Expenditure pattern, perceived Quality and financing Sources for Pregnancy and Delivery Services in Rural Thiruvananthapuram, Kerala

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Dissertation submitted in partial fulfilment of the requirements for the award of the degree of Master of Public Health

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May 2002.

DECLARATION

I hereby certify that the work embodied in this dissertation entitled "Expenditure Pattern, Perceived Quality and Financing Sources for Pregnancy and Delivery Services in Rural Thiruvananthapuram" is the result of original research and has not been submitted for any degree in any other University or Institution.

Thiruvananthapuram

May 2002

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Certificate

Certified that the dissertation entitled **"Expenditure Pattern, Perceived Quality and Financing Sources for Pregnancy and Delivery Service in Rural Thiruvananthapuram, Kerala"** is a record of bonafide original research work undertaken by Ajay.V.S, in partial fulfillment of the requirement for the award of the MPH degree, under our guidance and supervision.

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Contents

List of Abbreviations

ANOVA	Analysis of Variance
Antenatal	Expenditure on antenatal Checkups
C-Section	Caesarian Section
CV	Coefficient of Variation
GDP	Gross Domestic Product
KSSP	Kerala Sastra Sahithya Parishad
Lab	Expenditure on Laboratory investigations
NFHS	National Family Health Survey
RCH	Reproductive and Child Health
Rs	Rupees
Scan	Expenditure on Scanning
SES	Socioeconomic status
Sig	Significance
SPSS	Statistical Package for Social Scientists
St.Dev	Standard Deviation
WHO	World Health Organization

Abstract

Introduction

Over the past few years the cost of health care has shown a steady increase in Kerala. The growth of Private sector and the resource constraints in the public sector are the major reasons cited. It must be causing unnecessary burden over household. Though the cost on Pregnancy and delivery services is an expected event, is an unavoidable expenditure as far as reproductive health is concerned. This study was conducted in this scenario with an aim to under stand the current expenditure pattern, financing sources and perceived quality of services against payments made.

Methodology

A Cross-sectional survey was conducted among 300 post-natal women who delivered within 3 months of the survey in 6 rural Panchayats of Thiruvananthapuram. A structured questionnaire was used for the house-to-household survey.

Results.

52.7% of the deliveries were occurring in the public sector. Overall prevalence of Caesarian sections was 31.7%. The mean cost of delivery in the public sector was Rs: 3936/- and Rs: 9987/- in the private sector. Across socioeconomic groups and type of delivery there was significant difference on different type of expenses incurred during pregnancy and delivery. Borrowing was found to be the major source of financing among the poor (71%). The mean interest rate for borrowings was 47%. We found that perceived quality higher with private provider and among high socioeconomic group. But the perceived quality was found to have a mismatch with higher payments.

Discussion

The expenditure on pregnancy and delivery is causing unnecessary burden on poor households which for 30% of the population. The subsidized service in the public sector is not benefiting them as they incur expenses on medicine, under table payment and in terms of travel expenses. The high rate of Caesarian Section in the private sector is another concern.

There is urgent need to protect the poor from such debt traps and necessary policies to regulate the health providers in terms of cost as well as quality of services.

CHAPTER 1

INTRODUCTION

1.1. Background

It is widely acknowledged that Kerala has attained high health standards, close to that of a few industrialized nations, even while her economic development is not high[1]. The success can be attributable to both public and private sectors as they share the total beds in the ratio 2:3. Private sector has achieved a considerable growth in its health facilities in recent years and as a result, about 60% of deliveries occur in this sector[2]. On the other hand, delivery services offered by the public sector are perceived to be inadequate to meet the needs of the population owing to resource constraints. This indirectly forces the clients towards private sector thus pushing the cost of delivery up.

Even though some form of payment does exist in the public sector, such as pay wards, the quality of care is perceived to be inferior to that of the private sector. At the same time, there is no guarantee that the quality offered by the private sector too matches with the payment made by their clients as there is complete lack of government regulation of both payments and quality in the private sector. Absence of competition from public sector complicates it further. Therefore, it is reasonable to expect that the actual quality would fall short of the normative quality given the payments made. In other words, the clients at present might be paying much more than the quality they receive would suggest. All these contribute to the cost escalation, as Kerala appears to top the list in this aspect as well so much so that the 'low cost model' itself is challenged now.

Revamping the health sector by evolving an appropriate financing mechanism suiting local milieu but matching with the quality of care offered by it may be the first step towards relieving the people from debt burden on account of delivery cost. At the same time, blind introduction of new payment mechanism without taking into account the quality of care would only deteriorate the present state of affairs vis-à-vis delivery services.

In bringing about an alternative financing mechanism, there must be ensured that the poor (and the nearly poor) should be protected from financial shocks associated with their needs and should enhance the accessibility of services to the poor (particularly with respect to perceived quality and geographic access). Financing and provision aspects of health care are frequently closely linked[3]. In particular, enhancing access by improving (perceived) quality of care is closely linked to the question of how to create a pro-poor financing system. Although there are no user fees in a wholly tax funded system to create barriers to accessing care, there are frequently other barriers to accessibility. If the perceived quality of care is very low, even the poor may prefer to pay more to use higher quality private sector services. There may be significant time and transport costs associated with accessing care, particularly for the poor. Even in a system where there are no formal charges, informal charges for care may be widely prevalent. Tackling these problems is important to ensure that the mix of financing mechanisms is essential to promote a re-distribution between the rich and the poor, a central element of pro-poor financing policies.

1.2 Justification

A recent survey in three districts of Kerala revealed that 34.4% of the deliveries are Caesarian sections. It is higher than national average with 53.3% of them conducted in the private sector and the rest in the public sector. Documentation of health care seeking behavior and expenditure of the people on delivery service can be the first step towards evolving a financing mechanism and ultimately towards cost-effective care. This has particular relevance in the present day context when the cost of care gallops at a rate 10-15 times higher than that of the prevailing inflation in the country. Worse still, people are not aware whether their spending is at par with the quality they receive. The quality of services has received attention from the technical or medical quality of services alone. The client perspectives are also as important as technical quality. There is hardly any evidence in literature how the perceived quality of clients for pregnancy and delivery service varies across providers, and socioeconomic groups. So also how the payments influence the level of perceived quality. Research on this aspect hardly exists in Kerala. It is in this context we setup on this adventure.

The broad aim of this study is to examine the current expenditure pattern, perceived quality and financing sources for pregnancy and delivery services in rural Thiruvananthapuram district in Kerala.

1.3 Research Questions

In our study we tried to answer three research questions. What is the current expenditure pattern on delivery services, whether the payments match quality of service being received and what are the various sources of resource generation for pregnancy and delivery services among the rural population of Kerala.

Specific Objectives of this study were

1. To document the level and pattern of expenditure on pregnancy and delivery services among the rural population of Thiruvananthapuram district
2. To map various resource generating sources for delivery services.
3. To find out whether the benefits (quality of care) match the payments towards delivery services.

1.4 Literature

In many developing countries, governments are facing increasing pressure to improve efficiency and financial viability of health care delivery system. As a consequence in many parts of the world, plans to restructure sectors such as health are implemented within a macroeconomic environment, which emphasizes the limitation of government and financial responsibilities of individual citizen. On comparison with other countries, India is figured among countries with high spending with better health outcomes[4]. In India the public health investment over the years, as a percentage of GDP has declined from 1.3 percent in 1990 to 0.9 percent in 1999. The aggregate expenditure in the Health sector is 5.2 percent of the GDP. Out of this, about 70 percent of the aggregate expenditure is out-of-pocket expenditure, the balance being public health spending.[5] And 56% of the out-of-pocket expenditure goes to the private providers[6,7].

Information on health care seeking behavior and expenditure can be useful for assessing the feasibility and impact of cost-containment measures and formulating policies: how much can be recovered from whom; what will be the impact on access to services and ultimately, health.[8] There are very limited studies, which explored the health seeking behavior, quality of service and the expenditure pattern on pregnancy and delivery.

The choice of the provider is influenced by many factors. It could be past experience of self, relative, and other people, physical access, economic access in terms of free and subsidized services or benefits under various schemes, appropriate services offered by the providers etc[9]

A study in Nepal shows that households spend substantial amounts on health care when their initial consultations is with a public practitioner, despite the fact that the public carries free or nominal prices indicating that individuals use private services as a complement to the initial public consultation and patients who visit a public facility may continue to see a the doctor privately or purchase pharmaceuticals in the private sector because of stock-outs in public facilities.[10] This is true in India also as 71% of the patients using government facilities incurred some expenditure, who are supposed to provide free services.[11]

There exist very sharp gradients in the expenditure pattern of urban and rural Indian women. In the rural areas, the quality of these services, especially government services is of very poor quality, forcing individuals to visit the private sector instead.[12, 13] Also, the indirect costs like those associated with travel to the facilities act as deterrents for the rural population[14]. The ratio of private to public sector annual expenditure is 25: 1 in urban woman compared with 2.7:1 in rural population[8]. Regarding expenditure pattern, an average Indian household spends Rs. 250 per capita per annum on the use of health services. For the urban households, the figure is about 40 percent higher than their rural counterparts[15]. The type of expenditure also varies. It include the consultation fee to the physician, room rent, travel expenses, food expenses, expense over drugs and special diets, expenditure on caesarian section, laboratory expenditure, diagnostic expenditure and even under table payments etc. There are hidden charges like transportation, medicines, tests, diets and even bribes. Individuals incur considerable out-of-pocket expenses beyond the official fees charged in any case. The burden of these costs must necessarily fall more on the poorer sections of the society.[16]

One such study done in Bangladesh shows that most of the expenditure fall in the following categories like Medicine, blood, travel, food, hospital fee, ayas, tips etc[17]. Over all 21% of the families were spending 50-100% of their monthly income, and 27% of the families were 1-8 times their monthly income for maternity care. 74% of the caesarian mothers had insufficient fund, and 79% of those who had insufficient fund borrowed from others. The sources of borrowing were relatives or friends, money lender, advances from employer, selling of livestock, pledge of valuables, selling of rice/crops, use of business capital etc.

In India the expenditure on health care incurred by households has shown a rise in the decade 1986-96, as can be expected due to rising inflation and the continued use of private health care. Despite a large and extensive public health care system, there has always been some criticism regarding its quality and accessibility, especially in the recent past[18]. With regard to the direct provision of public services, the entire system is grossly overloaded and under-funded. Problems like crowded outpatient departments, poor physical conditions of the infrastructure, and primitive health information, continue to remain in the public health care system. On the other hand the private sector, which is easily accessible and is seen as delivering better quality services, is much more expensive and is largely supported by direct out-of-pocket payments. This discrepancy in the cost of treatment in the private sector is much higher in the urban areas than in the rural areas. For instance, the average cost of treatment involving hospitalisation in the private sector was 350 percent higher than the public sector in urban areas; whereas for the rural areas the same indicator was 150 percent higher.[19] Invariably poor households have to borrow money even at very high interest rates to meet treatment-related exigencies[20]

The following studies give information on cost of pregnancy and maternity events though their prime objective was to find out the general health expenditure pattern. Most of the studies focus on over all health expenditure patterns. Nearly all the studies are based on single visit interviews and very few information on detailed breakdown of costs for pregnancy and delivery service.

A study conducted in Jalgaon, Maharashtra[21] during 1987 was a pioneering effort aimed at documenting household strategies to access healthcare. The survey covered 153 live births, 2 still-births, and 7 abortions in Jalgaon district of Maharashtra. This study estimated a higher utilization of private sector in rural areas (59.61%) and higher utilization of public sector in urban areas (59.42%). The average expenditure on maternity event was Rs 199.752/-. The average cost of delivery was Rs 208/-. In rural areas, the mean maternity expenditure was estimated as Rs 205 /- and Rs 282/- respectively for public and private facility and in urban areas it was Rs 151 /- and Rs 176/- respectively. This study found that the cost difference in public and private was mainly due to consultation charges in the private sector.

Another study done in Madhya Pradesh during 1990 found that 25% of the expenditure was made on medicines, and an equal amount on hospitalization expenses[22].

The mean expenditure on pregnancy was Rs 590 /- in rural areas and Rs 441 /- in urban areas. The cost of delivery was estimated as Rs 772/- in rural areas and Rs1028 /- in urban areas. This study also gives information on class differential in the cost of maternity events. They found that, cost per event did not show any steady increase across classes. In terms of costs per paid events for deliveries, the upper class spends the largest while the lowest class spends the least.

Sundar et al[23] (1992) reported that average cost of normal delivery in public sector was Rs 256/- and Rs 1497/- in Private sector in the rural areas, while in the urban areas it was Rs: 230/- and Rs 1858/- respectively. This study estimated the mean cost of delivery in the rural area as Rs 400/- and Rs 632/- in the urban areas respectively. This study focuses mainly on the general health expenditure and gives only the aggregate data on delivery.

A survey conducted by the National Council for Applied Economic Research and a non-governmental organization called Self-Employed Women's Association (SEWA) during 1999 reported that the average expenditure on various maternal and child health services during the last two years turned out to be Rs 2,128 per rural woman and Rs 2,653 per urban woman. The higher total expenditure for the urban woman was mainly due to other out-of pocket expenditures (Rs 1,066 per urban woman as opposed to only Rs 668 per rural woman)[24].

Nandaraj S et al(2001) conducted a study in July 1996 in Mumbai, on morbidity , utilization, and expenditure on health care[25]. This study covered 49 pregnancies and 60 deliveries and 3 abortions. The mean expenditure on pregnancy was found to be Rs 213 /- and Rs 2428/- for delivery and post-natal care. As proportion of costs, medicine alone accounted for 25% of the total costs incurred during pregnancy. For deliveries major expenditure was incurred on hospitalization, which included doctor's fee and medicine, labor room charges, specialist's fee plus a lot of other charges. Pregnant women were advised for sonography and investigations and 24% of the expenditure during pregnancy was spent on this head.

Kerala, the southern most state of India has attained high health standards, even with its lower level of economic development. Kerala has achieved standard indicators of maternal, infant, child health as well as of the general health of the population on par with those of many developed countries. The role of government and the private sector was a key factor in these achievements. The per capita spending on public health by the state government during 1999-2000 was Rs.240.[26] It amounted to 1.4% of the state domestic product. According to the available data the government sector contributes 38% of the total beds strength while the rest 62% of the total beds is contributed by the private sector. In recent years, there has been a considerable growth in the private sector health facilities. Such a situation, where private sector, claims a large share of total demand imposes a significant burden on household.[27]

A study done by the Kerala Sastra Sahithya Parishad (KSSP) reported a rising trend in CS rates for Kerala, from 11.9% in 1987 to 21.4% in 1996 along with enormous growth of the private sector[2]. By the year of 1996, in Kerala, about the reproductive and child health care (RCH services), in particular, the percentage of institutional deliveries is about 97% and 99% of the deliveries had a skilled attendant at delivery. According to them the shift to almost 100% institutional delivery has benefited the private sector. 60% of the deliveries are taking place in the private sector while only less than 40% is in the public sector[28]. NFHS –1 (National Family Health Survey, 1992 – 93) puts the overall CS rate for Kerala at 13.6% with the urban figure at 17%[29]. The proportion of caesarian-section deliveries was higher in urban areas (38 percent) than in rural areas (27 percent)[30]. Another study had demonstrated that CS rates are higher in private than in public sector in Thiruvananthapuram[31].

A study done by Homan R K et al.(1995) in the city of Thiruvananthapuram shows a CS rate of 10% in public sector and 30% in private sector[32]. In a recent survey done in three districts of Kerala revealed that 34.4% of the deliveries are Caesarian sections and the rest 65.6% are of normal delivery[33]. The toll of caesarian sections is higher than national average and is one among the highest caesarian rates in the world. According to WHO no region in the world is justified in having a caesarian rate higher than 10-15%. Caesarian would cost at least 2 – 3 times more than a vaginal delivery.[34] The Mean cost of normal deliveries during 1996 was Rs 1670+/- in the public sector and Rs 2456 in private sector. Mean cost of caesarian section was Rs 2864 in public sector and Rs 4944/- in the private sector.[2]

A recent survey by Hemachandran et al (2001) done in three major cities of Kerala, reported that mean cost of normal deliveries ranges from Rs 1907+/- 1429 in the public sector and Rs 4559+/-2336 in private sector. Mean cost of caesarian section ranges from Rs 4044+/-1917 in public sector and Rs 10613+/-3238 in the private sector. Many of the studies focused on broad issues of health expenditure. Different coping mechanisms of the households to these expenditures and their assessment on the quality of services received against their payments were not extensively studied.

CHAPTER 2

METHODOLOGY

2.1 Conceptual framework

As it may be recalled, this study focuses on expenditure pattern, perceived quality and financing sources for pregnancy and delivery services. In this chapter, we will describe the conceptual framework behind this study. It is hypothesized that expenditure would vary across the type of deliver, type of provider and socioeconomic categories. Choice of provider depends on several factors such as ability to pay, quality of care, accessibility and a plain preference. Expenditure on Caesarian section is likely to be high, as it requires far more medical and hospital care. Socioeconomic factor comes into play, as the rich tend to go to expensive place, although healthcare or pregnancy per se is not a luxury good. Quality also is expected to play a significant role in influencing the expenditure because high quality care demands more resources too.

Although the poor tend to choose the public provider because the service if 'free', they do incur expenditure in accessing the public sector – open or hidden. While open expenditure gets translated into revenue to the public sector, it cannot be said about the hidden expenditure. The hidden expenditure is spent while accessing the public sector but it is not translated into revenue to the public sector. Cost of access is another type of expenditure, which is not transferred to the public sector. Similarly, patients end up spending a lot on drugs and supplies largely supplied by the private sector. Although this type of expenditure gets accounted as the expenditure on public sector, it is again not translated into the revenue to the public sector. All these factors influence the expenditure on public sector. The major difference between the public and private sector is that the expenditure incurred while accessing the private sector is almost completely translated into the revenue to that sector but the same does not hold for the public sector. Hence, if people incur expenditure in accessing the private sector, the beneficiary is private sector but if they incur expenditure while accessing public sector, the public sector is not the beneficiary. It could be the private sector or individuals in the public sector. In other words, services offered at the public sector is free of cost from a provider perspective but it is not so from a client perspective as they are incurring other types of expenditures, hidden or otherwise. But, what is common between both these sectors is that payment made by the clients more often do not tally with their ability to pay.

Since delivery service is an unavoidable expenditure, people tend to raise money from all possible sources to meet this need. Moreover, delivery differs from other forms of medical care because it is not a totally unexpected event. It cannot be avoided either. This may be imposing excess burden to a varying extent on various socioeconomic strata. In such situations they may raise resources by borrowing, selling of valuables, pledging of possessions, taking loan etc. In addition, there are other forms of financing at the community level aiming to help people at times of emergency. Additional amount of resources over and above their own ability to pay is of particular concern for the policy-makers as such expenditures are having far reaching consequences for the people.

Even when people are paying above their ability to pay the quality of care receive is of particular concern[35]. People may or may not receive adequate quality of care. Whether the payment matches the services received is important for policy decision. The comparison of quality of services that are tangible to the consumers in both private and public sector for various levels of payment is essential to understand how quality varies with payment in both sector[36]. The World Health Organization's (WHO) definition of quality of health care is: Quality of health care consists of the proper performance (according to standards) of interventions that are known to be safe, that are affordable to the society in question, and that have the ability to produce an impact on mortality, morbidity, disability, and malnutrition[37] Basically, quality of health care can be divided into two components:

1. Technical or Medical Quality of care
2. Service Quality or Customer quality

The Technical Quality of care is best described from the providers' side – i.e. the Doctor, the hospital management and the hospital staff. This is based on research, expert opinion and evidence-based medicine. The patient defines the aspect of service quality or customer quality of care. Quality can refer to the technical quality of care and also to non-technical aspects of service delivery such as clients' waiting time and staff's attitudes, and to programmatic elements such as policies, infrastructure, access, and management[38]. Different groups in the health care system have different issues of concern regarding quality of health care and are interested in different measures of performance. One can look at quality of health care from the providers' point of view i.e. from the Doctor's perspective or from the patient's perspective - consumer's view. From the patient's view, they measure quality as the way the doctor explains the disease to them. How he/she communicates with them. Patients expect a certain level of care, which includes: Clinical acumen, Hotel services, Emotional Support etc. In this study only the service quality will be measured as information asymmetry may interfere with the measurement of technical quality in a community-based study. This criterion can be used for assessing the quality of services received against their payments.

The expenditure and the sources will form a matrix, which will explain the flow of resources across various socioeconomic strata between the consumers and the providers. The picture of flow of resources from the beneficiaries to the providers across various socioeconomic strata will be a useful tool in developing appropriate payment mechanism in the state for delivery service, such as a pre-payment mechanism, user fee, social or private insurance and community financing or a combination of one or more of these. To identify the sites of intervention, for alternative financing for health care a clear picture about the flow of resources is essential which will help in developing appropriate models for payment mechanism in the private as well as public sector for delivery service. More over such a model will help in developing identical models for other health care services also.

2.2 Methodology

As mentioned above the broad aim of our study is to examine the current expenditure pattern, perceived quality and financing sources for pregnancy and delivery services in rural Thiruvananthapuram district in Kerala We conducted a community-based cross-sectional survey among the rural population.

2.2.1 Sampling

Since this study focuses on expenditure pattern and perceived quality and financing sources for pregnancy and delivery services in rural Thiruvananthapuram our sampling frame included women who recently had sought delivery service in the rural areas of Thiruvananthapuram. We classified 78 *panchayats* of the district into 3 groups based on their geographical location - costal, midland and highland. There were 18 in coastal, 47 in mid-land, and 13 in highland regions. Six Panchayats were randomly selected, two each from coastal, midland and highland regions. The population in each panchayat ward (according to the 1991 census) was listed and cumulative population calculated in each Panchayat. The sampling interval was calculated by dividing each Panchayat's population with the number of wards. With the help of a random number and sampling interval, 5 clusters (wards) in each Panchayats were identified (see appendix). From each cluster, 10 subjects were selected which formed 50 study subjects from each Panchayat. We covered a total population of 1,57,267 in which 2,831 births would have occurred during that year. Considering the birth rate of Kerala as 18/1000, there would have been approximately 707 births occurred during the reference period and we covered 42.4% of these births representing 10.6% of births occurring annually in these areas and 300 subjects. We conducted the survey among women who sought delivery service during the last 3 months starting from 10 days preceding the survey. We limited the reference period to 3 months in order to reduce the recall bias.

A house-to-house survey was conducted in each of the chosen 30 clusters, 5 in each village. After identifying the cluster (ward), the main landmark of the ward was ascertained from the local public. The left hand side of the main road from the said landmark was surveyed. In each house, after stating the purpose, it was enquired whether the household has anyone conforming to the subject definition. If yes, willingness to participate in the study was sought and the subject was interviewed using the prepared questionnaire. The process continued till ten subjects were met from that cluster. If there were less than ten subjects in that cluster, the very next ward was surveyed for concluding the required sample size from that cluster.

In all the Panchayats, the principal investigator undertook the survey. The questionnaire, after pre-testing, was translated into Malayalam (the local language) and the subjects were asked the questions in Malayalam. The duration of survey was 60 days commencing 15th of December 2001 to 15th of February 2002. Every day the study started at 9 am and finished after the completion of one cluster. There were days when one cluster was not able to be finished in one day. On such days, the remaining work in the cluster was finished first on the next morning before starting on a fresh cluster.

2.3 Variables

From the literature and from discussions with a cross section of experts, doctors and general public, we got a rough idea on what factors are likely to influence the expenditure pattern, perceived quality and financing sources. The variables identified for the study are elaborated below.

❖ **Educational status of father**

Studies show that higher the educational status of the couples higher that chance for Caesarian section[34]. Caesarian section leads to prolonged hospital stay, and more expense on medicine, which leads to higher cost. In this study educational status of the father was categorized in to five levels namely, illiterate, primary level, up to high school level, up to degree level, above degree level.

❖ **Educational status of mother**

Studies have shown that higher, the educational status of the mother, higher that chance for Caesarian section[34]. Caesarian section leads to prolonged hospital stay, and more expense on medicine which leads to higher cost. In this study educational status of the mother was categorized in to five levels namely, illiterate, primary level, up to high school level, up to degree level, above degree level.

❖ **Socio economic status**

Socioeconomic status is one of the major determinants of health seeking behavior and spending on health[9]. Socioeconomic status strongly influences the choice of provider and also the type of delivery.[34] In this study the subjects were classified into three categories, upper, middle and lower. Assessment of Socioeconomic status was done based on possession of valuables like type of house, car, two wheeler, phone, TV etc. An index was created and subjects were classified into lower, middle and upper socioeconomic status. The details of the index are given in the appendix I.

❖ **Type of delivery**

Type of delivery has a strong influence on the cost of delivery. Various studies have shown that cost of caesarian section is higher than normal delivery due to longer hospital stay and expenditure on medicines.[35] The type of delivery was classified into Normal Delivery and Caesarian Section.

❖ **Type of Provider (public / private):**

Owing to subsidized service in the public sector cost of delivery is higher in Private sector. There exists sharp differentials expenditure across these providers[12]. In this study we classified the providers in to Public and Private based on place where delivery was occurred.

❖ **Expenditure pattern**

The expenditure on the pregnancy and delivery service was classified into ten heads and the information on these heads was collected during the survey. The different heads are as follows:

- **Medicine during antenatal Period:** Expense on medicine during antenatal period was included in this head. More number of antenatal consultations may result higher spending on medicine and vice-versa.
- **Fee for doctor:** Expenses on consultation fee for doctor for antenatal consultations was included in this head. Higher number of private consultations will lead to higher expense on fee for the physician. Those consulting physician in Outpatient department of Public hospitals will have lower expense compared to those who have private consultation.
- **Fee for scanning:** Those who under go Ultra sound investigations will incur expense on fee towards scanning. Higher the number of scanning, higher the chance of incurring higher expenditure.
- **Laboratory visits:** Laboratory examinations associated with antenatal check-ups as well as during delivery. The expenditure on routine laboratory investigations as well as special laboratory investigations during pregnancy and delivery are included in this head.
- **Medicine during delivery:** Expenditure on medicine during delivery is included in this item. For caesarian sections, the expenditure on medicine will

be higher, than for a normal delivery. In public sector, expenditure on medicine will be lower because of subsidized service.

- **Charges for Normal delivery:** Fee for normal delivery was included in this head. In the public sector, no fee is levied on poor patients for normal delivery. A nominal fee of Rs: 60/- is charged towards normal delivery from those with higher income. In the private sector expenditure towards delivery is a major item.
- **Charges for caesarian:** Fee for Caesarian section was included in this head. In the public sector, no fee is levied on poor patients for Caesarian section. A nominal fee of Rs: 120/- is charged towards caesarian section from those with higher income. In the private sector expenditure towards Caesarian section is a major item.
- **Room rent:** Expenditure towards room rent is included in this head. Those rent a pay ward incur a higher expenditure than those stay in a general ward. The length of stay in the hospital also influences this expense. Longer the stay higher the expenses incurred towards room rent. In public sector no fee is levies towards stat in a general ward.
- **Gifts/Bribes:** All expenses towards bribes as well as complements for the hospital staff was included in this head.
- **Travel:** Expenses incurred for hiring a vehicle during ante-natal and delivery period was included in this head. Higher number of antenatal visits as well as longer hospital stays will result in higher expenditure towards travels.

Distance is also a major factor. Longer the distance higher the expense on travel.

- **Miscellaneous:** All other health expenditure related to pregnancy and delivery not coming under the above categories was included in this head.

- **Methods of mobilization of resources.**

The following financing sources were identified from the literature and discussion with subject experts and the information on sources of financing was collected and was classified under the following categories:

- **Own savings:** Money used for pregnancy and delivery service from own savings of the subjects was included in this head. Though assets are a form of savings, sale of their assets was not included in this head. Rich tend meet their expenditure from their own savings while poor depend more on borrowings.
- **Loan without interest:** Borrowings of the subjects to which no interest is paid was included in this category. Borrowings from friends, employer and relatives fall in this category. We collected information on these three categories separately and put together as a single entity.
- **Loan with interest without pledging**: Borrowings of the subjects, without any pledging of valuables, to which interest was to be paid was included in this category. Borrowing from moneylender and loan from bank were included in this category. Since there was no pledging of valuables such loans will have higher interest rates compared to other loans
- **Loan with interest with pledging:** Borrowings of the subjects, with pledging of valuables, to which interest was to be paid was included in this category.

We collected information separately for such loans like pledging of gold and included in this category. Such loans have lower interest rates compared to loans without pledging.

- **Sale of assets:** Money raised through the sale of assets used for delivery service was included in this category. This includes sale of gold, sale of produces, sale of land and sale of any other valuables. Finally we merged all such sources together to form sale of assets.
- **Others:** All other sources of money other than those mentioned above, used for pregnancy and delivery service was included in this category.
- **Interest rate:** The interest rate for those borrowing having interest was calculated in annual rates and was used for analysis.

❖ **Perceived Quality.**

A composite index on service quality of care was constructed for eliciting the perceived levels of quality of delivery service after consultation with Experts in the Reproductive and Child health field, and was used for assessing the perceived quality. The effort was to assess the service quality and less emphasis was made on medical quality as the information asymmetry with the clients may interfere with assessment of medical quality of the services received. We collected information on 19 parameters having influence on the service quality to asses the level of perceived quality of the subjects. Each parameter was measured on a scale with lowest score of zero and highest score of one. Finally the scores of all 19 parameters were added to form the final score. Thus the Lowest measure of the Quality index was zero and the highest measure was 19. In the analysis we considered 18 parameters out of 19 only as one of the parameter was applicable to only those subjects who had a complication during delivery. The details of the quality index are given in the appendix II.

2.4 Survey Instrument

The structured questionnaire was prepared after many rounds of discussion with the experts, guides and a thorough literature review. It was pre-tested and corrections were incorporated before the start of the survey. Questions were aimed at capturing accurate information on demographic characteristics, details on the delivery, costs, perceived quality and sources of financing. One questionnaire took about 20 to 25 minutes to complete.

2.5 Data entry and data analysis

A codebook was prepared by the investigator to facilitate data entry. Data was entered in Microsoft Excel Version.4. It was then cleaned and analyzed using SPSS for Windows version 6.1.

CHAPTER 3

RESULTS

3.1 Sample Characteristics

Three hundred subjects from six Panchayats of Thiruvananthapuram district were interviewed during the survey. Majority of the subjects belonged to middle socioeconomic class (51.3%) followed by low (30.3%) and high classes (18.3%). Over 50% of the women and 41% of men among the couples had college education. The details are given in the table-1.

Table-1. Educational status of the parent couples

Educational status	Mother	Father
Primary level	8 (2.67%)	16 (5.33%)
Up to high school	140 (46.67%)	161 (53.67%)
Up to Degree level	128 (42.67%)	107(35.67%)
Above Degree	24 (8.00%)	16 (5.33%)
Total	300 (100%)	300(100%)

3.2. Characteristics of delivery

The utilization of Public facilities was found to be higher (52.7%) compared to state average (41.7%)[2]. Out of 300 Deliveries, 68.3% were normal and remaining 31.7% were Caesarian sections. 71.5% of the deliveries in the Public sector and 64.8% in the private sector were normal. The proportion of C-section was 23.1% for low socioeconomic strata (SES), 34.3% for the middle and 41.8% for the rich. Overall C-section rate was lesser than that of urban areas (39.2%)[33]. The type of delivery and provider vis-à-vis SES are given table-2 and table-3.

Table-2.

	Normal Delivery	C-Section	Total
Low SES	70 (76.92%)	21 (23.08%)	91 (100%)
Medium SES	103 (66.88%)	51 (33.12%)	154 (100%)
High SES	32 (58.18%)	23 (41.82%)	55 (100%)

Table-3.

	Public	Private	Total
Low SES	83 (91.21%)	8 (8.79%)	91 (100%)
Medium SES	61 (39.61%)	93 (60.39%)	154 (100%)
High SES	14 (25.45%)	41 (74.55%)	55 (100%)

3.3. Choice of provider

Major factor determining the choice of the provider in both Private and Public sector was found to be "Physician" and the others were better care and facilities. Cost was one of the major considerations (48%) among those who sought the service from the public sector and was the least among those approached private providers (3.5%). The reasons are listed in the table-4.

Table 4- Reasons for the Choice of Provider

Reasons	Public (N=158)	Private (N=142)
Better care	86 (54.4%)	80 (56.3%)
Better facilities	64 (40.6%)	71 (50%)
Physician	107 (67.7%)	98 (69%)
Distance	23 (14.6%)	32 (22.5%)
Cost	76 (48.1%)	5 (3.5%)

3.4. Perceived quality vis-à-vis Payments

Out of 19 factors in scoring index we considered 18 factors for final scoring. One of the questions asked was "If you had a complication during delivery how soon was it managed?" Since this question was applicable to only those who had a complication we omitted this factor from the final scoring. And Perceived quality was finally measured on a scale ranging from zero to eighteen. The mean score was found to be 14.3. There was significant difference in the perceived levels of quality pertaining to services received among different socioeconomic groups (ANOVA $p < 0.001$) as well as among public and private providers (ANOVA, $p < 0.001$). One of our questions was "Will you recommend the same provider for somebody else?" Only 5% (N=15) of the respondents answered negatively and out of them 13 persons were received service from the public sector. There was no significant difference for perceived quality among subjects who have undergone normal delivery and C-sections. This means that caesarian section was never felt as a poor service quality by beneficiaries. The reasons are listed in the table-5.

Table- 5 Perceive Quality Across Socioeconomic Group, Providers and Type of Delivery

Category	Mean Score	St. Dev	F value	Significance of F-Test
Low SES	12.20	1.81	68.538	<0.001**
Medium SES	14.91	2.51		
High SES	16.07	1.46		
Public Provider	12.32	1.90	553.37	<0.001**
Private Provider	16.50	0.99		
Normal delivery	14.34	2.70	0.202	0.654
C-section	14.20	1.34		
TOTAL	14.30	2.59		
** Significant at 5% level				

3.5. Results of Multivariate Analysis for perceived quality

Apart from the bi-variate analysis using individual variables, a Multiple linear regression model was constructed to study the relationships between Perceived quality as the dependent variable and Type of provider (Private), Socioeconomic status (Middle & High), Educational status of father and mother Total expenditure as the independent vaiables. When subjected to multivariate analysis, Type of Provider (ANOVA, $p < 0.001$) and Socioeconomic status (ANOVA, $p < 0.001$) were found to be positively associated with Perceived levels of quality while Total expenditure was negatively associated with ($p=0.012$). Educational status of father and mother which were significant on univariate analysis were not significant on multivariate analysis. This finding is contrary to the assumption that quality is associated with higher cost. The perceptions of the beneficiaries regarding quality of service were found to be decreasing with increasing cost. The increase in the service quality with socioeconomic status can be explained by the fact that utilization of private sector increases with the socioeconomic status. The results are shown in Table -6

Table - 6 Results of Multivariate analysis			
Variables	B-value	T	Sig
Constant	11.998	71.466	0.001
Type of provider	11.998	17.358	<0.001
Educational status of father	0.267	1.221	.223
Educational status of mother	0.138	0.675	0.5
Middle Socio economic status	0.815	3.357	0.001
High Socio economic status	1.487	4.233	<0.001
Total expenditure	-6.106e-05	-2.538	0.012
Adjusted R square = 0.682			

This Model explains 68% of the variation in Perceived quality. The results show that when adjusted for other factors the perceived quality (Service Quality) is inversely related to Total expenditure and the service quality doesn't match the payments made.

3.6. Expenditure Pattern for Pregnancy and delivery service.

We collected information on expenditure on antenatal check-ups, scanning, laboratory investigations, medicine during delivery, charge for delivery, caesarian, gifts/bribes, travel and miscellaneous heads. Out of the 300 subjects, 32% (N=96) reported that they incurred higher expenditure than expected, while 10% (N=30) of the subjects reported that they incurred lower expenses than expected and the remaining 58% (N=174) incurred the same expenditure as they expected. Though we planned to collect information on expenses toward medicine and doctor's fee separately many who approached the private sector couldn't recollect exactly the amount spend on each item. So we combined these expenses together as expenses on ante-natal care.

3.6.1 Expenditure pattern across providers.

Unexpected expenditure was higher among those who approached the public sector, while 14% of those who approached the private sector responded that they incurred lesser expenditure than expected. This may be because high expectation on the cost of delivery in the private sector and lower expectation on cost of delivery in the public sector. The details are shown in the table-7.

Table- 7

Expenditure incurred	Public Sector	Private Sector
Higher than Expected	60 (38%)	36 (25.4%)
Same as expected	89 (56.3%)	85 (59.9%)
Lower than expected	9 (5.7%)	21 (14.7%)
Total	**158 (100)**	**142 (100)**

The expenditure pattern among those who sought delivery service from public and private providers varied considerably. The mean expenditure on pregnancy and delivery service in the public and private sector were 3936±2234 rupees and 9987±5156 rupees respectively. In the Public sector, major expenditure head is Ante-natal checkups (32.32%) which include the cost of medicine and fee for consultation of physician. The Expenditure on medicine during the time of delivery is another major heading. It indicates that those who approach the public sector had to buy the medicine from the general market (Mean Rs:569/-). This is only 32.2% of the cost incurred by those who approach Private sector (Mean Rs:1767/-) for the same purpose and is statistically significant. (ANOVA, $p < 0.001$) thought the proportion on spending on medicine during delivery in both sector is not statistically significant. (p=0.709). Bribes and gifts accounts for 10.38% of the total expenditure incurred in the public provider and was virtually

Table -8 EXPENDITURE PATTERN BY TYPE OF PROVIDER

USES	Public		Private		TOTAL	F-Test Sig.
	Mean	CV	Mean	CV	Mean	
Antenatal check-ups	1271 (32.32%)	0.62	1563 (16.91%)	0.81	1409.59 (25.02%)	<0.001**
Scan	362 (9.35%)	0.78	564 (6.36%)	0.48	457.57 (7.94%)	<0.001**
Lab	303 (8.01%)	0.79	477 (5.33%)	0.65	385.15 (6.75%)	<0.001**
Medicine during delivery	569 (16.08%)	0.74	1767 (16.47%)	0.81	1135.89 (16.26%)	0.709
Charges for normal delivery	7.96 (0.15%)	2.57	2480 (33.67%)	0.40	1117.54 (15.19%)	<0.001**
Charges for c-section	48 (0.68%)	1.24	5814 (38.35%)	0.52	3082.47 (20.51%)	<0.001**
Charges for delivery	19.4 (0.3%)	2.08	3654 (35.32%)	0.69	1739.77 (16.88%)	<0.001**
Room rent	222 (3.24%)	2.35	1110 (10.69%)	0.82	642.15 (6.77%)	<0.001**
Travel	806 (20.16%)	0.95	834 (8.68%)	0.91	819.38 (14.73%)	<0.001**
Gifts/bribes	374 (10.38%)	0.72	0 (0%)	0.00	197.03 (5.47%)	<0.001**
Miscellaneous	9.92 (0.16%)	3.40	18 (0.24%)	3.81	13.75 (0.20%)	0.336
Total	3936 (100%)	0.57	9987 (100)	0.52	6800.28 (100)	<0.001*

*p-value of mean total expenditure: ** significant at 5% level absent in the private sector. There is only nominal proportion of expenditure spent on charges (fee) for the delivery in public sector, which is the major head of expenditure in private sector (35.32%). The subsidized services in the public sector benefit the low socioeconomic group compared to others as they spend only 3.36% of their total expenditure as charges (fee) for the delivery (ANOVA, $p < 0.001$). The subsidized service in the public sector benefits a major proportion of the rural population (52.7% as per this study) as there is a difference of Rs 6051/- exists between public and private providers in terms of total expenditure. The details are shown in the table-8.

3.6.2 Expenditure pattern across socioeconomic status

Unexpected expenditure was higher among low socioeconomic group (40%) and it shows a negative trend with the socioeconomic status. 18% of those among the high socioeconomic group responded that they incurred lesser expenditure than expected. But the proportion of such People comes down with socioeconomic status. This is because of the higher payment capacity of high socioeconomic group. The details are shown in the table-9.

Table - 9

Expenditure incurred	Low SES	Middle SES	High SES
Higher than expected	36 (39.56%)	50 (32.47%)	10 (18.18%)
Same as expected	50 (54.95%)	89 (57.79%)	35 (63.64%)
Lower than expected	5 (5.49%)	15 (9.74%)	10 (18.18%)
Total	**91 (100%)**	**154 (100%)**	**55 (100%)**

The mean total expenditure significantly differ across socioeconomic group (ANOVA, $p < 0.001$). The mean expenditure for the whole episode was Rs 2976 ±1719/- among low socioeconomic group, Rs 7563 ± 4369/- in Middle SES and Rs 10991 ± 5606/- among high SES. 91.2% of the Low socioeconomic group approached the public sector.

Table – 10 EXPENDITURE PATTERN BY SOCIO-ECONOMIC STATUS

	Low SES		Middle SES		High SES		TOTAL	F-Test Sig.
	Mean	CV	Mean	CV	Mean	CV	Mean	
Antenatal check-ups	927.1 (31.2%)	0.62	1551.6 (23.4%)	0.79	1810.2 (19.3%)	0.47	1409.59 (25.02%)	<0.001**
Scan	271.8 (9.3%)	0.75	509.9 (7.7%)	0.53	618.3 (6.2%)	0.54	457.57 (7.94%)	0.003**
Lab	242.6 (8.3%)	0.90	397.8 (6.1%)	0.69	585.6 (6.0%)	0.52	385.15 (6.75%)	0.001**
Medicine during delivery	539.8 (18.1%)	1.12	1295.3 (16.1%)	0.90	1675.7 (13.9%)	0.93	1135.89 (16.26%)	0.026**
Charges for normal delivery	163.2 (3.4%)	3.82	1370.8 (19.3%)	0.97	2389.8 (27.8%)	0.63	1117.54 (15.19%)	<0.001**
Charges for c-section	309.5 (3.1%)	3.63	3086.7 (22.9%)	0.93	5605.0 (31.1%)	0.85	3082.47 (20.51%)	<0.001**
Charges for delivery	197.0 (3.36%)	3.87	1939.1 (20.5%)	1.09	3734.4 (29.2%)	0.97	1739.77 (16.88%)	<0.001**
Room rent	26.3 (0.5%)	3.74	704.9 (8.0%)	0.97	1485.3 (13.5%)	0.78	642.15 (6.77%)	<0.001**
Travel	520.8 (18.9%)	0.68	966.3 (14.1%)	0.82	902.0 (9.4%)	1.09	819.38 (14.73%)	<0.001**
Gifts/bribes	245.8 (10.1%)	0.74	182.8 (3.9%)	1.60	156.1 (2.2%)	2.06	197.03 (5.47%)	<0.001**
Miscellaneous	4.9 (0.1%)	4.79	15.7 (0.2%)	3.97	23.1 (0.3%)	2.61	13.75 (0.20%)	0.518
Total	2976.14 (100%)	0.58	7563.45 (100%)	0.58	10990.6 (100%)	0.51	6800.28	<0.001*

*p-value of mean total expenditure ** significant at 5% level

Expenditure on antenatal check-ups (Mean = Rs 927.12/-) was found to be the major share of the total expenditure in this group and 18% of the expenditure was spend for buying medicine at the time of delivery ((Mean = Rs 534/-). This group spends 10.1% of their expenditure towards bribes and gifts but average amount spent on bribes and gifts was consistent across different socioeconomic groups! The medium and high socio economic group spends a major proportion of their expenditure towards medicine charges and delivery charges in the hospital. This is because 60.4% of Middle SES and 74.5% of High SES approached Private providers. The details are shown in the table-10.

3.6.3 Expenditure Pattern by Type of Delivery

Unexpected expenditure was higher with caesarian section as 50.53% of those had caesarian section responded that they incurred higher expenses than expected, while such response was only 23.41% with Normal delivery. The number of subjects who encountered lower expense than expected was also lesser with caesarian section compared to normal delivery. The details are shown in the table-11.

Table 11

Expectation	Normal	C-Section
Higher than expected	48 (23.41%)	48 (50.53%)
Same as expected	133 (64.88%)	41 (43.16%)
Lower than expected	24 (11.71%)	6 (6.32%)
Total	**205 (100%)**	**95 (100%)**

The mean total expenditure for normal delivery is 5211.90$\pm$ 2794.11 and for C-section it is 10227$\pm$ 6560.33. There is significant difference between the proportion of expenditure spend on ante-natal check-ups (ANOVA, $p < 0.001$) and expenditure on scanning ($p = 0.043$) and laboratory investigations (ANOVA, $p < 0.001$). 42.61% of the total expenditure was spend on fee and medicines during delivery in the case of C-section, while in normal delivery only 28.76% is the corresponding proportion of expenditure. The higher expenditure for the C-section may be attributed by the higher rate of C-section in the private sector as well as high rate of C-section among high socioeconomic group. The details are shown in the table-12.

Table 12 EXPENDITURE PATTERN BY TYPE OF DELIVERY

	Normal Delivery		C-Section		TOTAL	Significance of F-Test
	Mean	CV	Mean	CV	Mean	
Antenatal check-ups	1289 (27.59%)#	0.56	1669 (19.48%)	0.90	1409.59 (25.02%)	<0.001**
Scan	418.4 (8.37%)	0.69	542.1 (6.99%)	0.53	457.57 (7.94%)	0.043**
Lab	353.3 (7.4%)	0.71	453.8 (5.32%)	0.77	385.15 (6.75%)	<0.001**
Medicine during delivery	647.7 (13.56%)	0.69	2189 (22.1%)	0.71	1135.89 (16.26%)	<0.001**
Charges for delivery	1117.54 (15.19%)	1.25	3082.4 (20.51%)	1.18	1739.77 (16.88%)	0.023**
Room rent	414.9 (5.71%)	1.31	1133 (9.05%)	1.02	642.15 (6.77%)	<0.001**
Travel	788.2 (16.31%)	0.92	886.6 (11.3%)	0.94	819.38 (14.73%)	<0.001**
Gifts/bribes	169.1 (5.65%)	1.31	257.4 (5.08%)	1.36	197.03 (5.47%)	0.518
Miscellaneous	13.3 (0.21%)	4.26	14.6 (0.17%)	3.10	13.75 (0.20%)	0.698
Total	5211.90	0.53	10227.84	0.64	6800.28	0.000*

*p-value of mean total expenditure: ** significant at 5% level

3.6.4. Results of multivariate analysis for Total Expenditure

Apart from the bi-variate analysis using individual variables, a Multiple linear regression model was constructed to study the relationships between Total Expenditure as the dependent variable and Type of Delivery (Caesarian Section), Type of provider (Private), Socioeconomic status (Middle & High), Educational status of father and mother Total expenditure as the independent variables. The details are shown in the table-13.

Table - 13

Variable	**B-value**	**T**	**Sig**
Constant	1495.083	4.539	<0.001
Type of delivery	4209.516	11.329	<0.001
Type of provider	4307.317	10.663	<0.001
Educational status of father	1382.166	3.171	0.002
Educational status of mother	357.663	0.866	0.387
Middle Socio economic status	1235.859	2.541	0.012
High Socio economic status	3005.887	4.352	<0.001
Adjusted R square = 0.639			

We found that there is significant positive association of Total expenditure with Caesarian section, Delivery in Private Provider, Higher socioeconomic status and educational status of father. Though educational status of the mother was significant on univariate analysis it was not significant in multivariate analysis. This model explains 64% of the variation in the total expenditure.

3.7. Sources Of Financing

We analyzed the financing sources of the subjects across type of providers, type of delivery and across socioeconomic status to explore the differentials across these groups. The results are described below.

3.7.1. Financing across providers

Table – 14 SOURCES by TYPE OF PROVIDER

	PUBLIC		PRIVATE		TOTAL	Significance of F-Test
	Mean	CV	Mean	CV	Mean	
Loan without interest	182 (6.4%)	3.52	707 (7.89%)	2.25	430.29 (7.10%)	0.501
Loan with interest without pledging	889 (29.14%)	1.34	472 (4.51%)	3.29	691.68 (17.48%)	<0.001**
Loan with interest with pledging	725 (19.55%)	1.57	775 (11.31%)	2.04	748.93 (15.65%)	0.848
Sale of assets	74.3 (2.12%)	5.70	255 (1.87%)	5.67	160.04 (2.00%)	0.008**
Others	84.8 (2.40%)	4.72	77.5 (0.99%)	5.77	81.32 (1.73%)	0.169
Own savings	1981 (40.38%)	1.27	7701 (73.43%)	0.72	4688.03 (56.03%)	<0.001**
Net interest rate	49.5	0.37	43.2	0.37	47.7	0.051

** significant at 5% level

Borrowing was found to be the major source of financing in Public sector (57.5%) and own savings in Private sector (73.43%) and there was significant difference in the proportion of savings and borrowing out of the total expenditure between public and private providers (ANOVA, $p < 0.001$). The major source of financing in the public sector was loan with interest (without any pledging) which is having higher interest rate

(49.5% per annum compared to 43.2% in private sector) though the difference in interest rate was not statistically significant at 5% level (ANOVA, p=0.051). We can see that 55.09% of the total expenditure in the public sector was met by loan alone while in the private sector it is only 23.71% only. The reason may be that relatively richer approach the private sector who need fewer borrowings compared to poorer. The details are shown in the table-14.

3.7.2. Financing Sources across Socioeconomic Groups

Table 15 SOURCES BY SOCIO-ECONOMIC STATUS

	Low SES		Middle SES		High SES		TOTAL	Significance of F-Test
	Mean	CV	Mean	CV	Mean	CV	Mean	
Loan without interest	211.7 (9.1%)	2.55	654.7 (8.1%)	2.26	163.6 (1.0%)	6.63	430.29 (7.10%)	0.029**
Loan with interest without pledging	940.9 (35.5%)	1.17	661.6 (11.5%)	2.37	363.6 (4.3%)	3.32	691.68 (17.48%)	<0.001**
Loan with interest with pledging	727.1 (24.1%)	1.37	938.4 (15.1%)	1.72	254.5 (3.2%)	3.80	748.93 (15.65%)	<0.001**
Sale of assets	203.4 (2.2%)	7.71	191.6 (2.6%)	4.30	0.0 (0.0%)		160.04 (2.00%)	0.333
Others	87.9 (2.9%)	3.94	100.0 (1.6%)	5.19	18.2 (0.2%)	7.42	81.32 (1.73%)	0.219
Own savings	805.1 (26.2%)	1.29	5017.3 (61.1%)	0.84	10190.6 (91.3%)	0.58	4688.03 (56.03%)	<0.001**
Net interest rate	50.4	0.40	45.98	0.34	38.25	0.28	47.73	0.102

** significant at 5% level

Financing of the pregnancy and delivery episode was significantly different across socioeconomic status (ANOVA, $p < 0.001$). The low socioeconomic group finance 71.6% of their total expenditure through borrowings and a major proportion is "loan with interest (without pledging) at a higher interest rate (50.39% per annum). It is a matter of particular concern that though 91.2% of the Low socioeconomic group approached the public sector, where service is offered at subsidized rate, had to depend on borrowings for meeting their expenses. The high socioeconomic group though incurs heavy payment for the services manage to finance 91.3% of their expenditure from their own savings. The details are shown in the table-15.

3.7.3 Financing sources across type of deliveries.

Table – 16 SOURCES BY TYPE OF DELIVERY

	Normal Delivery		C-Section		TOTAL	Significance of F-Test
	Mean	CV	Mean	CV	Mean	
Loan without interest	310.2 (7.27%)	3.19	689.5 (6.74%)	2.27	430.29 (7.10%)	0.821
Loan with interest without pledging	588.5 (17.66%)	1.98	914.2 (17.1%)	1.93	691.68 (17.48%)	0.887
Loan with interest with pledging	790.7 (17.37%)	30.93	658.8 (11.95%)	3.36	748.93 (15.65%)	0.106
Sale of assets	43.9 (1.22%)	0.40	410.6 (3.7%)	2.70	160.04 (2.00%)	0.075
Others	92.2 (1.78%)	5.16	57.9 (1.63%)	4.69	81.32 (1.73%)	0.889
Own savings	3386 (54.7%)	0.51	7497 (58.89%)	0.35	4688.03 (56.03%)	0.366
Net Interest Rate	46.8	0.38	50.1	0.00	47.73	0.299

A major finding is that though there is increment in mean borrowings for the C-section, there is no significant difference between the proportion of different types of borrowing across normal delivery and caesarian section. This fact in a ways indirectly points to higher rate of C-sections among high socioeconomic group as well as in the private sector. The proportion of borrowing out of the total expenditure was consistent (p=>0.05) for all financing sources. The details are shown in the table-16.

CHAPTER 4

DISCUSSION

Thiruvananthapuram is one of the districts with large number of Public and Private Hospitals offering reproductive and child health services including one medical college hospital, which is not a referral hospital[39]. The utilization pattern was higher with public sector and is not in agreement with previous studies. The major determinant in the choice of the provider was Physician. This is due to the peculiarity in the Kerala context where people prefer to have gynecologist for consultation on pregnancy and delivery. Cost may not be a consideration in selecting Private sector in such conditions. Some of the subjects belonging to poor socio economic group approached the private sector irrespective of cost. When asked why they were doing so, the response was they could compensate charges in the private sector with the expense on travel in accessing the public sector. Quality concerns were another factor. Other studies also found the same pattern. Homan[40] et al (1995) reported that quality (64.5% overall) was the most common reason for choosing the hospital and cost of care was a reason for choosing the hospital for public sector patients (44.3%) than for the private sector patients (7.8%) suggestive of inelastic demand. In our study also price was a major consideration among those who approached public sector and least with private sector.

Those who approached the private sector tended to report higher level of service quality compared to private sector. The reasons were superior provision of services like behavior of staff, provision adequate facility of water, toilet, electricity, absence of bribes cleanliness of surroundings etc in the private sector. This is the reason for the poor who tended to approach the public sector more, report lower level of service quality. Even though the private sector outweighed the public sector in terms of service quality, it might not be true in the case of technical quality as the rate of C-section was lesser in the public sector (28.5%) compared to private sector (35.2%).

One interesting finding in our study was that perceived quality does not match with the payment made. We found that as the total expenditure goes up the perceived levels of quality comes down. This may not be the case with technical quality. Though cost was a not a consideration in choosing the private sector, it can be argued that as cost goes up the perceive levels of quality comes down in the private sector suggesting that there service quality and payment does not go hand in hand rather, there is a mismatch between the payment and the perceived levels of quality. There can be another argument also. Critiques may argue that the responses to questions on the quality may be influenced by the incurred expenditure. But in our study only one question was asked to directly elicit the subject's assessment on the services received against their payment s made. Thus we have ample evidence to state that there is a mismatch between the payments made and the services received.

This study sheds light into the huge difference in the cost of service in the private sector and public sector. There is a cost difference of Rs: 6051/- exists between those who approach private sector (Rs 9987/-) and public sector (Rs 3936/-). Though the service quality in the public sector is behind that of Private sector, the direct and indirect subsidized service in the public sector, in a way benefits 53% of the rural population and is remarkable from a "welfare state" concept. The proportion of expenditure spent toward bribes and gifts in the public sector is to the tune of 10% of the total expenditure, which is reprehensible. This is a matter of concern among the poor as they are forced to spend one tenth of their expenditure to wards this evil section. Though the poor utilize public sector more, the cost of pregnancy and delivery service may be attributing too much of burden on individual household. Though the subsidized service in the public sector is a relief for the weaker section of the society the extent of its efficacy is doubtful as 40% of the poor who approached the public sector incurred a higher expenditure than they expected. The proportion of borrowing is 71.6% among poor socioeconomic strata. It is to be noted that, pregnancy and delivery are normal physiological events and are not unexpected events unlike other health events. If for such an expected event, the borrowing is the major financing sources for the poor, one can imagine how much would be the burden of other disease conditions over poor households. This is complicated by high interest rate for borrowing. One third of the borrowings are loans without pledging which are having higher interest rate. This points to absence a rural financing mechanism for the poor at times of contingency. There are efforts in this direction at the Panchayat level like "Kudumbashree" but their contribution towards financing health expenditure was found to be negligible. The Middle class is also not in a better off position. 33% of the middle class end up with higher expenditure than they expected and 39% of their expenditure was met from borrowings and sale of assets. Only the high socioeconomic group could limit 91% of their expenditure from their own sources.

The mean annual net interest rate was found to be 47.73%. This finding is of particular concern. Nationalized banks are offering loans at the rate of 16-18% for consumer goods; there is no provision for giving loans for expenses related to health of the citizen. Richer are able to avail at lower interest rates. Soft loans for health related expenses can protect the poor from high interest rates of private money lenders.

People do encounter great difficulties at time of paying for the health event though the services are delivered "free". There are considerable expenses on time, transport cost and informal charges incurred by the households. Much of the policy debate has focused on the extent to which governments are able to mobilize private resources that supplement public subsidies in financing public expenditures. Proponents of private resource mobilization argue that individuals are willing to pay for medical care and that additional financing will allow governments to expand and improve critical programs.[41 42] However, opponents argue that the poor are unable to pay for medical care and will be worse off if governments expand private resource mobilization. In the era of globalization, liberalization, and marketization; like any other developing country India is also undergoing structural adjustment programme. In this context the question of affordability is particular urgent because households often face combined user fee burden from various essential services including health. Thus people are expected to contribute more from their own pocket. Availability of basic health care has a relatively greater impact on households with low incomes or low education, or both, than more specialized services[43]. The studies on the use of health care services show that the poor and other disadvantaged sections such as scheduled castes and tribes are forced to spend a higher proportion of their income on health care than the better off. The burden of treatment is unduly large on them when seeking inpatient care.[44, 45] Very often they have to borrow funds at very high interest rate to meet both medical expenditure and other household consumption needs. One possible consequence of this could be the pushing of these families into a zone of permanent poverty[46]. The burden of expenditure on health care is however unduly heavy for households belonging to informal sector indicating a potential for alternative financing mechanisms to address such a vicious circle. Since health care is an essential expenditure, the market mechanism places unnecessary burden on those with lesser ability to pay. There is a more than three times difference between expenditure in a private and a public facility and even the public facilities are not as inexpensive as one would think[47]. It can be interpreted from the study results that though the expenditure on pregnancy and delivery are expected event, the insufficient savings among middle class and largely among the low socio economic group leads to huge borrowings. This problem can be address only if savings among the poor is promoted. This is true for all other health related expenditures. Such an intervention can be effectively implemented in the context of decentralized planning process in Kerala. As a part of the Peoples planning Campaign, all the villages in Kerala are covered under Poverty alleviation Programme namely Kudumbashree. Women of poor socioeconomic status are organized into Neighborhood groups and such groups for undertake micro financing activities though thrift and credit mechanism. The activities of such groups are limited to agriculture and small scale industries alone. If the existing micro credit group can be effectively used such groups can finance health expenditures of poor socioeconomic groups at low interest rates giving a relief to the poor.

4.2 Strengths and weaknesses of the study

Major advantage of this study is its community-based design where people were able to express all the expenditure incurred without having a fear about the providers especially under-the-table payments. Unlike other studies, this study focused on expenditure pattern on pregnancy and delivery service alone. The recall bias associated with these types of study holds good for this study as well because pregnancy and delivery spans over a period of 10 months. Moreover, the expenditure might carry a downward bias because the subjects may not be aware of all forms of expenditure occurred without their knowledge. We also didn't include the indirect cost of pregnancy and related events. Another weakness of this study is that the sample sized didn't allow more in-depth analysis.

4.3 Conclusions

The achievements of Kerala in the health sector, was contributed by the conscious efforts of both Public as well as private sector. This study points to the possible marginalization of the poor as the public sector is struggling to provide affordable and acceptable quality care to all citizens which is a responsibility of the state.

This study revealed that poor are exposed to more financial risk although pregnancy is an expected event. This could be due to their choice of provider or due to C-section, which is not an expected event due to the fact that they lack credit-worthiness. Whatever be the reason for their financial risk, the fact is that they faced such a risk and resorted to unorganized and cutthroat borrowings. A policy towards helping such people in financing pregnancy and related events would be a welcome relief for them. Community financing could be an alternate option for this land of *panchayati raj*. It is also stated that such a financing mechanism will be viable only if, it is comprehensive in nature taking into account all other health related contingencies.

On the other hand, middle class used the organized loans. Although they paid lesser interest rate compared to the poor, the fact is that they did bear interest rate. Such kind of households probably belonged to the organized sector and low interest loans can be supportive for this group of people.

Desirable Policy changes are imperative at this juncture to preserve the rich tradition of Kerala especially achievements in health at low cost.

4.4 Policy Suggestions

The results of our study vis-à-vis financing sources give an indication that promotion of savings among the poor rural folk will help at times of health related contingencies from cutthroat borrowings. The existing micro credit units like Kudumbashree can be used as a good tool for this purpose.

It is high time to prohibit bribing in the public sector which amounts 10% of the total expenditure. Poor are more victimized and this issue has to be seriously addressed.

Public sector in the rural areas has to strengthen especially the First Referral units to improve the access of the rural poor to maternity services to bring down the travel cost of rural poor which is 19% of their total costs.

Though Kerala has achieved a lot in terms of health indicators, there are inadequacies in terms of regulations and standards of care in both private as well as public sector. This evident from the high rate of caesarian section in the state. Authorities have to focus on this issue to ensure quality service to the clients.

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Appendix I

Assessment of Socio Economic Status

Item	SCORE		
	1	2	3
House	Kucha	Semi-pucca	Pucca
Cooking	Firewood	Kerosene	Gas
Phone	Nil	Present	
Vehicle	Nil	100 cc two-wheeler	>100 cc two-wheeler/ Car
Television	Nil	Black &White	Color
Refrigerator	Nil	Ordinary	Frost Free
Washing machine	Nil	Ordinary	Fully automatic
Computer	Nil	Present	
Education	< 25% of the members are graduates	<50 of the members are graduates	50-100% of the members are graduates

SCORE RANGE	**9 TO 25**
Low socioeconomic class	9- 12
Middle socioeconomic class	13- 18
Upper socioeconomic class	19- 25

Appendix II

Service Quality Index

No	Question No	Responses	Score
1	11	Delayed very much	0
		Somewhat delayed	0.5
		Immediately	1
2	12	No	0
		Yes	1
3	13	Never	0
		Occasionally	0.5
		Very Frequently	1

No	Question No	Responses	Score
4	14	Poor	0
		Average	0.5
		Excellent	1
5	15	> 6 Hour	0
		3- 6 Hour	0.33
		½- 3 Hour	0.66
		< ½ Hour	1
6	16	No	0
		Yes	1
7	17(1)	Bad	0
		Average	0.5
		Excellent	1
8	17(1)	Bad	0
		Average	0.5
		Excellent	1
9	17(1)	Bad	0
		Average	0.5
		Excellent	1
10	19	No	0
		Yes	1
11	20	Bad	0
		Average	0.5
		Excellent	1
12	21	Bad	0
		Average	0.5
		Excellent	1
13	22	Bad	0
		Average	0.5
		Excellent	1
14	23	Bad	0
		Average	0.5
		Excellent	1
15	24	Exorbitant	0
		Reasonable	0.5
		Cheap	1
16	25	No	0
		Yes	1

No	Question No	Responses	Score
17	Expenses on Bribes	No	0
		Yes	1
18	Stay in Pay ward	No	0
		Yes	1

Appendix III

Selection of Panchayats

Midland Region **Panchayat No 1 (Managalapuram)** Random No 3327 Sampling Interval 6584			
Ward No	Population	Cum. Population	Cluster
1	2828	2828	
2	3796	6624	1
3	2418	9042	
4	3366	12408	2
5	3289	15697	
6	3255	18952	3
7	2914	21866	
8	3163	25029	4
9	3891	28920	
10	1892	30812	5
11	2107	32919	

Midland Region **Panchayat No 2(Kilimanoor)** Random No 1217 Sampling Interval 3568			
Ward No	Population	Cum. Population	Cluster
1	2626	2626	1
2	2238	4864	2
3	2319	7183	
4	1825	9008	3
5	1766	10774	
6	1860	12634	4
7	1528	14162	
8	1815	15977	5
9	1862	17839	

High Land Region Panchayat No 1(Amboori) Random No 835 Sampling Interval 3267			
Ward No	Population	Cum. Population	Cluster
1	1854	1854	1
2	1932	3786	
3	1667	5453	2
4	1752	7205	
5	1727	8932	3
6	1458	10390	
7	1741	12131	4
8	2006	14137	5
9	2198	16335	

High Land Region Panchayat No 2(Aryanad) Random No 3748 Sampling Interval 4947			
Ward No	Population	Cum. Population	Cluster
1	2383	2383	
2	2770	5153	1
3	2308	7461	
4	1809	9270	2
5	1733	11003	
6	1833	12836	
7	1818	14654	3
8	2216	16870	
9	2687	19557	4
10	2645	22202	
11	2533	24735	5

Costal Region Panchayat No 1(Kadakkavoor) Random No 4208 Sampling Interval 4607			
Ward No	Population	Cum. Population	Cluster
1	2087	2087	
2	1809	3896	1
3	1805	5701	
4	2091	7792	
5	2557	10349	2
6	2570	12919	
7	2905	15824	3
8	2458	18282	4
9	2076	20358	
10	2679	23037	5

Costal Region	**Panchayat No 2 (Vizhinjam)**		
	Random No	6708	
	Sampling Interval	8480	
Ward No	Population	Cum. Population	Cluster
1	2518	2518	
2	3018	5536	
3	3534	9070	1
4	2459	11529	
5	4649	16178	2
6	2437	18615	
7	4091	22706	
8	2713	25419	3
9	3916	29335	
10	2540	31875	
11	2108	33983	4
12	2603	36586	
13	2492	39078	
14	3324	42402	5

Geographical Classification of Grama Panchayats in Thiruvananthapuram District

Mid-Land Villages					
1	Anad	17	Kudappanakkunnu	33	Parassala
2	Andoorkonam	18	Madavoor	34	Pazhayakunnummel
3	Aruvikkara	19	Malayinkezhu	35	Perumkadavila
4	Aryancode	20	Manamboor	36	Poovachal
5	Balaramapuram	21	Mangalapuram	37	Pothencode
6	Chemmaruthy	22	Manickal	38	Pulimath
7	Chenkal	23	Maranalloor	39	Pullampara
8	Elakamon	24	Mudakkal	40	Sreekariyam
9	Kallara	25	Nagaroor	41	Thirupuram
10	Kalliyoor	26	Navaikulam	42	Vattiyoorkavu
11	Karakulam	27	Nellanad	43	Vellanad
12	Karavaram	28	Ottoor	44	Vembayam
13	Kattakkada	29	Pallichal	45	Vilappil
14	Kazhakuttam	30	pallikkal	46	Vilavoorkkal
15	Kilimanoor	31	Panavoor	47	Vamanapuram
16	Kizhuvilam	32	Pangode		

Costal Villages	
1	Anjuthengu
2	Athiyannoor
3	Azhoor
4	Cherunniyoor
5	Chirayinkeezhu
6	Edava
7	Kadakkavoor
8	Kadinamkulam
9	Kanjiramkulam
10	Karode
11	Karumkulam
12	Kottukal
13	Kulathoor
14	Poovar
15	Vakkom
16	Venganoor
17	Vettoor
18	Vizhinjam

High land Villages	
1	Amboori
2	Aryanad
3	Kallikkadu
4	Kollayil
5	Kunnathukal
6	Kuttichal
7	Nandiyodu
8	Ottasekharamangala
9	Peringammala
10	Tholikkode
11	Uzhamalackal
12	Vellarada
13	Vithura

Expenditure pattern, perceived quality and financing sources for pregnancy and delivery service in rural Thiruvananthapuram, Kerala

Achutha Menon Centre for Health Science Studies

Sree Chitra Tirunal Institute for Medical Sciences and Technology

1. S. No.: Date:
2. Cluster:
3. Name of the Village:
4. General Information

	Mother	Father	1- Unemployed 2- Not seeking job 3- Casual labor 4- Self-employed 5- Govt. servant 6- Professional 7- Housewife	1- illiterate 2- Primary 3- High school 4- Up to Degree 5- Above Degree
Name				
Age				
Occupation				
Educational status				

5. Socio economic status

Item	1		2		3	
House	Kucha		Semi-pucca		Pucca	
Cooking	Firewood		Kerosene		Gas	
Phone	Nil		Present			
Vehicle	Nil		Two wheeler < 100 cc		Two-wheeler ≥ 100 cc & car	
Television	Nil		Black & White		Colour	
Refrigerator	Nil		Ordinary		Frost Free	
Washing machine	Nil		Ordinary		Fully automatic	
Computer	Nil		Present			
Education	< 25% of HHs are graduates		26-50% of HHs are graduates		51-100% of HHs are graduates	
Total						

6. Date of delivery:
7. Type of delivery: 1- Normal 2- Caesarian. ☐
8. Type of provider: 1- Public 2- Private 3- Others ☐
9. Why did you choose the particular provider?

   1- Better Care 2- Well-behaved Doctor & Staff

   3- Better Facilities 4- Clean & Hygiene ☐

   5- Low Cost/Free Care 6- Others (Specify)

10. Stay at the hospital

	Before delivery	After delivery
General Ward		
Pay Ward		
ICU		

Quality of Service

11. How quickly did the doctor assess your condition?.........................

12. Do you feel that you have been monitored sufficiently?

    1. No 2. Yes ☐

13. How frequently did the doctor or other staff explain and help during delivery?

    1 Never 2 Occasionally 3 Very Frequently ☐

14. How did you rate the cleanliness of the labor room? ☐

    1 Poor 2 Average 3 Excellent

15. After delivery when was your baby given to you for Breast feeding?

    1- > 6 Hour 2- 3- 6 Hour
    3- ½- 3 Hour 4- < ½ Hour ☐

16. During hospital stay did you give formula feed to baby? ☐

    Yes-1 No- 2

17. How did you rate the facilities such as water, electricity, toilet?

	Water	Electricity	Toilet
Excellent 3			
Average 2			
Bad 1			

18. If you had a complication during delivery how soon it was managed?

1 Delayed very much 2 Somewhat delayed

3 Immediately

19. Did you have any complications after the delivery?

1 Yes 2 No

20. How do you rate the doctor's technical competence?

1 Bad 2 Average 3 Excellent

21. How do you rate the cleanliness and the hygiene of the hospital?

1 Bad 2 Average 3 Excellent

22. How you comment on the behavior of the Doctor?

1 Bad 2 Average 3 Excellent

23. How you comment on the overall behavior of the staff?

1 Bad 2 Average 3 Excellent

24. What do you think about the payment for the service you received?

1- Exorbitant 2- Reasonable 3- Cheap

25. Will you recommend the same provider for somebody else?

1- NO 2- YES

26. EXPENDITURE PATTERN:

Code	Item	Number of times	Amount each time	Total spent
1	Antenatal checkups			
2	Scanning			
3	Vaccination			
4	Laboratory visits			
5	Medicine during antenatal period			
6	Medicine during delivery			
7	Under table payments			
8	Charges for delivery			
9	Charges for caesarian			
10	Room rent			
11	Compliments to the doctor			
12	Fee for anesthetist			
13	Travel expense			
14	Miscellaneous			
15	Grand Total			

27. How do you compare the expenditure with your initial expectation before the delivery?

1-Higher than expected 2- Same as expected ☐

3- Lower than expected

28. SOURCES OF EXPENDITURE

Code	Source	Amount	Interest
1	Own savings		
2	Loan from employer		
3	Borrowings from relatives		
4	Borrowings from friends		
5	Borrowings from money lender		
6	Loan from bank		
7	Sale of gold		
8	Sale of land		
9	Sale of produces		
10	Foregone investments		
11	Others		
12	Total		

NOTIONAL MAP
OF
PANCHAYATS
AND
COMMUNITY DEVELOPMENT BLOCKS
IN

TRIVANDRUM DISTRICT