experts say if a lower transverse incision is used for C-section, the mother can deliver the next child vaginally. In the sample, the percentage of patients with a lower transverse incision varies across facilities: for Monowara, it was 76.0 and for LAMBS and MMCH, it was 13.3 and 19.2 respectively (see figure 8). In the case of a longitudinal midline incision, the subsequent pregnancy should be delivered by s-section. This incision was carried out in about 87 per cent of the patients in LAMBS.

4.2 Economic, Social-Cultural And Demographic Characteristics

This section deals with the major economic, socio-cultural and demographic characteristics of c-section patients by different facilities. According to the 'Three delays Model' these characteristics affect both the first and second phases of delay. The socio-cultural characteristics investigated in this study include:

- household income
- husband's occupation
- housing ownership
- construction material of the dwelling house
- age distribution
- education
- religion
- distance to the health facility
- cost associated in reaching the health facility

4.2.a. Household income

Previous studies[15] show financial reasons have influenced decisions on whether to perform a

[15] Barros, Fernando C. et al, Why so many caesarean sections? The need for a further policy change in Brazil, *Health Policy and Planning*, 1986;

caesarean section since the incidence increased markedly with family income, from 19 per cent among the poorest mothers to 47 per cent among the richest. In the HEU study, household income was divided by three categories: a) less than Tk. 5,000 per month (low income); b) Tk. 5,001 to 10,000 per month (middle income); and c) More than Tk. 10,000 per month (high income). Eighty per cent patients of the private hospital (Monowara) were from the high-income group, whereas in LAMBS, 70 per cent patients were from low-income group. In the public hospital (MMCH), 40 and 38 per cent patients were from low and middle-income group respectively and the rest (21 per cent) was from high-income group. Figure 9 shows the income distribution at each of the clinics.

Irrespective of facilities, the middle and higher income groups in the patient sample had a higher rate of elective procedures as opposed to emergency procedures than the lower income group (Table 2).

Table 2: Percentage distribution of patients' household income by procedure (elective and emergency).

Procedure	Income Group			
	<Tk. 5000	Tk. 5001-10000	>Tk. 10000	**Total**
Elective	19.7	31.0	49.3	**71**
Emergency	36.2	26.8	37.0	**138**

4.2.b. Husband's occupation

The primary occupation of the husbands for the sampled women was divided into four categories: agriculture, business, services (white-collar job) and others. It is evident from figure 10 that most of the patients' husbands are employed in the service category, except at LAMB's where, as expected, the majority of husband's are agricultural workers.

4.2.c. Housing

Irrespective of the facilities, the greater part of the c-section sample were women living in households that owned their own house (63%). As figure 11 shows, at LAMB's, 73% of patients have their own house; the rest are in rented and shared housing. At MMCH, the composition is

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1(1): 19-29.

66%, 32% and 2%, respectively. At the private hospital (Monowara), none of the patients live in shared house, 55% of patients are in their own house and the rest, 45%, live in rented accommodation.

Dwelling units were categorised as pucca, tin roof and thatched hut, based on the construction material of the roof, floor and wall of the main dwelling houses. Figure 12 shows, women from tin roof dwellings were more commonly found in the c-section sample at LAMBS and MMCH, whereas in Monowara, 92.6% patients were from pucca dwellings.

4.2.d. Age distribution

Distribution of women by age groups is presented in the following figure 13. The average age of LAMBS respondents was 23 years, 26 years for MMCH and 25.6 years for Monowara patients. Patients from LAMBS and MMCH show a moderately symmetrical age distribution than Monowara.

4.2.e. Education/Literacy

Three-fourths of the sample respondents of all facilities are literate. About 43% of women from LAMBS and 35% from MMCH had 6-10 years of schooling. In Monowara, 50% respondents had 11-15 years of schooling. The mean years of schooling were 6.47 for LAMBS, 9.03 for MMCH and 12.3 for Monowara patients. Almost all the husbands are literate for all facilities. The mean years of schooling of the husbands was 8.23, 10.67 and 13.90 respectively.

4.2.f. Religion

From religious cultural point of view, Muslim-Hindu differentials in the reproductive behaviour are a long-standing survey finding [16]. A Hindu woman is more likely to use institutional delivery facilities than a Muslim woman is[17]. This study appears to support this. Although, there are a greater number of Muslim respondents from all the facilities, the non-Muslim group are more likely to have a c-section than the Muslim group (see figure 14). Over 20% of the c-

[16] See all CPS and BFS studies.

[17]Barkat et al, 1995. 'Knowledge, Attitude, Perception and Practices relevant to the utilization of Emergency Obstetric Care services in Bangladesh: A Formative Study.', URC (B), Dhaka.

section patients at Lambs and Monowara are Hindu, which is greater than the country average.

4.2.g. Access to health facility

According to the 'three delays model'[18], some of the community variables such as the distance, availability of transport, condition of roads, costs, etc. are important causal factors in making decisions to seek EOC services, as well as for reaching the EOC service delivery facilities. These were the reasons why distance and related factors were explored in this study. As c-sections are not currently performed at the Thana level so we will consider the distance and cost of availing the services from district and medical college hospital. Distance between the district hospital (and medical college hospital) and the home of the patient was ascertained by asking one or more knowledgeable person (s) of the patient's household (see figure 15).

The average distance between the home and medical college was about seven times higher for LAMBS, two times higher for MMCH than for Monowara. For all facilities, mean distance from home to medical college hospital is higher for elective patients (15.21 km) than emergency (12.35 km) ones. This suggests that greater distances between home and the health facility is not leading to a higher rate of emergency procedures as might be expected.

A previous study[19] shows that among all the items of expense of the patients, transport is a major component, we considered the transport cost from home of the patient to health facility. Figure 16 shows that in order to reach district hospital the cost reported by the LAMBS and MMCH patients was Tk. 75 and Tk. 48 respectively. For Monowara this cost was unreported, which is likely to be the result of the Dhaka location where tertiary facilities are available. The cost to get to a medical college hospital is higher than that to get to the district hospital for all three facilities, as expected.

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[18]

[19] Barkat, A et al, "Knowledge, Attitude, Perception and Practices relevant to the utilization of Emergency Obstetric Care services in Bangladesh: A Formative Study". URC (B), Dhaka, 1995.

4.3 Outcome of the Operation

4.3.a. Mortality

Immediate outcome of the operation for the sampled patients at all the facilities was satisfactory. Only one patient died who was at MMCH, although some experienced multiple complications.

4.3.b. Outcome of the baby

Most of the babies from all facilities were full term (see figure 17). This negates the concept that C-sections cause the risk of premature interruption of pregnancy particularly among cases with an appointed date for delivery. Almost all babies from the three facilities were health in the period until discharge and only 1.2 per cent in MMCH and 2.5 per cent in Monowara were 'not healthy' ('not healthy' includes babies with diarrhoea, vomiting and fever). However, complications were observed in 10% of the reporting babies, during the follow up period at MMCH, and in one baby at Monowara.

4.3.c. Outcome of the mother

As can be seen in figure 18, at Monowara, only one of the sampled patients experienced any complications prior to discharge. About 40 per cent patients in LAMBS had single, two or multiple complications. This figure is 12 per cent for MMCH. The complications include haemorrhage, deep versus thrombosis, pulmonary embolism, chest infection, aspiration pneumonia, pulmonary oedaema, caesarean hysterectomy, puerperal sepsis, UTI, bowel or bladder injury, paralytic ileum, intestinal obstruction, incisional hernia, residual abscess, mastitis or breast abscess wound infection, wound dehiscence.

Further complications were observed during the follow up period in 3% of LAMBs patients, 18% of MMCH patients and 20% of Monowara patients. Of the 144 patients recording follow-up information, 4 reported a complication in both mother and child during. It is also interesting to note the number of patients that continued to incur expenditure related to the procedure after discharge from the hospital. At LAMB's no expenditure was reported. However, over half those patients at MMCH and almost all patients at Monowara continued to do so, the reason for these charges were not clear but could be related to complications or follow up. Over 30% of the patient sample reporting payments post-discharge also had complications.

The complications may occur due to lack of care after delivery, poor quality of care in the facilities or could be associated with patients themselves. However, we cannot generalise to only one reason for the complication.

4.4 Facility Quality

Quality of services in every facility is important as it provides influences when and whether people will use that service. In most district hospitals in Bangladesh, there are not enough obstetric cases to make it possible to do training of physicians in cesarean section there. With a population of 1.7 million in the average district, and a birth rate of 35, at least 3,000 women in that district will require life-saving cesarean sections each year. This means that thousands of women in the district are dying each year of being seriously injured for lack of cesarean section facilities. Women experience delays to seek care for several reasons[20]:

a) Poor quality of services discourage people from using them;
b) It is not ethical to tell people to use services if those are not available;
c) There are many women who succeed in reaching hospitals only to die from lack of appropriate care.

The quality at the three facilities was explored using several indicators: equipment available; assessment of the facility environment by the investigators; patient waiting times and frequency of doctor visits; and lengths of stay.

4.4.a. Available Equipment

Equipment available at the facilities at the time of the survey was classified according to presence and functional status. Table 3 shows the equipment status at the facilities. All facilities have an anaesthetic machine. The ventilator is to assist after general anesthesia (G.A.) when all respiratory muscles become relaxed. In this situation, the ventilator acts as an artificial respirator. Further more the ventilator can indicate airway obstructions and cyanosis. In the

[20] Maine, D., Victoria Ward and Abdel Hadi El Tahir, 1993. "Meeting the community half way-Programming guidelines for the reduction of maternal mortality".

absence of the ventilator, this process can be done by manually (ambu bag) which needs extra manpower. This manual instrument fails to indicate any air way obstructions. In MMCH, where most of the operations are done with G.A., the anesthetic machine with ventilator is essential and the fact it is missing is of some concern.

Table 3: Condition of equipment by facility.

Items	Facility		
	LAMBS	**MMCH**	**Monowara**
Anaesthetic machine	Present	Present	Present
Anaesthetic with ventilator	Present	Absent	Present
Anaesthetic without ventilator	Absent	Present	Absent
Pulse oxymeter	Absent	Not working	Present
Cardiac monitor	Absent	Absent	Present
Oxygen Supply	Cylinder	Central	Cylinder
Suction apparatus	works well	Works not well	Works well
Nurse-patient ratio in recovery unit	>1:4	>1:4	>1:4
Defibrillator in recovery unit	No	No	yes

A pulse oxymeter indicates oxygen saturation in tissue and also airway obstructions. When the amount of oxygen becomes less than 94% then hypoxic cardiac (decrease oxygen concentration in the tissue) arrest occurs which is fatal for a cesarean patient. "It may happen that the patient dies on the operating table, if it can not be detected earlier". The cardiac monitor shows heart rate of the patient and also myocardial ischcemia if she has any. Like hypoxic cases this is also fatal for a cesarean patient. It is "impossible' to carry out a C-section without a cardiac monitor if this disorder has been found in the patient. Only at Monowara, the private clinic, are both these items recorded as present and functional. MMCH has a pulse oxymeter but it is reported as not working and it does not have a cardiac monitor. Although LAMBS deals with a good number (18% of all deliveries in a year) of c-section patients, it does not have either of these two items of equipment.

Only MMCH has a centrally provided oxygen source. Monowara and LAMBs use cylinder oxygen. This provides oxygen at high pressure using a small device. The disadvantages of this method are that it may damage the airway passage and cannot ensure continuous oxygen therapy if needed. Furthermore, it is expensive and time consuming to operate. On the other hand, central oxygen can be given in sufficient amounts at low pressure, which therefore has less chance of tissue injury.

The suction apparatus ensures the airway obstruction for baby just after birth. If it is not working then it can be done manually which is a very old unscientific procedure. This may be necessary at MMCH where the suction apparatus was not functioning well at the time of the survey.

The nurse patient ratio is low but no difference is discernible between the hospitals from the data collected. The defibrillator manages cardiac arrhythmia for example ventricular fibrillation when heart rate is very high. In this fatal condition of the patient, with the help of this machine, the patient's life can be saved. This equipment is only available at Monowara.

4.4.b. Investigators assessment of quality

One Investigator at each hospital gave their opinions on the facility environment. The conditions were found to be satisfactory at each. It would have been preferable to have a single investigator carry out this survey who would therefore have been able to discern differences between the facilities.

4.4.c. Patient assessed quality

Indicators of quality collected from the patient included their perceived waiting times and frequency of doctor visits. In terms of waiting times, tables 4a and 4b present the average times between admission and operation and, for the emergency patients the time between decision to operate and time operation. LAMBs performed the majority of c-sections within 12 hours of admission and only 13% waited longer than 36 hours. At MMCH and Monowara, 35% and 29%, respectively, of patients waited over 36 hours before they were operated on.

Table 3a: Patient assessed waiting time from time of admission (all reporting patients) to time of operation for each facility

	LAMB's	MMCH	Monowara	Total
	Percentage of reporting patients			
Up to 6 hours	48%	19%	28%	28%
6 to 12 hours	22%	10%	12%	13%
12 to 24 hours	13%	20%	17%	19%
24 to 36 hours	4%	16%	14%	14%

36 to 48 hours	0%	8%	6%	6%
48 to 72 hours	4%	14%	12%	12%
3 days to one week	9%	13%	11%	7%
N	23	79	109	201

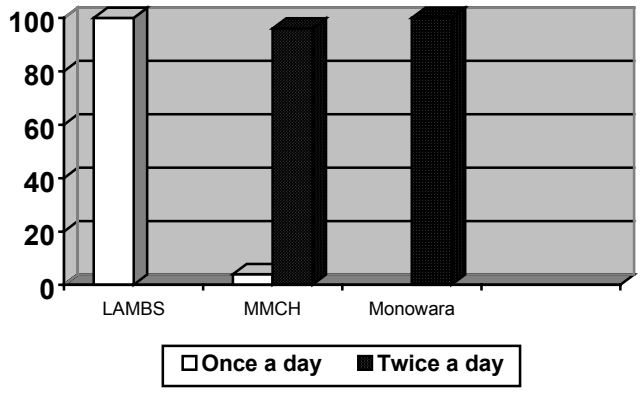
Table 3b: Patient assessed waiting time to operate from decision to operate (emergency patients only)

	LAMB's	**MMCH**	**Monowara**	**Total**
	Percentage of reporting patients			
Up to one hour	75%	5%	22%	23%
Between 1 & 2 hours	17%	17%	12%	15%
Between 2 & 5 hours	8%	41%	16%	26%
Between 5 & 10 hours	0%	9%	10%	8%
More than 10 hours	0%	28%	40%	28%
N	24	64	50	138

Of greater concern is the similar pattern visible for the emergency patients, in table 4b. Note that 40% of patients at Monowara and 28% of patients at MMCH have the impression of waiting more than 10 hours for an emergency c-section from *the time of decision to operate*. In this respect LAMBs performs well, carrying out 75% of the emergency operations within an hour of the decision to operate.

4.4.d. Frequency of patient seen by a doctor after the operation

Fig.21: Percentage of patients receiving one or two doctor visits per day



As far as quality of care is concerned it is very important to notice how frequently the patient was seen by a doctor after the operation in the hospital. In this respect, all three facilities showed a good performance with the almost 100% of patients receiving at least one doctor visit

per day.

4.4.e. Lengths of stay

The average lengths of stay were 12 days, 11.3 days and 6 days at LAMB, MMCH and Monowara respectively.

4.5 Total Cost of the C-Section Procedure

4.5.a. Total costs of the c-section procedure

Table 5 presents the main findings of the total cost survey. Due to transfer payments between the patient and the hospital, the total cost is not equivalent to the sum of the consumer and provider costs. To avoid double counting, the total costs has been calculated as the sum of the provider cost plus the cost of those payments made by the patient outside the hospital.

There is a considerable variation in the costs of the procedure between the facilities. The cost at Monowara is over double the cost at MMCH, which is in turn almost double the cost of that at LAMBs (19,764, 8,648 and 4,365 Taka, respectively). The reason for the large differential between Monowara and MMCH is not hard to identify and is due to personnel costs. At Monowara, the operation charge (covering surgeon and anesthetist charges) is 12,964 Taka or 66% of the total (see annex 2). In contrast, medical staff costs at LAMBs and MMCH come to a total of 799 (9%) and 300 Taka (7%) respectively. The different medical staff costs reflect very different payment and incentive systems. On the other hand the difference in costs between LAMBs and MMCH is due to the cost of drugs and supplies. At the former, the total cost of these items is 1,680 Taka (38% of total cost), whereas at MMCH the cost of these items is 6,527 Taka (75% of total cost).

Table 5: Total cost per patient of C-section procedure by facility (Taka).

	LAMBS	MMCH	Monowara
Providers' cost	2,493	3,415	3,183
Consumers' expenditures	6,753	5,670	20,781
Total cost *	4,365	8,648	19,764

*Total cost is not equal to the sum of provider's and consumers costs, as some transfer payments are made between provider and consumer

4.5.b. Provider costs

Table 6 describes the results of the providers' cost survey, by facility. The providers' cost is divided into two parts: a). Recurrent cost per patient; and b) capital cost per patient. The Recurrent cost includes overhead costs, cost of surgical materials and supplies, drug cost and

medical staff salary. Capital cost includes building cost and equipment cost. A detailed breakdown of provider costs is given in Annex 2.

Table 6: Providers' cost per patient by facilities (Taka).

		LAMBS	MMCH	MONOWARA
I	**Recurrent cost per patient**			
A	Overhead Costs	122	21	662
B	Cost of surgical materials and supplies per patient	1,087	2,438	1,294
C	Drug cost per patient	64	360	843
D	Medical staff cost per patient	799	300	200
	Sub-total	**2,072**	**3,315**	**2,999**
II	**Capital cost per patient**			
A	Building Costs:	16	14	51
B	Equipment Cost	405	86	133
	Sub-total	**421**	**100**	**184**
Grand-total		**2,493**	**3,415**	**3,183**

The average provider cost per patient was lowest of the three facilities at LAMBs (2,493 Taka). The cost per patient was highest at MMCH, where it was 3,415 Taka per patient. At Monowara, the mean cost per patient was 3,183 Taka. The provider cost at Monowara may in fact be an under-estimate as we have not accounted for the cost of any debts that the private clinic maybe incurring at the time of the survey. For example, if Monowara is paying interest equivalent to 15% of its running costs (recurrent costs) the total cost per patient would be inflated to 3,632 Taka and hence, Monowara's costs would be in fact the highest.

On a closer look at the results, an interesting pattern emerges. Recurrent costs comprise over 80% of the total provider cost for all facilities and are greater than 90% at MMCH and Monowara (excluding debt servicing). Overhead costs, including maintenance, administration, utilities, communications and transport (vehicle fuel and maintenance), comprise nearly ¼ of total recurrent costs at Monowara, whereas at MMCH and LAMBs overhead cost as a percentage of recurrent costs was below 10%. For all facilities, the major proportion of overhead cost goes for non-medical staff salaries: they were 89%, 98% and 94% for LAMBS,

MMCH and Monowara respectively.

As a whole, total staff costs (both medical and non-medical) comprise very different portions of recurrent costs across the facilities. Total staff costs were 44% of recurrent costs at LAMB's, yet only 27% at Monowara and 15% at MMCH. In the case of Monowara, this low percentage is due to the use of independent surgeons and anesthetists for surgical procedures such that the consultant fee is in effect a patient out of pocket expense and not included here as a provider cost. At MMCH the lower average staff cost per patient of staff is due to lower salary rates and a heavy patient burden.

The cost of surgical materials and supplies is highest for MMCH, where it is almost double the cost incurred for these items at Monowara and LAMBs. Per patient drug costs also vary considerably between the hospitals at 64 Taka, 360 Taka, and 843 Taka at LAMBs, MMCH and Monowara respectively. This maybe due to prescribing patterns and different types of pharmaceuticals (for instance the use of generic or patent name drugs). It should be noted that further costs for drugs and other medical supplies were incurred directly by the patient to supplement those provided by the hospital bringing the total to 529, 3,729 and 2,967 Taka respectively (see Annex 2).

In terms of capital cost, equipment cost took the majority proportion for c-section patients at all facilities. They were 96%, 86% and 72% for LAMBS, MMCH and Monowara respectively.

4.5.c. Consumer costs

The consumer costs of the c-section are reported in more detail in HEU's research note no. 7**Error! Bookmark not defined.**. It is sufficient to mention here that they include the patient expenses incurred at the hospital for bed rent, operation fee, consultants' fees, medicine and investigation charges as well as those charges directly related to accessing treatment but incurred outside the hospital: medicines, transport charges, investigation charges and, in the case of Monowara, consultants' fees.

As is shown in table 5, it was found that patients paid most at the Monowara Clinic, where the

mean expenditure per patient is 20,781 Taka. MMCH mean patient expenses are the lowest of the three facilities. At LAMB and MMCH, the mean expenditures per patient are 6,752 Taka and 5,669 Taka respectively.

Of total consumer expenditure MMCH, 92.3% of consumers' expenditure went outside the facility. In LAMBS and Monowara, these proportion were 27.7% and 79.8% respectively (Annex 2).

SECTION 5: CONCLUSIONS AND RECOMMENDATIONS

The study found a large variation in total costs for c-sections across the hospitals. It also reported satisfactory outcomes. The success of the c-section procedure and the limited variation in outcomes had the effect of constraining the study to a cost-minimisation exercise instead of the cost-effectiveness analysis planned. In order to carry out an economic evaluation it is necessary to have a comparison group. The study planned to compare successful with less successful outcomes at all facilities. At the completion of data collection only a small number of complications was found and there was some concern that bias may have been introduced in the form of the Hawthorn effect i.e. patient outcomes improved due to the presence of the survey. Thus, valid comparisons were only possible between the entire patient samples at the three facilities, leading us to the calculation of average costs and the identification of the lowest cost facility as well as a review of the outcomes and the factors that affect both utilisation and outcome.

The first part of the analysis to be carried out and reported was that on the consumer expenditures. These expenditures and their implications have been discussed elsewhere[9]. The consumer expenditures form an integral part of the three delays model discussed above and to ensure patients are able to gain access to care at a particular facility, these expenditures should be taken into consideration. The analysis found that the public facility patients reported the lowest average expenditures and the private the highest. These expenditures comprise both sanctioned and unofficial fees. At Monowara and likewise at LAMB, all charges are officially sanctioned by the institution. As a result, the total consumer expenditure falls within an expected range at both these facilities. At MMCH the reported patient expenditures were on average five times that which was expected. As mentioned above, a large share of this cost at MMCH is due to the cost of drugs and supplies. These expenditures result from supply shortages caused by government resource shortfalls, inefficient logistics and/or leakage from the system. This has implications for patient access to quality care and the introduction of emergency obstetric care at lower levels of the health system: if the same shortages of drugs and supplies are likely at the Thana facilities, perhaps compounded by laboratory and blood supply quality, a consequent transfer of the cost to the patient may also occur.

Other factors affecting utilisation and outcome of care in the three delays model include socio-economic factors and quality of care. The former is said to delay the decision to seek care and the latter to 'delay' the possibility of receiving adequate treatment. Our survey found a higher rate of emergency c-sections in the facility serving the population with the lowest income groups and least education. The implication is that those with a poorer socio-economic have delayed the decision to seek care and thus increased the chances of requiring emergency care, as described by the model.

As far as quality of care and services are concerned, the survey has examined equipment at the facility, delays within the hospital in terms of time spent waiting, frequency of doctor visits and length of stay. The effect on outcome of each of these factors, however, is not discernible. In spite of this, it is worth commenting on some of the findings. From the survey, we have found that the main equipment required for the c the private hospital most of the required equipment exist, whereas in NGO and public hospital it does not. The role of MMCH as a tertiary hospital implies that this is the site of last referral and should it be equipped to carry out a simple procedure such as a c-section. The missing and in particular non-functional equipment at MMCH is of serious concern suggesting poor maintenance. This situation should be reviewed, as with the low supplies and drug stocks at the same facility.

Patient waiting times suggest a more rapid movement of patients from admission to operating and a swifter response to an emergency situation at LAMBs than at the public and private facility. The longer time from admission to operation may be due to case mix: Monowara and MMCH are in urban areas where access to hospital is easier than the rural area around LAMB's. The patients arriving at LAMB's are therefore more likely to be in the later stages of labour. However the effect on patient outcomes is not known. The slow response to the required emergency procedure is worrying and introducing systems to reduce the time from decision to operate to operation should be a priority.

It is particularly surprising that so many patients are waiting longer than 36 hours for their operation in Monowara where it appears that a rapid throughput is encouraged. The average

length of stay for the patient sample was 6 days – half that at LAMBs and MMMCH. This different period reflects different attitudes to patient management.

A review of the data collected concerning patient outcome reveals that LAMB's reported worse outcomes for the immediate post-operative period. However, in the post-discharge period, Monowara patients who performed well while in hospital appear to present more complications than elsewhere. The differing rates of complications could be a result of the type of care received or the socio-economic and health status of the mother and baby. In terms of case mix, it is observed above that a greater percentage of c-sections at LAMBs are due to emergency which is likely to have a detrimental effect on the immediate outcome of the mother and child. Indeed the Apgar score[21] recorded for each child one minute and five minutes post discharge supports this argument, with the lower Apgar scores recorded for the emergency group. Socio-economic status and reproductive history also bears some importance on the outcome of the operation. It is noted above that high-income groups with a greater length of education predominate at Monowara, whereas at LAMBs low income groups with less education are the norm. The patient sample at MMCH is more mixed.

In the pre-discharge period, the percentage of complications in mothers is higher at LAMBs (43%), the facility serving the lower income population. However, if we move to the post-discharge period, the situation appears to reverse – a lower rate of complications in the mother and the baby at is observed at LAMBs (3%, 0%) than Monowara (20%, 5%) and Mymensingh (15%, 9%). The reasons for this may lie in the quality of inpatient care or follow up. It was also noted above that the mean length of stay at Monowara was half of that at LAMBs and Mymensingh – do the post discharge complications indicate that this maybe shorter than actually required? At Mymensingh, the mean length of stay is as long as at LAMBs but the post discharge complication rate was 15% for the mothers and 9% in the babies of the patient sample. More detail on the type of complication, their causes and effective treatment is required to make further conclusions.

[21] The Apgar score is a simple tool with which the individual carrying out the delivery can gauge the health status of the new born. It requires giving socres between 0 and 2, at 1 and 5 minutes post birth, for respiratory effort, pulse rate, colour, muscular tone and response to stimuli.

Comparing the total costs between the providers is difficult. The nature of the three facilities inevitably leads to different cost structures. Monowara, as a for profit clinic, aims to provide quality care as well as to achieve a profit from the services they provide. This leads to different attitudes to patient management and incentive structures for their staff. For example, the short length of stay allows for greater patient throughput and using independent consultants means Monowara does not have high cost physicians on their payroll. The consultancy fees are paid directly by the patient who without the bargaining power of an institution is at a disadvantage when prices are set perhaps leading to inflated fees. In contrast, at MMCH, staff are government employees with the job security that entails but the lower salary rates than would be available in the private sector. Does this structure lead to incentives to gain benefits in other areas such as colluding with pharmacists outside the hospital and extra charges to obtain a bed or cabin in the hospital, thus leading to a higher cost burden on the patient?

The HEU cost survey aimed to quantify patient expenditures and providers' cost on c-section surgery and observe the difference between different types of providers in terms of quality of care and outcomes in the context of the widening EOC programme. From the findings, the following recommendations are made:

1. Waiting times between decision to operate and actual procedure in the case of emergencies should be minimised.
2. Reduce shortfalls of drugs and other supplies in public facilities.
3. Introduce regular monitoring and accountability in the fee system, including unofficial fees.
4. Ensure charges for EOC are kept at an affordable level.
5. Ensure the presence and maintenance of equipment to strengthen existing quality of services.
6. Introduce regulations to stop provider incentives inflating costs.

ANNEX I: SURVEY QUESTIONNAIRES

List of Questionnaires used in HEU Cost Analysis of C-Section Procedures

I. ***Questionnaires administered*** **at time of decision** ***to perform a c-section***

Questionnaire 1: Patient enrollment and Reproductive History questionnaire

II. ***Questionnaires administered*** **at time of operation.**

Questionnaire 2: Facility environment questionnaire

Questionnaire 3: Clinical outcomes questionnaire

Questionnaire 4: Baby condition questionnaire

Questionnaire 5; Flow chart information on time spent in facility

Questionnaire 6: Doctor and staff time list

Questionnaire 7: Surgical materials and supplies questionnaire

III. ***Questionnaires administered*** **1 day after operation**

Questionnaire 8: Prices information questionnaire

IV. ***Questionnaire administered*** **2-3 days post-operation or when patient is comfortable**

Questionnaire 9: Socioeconomic Questionnaire

Questionnaire 10: Patient service rating questionnaire

Questionnaire 11: Consumer cost questionnaire

V. ***Questionnaires to be administered*** **very near to discharge**

Questionnaire 12: Patient/Baby Complications and care questionnaire

Questionnaire 13: Final consumer cost questionnaire

VI. ***Questionnaires for*** **follow-up**

Questionnaire 14: Household survey questionnaire

ANNEX 2: DETAILED COST TABLES

Table A2.1: Consumers' and providers' cost of LAMBS.

	Providers' cost per patient	Consumers' cost per patient (in taka)	
		Transfer to facility	Payment outside facility
Patient Expenditures			
Bed charge		642	
Supplies (including drugs)			529
Food expenses			860
Lab/investigation charge		174	
Operation charge		4,065	
Transport expenses			483
Provider costs			
Cost of surgical materials and supplies	1,087		
Drug costs	64		
Medical staff cost	799		
Overhead costs	122		
Capital cost	421		
Total	**2,493**	**4,881**	**1,872**
Total consumers' expenditure			**6,753**
Total cost			**4,365**

Table A2.2: Consumers' and providers' cost of MMCH.

	Providers' cost per patient (Taka)	Consumers' cost per patient (in taka)	
		Transfer to facility	Payment outside facility
Patient Expenditures			
Bed charge		356	
Supplies (including drugs)			3,729
Food expenses			1,089
Lab/investigation charge		81	
Operation charge			
Transport expenses			415
Provider costs			
Cost of surgical materials and supplies	2,438		
Drug costs	360		
Medical staff cost	300		
Overhead costs	217		
Capital cost	100		
Total	**3,415**	**437**	**5,233**
Total consumers' expenditure			**5,670**
Total cost			**8,648**

Table A2.3: Consumers' and providers' cost at Monowara.

	Providers' cost per patient (taka)	Consumers' cost per patient (in taka)	
		Transfer to facility	Payment outside facility
Patient Expenditures			
Bed charge		3,977	
Supplies (including drugs)			2,967
Food expenses			557
Lab/investigation charge		223	
Operation charge			12,964
Transport expenses			93
Provider costs			
Cost of surgical materials and supplies	1,294		
Drug costs	843		
Medical staff cost	200		
Overhead costs	662		
Capital cost	184		
Total	**3,183**	**4,200**	**16,581**
Total consumers' expenditure			**20,781**
Total cost			**19,764**

Table A2.4a: Recurrent Providers' Costs Per Patient of C-Section Procedure by Facility, Taka.

		LAMBS	MMCH	MONOWARA
I	**Recurrent cost per patient (Taka)**			
A	**Overhead Costs**	**122**	**217**	**662**
	- Building maintenance	0.0	0.3	3.8
	- Machinery maintenance	2.8	0.0	0.0
	- Car	0.0	0.0	0.0
	- Furniture	0.0	0.0	0.0
	- Electrical charges	4.0	0.2	2.5
	- Fuel and generator [a]	0.5	0.4	4.3
	- Water	0.0	0.0	0.0
	- Printing & Stationery	0.9	0.0	0.0
	- Telephone	0.1	0.0	0.0
	- Others [b]	5.5	2.4	27.5
	- Non-medical staff salaries	108.0	213.2	623.8
B	**Cost of surgical materials and supplies per patient**	**1,087**	**2,438**	**1,294**
	- Disposables/consumables	865.7	2,056.0	839.2
	- Reusables	1.3	0.2	16.0
	- Anaesthetic Agents	219.6	382.2	438.7
C	**Drug cost per patient**	**64**	**360**	**843**
	- Intravenous fluids	43.5	142.7	298.9
	- Injectible Antibiotics	13.7	99.1	448.9
	- Analgesics	1.4	6.9	71.4
	- Ergometrine	0.0	23.7	5.9
	- Steroids	0.0	8.4	0.0
	- Fresh Blood [c]	0.0	2.8	8.3
	- Others	5.8	76.6	9.6
D	**Medical staff cost per patient**	**799**	**300**	**200**
	- Surgeon [d]	351.9	47.5	
	- Resident # 1	26.4	48.4	39.9
	- Resident # 2	175.7	46.4	104.9
	- Anaesthetist [d]	27.9	53.7	
	- Assistant Anaesthetist	0.0	59.7	0.0
	- Nurse	217.3	44.2	55.2
Subtotal		**2,072**	**3,315**	**2,999**
II	**Capital cost per patient (Taka)**			
A	**Building Costs:**	**16**	**14**	**51**
	- Admin. room (Cashiers)	0.0	0.5	2.9
	- Admin. room (Administrative)[e]	0.0	0.0	0.0
	- Antenatal Ward	0.2	8.3	13.9
	- Operating Theatre	9.8	0.3	4.6
	- Labour & Delivery room	1.6	3.0	13.0
	- General ward (female)	1.4	1.2	11.6
	- Pathology & Lab.	0.1	0.0	0.2
	- OPD Female	0.0	0.0	0.2
	- Collection Room	0.0	0.0	0.3
	- Maternity waiting room	2.2	0.0	3.7
	- Cabin	0.3	0.9	0.6
	- Waiting room	0.1	0.0	0.2
	- Others	0.0	0.0	0.0
B	**Equipment Cost**	**405**	**86**	**133**
Subtotal		**437**	**115**	**235**
Grand-total		**2,509**	**3,429**	**3,234**

Notes:
a. In LAMBS, fuel and generator cost includes transport and water pumping cost.
b. In LAMBS, others include building maintenance, car maintenance, furniture, water, printing and stationery and telephone costs in admin. Room (cashiers) for MMCH and Monowara. In Monowara, others include machinery maintenance, car maintenance, furniture, water, printing and stationery and telephone costs.
c. In LAMBS, no patient in the sample required fresh blood.
d. In Monowara, the expenses of surgeon and anaesthetist are paid directly by the patient.
e. The capital cost of admin. Room (administrative) has been included.

Table A2.5: Mean patient expenses by facility (Value in Taka)

	Expenditure in Taka			
	LAMB N=30	**MMCH N=99**	**MONOWARA N=80**	**Total N=209**
Bed Charge	642	356	3,977	1,783
Drugs and Medical Supplies	529	3,729	2,967	2,978
Food Expenses	860	1,089	557	852
Lab/Investigation Charges	174	81	223	148
Operation Charge	4,065	0.00	12,964	5,546
Transport Expenses	483	415	93	301
Total	**6,752**	**5,669**	**20,782**	**11,609**
Expenditure per patient day	**666**	**537**	**3,790**	**1,800**

ANNEX 3: ALLOCATION OF OVERHEAD COSTS

Table A3.1: Allocation of Overhead Costs to C-Section Procedure at LAMBs

				Life	Value at	Annualised	Per Patient	
	No. of patient	Patient days		Period	1995	cost	provider	
				Remained		(A)	cost	* av length of stay
Total patient	53530	94009	per year					B10 x 7 days
Total in-patient	12384	52863	per year					B10 x 4 days
Total surgery patient days	543	3801						B8 x 7 days
Total C-Section patient days	156	1872						B9 x 12 days
No. of normal delivery	821	3283						
Total Cabin patient days	150	1050						B10 x 7 days
Hospital Sq. feet (Total)		9268						
Hospital Total Cost (construction)				20	1058336	52917	0.5629	(A)/Vo. of patient
Total Land Cost				20	43587	43587		
Building cost								
Admin. room (Cashiers)		952	Sq.Feet	20	12864	643	0.0120	(A)/No. of patient
Admin. room (Administrative)		952	Sq.Feet	20	21208	1060	0.0198	(A)/No. of patient
Antinental Ward		270	Sq.Feet	20	30832	1542	0.2224	(A)/6932 Antinatal P
O.T. Room		1202	Sq.Feet	20	137259	6863	9.8183	(A)/C-Sec+Surg patient
Labour & Delivery room		280	Sq.Feet	20	31974	1599	1.6367	(A)/C-sec+Del patient
General ward (female)		1828	Sq.Feet	20	208744	10437	1.3593	(A)/(In-P * 62%)
Pathology & Lab.		720	Sq.Feet	20	82219	4111	0.0778	(A)/No.Ancillary
OPD Female		528	Sq.Feet	20	60294	3015	0.0037	(A)/No.of out patient X 0.05
Collection Room		286	Sq.Feet	20	32659	1633	0.0305	(A)/No. of patient
Maternity waiting room		376	Sq.Feet	20	42936	2147	2.1978	(A)/C-sec+Del patient
Cabin		244	Sq.Feet	20	27863	1393	0.2961	(A)/No. of CP(n=150)
Waiting room		1714	Sq.Feet	20	195726	9786	0.1041	(A)/No. of patient
Others		280	Sq.Feet	20	31974	1599	0.0170	(A)/No. of patient
Total							**15.7954**	
Maintenance Cost								
Building:							0.0000	
Machinery						260000	2.7657	
Car							0.0000	
Furniture							0.0000	
Electrical charges						377043	4.0107	
Generator						44253	0.4707	
Water							0.0000	
Printing & Stationery						88595	0.9424	
Telephone						6000	0.0638	
Other						520000	5.5314	
Total							**13.7848**	

Table A3.2: Allocation of Overhead Costs to C-Section Procedure at MMCH

		Area /		Life	Value at	Annualised	Per Patient	
	No. of patient	Patient days		Period	1996	Cost	provider	
				Remained		(A)	cost	* av length of stay
Total patient	102110	386197	per year					B10 x 7 days
Total in-patient	76817	360904	per year					B10 x 4 days
Total surgery patient days	13974	97820						B8 x 7 days
Total C-Section patient days	831	9145						B9 x 11 days
No. of normal delivery	4206	29442						
Total Cabin patient days	1965	13755						B10 x 7 days
Hospital Sq. feet (Total)		25709.76						
Hospital Total Cost (construction)				20	11129253	556463	1.4409	(A)/Vo. of patient
Total Land Cost								
Building cost								
Admin. room (Cashiers)		2484	Sq.Feet	20	1075275	53764	0.5265	(A)/No. of patient
Admin. room (Administrative)			Sq.Feet	20	0	0	0.0000	(A)/No. of patient
Antinental Ward		1940	Sq.Feet	20	839961	41998	8.3373	(A)/B9 + B10Antinatal P
O.T. Room		202	Sq.Feet	20	87442	4372	0.2953	(A)/C-Sec+Surg patient
Labour & Delivery room		703	Sq.Feet	20	304207	15210	3.0195	(A)/C-sec+Del patient
General ward (female)		2719	Sq.Feet	20	1177002	58850	1.2357	(A)/(In-P * 62%)
Pathology & Lab.		631	Sq.Feet	20	272948	13647	0.0378	(A)/No.Ancillary
OPD Female		308	Sq.Feet	20	133392	6670	0.0132	(A)/No.of out patient X 0.05
Collection Room		100	Sq.Feet	20	43288	2164	0.0212	(A)/No. of patient
Maternity waiting room			Sq.Feet	20	0	0	0.0000	(A)/C-sec+Del patient
Cabin		9674	Sq.Feet	20	4187833	209392	0.8548	(A)/No. of CP(n=150)
Waiting room		323	Sq.Feet	20	139678	6984	0.0181	(A)/No. of patient
Others			Sq.Feet	20	0	0	0.0000	(A)/No. of patient
Total							**14.3594**	
Maintenance Cost								
Building:					2571170	128559	0.3329	
Machinery						0	0.0000	
Car						0	0.0000	
Furniture						0	0.0000	
Electrical charges					1714114	85706	0.2219	
Generator					2880000	144000	0.3729	
Water						0	0.0000	
Printing & Stationery						0	0.0000	
Telephone						0	0.0000	
Other					18610680	930534	2.4095	
Total							**3.3372**	

Table A3.3: Allocation of Overhead Costs to C-Section Procedure at Monowara

		Area /		Life	Value at	Annualised	Per Patient	
	No. of patient	Patient days		Period	1996	cost	provider	
				Remained		(A)	cost	* av length of stay
Total patient	7182	33838	per year					B10 x 7 days
Total in-patient	3465	30121	per year					B10 x 4 days
Total surgery patient days	3130	21910						B8 x 7 days
Total C-Section patient days	488	2928						B9 x 6 days
No. of normal delivery	69	277						B10 x 4 daya
Total Cabin patient days	1965	13755						B10 x 7 days
Hospital Sq. feet (Total)		25709.76						
Hospital Total Cost (construction)				20	11129253	556463	16.4449	(A)/Vo. of patient
Total Land Cost								
Building costs								
Admin. room (Cashiers)		957	Sq.Feet	20	414267	20713	2.8841	(A)/No. of patient
Admin. room (Administrative)			Sq.Feet	20	0	0	0.0000	(A)/No. of patient
Antinental Ward		358	Sq.Feet	20	154971	7749	13.9038	(A)/B9 + B10 Antinatal P
O.T. Room		772	Sq.Feet	20	334184	16709	4.6183	(A)/C-Sec+Surg patient
Labour & Delivery room		334	Sq.Feet	20	144582	7229	12.9717	(A)/C-sec+Del patient
General ward (female)		1152	Sq.Feet	20	498678	24934	11.6063	(A)/(In-P * 62%)
Pathology & Lab.		312	Sq.Feet	20	135059	6753	0.2242	(A)/No.Ancillary
OPD Female		602	Sq.Feet	20	260594	13030	0.1753	(A)/No.of out patient X 0.05
Collection Room		86	Sq.Feet	20	37228	1861	0.2592	(A)/No. of patient
Maternity waiting room		94	Sq.Feet	20	40691	2035	3.6507	(A)/C-sec+Del patient
Cabin		2773	Sq.Feet	20	1200464	60023	0.5886	(A)/No. of CP(n=150)
Waiting room		284	Sq.Feet	20	122938	6147	0.1817	(A)/No. of patient
Others			Sq.Feet	20	0	0	0.0000	(A)/No. of patient
Total							**51.0638**	
Maintenance Cost								
Building:					2571170	128559	3.7992	
Machinery						0	0.0000	
Car						0	0.0000	
Furniture						0	0.0000	
Electrical charges					1714114	85706	2.5328	
Generator					2880000	144000	4.2556	
Water						0	0.0000	
Printing & Stationery						0	0.0000	
Telephone						0	0.0000	
Other					18610680	930534	27.4997	
Total							**38.0873**	

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