FINANCING OF HEALTH CARE AMONG MARGINALISED COMMUNITIES OF KERALA

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Submitted to the University of Calicut
for the award of the Degree of

DOCTOR OF PHILOSOPHY IN ECONOMICS

By

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DECLARATION

I hereby affirm that the work for this thesis entitled '**Financing of Health Care Among Marginalised Communities of Kerala'** submitted to the University of Calicut for the award of the Degree of Doctor of Philosophy in Economics is an original record of research work carried out by me under the guidance and supervision of Dr. C Krishnan, Associate Professor, Government College, Kodanchery.

I also declare that no part of this thesis has been presented for the award of any degree, diploma, fellowship, or other similar title or recognition of any University/Institution before.

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This is to certify that this thesis entitled '**Financing of Health Care Among Marginalised Communities of Kerala'** prepared by **Mr. Shabeer. K. P.** for the award of the Degree of Doctor of Philosophy in Economics of the University of Calicut, is a record of bonafide research work carried out by him under my supervision and guidance. No part of the thesis has been submitted for any degree, diploma, fellowship or other similar title or recognition before.

It is also certified that all the corrections/suggestions from the adjudicators have been incorporated in the Thesis.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The role of health care in economic development has received increasing attention in recent years. It is widely acknowledged that health is an important component of effective human development. Empowerment of people comes from the freedom they enjoy and this includes, among others, freedom from poverty, hunger and malnutrition and freedom to work and lead a healthy life (Sen, 1999). Good health is unanimously recognized to be of intrinsic value and constitutes an integral part of development. In fact, health and economic prosperity go hand in hand. One can see abundance of evidences which connects wide arrays of health indicators that are positively associated with many dimensions of economic prosperity (Ruger et al. 2001; WHO, 2001; Thomas and Frankenberg, 2002). People's ability to learn, work and achieve their full potential depends on their health condition. Good health status is one among the basic human rights of any individual. By augmenting the capability of the population, it can lead to social and economic progress of the country. Healthy labour force increases the participation rate as well as hours worked and health is a prominent factor in determining labour productivity. A productive work force and a healthy population are necessary components of any development strategy, which could be ensured only by providing adequate health security to society. Health is one of the vital indicators that reflect the quality of human life. In order to ensure quality health care to all, developing countries like India face many challenges. Poor financial and physical resources are the key constraints. Financing of health care is one of the crucial determinants that influence the health outcomes in a country. Financing of health care is concerned with the mobilisation, accumulation and allocation of money to cover the health needs of the people, individually and collectively in the health system (WHO, 2000). The equity and accessibility goals of the health system require the adoption of a

proper financing strategy that protects the households from the financial catastrophe of treatment.

Turning to the Indian scenario, right to health is a part of right of life incorporated under the Article 21 of the Fundamental Rights of Indian Constitution. The country has built up broad-based health infrastructure and initiated a number of programmes and policies resulted in noticeable and significant improvement in all the population based indicators like life expectancy at birth, infant mortality rate, maternal mortality rate and morbidity rates. Despite the buoyant economic growth rates, there are growing concerns about the health care sector of the country. With the declining role of the public sector and growing presence of private providers, the country is unable to allocate an adequate share of its gross domestic product (GDP) to this crucial sector. Public spending on health as a percentage of GDP is only 1.30 per cent. Further, there is an uneven distribution of health care facilities in the country due to the gap between the actual spending and the required amount for health care in most of the states. This gap is much larger in the case of relatively low income states leading to discernible inter-state inequality. As a consequence of the low public spending, India ranks very low in terms of financial protection. The high out-of-pocket expenditure on health care forms a strong barrier to access health care and is causing the households to incur catastrophic expenditures, which in turn push them into indebtedness and poverty. Questions have been frequently raised about the progressivity, equity and efficiency of the existing health care financing mechanism being adopted in the country.

Kerala, a small state in India, with her unique development experience, has impressive health indicators compared to the other states of the country and has received international attention for her high levels of human development. But, in terms of financing of health care, the state has the highest private per capita health expenditure in the country compared to any other states in India (Sivakuamr et al., 2011; Divadanam et al., 2012). The estimates of the 71st round of National Sample Survey (NSS) shown that average health expenditure for non-hospitalised treatment in rural Kerala is ₹533 while, it is ₹448 for the urban Kerala, which are the highest

in the country. The levels of morbidity in the state, in spite of its creditable achievement in other aspects of health care are quite high (Suryanarayana, 2008). It has been pointed out that the much acclaimed Kerala model of health has failed to encompass the marginalised and outlier communities in the state (Kurien, 1995; Government of Kerala, 2006; Verghese, 2009; Kerala State Planning Board, 2009). The health expenditures are growing rapidly led by mostly unregulated private sector and where health insurance coverage is still limited. The medical costs of treating serious illness are beyond the means of most of the households among the marginalised communities in the state. As a result, households would be impoverished if serious illnesses strike unless they are insured or have the access to subsidised health services. Cost of treatment has emerged as one of the major reason of indebtedness of households belonging to the lower socioeconomic strata. Studies have found that, in less developed countries with underdeveloped health care financing system, spending for serious illness has thrust many households into poverty and aggravate existing poverty (Whitehead and Evans, 2001; Kawabata et al., 2002; Wagstaff and Doorslaer, 2003; Limwattananon et al., 2007; Flores et al., 2008; Gosh, 2011; Bhojani et al., 2012). It is in the above background that this study has been mooted, with an aim to analyse the mechanisms of health care financing among the marginalised communities of Kerala state.

1.2 Significance of the Study

Financing of health care is considered as one of the building blocks of the health system (WHO, 2007). Preferably, the health system should be financed in a way that people can use the health care services without any financial hardship. The term health care financing has been defined in a narrow as well as broad sense. Under the narrow definition, financing pertains only to the mobilisation of funds for health care. Under the broad definition, health care financing covers three issues. Firstly, it covers the mobilisation of funds for health care. Secondly, the allocation of the funds to regions and population groups and for specific types of health care and thirdly it covers the mechanisms for paying for health care.

Even though ensuring healthy lives and promoting well-being of people are aims of the countries and health has been considered as a fundamental human right since the Alma Ata Declaration[i] of 1978, expenditure on health care is often unexpected and can be catastrophic in nature. The financing affects the availability, distribution and access to health care. The financing mechanism adopted in the country determines the degree of financial protection against the risk of health shocks. The health shocks denote the unpredictable illness that adversely affects the health status of the household and is among the most important factor associated with impoverishment. Many a times, the households that are affected by the health shocks face the twin issues of payments for health care and loss of income due to the inability of the work (Leive et al., 2008).

Generally, five methods have been developed to finance health care across countries. They are: general revenue/ earmarked taxes, public insurance programme, private insurance, community financing and direct out-of-pocket payments. General tax revenues have long been used in every country to finance a major portion of health care by the government. Less developed countries often rely on general taxes to finance health care more than the developed countries. But low tax base in developing countries often translate into insufficient public expenditure for health care. Governments can also assign a particular tax for funding the health care sector. An advantage of this source of finance is that it is possible to assign a tax to fund certain priority health care programme. The main features of public insurance are that it is initiated by the government and insurance premiums and benefits are established through legislation. On the contrary, private insurance is a private contract offered by an insurer to exchange a set of benefits for a payment of a premium. Consumers voluntarily choose to purchase an insurance package that best matches their preferences. Private insurance is offered on individual and group basis. The method of community financing is based on three principles; community co-operation, self reliance and prepayment. The members of the community pay a contribution to a community organised entity in advance for a package of basic benefits. The out-of-pocket expenditures represent expenditures that households make out of their pocket at the time of using health care services and purchasing

medicines. Out-of-pocket expenditures exclude payment of insurance premiums but include fee for private health care services and user fee for the public providers. In India, out-of-pocket payments include fees, in-patient and out-patient hospital charges, medicines, diagnostic tests and ambulatory charges. (Doorslaer et al., 2007). The out-of-pocket expenditure incurred by the households is a good reflection of the extent of the utilisation of health care and their effective access to it. At the same time, the threat that out-of-pocket payments pose to the households' living standards and welfare is acknowledged as a foremost consideration in the financing of health care. Large out-of-pocket payments can push the households into permanent poverty, the magnitude of which varies across the countries depending upon the method through which the health care is financed.

Each method distributes the financial burden and benefits differently. Each method affects those who have access to health care and financial protection differently. In short, each method had different equity implications. All the countries finance health care using a mixture of these five methods. The financing method chosen is a major determinant of how much money will be available for health care. It determines how the funds will be used and managed, how efficiently the services will be delivered and what type of services will be available and for whom.

As already stated, most of the health care financing methods are designed to serve two purposes, namely, to ensure equal access to health care and to protect patients from catastrophic illness (financial protection) and thus preventing poverty. Access to health care is critical to improving health status and good health is necessary for empowerment. In the market based health care financing methods, if there are inadequate provisions ensuring basic level of health coverage, some people may not have access to the care they need. Along with the movement towards greater marketisation and liberalisation[ii] of the global economy, health care is becoming a commodity open to the market forces with the resultant escalation of cost. On the other hand, most government financed systems tend to provide most of the people living in the country with coverage that offers some basic level of health care. The purpose of the financial protection is to protect households from financial

ruin arising from serious illness that may drive family into poverty. An optimum financing method should eliminate or reduce the possibility of an individual's inability to pay for health care and impoverishment on account of seeking health care. Health care expenditure cuts poor households' budget in two ways. Not only do they have to spend a large amount of money and resources on medical care but also they are unable to earn during the period of illness. Moreover, rural people have a relatively higher burden of indirect costs such as expenses on transport, food, stay, opportunity cost of lost wages of the sick as well as the accompanying person associated with the illness episode.

Households often use a variety of ways or strategies to finance unforeseen health expenditure that cannot be met by their regular income (Saurborn et al., 1996; Damme et al., 2004; Leive and Xu, 2008; Flores et al., 2008; Wilkies et al.,2008; Daivadhanam et al., 2012). But the strategies or 'coping mechanisms', adopted by households to cope with the cost of illness, can trigger a vicious circle of impoverishment and more indebtedness (Dercon, 2002). Very often, the poor have to borrow funds at a higher interest rate to meet both medical expenditure and other consumption needs, which drives them into indebtedness. Future welfare is put at risk by incurring debt, selling productive assets or by sacrificing investment in future productivity, for example curtailing children's education (Whitehead et al., 2001). Thus, while examining the extent of financial protection of the households from health care payments, the coping mechanism provides vital information on how the households respond to health shocks and how the payments may affect their future welfare (Leive et al., 2008).

Despite the creditable achievement in the field of macro health indicators of India, a high proportion of the population in the country continue to suffer from preventable diseases, pregnancy and child birth related complication as well as malnutrition. Further, with the epidemiological transition, the country is facing the double burden of increasing chronic and non-communicable diseases. In many states and regions, the rural and urban public health care system is in an unsatisfactory state leading to pauperisation of poor households due to expensive private health

care. The public spending on health as a percentage of GDP in India has more or less stagnated during the past two decades of economic reforms .It was 0.9 per cent in 1990-91 and reached only 1.30 per cent of GDP in 2015-16. India ranks sixth from the bottom, amongst all countries in the world in terms of public expenditure on healthcare as a proportion of the GDP. The low percentage of GDP spending on health suggests that not enough resources are mobilised for health, that access to health care is insufficient and that quality of services are poor. Even the benefit of small public expenditure on health is distributed unequally between better endowed and vulnerable sections of the society. This is particularly true for the women, children and socially disadvantaged communities like scheduled tribes (Government of India, 2002).

The structural adjustment programme has led the central and state governments to reduce the funds for social sector. In fact, the two significant changes that have taken place in the health sector of the country during the era of economic liberalisation were the growing presence of private health care sector and the declining role of public institutions in the health care delivery. As public health investment decreased and user fees in the public sector increased, the private sector exploited the market opportunity. All these have led to expensive changes in the structure, organisation and delivery of health care services in the country.

Similar to the pattern of many developing countries, the private sector spending on health care in India is substantially higher compared to public spending, but within the private spending the share of out-of-pocket expenditure is considerably higher. In fact, out-of-pocket expenditure in India is over four times higher than that of the public spending on health care. Private health care being unregulated, significantly increases cost of health care and makes it unaffordable to the poor and vulnerable sections of the country. The worst part of the liberalised era is that the reform policies have led to greater commercialisation of health care sector and cost of health care has risen rapidly. While the public health infrastructure has been allowed to decay, private health care sector is wooed with a plethora of incentives. Due to these developments, access and affordability of health care have

suffered enormously, leading the failure to provide financial risk protection to the population in general and the poor in particular. The high out-of-pocket expenditure with limited role for the public sector to finance health expenditure has resulted in an inequitable method of health care financing and acts as a strong barrier for wider accessibility of health care (Dror et al., 2007).

Even though the country has one of the highest economic growth rates of the world during the reform period, public commitment on health still remains weak. Although several private health insurance schemes exist in India, they merely cover 3 per cent of the population, a majority of which serve the population in high- or middle-income brackets (Elis et al., 2000). The large majority of rural population of the country remains outside of any health insurance coverage for outpatient treatment and thus has very low protection against financial cost of illness.

Most of the backward caste population of the country lives in rural areas which accounts for 73 per cent of the population but have only 25 per cent of the country's health infrastructure, medical manpower and other health care resources (Patil et al., 2002). High levels of private health care expenditure and out-of-pocket expenditure are placing considerable financial burden on households (Berman et al., 2010). In the absence of integrated public health care or universal social insurance system, catastrophic payments are likely to plunge a sizable section of even the well-off to abysmal poverty levels (Krishna, 2004). The increased dependence of the population, including poor and vulnerable, on private health care providers, the lack of health insurance and out-of-pocket payments are leaving many impoverished (Ray et al., 2002; Mukherjee et al.,2010). Unregulated health care markets in countries like India tend to favour the affluent when the determining factor of treatment option offered to participants is not the real treatment indication but the need to enhance hospital performance through procedure volumes. Consequently the poor and marginalised either do not reach the hospital system or receive sub-standard care (Daivadanam et al., 2012). Considering the fact that it is the households who are the important contributor in the financing of health care in the country and only small portion of them are covered by any kind of insurance, it

necessitates the study of financing pattern employed by them to meet health care expenditure.

There were few noticeable initiatives in the health sector by the Central Government during the liberalisation period. One crucial initiative was the introduction of Rastriya Swasthya Bima Yojana (RSBY[iii]). Launched on March 2008 as a national health insurance scheme for people below poverty line, RSBY was designed to protect the households from financial risk against the hospitalisation. Some of the state governments also have come with their own insurance schemes. Despite an array of medical insurance schemes operated by the RSBY and by the state governments, public and private insurance companies, India's health insurance sector remains weak and fragmented.

With its renowned model of 'good health at a low cost', the state of Kerala has achieved health indicators measured in terms of mortality and fertility indicators, comparable with advanced economies of the world. The commendable achievements of Kerala's health care sector when compared to other states of India have been well documented (Paniker and Soman, 1984; Kannan et al., 1991). The focus of most of these studies have been mostly on the social determinants of improvements in health care (Harikurup, 2014).The tradition of the government support for health development has played a pivotal role in the advancement of health care sector in Kerala. In fact, the initial period of rapid growth in health facilities was dominated by the public sector. Further, many factors in the social settings of Kerala were favourable to the rapid growth of demand for health care. The high level of education, especially female education, ensured that people were easily sensitized to the newer developments in medical treatment. The settlement pattern in Kerala, with comparatively easy accessibility to the towns and other centres where medical institutions were situated, was another contributory factor. The rapid expansion of health care facilities in the government sector during the 1960s and 1970s led to the growing awareness of modern methods of medical care in the state. The increasing consumer expenditure associated with the changes in the distribution of income

especially among the lower income households also has fuelled the growing demand for private health care (Kutty, 2000).

By the mid 1980s, because of the fiscal and other problems, there was a slowdown in the growth of government health institutions. By this time, the private sector took the lead in the growth of health care facilities in the state. In the recent years, there has been considerable growth in private health care facilities in the state so much so that they now outstrip the government facilities in number. The average density of beds in the private sector is almost twice in the public sector in Kerala. Thus, the present challenge of health care system of Kerala is that, increasingly public sector is unable to meet the demands for health care and the people of the state have responded to these inadequacies by increasing private sector use. Despite the fact that the state has enormous health care infrastructure, the distribution of secondary care institutions[iv] are uneven. There is obvious concentration of secondary public and private providers in socio-economically better-off districts in the state. In fact the growths of private facilities are greater in those districts which had higher concentration of public provision of secondary care.

Further, the expectancy of life has increased, but with consequent rise in degenerative diseases of ageing and life-styles. Communicable diseases are still dominant and constitute major public health issue in the state. Changes in dietary habits and increased tobacco/ alcohol use in the state are likely to increase the incidence of chronic diseases in future as well. Though the mortality indicators are low in the state, morbidity rate is quite high resulting in what is known as "low mortality high morbidity syndrome". In terms of the financing of the health care in the state, household sector is the main contributor and there is heavy reliance of out-of-pocket payment as the principal source of health care financing. The rapid growth of private health care facilities led to the escalation of cost of treatment among the people who are conscious of quality health care. The burden of health expenditure incurred by the households in Kerala is the highest compared to other states of the country. Though the state has admirable accomplishments in its health care sector, it is argued that there are significant outlier population like marginalised communities

who have left out of Kerala's health success story. Given the peculiar situation of Kerala, where people live longer, presumably with costly chronic diseases along with relatively small financial resources, there is an urgent need for a comprehensive analysis of financing of health care in the state.

1.3 Scope of the Study

The study looks at the health care financing mechanism among the marginalised communities of Kerala. The scope of the study is limited to the analysis of financing of health care at the household level. Thus, among the different methods of financing, the present study essentially focuses on the out-of-pocket payments, public and private health insurance. With respects to the marginalised communities, the study confines its scope to the scheduled tribe communities who are the most deprived among the communities in Kerala. Schedule tribe households have much higher deprivation index as compared to any other caste and community groups in the state as defined by the Human Development Report of Kerala (Government of Kerala, 2006) and are the most disadvantaged one among the outlier communities (Kurien, 1995; Kerala State Planning Board, 2009; Rajasenan et al., 2013). The study limits its coverage to the three tribal concentrated districts of the state namely Wayanad, Idukki and Palakkad.

1.4 The Research Problem and Research Gap

Based on the literature reviewed, it has been found that the issue of impoverishment arising from health care expenditure has been widely studied. At the same time, there are gaps in knowledge about health care financing of the households of Kerala in general, and, the marginalised segments in particular. Studies using aggregate data on health expenditure may conceal the impact on individual households that carry the highest burden. With the changes in the structure of Kerala's health care delivery system, the large majority of vulnerable population in the state are susceptible to catastrophic health expenditure particularly when an earning member fell ill or the household faces a hospitalisation event. Given the rising expenditure on health care and the inability of the state and the

market to protect the vulnerable sections of the society, it becomes increasingly imperative to look at various mechanisms of financing of health care expenditure of marginalised communities. Thus, this study takes an analytical look at various aspects related to financing of health care of marginalised households by focussing on the scheduled tribe communities who are the most deprived among the marginalised communities in the state.

No comprehensive attempts have been made so far to understand the burden of health care payments among the tribal communities in the state. The studies that have examined the health care issues of tribal communities have ignored the important aspects financing of health care and essentially focussed on certain outcome variables. In the context where an equitable health financing system that protects households from financial hardship is either unavailable or deficient in the state, even relatively modest expenditures on health can be financially disastrous for the tribal communities. Even in the case of outcome variables, treating the tribal communities as one homogeneous group will undermine the inherent differences between different tribal communities. Therefore, an inter-tribal and intra-tribal analysis of health status and financing of health care are needed for a proper understanding of the problem. The present study is an attempt to address this research gap.

1.5 Objectives of the Study

The major objectives of the present study are:-

1. to examine the status, accessibility and utilisation of health care among the tribal communities
2. to trace out the incidence and intensity of out-of-pocket health care spending among the tribal households
3. to investigate the coverage of health insurance schemes among the tribal households
4. to explore the coping mechanisms employed by the tribal households to manage their health care expenditures, and

5. to analyse the extent of financial protection enjoyed by the tribal households in health care management.

1.6 Research Hypotheses

The study hypothesises that

1. there is no statistically significant difference in the median out-of -pocket health spending of tribal communities.

2. there is no statistically significant difference in the mean access to health care institutions among the tribal communities.

1.7 Methodology and Data Source

The study utilises both primary and secondary data. Primary data was collected through a sample survey among selected scheduled tribe households from three tribal concentrated districts of Kerala, namely Wayanad, Idukki and Palakkad. Wayanad (31.24%), Idukki (11.51%) and Palakkad (10.10%) accounts for over fifty percent of total tribal population in the state .Further, these three districts have the high deprivation indices of above 40 per cent. The tribal community in Kerala is largely heterogeneous and each community has different traditions, social customs, beliefs, rules and practices. It has also been observed to have considerable differences in the health, education and living standards among forward and backwards tribes in the state. The Census (2011) identified 36 tribal communities in Kerala in which 12 constitutes around 90 percent of their population. The study was conducted among eight such non-primitive tribal communities. The selected tribal communities were Paniyan, Adiyan, Kuruman, Kurichiyan, Uraly Kuruman, Mala Arayan, Muthuvan and Irular. A multi-stage stratified random sampling with the aid of structured interview schedule was undertaken for gathering information from the selected households. The process of sampling was carried out in three stages, namely at the community level, district level and at the tribal settlement level. All the tribal households in the state were identified as the sample frame. At the first stage, the settlements of eight selected tribal communities were selected from the

sample frame. At the second stage, by employing the principle of 'maximum percentage of tribal community as a percentage of the total population of the district', Wayanad was chosen for studying five communities (Paniyan, Adiyan, Kuruman, Kurichiyan and Uraly Kuruman), Idukki was chosen for two communities (Mala Arayan and Muthuvan) and Palakkad was chosen for the study of one tribal community (Irular). At the third stage, tribal settlements of each community were identified at the taluk level and households were selected using random sampling technique. The sample size was estimated in such a way as to ensure at least one percent representation of the total household of the eight tribal communities under study. Thus, the sample size of the study is calculated as 596 tribal households[v].

The reports of Directorate of Health Services, Government of Kerala, reports of NGOs working in tribal area, consumer expenditure surveys of National Sample Survey Organisation, SRS bulletin and census records of the country were the major sources of secondary data. Along with the quantitative methods, the qualitative research tool namely Focus Group Discussions were conducted to draw insights into the health seeking behaviours, community perceptions and their viewpoints on status of health and health care. The Focus Group Discussions were carried out for all the eight communities separately and also with the key stakeholders like officials of tribal welfare department, health care providers in the form of physician at primary health centres and elected members of local bodies.

1.7.1. Tools for Analysis

For the analysis of the prevalence, intensity and incidence of catastrophic health expenditure and to trace out the extent of financial protection enjoyed by the tribal communities, the study used the methodological framework of Minimum Standard Approach popularised by Wagstaff (2001, 2003) and Doorslaer (2006)[vi]. Along with descriptive statistics following tools of inferential statistics is used in the study.

a) Kruskal Wallis Test

The Kruskal Wallis *H* test is the non-parametric alternative of One Way Analysis of Variance (ANOVA) and is used when the mean of the distribution is not representative and the distribution is not normal. Based on the ranked data, the Kruskal Wallis test statistic *H* is calculated as:

$$H = \frac{12}{N(N+1)} \sum_{i=1}^{K} \frac{R_i{}^2}{n_i} - 3(N+1)$$

b) Mann-Whitney U Test

This is a powerful non-parametric method and is used for the pair-wise comparison when the distribution significantly deviate from the normality. As an alternative to *t* test, Mann Whitney *U* test statistic is calculated using the equation:

$$U = N_1 N_2 + N_1 \frac{(N_1 + 1)}{2} - R_1$$

c) Pearson's Chi Square Test

The Pearson's Chi Square test is the popular non-parametric test used to analyse the degree of association between two categorical variables. *Chi square* statistic is calculated using the equation:

$$\chi^2 = \Sigma \frac{(\text{observed}_{ij} - \text{model}_{ij})}{\text{model}_{ij}}$$

d) One-Way Analysis of Variance (ANOVA)

The One Way Analysis of Variance is used to test the equality of three or more means when the distribution is normally or approximately normally distributed. It uses the *F* statistic to check whether group means differ and is calculated as:

$$F = \frac{MS_M}{MS_R}$$

e) Binary Logistic Regression

The study uses binary logistic regressions which have dependent variable with binary outcome. The logit model assumes that the probability distribution of the error term follows the logistic distribution function. The probability of the model is specified as:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 X_{1i} + b_2 X_{2i} + \cdots + b_n X_{ni})}}$$

f) One Sample t Test

One sample *t* test is the parametric test used to check whether the population mean equals a specified value. The test statistic is calculated using the formula

$$t = \frac{\bar{x} - \mu}{\sqrt{\frac{S^2}{n}}}$$

1.8 The Chapter Scheme

The whole report is presented in eight chapters. After the introductory chapter, the second chapter reviews the relevant theoretical literature with cross country studies on financing of health care, studies on the health care sectors of India and Kerala along with the review of studies on tribal health care issues. The third chapter brings out approaches of measuring the health care payments, measures financial catastrophe and the significance of coping mechanism in the financing of health care. A thorough examination of health sector of Kerala is the focus of the fourth chapter. An analysis of the tribal communities in Kerala with special emphasis on the eight major selected communities is presented in the fifth chapter. The comprehensive attempt to examine the health status of the tribal communities in terms of prevalence of morbidity, mortality, pattern of ailments, self perception and reported limitations in daily living is carried out in the sixth chapter. The chapter also examines the geographical accessibility and utilisation of health care facilities among the tribal communities. The detailed analysis of the financing of health care among the tribal communities focusing on the pervasiveness of out-of-pocket health

expenditure, its incidence and the extent of health insurance coverage are included in the seventh chapter. It also traces out the coping mechanism adopted by the tribal households to manage their health expenditure. The last chapter summarises the major findings and provides suggestions.

1.9 Limitations of the Study

The following are the major limitations of the present study

a) The study used self perceived morbidity for the analysis of prevalence of ailments. As the tribal communities have a distinct perception about the illness, the analysis might have suffered from under-estimation. It may not have captured all illnesses occurred during the reference period.

b) For computation of the various measures of financial catastrophe, self reported income and expenditure data that are not verifiable from other sources, were utilised. Hence, the estimates may be biased.

c) The recall period of tribal community is poor, which may have exerted an influence on the findings of the study.

d) Out of the total tribal communities in the state, the study confined its focus on eight prominent non-primitive tribal communities. Since each tribal community has a distinct way of living, culture and perception, it will be difficult to generalise the findings for the other tribal communities.

e) Since the study concentrates on the three tribal dominated districts of Kerala, the results may have been influenced by the health care delivery system of the concerned districts. It may not be equally applicable to tribal communities of other districts in the state.

f) The dialect of the tribal communities[vii] like Muthuvan and Irular created difficulty in gathering information.

g) As some of the tribal households were unsure about the ailments they are being treated, the limited clinical knowledge of the researcher acted as a barrier for the analysis of type of ailments.

Notes

[i] The Alma Ata Declaration is the product of International Conference on Primary Health Care held at Alma Ata, Kazakhistan during September 6-12, 1978. It was the first international declaration that underlined the significance of primary health care. The declaration called for the member countries of World Health Organisation to attain the goal of 'health for all' by the year 2000 through the optimum utilisation of worlds' resources focussing on primary health care.

[ii] The process of Marketisation and liberalisation reforms initiated by the international institutions like World Bank, International Monetary Fund and World Trade Organisation had far reaching consequences on health care sector of the countries. In India, though the health sector reforms can be traced back to the early 1980s, the state began to reduce the role of public sector in the provision of health services with the economic liberalisation and structural adjustment programme of 1990s. The significant changes were the introduction of user fees in the public hospitals, decline in the public spending on health care and the liberalisation of drug pricing policy of the country.

[iii] Under RSBY every poor (below the poverty line) family can access free hospitalization care and day care procedures up to ₹30,000 per annum in selected private and public health facilities. A maximum of five members of a family can be covered under the scheme on a floater basis. While the state governments are responsible for identifying the eligible poor families for the scheme, the actual implementation of the scheme is done by the insurance companies, which are selected through bids at the state level. The eligible families are provided with a smart card by the insurance company, and treatment can be received at the selected health facilities without cash transactions.

[iv] Secondary health care institutions comprises of community health centres or taluk hospitals and district hospitals in Kerala.

[v] Further details regarding the sampling design is provided in the sixth chapter.

[vi] The minimum standard approach tries to quantify the inequalities in the payments for health care and examines whether health care payments exceed a pre-specified share of prepayment income. The various measures of the approach are discussed in the third chapter.

[vii] Most of the tribal communities have a distinct spoken language. The details are presented in the fifth chapter.

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CHAPTER 2
REVIEW OF LITERATURE

2.1 Introduction

The studies on financing of health care have by and large focussed on the financial implications of payments for health care, especially when payment takes the nature of out-of-pocket (OOP). Most of them used a few proxy variables to explore the issues like catastrophic health expenditure and health care related impoverishment. This chapter reviews recent theoretical literature which deals with financing of health care. The chapter is organised in six sections. In the second section, cross country studies are reviewed. In the next section, studies on Indian health care system and case studies of other states in the country are explored. Fourth section reviews studies on financing of health care in Kerala. The fifth section analyses studies on health care aspect of tribal communities followed by conclusion.

2.2 Cross Country Studies of Financing of Health Care

Liu et al. (1995) on the basis of the study on China's health care system points out that health expenditure had a substantial impact on household income and indebtedness. The interaction between health and income has led to the vicious circle of illness, poverty and further illness in the country. Saurborn et al. (1996) examined the strategies that the rural households in Burkina Faso used to cope with the costs of illness in order to avert negative effects for household's production and assets, using the information from a sample of 566 households. They analysed strategies in four different dimensions, namely the type of behaviour, the sequence in which strategies are employed, the level at which strategies are negotiated and the success of strategies in protecting household production and assets. Sales of livestock was the main strategy to cope with the financial costs of health care. Intra-household labour substitution was used to compensate for any labour lost due to

illness. However, labour substitution did not eliminate production losses among the majority of households struck with severe illness of a productive member. Only wealthy households were able to fully compensate labour losses by hiring labour or by investing in equipments to enhance productivity. The household's ability to avert the loss of production and / or assets was varied and depended on household size, composition of assets, on the type and duration of illness and on clustering of crisis. Coping with the costs of illness largely occurred at the level of household. Intra-household transfers of resources played only a minimum role.

Kei Kawabata et al. (2002) made a preliminary analysis using income and expenditure survey data of 60 countries and demonstrated that countries in lower income groups have a greater proportion of households with catastrophic levels of health spending than do the higher income groups. Important determinants that were identified to influence catastrophic health expenditures were income, age of household members and employed/unemployed status of household head. In addition, household with elderly, handicapped or chronically ill members were found to be more likely to confront with catastrophic health spending due to their greater need for health services and their lack of financial resources. On the contrary, younger and healthy households had a greater likelihood of avoiding catastrophic levels of health spending.

Damme et al. (2004) studied OOP expenditure during a dengue epidemic in poor rural area of Banteay Meanchey in Cambodia to trace out how health seeking behaviour influenced expenditure, how families financed such expenditure and how they tried to cope with incurred debts. A sample of 72 households with dengue patients were interviewed in three surveys to gain qualitative and quantitative insights into OOP expenditure. OOP payments during dengue epidemic for people seeking private health care were very high, often over 50 per cent of per capita income. Such expenditure was considerably lower for people using the public hospital in combination with private providers and still lower for those using exclusively the public hospital. It was found that after treatment 63 per cent were in debt. People who used a private provider had to borrow money or use sale of assets.

The study found that Cambodian households used combinations of different coping strategies such as savings, selling consumables, selling assets and borrowing money to finance OOP expenditure. The study observed that without well established national health services or social welfare systems, catastrophic health expenditure may be widespread and will result in impoverishment of households.

Thuan et al. (2006) analysed the relationship between illness and economic burden of OOP health care payments on households of Bavi district of Vietnam. They utilised twelve month follow up interviews among 621 households selected using multistage sampling procedure. The study found that 92.90 per cent of individuals suffered from at least one episode of illness during the year leading up to the survey. There were no significant differences in the incidence of illness among the different expenditure quintiles. Yet, the number of illness episodes was higher among the bottom expenditure quintile. Communicable diseases dominated the study area and constituted two-thirds of self reported illness. As a result, expenditure on communicable diseases account for nearly half of the total health expenditure of the households. Seven households had incurred catastrophic health expenditure based on the capacity to pay. Expenditure on communicable diseases accounted more than 85 per cent of total health expenditure. It was also revealed that the number of household members was relatively small and the number of illness episodes per person was higher among them. The study indicated that catastrophic health expenditure of households was not as a result of one single event of illness but rather a series of events and more to every illness among the poor households.

Doorslaer et al. (2007) tried to determine the magnitude and distribution of OOP payments for health care in 14 countries and territories that account for 81 per cent of the total population of Asia by focussing on catastrophic health expenditure that severely disrupts living standards of households using data from nationally representative household expenditure surveys. It was found that OOP payments were the principal means of financing throughout Asia. The OOP contribution reaches three quarters or more of total expenditures on health in Nepal, India and Vietnam. There were substantial variations across territories with respect to OOP

payments. The share of OOP payments that goes to medicines was generally larger in the poor and rural countries. The share was 70 per cent or more in Bangladesh, India and Vietnam. The income gradient was steepest for India suggesting that the better-off can respond to health problems with the purchase of medical care and medicines, while the poor cannot afford to divert resources from other pressing demand on their constrained budgets. The reliance in OOP payments was negatively correlated with national income. Heavy reliance on OOP had important consequences on household living standards. Households accommodated such spending through diversion of considerable resources from current consumption and / or accumulation of debt or the exhaustion of savings and assets with long term consequences for welfare of households.

Xu et al. (2007) examined the financial consequences of paying for health care utilising the household data of 89 countries during the period between 1990 and 2003 and estimated the extent of catastrophic spending and impoverishment associated with OOP payments for health services. The study exposed considerable variations in the incidence of financial catastrophe across countries, ranging from virtually zero per cent in the Czech Republic, Slovakia and the United Kingdom to more than 10 percent in Brazil and Vietnam. Financial catastrophe has occurred at all income levels. The problem was most severe in low income countries and more severe in middle than high income settings. Around 150 million people annually suffered financial catastrophe and 100 million were pushed under the poverty level simply because they need to pay for the health services they use. More than 90 percent of these poor live in low income countries. The proportion of the population above sixty years increased the incidence of financial catastrophe in middle income countries while the proportion of the population under the age of five was not significant in any income group. It was pointed out that the incidence of financial catastrophe was negatively correlated with the extent to which countries fund their health systems using any form of prepayment mechanism. At the same time, catastrophe was positively correlated with the relative importance of OOP payments in total health spending.

Limwattananon et al. (2007) has estimated the catastrophic expenditure and impoverishment due to household OOP payments comparing the periods before and after the introduction of universal health care coverage in Thailand. It was found that regardless of the health insurance scheme, most of the households utilising inpatient services faced catastrophic health expenditure. Further, those using the outpatient services of private hospitals had the greatest probability of experiencing financial catastrophe. The disparity between the impoverishing impact of OOP health payments in private and public hospitals was larger for those who sought inpatient care than for those who sought only outpatient care. It was revealed that the cost of self-medication had the smallest effect on impoverishment. The study showed that households using inpatient services, especially private and public hospitals outside the respondents' home province had a higher incidence of catastrophic expenditure and impoverishment from health payments.

Wilkies et al. (2008) provided a conceptual framework for understanding how households cope with cost of severe illness and high medical fees and explored different strategies that enabled households to cope it better. The study was based on household health expenditure survey in rural China which included 2722 households undertaken in 1994. The study found that most of the households were able to finance health care payments without incurring catastrophic impact. Resources outside the household, particularly those assessed through social networks, were important sources of labour and financial support. Majority of households were able to finance subsequent unanticipated expenditures and cope with cost of illness. Those households that were not able to meet such expenditures tend to be constrained in options available. Households that have lacked access to credit were forced to rely on assets within the households to finance medical bills, often at the expense of investment in production. In most extreme cases, the disposal of core productive assets combined with a credit constraint reduced subsequent incomes. The study found that households utilised different strategies to meet the unexpected cost of treatment including the use of accumulated savings and borrowings. The study suggests that none of the strategies selected alone are likely to provide full protection against catastrophic illness.

Leive et al. (2008) explored the problem of how households cope with OOP health payments in 15 African countries utilising world health survey of WHO conducted in 2002-03. It was found that, in most countries, around 30 per cent of households financed OOP health expenditure by borrowing and selling assets. About 50 per cent of such households had a hospitalisation in the previous year. In most of the countries, fewer households in the richest quartile sold assets or borrowed money to cope with health expenditure. Households that have incurred expenditure on inpatient services had greater likelihood of borrowing or selling assets. In half of the countries, urban households were found to be significantly less likely than rural ones to cope by borrowing and selling assets.

Galarraga et al. (2010) tried to estimate the treatment effect of health insurance targeted at the poorest families on catastrophic health expenditures and OOP health spending in Mexico. The study compared a number of variables with implementation of Seguro Popular (SP) or Popular Health Insurance, a comprehensive health reform effort to provide financial protection in health for the poorest segment of the population and tried to calculate the protective effect of the programme. The study used two different data sources namely SP impact evaluation survey and national health and nutrition survey. In the SP impact evaluation survey, it was found that 6.64 per cent of SP insured households and 9.39 per cent of uninsured households incurred catastrophic health expenditures. In the national health and nutrition survey, 4.71 per cent of insured and 6.67 per cent of uninsured households exhibited catastrophic health expenditures. In terms of OOP expenditures on health care, it was found to be significantly lower for the insured households than non-insured households in both the surveys. The study found a protective effect of 54 per cent for the country as a whole and the insurance scheme has a protective effect for the entire Mexico, not only in the pilot experiment area. Thus, the analysis showed that the popular insurance system for the poor in Mexico has reduced the catastrophic health expenditures for most of the households in the country.

Lara et al. (2011) has attempted to test how the non-insured households with low per capita income in Bogota, Colombia were able to handle the unexpected health expenditure and also to identify the key determinants of catastrophic health expenditure using the data of Health Services Use and Expenditure study conducted in 2001. The analysis revealed that 4.50 per cent of households incurred catastrophic health spending during the period. Among them, 33.90 per cent of the households entered into a stage of impoverishment due to OOP health expenditure. The highest prevalence of financial catastrophe was found among the lowest expenditure quintiles. Most of such households had incurred expenditure on inpatient services. The likelihood of catastrophic health spending was greater among smaller households. Households with self employed head had 1.90 per cent more likelihood for incurring catastrophic health expenditure. As expected, households with inpatient episodes had 36.60 per cent greater likelihood of catastrophic health spending than that of households with only outpatient visits. Further, the probability increased with the increase in the number of working adults in the households. Similarly, households with aged head had 0.20 per cent more likelihood of catastrophic spending than with households with younger head. Gender of the head and the presence of disabled members do not exert significant influence on catastrophic health expenditure among Bogota households. Duggal (2012) points out that US government spend nearly 9 per cent of its GDP on health care and yet about 50 million people do not have adequate access to health care. For him, this is due to the way in which health care is financed; it is predominantly insurance-based.

Brinda et al. (2014) has investigated the determinants of OOP health expenditures among adult and aged population of United Republic of Tanzania with respect to a number of social and economic factors using the data of Tanzania National Panel Survey. The analysis among adult participants revealed that female gender, occupation, hearing effects and functional disability are significantly associated with higher OOP health expenditures. At the same time, visits to the traditional healer increased the OOP health expenditures among the adult participants. Women aged above 45 years had significantly smaller OOP health expenditures than men indicating the fact that higher OOP health expenditure among

women can be attributed to expenditure on their reproductive health. The analysis among the older participants indicated that presence of visual impairment, functional disability and traditional health care visits significantly increased OOP health expenditures. But participants having unskilled manual labour as occupation incurred significantly lesser health expenditure, in spite of the fact that they have higher prevalence of disability. Similarly, participants without formal education had lower OOP health expenditures. The analysis showed that 18 per cent of the households experienced catastrophic health expenditure in the country. The multivariate analysis proved that factors such as household members with chronic illnesses, household head as manual labourer, visit to traditional healer and household significantly increased the likelihood of experiencing catastrophic health expenditure.

Adisa (2015) has investigated the existence and determinants of catastrophic health expenditure among urban elderly households in Nigeria. It was established that 9.6 per cent of the households under study faced catastrophic health expenditure. The study found significant differences across income quintiles for the 10 per cent threshold. It was revealed that household size was negatively correlated to catastrophe and more educated households were more likely to incur catastrophic health expenditure than less educated households. Non –enrolment in health insurance was positively associated with the risk of catastrophic health expenditure. Having access to informal health financing significantly reduced the risk of catastrophe. Households with more working age members were less likely to incur catastrophic health expenditure. At the same time, average marginal effects of gender were negative and significant.

Buigut et al. (2015) has investigated the incidence and determinants of catastrophic health expenditure among the slum communities in Kenya between May 2012 and April 2013 using the data from the Indicator Development for Surveillance of Urban Emergencies (IDSUE). They consider the OOP payments as a proportion of income and threshold ranging from 5 to 30 per cent were used to trace out catastrophic health expenditure. The study found that an increase in the number

of working adults reduced the likelihood of catastrophic expenditure. Similarly, the enrolment in the informal social safety net has reduced the risk of catastrophe. Visiting a hospital increased the chances of catastrophic health expenditure when compared to seeking remedy by purchasing drugs, while visiting a public hospital increased the likelihood by at least 3.9 times. Compared to households where no members fell sick or where no care is sought, those members requiring medical care for illness faced an increased likelihood of catastrophic health expenditure by 1.7 times. Having a formal employment or owning a business reduced the risk of financial catastrophe implying that a stable livelihood acts as a safeguard against catastrophic health expenditure. The study indicated that the proportion of households facing catastrophic health payments varies according to method employed.

2.3 Studies on Indian Health Care System

Sanyal (1996) points out that private health care dominate in outpatient treatment and public sector with respect to inpatients in India. The ratio of outpatients to inpatients in private sector far outstrips that of the public sector. There is hardly any difference between rural and urban sectors. Of particular importance is that much higher ratio obtained for secondary and tertiary hospitals compared to the lower level indicting the inefficiency or the incapability of the primary health care system. Thus substantial proportion of outpatients is treated in higher levels of hospitals which indicate that the primary health care system is not able to meet the demand. A little less than one-third of hospitalised cases even in the poorest stratum were treated in the private sector in rural areas. The proportion rises with the rise in income/expenditure, but the maximum value was 49 per cent. This indicates the extent to which public care system was used by the rich. The urban scene was not different either. The public or the government source is more in demand for acute cases.

Ellis et al. (2000) found that 82 per cent of total healthcare expenditure is spend by private sector and almost all of this represents private OOP in India. Most of the private spending is on curative care, consultations, diagnostics and inpatient

care. This OOP expenditure put enormous financial burden on individuals. Even visits to public facilities involve considerable OOP expenditure. This OOP expenditure takes the form of payments for medicines, laboratory tests and direct payment to providers. This happens in the country as medicines are often out of stock at public health facilities and patients have to approach the market for medicines as well as laboratory tests.

Ray et al. (2002) conducted a community based prospective cohort study in a Haryana village, Chhainsa, with 800 houses. Of the 800 families in the village, 160 were selected through systematic random sampling. Of these 156 families were followed up for a period of 12 months (September 1998 to August 1999) by undertaking monthly visits. The responses from each family were recorded and the results do show that private health sector was utilised in 59.04 per cent of total episodes. Utilisation of the private sector was directly associated with a higher socio-economic status. As the socio-economic status improved, the utilisation of the private sector increased significantly. Of the total expenditure on non-hospitalised cases, 83.6 per cent was incurred in the private sector. In a lower economic class, the p**e**r-episode and per capita mean expenditure was far less in relation to the proportion of morbidity and total expenditure. The reasons were the higher utilisation of the public sector and poor availability of money to spend on health among the people of the socio-economically disadvantaged groups. The mean per episode expenditure was high among the middle and upper middle classes in comparison to the lower and lower middle classes. . The study clearly shows that there was greater flow of monetary resources from the community to the private sector. This has led to higher per capita OOP health expenditure in the region.

World Bank (2002) study on India's health care system bring out that more than 40 per cent of individuals, who were hospitalised in the country in one year borrow money or sell assets to cover the costs. Those who avail treatment pay a large proportion of their annual income for health care. Hospitalised Indians spend more than half, estimated as 58 per cent, of their total expenditure on health care. One of the possible consequences of the high medical expenditure was pushing of

these families into a zone of permanent poverty. Almost one quarter of hospitalised Indians fall into poverty every year as direct consequences of the medical expenses they pay out of their pocket towards hospitalisation.

Garg and Karan (2005) have shown that approximately 11 per cent of households in India paid for medical needs which were more than 10 per cent of their total expenditure during 1999-2000. Such a high proportion of household resources are absorbed by health care markets that are predominantly led by the private sector. Using the norm of one dollar poverty line, they found that during 1999-2000, approximately 32 to 37 million people in India were pushed below poverty line due to high OOP payments for health care. Approximately six million households faced catastrophic impact in India. They point out that the catastrophic impact of OOP payments has been on the rise over the years.

Krishna (2007) conducted a study of three villages of Indian states of Rajasthan, Andhra Pradesh and Gujarat reveals that ill-health and health care expenses lead the list of common reasons for falling into poverty. Health care costs are one of the important causes of impoverishment in India.

Dror et al. (2007) estimated the cost of illness in five resource deficient locations, two each from Maharashtra and Tamil Nadu and one from Bihar to trace out the perceived needs for health care demand and financial risks of illness. The study found that the direct cost accounted for more sixty per cent of the cost of treatment. Out of the total illness episodes occurred, 63.6 per cent were acute, most of them parasitic, 18.5 per cent were chronic, most frequent being cardiovascular and 3.6 per cent were accidents and remaining 14.3 per cent were undetermined diseases. Striking differences in the morbidity patterns across age group were also observed. Among the youth, acute illness accounted 85 per cent but it was less than 30 per cent in the case of aged. While chronic illness accounted to 6 per cent in the case of children and adolescents, it was more than 50 per cent in the case of elderly. For the acute illness, the largest cost components were tests and drugs, it was hospitalisation and drugs for chronic illness and for accidents, hospitalisation was the most expensive item. The cost of chronic illness and accidents was higher than

cost of acute illness. In any case, illness involving hospitalisation was costlier. Half of the hospitalised respondents spend 23 per cent of their annual income for health care. The cost associated with illness increased with the increase in income.

Bonu et al. (2007) investigated the incidence, intensity and correlates of catastrophic health care payment and explored households that fell into poverty due to financial catastrophe. The study used data from 61st round of National Sample Survey Organisation (NSSO) data. It was observed that 1.4 per cent of households reported institutional health payments while 61.8 per cent reported non-institutional health payments. The monthly average health care payment was the lowest in Bihar and was highest in Kerala. Households from the richest decile spent close to twenty times more on health care than the poorest decile. The scheduled tribe households spent one-fourth amount than that of other castes spent on health care. Heath care payments constituted 4.6 per cent of the total household expenditure. The proportion of health care payment to total expenditure varied significantly between states. The incidence of catastrophe at 10 per cent threshold was found to be 13.1 per cent and at 40 per cent threshold it was 5.1 per cent. At both levels, the incidence of health care payment was higher in rural areas compared to urban areas. The incidence was higher among the households with less than five members, those in the richer deciles and those with older head of the household. The incidence varied significantly with type of employment and religion. 8.5 per cent of households below the poverty line have made health care payment more than 10 per cent of their monthly expenditure. The poverty headcount increased by 3.5 per cent as a result of health care payments.

Flores et al. (2008) in their study explored the financial coping mechanisms utilised by the households using 52nd round morbidity and health survey conducted by NSSO in 1995-96. They decomposed the impoverishment effect of health care payments into transient poverty and hidden poverty. The transient poverty refers to the poverty due to households' diverting consumption of other basic needs to health care. On the other hand, hidden poverty is household that are poor on the basis of their sustainable level of consumption not being recognised as poor by conventional measures because of their use of savings, assets or borrowings to pay for large

health care costs that temporarily raise their total spending above poverty threshold. The study found that in rural areas, borrowing was the main financial coping mechanism, financing almost 34 per cent of OOP expenditures, whereas in urban areas saving was the main source of funding but borrowing still accounts for 22 per cent of health expenditures.

Selvaraj et al. (2009) examined the nature and significance of growing burden of public health expenditure on households drawing evidences from different rounds of NSSO data on health care and consumption expenditure. The study compared the period of 1986-95 with that of 1996-2004, largely representing pre and post liberalisation period respectively. During the period of study, the role of private sector in health care delivery has witnessed a manifold rise. In 2004, public sector provision of outpatient health care accounted for approximately one-fifth of total outpatient care as against over one-fourth (26 per cent) in 1987-88. In hospitalisation care, the share of public provision which used to cater around 60 per cent in 1987-88 has registered a steep decline to approximately 40 per cent in 2004. Altogether, public sector provided care for only 26 per cent of the ailing episodes in India. . The cost of treatment has significantly increased over the years in the country both for inpatients and outpatients in both private and government sources. However, the increase has been much faster in the former. The study shows that a large proportion of households are required to pay for their medical needs much beyond their paying capacity and was incurring expenditure of a catastrophic nature. The OOP payments have proved as a significant drain on the household's total resources as measured in terms of household's total consumption expenditure. The OOP as a share of total resources increased from 5 per cent in 1993-94 to approximately 7 per cent in 2004-05 reflecting significant pressure on households living status. Approximately, 14 per cent of households in rural areas and 12 per cent of households in urban areas spend more than 10 per cent of their total consumption expenditure on health care. For these households, the OOP payment as a share of total non-food expenditure is quite high reflecting a catastrophic impact to these households. The poverty impact of OOP has been increasing both in terms of proportion and absolute number of poor. The increase in the additional number of

poor because of OOP payments over the years essentially reflects a long term and a perennial impact of OOP payments on Indian households. Despite low per capita OOP in rural areas as compared to that in urban areas, the impact of OOP in terms of the poverty head count was higher in rural areas in 2004-05. This changing scenario provides another reflection of the increasing impoverishment impact of OOP in rural areas.

Using the data from 25th schedule of the 60th round of NSSO conducted from January to June, 2004, Bonu et al. (2009) investigated the incidence and correlates of catastrophic maternal expenditure in India covering 6879 births. It was revealed that 73 per cent of women received antenatal care while 64 per cent received postnatal care. At the same time, only 43 per cent of births took place with all the health facilities. The utilisation of maternal health care services by the type of provider differed significantly by community, household and individual factors. Private providers were preferred over public providers in urban areas for all maternity services. In rural areas private providers was preferred only for the provision of antenatal care. Expenditures for all the maternity services were higher in urban areas except delivery care in public hospital, which the rural households spent more. The expenditures varied significantly with the states, households and women background characteristics. It was estimated that households from the poorest two deciles had expenditure greater than their annual capacity to pay indicating the financial distress that the poorest households face as a result of expenditures related to maternal health care. The incidence of financial catastrophe at 10 per cent threshold was calculated to be 16 per cent and the incidence was 51 per cent according to the criterion of capacity to pay. The incidence increased with the expenditure decile and the probability was higher in urban areas. The probabilities were significant in the case of educational status of women, religion and the states. The study points out that the households that are incurring expenditures on maternal health care in a particular year are likely to spend more than an average household in India would have spent on health care. Such households are facing financial distress as a result of it.

Chowdhury (2009) made a disaggregated analysis of the patterns of household health expenditure across socio-economic and ailment categories in an urban setting based on a primary survey of 150 slum households in South Delhi. The median health expenditure incurred by pensioners was the highest among households followed by the salaried. Average health expenditures demonstrated positive income gradient. The disease specific cost showed that households that experienced injury and accidents incurred highest average expenditures followed by tuberculosis and diseases of the nervous system. 39 per cent of the households spent more than 15 per cent of their income on health care. The average overshoot accounted 8 per cent of the total income for the 10 per cent threshold. Both the headcount and the gap decreased significantly for the higher thresholds. Households belonging to lower income category bears disproportionately higher burden of medical treatment. More female headed households incurred health expenditure above 10 per cent threshold and the ratio of OOP expenditure to total income was the highest for households whose main earner is a casual labourer.

Berman et al. (2010) attempted to measure the impoverishing effect of health care payments using NSSO's 60^{th} round of morbidity and health care survey conducted in 2004. The study found that 6.2 per cent of total households (6.6 per cent in rural areas and 5 per cent in urban areas) fell below poverty line as a result of total health care expenditure in 2004. Much of the impoverishment (79.3 per cent) was due to outpatient care which involved relatively small but more frequent payments, as only 20.7 per cent of impoverishment was due to inpatient care. That is, outpatient services accounted for much larger share of financial burden on households than inpatient services, even though the latter are more costly per service consumed. Furthermore, much of the impoverishment (76.5 per cent of households or 77.4 per cent of individuals) occurred in rural areas. The results of the study do indicate that the health expenditure related impoverishment in India is quite high. There is substantial variation across states of India, with few states accounting for most of the health expenditure related impoverishment. Kerala showed the highest effect of health related impoverishment. Kerala, Uttar Pradesh, Maharashtra, West Bengal and Andhra Pradesh accounted for over 50 per cent of impoverishment. The

high share of private health care spending, mainly OOP, reflects the considerable financial burden on households. The health care costs were found to be one of the important causes of impoverishment in India. The study also explored the importance of different sources of financial coping mechanisms and the results showed that the insurance coverage remains low and the current set of insurance plans were not well targeted or well designed to impact health related impoverishment.

Mondal et al. (2010) attempted to find out the major determining factors of catastrophic payments for health care and its impact on household economic status in three districts of West Bengal namely, Malda, North 24 Parganas and Bangura. It was revealed that more than 30 per cent of the affected households spent over 40 per cent of their annual non-food expenditure on inpatient care. The proportional spending was much lower for those who had spent only on outpatient care. Medical expenditure for chronic illness was the most important determinant for catastrophic expenditure followed by hospitalisation care. The analysis revealed that the type of medical care, the number of illness episodes, presence of household member with chronic illness, hospitalisation and institutional birth deliveries were important factors leading to catastrophic expenditure. The probability of household to incur catastrophic expenditure was highest for the treatment of chronic illness compared to the inpatient care, outpatient care and institutional care for child birth. About one quarter of hospitalised people were found to have made catastrophic health care payments and demonstrated high chances of tripping into poverty. It was observed that rural users were more vulnerable to such payments compared to their urban counterparts. Household size had a positive association with catastrophic payments but the association was weak across the thresholds. Similarly, treatment sought from private hospitals had higher chances of experiencing catastrophic payments than households where treatment had been sought from government facilities. The expenses incurred for the treatment of minor ailments were found to have exerted greater influence on household economic status.

Mukherjee et al. (2010) based on the two rounds of NSSO data, observed that people's dependence on private providers have increased over the years in the country, even among the poor and marginalised. This increased dependence of the population on private health care providers, the lack of health insurance and OOP payments have left many households impoverished in the country.

Ghosh (2011) explored the changes and magnitude of OOP spending on health care in India using the cross sectional data taken from the 50th (1993-94) and 61st (2004-05) round of consumption expenditure survey of NSSO focussing on 16 major states. The study revealed that the incidence of catastrophic health care expenditure has increased from 13.1 per cent in 1993-94 to 15.4 per cent in 2004-05. Drugs accounted for 61 to 88 per cent of the total OOP payments across states and hospitalisation accounted for only 13 per cent in 2004-05. While household in low income states spent a higher fraction of OOP payments on medicine, their counterparts in high income states spend a higher fraction on inpatient care. Despite greater concentration of catastrophic payments among better off households in the majority of the states, OOP payments aggravated the prevalence and intensity of poverty in India over the period. Evidence points out that higher incidence of impoverishment among lower-middle income population. Health care reforms in the country that resulted in the reduced role of the states in the provision of health care services and decline in the public spending, has pushed OOP payments upwards in both public and private facilities. These increases, in turn, affect health care utilisation and overall health. During the study period, the highest increase in OOP payments on health care as a share of total household consumption expenditure was observed in Kerala (4.7 per cent), Himachal Pradesh (2.5 per cent), Maharashtra (2 per cent) and Gujarat (1.9 per cent). Kerala has the highest average OOP health care spending share (10.5 per cent of total consumption) and there was little variation in this share across consumption expenditure quintiles. The proportion of households facing catastrophic OOP payments was 32.42 per cent in Kerala in 2004-5. The study found that apart from income and availability of health services, the mechanism of health care financing seemed to play an important role towards deciding state differences in OOP spending on health care. In states like Karnataka

where public health care investment and insurance coverage were higher, the share of OOP payments was lower. The study asserts that in the absence of adequate insurance coverage, expenditure to treat illness can lead to financial catastrophe, pushing individuals or households into poverty or deepening their existing poverty.

Bhojani et al. (2012) investigated whether and how OOP for outpatient care affected individuals with chronic conditions. The study was conducted among 3202 households that have are reported chronic conditions in K G Halli, Bangalore, South India. The study tried to assess the incidence and extent of the OOP payments and the resultant impoverishment among residents. It was found that 68.1 per cent of chronic conditions led to OOP payments. The incidence of payments varied in accordance with the health care service used. No statistically significant results were found in the OOP payment incidence between government and private sectors as place of consultation. The incidence was greatest and the odds for incurring OOP payment were 2.6 times greater for ailments treated in super speciality hospitals compared to government health centres. Median payment for chronic ailments was significantly greater when private sector was used for consultation. Households spend their greatest share of OOP payments on the purchase of medications. Apart from this, expenditures towards laboratory charges and consultation fee for doctors took the greatest share of OOP payments at the health centres and referral hospitals. At the super speciality hospitals, expenditure for travel accounted second largest share of OOP payments for health care. At any threshold, the incidence of financial catastrophe was greatest among the poorest households and decreased with the increase in income. The intensity of catastrophe at 10 per cent threshold was 2.5 per cent. The poorest households suffered greatest catastrophic overshoot and second greatest mean positive overshoot. The OOP payment for outpatient health care has pushed 0.9 per cent of individuals with chronic conditions below the poverty line in study area in a one month period, nearly doubling the absolute number of people living in poverty.

Kumar (2012) found that India is witnessing a rising incidence of non-communicable diseases (NCDs) such as cardiovascular diseases, chronic obstructive

pulmonary diseases, cancer, diabetics and injuries. High cost of medicines and longer duration of treatment of NCDs constitutes a great financial burden of the people of the country. Rao et al. (2012) point out that over 70 per cent of the spending on health is OOP in India. He argues that the low public spending on health care and uneven distribution have been a major cause for the immeseration of the poor in the country. On the contrary, Dilip (2012) believes that the increase in OOP expenses in the country is due to the larger share of households seeking medical care and improvement in access to health care. The growth of private health care sector and rise in the share of hospitalisation may also have contributed.

Selvaraj et al. (2012) has evaluated the RSBY and certified that it is a failure in terms of providing financial risk protection against catastrophic health care expenditure by households in India. Dror et al. (2012) have shown that the coverage of RSBY with in BPL households had touched 28 per cent as on 31st March 2011.

Shahrawat et al. (2012) made an attempt to estimate OOP payments for health care and related impoverishment across economic groups in India and also tried to explore the financial protection provided by RSBY programme using the 61st round of consumer expenditure survey (July 2004-June 2005) conducted by the NSSO. It was estimated that 62 per cent of all households and 52 per cent of households belonging to below poverty line had made OOP payments for health care. The poverty head count ratio increased by 3.5 per cent as a result of such payments. The increase in the poverty head count was larger among the rural population compared to their urban counterpart. Further, the increase in poverty gap for the people below poverty line was substantially larger than above poverty line suggesting that health payments have led to deepening of poverty among the very poor. Catastrophic expenditure on health was incurred by the 5 per cent of households that was considerably higher among the rural households compared with urban. The catastrophic payment for health increased progressively with the increase in economic status of the households. 72 per cent of OOP expenditures incurred on health care were on medicines and its share was significantly higher for outpatient than inpatient treatment. It was found that if no expenditures were incurred for

medicines, there would have been no increase in poverty headcount. The deepening of poverty among the poor due to payments for health care was substantially larger for the urban poor compared to rural poor.

Rama Pal (2012) attempted to provide a new measure of catastrophic OOP health expenditure based on new measure of consumption of necessities. The study was conducted for 15 major states of India utilising all India consumer expenditure survey of conducted by NSSO during July 2004 to June 2005. The analysis reveals that majority of Indian households were facing the incidence of catastrophic health expenditure. It indicates the adverse impact of ongoing health care policies which has put major burden of health care cost on households. The incidence of catastrophic payment went down with the increase in income. Almost all households from the lowest two consumption quintile groups incurred catastrophic health expenditure. The examination of determinants of catastrophic health expenditure showed that land possession and wealth index reduced the probability of catastrophic spending in rural India. The effect of education was seen as highest if the head of the household have education above primary level as compared to illiterate head. It was revealed that social factors played vital role in determining whether a household experience financial catastrophe. Households from socially deprived classes, namely, scheduled caste, scheduled tribes and those from other backward communities were found to be more likely to incur catastrophic health expenditure than households belonging to general category. The presence of children and elderly members increased the probability of catastrophic health expenditure. It was observed that spreading of awareness about health issues and availability of health care facilities played a crucial role in reducing the OOP health payments of households.

Devadasan et al. (2013) analysed the contribution of RSBY towards universal health coverage and the extent to which the scheme protects households from OOP payments. They studied the characteristics of patients who were hospitalised under the scheme to examine the extent of protection of patients from OOP payments at the time of hospitalisation. Two-stage stratified sampling

technique with a sample of 2920 households who are enrolled in the RSBY in Patan district of Gujarat was used for the study. Among 13087 individuals enrolled in RSBY, 520 hospitalisation episodes were reported leading a hospitalisation rate of 40 admissions per 1000 enrolled individuals. Most common reasons for hospitalisation were pregnancy related followed by hysterectomies, injuries and heart ailments. 73 per cent of individuals sought their treatment from private hospitals and 93 per cent of all hospitalised patients were satisfied with the treatment they received. The rate of hospitalisation fell with distance and there were no difference in hospitalisation rate between various religious groups, even though patients belonging to scheduled caste category had higher rate. The rates were higher for adults and elderly compared to children and adolescents. The study revealed that as high as 58 per cent of all admitted patients still had to make OOP payments to receive care at the time of hospitalisation. The study inferred that despite having the RSBY card, hospitals collected money from the patients. It confirms that though assess to hospital care has increased, the RSBY scheme were unable to prevent the occurrence of OOP payments of patients.

Tripathi et al. (2014) explored health care accessibility using unit data from the 60th round of NSSO and facility survey from the district level household survey of Uttar Pradesh (UP). They found that the OOP expenditure incurred by the scheduled caste households were lower than that of other castes in all four regions of UP. OOP expenditure was higher in the higher MPCE group and in the rural areas. There were wide variations across socio economic groups and in the rural areas. Further there were large variations in all regions of UP, but the situation was worse in Bundelkhand region. The health expenditure was primarily financed by the household's own resources but also revealed that borrowing was an important source of financing of OOP expenditure. In many cases, it accounted for almost ten percentage of OOP expenditure on health care. The scheduled caste households are in general seen to borrow a larger percentage in all regions of the state and the gap in the borrowing between them and other castes was the widest in Bundelkhand region. The study unveiled that rural poor and marginalised sections of the society are among the worst sufferers in terms of burden of treatment, regardless of the

region to which she/he may belong. The burden of treatment could be a major determinant of access to health care services, as it directly reflects the cost of treatment and capacity of household to be able to afford it. The higher the ratio the lower would be capacity of the household to bear it.

Gupta et al. (2015) explored the trends in health care expenditure, composition of OOP expenditure and incidence and distributional changes in India during eighteen years from 1993-94 to 2011-12. The study used three rounds of NSSO Data on household consumer expenditure, namely 50^{th}, 61^{st} and 68^{th}. During the period, the growth rate of OOP health expenditure surpassed the growth of consumption expenditure with a compound annual growth rate of 4.1 per cent. This has led to greater share of health expenditure in the consumption expenditure of the households in the country. The growth of health expenditure has been highest for the bottom and for the top quintiles resembling a U-shaped nature across income class. The analysis showed that OOP health expenditure were increasingly progressive during the first eleven years period and turned increasingly regressive during the latter part of the period. During the latter part, the annual compound growth rate of health expenditure of poorest quintile was double as that of richest quintile. Expenditure on medicines formed the major part of OOP health expenditure though its share has declined over the years. The sharpest increase was noticed in the case of diagnostics and its growth rate was higher for institutional care than that of non-institutional expenses. There was significantly high share of miscellaneous items that includes nonmedical expenses while seeking care, especially in the case of economically vulnerable communities. Put together, medicines and diagnostics played a significant role in increasing OOP health expenditures during the period of analysis.

Sundararaman and Muraleedharan (2015) examined the extent of financial protection enjoyed by the Indian households from the cost of health care and the trends and patterns in the morbidity using the 71^{st} round data of NSSO. The study found that average cost of health care in the country has risen sharply between the 60^{th} and 71^{st} rounds of NSSO. While the cost has doubled between 52^{nd} and 60^{th}

round, it has tripled between the 60th and 71st round. The OOP health expenditure was much higher in the private sector. In fact, OOP health expenditure incurred for the child birth in the private health care sector was 9.5 times higher that of public sector. Similarly, OOP health expenditure in the private sector was about four times higher than public sector with respect to hospitalisation and three times for outpatient care. The study revealed that though private providers dominate the outpatient care in the country, significant shift towards public providers are taking place in the rural parts of the country. About 90 per cent of the households in rural India and 89 per cent in urban area utilised allopathic form of treatment. There was marked reduction in the proportion of people who sought no care. The morbidity prevalence rate was 89 per thousand person in rural India and 118 in urban area in the reference period of 15 days. The study found that the gap between rural and urban India has widened in terms of morbidity. At the same time, Jain et al. (2015) has provided a different interpretation of the 71st Round data of NSSO. It is pointed out that the private doctors are the single most significant source of treatment in rural and urban parts of the country. 72 per cent of ailments in rural areas and 79 per cent of ailment in urban areas are treated in the private health care sector. Yet, the survey reveals the perceptible increase in the share of public sector in the outpatient treatment between 60th and 71st round of data in the country as a whole. But, there has been a decline in the share of public sector in nine states of the country; it has improved marginally in six states while there were impressive increases in six states. The picture was different in the case of inpatient care. In rural areas of 12 states and in urban areas of 17 states, a decline was observed in share of public facilities of inpatient care. This reflects that there is a general preference of general public for private provision of inpatient care. They point out that the government expenditure on health care has increased by more than four times between 60th and 71st rounds. But the share of patient load for hospitalised care in government facilities has remained stagnant during the period. This calls bringing about greater efficiency in public spending. As the private health care sector is rapidly expanding their base in the country, greater section of the population is vulnerable to financial shocks arising out of OOP health expenditure.

2.4 Studies on Kerala Health Care System

Kunchikannan and Aravindan (1996) examined the rate of increase in family health expenditure of households in Kerala with respect to total household expenditures during the period 1991-1994. The study was conducted in a semi-urban locality in Kozhikode among 52 households with 310 persons. The households were prospectively surveyed for the month of November 1991 and in November 1994 using the same questionnaire. It was witnessed that per capita expenditure and the per capita medical expenditure incurred by persons affected by morbidity show significantly higher rates of increase. While the general indices show an increase between 30 and 40 per cent in three years, the per capita expenditure has risen by 65.8 per cent and the per capita medical expenditure by a astounding rate of 141 per cent. This far outstrips and is more than double the rate of rise in general consumer expenditure. In other words, in a background of fast rising cost of living, the expenses towards health care were rising at an even faster rate. Of all major items of expenditure, it was observed that per capita medical expenditure showed the sharpest increase and a jump from 3.9 per cent of total expenditure in 1991 to 6.7 per cent of the total in 1994, in the sample families. The expenditure on drugs per capita rose by 75.9 per cent which is higher than the increase in general consumer expenditure. In addition, other items of medical expenditure like doctor's fees and laboratory investigation expenditure have shown greater rate of increase. The study points out that there was weakening of the public health institutions in the state. The entire public sector health infrastructure from the primary health centre to the medical college hospitals were no longer able to cater to the increasing demands from a population which is conscious of the quality of care. Simultaneously, there occurred a proliferation of private clinics and hospitals leading to expensive medical care. They argue that these policy shifts in Kerala as well as the restructuring of the economy by the governments were responsible for the dramatic rise in health care costs and points out that if such a trend continues it may even eventually result in a deterioration of the health indices among the vulnerable sections of Kerala's population.

Kutty (2000) points out that with the rise in disposable income in Kerala, more and more people are seeking health care services in the private sector, with the evidences from NSSO consumer expenditure surveys. The high demand for health care in Kerala provided the impetus for the growth in its private sector. The unique demographic phenomenon of population ageing and high proportion of chronic diseases among the elderly have also influenced the demand for health care in the state. The growing number of people with longstanding illness and growth of disposable incomes meant that greater numbers of people are prepared to pay money for health care. According to him, the private health sector exploited this increased demand raising stern concern about financing of health care.

Deshpande (2000) examined the role of caste affiliation as a descriptor of intergroup disparity by looking at Inequality in Kerala. The study used the Schedule 1 of 50th round of NSSO's consumption expenditure survey of 1993-94. This schedule surveys household-consumption expenditure from July 1993 to June 1994 for all the states in India and it covered 2,483 rural and 1,754 urban households of Kerala. The study focussed on two of the three basic survival expenditures, food and clothing, to get an idea of the disparity at the most basic level. The study revealed that despite Kerala's superior performance in reducing caste discrimination, inter caste disparity continues to underlie overall disparity in terms of expenditure on food and clothing, landholdings and educational levels of head of households. The study found significant inequalities in the expenditure on food, clothing, land-holdings and in educational attainment in state between marginalised communities and that of general population. The calculations with the Theil index suggest a low to medium level of overall inequality and also suggest that the existence of an elite group, or upper class, is much more pronounced in the others category than it is in the SC or ST category.

Ramankutty (2000) sought to describe the growth of health care facilities in Kerala, with respect to increase in the number of public institutions and bed and trends in government expenditure on health, the pattern of distribution of heath care facilities in the public and private sectors and its implications for the state's future

health development. From the time of the state's formation, the government's budget allocation for health was considerable. But by the mid 1980s because of the fiscal crisis faced by the state, there occurred a definite slowing down of government expenditure on health and growth of government health institutions. The government's cutting down of supplies had a major effect on the secondary sector, consisting of the district and Taluk hospitals and the primary sectors, consisting of PHCs. Since these accounted for a majority of beds in the health services most accessible to the common people, the quality of medical care in the government hospital had been affected. Private hospitals now surpass government facilities in the density of beds, employment of personnel and provision of high tech methods of diagnosis and therapy. It was found that the density of beds in the private sector has a highly significant correlation with literacy and with the per capita income of the districts. Further, geographical density of private hospitals in the state is highly correlated with both literacy and geographical density of government hospitals. The growth of disposable income of the people, improvement in literacy and population ageing contributed to this trend.

Dilip (2002) examined the prevalence of ailments and hospitalisation in Kerala using the data from 52nd Round of NSSO conducted in 1995-96 with 4928 households covering 24401 individuals. The morbidity prevalence rate for Kerala was calculated as 110 per thousand population using 15 day reference period. Sex difference in the prevalence was not observed and elderly people were found to be more vulnerable to ill health. The rate was 234 and it was 133 for those aged between 35 to 39 and 125 for those aged less than 14 years. People aged 15-39 were the healthier with the lowest morbidity prevalence rate. The rate was higher in rural Kerala and for smaller households. Positive association was observed between economic status and prevalence of ailments. The morbidity prevalence rate showed high degree of seasonal variation with highest burden of diseases during months from July to September. The rate was found to be higher in southern Kerala. The prevalence of acute ailments was 77 and was highest among children and in rural areas. The prevalence of chronic ailments was relatively small with 35. Chronic ailments were found to be associated with old age and the rate was highest for

population above 60 years. No significant seasonal variations were observed in the case of chronic ailments. The hospitalisation rate for Kerala was found as 68 per thousand population. Gender specific differences were observed in the hospitalisation rate and it was higher among older age group and among individuals residing in rural Kerala. Nabae (2003) argues that the burgeoning private health care sector in Kerala raises household health care expenditures making health a commodity purchased by 'ability to pay'. Technological development and ageing society have raised cost of health care in the state.

George (2005) explored the OOP payments for health care of Keralites by using the 55th round data of NSSO. The analysis shows that state is highest in terms of monthly health expenditure compared to other states in the country. This is true for both inpatient and outpatient health expenditure. In rural Kerala, around 14 per cent of the population spends more than 15 per cent of its income on health care. In urban Kerala, around 11 per cent exceeds this threshold expenditure. The incidence of financial catastrophe was comparatively higher in rural Kerala. In rural Kerala, concentration index for the catastrophic payment head count remained negative, despite increasing threshold. This implies that a disproportionate number of individuals with low income show higher threshold level of expenditure. That is, the poor constitute the majority in those who exceed the threshold levels of expenditure in the state. The higher proportion of the poor in the catastrophic payment measures intensified the weighted catastrophic payment headcount to 74.82 per cent from 66.81 per cent (non-weighted) at the threshold level of 2.5 per cent and to 14.54 per cent from 14.04 per cent at the 15 per cent threshold level in rural Kerala. The study reveals that there is an extreme situation of non-affordability of health care due unaffordable expenses of health care. It was estimated that an additional 4 per cent of households in the state are impoverished due to health care payments. Unlike other studies based on NSSO reports, this study found that expenses other than inpatient care contributed to more than half of the impoverishment. The study found that households in the state spends a substantially higher proportion of their income on health and the poor in the state bear a larger share of this increasing health expenditure.

Kerala Shastra Sahithya Parishad (2006) conducted *Kerala Padanam* with the broad objective to create a database about the living environment and development issues of Kerala in both quantitative and qualitative dimension. 5696 households across Kerala were studied and the survey was conducted during the period January 2004 to April 2004. They found out symptoms of slight decline in the morbidity rates of Kerala in 2004 compared to 1987. Morbidity rates were found to be 85.1 per thousand for the poorest while it was 73.9 for the richest. Though morbidity rates were dropped, there occurred a perceptible increase in the cost of treatment. Cost of health treatment per head for year was only ₹89 in 1987 rose to ₹1722. Health treatment constitutes 31.7 per cent of total household expenditure for the poorest strata of the society. The study locates changing system of health care, high cost caused by scanning and laboratory related tests, rising prices of medicines as the major reasons for the increasing health care expenditure. Since the poorest strata of Kerala are forced to spend one third of their total household expenditure on health care, cost of treatment forms one of the prime reason that pushes these families into indebtedness. The highest portion expenditure was for the purchase of medicines, followed by other expenses, fees and laboratory tests. As family income increases, the preference for the private sector also increases. It was found that only 50 per cent of the poorest strata depend on government sector for getting treatment. In the case of hospitalisation, 22.8 per cent of the highest strata resort to government hospitals while it was 55 per cent among the poorest households. Average cost of one hospitalisation event was ₹6698 for the poorest and ₹17,177 for the richest. At the same time, average cost of hospitalisation was ₹10445 for private hospitals while it was ₹6609.5 for government hospitals. Though private health care treatment was relatively more expensive, even cost in the government sector constitutes almost two thirds of that in the private sector. The study points out that this happened mainly due to the reliance on private sector for medicine and diagnostic tests.

Mohindra et al. (2006) conducted a study to explore whether caste and socio economic position influences women's health in rural community of Kerala by focusing on Kottathara panchayath of Wayanad district, which has highest proportion of tribal population in the state using cross sectional data from a

household survey. A higher prevalence of poor health outcomes was observed among scheduled caste, scheduled tribes and women from other backward communities than in the forward caste women. Poor health was also associated with lower levels of education and small household landholdings. Among women from scheduled caste, scheduled tribe and other backward communities, the influence of socioeconomic variables on health tends to have magnifying effect, where as among the forward caste women there is a buffering effect, with the exception of education. The study also observed a perception bias among Paniya tribe. The Paniya tribal community have absorbed an inferior status and lack of capacity to aspire, which led to the report that they were enjoying better health despite their high levels of deprivation and greater exposure to health risks. This study shows that both belonging to lower caste and of low socioeconomic status can trap people into poor health more than either inequality on its own.

Simon (2007) investigated into the health care accessibility among socio economic groups on the selected 600 households of Thrissur district. Among the caste groups, tribal households reported highest morbidity and the rate was higher in urban area when compared to rural area. Similarly, the highest percentage share of health expenditure was recorded in tribal households (14.23 per cent). The daily wage households paid more for health expenditure. The Chi square test of independence revealed that the significant relationship between high catastrophic health expenditure and caste. Among the households who were included in high catastrophic health expenditure, 40 per cent are of tribal households followed by households from scheduled caste with 36.4 per cent. The odds ratio showed that the two major determinants of the higher catastrophic health expenditure are the presence of chronic ailment in the household and being scheduled tribe. Majority of tribal households (73 per cent) were away from the health care institution beyond eight kilometres from the primary health centre, 13 per cent households were between 3 kilometres and eight kilometres and 14 per cent of tribal households were away between one kilometre and three kilometres. No tribal households were within distance below one kilometre. The connectivity to the health care institutions by means of conveyance is low among backward communities. Walking percentage

households to health care institutions is highest among the tribal community. At the same time, health care personnel visits were quite high among the tribal households compared to other categories. Distance, time of travel, consultation fee and availability of free medicines were major determinants of choice of provider. Further a significantly higher proportion of tribal households opted for government sources for treatment.

Levesque et al. (2007) while comparing the cost of public and private hospitalisation in urban Kerala utilised NSSO survey on health care (1995–1996) for urban Kerala and found that poor households and those headed by casual workers showed significantly lower levels of health expenditure and a higher proportion of health-related loss of income than other social groups. Factors linked with higher expenditure were duration of stay, hospitalizations on paying public wards and in the private sector, hospitalizations for above poverty line households and hospitalizations for chronic illnesses. Expenditure for services bought from outside the hospital was the main item of health expenditure in the public sector.

Suryanarayana (2008) analysed health sector in Kerala by looking at the incidence of morbidity across socioeconomic dimension and explored their implications for economic policy. The study was based on 60^{th} round of NSSO survey on morbidity and utilisation of health services conducted during January to June 2004. The study found higher incidence of morbidity in Kerala compared to India as a whole for all the decile groups. For Kerala, the incidence was found to be 25.11 per cent against all India value of 9.11 per cent. The rate was marginally higher for rural Kerala for both men and women while the opposite was observed in the case of national level. Within the state of Kerala, southern Kerala had higher incidence of morbidity across gender and in rural and urban areas. The analysis of morbidity pattern by occupation for rural Kerala revealed that largest incidence of morbidity was among other labour category, while for south Kerala it was among self employed in agriculture and other labour in north. With respect to urban Kerala, morbidity was highest among casual labourers. In north urban Kerala also it was casual labourers and in south and in Kerala as a whole it was the other labour. The

study found that the extent of inequality in morbidity was lower in Kerala than in India. At the same time, inequality was higher in urban Kerala than in rural Kerala. It points out that major diseases in Kerala were associated with life style and not deprivation. Hypertension and heart diseases account for 11 per cent for rural Kerala. At the same time, it was only 5 per cent for India. The major diseases that caused hospitalisation were fever of unknown origin, cardio vascular diseases, fractures and other diagnosed. The study also brings out the fact that the dependence on the public sector for health care is higher in Kerala than all India.

Navaneetham et al. (2009) examined the levels, patterns and determinants of morbidity of Kerala based on a community survey covering 3320 households in three districts of Thiruvananthapuram, Malappuram and Kannur. The study utilised reported morbidity of all individuals in the household during the reference period of two weeks prior to survey. It was found that the prevalence of morbidity in the districts was 242 per thousand population. There existed significant difference between rural and urban areas with respect to the morbidity in the state and the rate was higher in urban Kerala (252) compared to rural Kerala (239). Among the districts studied, the rate was highest in Thiruvananthapuram. In the district, the morbidity prevalence rates of rural areas were significantly higher than that of urban areas. In Kannur, the pattern was opposite and the rural-urban difference was negligible in the case of Malappuram district. It was observed that the risk of morbidity was higher among females than the males. The prevalence of morbidity was the highest among scheduled tribes in Thiruvananthapuram and Kannur while the scheduled caste had higher prevalence rate in Malappuram. The morbidity rate among illiterates was 515 as compared to 142 among individuals having higher education. It was also found that there was a negative association between socioeconomic status and morbidity implying that the poor people have a greater risk of diseases than the rich in the state. The rate was lower for infants compared to child population and the rate declined till the age group of 19 to 34 and increased in a rapid manner thereafter.

Mukherjee et al. (2011) analysed economic burden of the health care and variations across caste groups by identifying households that spend relatively large amounts on health care and investigating their sources of funds for OOP health care expenditure focussing on Kottathara Panchayat of Wayanad district having 28 per cent of tribal population using a 12 month long panel survey conducted in October 2003 to September 2004. The study revealed that Paniya and other households from scheduled caste and tribe spend significantly less on health per capita than do the forward caste households, even taking into account the effects of levels of health care need, household's land holdings, vulnerability of female headed households and volume and type of health care utilisation. While per capita health expenditure of the paniya household was the lowest, a higher proportion of paniya households incurred relatively large expenditure compared to other caste groups. It was found that hospitalisation expenditure had more impoverishing effects on households especially on Paniya, other scheduled caste, tribe and backward community households. The households depended more on loans and donations to meet hospitalisation expenditure than to meet expenditure on outpatient visits. This was due to the unpredictable nature and large amount on hospitalisation expenses. The per capita health expenditure was highest for very high health care need households followed by high need households and low need households. Whereas the number of government or informal outpatient visits had no significant effect on the household's OOP health expenditure, private outpatient visits and hospitalisation (government or private) had significant positive effects on the level of OOP health expenditure. All castes showed higher per capita expenditure on acute episodes than chronic episodes; but the difference was striking for paniya and other scheduled caste and tribe. There were large unmet need for chronic health care in the Paniya and other scheduled caste and tribe households.

Thresia and Mohindra (2011) has attempted to review health accomplishments and emerging health challenges of Kerala and Sri Lanka using vital statistics and reports of national and international organisations. They point out that health achievements of Kerala have improved with decline in mortality and fertility and increase in life expectancy during the post independence period. The

health achievements of the state has mainly been attributed to progressive policies pursued by the successive state governments in the form of provision of free health care services, free universal education, widespread public distribution system and land reforms. But since 1990s, there has been increasing incidence of infectious diseases like chikungunya, leptospirosis and malaria that led to rising mortality in Kerala. They argued that public health sector of the state were incapable to combat this outbreak of emerging end re-emerging infections. Further, the incidence of non-communicable diseases including cardiovascular disease, diabetes and cancer is rising rapidly in the state. The prevalence of chronic non-communicable diseases is particularly higher among the elderly population. Along with these, the state carries heavy burden of mental ill-health, particularly among women. The prevalence of psychiatric morbidity is reported as 20 per thousand population and suicide rate in Kerala is 26.80 per cent per lakh which is amongst the highest in the world. Another grave health challenge for Kerala is the rapid growth of privare health care sector that has led to hasty escalation of health care expenses. The study asserts that Kerala ranked highest with respect to OOP health expenditure and impoverishment due to inpatient and outpatient services in the country. The impoverishment due to health expenses has found to be especially pronounced among the poor, lower caste groups and scheduled tribes.

Daivadanam et al. (2012) examined catastrophic health expenditure and coping Strategies associated with Acute Coronary Syndrome (ACS) in Kerala. The study was based on a cross sectional survey conducted in Thiruvananthapuram district with the sample size of 210 to examine the proportion of ACS patients experiencing catastrophic health expenditure during June – September 2008. Following the definition adopted by WHO, catastrophic health expenditure was estimated using 40 per cent threshold methodology. They found that all participants were experiencing OOP expenditure related to ACS in varying degrees. 84 per cent experienced catastrophic health expenditure. The catastrophic health expenditure was significantly more in rural participants than urban participants, in poor socio economic status, in less educated subjects, in those with no health security coverage, in those who are non-compliant, in those whose employment status was adversely

affected, in those with loans/asset sales and in those with new loans/asset for sale. Loans were found to be the predominant coping strategy and were not confined to any socioeconomic strata. 14 per cent had financed their treatment exclusively from savings and of these 70 per cent experience catastrophic health expenditure. 41 per cent of the study participants had financed their treatment solely from loans while 37 per cent used a combination of loans, savings, gifts, insurance etc. 36 per cent of previously loan free households had to avail new loans for treatment. In spite of this, 41 per cent among those who availed loans were non-complaint due to lack of financial resources. 47 per cent of those who were noncompliant belonged to low socioeconomic category. Apart from the obvious strategies to increase the household reserve, some households were found to employ masked strategies to check the drain on household reserves. The study pointed out that public facility did not provide any kind of protection against catastrophic health expenditure.

2.4 Studies on Health Care Issues of Tribal Communities

Francis (2006) tried to evaluate the influence of internal factors of economic actions and to identify internal constraints of the tribes which restrict their development. The study was based on a sample of 270 households of Paniya, Kurichya and Kattunaikka (90 each) of Wayanad district. It was found that the tribes were reluctant to utilise medication and depended more on religious leaders than registered practitioners. While 74.45 per cent of Paniya community and 68.89 per cent Kattunaikka community prefer tribal medical practices, only 25.6 per cent of Kurichiyan community depend on tribal medical practices. It was strikingly noticed that nearly half of the Kurichiyan rely on allopathic medicines. High rate of permanently disabled persons were found among tribal people due to various types of illnesses and age related diseases. There were sizeable loss of working days among tribal communities due to illness and physical fatigue. Excessive use of liquor was found to be one of the main reason for the loss of working days among Paniya and Kattunaikka.

Kerala State Planning Board (2009) made an attempt to understand the human development among the tribal communities in Kerala by focusing on nine

prominent tribal communities. The study also aimed to bring out the inter community differences in human development aspects like livelihood options, educational level and health status. The study reveals that tribal communities of the state face social exclusion and geographical deprivation in many income and livelihood dimensions. They are way behind general population in almost all development indicators. Infant mortality rate among tribal population was 17.3 (female 19.77 and male 14.8) compared to state average of 10 (female 12 and male 9). It was found that asthma and other respiratory diseases dominate (21.8 per cent) among disease pattern followed by cardiovascular disease (18.2 per cent). The highest morbidity rates were reported among Mala Arayan community. Half of the tribal population reported at least one ailment during the reporting period. The morbidity prevalence rate among the tribal communities was significantly higher compared to generation population in the state. On an average, 72 per cent of the tribal communities go to doctor for allopathic treatment on the onset of any symptom of a disease and only 11 per cent does it when the disease worsens. With respect to the system of medicine, majority among the community preferred allopathic system of treatment. The inherent tendency of late reporting of morbidity episodes subsequently worsens the intensity of health disorder and increases the related morbidities. It was reported that financial incapability was the prominent reason for not seeking health care from government hospitals. The disaggregated data showed that the problem of financial incapability is more serious among the backward communities. On an average, more than 90 per cent among backward communities suffer from financial incapability, but it was relatively less in forward communities. Physical accessibility to health care provisions was found as an important reason for not seeking care. In the case of health status, the perception-reality gap is high among tribal communities. It was found that tribal communities generally perceive their health to be of better quality. However, the standard of health status indicators like morbidity and mortality rates are very high among tribal communities.

Varadarajan et al. (2009) examined the pattern of health care practices of the tribal communities of Andhra Pradesh covering 225 couples in nine tribal

concentrated villages. 107 incidences of self reported morbidity were found in the sample households. The analysis showed that tribals in the study area were at different stages of epidemiological transition. The gradual shift from primary food production appears to be the basis of the changing disease pattern. It was observed that substantial proportion of the sick persons (35.5 per cent) do not approach any health care personnel for treatment but take home remedies. The remaining morbidity cases sought some kind of treatment either from modern or traditional sources. The treatment seeking pattern of tribals largely depends upon the seriousness of the ailments. The modern health care system was predominantly accepted by the tribals for all serious ailments. 120 out of the 225 respondents prefer to use alternative health care services. Besides faith and affordability, absence of medical officers and non-availability of medicines at primary health centres are the two major reasons for using alternative health care practices.

Sachdev (2012) attempted to study the awareness and perception of the Nomad tribal populations on health related issues in Jhanjhumu, Sikar and Churu districts of Rajasthan. 92 per cent of the Nomad population shows their preference for visiting private hospitals as compared to government hospitals. The main factors that influence the selection of hospital were found to be the availability, good service and referral by somebody. Large group of Nomad population (63 per cent) took delivery at home in spite of having aware about the incentives given for delivery of the child in government hospitals. The causal factors for the poor health status of Nomad tribes are the Nomad tribal environment and non-acceptance of community towards professional doctors. The inaccessibility and unaffordability to health care and reluctance to seek help for health issues remain a significant problem among Nomad tribal community.

Vivek et al. (2012) tried to explore the oral health beliefs and behaviour among Paniya tribal community of Wayanad district, Kerala with the aid of convenient sample of 180 subjects. It was found that high proportion (91 per cent) of the subjects reported that they clean teeth every day. Among them 43.9 per cent used indigenous tooth cleaning methods. It was established that majority of Paniya

believed that dental diseases would have severe consequences if neglected and they were also concerned about their aesthetics. The importance of retaining the natural teeth was higher among the Paniya tribal population

Mishra et al. (2013) studied the concept of health and illness among the migrant tribal community living the slums of Bhubaneswar with the aid of interviews with 50 general community members and 26 key informants in the slums. It was revealed that health was the present condition of body and almost all participants said that their health was good. The health and illness concept and prescriptions of the community differed along gender lines. Further, the perceptions about types of illness varied from community member to traditional healers. People perceived different agents and behaviours are causes of illness that include supernatural powers, physical causes and contagious agents. The study population expressed that the environment was a key factor for causing illness and for leading a healthy life.

Rajasenan et al. (2013) tried to unfold the paradox that exists in the tribal community with respect to development indicators based on a sample survey of 500 households in the tribal dominated districts of Wayanad, Idukki and Palakkad in Kerala. The study reveals the disproportionate nature of socio economic indicators within the tribes of Kerala. Tribes with good education and employment had a better living standard and those with low education had poor living standards. Even though majority of the tribes perceive their health status as good, an enquiry into the health pattern of the tribal communities shows that it was very much away from reality. While the health profile of Uraly and Kattunaikka community was low, Kuruma, Irular, Mala Arayan, Muthuvan, Adiyan, Kurichiyan and Paniya were close to medium health level. Despite government efforts in the area of health care, tribal communities still lack awareness, access and affordability to modern health care. The ignorance and severity of many health conditions and the problem of in-affordability to modern medical facilities expose them to health risks and eventually to high morbidity and mortality situations. The correlation analysis revealed no significant relation between health patterns and other socio economic variables

implying that health pattern of tribes are influenced by some external factors. Health indicators were found to be playing a limited role in the determination of standard of living of tribal communities.

Kshatriya (2014) attempted to understand the association of age, sex and body mass index with respect to different metabolic health risk factors among six tribal communities in Birbham district of West Bengal and Mayurbhanj district of Odissa with 1434 subjects. It was observed that a considerable proportion of tribal population suffers from malnutrition. With the stress of under-nutrition, they were also susceptible to hypertension. Younger males showed strongest association with hypertensive mean arterial pressure as well as hypertensive blood pressure. They were more likely to develop different metabolic risks when they had low status with respect to body mass index. It was revealed that tribal females were in danger of developing metabolic risks at lower body mass index, irrespective of their age. There was high under-nutrition stress among the females in both younger as well as older age group.

Mahant (2015) conducted a study in Bastar district in Chattisgarh state through a field survey in seven rural and forest villages. It was revealed that tribals have firm belief and awareness of traditional methods of home remedy. The reasons of non-consultation for illness include no belief in allopathy, ritual therapy, don't have modern facilities and so on. It was observed that the villager's first preference was to seek traditional healer for treatment. The traditional method of using plants as a medicine was found to be prevalent in Bastar district. The survey indicated the loss of knowledge in preparing medicines due to the decline in the number of vaidhyas. Further, the cost of modern medicines was higher than the cost of indigenous medicines.

Jayaprakash and Saravanan (2015) undertook a study to assess the economics of health seeking behaviour of tribal women in Villupuram district of Tamil Nadu with a data of 300 respondents. The study revealed that majority of tribal women sought the service of government hospital when they fell ill followed by the ayurvedhic hospital. Only 9 per cent of the respondents approached private hospital for

treatment. This was true for all the age groups and most in the category of above 45 age-groups. Most of the illiterate tribals resorted to primary health centre while those who have government job and had higher income utilised private hospital for treatment. The most common disease was found to be fever, jaundice and cholera. The average cost of treatment of tribal women was ☐ 18971, of which ☐ 15408 was for the purchase of medicines and ☐ 3563 was towards consultation. The cost of treatment was highest in the case of blood pressure, for which most them sought private treatment.

2.6 Conclusion

The literature reviewed above brings out that the cross country studies generally concentrated on the analysis of magnitude and distribution of health care payments and the threat it poses to households when payment becomes out-of-pocket in nature. The studies have explored the incidence of financial catastrophe and the factors determining catastrophic level of health spending. Some of the studies have also analysed the coping strategies adopted by the households to cope with the cost of illness. Majority of the studies on the Indian context have relied on data from different rounds of NSSO and brought out the increasing burden of out-of-pocket health payments in the country and its impoverishing effects on the households. The studies have also highlighted large inter-state variations in health expenditure. The role played by different components of health expenditure is also well documented. However, only a few studies have dealt with the different aspect of financing of health care in the context of Kerala. Generally, the studies have looked into the issues such as trends, patterns and determinants of morbidity in the state, the prevalence of hospitalisation along with the analysis of economic burden of medical treatment. Theoretical literature on health care issues among tribal communities focussed on the health seeking behaviour, their perception towards illness and morbidity pattern and the preferences of the different system of treatment. To conclude, different aspects of financing of health care and the impoverishment from catastrophic health payment in India and Kerala using data from different rounds of NSSO are well-examined. At the same time, there is a

shortage of studies on the financing of health care among different tribal communities in general and Kerala in particular. Given the fact that tribal communities in Kerala are essentially heterogeneous, this study takes an analytical look at the financing of health care among eight prominent tribal communities in three tribal dominated districts of Kerala. This is the major justification for conducting the present study.

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CHAPTER 3

THEORETICAL AND CONCEPTUAL FRAMEWORKS OF THE STUDY

3.1 Introduction

Health is considered as a pre-condition for people to survive and flourish as human beings but also subject to potentially large "shocks" which are unforeseen and are rarely the result of a deliberate choice by the individual concerned. Health care is the appropriate way to restore health status following such a shock (Culyer et al., 1993). Importance of financing of health care stems from the fact that health care utilisation is a response to an unforeseen and unsolicited shocks and it can be sufficiently costly to represent a threat to the households' ability to purchase other goods and services. Accessing health care services may lead households to spend catastrophic proportions of their available income and some households may be pushed to poverty as a result. Furthermore, some households may forgo health services and suffer ill health (Xu, 2005). Ideally health system should be financed in such a way that people use health care services without financial hardship and impoverishment. At the same time, health care financing of developing countries are dominated by the out-of-pocket expenditures. With insufficient coverage of health insurance and prepayment mechanism, households face the risk of incurring large health care expenditure should any member fall ill. If the health care expenditures are large relative to the available resources of the household, this disruption to the living standard may be considered catastrophic. This chapter examines various approaches of measuring health care payments. The chapter is organised as follows. The following section looks at two distinct approaches of measuring health care payments. Next section addresses various measures that capture the incidence and intensity of health care payments. Third section explores the significance of coping mechanism followed by concluding observations.

3.2 Approaches of Measuring Health Care Payments

There are two distinct approaches that deal with the measures of health care payments. They are egalitarian or agnostic approach of fairness in health care payment and the minimum standard approach. As these approaches are fundamentally different, brief discussions of these concepts are summarised here.

3.2.1 The Egalitarian Approach

The approach is based on the egalitarian concept of equity or fairness in health care payment. The common premise of egalitarian approach is that payments for health care should be linked not to usage of health services but to ability to pay. It sets minimum in terms of absolute level of income. The concern is to ensure that spending on health care does not push households into poverty- or further into it if they already there (Wagstaff et al., 2001).

The egalitarian approach focuses on vertical equity. It focuses on how people with different pre-payment incomes or with different abilities ought to pay for their health care relative to their income. In the case where payment is required to be proportional to ability to pay, it calculates the departure from proportionality or it compares inequality in income after deductions before health care payments with inequality in income after deductions and health care payments. In the situation where the proportionality is not assumed, the approach calculates departure from proportionality in the vertical relationship between health care payment and prepayment income or evaluates comparing inequality in pre-payment income with inequality in post-payment income. In essence, the emphasis of the egalitarian ability to pay approach is on vertical equity.

Since no target distribution is specified for payment, the agnostic or egalitarian approach does not provide any information on the degree of horizontal inequity in the distribution of payment for health care. As it focuses only on vertical equity, the approach ignores the core fact that much of the inequity in payment for health care takes place from horizontal inequity because people on a given income can spend quite different amounts depending on when they are struck by illness. In

the framework of financing of health care, especially when there is predominance of out-of-pocket payments, analysis of horizontal equity is imperative because randomness of ill health makes it very likely that households with similar incomes will end up paying significantly different amounts towards health care. In most of the situations, horizontal inequities will dominate the vertical differences.

3.2.2 The Minimum Standard Approach

The minimum standard approach is more recent and more ambitious and tries to quantify the inequalities in the payments for health care (WHO, 2000). The approach requires that health care payments should not exceed a pre-specified share of prepayment income or not drive households into poverty. Thus, the concern of minimum standard approach is not with inequality in any variable but rather with a variable exceeding or falling short of a threshold (Wagstaff et al., 2001).

There are two sub strands of literature that can be identified within the minimum standard approach. The first sub-strand lay down the threshold in terms of proportionality of income. The focus is to ensure that households do not spend more than some specified fraction of their income on health care (categorised as Z). Spending in excess of Z is regarded as "catastrophic". This version ensures that household have at least (1-Z) of their income to spend on things other than health care (Wagstaff et al., 2003). The second sub-strand sets the minimum of payments for health care in terms of the absolute level of income. Thus, a household's health expenditure is considered as catastrophic if the ratio of household's out-of-pocket expenditure on health care and its income reaches a certain critical limit (Lu et al., 2009). Thus, both approaches are built up around the perception that payments for health care should not exceed or fall short of a threshold.

Literature provides different methods of calculating catastrophe in health care payments. The pioneering attempt was made by Berki (1986) and for him, catastrophic health expenditure is one which constitutes large part of household's budget and which affects their ability to maintain customary standard of living. Wagstaff et al. (2003) measured the incidence and intensity of catastrophic health

expenditure in Vietnam and defined catastrophic health expenditure as that exceeds some fixed proportion of total household expenditure. On the other hand, Xu et al. (2002) classifies those households as experiencing catastrophe that are spending a more than a fixed proportion of their capacity to pay.

The choice of threshold limit above which payment for health care is considered as a catastrophic is obviously subjective in the minimum standard approach. Though there is no universally accepted cut off values or threshold for defining the catastrophic nature of health care payments, 10 per cent of household's income is widely accepted as the standard, as this represents an fairly accurate threshold at which the households are forced to cut down on subsistence needs, sell productive assets, incur debts or impoverished (Russel, 1996; Pradhan et al., 2002; Ranson, 2002; Wagstaff et al., 2003; Doorslaer et al., 2007; Ghosh, 2011). At the same time, WHO estimates that families who spend 50 per cent or more of their non-food expenditure on health care are likely to be impoverished (WHO, 2000). Xu et al. (2003) and Daivadanam et al. (2012) defined health care expenditure as catastrophic if a household's health expenditure exceeds 40 per cent of income remaining after subsistence needs have been met. Since there is no consensus on the catastrophic threshold, the present study used different threshold values to trace out the financial protection and the prevalence of catastrophic health care payments among the tribal households in Kerala.

Due to the above stated limitations of the egalitarian approach, the present study has utilised the minimum standard approach for the analysis of health care payments among tribal communities in Kerala. The minimum standard approach proposes a variety of measures that capture the incidence and intensity of catastrophe in health care payment, which are explained in the next section. But approximating the catastrophic economic consequences of illness through larger health care budget shares do got some limitations. It identifies only households that incur catastrophic medical expenditures and does not consider those who cannot meet these expenses and forgo treatment. Through subsequent deterioration of health, such households probably suffer a greater loss of welfare than those

incurring catastrophic payment (Doorslaer et al., 2007). Recognising the vital issue, this study also makes an attempt to supplement catastrophic analysis with cases of non-treatment due to financial reasons among tribal communities in Kerala.

3.3 Measures of Financial Catastrophe

In this section, we are exploring various measures that capture the impoverishing effect of health care payment, by distinguishing between incidence, intensity and distributional fairness of catastrophic health expenditure.

3.3.1 Catastrophic Payment Headcount (H_{cat})

Headcount is the percentage of households whose monthly out-of-pocket health expenditure, as a fraction of monthly household income exceeds a particular threshold (Bhojani et al., 2012). It is the summary measure of the extent to which a given sample of households has been exposed to catastrophic health expenses. Thus, H_{cat} is the fraction of the sample households whose expenditures as a proportion of their income exceed the threshold Z_{cat} (Wagstaff et al., 2003). We have calculated the catastrophic payment head count at four different thresholds, namely, 5 per cent, 10 per cent and 20 per cent. The catastrophic payment headcount is equal to

$$H_{cat} = \frac{1}{N}\sum_{i=1}^{N} E_i$$

Where N is the sample size, E is an indicator equal to one if $\frac{T_i}{X_i} > Z$ and zero otherwise. T_i is the out-of-pocket expenditure by the household i, X_i is the income of the household i and Z is the catastrophic threshold.

3.3.2 Catastrophic Payment Gap (G_{cat})

The headcount only suggests the percentage of households that incur out-of-pocket health expenditure beyond the particular threshold. The limitation of this measure is that it fails to capture the height above which households exceeding the

threshold actually exceed it. That is, headcount does not give an idea on the intensity catastrophic health care payments by the household. A measure analogous to poverty gap known as catastrophic payment gap (or excess or overshoot) captures the height by which payments for health care as a proportion of income exceeds the threshold Z_{cat}. G_{cat} measures the degree by which an average out-of-pocket expenditure in entire sample households crossed the given threshold. Thus, we measure the intensity or severity by defining the average gap or excess of catastrophic payments as

$$G_{cat} = \frac{1}{N}\sum_{i=1}^{N} O_i$$

Where O_i is the catastrophic overshoot, equal to $\frac{T_i}{X_i - Z_{cat}}$ if $\frac{T_i}{X_i} > Z_{cat}$ and zero otherwise.

3.3.3 Mean Positive Gap (MPG_{cat})

Unlike the overshoot, that uses all the sample households as denominator, the mean positive gap or overshoot considers only households that have actually experienced catastrophe as the denominator. Thus, MPG_{cat} measures the degree by which the average out-of-pocket expenditure by households that have experienced catastrophe has exceeded the given threshold. The mean positive gap is

$$MPG_{cat} = \frac{\sum_{i=1}^{n} O_i}{\sum_{i=1}^{n} E_i}$$

That is, mean positive overshoot or mean positive gap =overshoot/headcount. Hence, if household i experienced the catastrophic health expenditure, it would have spend $MPG_{cat} + Z_{cat}$ percentage of the household's income on health care.

3.3.4 Concentration Index (C_E)

The minimum standard approach and the measures outlined above are blind as to whether it is the poor or the better-off households who exceed threshold. It is

very much possible that in most societies, households in the lowest decile as a share of their income exceed the threshold than those who are at the top decile (Wagstaff et al., 2003). One way of solving this is to analyse how the proportions of those exceeding the threshold vary across the income distribution. This can be done using a concentration index for catastrophic head count which can be called as C_E.

The concentration index helps to understand the distribution of catastrophic health expenditures across income quintiles. Positive value for C_E for E_i indicates a greater tendency for rich households to exceed the threshold the threshold, while negative values indicate values indicates a greater tendency for poor households to exceed the threshold (Ghosh, 2011). When concentration index is zero, it suggests the absence of income-related inequalities in the distribution of catastrophic health expenditure. Concentration index has been calculated using the following formula adapted from O'Donnell et al. (2008).

$$C_E = (P_1L_2 - P_2L_1) + (P_2L_3 - P_3L_2) + (P_3L_4 - P_4L_3) + (P_4L_5 - P_5L_4)$$

Where P is the cumulative percentage of households ranked by their monthly income, L is the cumulative percentage of households experiencing catastrophe for the corresponding P and numbers 1 to 5 represents the relevant income quintiles (Bhojani et al., 2012).

3.4 Role of Coping Mechanism

The analysis of health care payments will provide only a partial picture of multifaceted issue of financing of health care. The flip side of catastrophic payment analysis is that it does not explore the situation of catastrophic payment and subsequent erosion of earning capacity and resultant indebtedness of households. It is therefore important to complement the study of health care payment with that of coping mechanisms employed by households to meet health care expenses that cannot be met with their regular income. When measuring financial protection from health care payments, coping mechanism provides important information on how households respond to health shocks and how payment may affect their future welfare (Flores et al., 2008). While out-of-pocket expenses are real time reduction in

the standard of living, the coping strategies may become potential poverty traps. The chain of events has been termed as the "poverty ratchet" (Chambers, 1983) and the "medical poverty trap" (Whitehead et al., 2001).

The health care payment to income ratio is not responsive to the coping mechanism. If one household has used their past savings to finance the health care and the other household incurred a debt or sold their productive asset to meet the same cost, the differences are not reflected in the ratio of health payment to income as per the minimum standard approach. The ratio will be the same for both the households. At the same time the catastrophic impact would be substantially greater for those households who have accumulated debts or sold productive asset, mortgaged asset or those who have sacrificed their present consumption to cope with payments for health care when one or more members fell ill. Thus, the analysis of catastrophic health expenditure without considering the coping mechanism employed by households to meet their inpatient and outpatient medical expenses will under estimate or over estimate the true consequences of payments for health care. Thus, this study specifically looks at the coping mechanism employed by tribal households to meet their health care expenses incurred for outpatient treatment and that of hospitalisation. The health care payments causing indebtedness among the tribal households and their sources of borrowing was also examined.

3.5 Conclusion

This chapter reviewed two distinct methodological approaches of measuring the fairness in the distribution of payments for health care. An attempt was made to clarify the meaning of the terms and measures to be employed in the analysis of health care payments of tribal communities. The significance of the analysis of coping mechanism as a complementary to the analysis of payment for health care was explained. Though there are limitations of exploring economic consequences of illness using household budget shares, it can reasonably assume that most households that spend a substantial fraction of their budget on health care can be expected to experience a disruption to their material living standards. At the same time, any assessment of the fairness of health care financing requires not just what

households' pay for health care but also how much they use the health services. This is particularly important in the case of tribal communities. Further, tribal households in Kerala especially those communities from remote areas do not have access to health care and face adverse health consequences which the minimum standards approach may not fully reveal. The tribal households are likely to opt out of health care despite the health needs due to reasons such as cultural barriers, ignorance, absence of ability to pay etc. They also face "utilisation paradox" (Borah, 2006) where price elasticity of demand for health care services varies with income, with higher elasticity at lower income households compared to higher income households. Thus, this study also examines the access and utilisation of health services along with the analysis of financing of health care.

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CHAPTER 4
HEALTH CARE SECTOR OF KERALA

4.1 Introduction

The analysis of financing of health care requires a detailed examination of health care delivery system in operation. Thus, this chapter takes an analytical look at the health care sector of Kerala with special emphasis on the financing mechanism in operation in the state. The chapter is organised in five sections. The second section explores the status of health care sector in terms of health and demographic indicators. The third section examines the pattern, concerns and emerging challenges of health care financing mechanism in the state. The high morbidity low mortality syndrome in Kerala and its implication to financing of health care is explored in the fourth section followed by the conclusion.

4.2 Status of Health Care Sector

Kerala has received international recognition for its remarkable performance in health indicators. The Kerala model of "good health at a low cost" is often acknowledged as an example for other countries to follow. The state has made noteworthy strides in terms of health indicators like infant mortality rate, birth rate, death rate, life expectancy etc. The current status of health indicators of Kerala is more akin to those of countries with higher level of income. The health indicators of the state are considerably superior to the national figures. The comparative figures of major health indicators of the state and national level is summarised in the table 4.1.

Table 4.1: Selected Health Indicators of Kerala and India

Health Indicators	Kerala		India	
	2007	2012	2007	2012
Birth rate	15	14.8	23.8	22.1
Death rate	6.4	7	7.6	7.2
Infant mortality rate	14	13	58	47
Child mortality rate	3	2	17	15
Maternal mortality rate	110	81	300	212
Total fertility rate	1.7	1.7	2.9	2.6
Life at birth (Male)	70.9	71.4	61.8	62.6
Life at birth (Female)	76	76.3	63.5	64.2
Life at birth (Total)	73.45	74	62.7	63

Source: Directorate of Health Services, Government of India

Though the birth rate per thousand population has declined, there is a noticeable increase in the crude death rate from 6.4 to 7 per thousand population during the period. The death rate of Kerala was only 6 per thousand population in 1989. The Infant Mortality Rate (IMR) is a sensitive indicator of not only the health status of the population but also the level of human development. IMR of Kerala which reached 10 per thousand live births now stood at 13 while national average is 47. The child mortality rate (0 to 4 years) per thousand population of the state is only 2 in 2012 and maternal mortality rate (per lakh live births) is 81. The Total Fertility Rate (TFR) defined as the average number of children a woman would have if she were to pass her reproductive years bearing the children at the same rate as she has in each age group, stood at 1.7 in 2012. The life expectancy at birth or longevity is an overall indicator of the social, health and economic wellbeing of the people. As a society advances, the life expectancy of its people also increases. The same happened in the case of Kerala as well, as the life expectancy of the people showed an improvement from 73.45 in 1991 to 74 in 2012 while national average is only 63.

Kerala's achievements in health care have been accompanied by an increasing coverage by medical care institutions. This wide coverage has contributed

to greater physical access to health care (Panikar, 1992; George, 2005). Kerala has a well developed health infrastructure and services. There is at least one government health institution in every village. The state has a three-tier system of health care, namely, the primary health centre, community health centre, district hospitals and medical colleges distributed in rural and urban areas. The health infrastructure of the State consists of 1281 institutions with 38400 beds. Out of the total institutions 46.87% are under allopathy, 32.01% under ayurveda and 21.12% under homoeopathy department. Medical services are also provided through the co-operative sector and the private sector. There are 65 hospitals with 6297 beds under the co-operative sector in the state. There are 852 Primary Health Centres (PHCs), 230 Community Health Centres (CHCs), 79 taluk head quarter hospitals, 16 district hospitals, 18 general hospitals and 11 medical colleges. The bed population ratio in Kerala is 873 and the average doctor-bed ratio is 7.56. (Government of Kerala, 2016). The universally available health care institutions in the state have significantly contributed to the health success story of the Kerala.

Successful implementation of several policies by the government, high level of education especially female education and greater health consciousness has also played a leading role in influencing the health status of Kerala. Further, the epidemiological and demographic transition took place in the state has led to increased life expectancy and reduction in mortality rates.

4.3 Health Care Financing Mechanism

From the time of formation of the state, the government's budget allocation for health sector was considerable. Social sectors mainly comprising of education and health, accounted a large share of government development expenditure (Ramankutty, 2000). But with the latter half of 1980s, there took place a slowdown in the government's allocation to health care in the state. State government expenditure on medical and public health as a percentage to aggregate disbursement has declined over the years. The average share of health expenditure which was 10.45 during 1960-65 fell to 8.6 during 1991-95 (Sadanandan, 2001) fell further to 5.2 during 2013-14 (budget estimate). In spite of the fact that the state is facing

serious threats of communicable, non-communicable and traumatic diseases, government's health expenditure as a ratio to aggregate disbursement is stagnant. This is revealed in the following figure which presents expenditure of state government on health and family welfare after 2000.

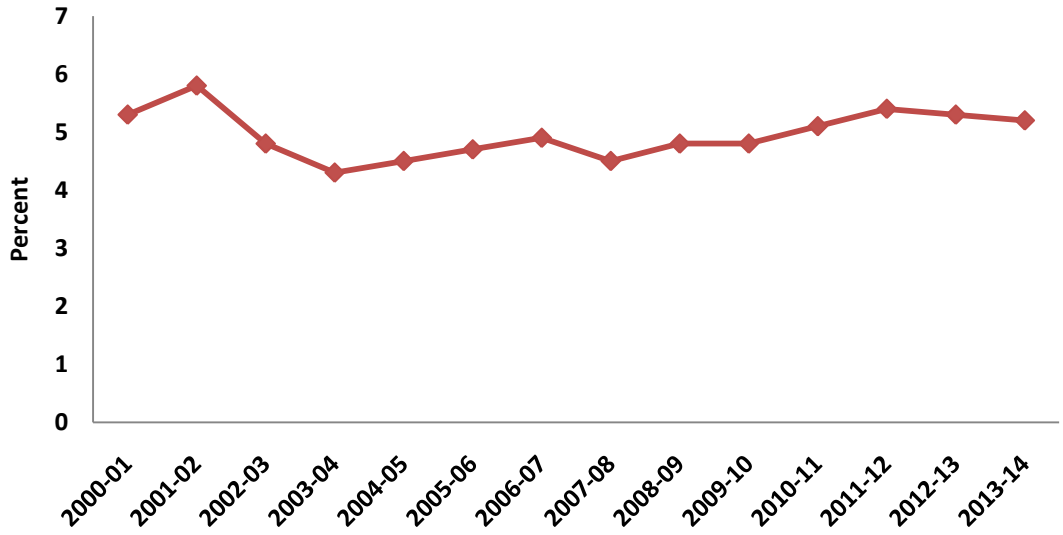

Figure 4.1: Expenditure on Medical, Public Health and Family Welfare

The Kerala "health miracle" was built on the solid foundations of active public support in the health and educational sectors (Kunchikannan and Aravindan, 1996). But a change is rapidly occurring in the state. The declining allocation of government expenditure to health care has resulted in the weakening of public health institutions. The entire public health infrastructure from the PHC to medical college hospitals are no longer able to cater to the increasing demands from a population which is conscious of quality of care. The government is reducing its investments in health and educational sectors due to fiscal crisis and pressure from funding and lending agencies. With respect to the financing of health care, it is disturbing to note that public health care system is increasingly getting alienated from the common public of the state. The study by the Kerala Shastra Sahitya Parishath (2006) covering 5696 households shows that only 50.80 per cent of the people from the lowest income strata sought medical treatment from government hospitals. The reasons for not using public hospitals include non-availability of medicines and lack

of proper attention. Studies have shown that only 30 to 40 per cent of low income households utilise the services of PHCs in the state (Kunchikannan, 2000; Nair, 2004). This is obviously due to poor quality of health care provided by the public sector institutions.

The perceived inefficiency of the public health care facilities in the state has provided the impetus for the steady growth of private health care facilities in the state. The growing demand for the health care as a result of demographic and epidemiological transition was exploited by the private health care sector. The poorest patients who are in pressing needs of health services are forced into the arms of private sector because of the non-availability of such services free of charge in the government hospitals. The PHCs and sub centres, which historically have been the key institutions for the delivery of primary health care, are not increasingly utilised by the Kerala public.

In fact, the private hospitals now surpass the government facilities in the density of beds and the provision of high-tech methods of treatment (Ramankutty, 2000). The huge remittances from abroad even to low and middle income households has resulted in the increase in the disposable income of the people in the state and led to the increase in demand for health care as well. Further, the absence of government regulations for opening private hospitals has facilitated the growth of private health care facilities.

At the same time, it is interesting to note that private hospitals are concentrated in those districts which already have high investments in public health care facilities. The geographic density of private hospitals in the state is highly linked with the income and literacy level of the district. Thus, it is evident that private health care sector has exploited the inefficiency of the public providers of health care in the state. The transformed health scenario of the state has grave consequences in terms of financing of health care and has led to the escalation of cost of treatment. This has resulted in the increasing out-of-pocket health expenditure and the resultant impoverishment of households. This is explored in the subsequent sections.

4.3.1 Extent of Out-of-Pocket Health Expenditure

The most concerning aspect of the health care financing mechanism of Kerala is the prevalence of large out-of-pocket payments that households incur for accessing health care. The lion-share of the health expenditure in the state is borne by the households resulting in drain of their limited resources. With the changing structure of the health care delivery system and the growth of unregulated private sector, the health expenditure has registered manifold increase.

Based on a study of 31 households for the years 1991 to 1994, Kunchikannan and Aravindan (1996) found that increase in the per capita health expenditure was more than double that of the increase in general consumption expenditure. The non-drug items registered the greater increase. Similar result was provided by the survey on 5000 individuals in the state which bring out that health expenditure per morbid person per episode has increased from ₹ 16.56 in 1987 to ₹ 165.22 in 1996, thus registering an increase at the rate of 898 per cent in nominal terms. While the poor spends over 40 per cent of their income on health care, it was as low as 2.4 per cent among the rich (Kunchikannan , 2000). This is clearly because of what has come to be widely referred to as "mediflation" or inflation in medical expenses. Studies by the Kerala Shastra Sahitya Parishath (1987; 1991; 2006) have brought out the extreme situation of non-affordability of health care due to unaffordable expenses of health care in the state. The per capita cost of medical treatment for a year was ₹ 89 in 1987 increased to ₹ 1722 in 2004. The health expenditure constitutes 31.70 per cent of total household expenditure for the poorest strata in the state. The changing system of health care delivery, high cost caused by the diagnostic tests and rising prices of medicines were the important contributory factors for the rising health expenditure. Since the poorest households spend one third of their total expenditure on health care, the cost of treatment forms one of the prime reason that pushes the households into poverty and deep indebtedness. That is, the impact of mediflation is most severe among the lower economic groups leading to marginalisation of the poor as they find it extremely difficult to meet the growing health expenditure. The privatisation of health care in the state leads to over-medicalisation (Ekbal, 2008)

and health care has become a commodity purchased by the ability to pay.

The national level surveys conducted by the NSSO shows that the burden of out-of-pocket health expenditure is severe in the state. George (2005) has measured the incidence and intensity of catastrophic health expenditure of Keralites by using the 55th round data of NSSO for the year 1999-2000. The analysis shows that the monthly per capita out-of-pocket health expenditure on both inpatient and non-inpatient care were the highest in both rural and urban Kerala when compared to other states of the country. In the rural Kerala, catastrophic headcount at 15 per cent threshold was 14.04, while it was 11.25 for urban Kerala. The calculated values point towards relatively very high levels of health expenditure and the incidence of catastrophic payment is worse in rural Kerala. The concentration index of health care payment was negative implying that a disproportionate percentage of households at lower strata of income incur higher levels of health expenditure. The impoverishing impact of health care payments was 3.82 indicating that an additional 3.82 per cent of the population in the state are falling below the poverty line due to out-of-pocket health expenditure. The impoverishing impact was comparatively greater for outpatient expenditure in the state.

Berman et al. (2010) has examined the impoverishment caused by health care payments across major states of India using the 60th round of morbidity and health care survey of NSSO. They found that Kerala has the highest impoverishing effect of health care payments. In the state, 12 per cent of households fell below the poverty line due to the cost incurred towards health care, with out-patient services accounting greater share than in-patient care. Rama Pal (2012) while examining the incidence of catastrophic health expenditure of households using 61st round of NSSO data found that all the households belonging the lowest three consumption quintile groups in urban Kerala incurred catastrophic health expenditure. For the rural Kerala, all the households in the lowest two groups experienced financial catastrophe, when measured using necessities consumption approach. The incidence of catastrophic health expenditure among the richest households was 2.65 per cent for urban Kerala and 2.22 per cent for rural Kerala. The incidence of catastrophic

health expenditure using the capacity to pay approach exposed that 9.71 per cent of the households belonging to the poorest quintile experienced financial catastrophe in rural Kerala, which was the highest among all the states in the country. 7.43 per cent of poorest households in urban Kerala faced catastrophic impact owing to out-of-pocket health care expenditure. The prevalence of financial catastrophe among the richest quintile was 12.16 per cent for the rural Kerala and 7.92 per cent for urban Kerala. Thus, the incidence was comparatively lower for the poorer consumption quintile groups.

The comparison of the 50th (1993-94) and the 61st (2004-05) rounds data of NSSO by Ghosh (2011) bring out that Kerala registered the highest increase in the out-of-pocket payments for health care as the share of total consumption expenditure. Further, the average out-of-pocket payments as a proportion of household consumption expenditure was the highest in the state with 5.62 per cent in 1993-94 increased to 10.36 per cent in 2004-05. There were very little variations in the share of out-of-pocket health care payments across consumption quintile groups. The proportion of households facing catastrophic health payments at 10 per cent threshold was highest with 32.42 per cent. The proportion was 17.40 per cent in 1993-94. Kerala recorded the highest mean overshoot at 4.97 per cent reflecting higher intensity of payments. The percentage of households impoverished in the state owing to health care payments was 4.33 per cent in 1993-94 raised to 6.15 per cent in 2004-05. In spite of the fact that the concentration index for the state was positive with 0.0156, indicative of greater concentration of catastrophic payment among the better-off households, out-of-pocket payments for health care has aggravated the prevalence and intensity of poverty in Kerala.

4.3.2 Status of RSBY in Kerala

Given the fiscal constraints being faced by the successive governments in the state and their inability to allocate the required funds for the vital sector of health care, the public insurance can play a critical role in mobilising the required resources and to providing protection from the risk of financial ruin caused by the health expenditure in Kerala. As already stated, the national health insurance scheme of

RSBY is envisaged for people below poverty line to protect them from financial risk against the hospitalisation.

In Kerala, the scheme was launched in October 2, 2008 and Alapuzha district was the first district to launch the scheme. Subsequently, RSBY was expanded to all the fourteen districts of the state. A separate agency namely Comprehensive Health Insurance Agency of Kerala (CHIAK) has been constituted for the effective implementation and monitoring of the scheme in the state. Another noteworthy initiative taken by the state in this respect is the implementation of Comprehensive Health Insurance Scheme (CHIS) in 2008. The CHIS extends the insurance coverage to incorporate families not covered under RSBY. The scheme covers families below poverty line who are not included in the list defined by the planning commission and also those families above the poverty line. The status of the RSBY/CHIS scheme in the state as on 2015-16 is summarised in the table 4.2.

Table 4.2: Status of RSBY/CHIS in Kerala (2016)

District	Number of registered families	Number of families with Smart Card	Enrolment (in percentage)	Number of empanelled hospitals	
				Public	Private
Thiruvananthapuram	392470	375680	95.72	24	29
Kollam	349508	326016	93.28	17	19
Pathanamthitta	124048	103344	83.31	9	7
Allapuzha	348720	334536	95.93	14	25
Kottayam	212385	193281	91.01	13	13
Idukki	141856	116163	81.89	9	9
Eranakulam	239430	208893	87.25	16	16
Thrissur	300500	255899	85.16	16	10
Palakkad	275751	234818	85.16	14	13
Malappuram	322672	294411	91.24	13	19
Kozhikode	395063	378489	95.80	18	22
Wayanad	113424	91494	80.67	2	7
Kannur	219997	197650	89.84	6	11
Kasaragod	94136	82243	87.37	7	9
Total	3529960	3192917	90.45	178	209

Source: www.chiak.org and www.rsby.gov.in

More than ninety per cent of families enrolled in the scheme were received the smart card in the state. At the same time, the status of enrolment in the backward and tribal dominated districts of Wayanad and Idukki are comparatively poor. This is mainly on account of the fact that families who are already enrolled in the scheme are not renewing their membership.

4.4 Low Mortality-High Morbidity Syndrome

The much acclaimed Kerala model of "good health at a low cost" is based on the state's impressive performance in terms of mortality and fertility indicators. But the picture is different when one analyses the reported prevalence of morbidity in the state. Although mortality rate is low, the morbidity levels in the urban and rural Kerala are high compared to other states of the country. This has led the debate on "low mortality- high morbidity syndrome" in Kerala. The paradox is that, on the one hand Kerala outperforms other states in all other health indicators, but it also outstrips other states with respect to morbidity prevalence especially that of chronic illness.

The existence of the syndrome in Kerala was first point out by Panikar and Soman (1984). For them, the high levels of morbidity in the state are due to the higher incidence of diseases among the people with low socio-economic status and inadequate nutritional status among them. The main reason is the lopsided health strategy of the state giving priority to curative medicine and not on the improvement in health status through the provision of adequate nutrition, housing, water supply and sanitation. The morbidity estimates of Kerala may also be over-estimates due to better education and greater health consciousness of the people. Large household surveys conducted in the state confirm the prevalence of higher morbidity among people from poor economic and educational background. The level of morbidity rate among the poor was estimated to be higher by 40 per cent than that of rich in Kerala and majority of diseases are infectious in nature (Kannan et al., 1991). National level surveys of NSSO also show that morbidity in Kerala is much higher than other states of the country. The morbidity prevalence rate of the state was 242 per thousand as per the 60^{th} round of NSSO. The corresponding figure for India as a whole was only

91 per thousand. One in every four person reported themselves to be sick during the reference period of fifteen days (Navaneetham et al., 2009).

The above estimates confirm that higher morbidity rates in Kerala is real and not due to higher degree of perception supported by better education and universal availability of health care services. Further, as a consequence of high morbidity, the hospitalisation rate also is highest in Kerala compared to other states. The proportion of persons hospitalised is 10.10 per cent for rural Kerala and 9 per cent for urban Kerala. The corresponding estimates for all India are only 2.30 per cent and 3.10 per cent respectively.

The higher morbidity along with the lower mortality rate in Kerala than elsewhere in India has some grave implications with respect to financing of health care in the state. Further, the state is also witnessing the epidemiological polarisation which is key feature of health transition. With low mortality rates, non-communicable diseases are more prominent, with malnutrition and infectious diseases concentrated among the poor than the rich (Dilip, 2002). Now, in general, the major diseases in Kerala are associated with life style than deprivation. At the same time, the state is now facing twin challenges of communicable and non communicable diseases. The incidence of many diseases is higher than the national average.

Kerala has been successful in controlling communicable diseases such as dengue fever, aids, malaria, leptospyrosis, hepatitis, chikungunya fever, etc. in the past. In recent years, there is a resurgence of these diseases leading to considerable morbidity and mortality in the state. Early success in reducing mortality has led to ageing population suffering from many non communicable diseases associated with demographic shift occurred in the state. Common non–communicable diseases causing great threat to life of Keralites are cancer, diabetes, cardio vascular diseases and lung diseases. The non-communicable diseases are chronic in nature necessitating constant medical attention and longer duration of treatment. With the weakening of the public provision of health care and the unleashing of high-cost private health care providers, the cost of treatment is beyond the capacity of average

household in the state. The cost of medical constitutes great financial burden to low income groups and this raises major concerns with respect to equity and sustainability of health care financing mechanism being followed in the state. The burden of treatment is likely to increase substantially in future, due to ageing population and changes in the life style of people of the state. With increased life expectancy, there is higher incidence of non-communicable diseases associated with old age.

4.5 Conclusion

The available evidences do suggest that there are serious emerging challenges to Kerala model of health and the financing mechanism in operation in the state. While on the one hand, public health care system has weakened, there occurred stupendous growth of private health care sector resulting in runaway increase in health care costs. Studies have proved that the incidence of catastrophic health care payment is much higher in Kerala compared to other states in the country. The increasing presence of private providers in the health care delivery system of the state is adversely affecting the household budget of Kerala. While it is the poor and marginalised people, such as tribal communities, who are more vulnerable to ill health, Kerala's highly praised health success story at such high prices, calls for introspection. Otherwise, Kerala's good health will be at the cost of impoverishment of low income groups of the state. With lower income and higher morbidity rate, large majority of tribal population is susceptible to catastrophic health spending. Thus, this study examines the financing of health care among the major tribal communities of Kerala.

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CHAPTER 5
TRIBAL COMMUNITIES IN KERALA

5.1 Introduction

Article 366 (25) of the Indian Constitution refers to the Scheduled Tribe as those communities who are scheduled in accordance with the Article 342 of Constitution. The Article says that only those communities who have been declared by the President of India through an initial public notification or through the subsequent amendment by the Parliament can be considered as Scheduled Tribe. Article 342 provides specification of tribal communities for the purposes of the Constitution of the Scheduled Tribes in relation to that of the state or union territory. The essential characteristics for a community to be identified as Scheduled Tribe community in India are indications of primitive traits, distinctive culture, shyness of contact with community at large, geographical isolation and backwardness (Government of India, 2013). This chapter intends to provide an overview of Scheduled Tribe communities in Kerala to create a background for the analysis chapters. The chapter is organised in three sections. The next section examines tribal communities in Kerala with special emphasis on the eight tribal communities which this study is concerned with, followed by a conclusion.

5.2 Profile of Tribal Communities in Kerala

In India, there are 705 tribal communities with a population of 10,42,81034 which is 8.6 per cent of the total population of the country. At the same time, in Kerala, the tribal population is 4, 84,839 constitutes 1.45 per cent of the state's total population. The proportion of tribal population during the earlier Census (2001) was 1.14 per cent. Thus, there has been an increase of 0.31 per cent in the proportion between decennial censuses. The status of tribal communities of Kerala is, to some extent, better than their counterparts in the rest of the country. Table 5.1 provides a comparative status of Scheduled Tribes of Kerala with respect to a number of indicators.

Table 5.1: Status of Scheduled Tribes in India and Kerala

Sl No	Parameter	Kerala	India
1	Population (in lakh)	4.85	1042
2	Percentage to total population	1.45	8.61
3	Decadal growth rate of population (Rural)	23.7	21.3
4	Decadal growth rate of population (Urban)	26.5	49.7
5	Decadal growth rate of population (Total)	33.10	23.66
6	Mean household size (Rural)	4.0	4.8
7	Mean household size (Urban)	4.1	4.6
8	Mean household size (Total)	4.0	4.8
9	Child population to total population	11.2	16
10	Sex ratio (Rural)	1031	991
11	Sex ratio (Urban)	1070	980
12	Sex ratio (Total)	1035	990
13	Child sex ratio	949	957
14	Literacy rate (Male)	80.76	68.53
15	Literacy rate (Female)	71.10	49.35
16	Literacy rate (Total)	75.81	58.96
17	Work Participation Rate (WPR)	47.5	48.7
18	Percentage of households having drinking water facility within the premises	44.3	19.7
19	Percentage of households having toilet facility	71.4	22.6
20	Percentage of households having bathing facility	28.6	17.3

Source: Population Census (2011)

It is evident from the table that, the level of literacy is higher among the tribal communities of Kerala than the national average, so is the female literacy. The overall literacy rate among tribal communities has increased from 64.4 per cent in 2001 to 75.81 per cent in 2011 in the state. The sex ratio is favourable for females in the case of Kerala while it is not the case of India. Mean household size and decadal growth rate of tribal population is lower in Kerala compared to the national average. It should be emphasised that though decadal growth rate of tribal population (33.10)

is lower in Kerala, it is significantly higher compared to the growth rate of general population in the state, which is only 4.91 per cent. This is due to factors such as inclusion of new communities into the list of scheduled tribes and the tribal community have yet to reach the stage of demographic transition, which Kerala has already attained. Similarly the percentage of tribal households with access to drinking water facility within the premises, having toilet and bathroom facility are much higher in Kerala. However, the work participation rate among the tribal population of Kerala is slightly lower than the national average. The figure 5.1 presents the age structure of the tribal population in Kerala.

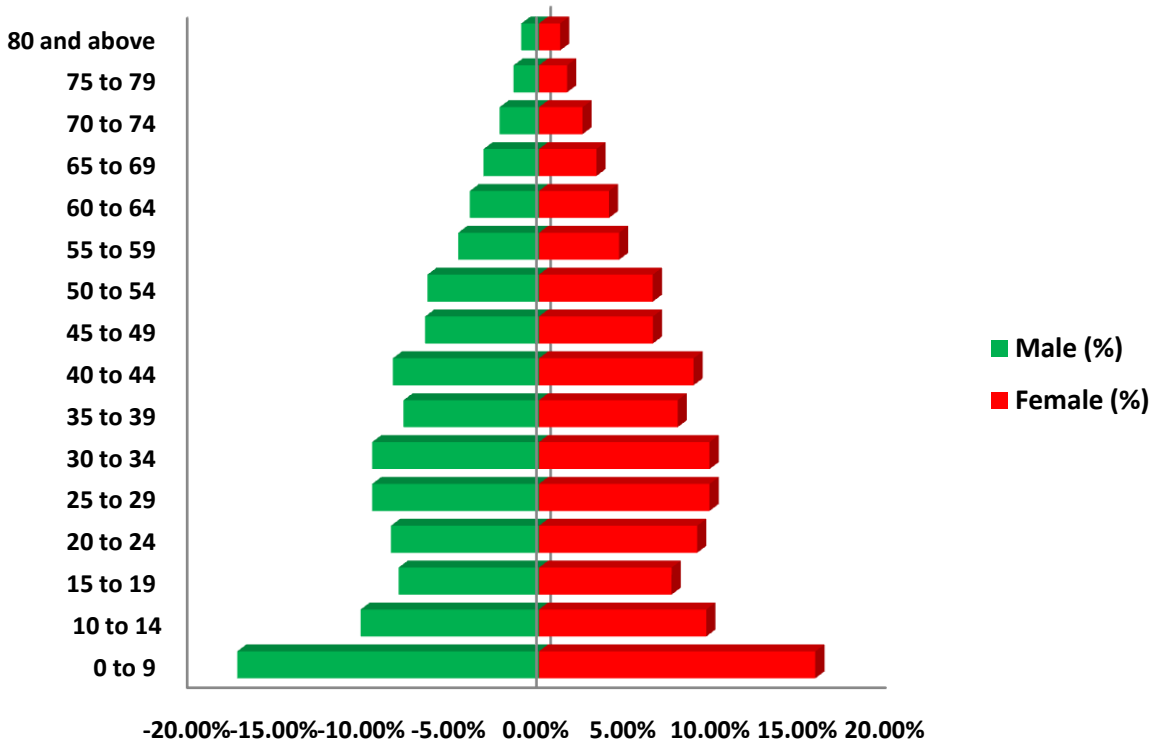

Figure 5.1: Age Pyramid of Scheduled Tribe Population in Kerala

The age pyramid of tribal population shows that the tribal population is relatively younger compared to the population of the state as a whole. More than one-third of the tribal population (34.27) is less than twenty years. At the same time, the percentage of aged population (sixty years and more) is only 9.17 per cent, while Kerala has 13.5 per cent of its population as aged. Zachariah et al. (2004) has

pointed out that the age pyramid of general population of Kerala resembles that of a developed country as it has already entered into the last stage of demographic transition, the age pyramid of tribal communities resembles the case of a developing country, with predominantly younger population. Younger population implies that there are chances of higher fertility and further increase in the population of tribal communities in the state.

With the constitutional amendment of 2002, the state has 36 communities classified as scheduled tribes which come to 1.45 per cent of total population in the state. The tribal communities in Kerala are listed in table 5.2.

Table 5.2: Tribal Communities in Kerala

Sl. No.	Tribal Community	Sl. No.	Tribal Community
1	Adiyan	19	Mala Vettuvan
2	Aranadan	20	Mala Arayan
3	Cholanaickan	21	Malai Pandaram
4	Eravallan	22	Malai Vedan or Malavedan
5	Hill Pulaya, Mala Pulayan	23	Malakkuravan
6	Irular, Irulan	24	Malasar
7	Kadar, Wayanad Kadar	25	Malayan
8	Kanikaran, Kanikkar	26	Malayarayar
9	Karimpalan	27	Mannan
10	Kattunayakan	28	Mavilan
11	Kochuvelan	29	Muthuvan
12	Koraga	30	Palleyan
13	Kudiya or Melakudi	31	Paniyan
14	Kurichchan, or Kurichiyan	32	Ten Kurumban or Jenu Kurumban
15	Kurumans, Mullu Kuruman	33	Thachanadan
16	Kurumbas or Kurumban	34	Ulladan
17	Maha Malasar	35	Uraly
18	Mala Panickar	36	Vetta Kuruman

Source: Population Census (2011)

There are five communities that are notified as primitive considering the stage of transition in to the modern society and categorised as Particularly Vulnerable Tribal Groups (PVTGs) in Kerala. They are (1) Cholanaickan (2) Kadar (3) Kattunayakan (4) Koraga and (5) Kurumbas. Tribal communities in Kerala is a heterogenous group. There are perceptible differences between communities with respect to culture, source of livelihood, income, educational status and development perspsectives. Though few tribal communities in the state are better-off than their counterpart in rest of the country, major proportion of tribal people still live in poverty and vulnerable living conditions (Government of Kerala, 2009). Further, there exists perceptible differences in the level of development within the tribal community in Kerala. The benefits of reservation in government jobs, the support and schemes offerred by the government to the tribal communities are not equally distributed among tribal communities (Kerala State Planning Board, 2009). Table 5.2 provides few demographic indicators of tribal communities in Kerala.

Table 5.3: Population, Sex Ratio, Literacy and Work Participation Rate among Tribal Communities in Kerala (2011)

Name of Community	Population	Literacy Rate	Sex Ratio	Work Participation Rate
Adiyan	11,526	66.8	1090	50.7
Arandan	283	50.4	1194	43.1
Cholanaickan	124	19.8	722	37.9
Eravallan	4,797	53	1031	58.4
Hill Pulaya	2,959	61.2	1025	59.2
Irular	23,721	62.8	1016	52.1
Kadar	2,949	71.2	1028	47.5
Kanikaran	21,251	88	1130	42.7
Karimpalan	14,098	84	1043	47.9
Kattunayakan	18,199	57.5	1013	49.2
Kochuvelan	38	91.4	727	39.5
Koraga	1,582	77.2	1033	52.8
Kudiya, Melakudi	785	80.8	948	42.9
Kurichiyan	35,171	83.6	993	48.3
Kurumans	24,505	84.1	1017	49.4

Name of Community	Population	Literacy Rate	Sex Ratio	Work Participation Rate
Kurumbas	2,586	56.3	986	49.4
Maha Malasar	154	53.1	1169	43.5
Mala Panickar	1,023	83.5	1158	36.9
Mala Vettuvan	17,869	65.8	1019	47.7
Mala Arayan	33,216	96.3	998	45.1
Malai Pandaram	2,422	60.2	974	43.6
Malai Vedan	8,149	81.9	1089	44
Malakkuravan	175	65.9	989	46.3
Malasar	3,195	48.7	988	55.3
Malayan	5,917	64.4	1047	49.2
Malayarayar	1,568	80.7	1058	51.4
Mannan	9,780	69.3	1041	53.1
Mavilan	30,867	77.2	1062	48
Muthuvan	23,746	56.9	990	55.4
Palleyan	1,464	73.5	989	61.2
Paniyan	88,450	63.2	1068	49.8
Ten Kurumban	25	61.1	1500	40
Thachanadan	1,745	79.4	1031	49.7
Ulladan	16,230	88.4	1060	42.8
Uraly	11,179	80.1	996	55.2
Vetta Kuruman	739	70.1	1136	49.9
Generic Tribes	62,352			
Scheduled Tribe (Total)	4,84,839	75.8	1035	47.5

Source: Statistical Profile of Scheduled Tribes in India (2013)

From the table, it can be observed that literacy rate among tribal communities is only 75.8 per cent. Even though Mala Arayan community do have a literacy rate of 96.3 per cent (male: 97.2 and female 95.4) but Cholanaickan community of Nilambur valley have the lowest literacy of 19.8 percent. Among this primitive community, literate males constitute only 12.5 per cent. Sex ratio is one of the indicators that can be used for understanding the gender discrimination in the population. Like the general population, sex ratio among the tribal communities is favourable to females with 1035 females for 1000 males. The state average is 1084. There is significant variation among tribal communities with respect to the sex ratio.

Sex ratio is highest among Ten Kurumban, but they have a population of only 25. Twenty four out of thirty six communities had sex ratio favourable to females. It is lowest among Cholanaickan with only 750 females for 1000 males. The work participation rate among tribal communities is 47.5, which is significantly higher than that for the general population of Kerala (34.78 per cent). There occurred an increase in the work participation rate among tribal community from 46.3 per cent in 2001 to 47.5 per cent in 2011 as well. The rate is highest among Palleyan community and is lowest among Mala Panickar community.

Majority of tribal communities in Kerala live in the districts of Wayanad, Idukki, Palakkad and Kasaragod. The distribution of sheduled tribes in the fourteen district of Kerala is shown in the table 5.4.

Table 5.4: Percentage Distribution of Scheduled Tribes in Kerala (2011)

District	Population	Percentage	Percentage of District Population
Thiruvananthapuram	26759	5.52	0.81
Kollam	10761	2.22	0.41
Pathanamthitta	8108	1.67	0.68
Allapuzha	6524	1.36	0.31
Kottayam	21972	4.53	1.11
Idukki	55815	11.52	5.03
Eranakulam	16559	3.42	0.50
Thrissur	9430	1.94	0.30
Palakkad	48972	10.10	1.74
Malappuram	22990	4.74	0.56
Kozhikode	15228	3.14	0.49
Wayanad	151443	31.24	18.53
Kannur	41371	8.53	1.62
Kasaragod	48857	10.08	3.74
Total	4,84,839	100.00	1.45

Source: Population Census (2011)

As is evident from the table, more than one-third of tribal communities in the state lives in Wayanad. The districts of Idukki, Palakkad and Kasaragod also have high concentration of scheduled tribes. These four districts together accounts for more than sixty per cent of tribal population of Kerala. Wayanad has the highest concentration of tribals in the state while the Alapuzha has the lowest percentage of tribal population.

Out of the 36 tribal communities in Kerala, this study explores the financing of health care among eight communities, which together constitutes 52 per cent of the total tribal population in the state. The selected tribal communities are Paniyan, Adiyan, Kuruman, Kurichiyan, Uraly Kuruman, Mala Arayan, Muthuvan and Irular. The subsequent section provides a short description about these eight tribal communities.

5.2.1 Paniyan

Paniyan constitutes the single largest tribal community in Kerala who constitute 18.24 per cent of the total scheduled tribe population in the state. Etymologically, "pani" means work and Paniyan signifies "one who works". Though the largest, Paniyans are one of the most backward and poorest among the tribal communities.

Traditionally, Paniyans were bonded labourers attached to local land lords. It is believed that they were brought to Wayanad by the Gounder who trained them to be the agricultural labourer in the field. When the bonded labour system was abolished by the government in 1976, they started to work as agricultural labourers. But the decline of paddy cultivation in Wayanad has adversely affected the living conditions of this community. Lack of education and skills required for the jobs in plantation and tourism sectors meant that Paniyan failed to become part of the modern labour market of Wayanad. Now, majority of community are working as agricultural labourers and as wage labourers. The Paniyan community is divided into various lineages known as 'illam'. Members of an illam trace their lineage from common ancestor. Paniyans believe that they are descendents of 'ippimalamuttappan'

Most of Paniyan tribal community had failed to reap benefits from the government programme of rehabilitation of bonded labourers. Only few of them benefited from schemes like Sugandhagiri project that provided acres of land and benefits such as housing. The community, though largest, do not have adequate representation in local bodies and in government service.

The Paniyan community has a distinct language of their own known as "Paniyabhasha". It is a spoken language without any script, which the community uses within the kin groups. The dialect contains words from Tamil, Tulu and Malayalam languages. The language and script used with others is Malayalam. Paniya community usually does not depend on home-cooked food throughout the year, but they purchase food from nearby hotels and tea stalls. Majority of Paniyan community live in Wayanad district, but they are also found in the districts of Kannur, Kozhikode, Malappuram, Palakkad district of the state, Gudallur taluk of Nilgiri and also in neighbouring areas of Karnataka state. 74. 47 per cent of Paniya community lives in Wayanad followed by Kannur (13.55 per cent), Malappuram (8.1 per cent) and Kozhikode (3.07 per cent). In Wayanad, all the 25 grama panchayaths and Kalpetta municipality have representation of Paniya community (Government of Kerala, 2011). The total population of Paniya tribal community is 88450 in which 42775 are males and 45675 are females. The sex ratio is 1068 and mean family size is 4.29 as per the Census (2011). The age structure of the community is presented in the through age pyramid in figure 5.2

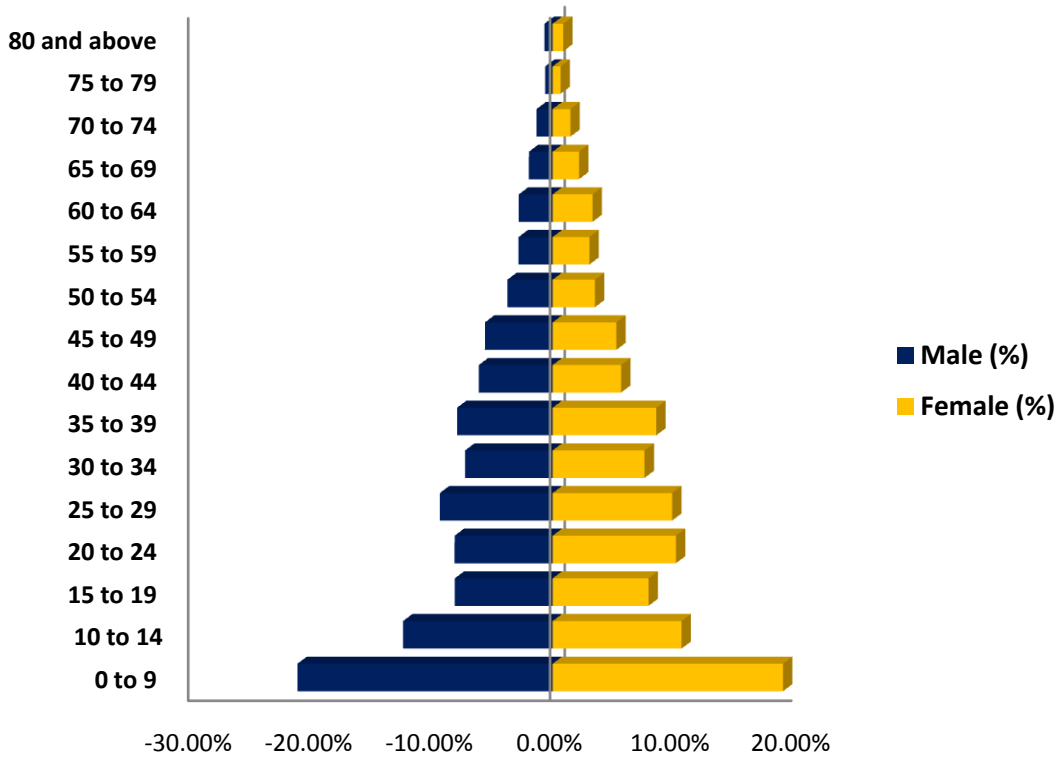

Figure 5.2: Age Pyramid of Paniyan Tribal Community

The Paniyan community do have a young population. 42.17 per cent of the community are below the age of 21. Further 20.07 per cent of the population is below the age of 10. Only 7.94 per cent of the community is aged population. Thus, there are greater possibilities of a rapid increase in population in the case of the largest tribal community of Paniya in the state.

5.2.2 Adiyan

Like Paniya, the tribal community of Adiyan also used to be bonded labourers till the enforcement of Abolition of Bonded Labour Act of 1976. The word Adiyan means “slave” or “serf” in Malayalam. Traditionally Adiyan community were slave to local landlords and latter bonded labourers attached to these families. However, the community prefers to be known as “Ravuler”, as they are known in Karnataka. Wives are referred to as ‘rati’ and the husbands as ‘ravulan’.

Now the Adiyan community are marginal agriculturalists and the majority of them are agricultural labourers. Like most of the tribal communities in Kerala, Adiyan also are decentralised as a response to the socioeconomic transition that the region underwent. Community members, especially younger ones, are exposed to modern education, political process, media etc. The community had representatives in the legislative assembly of Kerala and local bodies. Despite this, the Adiyan community do not have adequate representation in government services. Majority of them remain landless and poor.

Adiyan community is bilingual. They speak a separate dialect called "adiyabhasha". This dialect is influenced by Malayalam and Kannada, which the community speak at home and with kin groups. With others they use Malayalam. The community is divided into a number of clans called "manta or chemmam" and the clan head is known as Chemmakkaran. The head of hamlet is known as kuntumoopan. Gaddika is the famous art form of Adiyan community.

Adiyan community is mainly concentrated in Wayanad district, the adjoining areas of Kannur district and Kodagu (Coorg) in Karnataka. 99.80 per cent of Adiyan population is settled in Wayanad alone. In Wayanad district, Adiyan community are found in nine grama panchayaths. However, their sizable population is seen in four panchayaths namely Thirunelli, Mananthavady, Panamaram and Pulpally. 45.35 per cent of Adiyan community is found in Thirunelli panchayath alone (Government of Kerala, 2011).

The population of Adiyan tribal community in the state is 11516 with 5515 males and 6011 females. The sex ratio of the community is 1082 which is similar to that of general population in the state. The average family size of the Adiyan community is 4.35 which is higher than the state average. The age structure of Adiyan community is portrayed in figure 5.3.

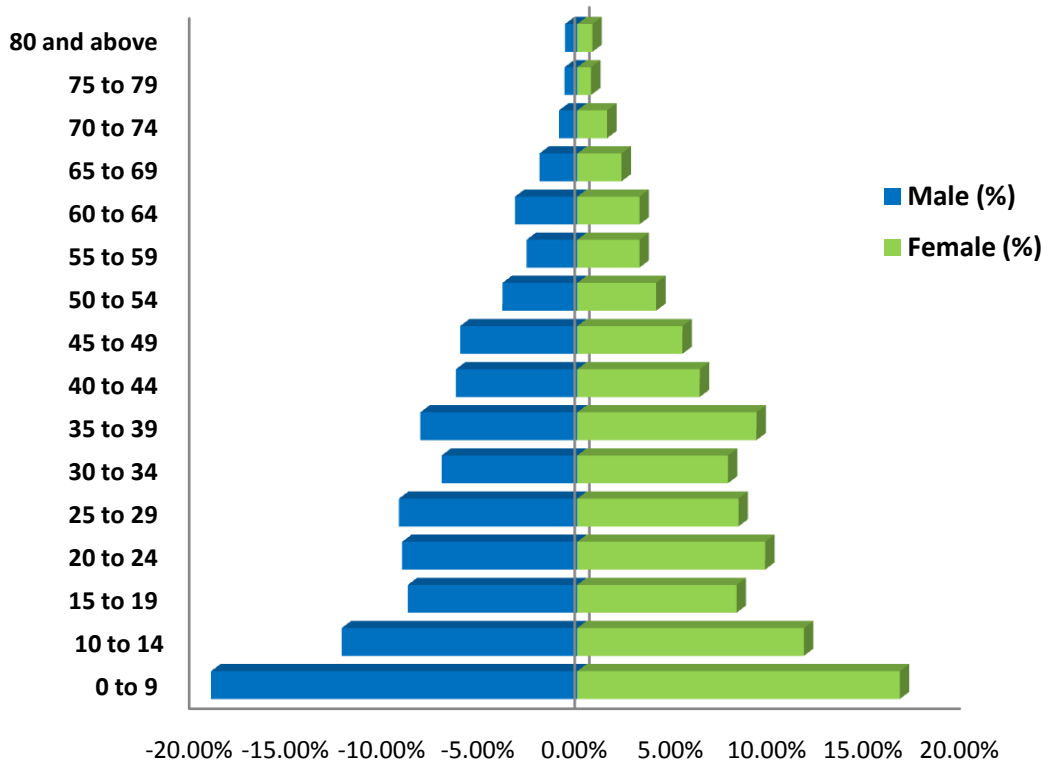

Figure 5.3: Age Pyramid of Adiyan Tribal Community

Like the general pattern among tribal communities, Adiyan too have a young population. 40.61 per cent of the community is at the age group of less than 21 years. Further, 17.82 per cent is less than 10 years. The percentage of aged population is only 8.02 per cent.

5.2.3 Kuruman

Kuruman or Kurumar is one of the dominant tribal communities mainly settled in Wayanad district. It is believed that they are the autochthones of Wayanad and descendents of Veda Kings who initially ruled the district. They are called by different names such as Mulla Kuruman and Mullu Kurumbas. Etymologically, mulla means bamboo and mullu means thorn, indicating that the community were connected with bamboo and thorns or arrows. In their initial stages, the principal occupation of Kuruman community was wood cutting and the collection of minor forest produces. Now, Kuruman are settled agriculturists. Their main crop is paddy

and also does animal husbandry and they are experts in hunting which is a part of their culture.

Kuruman tribal community enjoys a higher status among tribal communities in Kerala. They had considerable land holdings and are involved in paddy cultivation. Their settlements are in the valley and follow joint family system. In terms of development indicators, Kuruman community are much ahead of other tribal communities. Although educationally backward, this hardworking community has improved a lot. They have responded positively to most of the development initiatives of the government and reaped rewards from the schemes and programmes meant for tribal welfare. They have jobs in government service and the community has accepted modernity to a great extent and has decentralised fairly (Government of Kerala, 2011). Kuruman tribal community is well represented in the local leadership of all major political parties and community members are active in public life.

Kuruman settlement is known as "kudi". Each settlement has a "porunnavan" who controls the traditional social organisation of the community. Kuruman community is spread over six districts. However, 98.18 per cent of their population is in Wayanad district. Kuruman community is concentrated in eight panchayaths in Wayanad namely Noolpuzha, Nenmeni, Poothadi, Ambalavayal, Pulpally, Kaniambetta and Sulthanbathery. Total population of the community in the state is 24505 in which 12148 are males and 12357 are females. The mean size of the Kuruman family is 4.06 and the sex ratio is 1012 (Census, 2011). The age pyramid of the community is depicted in figure 5.4.

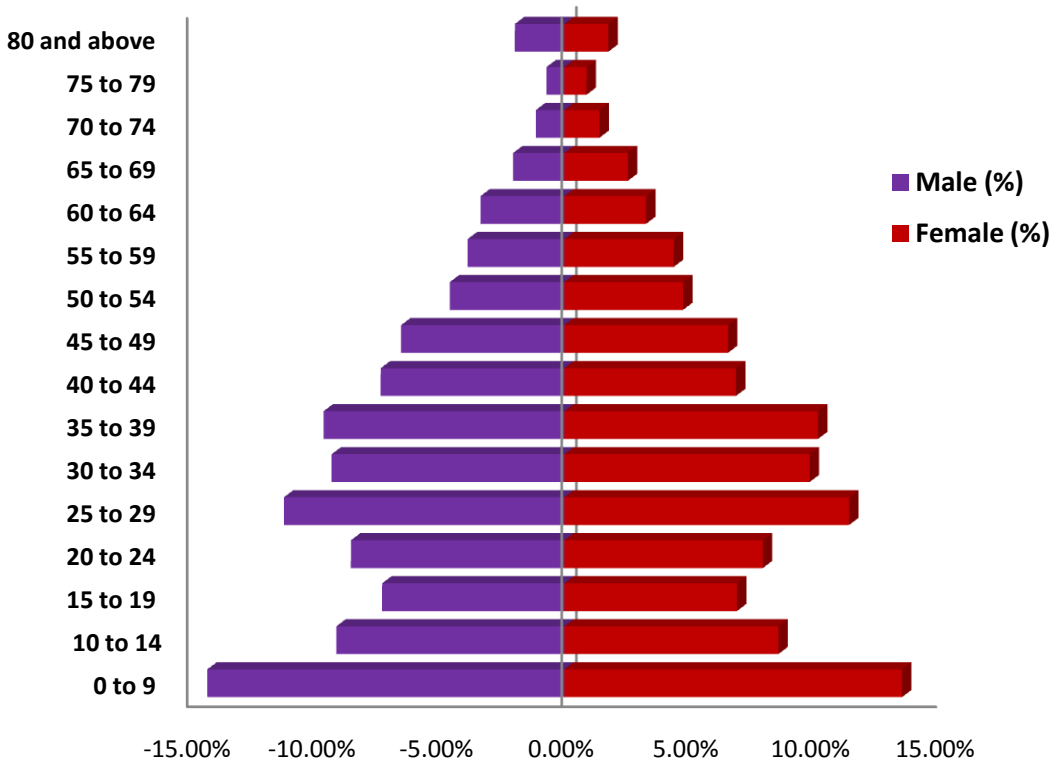

Figure 5.4: Age Pyramid of Kuruman Tribal Community

More than one-third (31.49 per cent) of the Kuruman community is less than 21 years of age. 13.91 per cent of the community is under the age group of less than ten years. The percentage of aged population is 8.56 which is less than the value for tribal community as a whole.

5.2.4 Kurichiyan

Kurichiyan is the second largest tribal community in terms of population, mostly concentrated in Wayanad district. They are one of the major tribal community known for its martial traditions. It is believed that Kurichiyan community are descendents of the Thekku Perumbadan Villali Karinairs who were brought from Perumbadan in the south by the Raja of Kottayam in his fight against the Veda Kings. The community were experts in archery and hence were also known as villali karinairs. The name Kurichiyan was derived from the word “kurinilam” or “kurichasthalam” meaning appointed place because they promptly reported at the

mustering place fixed by the Raja. With their martial skills, the community supported Pazhassiraja of Kottayam dynasty in eighteenth century to fight against the British. The Kurichiyan tribal community received greater patronage from the King and are highly endowed with land. During the initial phase of their development, the community used to follow untouchablity with other tribal communities.

Kurichiyan community is socially and economically better-off compared to other tribal communities and claims a higher status over the rest of the tribal communities in Wayanad. Majority of Kurichiyan community are land owners and a few of them work as agricultural labourers as well. Kurichiyans are rated as best paddy cultivators among tribal communities of Kerala. They cultivate many species of rice. Cash crops like coffee, pepper, areca nut, ginger, turmeric, tapioca and coconut are also grown by the community. Some of the community members have also entered into government/semi government jobs and plantation sector. The community has expert knowledge in identifying medicinal plants for curing certain diseases.

The Kurichiyan community are segmented into four subdivisions, namely, Kurichiyan of Wayanad or Jati Kurichiyan who accepted the titular name Kurichiyan from the Kottayam Raja; Kunnam Kurichiyan of Kannavam forest, Koothuparamba of Kannur; Anchilla Kurichiyan of Tirunelly and Pathiri (priest) Kurichiyan who embraced Christianity way back in 1908-10.

The Kurichiyan community of Wayanad follows joint family system called “mittom” consisting of 30 to 100 or more members. The elder male in mittom is called “poopan” and his wife is known as “poopathi”. Their territorial head is called “Nadu moopan”. 99.96 per cent of Kurichiyan community is concentrated in three districts of Wayanad, Kannur and Kozhikode. However, 70.36 per cent of Kurichiyan live in Wayanad. Thaninjal, Thondernad, Kottathara, Panamaram, Vellamunda, Mananthavady, Edavaka and Tirunelly are the eight panchayaths in Wayanad district which have sizable population of Kurichiyan tribal community (Government of Kerala, 2011).

There are 35175 members of Kurichiyan community according to Census (2011). Among them, 17643 are males and 17528 are females. The mean family size of the community is 4.29 and the sex ratio is low with only 981 females for 1000 males. The population pyramid of the community is shown in figure 5.5.

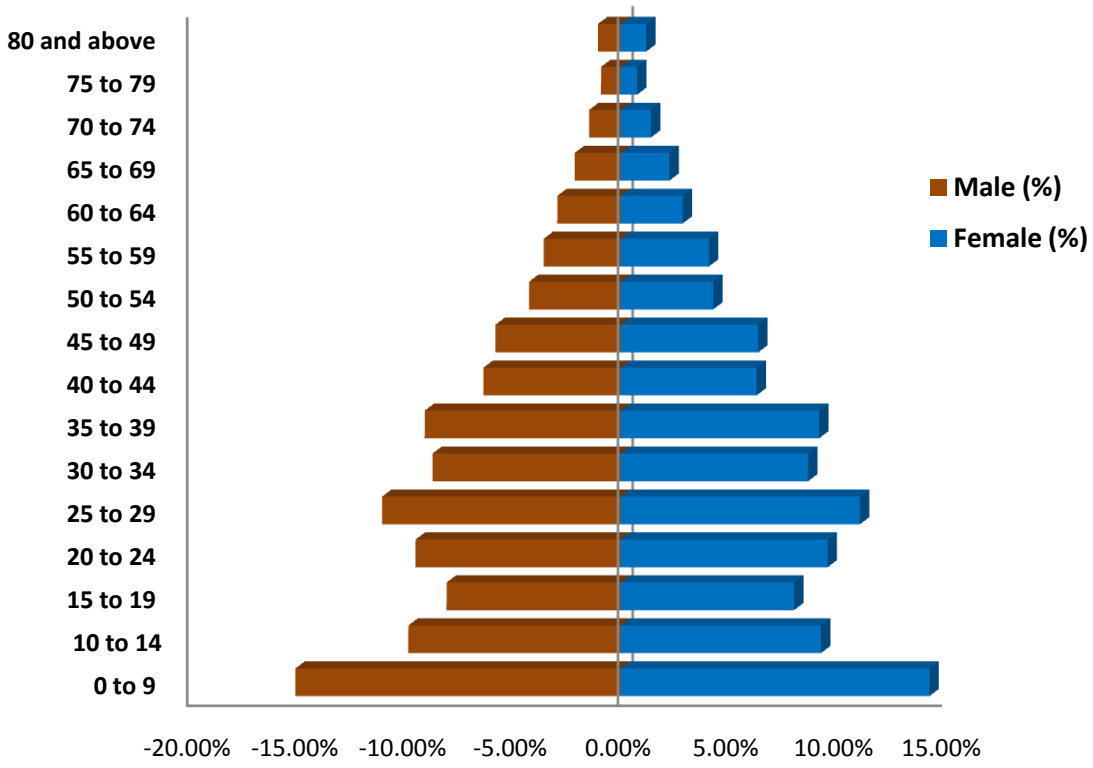

Figure 5.5: Age Pyramid of Kurichiyan Tribal Community

Following the general pattern of the tribal population, Kurichiyan community has 34.32 per cent of its population less than age of 21. The percentage of population less than ten years of age is 14.71. The aged population constitutes 8.48 per cent of Kurichiyan tribal community.

5.2.5 Uraly Kuruman (Vetta Kuruman)

The word Uraly means the ruler of a village. Uraly community is believed to be the descendents of Mutturaja of Madurai. Uraly Kuruman tribal community was categorised with Uraly community in the census records. The community was categorised as Scheduled Tribe only in 2003. Their identity was revived only in

2008 with a survey by Scheduled Tribe Welfare Department. But even in the Census of 2011, majority of Uraly Kuruman community were enumerated as a part of Uraly community.

Uraly Kuruman community are basically forest dwellers. They have a distinctive position among tribal communities in Kerala. They are well known for their artistic skills in making hand-made pottery. They cut and fashion wooden artefact and carryout carpentry work as well. The community are also expert black smiths and in the past they used to prepare iron part of the arrows used by the Kurichiyan tribal community. The womenfolk of the community are proficient in basketry and bamboo mat weaving. The community members sell non-timber forest produce which is seasonal income for them. They cultivate paddy in limited forest areas. They also practice shifting cultivation of paddy. Only a minority among the community do have land holdings and few of them are agricultural labourers and wage labourers.

Uraly Kuruman community is bilingual. They use their own dialect which is a mixture of Malayalam and Kannada among themselves. Their headman of the community is called “megalan” Majority of the community is concentrated in Wayanad district and they are found in five panchayaths of Thirunelly, Ambalavayal, Noolpuzha, Panamaram and Poothadi.

As the Uraly Kuruman community is enumerated as a part of Uraly community in the census, precise population of the community is not known separately from census data. Yet, from the data collected by the Department of Local Self Government in 2008, there are 1703 Uraly Kuruma families with a population of 6482 consisting of 3193 males and 3289 females. Mean family size is low with only 3.81 and the sex ratio is 1030. Figure 5.6 presents the age structure of the community.

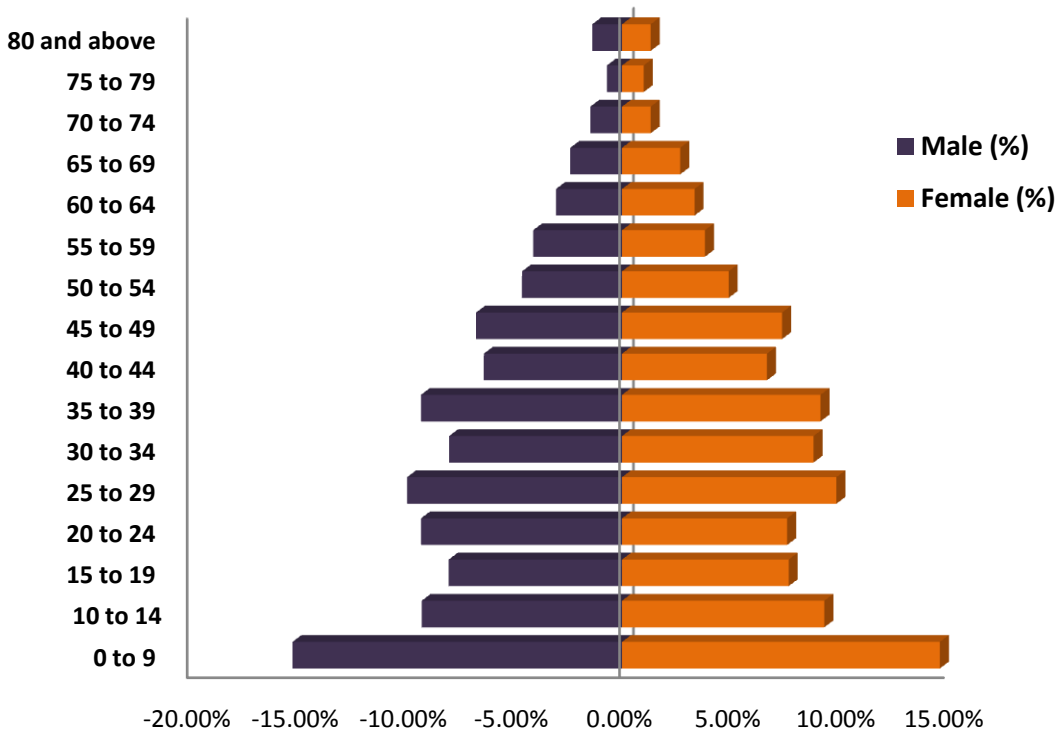

Figure 5.6: Age Pyramid of Uraly Kuruman Tribal Community

33.98 per cent of the Uraly Kuruman community is less than the age of 21. Further, 14.97 per cent among them are less than 10 years of age. The percentage of aged population in the community is 9.33 per cent which is slightly higher when compared to other tribal communities.

5.2.6 Mala Arayan

Mala Arayan, also known as Malai Arayan and Malayarayar, are the fourth largest tribal community in Kerala and are the second community among scheduled tribes which has representatives in largest number of local bodies. The world Mala Arayan derived from 'Mala Arachan' meaning lord of the hills. This is the first tribal community in Kerala to embrace Christianity and this section comes to 30 per cent of their population. The conversion dates back to 1853 and the missionaries started vernacular schools and since then the progress of the community were fast and steady.

The community has generously benefited from the missionary activities. Mala Arayan tribal community is relatively well educated and are the major beneficiaries of reservation policy of central and state governments in education and government jobs. The community is well-represented in state government service and also in Indian civil service. The land holding status of the community is high compared to other tribal communities and income generation from agriculture is also high. Mala Arayan community is socially and economically better-off and many of them are big landlords.

Though Mala Arayan community is spread in 13 districts of the state (Kannur is only exception), 92.16 per cent of them are settled in Idukki and Kottayam. The community is mainly distributed in Thodupuzha Taluk of Idukki and Meenachil Taluk of Kottayam district. They have migrated and formed a few settlements in Eranakulam, Pathanamthitta, Thiruvananthapuram and Wayanad. Majority of Mala Arayan community are concentrated in nine panchayaths, namely, Arakkulam, Velliyamattom, Udumbannur and Vannuppuram (Idukki district), Melukavu, Moonilavu, Mundakkayam, Korathodu and Erumeli in Kottayam district.

Total population of the community is 33216 with 16622 males and 16594 females according to Census (2011). A decline has taken place in the population of the community when compared to 2001 census. Mean family size of the community is only 3.69 which is one of the lowest among tribal communities and sex ratio is 998. The structure of the population is examined in the figure 5.7.

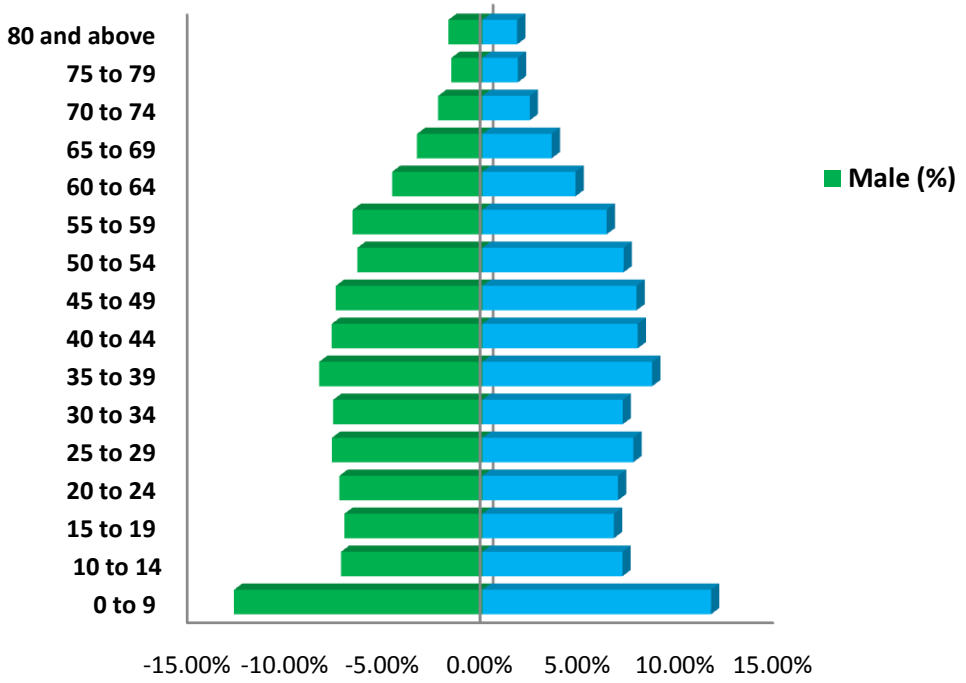

Figure 5.7: Age Pyramid of Mala Arayan Tribal Community

As is evident, the population pyramid of Mala Arayan community acquires a different shape compared to other tribal communities and it resembles that of general population of Kerala. The percentage of Mala Arayan community less than 21 years old is 27.70 which is lower than average for the tribal communities (34.27 per cent). Similarly, 12.21 per cent of the community is less than 10 years of age while average for all communities is 16.54 per cent. More interesting is the fact that the percentage of aged population is 13.93 which is comparable to Kerala's general population (13.5 per cent) and significantly higher than scheduled tribe as a whole (9.17 per cent). Thus, Mala Arayan community have reached the final stage of demographic transition.

5.2.7 Muthuvan

The tribal community of Muthuvan lives near the Western Ghats. In Malayalam, the word Muthuvan means those who carry something on their back ("muthu" means back and "van" means one that carries weight on back). It is said that they have carried their children and belongings during their migration to

Western Ghats, hence they are called Muthuvan. It is believed that Muthuvan community had migrated from Madurai of Tamil Nadu.

The community lives adjacent to forest and the major source of livelihood is agriculture, hunting and collection of minor forest produce. They are mainly a land owning community. In some areas, the Government has allotted agricultural land for them, but not on ownership basis. Their primary cultivations are paddy, coffee, ginger, ragi, cardamom, pepper and sugar cane. Muthuvan are known for their organic cultivation of ragi and paddy. They shifts cultivation site every two years. The wide varieties of cardamom and pepper strengthen their economic base. One notable feature of the agricultural practices of Muthuvan community is their proficiency in water management. They locate springs and streams on the mountains and conduct the water through bamboo pipes, split halves of bamboos to their fields. Animal husbandry and daily wage labour are their subsidiary occupations. The dialect spoken by the community is closely related to Tamil.

Muthuvan is one of the few tribal communities who have still refrained from developing contacts with people of general population. The traditional value system of parity and pollution ideas distanced Muthuvan community from other communities, especially in the case of women attaining formal education. The percentage of literate women in the community is only 46.7 which is much less lower than average for scheduled tribe community as a whole (71.1 per cent). The Muthuvan family pattern is of the nuclear type, but people live together in clusters of closely related individuals. A group of such families is called a “kudi”. The headman of the Muthuvan community is called “moopan” who holds supreme control over the community and presides over the council of elders.

The concentration of Muthuvan tribal community is in the districts of Idukki and Eranakulam. 64 per cent of the community is concentrated in Idukki district. Majority Muthuvan settlements are found in the panchayaths of Adimaly, Marayur, Mankulam, Edamalakkudi (Idukki district) and Kuttampuzha (Eranakulam district). Edamalakkudi, the only tribal panchayath in Kerala has the total tribal population of 2097 and all of them belong to Muthuvan community. Total population of the

community as per the Census (2011) is 23746 with 11931 males and 11815 females. The sex ratio is low with 979. The mean family size is also small with 3.74. The age structure of the community is analysed in figure 5.8.

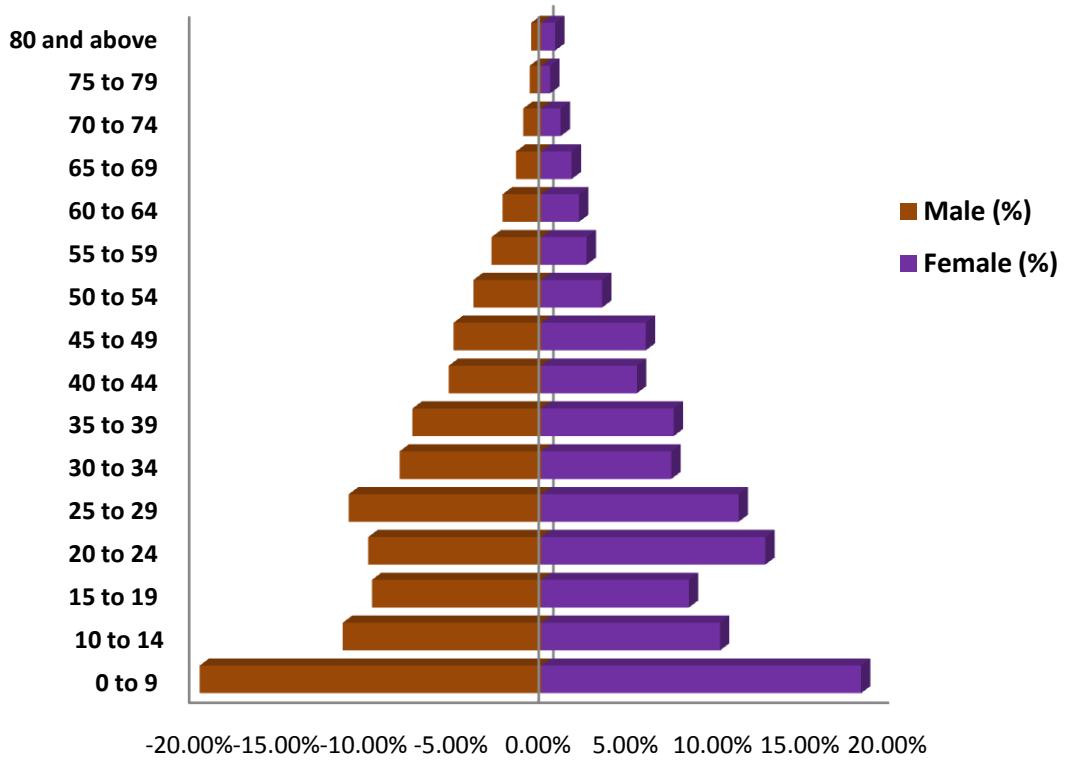

Figure 5.8: Age Pyramid of Muthuvan Tribal Community

Population pyramid of Muthuvan tribal community visibly indicates the case of a developing society with higher proportion of younger population. The percentage of Muthuvan community below the age of 21 is 41.46, which is one of the highest among the tribal communities and to a large extent higher than the average for the entire scheduled tribe population (34. 27 per cent). Similarly, the percentage of population below the age of ten years is also high with 18.91 per cent. The percentage of aged population is only 6.11 lower than average for entire scheduled tribe communities.

5.2.7 Irular

Irular community is the seventh largest tribal community in Kerala. In Malayalam, the word 'irul' means dark. For Luiz (1962) the name Irular has originated from their own description of their colour Irula (dark). The Irular tribal community reside in the Attappady valley in Palakkad district as well as adjoining areas of Attappady in Tamil Nadu and Karnataka. The community has a dialect of their own known as "irula bhasha" which has more resemblance to Tamil and they use only among community members. With others they use Malayalam or Tamil.

In initial stages of development, the Irular community were hunters, gatherers and shifting cultivators. Now they are mostly settled agriculturalist and agricultural labourers. For cultivation they stay away from hamlets and put up temporary huts. They cultivate paddy, red gram, maize, millets, groundnuts and vegetables. Few of community members are also employed in government and private services. Animal husbandry, basket making, mat weaving and collection of minor forest produce are their subsidiary sources of income.

The Irulars have eleven 'kulams' or clans. The position in the traditional social organisation of Irular community is hereditary. Chieftain of the hamlet is 'oorumoopan'. Besides him, the community have 'bhandari' (cashier), 'kuruthala' (peon) and 'mannukaran' (the agricultural specialist and priest) for social control of their hamlets. Traditional institutions play an influential role in the social control mechanism of the Irular tribal community.

Almost 99 per cent of Irular community is concentrated in Palakkad. In which 95.20 per cent of the community is located in three panchayaths of Attappady namely Agali, Sholayur and Pudur. Pudussery and Malampuzha are the other two grama panchayaths with sizable population of Irular community. Total population of Irular community is 23721 with 11766 males and 11955 females. The sex ratio is 1015 and the average family size is comparatively small with 3.48. The population pyramid of the Irular tribal community is shown in the figure 5.9.

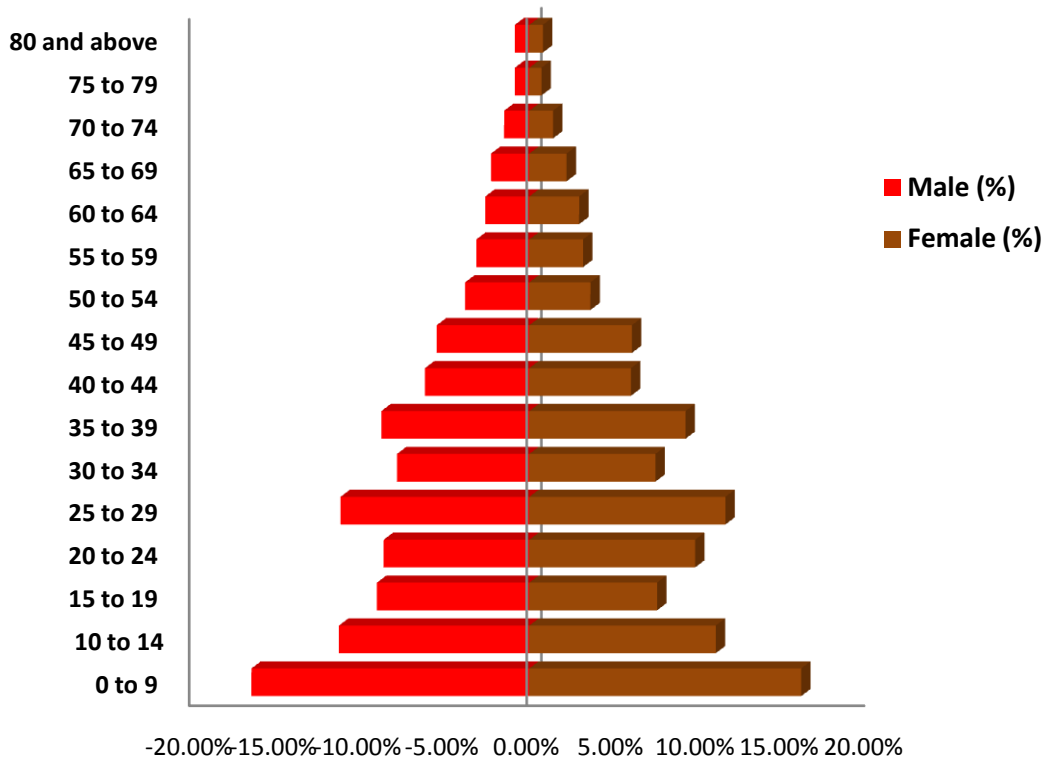

Figure 5.9: Age Pyramid of Irular Tribal Community

The population pyramid of the Irular community bear resemblance to the pattern of tribal community as a whole with 37.66 per cent of the population below 21 years of age. The fraction of the population under the age of ten is 16.28 per cent (16.54 per cent for entire tribal population). The proportion of aged population is only 8.09, which is less than the pattern of tribal community as a whole.

5.3 Conclusion

In this chapter an attempt has been made to portray the socio-economic profile of tribal communities in Kerala with emphasis on the eight communities. Tribal community in Kerala are in a superior position compared to their counterparts in other states of the country. At the same time, there are obvious variations in the socio-economic status of different communities. Communities like Mala Arayan, Kurichiyan and Kuruma are relatively better off than other tribal communities. Economically better off communities have higher literacy rate as well. There are

also marked differences in sex ratio among communities. As per the population pyramid constructed for the major tribal communities, younger population is very high (in excess of 40 per cent) among Paniya, which is the largest tribal community, Adiyan and Muthuvan. We apprehend that due to such inter-community disparities, treating scheduled tribe in Kerala as one homogenous group will undermine the health care related issues faced by these communities. Thus, analyses of inter-tribal and intra-tribal nature are indispensable for a proper understanding of the issue. Having observed the inherent heterogeneity among tribal community we proceed to the analysis of status of health and financing of health care among them.

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CHAPTER 6
STATUS, ACCESS AND UTILISATION OF HEALTH CARE AMONG TRIBAL COMMUNITIES

6.1 Introduction

This chapter examines the health profile, accessibility and utilisation of health care among the tribal communities. Household surveys conducted by the NSSO provide data only at aggregate level and does not make available information at sub caste level. Thus, in order to overcome the gap in knowledge we have done a primary survey among eight prominent tribal communities in the three tribal dominated districts of Kerala. The chapter is organised in seven sections. The next section provides the sample frame of the study. The subsequent sections deal with the socioeconomic and demographic characteristics of tribal communities, health status of tribal communities in terms of prevalence of illness, hospitalisation, mortality and ill-health behaviours. The heath care accessibility among different tribal communities is explored in the fifth section. The pattern of utilisation of health care facilities and determinants of choice of provider is explained in sixth section followed by the conclusion.

6.2 Sample Framework

The study is based on the primary data collected from households of eight prominent non-primitive tribal communities in the districts of Wayanad, Idukki and Palakkad. These eight communities together constitute 51.86 per cent of total tribal population in Kerala. The three districts selected are the main habitats of tribal population in the state and they cover major tribal communities of Kerala as well. The details of the sample framework are explained in the table 6.1.

Table 6.1: Sample Framework

Sub caste	Total Population	Estimated Number of Households	Number of Households in the Sample	Percentage
Paniyan	88,450	19656	197	33.05
Adiyan	11,526	2561	26	4.36
Kuruman	24,505	5446	54	9.06
Kurichiyan	35,171	7816	78	13.09
Uraly Kuruman	11,179	2484	25	4.19
Mala Arayan	33,216	8977	90	15.10
Muthuvan	23,746	6418	64	10.74
Irular	23,721	6242	62	10.40
Total	2,51,514	59600	596	100.00

Source: Population Census (2011).

From the Census (2011) data, we have estimated the number of households of each tribal community. The sample is formed in such a way as to ensure one per cent representation of the total households of each tribal community under study. Thus, the present study covers a total of 596 tribal households which adequately represent the tribal community in the state. Wayanad district that have the highest concentration of tribal community in the state was chosen for the study of five communities (Paniyan, Adiyan, Kuruman, Kurichiyan and Uraly Kuruma), Idukki district was chosen for two communities (Mala Arayan and Muthuvan) and Palakkad district was chosen for the study of one tribal community (Irular). A multistage stratified random sampling with the aid of structured interview schedule was undertaken for gathering information from the selected households. The survey was conducted during the months of September-October 2016. The respondents were heads of the household and in the absence of the head, any adult member who

had information about the health status and financing pattern of the household was selected.

6.3 General Profile of Sample Households

The total population of the selected households was 2594 with 1284 males and 1310 females as shown in table 6.2.

Table 6.2: Number of Individuals in the Sample Households

Sub caste	Number of Males	Number of Females	Total
Paniyan	440	472	912
Adiyan	64	55	119
Kuruman	124	119	243
Kurichiyan	162	174	336
Uraly Kuruman	50	42	92
Mala Arayan	181	179	360
Muthuvan	133	139	272
Irular	130	130	260
Scheduled Tribe (combined)	1284	1310	2594

Source: Primary data

The average age of the tribal population under study is 34.02 years (95 per cent confidence interval: Lower 33.12, Upper 34.91). The mean size of tribal family and average age of the population is calculated in the table 6.3.

Table 6.3: Mean Family Size and Age among Tribal Communities

Sub caste	Mean Family Size	95 per cent Confidence Interval		Mean Age	95 per cent Confidence Interval	
		Lower Bound	Upper Bound		Lower Bound	Upper Bound
Paniyan	4.62	4.39	4.87	32.25	30.77	33.73
Adiyan	4.57	4.08	5.08	32.53	28.91	36.15
Kuruman	4.50	3.89	5.11	34.09	31.68	36.49
Kurichiyan	4.31	3.97	4.64	33.78	31.37	36.19
Uraly Kuruman	3.68	3.19	4.17	39.00	34.55	43.55
Mala Arayan	3.99	3.71	4.26	39.92	37.74	42.11
Muthuvan	4.28	3.91	4.65	32.17	28.99	35.75
Irular	4.18	3.74	4.61	31.61	28.64	34.57
Scheduled Tribe (combined)	4.35	4.22	4.48	34.02	33.12	34.91

Source: Primary data

The Mala Arayan community have the highest average age. We have already established that Mala Arayan tribal community has reached the final stage of the demographic transition (figure 5.7 of chapter five) and it consists of relatively higher ratio of aged population. The mean age is lowest in the case of Irular community. The average family size of the tribal community is 4.35 (95 per cent confidence interval: lower 4.22, upper 4.48). The result is tested with mean family size of 4 provided by the Population Census (2011) using the one sample t test. It was found that the mean family size is statistically different from the average of tribal population as a whole according to the one sample t test ($P<0.01$). The results are summarised in table 6.4.

Table 6.4: One Sample t test for Mean Family Size

N	596
Test Value	4.00
Mean	4.3523
Standard Deviation	1.64
t value	5.23
Degree of freedom	595
P value	.000**
Mean Difference	.35235
95% confidence interval of the difference	Lower : .2201
	Upper: .4846

** Significant 1 per cent level of significance

Thus, there is significant increase in the mean family size of the tribal communities compared to the previous Census. The mean difference is 0.35235 and difference is significant at 99 per cent confidence interval. The Paniyan community has the highest family size while Uraly Kuruman community has the lowest.

The gender of the head of the household does influence the health status and financing pattern of household. Analysis of the gender of the household is summarised in the following table.

Table 6.5: Gender Status of the Head of the Household

Sub caste	Male		Female	
	Number	Percentage	Number	Percentage
Paniyan	163	82.74	34	17.26
Adiyan	22	84.62	4	15.38
Kuruman	37	68.52	17	31.48
Kurichiyan	64	82.05	14	17.95
Uraly Kuruman	21	84.00	4	16.00
Mala Arayan	81	90.00	9	10.00
Muthuvan	54	84.38	10	15.63
Irular	43	69.35	19	30.65
Scheduled Tribe (combined)	485	81.38**	111	18.62**

** Significant at 1 per cent level of significance
Source: Primary data

As shown in the table a significantly higher proportion of the households are male headed (Chi –square=234.691, P <0.01). Female headed households' add up to only 18.60 per cent of the total households under study. The types of habitat of the tribal communities are explained in the table 6.6.

Table 6.6: Types of Tribal Habitat

	Colony		Scattered	
Sub caste	**Number**	**Percentage**	**Number**	**Percentage**
Paniyan	162	82.23	35	17.77
Adiyan	26	100.00	0	0.00
Kuruman	39	72.22	15	27.78
Kurichiyan	74	94.87	4	5.13
Uraly Kuruman	25	100.00	0	0.00
Mala Arayan	0	0.00	90	100.00
Muthuvan	64	100.00	0	0.00
Irular	62	100.00	0	0.00
Scheduled Tribe (combined)	452	75.84	144	24.16

Source: Primary data

As evident from the table more than seventy five per cent of the tribal community lives in colonies. Entire households form Adiyan, Uraly Kuruman, Muthuvan and Irular live in tribal colonies. At the same time, the pattern exactly reverses in the case of Mala Aryan tribal community, in which no households live in colonies. The educational status of the households on the basis of highest educational qualification of the household members is summarised in table 6.7.

Table 6.7: Educational Qualification of Tribal Communities

Sub Caste	Illiterate		Primary Education		High School Education		Above High School	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
Paniyan	12	6.09	86	43.65	83	42.13	16	8.12
Adiyan	0	0.00	7	26.92	13	50.00	6	23.08
Kuruman	4	7.41	11	20.37	21	38.89	18	33.33
Kurichiyan	3	3.85	13	16.67	23	29.49	39	50.00
Uraly Kuruman	1	4.00	14	56.00	5	20.00	5	20.00
Mala Arayan	0	0.00	3	3.33	26	28.89	61	67.78
Muthuvan	3	4.69	39	60.94	18	28.13	4	6.25
Irular	1	1.61	15	24.19	28	45.16	18	29.03
Scheduled Tribe (combined)	24	4.03	188	31.54	217	36.41	167	28.02

Source: Primary data

Four per cent of the tribal households are illiterate. The proportion of illiterates is highest among Kuruman community. More than one third of the tribal households have high school as highest educational qualification. From the education point of view, Mala Arayan community is far ahead compared to the other tribal communities. None of the Mala Arayan households are illiterates and 67.80 per cent of the households have attained above high school level of education.

The sources of livelihood of the community do exert an influence on their health outcome. Stable sources of livelihood can be associated with higher utilisation of heath care facilities and better health outcome. Further, sources of livelihood of the households have an impact on the affordability of health care and the likelihood of catastrophic health expenditure. Figure 6.1 brings out major sources of livelihood of tribal communities.

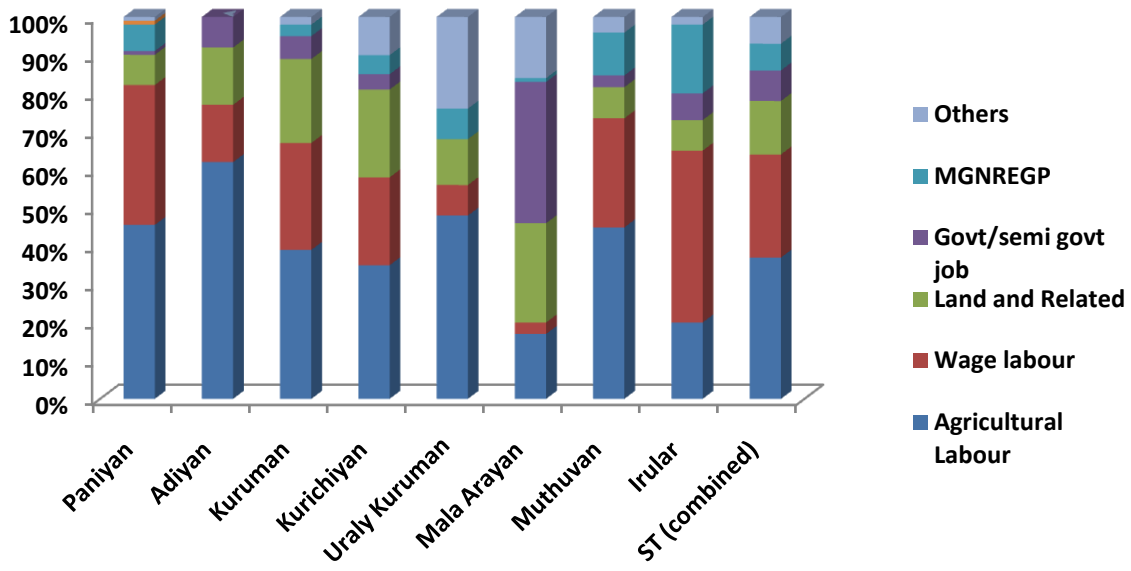

Figure 6.1: Main Source of Livelihood of Tribal Communities

Major proportion of tribal community, 37.10 per cent, work as agricultural labourers for their livelihood followed by wage labour (non-agricultural worker or coolie) which accounts for 26.80 per cent. Income from land and related activities forms 14.40 among the households. However, this general pattern is altered in the case of Mala Arayan tribal community. It is interesting to note that 36.70 per cent of the Mala Arayan community have their major source of livelihood as government/semi government jobs. It is obvious that Mala Arayan community has benefited from the reservation policy in government jobs than the other tribal communities. Further 25.60 per cent of the community derive their income from land and related activities; majority of them have sizable area of land.

The structure of the residence and the status of electrification will have a bearing on the health status of the population. Living in unhygienic surroundings and lack of stability in the place of stay can often result in adverse health outcomes. The analysis of the nature of residence of tribal communities bring out that majority of the tribal houses were pucca in nature with cement floor and concrete roof. It shows that government programme of housing schemes for the tribal communities has benefited them since 71.80 per cent of the community lives in government

provided houses. The per cent of electrified houses are 76.80. While almost all the Mala Arayan houses are electrified, the status of electrification among Muthuvan community is only 40.40 per cent. This is because of the fact that majority of the Muthuvan community lives close to the forest area without the access of electricity. The detail analysis of nature of residence of tribal communities is presented in the appendix 1.

Land is a key productive asset and hence the landholdings of the household can be used to trace out the economic status of the household. Ownership of land, most often, is the only productive asset that the tribal community possesses and is the most prominent factor in determining occupation and income of the household. Ownership of land confers collateral in the credit market and act as a security against economic shocks (Mearns, 1999). The study measured the landholdings of the household in cents (100 cents equals 1 acre of land). The descriptive statistics shows high inequalities in the distribution of household landholdings with the mean landholdings being 46.84 cents with high variance. Considering the fact the average landholdings in Kerala is only 0.10 hectare, tribal households do possess comparatively larger areas of land.

Table 6.8: Descriptive Statistics of Landholding

Sub Caste	Mean (in cents)	Standard Deviation	95 per cent Confidence Interval	
			Lower Bound	Upper Bound
Paniyan	53.21	133.2	34.50	71.93
Adiyan	42.69	52.08	21.65	63.73
Kuruman	41.67	74.58	21.31	62.02
Kurichiyan	44.46	41.59	35.08	53.84
Uraly Kuruman	15.40	25.17	5.01	25.79
Mala Arayan	60.94	81.34	43.90	77.98
Muthuvan	30.09	30.00	22.59	37.59
Irular	45.32	93.29	21.63	69.01
Scheduled Tribe (combined)	46.84	93.81	39.29	54.39

Source: Primary data

The descriptive statistics shows high degree of dispersion around the mean value of land holdings. The average land holding is highest among the Mala Arayan community who have average of 60.94 cents (95 per cent confidence interval: lower 43.90 and upper 77.98). It is lowest among the Uraly Kuruman community. It should be noted that the average land holdings among the largest tribal community of Paniya (53.21 cents) and that of Adiya (42.59 cents) are profoundly influenced by the households in Puzhuthana, Suganthagiri and Priyadharshini tribal settlements. From the focus group discussions with community members it is inferred that these households were granted five acres of land by the state government as a part of rehabilitation of bonded labourers. At the same time, district-wise comparison of landholdings bring out that mean land holdings is highest among the tribal households of Idukki (48.12 cents) followed by Wayanad (46.57 cents) and Palakkad district (45.32 cents).To probe more into the intra-tribal differences in the crucial productive asset of land holdings, we have drawn the Lorenz curve, the measure of inequality and estimated the Gini coefficient using following formula.

$$G = \frac{1}{2n^2\,\mu}\sum_{i=1}^{n}\sum_{j=1}^{n}\left|h_i - h_j\right|$$

Figure 6.2 Lorenz Curve of Land Holdings

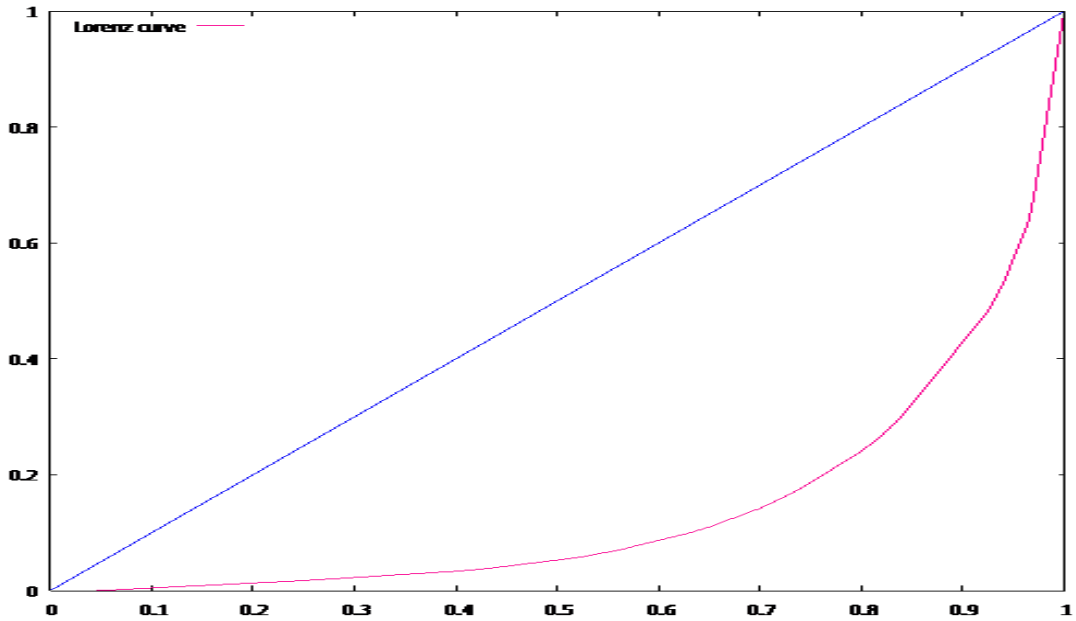

Table 6.9: Gini Coefficient of Landholdings

Sub caste	Sample Gini Coefficient	Estimate of Population Value
Paniyan	0.82	0.82
Adiyan	0.56	0.58
Kuruman	0.65	0.66
Kurichiyan	0.65	0.66
Uraly Kuruman	0.59	0.62
Mala Arayan	0.53	0.54
Muthuvan	0.50	0.51
Irular	0.78	0.79
Scheduled Tribe (combined)	0.72	0.72

Source: Primary data

The prevalence of high inequality in the possession of land holdings among the tribal communities is obvious from the estimated value of Gini coefficient ($0 \leq G \leq 1$). The inequality is highest among the Paniyan community and it is lowest among the Muthuvan. Similarly, the analysis of monthly income of the households also indicates high degree of intra-tribal inequality. The average monthly income is the lowest for Uraly Kuruman while it is highest for Mala Arayan households. It is evident that Mala Arayan community who are the major beneficiaries of the reservation policy of the central and state government in education and government jobs, were able to render it into higher income (Table 6.10)

Table 6.10: Descriptive Statistics of Monthly Income of Tribal Households

Sub Caste	Mean (in Rs)	Standard Deviation	Skewness	95 per cent Confidence Interval	
				Lower	Upper
Paniyan	7921.57	4457.07	1.15	7295.31	8547.83
Adiyan	8634.62	3953.63	0.12	7037.71	10231.5
Kuruman	10024.1	6766.39	2.62	8177.2	11870.9
Kurichiyan	11019.2	8124.61	2.94	9187.41	12851.1
Uraly Kuruman	4504	2419.62	1.16	3505.22	5502.77
Mala Arayan	22288.9	19240.8	3.66	18259	26218.8
Muthuvan	7531.25	3214.39	0.69	6728.32	8334.18
Irular	7364.52	5018.49	2.12	6090.06	8638.97
Scheduled Tribe (combined)	10474.9	10296.7	5.75	9646.58	11303.3

Source: Primary data

Thus, the status of health, accessibility, utilisation and financing patterns are essentially depends upon the socioeconomic and demographic characteristics of the households. The analysis done among the tribal communities confirms our contention that tribal communities are primarily a heterogeneous group. If we use the status of education and economic status as indicators, we can categorise the Mala Arayan, Kurichiyan and Kuruman as forward tribal communities and Paniyan, Adiyan, Uraly Kuruman, Muthuvan and Irular as backward tribal communities. With this background in view, we proceed to examine the health status of tribal communities in Kerala.

6.4 Health Status of Tribal Communities

In this section an attempt is being made to trace out the health status of tribal communities using the measures of morbidity rates, type of ailments, hospitalisation rates, perception of own health by the household, level of health care need, mortality record and reported limitations in daily living in terms of days lost due to illness. We

have also examined the ill-health behaviours and status of drinking water and latrine facilities in the household as these have considerable influence on health outcomes.

6.4.1Morbidity

The morbidity prevalence rate or rate of ailment is often cited as an important indicator of the health status and sometimes it is referred as an indicator of health consciousness (Verghese, 2009). The prevalence of morbidity has been defined as the number of reported disease prevailing in a population during the reference period to the total population exposed to the risk of that disease (Navaneetham et al., 2009). Thirty days prior to the date of survey has been used as the reference period for computing the morbidity prevalence rate. As stated above, the primary survey covered a sample of 596 tribal households and we estimated the prevalence rate with respect to the population of 2594. The rate is computed as:

$$\text{Morbidity Prevalance Rate} = \frac{\text{Number of persons who are ailing during the 30 days prior to the survey}}{\text{Total Population}} \times 1000$$

An ailment is defined as any deviation from a state of physical and mental well-being (Dilip, 2002). The results of morbidity pattern among the tribal communities are given in the table 6.11.

Table 6.11: Prevalence of Morbidity among Tribal Communities

Sub caste	Population	Number of Ailment	Morbidity Prevalence Rate
Paniyan	912	201	220.39
Adiyan	119	36	302.52
Kuruman	243	75	308.64
Kurichiyan	336	83	247.02
Uraly Kuruman	92	40	434.78
Mala Arayan	360	80	222.22
Muthuvan	272	53	194.85
Irular	260	83	319.23
Scheduled Tribe (Combined)	2594	651	250.96

Source: Primary data

The morbidity prevalence rate among tribal population is estimated as 250.96 per thousand population. The Uraly Kuruman community have reported highest prevalence of morbidity among the tribal communities followed by the Irular community. It brings out the fact that communities which are in the low socioeconomic category reported high morbidity. This is consistent with the literature as people of lower socioeconomic status consistently appear to have much worse health outcomes (Smith, 2005). Studies have shown that morbidity prevalence rate will be higher among the people belonging to poor socioeconomic and educational background than others in Kerala (Kannan et al., 1991; Mohindra et al., 2006). The morbidity prevalence rate can have high degree of seasonal variation. As stated above, the survey was undertaken during the months of September-October, which are relatively devoid of fluctuations of weather in Kerala.

Our finding of morbidity prevalence rate as 250.96 per thousand population among tribal community is comparable with some of the earlier studies which have tried to estimate the same. Navaneetham et al. (2009) in their study on level, pattern and determinants of morbidity in Kerala found the prevalence of morbidity as 241.60 per thousand for entire population and 261.50 for scheduled tribes. But the study was based on the samples of three districts of Kerala namely Thiruvananthapuram, Malappuram and Kannur, which do not have large concentration of tribal population. Simon (2007) has estimated morbidity rate as 271 for population and 287 for scheduled tribes. The study was conducted in Thrissur district which has only 1.94 per cent of tribal population of the state. Our finding is significantly less than the rate calculated by Kerala State Planning Board (2009) where the morbidity prevalence rate among tribal population was 433.

The attempt to decompose the morbidity prevalence rate among the tribal communities from a gender perspective shows that the prevalence of ailments is higher for males compared to females. The estimated rate for males is 271.81 compared to 230.53 for females. The pattern of relatively higher morbidity prevalence rate among males is applicable for six tribal communities, but the pattern reverses in the cases of Kurichiyan and Irular communities (Figure 6.3).

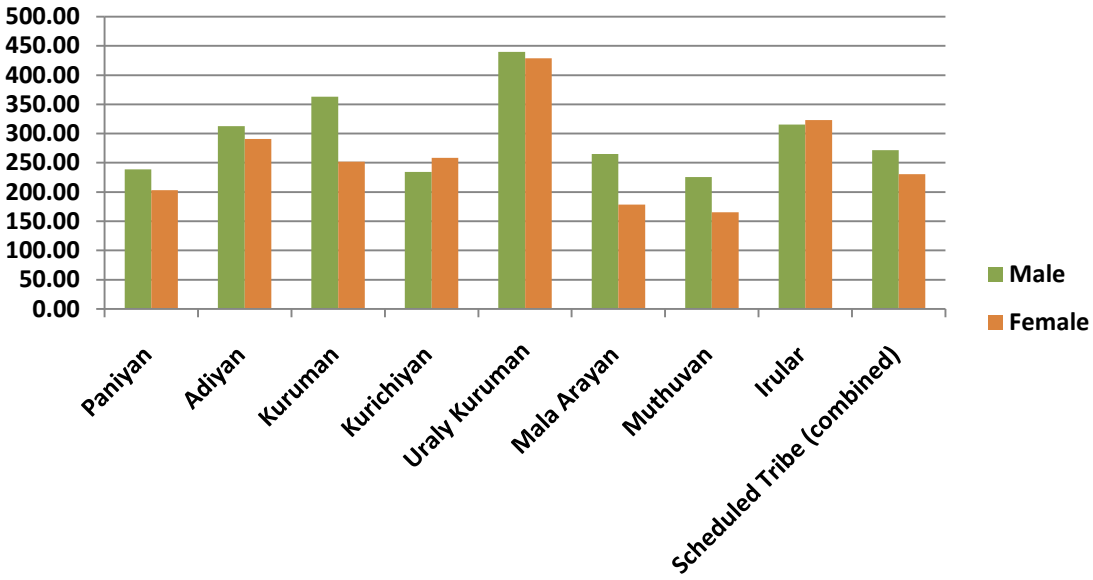

Figure 6.3: Gender Specific Morbidity Prevalence Rate

The result that tribal male population enjoys a better health status compared to their counterparts can be due to underreporting of ailments among the females, since majority of the respondents are males (81.40 per cent of the tribal households are male headed). An attempt was also made to understand the common diseases which exist among the tribal households. The pattern of ailments among the tribal households are summarised in the table 6.12.

Table 6.12: Types of Ailment among Tribal Households during 30 days Reference Period

Ailment	Paniyan	Adiyan	Kuruman	Kurichiyan	Uraly Kuruman	Mala Arayan	Muthuvan	Irular	Scheduled Tribe (combined)
Fever of unknown Origin	87 (43.80)	18 (50.00)	29 (38.67)	25 (30.12)	12 (30.00)	28 (35.00)	22 (41.51)	38 (45.75)	259 (39.78)
Asthma and other respiratory diseases	15 (7.46)	8 (22.22)	2 (2.67)	5 (6.02)	3 (7.50)	6 (7.50)	1 (1.89)	11 (13.25)	51 (7.83)
Cardiovascular ailments	14 (6.97)	0 (0.00)	6 (8.00)	8 (9.64)	1 (2.50)	9 (11.25)	0 (0.00)	2 (2.41)	41 (6.30)
Blood Pressure	15 (7.46)	2 (5.56)	12 (16.00)	12 (14.46)	2 (5.00)	16 (20.00)	16 (30.19)	6 (7.23)	81 (12.44)
Skin Diseases	4 (1.99)	2 (5.56)	0 (0.00)	2 (2.41)	1 (2.50)	1 (1.25)	1 (1.89)	4 (4.82)	15 (2.30)
Ear/throat/eye ailments	11 (3.98)	0 (0.00)	1 (1.33)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (1.20)	10 (1.54)
Kidney/urinary system related	7 (3.48)	1 (2.78)	1 (1.33)	2 (2.41)	2 (5.00)	3 (3.75)	0 (0.00)	2 (2.41)	18 (2.76)
Cancer/tumor	1 (0.50)	0 (0.00)	0 (0.00)	1 (1.82)	0 (0.00)	1 (1.25)	0 (0.00)	1 (1.20)	7 (1.08)
TB	4 (1.99)	0 (0.00)	0 (0.00)	2 (2.41)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	6 (0.92)
Chicken pox	1 (0.50)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	3 (3.75)	0 (0.00)	1 (1.20)	5 (0.77)
Diseases of mouth/teeth/gum	0 (0.00)	0 (0.00)	4 (5.33)	2 (2.41)	7 (17.50)	0 (0.00)	0 (0.00)	0 (0.00)	13 (2.00)
Accident/injury/fractures	5 (2.49)	0 (0.00)	0 (0.00)	3 (3.61)	0 (0.00)	1 (1.25)	0 (0.00)	3 (3.61)	12 (1.84)
Diarrhoea/decentry	2 (1.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (2.41)	4 (0.61)
Gynaecological disorders	3 (1.49)	0 (0.00)	5 (6.67)	3 (3.61)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	11 (1.69)
Sickle Cell Anaemia	2 (1.00)	2 (5.56)	1 (1.33)	0 (0.00)	0 (0.00)	0 (0.00)	2 (3.77)	1 (1.20)	8 (1.23)
Diabetics	14 (6.97)	3 (8.33)	6 (8.00)	6 (7.23)	0 (0.00)	7 (11.25)	5 (9.43)	2 (2.41)	45 (9.91)
Epilepsy	1 (0.50)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.15)
Anaemia	6 (2.99)	0 (0.00)	0 (0.00)	1 (1.20)	6 (15.00)	1 (1.25)	3 (5.66)	0 (0.00)	17 (2.61)
Mental disease	2 (1.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (2.41)	4 (0.61)
Celebral parsy	0 (0)	0 (0.00)	0 (0.00)	1 (1.20)	3 (7.50)	0 (0.00)	1 (1.89)	2 (2.41)	7 (1.08)

Ailment	Paniyan	Adiyan	Kuruman	Kurichiyan	Uraly Kuruman	Mala Arayan	Muthuvan	Irular	Scheduled Tribe (combined)
Arthrities	1 (0.50)	0 (0.00)	4 (5.33)	5 (6.02)	0 (0.00)	0 (0.00)	1 (1.89)	2 (2.41)	12 (1.84)
Gastro enteric disease	3 (1.49)	0 (0.00)	2 (2.67)	2 (2.41)	0 (0.00)	1 (1.25)	1 (1.89)	1 (1.20)	10 (1.54)
Liver sirosis	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (5.00)	0 (0.00)	1 (1.89)	0 (0.00)	3 (0.46)
Migraine	2 (1.00)	0 (0.00)	1 (1.33)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	3 (0.46)
Gioter	1 (0.50)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.15)
Back pain	2 (1.00)	0 (0.00)	1 (1.33)	0 (0.00)	0 (0.00)	1 (1.25)	0 (0.00)	0 (0.00)	4 (0.61)
Piles	1 (0.50)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.15)
Total	201 (100)	36 (100)	75 (100)	83 (100)	40 (100)	80 (100)	53 (100)	83 (100)	651 (100)

Note: Figures in the parenthesis are percentages.

Source: Primary data

The analysis of ailment pattern among the tribal households reveals that the major ailment that has affected them is fever of unknown origin (39.78 per cent) followed by high/low blood pressure (12.44 per cent). Apart from the fever, life style ailments have a significant share among the forward tribal communities. The Uraly Kuruman community which has the highest morbidity prevalence rate reported as large percentages of diseases of mouth/teeth/gum and anaemia. Fever, blood pressure and diabetes together account for 59 per cent of the total disease among the tribal population. The occurrence of sickle cell anaemia was reported among the tribal communities of Paniyan, Adiyan and Kuruma of Wayanad district, Muthuvan of Idukki district and Irular of Palakkad district in large numbers. Given the nature of ailment and the significant presence of chronic and life style diseases, it will have severe consequences in terms of their duration and cost of treatment and the resultant financial burden. In fact, 72 per cent of the tribal households did report to have experienced at least one ailment during the reference period of 30 days. Further, 34.99 per cent of the household had the presence of a chronically ill person.

There was a significant relationship between sub caste and presence of chronically ill person (Pearson Chi-square = 34.985, P<0.01).

6.4.2 Hospitalisation

In the earlier analysis of morbidity, the self reported or perceived morbidity facts were used to calculate the morbidity prevalence rate among the tribal communities. One of the limitations of drawing inferences from the morbidity rate is that, morbidity being a subjective concept is susceptible to reporting errors. The differences in the knowledge about the illness, the willingness to accept a physical/mental difficulty as an ailment and lack of knowledge of respondents about the illness of other members in the household will certainly influence the calculation of the morbidity prevalence rate. From the focus group discussion with officials of the health department working in the tribal area, it was understood that there is enormous late reporting and underreporting of morbidity among the tribal population. Majority of the tribal population will seek treatment only when the disease worsens and ill health affects their daily activities.

To overcome this limitation and to supplement the analysis of health status of the tribal population, we have calculated the annual hospitalisation rate. Hospitalisation is considered as a non-fatal health outcome which is relatively free from the reporting bias or errors of perception of the respondents. The annual hospitalisation rate is defined as the number of persons who had been hospitalised during the year leading up to the survey per thousand population. A person is considered to have been hospitalised if he or she had used in-patient medical services in any hospital (Dilip, 2002). The rate is computed as:

$$\text{Annual Hospitalisation Rate} = \frac{\text{Number of persons who had been hospitalised during the one year prior to the survey}}{\text{Total Population}} \times 1000$$

The hospitalisation rate among the tribal communities is explained table 6.13.

Table 6.13: Hospitalisation Rate among Tribal Communities

Sub caste	Number of Hospitalisation	Population	Annual Hospitalisation Rate
Paniyan	89	912	97.59
Adiyan	10	119	84.03
Kuruman	30	243	123.46
Kurichiyan	41	336	122.02
Uraly Kuruman	10	92	108.70
Mala Arayan	42	360	116.67
Muthuvan	17	272	62.50
Irular	30	260	115.38
Scheduled Tribe (combined)	269	2594	103.70

Source: Primary data

The annual hospitalisation rate is 103.70 per thousand for tribal communities as a whole. The rate is highest for the Kuruman community and is lowest for the Muthuvan tribal community. Dilip (2002) has calculated the annual hospitalisation rate for Kerala as 68 per thousand. Thus, hospitalisation rate, like the morbidity rate, is higher among the tribal communities when compared to population as a whole. Simon (2007) has found the annual hospitalisation rate in percentages as 8.6 for tribal community as a whole using NSSO unit level data. Our finding implies that annual hospitalisation rate has increased over the years partly due to increasing morbidity and partly due to greater utilisation of health care facilities by the tribal community. The details of the diseases that led to hospitalisation are provided in the table 6.14.

Table 6.14: Type of Ailments leading to Hospitalisation

Ailment	Paniyan	Adiyan	Kuruman	Kurichiyan	Uraly Kuruman	Mala Arayan	Muthuvan	Irular	Scheduled Tribe (combined)
Fever of unknown Origin	18 (20.22)	1 (10.00)	3 (10.00)	4 (10.00)	0 (0.00)	8 (19.05)	3 (17.65)	3 (10.00)	40 (14.87)
Asthma and other respiratory diseases	12 (13.48)	0 (0.00)	1 (3.33)	1 (2.50)	0 (0.00)	3 (7.14)	0 (0.00)	2 (6.67)	19 (7.06)
Cardiovascular ailments	14 (15.73)	0 (0.00)	3 (10.00)	7 (17.50)	1 (10.00)	3 (7.14)	0 (0.00)	4 (13.33)	32 (11.90)
Blood Pressure	5 (5.52)	2 (20.00)	6 (20.00)	5 (12.50)	0 (0.00)	4 (9.52)	0 (0.00)	0 (0.00)	22 (8.18)
Skin Diseases	2 (2.25)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (4.76)	0 (0.00)	0 (0.00)	4 (1.49)
Ear/throat/eye ailments	3 (3.37)	0 (0.00)	3 (10.00)	0 (0.00)	0 (0.00)	1 (2.38)	1 (5.88)	1 (3.33)	9 (3.35)
Kidney/urinary system related	4 (4.49)	0 (0.00)	0 (0.00)	1 (2.50)	0 (0.00)	2 (4.76)	0 (0.00)	0 (0.00)	7 (2.60)
Cancer/tumor	3 (3.37)	2 (20.00)	0 (0.00)	4 (10.00)	0 (0.00)	2 (4.76)	0 (0.00)	2 (6.67)	13 (4.83)
TB	3 (3.37)	0 (0.00)	1 (3.33)	3 (7.50)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	7 (2.60)
Jaundice	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (20.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (0.74)
Chicken pox	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (2.38)	0 (0.00)	0 (0.00)	1 (0.37)
Diseases of mouth/teeth/gum	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (10.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.37)
Accident/injury/fractures	9 (10.11)	0 (0.00)	4 (13.35)	7 (17.50)	2 (20.00)	9 (21.43)	2 (11.76)	8 (26.67)	41 (15.24)
Diarrhoea/decentry	1 (1.12)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (11.76)	0 (0.00)	3 (1.12)
Gynaecological disorders	7 (7.87)	1 (10.00)	3 (10.00)	1 (2.50)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	12 (4.46)
Sickle Cell Anaemia	1 (1.12)	2 (20.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (11.76)	1 (3.33)	6 (2.23)
Diabetics	2 (2.25)	0 (0.00)	1 (3.33)	1 (2.50)	0 (0.00)	4 (9.52)	5 (29.41)	0 (0.00)	13 (4.83)
Epilepsy	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (4.76)	0 (0.00)	0 (0.00)	2 (0.74)
Anaemia	2 2.25	0 (0.00)	0 (0.00)	1 (2.50)	0 (0.00)	0 (0.00)	1 (5.88)	2 (6.67)	6 (2.23)
Mental disease	1 (1.12)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (3.33)	2 (0.74)
Celebral parsy	0 (0.00)	2 (20.00)	0 (0.00)	2 (5.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (6.67)	8 (2.97)
Arthrities	1 (1.12)	0 (0.00)	2 (6.67)	1 (2.50)	2 (20.00)	0 (0.00)	0 (0.00)	0 (0.00)	6 (2.23)
Gastro enteric disease	1 (1.12)	0 (0.00)	3 (10.00)	3 (7.50)	2 (20.00)	1 (2.38)	0 (0.00)	3 (10.00)	11 (4.09)
Migraine	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (3.33)	1 (0.37)
Liver sirosis	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (5.88)	0 (0.00)	1 (0.37)
Total	89 (100)	10 (100)	30 (100)	41 (100)	10 (100)	42 (100)	17 (100)	30 (100)	269 (100)

Note: Figures in the parenthesis are percentages. Source: Primary data

The most important cause for hospitalisation is accident, injury or fractures closely followed by fever, which is the most prevalent disease among the tribal community. The number of in-patient treatment as a result of life style diseases like cardiovascular ailments and blood pressure is also high especially among the better-off tribal communities. In fact, One third of hospitalised episodes were among the Kuruman community, who reported the highest hospitalisation rate, are caused by these two ailments.

6.4.3 Mortality

Along with the analysis of morbidity and hospitalisation, the present study also looked at the mortality record among the tribal population to draw further inferences about their health status. We used the reference period of one year prior to the survey. A total of 42 events of death were reported by the tribal households. The descriptive statistics of age at death is provided in the table 6.15.

Table 6.15: Descriptive Statistics of Age at Death

Descriptive statistic		**Statistic**	**Standard Error**
Mean		56.9412	3.69152
95% Confidence Interval for Mean	Lower Bound	49.4307	
	Upper Bound	64.4516	
Median		59.5000	
Variance		463.330	
Std. Deviation		21.52510	
Minimum		7.00	
Maximum		105.00	
Inter quartile Range		29.75	
Skewness		-.029	.403
Kurtosis		.125	.788

Source: Primary data

The average age at death among the tribal community is relatively low at 56.94 (95 per cent confidence interval: lower 49.43 and upper 64.45). There is high dispersion of items around the mean value. It is noteworthy to observe that the most important reason for the mortality among the tribal population is cancer followed by the old age related (Table 6.16). The mortality caused by accidents is also high. In 57.14 per cent of cases, deceased received medical attention before death.

Table 6.16: Reasons for Death

Cause of Death	Number	Percentage
Old age related	8	19.05
Cancer	15	35.71
Accident/injury	6	14.29
Communicable diseases	1	2.38
Kidney related diseases	3	7.14
Suicide	2	4.76
Asthma	2	4.76
Jaundice	2	4.76
Heart attack	3	7.14
Total	42	100.0

Source: Primary data

6.4.4 Health Perception

Health status of the population can also be measured using self assessed health as an outcome measure. Here, an attempt is made to assess self reported health status of tribal households using a five point Likert scale. Respondents were asked to rate the overall perceived health status of household members as very poor, poor, moderate, good and very good. The results are summarised in table 6.17.

Table 6.17: Perception on Health (in percentages)

Sub Caste	Very Poor	Poor	Moderate	Good	Very Good
Paniyan	8.60	26.90	33.50	22.80	8.20
Adiyan	15.40	15.40	38.50	30.80	0.00
Kuruman	3.70	18.50	33.30	38.90	5.60
Kurichiyan	9.00	19.2	26.9	26.90	18.00
Uraly Kuruman	28.00	32.00	40.00	0.00	0.00
Mala Arayan	7.80	13.30	12.20	34.40	32.20
Muthuvan	0.00	31.30	10.90	37.50	20.30
Irular	6.50	19.40	21.00	33.90	19.30
Scheduled Tribe (combined)	8.10	22.50	26.20	28.70	14.50

Source: Primary data

It is clear from the table that 43.20 per cent of the tribal household perceive their health as good or very good. Majority of the Mala Arayan community perceive their health as good and 66.60 per cent rate their health as good or very good. Self perceived health status is low among the Uraly Kuruman community. This is not unexpected given the fact that Uraly Kuruman community reported highest morbidity prevalence rate compared to any other tribal community. Further, we can also see an instance of "perception bias" among tribal community since 72 per cent of households reported at least one ailment during the 30 days reference period. Sen (2002) has pointed out that perception bias may emerge among the people who lack the informational base to assess their own health status. It seems that tribal households have underreported their ill health status.

6.4.5 Health Care Need

Following the methodology of Mukherjee et al. (2011), we have classified the tribal communities on the basis of their health care need. The classification was done on the basis of two characteristics, namely, the number of household members who were elderly (aged 60 years and more) and the number of members with

chronic illness (illness having long duration of at least six months or more). A household having neither elderly member nor a member with chronic illness was categorised as 'low health care need household'. A household having either, (a) no elderly member but one or more members with chronic illness or (b) no member with chronic illness but one or more elderly members was categorised as 'high health care need'. A household with at least one or more elderly members and one or more members with chronic illness were categorised as 'very high health care need'. The analysis demonstrated that majority of tribal households (43.60 per cent) belong to low health care need category based on the criteria employed (Figure 6.3). At the same time, 41.10 per cent Mala Arayan tribal community fit into very high health care category due to the presence of elderly households (53.30 per cent) and prevalence of chronic illness (53 per cent).

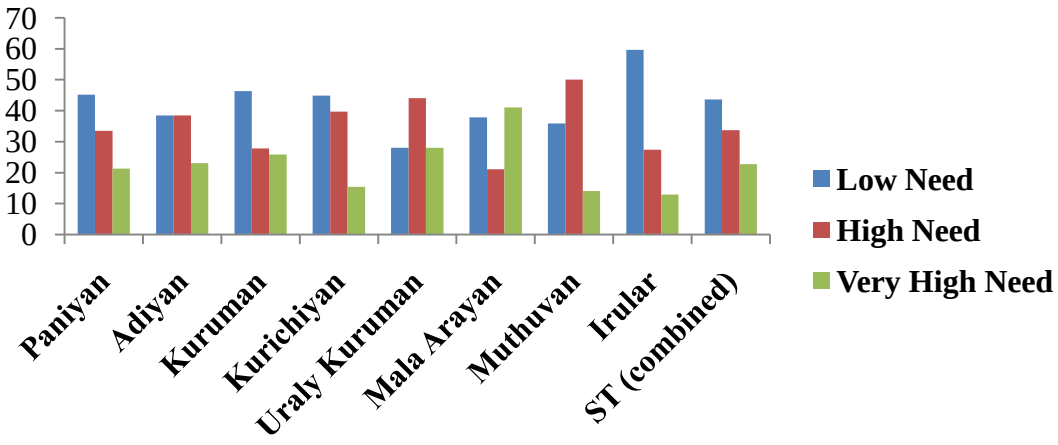

Figure 6.4: Level of Health Care Need among Tribal Communities

6.4.6 Days Lost Due to illness

Here we analyse the impact of ill health on daily living of tribal population. We use the days lost due to illness during the reference period of 30 days prior to the survey as the proxy to investigate the effect of ill health on the means of livelihood of the tribal community. The analysis is summarised in the table 6.18.

Table 6.18: Days Lost Due to Illness in 30 Days Reference Period

Sub Caste	Median	Mean	Standard Deviation	Skewness
Paniyan	1	3.51	5.70	2.63
Adiyan	2	4.77	6.48	1.55
Kuruman	2	3.69	5.74	2.34
Kurichiyan	2	3.22	5.32	2.53
Uraly Kuruman	5	5.12	5.91	3.29
Mala Arayan	1	3.18	6.19	3.18
Muthuvan	0	1.58	2.75	1.81
Irular	1	1.42	1.92	2.07
Scheduled Tribe (combined)	2	3.13	5.32	2.88

Source: Primary data

As the data is skewed in nature we use the median to explain the pattern in days lost due to illness. The median days lost due to illness among the scheduled tribe as a whole is 2, with Uraly Kuruman community having the highest median value of 5. This is a likely result since the community has the highest prevalence of morbidity compared to other communities. Median days lost due to illness among Muthuvan are zero and the community has the lowest prevalence of morbidity as well. Days lost due to illness can adversely affect the income earning capacity of tribal households since majority of them are daily wage labourers and agricultural labourers. To analyse whether differences among the communities are significant or not, we use the non-parametric tool of Kruskall Wallis test (Null hypothesis H_0: Median of days lost are the same).The result is summarised in the table 6.19.

Table 6.19: Kruskal Wallis Test on Days Lost Due to Illness

Sub Caste	Median	Mean Rank
Paniyan	1	310.31
Adiyan	2	337.83
Kuruman	2	319.73
Kurichiyan	2	294.28
Uraly Kuruman	5	413.32
Mala Arayan	1	287.40
Muthuvan	0	238.90
Irular	1	262.63
Kruskal Wallis Test Statistic (Chi-Square)		27.403
Degree of freedom		7
P value		.000**

** Significant at 1 per cent level of significance

Source: Primary data

The result of the Kruskall Wallis *H* test is significant with Chi square 27.403 and P<0.01 rejecting the null hypothesis H_0: Median of days lost are the same. Thus, there is a significant difference between median days lost due to illness among the tribal communities. The result of the effect of ill health on daily living of tribal population reaffirms the earlier findings of morbidity prevalence rate among the communities.

6.4.7 Ill Health Behaviours

Many studies (Kannan et al., 1991; Rajasenan et al., 2013) have pointed out that the high rate of morbidity and mortality among the tribal population is to a large extent attributed by the ill health behaviours among them. The use of alcohol and tobacco tends to have severe consequences on the health status of the population. Table 6.20 presents the extent of ill health behaviour among the tribal communities.

Table 6.20: Prevalence of Ill health Behaviour among Tribal Communities

Sub Caste	Use of Tobacco			Use of Alcohol		
	Never	Rarely/sometimes	Often/always	Never	Rarely/sometimes	Often/always
Paniyan	24 (12.18)	59 (29.95)	114 (57.87)	44 (22.34)	96 (48.73)	57 (28.93)
Adiyan	0 (0.00)	4 (15.38)	22 (84.62)	4 (15.38)	8 (30.77)	14 (53.85)
Kuruman	15 (27.78)	19 (35.19)	20 (37.04)	14 (25.93)	28 (51.85)	12 (22.22)
Kurichiyan	28 (35.90)	22 (28.21)	28 (35.90)	50 (64.10)	22 (28.21)	6 (7.69)
Uraly Kuruman	2 (8.00)	8 (32.00)	15 (60.00)	7 (28.00)	12 (48.00)	6 (24.00)
Mala Arayan	70 (77.78)	20 (22.22)	0 (0.00)	50 (55.56)	38 (42.22)	2 (2.22)
Muthuvan	9 (14.06)	28 (43.75)	27 (42.19)	18 (28.13)	28 (43.75)	18 (28.13)
Irular	7 (11.29)	19 (30.65)	36 (58.06)	22 (35.48)	26 (41.94)	14 (22.58)
Scheduled Tribe (combined)	155 (26.01)	179 (30.03)	262 (43.96)	209 (35.07)	258 (43.29)	129 (21.64)

Note: Figures in the parentheses are percentages.

Source: Primary data

Alarmingly high proportions of tribal population are involved in the ill health behaviours. About 75 per cent of tribal households regularly use tobacco/pan-masala and in which 43.96 per cent always use the same. Further, 65 per cent of the households consume alcohol and 21.64 per cent regularly consume alcohol. The regular consumption of tobacco is very high among backward tribal communities like Adiyan, Uraly Kuruman and Irular and comparatively less among better-off tribes. In fact, none of the Mala Arayan households regularly consume tobacco. Similarly, the regular consumption of alcohol is highest among the Adiyan tribal community followed by Paniyan. Thus, ill health behaviours like the use of tobacco

and alcohol might have been a significant contributor for the high prevalence of morbidity among the backward tribes.

6.4.8 Health and Hygiene

The use of contaminated drinking water and improper disposal of human excreta can lead to severe health hazards. Thus, the study examined the status of tribal households having access to drinking water, sanitation facilities and households' health and hygienic practices. Table 6.21 bring out the sources of drinking water of tribal communities.

Table 6.21: Sources of Drinking Water of Tribal Communities (in percentages)

Sub Caste	Own well/tube well	Public well/tube well	Public tap	Public pond	River	Oli	Other	Total
Paniyan	5.08	60.41	14.21	1.52	3.55	15.23	0.00	100
Adiyan	0.00	26.92	23.08	0.00	0.00	50.00	0.00	100
Kuruman	14.81	57.41	16.67	0.00	0.00	5.56	5.56	100
Kurichiyan	51.28	29.49	7.69	0.00	1.28	8.97	1.28	100
Uraly Kuruman	4.00	60.00	28.00	4.00	0.00	4.00	0.00	100
Mala Arayan	57.78	23.33	0.00	0.00	1.11	17.78	0.00	100
Muthuvan	1.56	10.94	14.06	6.25	0.00	67.19	0.00	100
Irular	0.00	40.32	50.00	8.06	0.00	1.61	0.00	100
Scheduled Tribe (combined)	18.79	41.61	16.11	2.18	1.51%	19.13	0.67	100

Note: Oli is a traditional non-mechanised method of collecting water from streams and rivers using pipes and bamboo.

Source: Primary data

Only 18.79 per cent of tribal households have own well or tube well. Majority of the households depend upon the public provision for drinking water. Oli is the major source of drinking water for communities like Muthuvan who live close to the forest without adequate public provision of water supply. It can be observed that most of the households from economically better-off communities like Mala

Arayan and Kurichiyan have own well or tube well. As the 81.21 per cent of the tribal households do not have own well or tube well, we investigated the distance of the source of drinking water. Table 6.22 presents the descriptive statistics of distance to source of drinking water measured in meters.

Table 6.22: Descriptive Statistics of Distance to the Source of drinking Water

Sub Caste	Mean Distance (in meters)	95 per cent Confidence Interval for Mean		Standard Deviation	Skewness
		Lower Bound	Upper Bound		
Paniyan	235.34	198.18	272.49	264.44	1.48
Adiyan	290.38	202.49	378.28	217.61	-0.09
Kuruman	166.29	88.10	244.49	286.48	5.22
Kurichiyan	294.42	185.26	403.59	484.17	3.04
Uraly Kuruman	280.20	187.09	373.31	225.57	0.74
Mala Arayan	361.72	256.76	466.68	501.13	1.87
Muthuvan	515.63	412.39	618.85	413.26	1.53
Irular	425.88	304.18	547.59	479.24	0.87
Scheduled Tribe (combined)	307.93	276.58	339.25	389.50	2.24

Source: Primary data

The average distance that tribal households had to travel for drinking water is 307.93 meters. The mean distance is highest among the Muthuvan community. It stems from the fact that majority of the community rely on oli for their drinking water. Even though Mala Arayan community have highest proportion of household having own well, the mean distance is high due to the effect of 17.78 per cent of their households who resort to oli, which is far away from the household premises. The status of sanitary latrines among the tribal communities are summarised in the table 6.23.

Table 6.23: Status of Sanitary Latrines among Tribal Communities (in percentages)

Sub Caste	No latrine	Without door	With roof and door, but no water connection	With roof and door, but with no water connection	With roof, door and water connection
Paniyan	9.14	10.15	4.57	73.10	3.05
Adiyan	0.00	15.38	0.00	23.08	61.54
Kuruman	3.70	9.26	1.85	75.93	9.26
Kurichiyan	7.69	5.13	2.56	62.82	21.79
Uraly Kuruman	20.00	12.00	0.00	52.00	16.00
Mala Arayan	0.00	0.00	0.00	38.89	61.11
Muthuvan	12.90	17.74	6.45	43.55	19.35
Irular	12.90	17.74	6.45	43.55	19.35
Scheduled Tribe (combined)	9.23	10.91	2.68	57.89	19.30

Source: Primary data

It is disturbing to note that only 19.30 per cent of tribal household do have a latrine facility with roof, door and water connection. Nearly one tenth of the community still resorts to open defecation. The percentage of household that do not have latrine facility is highest among the Uraly Kuruman community, which have reported highest morbidity prevalence rate. As expected, the forward tribal households had better access to basic sanitation facilities.

The study also examined the extent of hygienic health practices among tribal households. Households were asked to estimate the frequency with which they followed hygienic health practices like treatment of drinking water and washing the hand before meals.

Table 6.24: Hygienic Health Practices among Tribal Communities

(Figures are in percentages)

Sub Caste	Drinking Water Treatment				Washing of Hand before Food			
	No treatment	Boiling	Cloth screen	Any disinfectant	Rarely	Sometimes	Most of the time	Systematically always
Paniyan	24.87	62.94	11.68	0.51	6.09	18.78	48.22	26.90
Adiyan	65.38	30.77	0.00	3.85	50.00	26.92	23.08	0.00
Kuruman	14.81	77.78	7.41	0.00	0.00	18.52	40.74	40.74
Kurichiyan	42.31	51.28	6.41	0.00	6.41	33.33	30.77	29.49
Uraly Kuruman	56.00	40.00	4.00	0.00	28.00	12.00	20.00	40.00
Mala Arayan	22.22	68.89	6.67	2.22	0.00	3.33	21.11	75.56
Muthuvan	54.69	42.19	3.13	0.00	7.81	26.56	46.88	18.75
Irular	25.81	74.19	0.00	0.00	0.00	3.23	80.65	16.13
Scheduled Tribe (combined)	32.21	60.23	6.88	0.67	7.05	17.62	42.11	33.22

Source: Primary data

It is worth mentioning that more than two third of the tribal households do resort to one or the other treatment of the drinking water. At the same time, 32.21 per cent of the household do not exercise any treatment on their drinking water. More than 80 per cent of households belonging to communities like Kuruman and Mala Arayan who are socioeconomically better-off, regularly follow the habit of treating the drinking water. Majority of tribal population wash their hand before food. The proportion is comparatively higher among forward tribes and is the lowest among the Uraly Kuruman community which has poor health indicators as well.

6.5 Accessibility of Health Care

Kerala has extensive coverage of health care institutions which was one of the major contributory factors in the health success story of the state. The greater coverage of institutions and facilities had led to easy and better physical access to health care to the people of the state (Panikar, 1992; George, 2005). But concerns have been raised about the accessibility of health care among marginalised communities like tribal communities who live in places away from the main stream. It is pointed out that there are inequalities in the effective access to health care institutions among the marginalised group in all societies and is more pronounced in developing countries (Sen, 1999). Thus, this section looks at the issue of health care accessibility among different tribal communities to investigate whether there are any inequalities in the same.

The health care availability and accessibility are significant aspects that influence the affordability and utilisation of health care and in turn affecting the health outcome. Studies have shown that the availability of health care institutions with easy accessibility has helped to attain higher health care utilisation in the state (Krishnan, 1991; Navaneetham et al., 2009). But with respect to communities like scheduled tribes, health care availability and accessibility are low (Simon, 2007). Further, physical inaccessibility is a serious constraint among the tribal population as they live in geographically challenged areas. Broadly, accessibility includes the components of geographical or locational accessibility, economic or financial accessibility and social accessibility. This section deals with the geographical accessibility. The issue of economic accessibility and affordability will be examined in the next chapter. The accessibility is explored using indicators of distance to health care institutions, mode of conveyance, distance to tarred road and frequency of bus service to the next town.

6.5.1 Distance to Health Care Institutions

The attempt here is to examine the distance to the nearest health care institutions like primary health centre, government hospitals that offer in-patient treatment and private hospitals. Primary Health Centre (PHC) is the cornerstone for

the provision of health care services at the grass root level. There are 852 PHCs functioning in the state (Government of Kerala, 2016). These are institutions extensively used by the people from lower strata of society as a first referral centre for diagnosis in the event of ill health. Table 6.25 summarises the descriptive statistics of distance to the PHCs among tribal communities measured in kilo meters.

Table 6.25: Descriptive Statistics of Distance to the Primary Health Centre (in Kilo Meters)

Sub caste	Mean	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
				Lower Bound	Upper Bound
Paniyan	3.28	2.37	0.17	2.95	3.62
Adiyan	5.88	1.47	0.29	5.29	6.48
Kuruman	3.52	2.33	0.32	2.88	4.15
Kurichiyan	3.90	1.80	0.20	3.49	4.31
Uraly Kuruman	4.00	2.08	0.42	3.14	4.85
Mala Arayan	3.61	1.35	0.14	3.32	3.89
Muthuvan	4.44	0.71	0.09	4.26	4.61
Irular	3.19	1.82	0.23	2.73	3.65
Scheduled Tribe (combined)	3.69	2.01	0.08	3.53	3.86

Source: Primary data

The mean distance that the tribal population had to travel to avail the services of the health care institution of PHC is 3.69 kilo meters, which is reasonably small reflecting the extensive coverage of public health care providers in the state. The mean distance to the PHC is highest among the Adiyan community and is the lowest among the Irular tribal community. Since the data is approximately normally distributed (N=596, Skewness = 0.89), in order to understand the differences of access to PHC at community level we have used the tool One Way Analysis of Variance (ANOVA). The results are presented in table 6.26.

Table 6.26: Results of One Way ANOVA

	Sum of Squares	Degrees of freedom	Mean Square	F Statistic	P Value
Between Groups	216.805	7	30.972	8.314	.000**
Within Groups	2190.562	588	3.725		
Total	2407.367	595			

** Significant at 1 per cent level of significance

The results of ANOVA is significant (F = 8.314, P<0.01) and we can reject the null hypothesis (H_0) that the mean distances are the same. Thus, there is statistically significant difference in the average distance to PHC among tribal communities. To investigate into the communities in which the differences exist we have used the post hoc test of Dunnett's T3, which does not assume equality of variances, for multiple pair wise comparison. The results are summarised in the table 6.27.

Table 6.27: Multiple Comparison of Distance to PHC (Dunnett T3 Post Hoc Test)

(I) Sub Caste		Mean Difference (I-J)	Standard Error	P value	95 per cent Confidence Interval for Mean Difference	
					Lower Bound	Upper Bound
Paniyan	Adiyan	-2.60035	.40274	.000**	-3.8609	-1.3398
	Kuruman	-.23425	.29648	1.000	-1.1622	.6937
	Kurichiyan	-.61958	.25821	.374	-1.4278	.1886
	Uraly Kuruman	-.71574	.40979	.903	-1.9984	.5669
	Mala Arayan	-.32685	.24557	.996	-1.0955	.4418
	Muthuvan	-1.15324	.27771	.001**	-2.0225	-.2840
	Irular	.09072	.28107	1.000	-.7890	.9705

(I) Sub Caste		Mean Difference (I-J)	Standard Error	P value	95 per cent Confidence Interval for Mean Difference	
					Lower Bound	Upper Bound
Adiyan	Kuruman	2.36610	.46073	.000**	.9240	3.8082
	Kurichiyan	1.98077	.43709	.000**	.6127	3.3489
	Uraly Kuruman	1.88462	.54065	.015*	.1924	3.5769
	Mala Arayan	2.27350	.42974	.000**	.9284	3.6186
	Muthuvan	1.44712	.44888	.037*	.0421	2.8521
	Irular	2.69107	.45097	.000**	1.2795	4.1026
Kuruman	Kurichiyan	-.38533	.34169	1.000	-1.4548	.6842
	Uraly Kuruman	-.48148	.46691	1.000	-1.9429	.9800
	Mala Arayan	-.09259	.33224	1.000	-1.1325	.9473
	Muthuvan	-.91898	.35665	.248	-2.0353	.1973
	Irular	.32497	.35927	1.000	-.7996	1.4495
Kurichiyan	Uraly Kuruma	-.09615	.44360	1.000	-1.4846	1.2923
	Mala Arayan	.29274	.29859	1.000	-.6419	1.2273
	Muthuvan	-.53365	.32553	.948	-1.5526	.4853
	Irular	.71030	.32841	.581	-.3176	1.7382
Uraly Kuruman	Mala Arayan	.38889	.43636	1.000	-.9769	1.7547
	Muthuvan	-.43750	.45522	1.000	-1.8624	.9874
	Irular	.80645	.45728	.895	-.6248	2.2377
Mala Arayan	Muthuvan	-.82639	.31560	.224	-1.8142	.1614
	Irular	.41756	.31856	.997	-.5795	1.4147
Muthuvan	Irular	1.24395	.34394	.009**	.1674	2.3205

** Significant at 1 per cent level of significance
* Significant at 5 per cent level of significance

The multiple pair wise comparison shows that the mean distance of Adiyan community is statistically different and is higher when compared to all the other seven tribal communities. Further, there is a statistically significant difference in the average distance between Muthuvan community with respect to Paniyan and Irular. The PHC provides only a preliminary diagnostic service in limited scale and do not usually have facilities for in-patient treatment. Thus, we have also explored the distance to the nearest government hospital that offers in-patient treatment. The descriptive statistics is shown in the table 6.28.

Table 6.28: Descriptive Statistics of Distance to the Government Hospital

Sub caste	Mean	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
				Lower Bound	Upper Bound
Paniyan	9.69	8.74	0.62	8.47	10.93
Adiyan	25.35	9.59	1.88	21.47	29.22
Kuruman	14.35	8.11	1.10	12.14	16.57
Kurichiyan	18.53	7.48	0.85	16.84	20.21
Uraly Kuruman	15.20	9.69	1.94	11.19	19.20
Mala Arayan	7.66	5.12	0.54	6.58	8.73
Muthuvan	5.38	1.00	0.13	5.13	5.62
Irular	7.34	3.49	0.44	6.45	8.23
Scheduled Tribe (combined)	11.17	8.74	0.36	10.47	11.87

Source: Primary data

The analysis of access to nearest government hospital having the facilities of in-patient treatment using the variable of distance indicates that tribal community has to cover an average distance of 11.17 kilo meters to reach the nearest government hospital. The pattern among the tribal communities follows almost the same as in the case of distance to PHC. Like the earlier analysis, the Adiyan households are far away from the government hospital with a mean distance of 25.35 kilo meters followed by Kurichiyan. Along with the analysis of access to

public health care facilities, the study also examined the access to the private hospital. It is interesting to note that mean distance to the private hospital is significantly less than that of government hospital, indicating the extent to which the private health care sector has expanded its operation in the state, even in the geographically remote area (Table 6.29) .The average distance is highest among the Kurichiyan community. But the critical question is whether the tribal households depend upon the private providers for their medical treatment. This pertinent issue will be examined in the section 6.6.

Table 6.29: Descriptive Statistics of Distance to Private Hospital

Sub caste	Mean	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
				Lower Bound	Upper Bound
Paniyan	7.52	6.95	0.50	6.54	8.50
Adiyan	7.77	1.97	0.39	6.98	8.56
Kuruman	9.80	3.24	0.44	8.91	10.68
Kurichiyan	12.23	10.83	1.23	9.79	14.67
Uraly Kuruman	8.64	1.32	0.26	8.10	9.18
Mala Arayan	6.54	4.92	0.52	5.51	7.57
Muthuvan	5.38	1.00	0.13	5.13	5.62
Irular	7.40	6.85	0.87	5.66	9.14
Scheduled Tribe (combined)	8.01	6.68	0.27	7.47	8.55

Source: Primary data

6.5.2 Mode of Conveyance

The means of conveyance for health care facilities will influence the choice of provider and, as a result, will also influence the pattern of utilisation and the travel cost involved. The mode of conveyance used by the tribal household for reaching the nearest health care institution is summarised in the table 6.30.

Table 6.30: Mode of Conveyance to Health Care Institution (in percentage)

Sub Caste	By walk	By bus	Own vehicle	Rented vehicle
Paniyan	4.06	46.19	0.51	49.24
Adiyan	0.00	15.38	0.00	84.62
Kuruman	7.41	46.30	0.00	46.30
Kurichiyan	10.26	42.31	1.28	46.15
Uraly Kuruman	0.00	60.00	0.00	40.00
Mala Arayan	2.22	35.56	15.56	46.67
Muthuvan	1.56	70.31	0.00	28.13
Irular	1.61	45.16	0.00	53.23
Scheduled Tribe (combined)	4.03	45.81	2.68	47.48

Source: Primary data

The most frequently used means of conveyance to health care institution are the rented vehicles that constitute 47.48 per cent of the total, closely followed by travel by bus. The high proportion of rented vehicles will have significant influence on the cost incurred towards travel and the financing pattern, which is to be examined in the next chapter on financing of health care. The reliance on rented vehicles is very high among Adiyan community who are far away from the public health care institutions. As can be expected, the use of own vehicle is small among the tribal community, though 15.56 per cent of Mala Arayan community resort to this method of conveyance. Travelling to health care institutions by foot constitutes 10.26 per cent among Kurichiyan community.

6.5.3 Frequency of Bus Service

The mode of conveyance is in turn influenced by the frequency of bus service to the next town as explained in the table 6.31.

Table 6.31: Frequency of Bus Service (in percentages)

Sub Caste	Less than One Hour	Every Hour	One in Two Hours	More than Two hours
Paniyan	19.80	43.15	18.78	18.27
Adiyan	7.69	76.92	7.69	7.69
Kuruman	27.78	62.96	3.70	5.56
Kurichiyan	6.41	64.10	7.69	21.79
Uraly Kuruman	0.00	100.00	0.00	0.00
Mala Arayan	37.78	37.78	8.89	15.56
Muthuvan	0.00	0.00	39.06	60.94
Irular	0.00	38.71	61.29	0.00
Scheduled Tribe (combined)	15.94	45.64	19.80	18.62

Source: Primary data

Most of the tribal households do have the bus services every hour to go to the next town. The most frequent availability of service is with respect to Mala Arayan community who do not live in colonies, but scattered in urban areas of Idukki and are well-connected with all types of transport systems. The frequency is low in the case of Muthuvan community since they live in geographically isolated areas close to the forest.

6.5.4 Distance to Tarred Road

Another important aspect which needs to be examined while analysing the access to health care in the case of tribal communities is the distance to the tarred road. The availability of tarred road determines the ease with which households can use of the mode of conveyance and can reduce the time taken to catch bus or rented vehicle. The descriptive statistics of distance to the tarred road is explained in the table 6.32.

Table 6.32: Descriptive Statistics of Distance to Tarred Road

Sub caste	Mean (in meters)	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
				Lower Bound	Upper Bound
Paniyan	165.51	211.00	15.03	135.86	195.15
Adiyan	826.92	290.60	56.99	709.55	944.30
Kuruman	368.98	439.49	59.81	249.02	488.94
Kurichiyan	447.05	491.07	55.60	336.33	557.77
Uraly Kuruman	1892.00	933.15	186.63	1506.82	2277.18
Mala Arayan	174.44	266.07	28.05	118.72	230.17
Muthuvan	1957.81	1250.63	156.33	1645.42	2270.21
Irular	508.06	174.19	22.12	463.83	552.30
Scheduled Tribe (combined)	551.51	805.04	32.98	486.75	616.27

Source: Primary data

The average distance that tribal households had to travel to reach a tarred road is more than half a kilometre. As expected, the Muthuvan community has the disadvantage of being far off from the tarred road and Paniyan community and Mala Arayan are better off compared to other communities in terms of proximity to the tarred road.

It may be noted that geographical accessibility or the existence of health care institutions is a necessary, but not a sufficient condition, for better health outcome. It is important also to examine whether the community uses these available facilities which can be termed as acceptability of health care services. The following section analyses the issue of utilisation in detail.

6.6 Utilisation of Health Care

It is imperative to understand the health seeking behaviour of tribal population in order to trace out the reasons behind their relatively poor health indicators. Thus, this section examines the preferences of the system of treatment and providers of health care services followed by the analysis of utilisation of in-patient and out-patient health care facilities and the underlying contributory factors which influence the choice of provider.

6.6.1 Preference of system of medicine and Provider

The table 6.33 brings out the preferences of the system of medicine by the tribal households.

Table 6.33: Preference of the System of Medicine (in percentage)

Sub Caste	Traditional/tribal	Ayurvedhic	Homeopathic	Allopathic
Paniyan	1.52	1.52	3.55	93.40
Adiyan	23.08	7.69	0.00	69.23
Kuruman	5.56	3.70	1.85	88.89
Kurichiyan	3.85	2.56	0.00	93.59
Uraly Kuruman	20.00	0.00	0.00	80.00
Mala Arayan	0.00	5.56	1.11	93.33
Muthuvan	0.00	0.00	3.13	96.88
Irular	0.00	3.23	0.00	96.77
Scheduled Tribe (combined)	3.36	2.68	1.85	92.11

Source: Primary data

An overwhelmingly higher proportion of tribal households prefer the allopathic form of medicine. The reliance on the traditional system of tribal medicine is meagre. Yet, significant proportions of Adiyan and Uraly Kuruma community prefer this type of medicine. In fact, nearly one third of the Adiyan household favour traditional or ayurvedhic type of medicine. We also explored

whether there is any deviation from the preference when the treatment is offered to children and aged. Table 6.34 summarises the findings.

Table 6.34: Preference of the System of Medicine for Children and Aged (in percentage)

Sub Caste	Children				Aged			
	Traditional/tribal	Ayurvedhic	Homeopathic	Allopathic	Traditional/tribal	Ayurvedhic	Homeopathic	Allopathic
Paniyan	1.52	0.51	3.05	94.92	1.02	1.52	3.05	94.42
Adiyan	18.75	7.69	60.00	33.57	15.38	7.69	0.00	76.92
Kuruman	0.00	1.85	0.00	98.15	1.85	7.41	0.00	90.74
Kurichiyan	2.56	5.13	0.00	92.31	2.56	7.69	0.00	89.74
Uraly Kuruman	20.00	0.00	0.00	80.00	20.00	0.00	0.00	80.00
Mala Arayan	0.00	4.44	2.22	93.33	0.00	5.56	1.11	93.33
Muthuvan	0.00	0.00	3.13	96.88	0.00	0.00	3.13	96.88
Irular	0.00	1.61	0.00	98.39	0.00	3.23	0.00	96.77
Scheduled Tribe (combined)	2.68	2.18	1.68	93.46	2.35	3.69	1.51	92.45

Source: Primary data

Allopathy is the preferred system of medicine for both children and aged among the tribal households. At the same time, majority of Adiyan household prefer homeopathic treatment for their children. 15.38 per cent of the community prefers traditional tribal medicine for aged members. More than 7 per cent of the households among Adiyan, Kuruman and Kurichiyan community prefers ayurvedhic treatment for aged. The reasons for the selection of the system of medicine were also sought, which is shown in the figure 6.5.

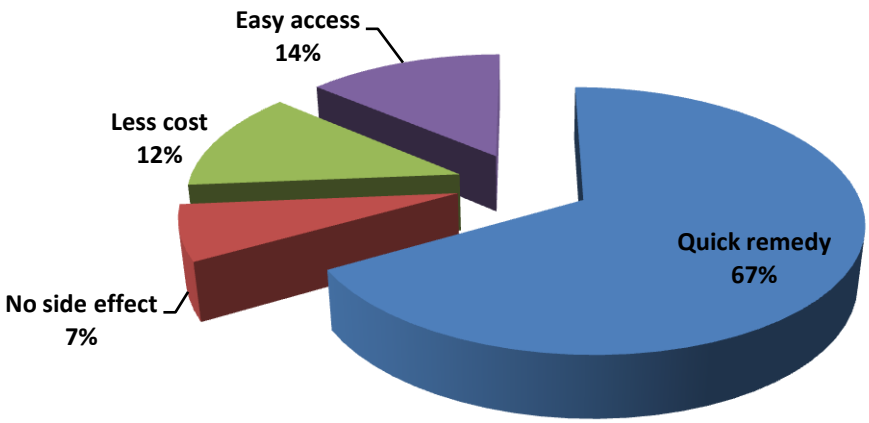

Figure 6.5: Reasons for the Selection of the System of Medicine

The most important reason for the selection of the system of medicine is quick remedy followed by easy access. The cross tabulation carried out showed that the most important reason behind choosing allopathy as the preferred choice is that it provides quick remedy to ailment (70.49 per cent). Majority of the households that choose ayurvedhic system of medicine (56.25 per cent) viewed that it has no side effect. The traditional tribal medicine was preferred due its low cost and homeopathy was preferred by households as it was believed to have no side effect. Similarly, the study also examined whether there occurred any changes in the system of medicine followed by the households. Only 32 households constituting 5.4 per cent of the total have changed the type of medicine they followed. The reasons for the change are shown figure 6.5. Majority of the households changed their system of medicine due to long duration of healing, followed by the fact that treatment is not available in the system of medicine they followed. Combining the earlier findings on the reason for the selection, tribal households expect quick healing while choosing the system of medicine.

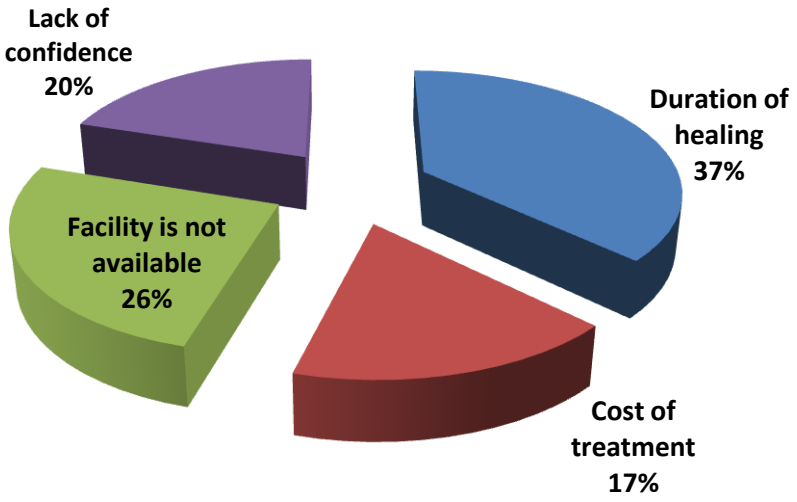

Figure 6.6: Reasons for the Change in the System of Medicine

The study has investigated the preference for in-patient treatment among tribal community between different providers. Table 6.35 summarises the preference of household among different providers of in-patient treatment or hospitalisation.

Table 6.35: Preference of Providers of In-patient Treatment

Sub Caste	Govt Taluk or District Hospital		Govt Medical College		Private Hospital	
	Number	Percentage	Number	Percentage	Number	Percentage
Paniyan	149	75.63	17	8.83	31	15.74
Adiyan	22	84.61	2	7.69	2	7.69
Kuruman	37	68.52	0	0	17	31.48
Kurichiyan	52	66.67	6	7.69	20	25.64
Uraly Kuruman	25	100.00	0	0.00	0	0.00
Mala Arayan	55	61.11	5	5.56	30	33.33
Muthuvan	52	81.25	8	12.50	4	6.25
Irular	39	62.90	5	8.06	18	29.04
Scheduled Tribe (combined)	431	72.32	43	7.21	122	20.47

Source: Primary data

Majority of tribal household prefer government taluk or district hospital for in-patient treatment. When we consider the share of medical colleges as well, almost 80 per cent of tribal household prefer public hospitals for in-patient treatment. The preference towards public providers is very high among the backward communities like Muthuvan, Uraly Kuruman and Adiyan. At the same time, 20.47 per cent of tribal households favour private hospital. The preference for private providers is significant among the forward communities like Mala Arayan, Kuruman and Kurichiyan. Interestingly, nearly 30 per cent of Irular community favour private hospitals. From the focus group discussion it is inferred that the private charitable trust hospitals functioning in the Attappady region, who offer nearly free health care to tribal community, was the reason for such a preference pattern. The preference of private system of in-patient treatment can have significant influence on health care payment and financing pattern. Thus, the study explored the reasons for selecting the private provider and reason for not choosing public provider among households who favoured private providers.

Table 6.36: Reasons for Choosing Private Providers

Reasons	Number of Households	Percentage
Better facilities	84	68.85
Accessibility/Distance	25	20.49
Doctors	12	9.84
Financial Reasons	1	0.82
Total	122	100.00

Source: Primary data

The most important reason for the preference of private providers is that they offer better facilities of treatment relative to the public providers. It shows that tribal households do seek quality health care even if it is at the expense making a payment. Easy access is another significant reason for choosing private hospital for in-patient treatment.

Table 6.37: Reasons for not Choosing Public Providers

Reasons	Number of Household	Percentage
Lack of proper attention	58	47.54
Lack of facilities	24	19.67
Distance	21	17.21
Non availability of drugs	9	7.38
Lack of trust	9	7.38
Lack of knowledge	1	0.82
Total	122	100.00

Source: Primary data

It is due to the lack of proper care and attention from government institutions that tribal households are opting for private providers. Lack of facilities in government hospitals when compared to private hospital is also a significant reason as it is better facilities that attract tribal households to private providers of in-patient care. Accessibility and non-availability of medicines in government hospitals too has influenced decisions of not opting public providers for in-patient care by the tribal households.

6.6.2 Utilisation of Out-patient Health Care

After probing the preferences of tribal households towards the type of medicine and providers of health care, the study now examines the utilisation of health care facilities by the households. First of all, one needs to look at the stage at which tribal households seek treatment or utilise out-patient facilities when an ailment happen to a member in the household. The table 6.38 reveals the stage at which tribal households tends to utilise out-patient treatment when a disease occurs.

Table 6.38: Stage of Health Care Utilisation

Sub Caste	Very Beginning	After Trying Over the Counter Medicines from Medical Shops	After Trying Tribal Medicines	When Disease Gets Worsened
Paniyan	146 (74.11)	9 (4.57)	1 (0.51)	41 (20.81)
Adiyan	9 (34.62)	2 (7.69)	7 (26.92)	8 (30.77)
Kuruman	38 (70.37)	0 (0.00)	6 (11.11)	10 (18.52)
Kurichiyan	60 (76.92)	5 (6.41)	6 (7.69)	7 (8.97)
Uraly Kuruman	19 (76.00)	1 (4.00)	5 (20.00)	0 (0.00)
Mala Arayan	80 (88.89)	8 (8.89)	1 (1.11)	1 (1.11)
Muthuvan	45 (70.31)	7 (10.94)	0 (0.00)	12 (18.75)
Irular	55 (88.71)	0 (0.00)	0 (0.00)	7 (11.29)
Scheduled Tribe (combined)	452 (75.84)	32 (5.37)	26 (4.36)	86 (14.43)

Note: Figures in the parentheses are percentages.
Source: Primary data

More than 75 per cent of the tribal household immediately seek treatment when an illness occurs. At the same time, major proportion does resort to self medication either by purchasing medicines from local shops or by resorting to tribal medicines. The result that more than two third of the households resort to medical treatment when a disease occurs, do contradicts with the views made by officials of the health department. In the focus group discussion, they have made the opinion that late reporting of morbidity is widespread among the tribal communities

especially communities like Paniya and Uraly Kuruman. This is arguably one of the main reasons for the poor health status of tribal households.

For the calculation of health care utilisation, we followed the same reference period that was used for the calculation of morbidity prevalence rate, which is 30 days prior to the survey, to trace out the extent of utilisation of out-patient health care facilities by the households. Table 6.38 summarises the pattern of utilisation of public providers, including primary health centres, taluk hospitals, district hospitals and government medical colleges by the tribal households for out-patient treatment.

Table 6.39: Utilisation of Public Health Care Facilities for Out-patient Treatment (in 30 Days Reference Period)

Sub Caste	Number of Visits					
	0	**1**	**2**	**3**	**4**	**5 and above**
Paniyan	69 (35.03)	26 (13.20)	43 (21.83)	18 (9.14)	19 (9.64)	22 (11.17)
Adiyan	11 (42.31)	2 (7.69)	2 (7.69)	2 (7.69)	3 (11.54)	6 (23.08)
Kuruman	21 (38.89)	6 (11.11)	13 (24.07)	1 (1.85)	13 (24.07)	0 (0.00)
Kurichiyan	36 (46.15)	8 (10.26)	10 (12.82)	6 (7.69)	8 (10.26)	10 (12.82)
Uraly Kuruman	3 (12.00)	0 (0.00)	7 (28.00)	3 (12.00)	5 (20.00)	7 (28.00)
Mala Arayan	40 (44.44)	16 (17.78)	16 (17.78)	13 (14.44)	5 (5.56)	0 (0.00)
Muthuvan	29 (45.31)	13 (20.31)	10 (15.63)	6 (9.38)	4 (6.25)	3 (1.13)
Irular	28 (45.16)	11 (17.74)	9 (14.52)	10 (16.13)	2 (3.23)	2 (3.23)
Scheduled Tribe (combined)	237 (39.77)	82 (13.76)	110 (18.46)	59 (9.90)	59 (9.90)	49 (8.22)

Note: Figures in the parentheses are percentages.

Source: Primary data

60.23 per cent of tribal households have utilised and availed the services of government health care institutions during the period of one month leading up to the survey. Majority of the households make at least two visits during the reference period. The utilisation of public providers is highest among the Uraly Kuruman community. This is on account of its high rate of prevalence of morbidity, which has been already looked into. To trace out whether there is any significant difference with respect to the utilisation of public health care providers for out-patient treatment, the nonparametric tool of Kruskall Wallis test is used (Null hypothesis H_0: There is no difference in the median number of visit). The results are summarised in the table 6.40.

Table 6.40: Kruskal Wallis Test on Utilisation of Public Providers for Out-patient Treatment

Sub Caste	Median	Mean Rank
Paniyan	2.00	315.79
Adiyan	1.50	328.35
Kuruman	1.50	300.58
Kurichiyan	1.00	293.78
Uraly Kuruman	3.00	435.96
Mala Arayan	1.00	264.06
Muthuvan	1.00	262.24
Irular	1.00	267.18
Kruskal Wallis Test Statistic (Chi-Square)	29.424	
Degree of Freedom	7	
P Value	0.000**	

** Significant at 1 per cent level of significance

The Kruskal Wallis test is significant ($P<0.01$) and it rejects the null hypothesis that median number of utilisation are equal. Thus, there is a statistically significant difference in the utilisation of public health care facilities for out-patient

treatment among the tribal communities. The median is significantly higher for the Uraly Kuruma community. Table 6.41 bring out the pattern of utilisation of private providers in the form of private clinics including consultation at home by the physician and private hospitals by the tribal households for the out-patient treatment.

Table 6.41: Utilisation of Private Providers for Out-patient Treatment (in 30 Days Reference Period)

Sub Caste	Number of Visits					
	0	**1**	**2**	**3**	**4**	**5 and above**
Paniyan	148 (75.13)	21 (10.66)	17 (8.63)	6 (3.05)	3 (1.52)	2 (1.02)
Adiyan	22 (84.62)	2 (7.69)	2 (7.69)	0 (0.00)	0 (0.00)	0 (0.00)
Kuruman	30 (55.56)	11 (20.37)	7 (12.96)	3 (5.56)	2 (3.70)	1 (1.86)
Kurichiyan	56 (71.79)	11 (14.10)	6 (7.69)	2 (2.56)	0 (0.00)	3 (3.85)
Uraly Kuruman	23 (92.00)	2 (8.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Mala Arayan	48 (53.33)	20 (22.22)	11 (12.22)	6 (6.67)	3 (3.33)	2 (2.22)
Muthuvan	55 (85.94)	4 (6.25)	4 (6.25)	0 (0.00)	0 (0.00)	1 (1.56)
Irular	43 (69.35)	10 (16.13)	4 (6.45)	1 (1.61)	4 (6.45)	0 (0.00)
Scheduled Tribe (combined)	425 (71.31)	81 (13.59)	51 (8.56)	18 (3.02)	12 (2.01)	9 (1.51)

Note: Figures in the parentheses are percentages.

Source: Primary data

Nearly 30 per cent of the tribal households have made use of private health care facilities for out-patient health care treatment. 13.59 per cent of the households made at least one visit to private provider. The utilisation of private health care facilities is relatively higher among communities such as Mala Arayan and Kuruman which are socioeconomically better-off than others. The utilisation is lowest among the Uraly Kuruman community since majority of them use public health care facilities. To understand the inter-community differences in the utilisation of private health care facilities, the study has employed the tool of Kruskall Wallis test (Null hypothesis H_0: There is no difference in the number of visit). The results are presented in the table 6.42.

Table 6.42: Kruskall Wallis Test on Utilisation of Private Providers for Out-patient Treatment

Sub Caste	Mean	Mean Rank
Paniyan	0.33	287.76
Adiyan	0.23	257.00
Kuruman	0.72	346.17
Kurichiyan	0.57	296.85
Uraly Kuruman	0.08	233.24
Mala Arayan	0.91	352.45
Muthuvan	0.26	254.65
Irular	0.59	303.86
Kruskall Wallis Test Statistic (Chi-Square)	36.356	
Degree of Freedom	7	
P Value	0.000**	

** Significant at 1 per cent level of significance

A significantly high proportion of the households among tribal communities did not utilise private health care providers for out-patient treatment, the median value was zero for all communities. Thus, the mean value was used to get some insight in the extent of utilisation. The average utilisation is the highest among the Mala Arayan community and is the lowest among the Uraly Kuruman community.

The Kruskall Wallis statistic of Chi square is significant (P<0.01) indicating that there exists significant differences with respect to the utilisation of private providers among the tribal communities.

6.6.3 Utilisation of In-patient Health Care

In the earlier computation of hospitalisation rate among tribal population, it was found that there were 269 hospitalisation events among the tribal population of 2594 under the study. The table 6.43 reveals the pattern of utilisation of in-patient care or hospitalisation by the tribal households between different providers of care.

Table 6.43: Utilisation of In-patient Treatment

Sub Caste	Govt Taluk/District Hospital	Govt Medical College	Private Hospital	Total
Paniyan	62 (69.66)	15 (16.85)	12 (13.48)	89 (100.00)
Adiyan	6 (60.00)	2 (20.00)	2 (20.00)	10 (100.00)
Kuruman	15 (50.00)	4 (13.33)	11 (36.67)	30 (100.00)
Kurichiyan	19 (46.34)	12 (29.27)	10 (24.39)	41 (100.00)
Uraly Kuruman	7 (70.00)	3 (30.00)	0 (0.00)	10 (100.00)
Mala Arayan	21 (50.00)	5 (11.90)	16 (38.10)	42 (100.00)
Muthuvan	11 (64.71)	4 (23.53)	2 (11.76)	17 (100.00)
Irular	15 (50.00)	7 (23.33)	8 (26.67)	30 (100.00)
Scheduled Tribe (combined)	156 (57.99**)	52 (19.33**)	61 (22.68**)	269 (100.00)

Note: Figures in the parentheses are percentages.

** Significant at 1 per cent level of significance

Source: Primary data

The pattern of utilisation of in-patient treatment by the tribal household demonstrates the significant difference (Chi-square 70.707, P<0.01) between different providers of in-patient care. Combining the shares of government hospital and medical colleges, the share of public provider is 77.32 per cent. It can be noted that private sector does have a share of 22.68 in in-patient treatment. Similar to the utilisation of out-patient, the proportion of private provider is relatively higher among communities like Mala Arayan and Kuruman.

6.6.4 Utilisation of Maternal and Paediatric Care

36 tribal households constituting 6.21 per cent of the sample households experienced the event of delivery during the reference period of one year prior to the survey. A look at the place of delivery shows that more than 80 per cent of the deliveries have taken place in government hospitals (Table 6.44). The private hospitals account for 16.67 per cent and only one delivery has taken place outside the hospital without the assistance of trained medical staff.

Table 6.44: Place of Delivery

Place	Number	Percentage
Government Hospital	29	80.56
Private Hospital	6	16.67
Home	1	2.78
Total	36	100.00

Source: Primary data

The study also examined whether the tribal households have utilised immunisation care for their children and whether the children are registered for the paediatric care. Table 6.45 provides the extent of the coverage of immunisation programme among the tribal households. Only those tribal households having at least one child are considered for the analysis.

Table 6.45: Utilisation of Immunisation Programme

Sub Caste	Not Vaccinated	Government Agency	Private Agency	Not Applicable
Paniyan	6 (3.05)	147 (74.62)	3 (1.52)	41 (20.81)
Adiyan	0 (0.00)	15 (57.69)	0 (0.00)	11 (42.31)
Kuruman	1 (1.85)	31 (57.41)	1 (1.85)	21 (38.89)
Kurichiyan	6 (7.69)	43 (55.13)	2 (2.56)	27 (34.62)
Uraly Kuruman	0 (0.00)	12 (48.00)	0 (0.00)	13 (52.00)
Mala Arayan	1 (1.11)	42 (46.67)	11 (12.22)	36 (40.00)
Muthuvan	4 (6.25)	36 (56.25)	0 (0.00)	24 (37.50)
Irular	2 (3.23)	35 (56.45)	0 (0.00)	25 (40.32)
Scheduled Tribe (combined)	20 (3.36)	360 (60.40)	17 (2.85)	197 (33.22)

Note: Figures in the parentheses are percentages.

Source: Primary data

There is wide coverage of immunisation among the tribal households. Only a negligible proportion of households have not provided the immunisation to their children. It is highest among the Muthuvan community due to difficulty of access to health care facilities. Table 6.46 provides information about whether the children were enrolled in paediatric care of any type.

Table 6.46: Registration for Paediatric Care

Sub Caste	Not Registered	In Govt Hospital	In PHC/CHC	With Physician	In Private Hospital	Not Applicable
Paniyan	26 (13.20)	40 (20.30)	85 (43.15)	1 (0.51)	3 (1.52)	41 (20.81)
Adiyan	1 (3.85)	2 (7.69)	12 (46.15)	0 (0.00)	0 (0.00)	11 (42.31)
Kuruman	7 (12.96)	11 (20.37)	13 (24.07)	0 (0.00)	2 (3.70)	21 (38.89)
Kurichiyan	14 (17.95)	24 (30.77)	10 (12.82)	1 (1.28)	2 (2.56)	27 (34.62)
Uraly Kuruman	1 (4.00)	4 (16.00)	7 (28.00)	0 (0.00)	0 (0.00)	13 (52.00)
Mala Arayan	0 (0.00)	23 (25.56)	16 (17.78)	0 (0.00)	15 (16.67)	36 (40.00)
Muthuvan	5 (7.81)	19 (29.69)	16 (25.00)	0 (0.00)	0 (0.00)	24 (37.50)
Irular	3 (4.84)	16 (25.81)	19 (30.65)	0 (0.00)	1 (1.61)	25 (37.10)
Scheduled Tribe (combined)	57 (9.73)	139 (23.32)	178 (29.87)	2 (0.34)	23 (3.86)	197 (32.89)

Note: Figures in the parentheses are percentages.

Source: Primary data

79.45 per cent of tribal households which have at least one child, utilised the paediatric care in public facilities. Nearly 15 per cent of the applicable households didn't register with any provider. The utilisation of private providers for paediatric care is relatively higher among the Mala Arayan community

6.6.5 Choice of Provider: Bivariate Analysis

The choice of health care provider is a key factor in determining the affordability of treatment and the impact of health care payment on the households. In the earlier examination of the utilisation of in-patient health care facilities, it was found that 28.69 per cent of the households have made at least one visit to private providers. In order to predict the variables that exert influence on the choice of provider, the model of binary logistic regression is used. The attempt is to investigate the probability of utilising private health care facilities by the tribal households.

The dependent variable is binary outcome variable coded 1, if the household has made at least one visit to private provider, 0 otherwise. The explanatory variables used in the model are sub caste (coded 1 for households belonging to Mala Arayan, Kurichiyan and Kuruman, 0 for other households), status of education of the head of the household (coded 1 if the head is illiterate, 0 otherwise), habitat (coded 1 for households which are scattered, 0 otherwise), chronic ailments (coded 1 if any member of the household is chronically ill, 0 otherwise), acute ailments (coded 1 if any member of the household is having an illness of acute nature, 0 otherwise) and the three variables of distance, namely distance to government hospital, distance to taluk hospital and distance to private hospital to capture the effects accessibility which are measured in continuous scale. The null hypothesis for the model is H_0: all the coefficients are simultaneously zero. The results of the logistic regression are summarised in the table 6.47.

Table 6.47: Results of Logistic Regression Model of the Choice of Provider

Variables	Coefficient	Standard Error	Z-Statistic	P value
Constant	-1.646972	0.350361	-4.700794	0.0000**
Sub caste	0.719840	0.242333	2.970457	0.0030**
Education status of Head of the household	0.453664	0.218569	2.075612	0.0379*
Habitat	-0.389366	0.267503	-1.455553	0.1455
Chronic ailments	0.752970	0.199216	3.779671	0.0002**
Acute ailments	0.817955	0.281826	2.902337	0.0037**
Distance to private hospital	-0.038119	0.019177	-1.987755	0.0468*
Distance to government district hospital	-0.004026	0.014983	-0.268735	0.7881
Distance to government taluk hospital	0.054158	0.017602	3.076781	0.0021**

Number of observations	596
McFadden R-squared	0.105963
LR statistic	75.70463
Prob(LR statistic)	0.000000
Mean dependent var	0.286913
S.E. of regression	0.427117
Sum squared resid	107.0858
Log likelihood	-319.3688
Deviance	638.7375
Restr. log likelihood	-357.2211
Hosmer-Lemeshow Statistic	5.4869 ,Prob. Chi-Sq(8): 0.7045

Since the value of likelihood ratio statistic (LR Statistic) is 75.70463 and P value is practically zero, the null hypothesis that all the coefficients are simultaneously zero is refuted. Thus, it can be said that all the eight variables included in the logit model are important determinants of the choice of provider. The good of fit of the model is verified with Hosmer-Lemeshow test and the statistic is 5.4869 with probability of 0.7045.

From the estimated coefficient it can be inferred that sub castes do have a significant influence ($P<0.01$) in determining the choice of provider and that households belonging to higher socioeconomic category have a greater probability of resorting to private health care treatment. Households with literate heads have significantly higher probability of resorting to private treatment. Place of stay of the tribal household does not exert any significant influence on the dependent variable. The presence of a member with chronic ailment that requires prolonged treatment significantly increased the probability of using private facilities. Following the similar pattern, prevalence of acute episodes in the household increases the probability of choosing private provider. The coefficients of three continuous variables included in the model to capture the accessibility of health care facilities, reveals that distance to government district hospital do not have any influence on the choice of health care provider. As expected, the distance to private hospital is significant and the coefficient is negative implying that, as the distance to private hospital decreases, the probability of choosing private health care facilities increases. The distance to government taluk hospital is also highly significant and as the distance to government hospital increases, there is greater probability of choosing private health care facilities. Thus, the binary logistic model brings out that households belonging to forward socioeconomic category with a literate head, with chronic and/or acute ailments and are more immediacy to private facilities tend to choose private providers for health care treatment.

6.7 Conclusion

This chapter has examined the health status of the tribal population, their accessibility and utilisation of health care. The analysis of the socioeconomic characteristics of households has brought out the inherent heterogeneity among the tribal community. The attempt to trace out the health status using the indicators of morbidity and hospitalisation showed that communities which belong to low socioeconomic status reported highest morbidity. One among every four tribal individual perceived themselves to be sick during the reference period. Fever of unknown origin, blood pressure and diabetics are the most common ailments. Poor health behaviours like the use of tobacco and alcohol and unhygienic dwelling places increases health risks among the population. The accessibility to health care institutions in terms of distance and road connectivity is low among the communities such as Muthuvan and Adiyan. In terms of utilisation of health care facilities, allopathic system of medicine is preferred to other forms of medicine. The reliance on the traditional tribal medicine is very low among the households. The public providers are more chosen than private providers for both out-patient and in-patient care. The bivariate analysis confirmed that the educated households hailing from superior socioeconomic background tend to have higher probability of choosing private providers for medical treatment that will exert unambiguous influence on the financing of health care among the tribal folks, which is the focus of the next chapter.

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CHAPTER 7

FINANCING OF HEALTH CARE AND COPING MECHANISM

7.1 Introduction

An equitable health care financing system should protect the households from impoverishment arising out of large payments on health care. The financing mechanism followed by the developed countries utilises the method of health insurance to accomplish this task. But, with the absence of risk pooling mechanism, declining role of public provisioning of health care and increasing commercialisation of health care sector of Kerala, it is imperative to analyse the financing of health care utilised by the vulnerable communities like scheduled tribes. Thus, this chapter examines the vital research issue of the methods of health care financing utilised by the tribal communities. The focal point of analysis is on the out-of-pocket health expenditures which is the principal form of financing of health care in developing societies. The study also investigates the coping strategies adopted by the household to alleviate the burden of out-of-pocket health expenditure that could not be managed by their regular income. The chapter is organised in eight sections. The next section analyses the prevalence of out-of-pocket health expenditures and its components. The extent of financial protection enjoyed by the tribal households is examined using the theoretical framework of minimum standard approach in the third section. The fourth section traces out various determinants of catastrophic health expenditure. The burden of in-patient treatment of hospitalisation is examined in the fifth section. The coverage and utilisation of health insurance by the tribal households is explained in the sixth section. Various strategies employed by the households to cope with the cost of illness and hospitalisation are examined in the seventh section, followed by the conclusion.

7.2 Prevalence of Out-of-pocket Health Expenditure

Though the extent of out-of-pocket health expenditure is used as an indicator of access to health care facilities and utilisation, it is commonly acknowledged that large prevalence of out-of-pocket health expenditure is the most inequitable and regressive form of health care financing. It stems from the fact that high out-of-pocket health expenditure can have adverse consequences on the living standards of the poor households and can push them into indebtedness and acute poverty. Table 7.1 brings out the prevalence of out-of-pocket health care payments among the tribal households.

Table 7.1: Extent of Out-of-pocket Health Expenditure among Tribal Households

Sub caste	Presence of OOP		Absence of OOP	
	Number	Percentage	Number	Percentage
Paniyan	147	74.62	50	25.38
Adiyan	15	57.69	11	42.31
Kuruman	43	79.63	11	20.37
Kurichiyan	57	73.08	21	26.92
Uraly Kuruman	22	88.00	3	12.00
Mala Arayan	64	71.11	26	28.89
Muthuvan	36	56.25	28	43.75
Irular	41	66.13	21	33.87
Scheduled Tribe (combined)	425	71.31**	171	28.69**

** Significant at 1 per cent level of significance

Source: Primary data

A significantly higher proportion of scheduled tribe households has incurred the out-of- pocket health expenditure during the reference period of one month leading up to the survey (Chi square 108.248; $P<0.01$). The proportion is highest among the Uraly Kuruman community and they have recorded highest prevalence of morbidity as well. The prevalence is comparatively small among the backward tribal

communities like Muthuvan and Adiyan. The descriptive statistics of out-of-pocket health expenditure are summarised in the Table 7.2.

Table 7.2: Descriptive Statistics of Out-of-pocket Health Expenditure

Sub caste	Mean (in Rupees)	Median (in Rupees)	Standard Deviation	Skewness	95 per cent Confidence Interval for Mean	
					Lower Bound	Upper Bound
Paniyan	584.57	400	686.09	1.61	488.08	681.06
Adiyan	318.85	175	380.69	1.24	165.08	472.61
Kuruman	839.44	500	942.39	1.18	582.22	1096.67
Kurichiyan	863.53	325	1181.93	1.54	597.04	1130.01
Uraly Kuruman	588.00	450	517.26	1.09	374.49	801.51
Mala Arayan	1089.67	800	1232.06	1.34	831.62	1347.72
Muthuvan	357.50	100	497.19	1.57	233.31	481.69
Irular	502.66	300	651.71	1.61	337.16	668.17
Scheduled Tribe (combined)	676.09	350	885.73	1.94	604.84	747.34

Source: Primary data

The median health expenditure, including all the components, of tribal household is ₹ 350. The highest mean and median out-of-pocket health expenditure is incurred by the Mala Arayan tribal community. Out-of-pocket health expenditure is high among the forward communities like Mala Arayan, Kurichiyan and Kuruman. The out-of-pocket health expenditure is lowest among the Muthuvan tribal community and they spends only one eighth of the amount that Mala Arayan community spends for health care. It may be noted that Muthuvan community also have reported lowest prevalence of morbidity during the reference period (Table 6.11) and faces severe constraints in terms of accessibility of health care. The median out-of-pocket health expenditure of Uraly Kuruman community is relatively high mainly due to the high prevalence of morbidity among them. There are obvious

differences between the tribal communities with respect to the mean out-of-pocket expenditure and the confidence interval for the mean is also large. The variations across tribal communities are apparent from the box plot of out-of-pocket health expenditure.

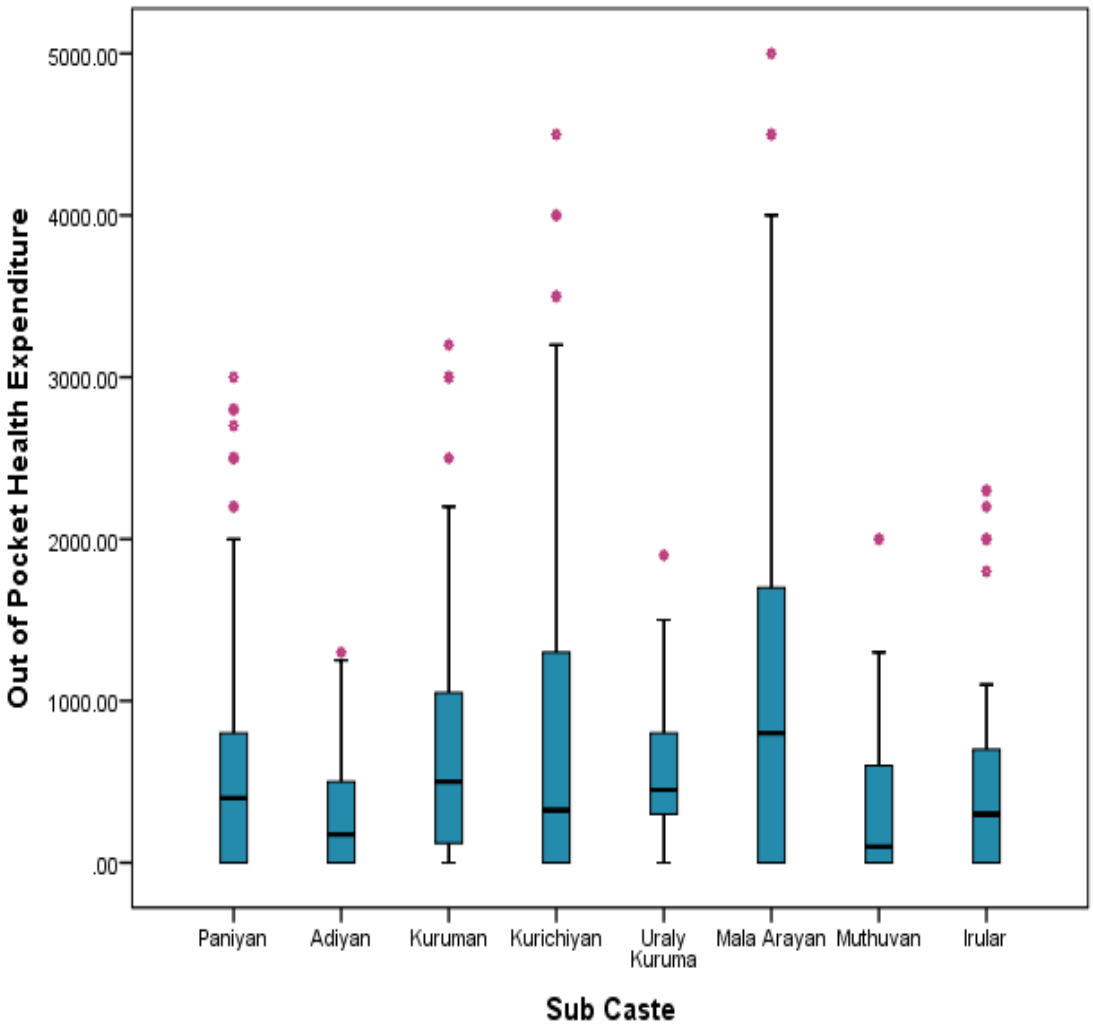

Figure 7.1: Box Plot of Out-of-pocket Health expenditure

As obvious from the figure, the median out-of-pocket health expenditure, indicated with the thick line in the rectangle, is highest among the Mala Arayan community and is lowest among the Muthuvan community. Since the top whisker of the box plot indicates the highest out-of-pocket health expenditure excluding the outliers, the points marked above it shows the presence of outlier households that are spending significantly higher amount on health care compared to other households

within the community (analysis of the outlier households is to be explored later in this chapter). Since there exists large differences between mean health expenditure and the distribution is positively skewed with the presence of outliers, the study used Kolmogorov- Smirnov and Shapiro-Wilk test to verify the presence of normality. The null hypothesis is H_0: the distribution is normal. The test results are summarised in the table 7.3.

Table 7.3: Normality Tests of Out-of-pocket Health Expenditure

Test of Normality	Statistic	Degree of Freedom	P Value
Kolmogorov-Smirnov Test	0.223	596	0.000**
Shapiro-Wilk Test	0.759	596	0.000**

** Significant at 1 per cent level of significance

Both the test statistics are significant refuting the hypothesis that out-of-pocket health expenditure incurred by the tribal households is normally distributed. Thus, the study uses the nonparametric method of Kruskal Wallis Test to check whether median out-of-pocket health expenditures of tribal communities are equal.

Table 7.4: Kruskal Wallis Test on Out-of-pocket Health Expenditure

Sub Caste	Median	Mean Rank
Paniyan	400	297.06
Adiyan	175	234.87
Kuruman	500	332.60
Kurichiyan	325	307.06
Uraly Kuruman	450	325.64
Mala Arayan	800	350.16
Muthuvan	100	233.91
Irular	300	270.02
Kruskal Wallis Test Statistic (Chi-Square)		25.927
Degree of freedom		7
P value		.001**

** Significant at 1 per cent level of significance
Source: Primary data

The results of Kruskal Wallis test are significant refuting the null hypothesis that median out- of-pocket health expenditures are equal. Thus, we can confirm that there is a statistically significant difference in the out-of-pocket health expenditure between different tribal communities. But, the Kruskal Wallis test only indicates the existence of a difference between median out-of-pocket health expenditure. It does not provide insights into among which communities health expenditures differ from each other. To overcome this limitation, the study follows up with Mann Whitney *U* test of multiple comparisons between pairs of tribal communities. The results are summarised in the table 7.5.

Table 7.5: Man-Whitney U Test for Multiple Comparisons

Sub Caste		**Man-Whitney U**	**Z**	**P value**
Paniyan	Adiyan	1990.50	-1.86500	.062
	Kuruman	4642.00	-1.44300	.149
	Kurichiyan	7447.50	-0.40000	.689
	Uraly Kuruman	2208.50	0.84600	.398
	Mala Arayan	7166.00	-2.63000	0.009**
	Muthuvan	4888.50	-2.73600	0.006**
	Irular	5511.00	-1.17100	.241
Adiyan	Kuruman	467.00	-2.44200	0.015**
	Kurichiyan	765.00	-1.66900	.095
	Uraly Kuruman	219.00	-2.96600	.043*
	Mala Arayan	1080.50	-2.96600	0.003**
	Muthuvan	821.00	-0.10200	.919
	Irular	711.50	-0.18500	.375
	Kurichiyan	1937.50	-0.78600	.432
	Uraly Kuruman	657.50	0.98200	.853

Sub Caste		Man-Whitney U	Z	P value
Kuruman	Mala Arayan	2251.50	-0.74000	.457
	Muthuvan	1172.00	-3.06000	.002**
	Irular	1308.00	-2.04800	0.041*
Kurichiyan	Uraly Kuruman	912.50	-0.48400	.628
	Mala Arayan	3079.00	-1.38700	.166
	Muthuvan	1892.00	-2.53000	0.011*
	Irular	2147.00	-1.15300	.249
Uraly Kuruman	Mala Arayan	967.50	-1.07700	.281
	Muthuvan	513.50	-2.67500	0.007**
	Irular	630.50	-1.37200	.170
Mala Arayan	Muthuvan	1876.50	-3.76300	0.00**
	Irular	2050.50	-2.81600	0.005**
Muthuvan	Irular	1727.00	-1.29300	.196

** Significant at 1 per cent level of significance
* Significant at 5 per cent level of significance

From the table of multiple comparisons it can be inferred that the out-of-pocket health expenditure of the largest tribal community Paniyan, is significantly less than that of Mala Arayan and is higher than the health expenditure of Muthuvan community. Health expenditure of Adiyan community is smaller when compared to Kurumann, Uraly Kuruman and Mala Arayan. The Kuruman community incurred out-of-pocket health expenditures which is significantly higher than communities of Adiyan, Muthuvan and Irular. The tribal community of Kurichiyan and Muthuvan are different with respect to out-of-pocket health expenditures. The Uraly Kuruman community incurs higher out-of-pocket health expenditures than Adiyan and Muthuvan. The Mala Arayan community who have reported highest median expenditures differ significantly from all the four backward tribal communities

namely Paniyan, Adiyan, Muthuvan and Irular. The Muthuvan community has incurred the smallest out-of-pocket expenditure and it is significantly lower compared to all other tribal communities except Adiyan, who has reported second smallest out-of-pocket health expenditures.

7.2.1 Components of Out-of-pocket Health Expenditure

An attempt is being made in this section to compare different components of out-of-pocket health expenditure. The total out-of-pocket health expenditure incurred by the tribal households are categorised into direct medical expenditure, expenditure on transportation, expenditure on accommodation and miscellaneous expenses to draw further insights in to the pattern of financing of health care among them. The direct medical expenditure comprises of expenditure on medicines, diagnostic tests, consultation fee and user charges, if any. The share of each component of out-of-pocket health expenditure is summarised in table 7.6

Table 7.6: Components of Out-of-pocket Health Expenditure (in percentages)

Sub Caste	Direct Medical Expenditure	Expenditure on Travel	Accommodation expenditure	Miscellaneous Expenses
Paniyan	54.92	32.27	0.09	12.72
Adiyan	36.79	53.56	0.00	9.65
Kuruman	65.10	23.20	0.66	11.05
Kurichiyan	62.01	25.65	1.50	10.84
Uraly Kuruman	48.98	30.61	0.00	20.41
Mala Arayan	61.84	24.67	0.96	12.54
Muthuvan	43.62	45.79	0.00	10.58
Irular	63.65	29.64	1.00	5.71
Scheduled Tribe (combined)	59.37	29.61	0.67	10.34

Source: Primary data

The direct cost accounts for about 60 per cent of the total out-of-pocket health expenditure of tribal households. The cost incurred on transportation represents one third of the total expenditure on health care. The cost on accommodation, which is mostly needed when the household faces an event of hospitalisation, is relatively meagre. The share of direct medical expenditure is high among the forward tribal communities such as Mala Arayan, Kurumann and Kurichiyan mostly due to the utilisation of private health care facilities for out-patient treatment. Thus, it can be asserted that almost entire out-of-pocket health incurred by the tribal households was derived from direct expenses, expenses on travel and miscellaneous items. Table 7.7 summarises the direct medical expenditure component of out-of-pocket health expenditure.

Table 7.7: Descriptive Statistics of Direct Medical Expenditure

Sub Caste	Mean	Median	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
					Lower Bound	Upper Bound
Paniyan	322.18	0	490.69	34.96	253.24	391.13
Adiyan	117.31	0	211.16	41.41	32.02	202.60
Kurumann	551.30	350	685.49	93.28	364.19	738.40
Kurichiyan	531.54	200	792.68	89.75	352.82	710.26
Uraly Kuruman	288.00	200	341.96	68.39	146.85	429.15
Mala Arayan	717.78	450	1076.75	113.50	492.26	943.30
Muthuvan	153.91	0	261.15	32.64	88.67	219.14
Irular	319.84	0	558.93	70.98	177.90	461.78
Scheduled Tribe (combined)	401.39	100	674.22	27.62	347.15	455.63

Source: Primary data

The average direct health expenditure incurred is highest among the Mala Arayan community, reflecting similar pattern of total out-of-pocket health expenditure. It may be noted that the median direct medical expenditure is zero for the communities of Paniyan, Adiyan, Muthuvan and Irular as major proportions of the community do not have incurred any expenditure on direct medical expenditure. As is evident from the table there are variations in the median direct medical expenditure between tribal communities. The study used Kruskall Wallis test for statistical confirmation (Table 7.8). The results of the test was significant ($P<0.01$) and it can be asserted that there are significant differences in direct medical expenditure among the tribal communities.

Table 7.8: Kruskal Wallis Test on Direct Medical Expenditure

Sub Caste	Median	Mean Rank
Paniyan	0	287.81
Adiyan	0	221.52
Kuruman	350	344.07
Kurichiyan	200	318.03
Uraly Kuruman	200	299.20
Mala Arayan	450	364.52
Muthuvan	0	236.73
Irular	0	268.12
Kruskal Wallis Test Statistic (Chi-Square)		38.853
Degree of freedom		7
P value		.000**

** Significant at 1 per cent level of significance

Source: Primary data

The expenses incurred for travel to seek medical treatment are a vital determinant in the utilisation of health care facilities by the tribal communities. This study has earlier shown that there are significant differences in the geographical accessibility among different communities (Section 6.5). Table 7.9 brings out the descriptive statistics of transportation expenses incurred by the tribal communities.

Table 7.9: Descriptive Statistics of Transportation Expenditure

Sub Caste	Mean	Median	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
					Lower Bound	Upper Bound
Paniyan	189.29	100	197.06	14.04	161.60	216.98
Adiyan	170.77	125	207.23	40.64	87.07	254.47
Kuruman	196.48	180	204.38	27.81	140.70	252.27
Kurichiyan	219.81	100	303.72	34.39	151.33	288.29
Uraly Kuruman	180.00	150	162.02	32.40	113.12	246.88
Mala Arayan	286.33	200	323.92	34.14	218.49	354.18
Muthuvan	161.56	45	195.42	24.43	112.75	210.38
Irular		100	185.34	23.54	101.88	196.02
Scheduled Tribe (combined)		100	237.23	9.72	181.13	219.30

Source: Primary data

There is a significant presence of travel expenditure among the tribal communities as revealed by the mean amount of expenditure and positive median value. The median expenditure is highest among Mala Arayan community, indicative of higher utilisation of health care facilities and better economic status. The median travel expenses are lowest among the Muthuvan community. More than 70 per cent of the community uses bus service as a mode of conveyance to health

care institutions, which is the highest among the tribal communities (Table 6.30). The reliance on the relatively low-cost mode of conveyance has reduced the travel cost among the Muthuvan community even though most of them live in geographically challenged areas. The results of the Kruskall Wallis test on the travel expenditure are summarised in the table 7.10.

Table 7.10: Kruskal Wallis Test on Transportation Expenditure

Sub Caste	Median	Mean Rank
Paniyan	100	305.74
Adiyan	125	277.92
Kuruman	180	312.35
Kurichiyan	100	288.81
Uraly Kuruman	150	308.14
Mala Arayan	200	327.97
Muthuvan	45	270.39
Irular	100	266.61
Kruskal Wallis Test Statistic (Chi-Square)		8.207
Degree of freedom		7
P value		.315

Source: Primary data

It is interesting to note that the test statistic of Kruskall Wallis test is not significant, implying that there is no statistical evidence to reject the null hypothesis that travel expenses of tribal communities are equal. Thus, it can be inferred that there is no statistical difference between the median travel expenditure among the tribal communities. The remaining component constituting the out-of-pocket health expenditure is the miscellaneous expenses which are incurred for the purchase of food and the expenditure of accompanying persons while seeking to utilise the health care facilities. Table 7.11 summarises miscellaneous health expenses incurred by the tribal households.

Table 7.11: Descriptive Statistics of Miscellaneous Health Expenditure

Sub caste	Mean	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
				Lower Bound	Upper Bound
Paniyan	74.62	150.14	10.70	53.52	95.72
Adiyan	30.77	47.07	9.23	11.76	49.78
Kuruman	93.52	161.08	21.92	49.55	137.49
Kurichiyan	92.95	267.83	30.33	32.56	153.34
Uraly Kuruman	120.00	156.79	31.36	55.28	184.72
Mala Arayan	145.56	257.54	27.15	91.61	199.50
Muthuvan	37.34	110.18	13.77	9.82	64.87
Irular	28.71	68.03	8.64	11.43	45.99
Scheduled Tribe (combined)	80.65	182.01	7.46	66.01	95.30

Source: Primary data

The mean expense towards miscellaneous items is only just over □ 80. Like the other components of out-of-pocket health expenditure, the Mala Arayan community reported largest expenditure. It is the smallest for the Irular community. Since majority of the tribal households did not incur any expenses towards miscellaneous items of health expenditure, the median amount is zero for all the tribal communities except the Uraly Kuruman community. As a result, Kruskal Wallis test statistic is significant and there is significant difference between miscellaneous components of out-of-pocket health expenditure.

Table 7.12: Kruskal Wallis Test on Miscellaneous Health Expenditure

Sub Caste	Median	Mean Rank
Paniyan	0	305.84
Adiyan	0	276.46
Kuruman	0	331.65
Kurichiyan	0	285.46
Uraly Kuruman	100	393.36
Mala Arayan	0	325.67
Muthuvan	0	240.74
Irular	0	253.90
Kruskal Wallis Test Statistic (Chi-Square)		34.165
Degree of freedom		7
P value		.000

Source: Primary data

Thus, the major component of out-of-pocket health expenditure is the direct medical expenditure followed by the expenses incurred toward travel. Together, these two items represent more than 90 per cent of the total health expenditure of the tribal households. Since the direct medical expenditure comprises of various components such as, the purchase of medicines, diagnostic tests, consultation fee etc, an attempt is made to identify the most significant component of out-of-pocket health expenditure among the 425 tribal households that have incurred out-of-pocket health expenditure during the reference period. It is summarised in the table 7.13.

Table 7.13: Chief Constituent of Out-of-pocket Health Expenditure

Sub Caste	Purchase of Medicines	Diagnostic Tests	Travel	Consultation Fee	Others	Total
Paniyan	73 (49.66)	16 (10.88)	55 (37.41)	3 (2.04)	0 (0.00)	147 (100)
Adiyan	2 (13.33)	4 (26.67)	9 (60.00)	0 (0.00)	0 (0.00)	15 (100)
Kuruman	26 (60.47)	7 (16.28)	9 (20.93)	0 (0.00)	1 (2.33)	43 (100)
Kurichiyan	33 (58.93)	7 (12.50)	16 (28.57)	0 (0.00)	0 (0.00)	56 (100)
Uraly Kuruman	4 (18.88)	10 (45.45)	8 (36.86)	0 (0.00)	0 (0.00)	10 (100)
Mala Arayan	39 (60.00)	14 (21.54)	11 (16.92)	1 (1.54)	0 (0.00)	65 (100)
Muthuvan	15 (41.67)	3 (8.33)	18 (50.00)	0 (0.00)	0 (0.00)	36 (100)
Irular	14 (34.15)	8 (19.51)	18 (43.90)	1 (2.44)	0 (0.00)	41 (100)
Scheduled Tribe (combined)	206 (48.47**)	69 (16.24**)	144 (33.88**)	5 (1.88**)	1 (0.24**)	425 (100)

** Significant at 1 per cent level of significance
Note: Figures in the parentheses are percentages.
Source: Primary data

It can be inferred that the most significant item in the out-of-pocket health expenditure of the tribal communities is the expenses incurred towards the purchase of medicines followed by the travel expenses. The statistical significance of results were verified using Chi square test and the results were significant (Chi square 374.518; $P<0.01$). Significantly high proportion of health expenditure among the

Adiyan community is accounted by expenses towards travel. It has already been confirmed that the community faces serious constraints in terms of accessibility to health care (Section 6.5). 84.62 per cent of Adiyan households rely on rented vehicle as the mode of conveyance to health care institutions (Table 6.30). Large prevalence of the ailments of mouth, teeth and gum among the Uraly Kuruman community is the reason for high share of expenses towards diagnostic test among them. The expenses toward the purchase of medicines are relatively high among the Mala Arayan, Kuruman and Kurichiyan tribal communities who are socioeconomically better-off than others. It appears that the in-patient treatment when hospitalised did not absorb the largest proportion of out-of- pocket health expenditure; since more is spent on medicines and transportation. If this were not the case, then out-of-pocket health expenditure would have concentrated on fewer numbers of households receiving hospitalisation.

The finding that the most important contributors of out-of-pocket health payment of tribal households are purchase of medicine and travel cost, is consistent with some of the other findings. Studies have shown that the share of out-of-pocket health expenditure that goes to medicines is generally large among poor and rural households (Wagstaff et al., 2001; Doorslaer et al., 2007) and has remained as a consistent feature in India (Ghosh, 2011). The reasons often being attributed is the greater prevalence of self medication and also the necessity to purchase medicine prescribed as a part of out-patient treatment. But it was observed that the extent of self medication is less among the tribal communities (Section 6.6.2) as only five per cent of the community resorts to it by purchasing medicines from shops. The finding that there is a high proportion of out-of-pocket spending on medications is interesting, given the fact that majority of the tribal households utilised public providers for both in-patient and out-patient treatment. It points towards the unavailability of essential medicines in the primary health centres and government hospitals. Thus, expenditure on medicines, whether it is prescribed or not, accounts for a large fraction of out-of-pocket health expenditure among the tribal communities. Another major component of health expenditure is the expense

incurred towards travel, which is expected since the geographical accessibility to health care institution is a major constraint among the tribal communities.

7.3 Measures of Financial Catastrophe: The Minimum Standard Approach

After analysing the prevalence of out-of-pocket health expenditure among the tribal communities, an attempt is being made in this section to trace out the financial protection enjoyed by the households with a view to examine the impoverishing effect of health care payments. The measures of financial catastrophe in the Minimum Standard Approach are utilised (Section 3.3). The analysis of the financial protection envisaged in the minimum standard approach essentially compares the out-of-pocket health expenditure to a certain threshold level of income. The approach requires that out-of-pocket health expenditure should not exceed the pre-specified threshold level of income. The threshold is defined in terms of proportionality of income. The premise is that household should not incur more than specified proportion of income on health care. If the ratio of out-of-pocket health expenditure exceeds the specified threshold, health expenditure is considered as catastrophic. Thus, the minimum standard approach essentially focuses on the out-of-pocket health care payments that are catastrophic in the sense that it severely disrupts the living standards of the households.

One important measure of financial catastrophe is the catastrophic payment headcount (H_{cat}) which is the summary measure of the extent to which the households are exposed to the catastrophic health expenditure. The headcount is the proportion of households that have exceeded the threshold level of income. The study has computed the catastrophic payment head count at four different thresholds, namely, five per cent, ten per cent, fifteen per cent and twenty per cent. It is summarised in the table 7.14.

Table 7.14: Catastrophic Head Count

Sub Caste	5 per cent Threshold		10 per cent Threshold		15 per cent Threshold		20 per cent Threshold	
	No.	Head Count	No.	Head Count	No.	Head Count	No.	Head Count
Paniyan	107	54.31	81	41.12	40	20.3	25	12.69
Adiyan	9	34.62	7	26.92	3	11.54	1	3.85
Kuruman	32	59.26	25	46.30	12	22.22	9	16.67
Kurichiyan	36	46.15	29	37.18	22	28.21	18	23.08
Uraly Kuruman	21	84.00	14	56.00	10	40.00	6	24.00
Mala Arayan	36	40.00	26	28.89	19	21.11	12	13.33
Muthuvan	24	37.50	18	28.13	10	15.63	7	10.94
Irular	28	45.16	22	35.48	10	16.13	8	12.90
Scheduled Tribe (combined)	293	49.16	222	37.25	126	21.14	86	14.43

Source: Primary data

The measure of headcount reveals that the catastrophic impact of health care payments is pervasive among the tribal communities. It is noteworthy that even though forward communities like Mala Arayan and Kurichiyan incur high amounts of out-of-pocket health expenditures, the burden of payment is largely felt by the vulnerable communities like Uraly Kuruman. At any given threshold, the incidence of financial catastrophe measured by the catastrophic headcount is the greatest among one of the poorest households among the tribal communities in the state, namely Uraly Kuruman. The catastrophic payment is most prevalent among the community at all threshold levels. In fact, at the lower threshold value of five per cent, 84 per cent of the Uraly Kuruman households are spending in excess of the threshold. The high prevalence of morbidity among the Uraly Kuruman has resulted in the impoverishment of the community through out-of-pocket payments for health

care. It can be noted that 37.25 per cent of tribal households spend more than ten per cent of their monthly income of health care, thus facing the burden of catastrophic payment. About half of the households incur more than five per cent of their income on health care. Thus, the analysis of the financial protection from the burden of payments for health care available to the tribal households, is meagre, as more than one third of the household makes catastrophic health payments at ten per cent threshold. The incidence of catastrophic headcount necessarily falls as the threshold level is raised from five per cent to twenty per cent. Yet, the changing of threshold level does not significantly affect Uraly Kuruman community that have the highest incidence of catastrophic health care payments. But there is noteworthy re-ranking of other communities at higher levels of threshold. There appears to be a negative relationship between the incidence of catastrophic payments and income as communities such as Mala Arayan are relatively less affected from financial catastrophe.

The findings on the prevalence of financial catastrophe are comparable with some of the earlier studies on health care financing of Kerala. George (2005) using the 55^{th} round data of NSSO estimated that catastrophic payment headcount for rural Kerala is 26.64 per cent while it is 20.90 per cent for urban Kerala in 1999-2000 at ten per cent threshold. Ghosh (2011) utilising 61^{st} round of NSSO data found that the headcount is 32.42 per cent at the same threshold level. Thus, the incidence of financial catastrophe owing to health care payments in relatively higher among the tribal population as compared to the general pattern in Kerala.

The above measures of headcount bring out the incidence of catastrophic payments. But it does not indicate the intensity of out-of-pocket health care payments on the tribal households. Thus, to gain further insights into the out-of-pocket health expenditure among the tribal communities, the catastrophic payment gap (G_{cat}) has been calculated that captures the height above which the households which experience financial catastrophe make the payment. Thus, it captures the actual intensity of health care payments on the households. The calculated catastrophic payment gap of tribal communities is summarised in the table 7.15.

Table 7.15: Catastrophic Payment Gap

Sub Caste	Catastrophic Threshold			
	5 per cent	10 per cent	15 per cent	20 per cent
Paniyan	6.56	4.32	2.91	2.13
Adiyan	3.10	1.61	0.58	0.19
Kuruman	5.88	3.34	2.08	1.20
Kurichiyan	7.59	5.58	4.17	2.99
Uraly Kuruman	9.14	6.09	3.81	2.57
Mala Arayan	5.21	3.56	2.43	1.58
Muthuvan	3.99	2.45	1.30	0.69
Irular	4.77	2.82	1.67	1.01
Scheduled Tribe (combined)	5.89	3.88	2.55	1.71

Source: Primary data

The calculated catastrophic payment gap reveals the intensity of financial catastrophe of health care payment among the tribal households. The payment gap at the commonly used threshold of ten per cent is 3.88 implying that, on an average, the tribal households spend 3.88 per cent beyond the catastrophic threshold. Like the headcount, Uraly Kuruman community has the highest payment gap at threshold of ten per cent. The catastrophic payment gap is dominated by the incidence and displays more or less the same general pattern among the tribal communities as the headcount statistics. However, with the increase in the threshold the burden invariably falls on the richer households of Kurichiyan, Mala Arayan and Kuruman, reflecting the higher amount of payments by these communities. Defining the threshold at twenty per cent, the Kurichiyan community has the highest payment gap or overshot, although it was only second highest incidence in terms of headcount, portraying very high intensity of catastrophic health care payment. It can also be inferred that the variability in intensity is comparatively less than in the prevalence indicated by the headcount statistic. This finding is a manifestation that there is

always an upper maximum limit of the proportion of health expenditure in total income of the household.

At the same time, all the tribal households did not experience the financial catastrophe from health care payments. Therefore, the intensity of health care payments can be better represented by another measure of mean positive gap or overshoot (MPG_{cat}). The mean positive gap considers only the health care payments in excess of the threshold averaged over the households that have experienced the burden of catastrophe at the given threshold. Thus, mean positive gap is calculated using only the households that have actually experienced catastrophe as the denominator. Table 7.16 bring out results the mean positive gap of health care payments.

Table 7.16: Mean Positive Gap

Sub Caste	Catastrophic Threshold			
	5 per cent	10 per cent	15 per cent	20 per cent
Paniyan	12.92	12.53	15.50	19.06
Adiyan	10.08	5.97	7.5	5
Kuruman	10.23	9.50	9.35	8.13
Kurichiyan	17.43	16.73	17.15	14.59
Uraly Kuruman	12.69	12.70	10.57	12.88
Mala Arayan	13.39	14.55	12.18	14.19
Muthuvan	11.09	8.69	9.25	11
Irular	11.38	8.73	11.51	10.44
Scheduled Tribe (combined)	12.84	12.04	13.17	14.38

Source: Primary data

The tribal households that have in fact experienced financial catastrophe at ten per cent threshold spend an average 12.04 per cent beyond the threshold. Thus these households spend 22.04 per cent of their income on out-of-pocket health expenditure, that is, threshold and mean positive gap. It is intriguing to note that households that have faced catastrophic health expenditure at the highest threshold

of twenty per cent spend 14.38 per cent in excess of threshold. At this threshold level, the Paniyan community is the worst hit raising the concern over equity of health care payments.

The divergence between the tribal communities with respect to the mean positive gap indicates the presence of outlier households which are spending a disproportionate share of their income towards health expenditure. Thus, an attempt is made to trace out the outlier households with respect to out-of-pocket expenditure on health care among the tribal communities in the next section. Since the measures of headcount do not differentiate between the rich and poor households, to supplement the analysis and to examine the extent of progressivity of health care payments, the concentration indices of headcount is calculated and is summarised in table 7.17.

Table 7.17: Concentration Index of Catastrophic Payment

Sub Caste	5 per cent Threshold		10 per cent Threshold		15 per cent Threshold		20 per cent Threshold	
	Concen-tration Index	Standard Error	Concen-tration Index	Standard Error	Concen-tration Index	Standard Error	Concen-tration Index	Standard Error
Paniyan	-0.547	0.068	-0.114	0.062	-0.711	0.064	0.0009	0.0173
Adiyan	-0.236	0.077	-0.251	0.087	0	0	0	0
Kuruman	-0.013	0.059	-0.035	0.068	0.059	0.135	0.0796	0.1757
Kurichiyan	-0.145	0.049	-0.304	0.150	0.023	0.047	0.0703	0.0219
Uraly Kuruman	-0.082	0.032	-0.050	0.056	-0.211	0.065	-0.1667	0.0248
Mala Arayan	-0.104	0.114	-0.105	0.073	-0.123	0.056	-0.0677	0.0397
Muthuvan	-0.107	0.032	-0.134	0.023	-0.261	0.116	-0.1647	0.1643
Irular	0.001	0.049	-0.033	0.069	-0.581	0.036	0.0346	0.0276
Scheduled Tribe (combined)	-0.104	0.051	-0.155	0.064	-0.121	0.070	-0.1440	0.0697

Source: Primary data

The computed indices for the tribal communities as a whole is negative at all the predefined threshold level. The negative values of the concentration indices are

indicative of the disproportionate concentration of financial catastrophe at poorer households. That is, a disproportionate number of tribal households at the lower income show a higher threshold level of health expenditure. It implies that, poor households constitute the majority of those who exceeded the threshold level of expenditure. It can also be observed that there is near stagnancy in the value of concentration indices at different threshold. It signifies that even with the increase in the threshold level of expenditure, the burden on the poor remains the same and does not decline. At the same time, the value of concentration indices at the fifteen per cent and twenty per cent threshold becomes positive for the Kuruman and Kurichiyan community, Paniya and Irular at twenty per cent threshold implying that the burden of catastrophic health payments is being felt by the richer tribal household too.

7.3.1 The Outlier Analysis

The above analysis of measures of financial catastrophe indicates the presence of outlier households with high out-of-pocket health expenditure compared to other households in the same community. Thus, the tool of statistical outlier is being utilised to identify the outlier households among each tribal communities. The households whose out-of-pocket health expenditure is high when compared to other households in the same community, during the reference period of one month prior to the survey, is recognized as outlier households.

Defining Q_{1C} and Q_{3C} as the first the third quartiles of the distribution of out-of-pocket health expenditure, the outlier households are those which have incurred health expenditure greater that $Q_{3C}+K\ (Q_{3C}-Q_{1C})$, where K is constant. The outlier households are estimated for three different values of K. Apart from the commonly used value of K=1.5, two other lower values of 0.5 and 1 are also being used. This is to provide greater flexibility in the analysis and to calculate the different cut off with respect to the out-of-pocket health expenditures of the tribal communities. Table 7.18 presents the prevalence of outlier households and cut off health expenditure at different values of K.

Table 7.18: Extent of Outlier Households

Sub Caste	K=0.5		K=1		K=1.5	
	Health expenditure cut-off (in Rs)	Outlier Household (in percentage)	Health expenditure cut-off (in Rs)	Outlier Household (in percentage)	Health expenditure cut-off (in Rs)	Outlier Household (in percentage)
Paniyan	400	44.16	1600	6.59	2000	4.06
Adiyan	750	7.41	1000	7.41	1750	0.00
Kuruman	1513.75	18.52	1977.50	14.81	2441.25	9.26
Kurichiyan	1912	17.95	2550	12.82	3187.50	7.69
Uraly Kuruman	1050	24.00	1300	12.00	1550	4.00
Mala Arayan	2475	16.67	3300	8.89	4125	3.33
Muthuvan	900	17.19	1200	4.69	1500	3.13
Irular	1012	14.52	1350	11.29	1687	11.29
Scheduled Tribe (combined)	1350	15.10	1800	10.74	2250	6.04

Source: Primary data

From the table, it is obvious that the cut off of health expenditure is higher for the higher values of K. Further the cut off expenditure is higher for the forward tribal communities like Mala Arayan, Kurichiyan and Kuruman compared to others. Although the Paniyan tribal community spends relatively less on health care, the distributions of their out-of-pocket expenditure shows that high percentage of the community incurs large expenditure at K=0.5. At the highest value of K, the proportion of outlier households is largest among the Irular tribal community.

7.4 Determinants of Catastrophic Health Expenditure

Having explored the incidence and intensity of catastrophic health expenditure among the tribal communities, an attempt is being made in this section to analyse the major determinants of catastrophic health expenditure. From the policy perspective, it is important to understand the key determinants of catastrophic health expenditures to trace out the factors that endanger the financial protection

received by the tribal household. To identify the determinants, the tool of logistic regression is used. The dependent variable is constructed as a binary, with 1, if the household incurred catastrophic health expenditure and 0, otherwise. The threshold level of ten per cent is used for the construction of the dependent variable. The explanatory variables of the model are explained below.

- Landholdings

Landholdings are key productive assets for tribal households and used as an indicator of economic status of the household. Being used as the second best proxy to trace out the economic status, the study assumes a negative relationship between the probability of catastrophic health expenditure and land holdings. Landholding is measured in cents as a continuous variable in the model.

- Size of the Household

The size of the household can be an important driver of catastrophic health expenditure of the tribal household. Larger household implies larger demand for health care and the chances of incurring catastrophic health expenditures may also be high. The study hypothesis increase in the probability of catastrophic health expenditure with the increase in the size of the tribal households. The size of the household is measured as a continuous variable.

- Mean Age of the Household

The average age of household members is likely to influence the probability of incurring catastrophic health expenditures. Households with higher mean age are more susceptible to face financial catastrophe. The mean age of the household is measured as a continuous variable.

- Number of Elderly Members in the Household

Elderly persons are more vulnerable to health risks and thus the households with elderly members are likely to spend more on health care. These households assume to have greater probability of confronting catastrophic health expenditures

because of their greater need for health care. The number of elderly member (60 years and above) is measured as a continuous variable.

- Literacy Status of the Head of the Household

The education status of the head of the household can influence health care utilisation and health care expenditure. Educated people understand the importance of seeking health care and are likely to take care of their health. It can affect the health expenditure in both the directions. Educated households place high value on their health, facing less risk of ill health. On the contrary, higher utilisation due to greater health consciousness can increase catastrophic health expenditure as well. In the regression model, literacy status of the head is treated as a dichotomous variable with 1, if the head is literate, 0 otherwise.

- Gender of the Head of the Household

The gender dimension is incorporated in the model to verify whether male or female headed households are likely to face the greater risk of catastrophic health expenditure. Male headed households are coded as 1 and female headed households are coded 0 in the model.

- Habitat of the Household

Health expenditures are assumed to be different across habitats of the household. Since tribal households live in colonies as well as scattered, the dichotomous variable is incorporated in the model as 1, if the households live in scattered and 0 otherwise.

- Presence of Chronic Ailments

Households with members suffering from chronic diseases which require longer duration of treatment are likely to face greater probability of catastrophic health expenditure. The variable is coded as 1, if any member is chronically ill, 0 otherwise.

- Presence of Acute Ailments

Similar to the chronic ailments, households with members of acute ailments faces increased risk of catastrophic health expenditures. The variable is coded as 1, if any member faces chronic ailments, 0 otherwise.

- Presence of Disabled Members

The households with members suffering from mental or physical disability are assumed to be at a greater risk of incurring catastrophic health expenditure. The variable is coded as 1, if any member is physically or mentally disadvantaged, 0 otherwise.

- Number of Private Out-patient Visit

More visits to the out-patient treatment facilities reflect greater utilisation of health care facilities. At the same time, more number of visits to the private health care facilities is likely to have an effect on the health care expenditure. Thus, it can be assumed that households using more private providers are likely to face higher probability of incurring catastrophic health expenditure. The number of visits to the private providers is measured as a continuous variable.

- Health Insurance Coverage

The enrolment in public or private health insurance is likely to reduce the likelihood of the occurrence of catastrophic health expenditure. Thus, a negative relationship between the enrolment in the health insurance and catastrophic health expenditure can be assumed. The variable is coded as 1, if any household is enrolled in public or private health insurance, 0 otherwise.

In the model, seven out of the twelve explanatory variables are categorical in nature. Thus, the nonparametric test of Pearson's Chi square is applied initially to check relationship between the dependent and explanatory variables. The Null hypothesis tested is H_0: variables are independent. The results of the tests are summarised in the table 7.19.

Table 7.19: Chi Square Test of Catastrophic Health Expenditure

Variable	Pearson Chi Square Statistic	Likelihood Ratio	P value
Gender of the head of the household	0.50	0.50	0.823
Habitat of the household	4.892	5.013	0.027*
Presence of chronic ailments	17.260	17.112	0.000**
Presence of acute ailments	21.692	20.778	0.000**
Presence of disabled members	8.674	9.755	0.013*
Health insurance coverage	5.642	5.606	0.018*
Literacy status of the head of the household	0.156	0.156	0.693

** Significant at 1 per cent level of significance

* Significant at 5 per cent level of significance

The results of the Chi square test of independence shows that there is no statistically significant relationship between catastrophic health expenditure and gender and literacy status of the head of the household. Thus, the two variables are omitted from the model of logistic regression. Table 7.20 summarises the results of the modified logistic regression model.

Table 7.20: Determinants of Catastrophic Health Expenditure - Logistic Regression Model

Variables	Coefficient	Standard Error	Z-Statistic	P Value
Constant	-2.356134	0.687835	-3.425437	0.0006**
Landholdings	-0.000889	0.001308	-0.679278	0.4970
Size of the household	0.021146	0.072120	0.293211	0.7694
Mean age	0.023562	0.013265	1.776323	0.0757
Number of elderly members	-0.348581	0.198732	-1.754020	0.0794
Habitat	0.871691	0.263467	3.308541	0.0009**

Variables	Coefficient	Standard Error	Z-Statistic	P Value
Presence of chronic ailments	0.543516	0.212445	2.558382	0.0105*
Presence of acute ailments	0.735199	0.304199	2.416838	0.0157*
Presence of disabled members	0.481935	0.365297	1.319297	0.1871
Number of private out-patient visit	0.747798	0.111266	6.720816	0.0000**
Health insurance coverage	-0.443828	0.198421	-2.236799	0.0253*

Number of observations	596
McFadden R-squared	0.145251
LR statistic	114.0104
Prob(LR statistic)	0.000000
Mean dependent var	0.369128
S.E. of regression	0.440906
Sum squared residual	113.7230
Log likelihood	-335.4547
Deviance	670.9093
Restr. log likelihood	-392.4599
Hosmer-Lemeshow Statistic	11.1534 ,Prob. Chi-Sq(8): 0.1932

** Significant at 1 per cent level of significance

* Significant at 5 per cent level of significance

The value of likelihood ratio statistic (LR Statistic) is 114.0104 and P value is practically zero refuting the null hypothesis that all the coefficients are simultaneously zero. Thus, it can be said that all the ten variables included in the model of logistic regression are important determinants of catastrophic health expenditure. The model converges at the fourth iteration suggesting that

multicollenearity is weak or absent. The goodness of fit of the model is verified with Hosmer-Lemeshow test and the statistic is 11.1534 with probability of 0.1932.

From the calculated coefficients, it can be inferred that, though landholding reduce the likelihood of catastrophic health expenditure, the result is not significant. Similarly, the size of the household, average age, number of elderly members and the presence of physically disadvantaged member do not have significant influence on the probability of catastrophic health expenditure. The habitat of the household has a significant influence on the catastrophic health expenditure. This indicates that tribal households' living outside the colonies has a greater probability of incurring the catastrophic health expenditures. The presence of members suffering from chronic and acute ailments significantly increases the probability of catastrophic health expenditure. The influence of private out-patient visit on the dependent variable is highly significant and households utilising the private providers for out-patient treatment has significantly higher probability of incurring catastrophic health expenditure. The enrolment in some form of health insurance system significantly reduces the likelihood of catastrophic health expenditure. Thus, from the estimated model we can assert that the location of the household, presence of chronic or acute ailments, utilisation of private out-patient treatment and enrolment in health insurance are the significant determinants of catastrophic health expenditures.

7.5 Burden of Hospitalisation

The cost incurred towards hospitalisation can have severe consequences on the wellbeing of the poor and vulnerable households. Even though cost of in-patient treatment may not have significantly influenced the incidence of financial catastrophe, hefty amounts for the nonfatal health outcome of hospitalisation can result in indebtedness and impoverishment. As explained earlier, the details of hospitalisation were collected using the recall period of one year prior to the survey. There were a total of 269 hospitalisation events in the tribal households and 246 households faced at least one hospitalisation event, excluding hospitalisation associated with pregnancy. The ensuing analysis pertains only to the households that have faced the event of hospitalisation. Table 7.21 and mean chart in figure 7.2 brings out the costs incurred towards hospitalisation during the reference period.

Table 7.21: Descriptive Statistics of Hospitalisation Expenditure

Sub Caste	Mean	Median	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
					Lower Bound	Upper Bound
Paniyan	3301.53	1900	4151.47	450.29	2406.08	4196.98
Adiyan	3192.00	2950	3135.01	991.38	949.35	5434.65
Kuruman	6608.93	2000	9667.20	1826.93	2860.38	10357.48
Kurichiyan	21394.29	7000	33083.76	5592.18	10029.62	32758.96
Uraly Kuruman	12000.00	5000	16178.66	5116.14	426.49	23573.51
Mala Arayan	22590.79	8250	34824.52	5649.28	11144.25	34037.32
Muthuvan	3261.54	2000	2341.04	649.29	1846.86	4676.22
Irular	8121.30	2600	18961.64	3649.17	620.32	15622.27
Scheduled Tribe (combined)	10107.83	3000	21552.51	1374.14	7401.19	12814.46

Source: Primary data

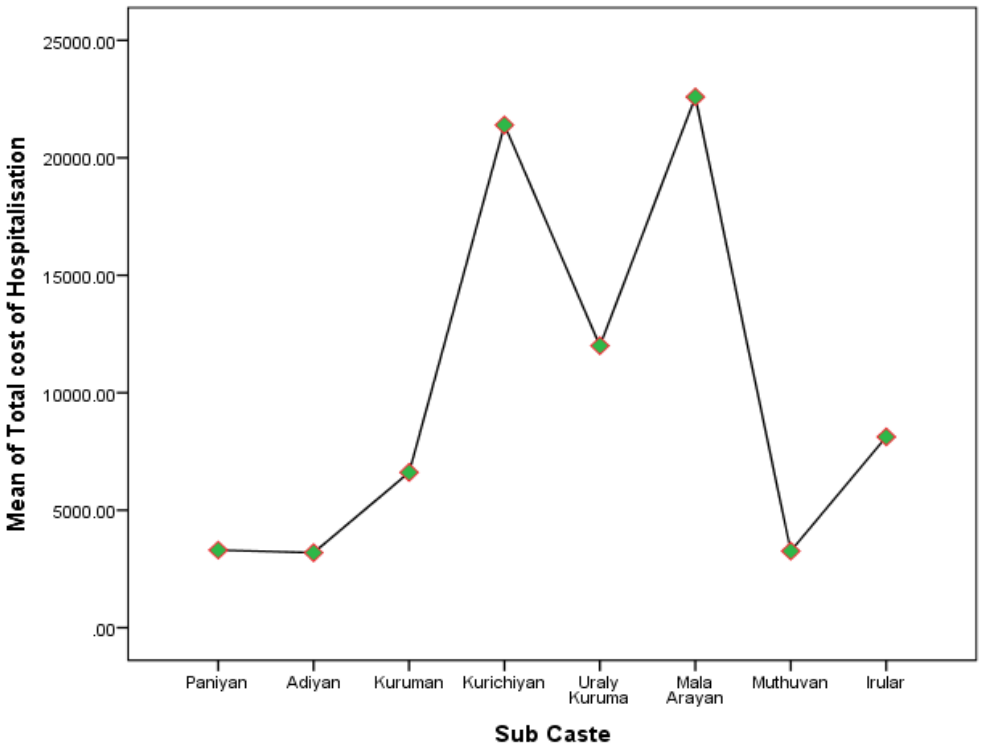

Figure 7.2: Mean Plot of Hospitalisation Expenditure

From the descriptive statistics and mean plot it is evident that there exists significant variation in the hospitalisation expenditure among the tribal communities. The relatively well-off community of Mala Arayan incurred the largest expenditure with the median amount of ₹8250. It is interesting given the fact that in terms of annual hospitalisation rate calculated, the community only occupies the third position behind Kuruman and Kurichiyan community (Table 6.13). Relatively larger utilisation of private hospitals for in-patient treatment is the reason for the highest expenses among the Mala Aryan tribal community. The average amounts for the forward tribal communities are significantly higher compared to their counterparts. The lowest amount towards hospitalisation is incurred by the largest tribal community of Paniyan. The statistical significance of the differences among the communities is confirmed by the Kruskal Wallis test for the difference in the median hospitalisation expenditure. The Null hypothesis is H_0: median hospitalisation expenditures are equal. The results of test is summarised in the table 7.22.

Table 7.22: Kruskal Wallis Test on Hospitalisation Expenditure

Sub Caste	Median	Mean Rank
Paniyan	1900	94.42
Adiyan	2950	103.65
Kuruman	2000	116.09
Kurichiyan	7000	163.56
Uraly Kuruman	5000	130.55
Mala Arayan	8250	164.71
Muthuvan	2000	111.81
Irular	2600	123.19
Kruskal Wallis Test Statistic (Chi-Square)		39.602
Degree of freedom		7
P value		.000**

** Significant at 1 per cent level of significance

Source: Primary data

The test statistic of Chi square in the Kruskall Wallis *H* test is significant and there are statistically significant differences between tribal communities with respect to the hospitalisation expenditure. An effort was made to explore the components of hospitalisation expenses as well. The total cost of hospitalisation was collected under five broad categories namely, the cost of medicine, consultation fee, other treatment cost, cost of transportation and cost of lodging and miscellaneous expenses. Table 7.23 provides the share various components of hospitalisation expenditure.

Table 7.23: Components of Hospitalisation Expenditure (in Percentages)

Sub Caste	Cost of Medication	Consultation Fee	Other Treatment Cost	Cost of Transportation	Lodging and Miscellaneous Expenses
Paniyan	41.99	4.82	30.33	21.68	1.17
Adiyan	43.61	6.27	28.82	21.30	0.00
Kuruman	45.39	14.70	24.33	12.38	3.21
Kurichiyan	45.15	8.83	19.02	14.92	12.09
Uraly Kuruman	59.17	0.00	27.83	13.00	0.00
Mala Arayan	43.08	8.39	38.72	9.09	0.72
Muthuvan	44.34	2.36	10.61	36.79	5.90
Irular	30.00	13.42	33.99	22.59	0.00
Scheduled Tribe (combined)	43.43	8.51	28.97	14.58	4.52

Source: Primary data

Most important components of hospitalisation expenses among the tribal community are cost of medications, diagnostic and treatment cost and cost of transportation. These components together constitute more than 86 per cent of the total cost. The share of travel cost is less compared to the out-patient treatment. This is due to less frequency of travel when admitted to hospital and there is the facility

of vehicles under the scheduled tribe welfare department of each district for free transportation to and from government hospitals for seeking in-patient treatment. The cost incurred towards hiring the private vehicle is also reimbursed by the Department. Cost towards travel is high among the Mala Arayan community because one third of the community utilised private hospitals for in-patient treatment. Similarly, expense towards consultation is zero among the Uraly Kuruman community since all the hospitalisation episodes among the community took place in public facilities. Table 7.24 provides the descriptive statistics of the cost of medication involved in the hospitalisation treatment.

Table 7.24: Descriptive Statistics of Expenses for Medications for In-patient Treatment

Sub caste	Mean	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
				Lower Bound	Upper Bound
Paniyan	1389.41	2358.07	255.77	880.79	1898.04
Adiyan	1392.00	3055.90	966.36	-794.06	3578.06
Kuruman	3032.14	5487.36	1037.01	904.37	5159.92
Kurichiyan	10188.57	18053.40	3051.58	3987.01	16390.13
Uraly Kuruman	7100.00	12312.60	3893.58	-1707.90	15907.90
Mala Arayan	9480.26	14539.58	2358.63	4701.22	14259.30
Muthuvan	1446.15	1000.30	277.43	841.68	2050.63
Irular	2441.67	5784.13	1113.16	153.54	4729.79
Scheduled Tribe (combined)	4428.84	10275.81	655.16	3138.37	5719.31

Source: Primary data

The average expenses towards medications by the tribal households that have experienced the event of hospitalisation is ₹ 4428. The expenses towards the purchase of medicines were highest among the Kurichiyan community with the average of ₹ 10188. Major ailments that caused hospitalisation among the community are accidents and injury, cancer, hypertension and cardio vascular

diseases. All these ailments require considerable medications and one fourth of the community also utilised private providers of in-patient treatment. The large confidence interval for mean expenses for the communities of Adiyan and Uraly Kuruman reveal the presence of households that has incurred considerably high amount towards the medication component of hospitalisation. Table 7.25 brings out the descriptive statistics of diagnostic and other treatment cost incurred during the event of hospitalisation by the tribal households.

Table 7.25: Descriptive Statistics of Diagnostic and Other Treatment Costs for In-patient Treatment

Sub caste	Mean	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
				Lower Bound	Upper Bound
Paniyan	1003.53	2597.18	281.70	443.33	1563.73
Adiyan	920.00	1159.31	366.61	90.68	1749.32
Kuruman	1625.00	3834.89	724.73	137.98	3112.02
Kurichiyan	4291.43	7780.34	1315.12	1618.79	6964.07
Uraly Kuruman	3340.00	4020.56	1271.41	463.87	6216.13
Mala Arayan	8526.32	19298.14	3130.57	2183.18	14869.46
Muthuvan	346.15	746.79	207.12	-105.13	797.43
Irular	2766.67	5144.53	990.06	731.56	4801.77
Scheduled Tribe (combined)	2954.47	8898.81	567.37	1836.93	4072.01

Source: Primary data

As in the total expenses towards the hospitalisation expenses, the diagnostic and other costs of in-patient treatment is highest among the Mala Arayan tribal community. This is on account of higher utilisation of private hospitals for in-patient treatment. The expense towards this component is lowest among the Muthuvan tribal community which have recorded the lowest rate of hospitalisation. Table 7.26

summarises the expenses incurred towards transportation while seeking in-patient care.

Table 7.26: Descriptive Statistics of Transportation Expenses for In-patient treatment

Sub caste	Mean	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
				Lower Bound	Upper Bound
Paniyan	705.65	782.60	84.88	536.84	874.45
Adiyan	680.00	513.81	162.48	312.44	1047.56
Kuruman	826.79	840.03	158.75	501.06	1152.51
Kurichiyan	3365.71	5460.50	922.99	1489.97	5241.46
Uraly Kuruman	1560.00	1575.65	498.26	432.85	2687.15
Mala Arayan	2000.00	2841.68	460.98	1065.96	2934.04
Muthuvan	1200.00	1293.57	358.77	418.30	1981.70
Irular	1838.89	4735.43	911.33	-34.38	3712.16
Scheduled Tribe (combined)	1482.03	3009.85	191.90	1104.05	1860.02

Source: Primary data

The Kurichiyan tribal community incurred the largest expenses towards the travel to health care institutions for the in-patient treatment. This is mainly because of the fact that majority of the Kurichiyan community is far away from health care institutions providing in-patient services. In fact the community was the worst when compared to other tribal communities in terms of geographical access to the private hospital (Table 6.29). The mean distance to private hospital is 12.23 kilo meters and nearly half of the community uses rented vehicles as mode of conveyance.

Apart from the 269 hospitalisation events among the tribal households, there were 35 cases of hospitalised delivery during the reference period. The expenses associated with delivery is summarised in the table 7.27.

Table 7.27: Descriptive Statistics of Expenses Associated with Hospitalised Delivery

Sub caste	Mean	Standard Deviation	Standard Error	95 per cent Confidence Interval for Mean	
				Lower Bound	Upper Bound
Paniyan	4073.68	5644.45	1294.93	1353.15	6794.22
Kuruman	8333.33	5773.50	3333.33	-6008.84	22675.51
Kurichiyan	15166.67	16117.28	6579.85	-1747.38	32080.71
Uraly Kuruman	1000.00	0.00	0.00	1000.00	1000.00
Mala Arayan	1000.00	NA	NA	NA	NA
Muthuvan	833.33	288.68	166.67	116.22	1550.44
Irular	500.00	NA	NA	NA	NA
Scheduled Tribe (combined)	5697.14	8931.55	1509.71	2629.05	8765.24

NA: Not applicable

Source: Primary data

There were no reported deliveries among the Adiyan tribal community. Thus, the analysis is confined to seven tribal communities. The mean expense towards delivery among the tribal community is ₹ 5697. The average expenditure associated with delivery is highest among the Kurichiyan community. The reason is that 67 per cent of the delivery among the community has taken place in the private hospitals. There was only one event of delivery among the Irular and Mala Arayan community and both have taken place in the government hospital.

7.6 Health Insurance Coverage among Tribal Households

The health insurance component of the financing of health care can have a positive impact on the equity of financing and can protect households from the financial catastrophe caused by large health care payments. Further, having enrolled in a health insurance scheme may encourage households to higher utilisation of

health care facilities. At the same time, it may also result in taking fewer health precautions. Thus, the problem of moral hazard is applicable to health insurance as well.

Health care financing mechanisms of most of the developed countries are predominantly insurance based. But vast majority of population living the developing countries remains outside the purview of health insurance system and thus exposed to the financial impoverishment due to unexpected health care expenses. In this regard, an important policy initiative taken by the government of India was the launching of Rastriya Swasthya Bima Yojana (RSBY) on March 2008. Designed as a hospitalisation insurance scheme, RSBY provides every below the poverty line family an access to free hospitalization care and day care procedures up to ₹30,000 per annum in selected private and public health facilities.

This section examines the extent of penetration of RSBY and other health insurance schemes and their utilisation among the tribal communities. Since the community based health insurance scheme which is a popular health financing mechanism for the poor in many states like Gujarat is absent in Kerala, the analysis of health insurance coverage essentially confines to the RSBY and private health insurance schemes. The tribal population having relatively poor health indicators and faces issues related to access to health care, the higher utilisation of health care facilities as an outcome of health insurance can be socially desirable. The table 7.28 summarises the enrolment of tribal households in the RSBY.

Table 7.28: Status of RSBY Enrolment among the Tribal Households

Sub caste	RSBY Enrolled		Uninsured	
	Number	Percentage	Number	Percentage
Paniyan	133	67.50	64	32.50
Adiyan	18	69.20	8	30.80
Kuruman	36	66.70	18	33.30
Kurichiyan	40	51.30	38	48.70
Uraly Kuruman	23	92.00	2	8.00
Mala Arayan	44	48.90	46	51.10
Muthuvan	33	51.60	31	48.40
Irular	51	82.30	11	17.70
Scheduled Tribe (combined)	378	63.40**	218	36.60**

** Significant at 1 per cent level of significance
Source: Primary data

Significantly higher proportion of the tribal households are enrolled in RSBY (Chi-square 42.953; $P<0.01$). It is intriguing to note that the enrolment is relatively higher among the poorer tribal communities like Uraly Kuruman and Irular. The coverage of RSBY is the lowest among the Mala Arayan community. The main reason is that sizable proportion of the Mala Arayan households is above poverty line, thus not satisfying the some of the eligibility condition for enrolment in RSBY. This partly explains the high expense towards hospitalisation incurred by the community. The enrolment is also low among the Kurichiyan community which has the second largest expenditure towards hospitalisation among the tribal communities. The low enrolment among the Muthuvan tribal community is due to their difficulty to access the the enrolment camp conducted under the auspicious of RSBY. It is also pertinent to analyse the extent of utilisation of RSBY health card. It is presented in the figure 7.3.

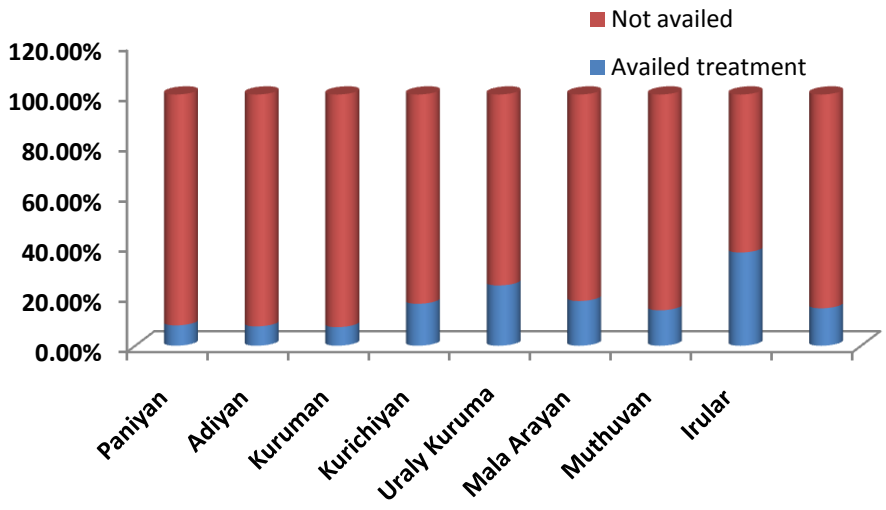

Figure 7.3: Utilisation of RSBY

It can be noted that significantly high proportion (85.10 per cent) of tribal households did not avail the benefit of RSBY health card for in-patient treatment. From the focus group discussion held with the community members, it was understood that majority lack information about how to use the RSBY health card, unaware of the benefit of the scheme and the procedures involved for availing the benefit of the scheme. Another important limitation for poor utilisation of the scheme is the shortage of empanelled hospitals in the three tribal dominated districts under the study. In fact, there are only two government hospitals in Wayanad which are in the empanelled list of hospitals under the RSBY scheme. As a consequence, tribal patients were forced to seek in-patient treatment from un-empanelled hospitals incurring substantial expense towards treatment. Another plausible explanation for not seeking in-patient treatment using the RSBY health card is the travel cost involved, since empanelled hospitals are not easily accessible to many tribal households. There is also the problem of patients being asked to purchase medicines and conduct diagnostic test from outside the hospital seeking in-patient care. An attempt was made to trace the enrolment of other health insurance apart from RSBY among the tribal communities. It is summarised in the table 7.29.

Table 7.29: Coverage of Health Insurance

Sub caste	Insured		Uninsured	
	Number	Percentage	Number	Percentage
Paniyan	8	4.06	189	95.94
Adiyan	3	11.54	23	88.46
Kuruman	3	5.56	51	94.44
Kurichiyan	5	6.41	73	93.59
Uraly Kuruman	0	0.00	25	100.00
Mala Arayan	21	23.33	69	76.67
Muthuvan	4	6.25	60	93.75
Irular	1	1.61	61	98.39
Scheduled Tribe (combined)	45	7.55**	551	92.45**

** Significant at 1 per cent level of significance

Source: Primary data

The coverage of health insurance among the tribal community other than RSBY is meagre among the tribal households. Statistically significant proportion of tribal households do not have protection of any other health insurance (Chi square 429.591; P<0.01). At the same time, 23.33 per cent of Mala Arayan households have enrolled in some form of health insurance. It can be noted that Mala Arayan community reported lowest enrolment in RSBY.

7.7 Nature of the Coping Mechanism

After estimating the incidence and intensity of catastrophic health care payments among the tribal households, this section examines how the households cope with the out-of-pocket payments on health care. An analysis to explore how the coping mechanism differs from the out-patient treatment service and in-patient hospitalisation, is also being carried out.

Most of the studies analysing the financial impoverishment as a consequence of out-of-pocket health care health care payments has essentially focussed on the ratio of health expenditure to total expenditure or income, thus sidelining the effects of financial coping mechanism on the households. It is critical to analyse how the

households finance their out-of-pocket health expenditure. To trace out the extent of financial protection from health care payment on households, it is imperative to examine the coping mechanism to examine how the household responds to unexpected event of health care payments and how the payments affect the future wellbeing of the household. The coping mechanism implies the strategies adopted by the households to finance out-of-pocket health expenditure that could not be managed with their regular income. It includes strategies such as use of past savings, borrowing, sales of assets and consumables, donations from friends and relatives etc.

From the analysis, it was found that the tribal households employed different varieties of strategies to cope with the health shocks. Table 7.30 brings out the strategies employed by households to finance expenditure on out-patient visits.

Table 7.30: Coping Mechanism to Finance Out-patient Treatment Expenses

	Past Savings	Donations from Friends/relatives	Borrowing	Sale of Assets	Sale of Consumables	Total
Paniyan	103 (70.07)	6 (4.08)	38 (25.85)	0 (0.00)	0 (0.00)	147 (100.00)
Adiyan	8 (53.33)	1 (6.67)	4 (26.67)	2 (13.33	0 (0.00)	15 (100.00)
Kuruman	35 (81.40)	1 (2.33)	5 (11.63)	0 (0.00)	2 (4.65)	43 (100.00)
Kurichiyan	38 (66.67)	5 (8.77)	14 (24.56)	0 (0.00)	0 (0.00)	57 (100.00)
Uraly Kuruman	11 (50.00)	3 (13.64)	8 (36.36)	0 (0.00)	0 (0.00)	22 (100.00)
Mala Arayan	58 (90.63)	2 (3.13)	4 (6.25)	0 (0.00)	0 (0.00)	64 (100.00)
Muthuvan	32 (88.89)	1 (2.78)	3 (8.33)	0 (0.00)	0 (0.00)	36 (100.00)
Irular	37 (90.24)	2 (4.88)	2 (4.88)	0 (0.00)	0 (0.00)	41 (100.00)
Scheduled Tribe (combined)	322 (75.76**)	21 (4.94**)	78 (18.35**)	2 (0.47**)	2 (0.47**)	425 (100.00)

Note: Figures in the parenthesis are percentages.
** Significant at 1 per cent level of significance
Source: Primary data

There are significant differences with respect to the coping mechanism adopted by the households (Chi square 818.510; P<0.01). As in the case of other communities, the tribal households used a combination of different strategies to cope with the expenses incurred for the out-patient treatment. As the first choice, households used their accumulated savings to finance out-of-pocket health expenditure that could not be met by their regular income. Comparatively, richer communities like Mala Arayan and Kuruman were able to finance bulk of their out-patient expenses from their savings. The borrowings also were found to be a predominant coping strategy adopted by the tribal households. The share of borrowing is highest among the Uraly Kuruman community that have reported both highest morbidity prevalence and largest incidence of financial catastrophe. On the contrary, high proportion of the past savings among the Muthuvan community is partly explained by the low prevalence of ailments and the lowest average out-of-pocket health expenditure among the community. It would be illuminating to examine whether there are variations in the coping strategy between the households who faced financial catastrophe and those who do not. In the earlier analysis, it was estimated that 425 tribal households have incurred out-of-pocket health expenditure, in which 222 households faced the distress of financial catastrophe. The figure 7.4 presents the coping strategies among the catastrophic and non-catastrophic households.

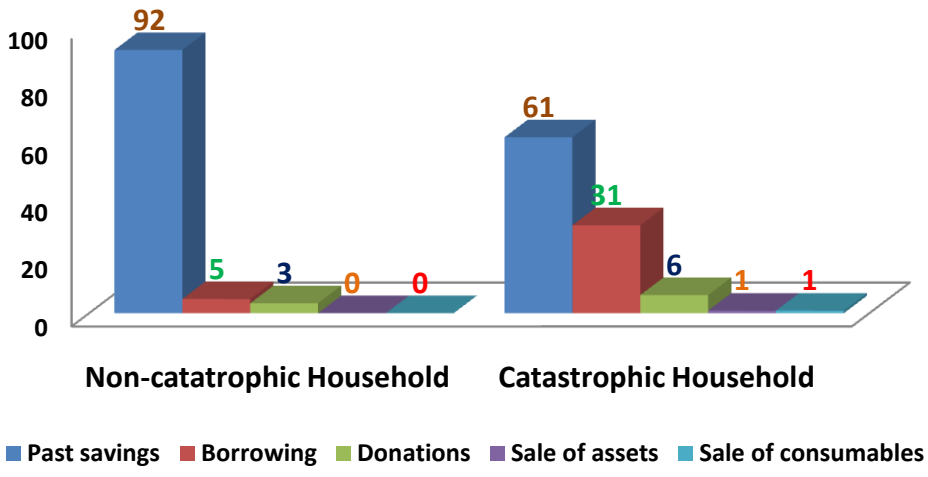

Figure 7.4: Coping Mechanism and Financial Catastrophe

It is evident that there are variations in the coping strategies between catastrophic and non-catastrophic households. The households that did not succumb to financial catastrophe were able to manage 91.63 per cent their out-patient expenditure using the past savings. At the same time, borrowings accounted to 30.63 per cent of the coping mechanisms adopted by the households that have faced financial catastrophe. It suggests that the incidence of financial catastrophe is pushing the tribal households into indebtedness, especially those who spend a disproportionate proportion of their income towards health care expenditure.

An attempt was made to analyse the coping mechanism followed by the households who face the hospitalisation event. Generally, the in-patient hospitalisation is unexpected and unpredictable but involves substantial amount of money (Section 7.5). For the vulnerable communities like scheduled tribes, it imposes huge financial burden. Thus, it is essential to explore how the households who faced the event of hospitalisation managed to finance the expenditure. Table 7.31 summarises different strategies employed by households to finance expenses incurred on hospitalisation.

Table 7.31: Coping Mechanism to Finance Hospitalisation Expenses

Sub Caste	Past Savings	Donations from Friends/relatives	Borrowing	Sale of Assets	Total
Paniyan	36 (45.00)	5 (6.25)	38 (47.50)	1 (1.25)	80 (100.00)
Adiyan	4 (30.77)	2 (15.38)	7 (53.85)	0 (0.00)	13 (100.00)
Kuruman	13 (43.33)	5 (16.67)	12 (40.00)	0 (0.00)	30 (100.00)
Kurichiyan	15 (42.86)	1 (2.86)	19 (54.29)	0 (0.00)	35 (100.00)
Uraly Kuruman	2 (25.00)	1 (12.50)	5 (62.50)	0 (0.00)	8 (100.00)
Mala Arayan	26 (63.41)	7 (17.07)	8 (19.51)	0 (0.00)	41 (100.00)
Muthuvan	5 (45.45)	0 (0.00)	6 (54.55)	0 (0.00)	11 (100.00)
Irular	13 (46.43)	7 (25.00)	7 (25.00)	1 (3.57)	28 (100.00)
Scheduled Tribe (combined)	114 (46.34**)	28 (11.38**)	102 (41.46**)	2 (0.81**)	246 (100.00)

Note: Figures in the parenthesis are percentages.
** Significant at 1 per cent level of significance
Source: Primary data

There were a total of 269 hospitalisation events among tribal households and 246 households faced at least one hospitalisation event, excluding hospitalisation associated with pregnancy. Unlike the coping mechanism employed for the out-patient expenses, cost incurred towards hospitalisation has led to greater indebtedness among the households. The analysis manifests that borrowing is a significant source of financing of in-patient treatment of hospitalisation (Chi square 575.930, P<0.01). Borrowing is found to be one of the predominant strategies to cope with hospitalisation expenses and is not confined to any particular tribal community. In the cases of Adiyan, Kurichiyan, Uraly Kuruman and Muthuvan, borrowing is the main coping strategy in more than half of the households. 41.46 per cent of the households financed their expenses resorting to borrowing and are indebted as a result of hospitalisation.

A total of 35 hospitalised delivery events were also reported during the reference period among the tribal households. Figure 7.5 bring out the coping strategies adopted by the households to finance the expenses incurred towards hospitalised delivery.

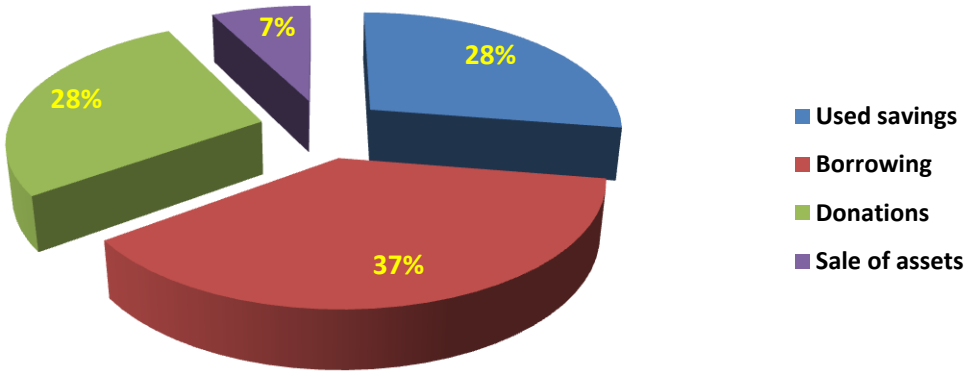

Figure 7.5: Coping Mechanism to Finance Expenses of Hospitalised Delivery

The proportion of borrowing to finance the expenses of hospitalised delivery is less compared to hospitalisation in general. More than one third of the expenses were financed through the borrowing. The share of donations from the friends and

relatives is also comparatively high. Thus, borrowing is a significant strategy to cope with the health care payments for out-patients and in-patients services. This necessitates an examination of sources of borrowing among the indebted tribal households, which is explored in the figure 7.6.

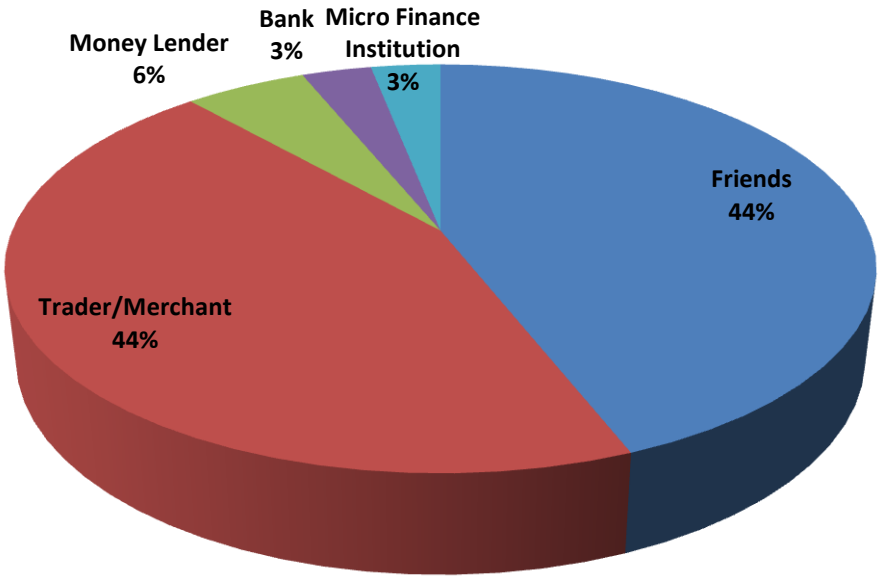

Figure 7.6: Sources of Borrowing

Significant dependence on trading community for borrowing by the tribal folks reflects the strong nexus between the two parties at the grass root level. With only labour and output to pledge against loan for the majority of the tribal community, this can be highly exploitative. Since no proper valuation is made for the effort or the produce of the tribal households by the traders, utilising the ignorance of the community, large borrowing can lead to further marginalisation and pauperisation of households.

7.7.1 Coping Mechanism: Bivariate Analysis

Since reliance on borrowing is widespread among the communities and is the prominent coping strategy employed to finance both the out-patient and in-patient treatment expenses, the bivariate analysis is being attempted to predict factors

associated with indebtedness. The logistic regression model is used with the binary dependent variable representing the coping strategy of borrowing. The dependent variable is equal to one if the households used borrowing as a coping strategy for out-patient and/or in-patient treatment expenses and zero if only past savings or donations or sale of asset were used. The following independent variables are used in the model. Only those households that have utilised out-patient health care facilities or in-patient health care facilities or both are considered for the analysis. The following are the explanatory variables in the model.

- Landholdings

Since landholdings are the most important asset for tribal households and in most cases is the only asset that can be mortgaged for availing loans. At the same time, the ownership of land can work in both the directions. Large land holdings can increase the creditworthiness and ability to borrow. On the other hand, it can also protect households from shock of health payments and may reduce the likelihood of borrowings. Landholding is measured in cents as a continuous variable.

- Number of Elderly Members in the Household

There is greater likelihood of incurring higher health expenditure if the household do have elderly members. Thus, a positive association with dependent variable is assumed. The number of elderly member (60 years and above) is measured as a continuous variable.

- Habitat of the Household

Habitat of the tribal household may influence the health expenditure and the resultant indebtedness. Households living outside the tribal colony will have more access to sources of loan and likelihood of indebtedness may be greater. Location is measured as the dichotomous variable is categorised as 1, if the household live outside the colonies and 0 otherwise.

- Presence of Acute Ailments

Acute ailments which are sudden and unexpected in nature increase the probability of health expenditure and can push households into indebtedness. Households with members suffering from acute ailments were coded as 1 and otherwise 0.

- Number of Private Out-patient Visit

Increased utilisation of private out-patient services will lead to spurt in health care expenses and the households availing more private health care facilities are likely to be indebted. The number of visits to the private providers is measured as a continuous variable.

- Sub Caste

Belonging to forward tribal communities can influence health expenditure and likelihood of indebtedness in two ways. Economically better-off communities are likely to incur higher health expenditure. Further, as they have greater credit worthiness and can easily avail loan as well. The model assumes positive relationship with the probability of indebtedness. Households belonging to forward tribal communities of Mala Arayan, Kurichiyan and Kuruman are categorised as 1 and 0 otherwise

- Health Insurance Coverage

The enrolment in the public health insurance programme of RSBY and/or any other private health insurance scheme can reduce the likelihood of indebtedness from high health care payments. Thus, the model assumes an inverse relationship between enrolment in insurance and probability of indebtedness. The variable is coded as 1, if any household is enrolled in public or private health insurance, 0 otherwise.

- Hospitalisation

The nonfatal health outcome of hospitalisation can be an important determinant of indebtedness. Hospitalisation expenses are significantly higher compared to out-patient expenses and are often unexpected in nature. Thus, vulnerable tribal households that face the hospitalisation event may be compelled to borrow due to their limited financial resources.

The Chi square tests are used to check the association between dependent variable and explanatory variables that are dichotomous in nature (Null hypothesis H_0: variables are independent). The result is summarised in the table 7.32.

Table 7.32: Chi Square Test of Coping Mechanism

Variable	Pearson Chi Square Statistic	Likelihood Ratio	P value
Habitat of the Household	13.812	14.909	0.000**
Presence of Acute Ailments	16.624	15.713	0.000**
Health Insurance Coverage	0.043	0.043	0.835
Sub Caste	6.072	6.176	0.014*
Hospitalisation	39.529	41.026	0.000**

** Significant at 1 per cent level of significance

* Significant at 5 per cent level of significance

Out of the five explanatory variables which are dichotomous in character, four variables were found to be significant in the nonparametric Chi square test of independence. The relationship between dependent variable and enrolment in health insurance were found to be statistically insignificant. Thus, the modified logistic model excluded the explanatory variable of health insurance from the analysis. The results are summarised in the table 7.33.

Table 7.33: Probability for Indebtedness from Health Care Payments - Logistic Regression Model

Variables	Coefficient	Standard Error	Z-Statistic	P Value
Constant	-2.214148	0.416231	-5.319523	0.0000**
Landholdings	0.002836	0.001393	2.035251	0.0418*
Number of Elderly Members	-0.308478	0.160100	-1.926777	0.0540
Location	1.081103	0.363246	2.976231	0.0029**
Presence of Acute Ailments	1.007731	0.303662	3.318591	0.0009**
Number of Private Out-patient Visit	0.102030	0.083096	1.227849	0.2195
Sub Caste	-0.385901	0.259080	-1.489507	0.1364
Hospitalisation	0.961920	0.192538	4.995993	0.0000**

Number of observations	450
McFadden R-squared	0.116897
LR statistic	66.96573
Prob(LR statistic)	0.000000
Mean dependent var	0.333333
S.E. of regression	0.441798
Sum squared residual	86.26186
Log likelihood	-252.9485
Deviance	505.8970
Restr. log likelihood	-286.4314
Hosmer-Lemeshow Statistic	15.2789 ,Prob. Chi-Sq(8): 0.0539

** Significant at 1 per cent level of significance
* Significant at 5 per cent level of significance

The logistic regression model fitted is significant as the likelihood ratio statistic (LR Statistic) is 66.96573 and P < 0.01. Thus, the null hypothesis that all the coefficients are simultaneously zero, can be rejected. The model converged at the fourth iteration and the goodness of fit is satisfied with the Hosmer-Lemeshow test statistic of 15.2789 with the probability of 0.0539. From the estimated coefficients of the model, the following inferences can be drawn. The coefficients of the landholding is significant and with a positive sign. It implies that with the increase in landholdings of the households, the probability of indebtedness increases. The households that are outside the tribal colonies have greater likelihood for indebtedness. As expected, the presence of members with acute ailments significantly increases the probability of indebtedness. Scheduled tribe households' belonging to forward communities has lesser likelihood of resorting borrowing as the coping strategy. One of the significant reasons for the indebtedness is hospitalisation, as the coefficient is highly significant and has the positive sign. Thus, it can be inferred that landholdings, acute ailments, caste characteristics and hospitalisation exert significant influence on the likelihood of utilising borrowing as the coping strategy.

7.8 Conclusion

The study has estimated the magnitude and intensity of out-of-pocket health care expenditure among the tribal communities, which is the principal means of financing health care in the state. The out-of-pocket health expenditure is widespread and absorbs large proportion of the household resources especially among the relatively poor tribal communities. The financial protection from health shocks is low and the catastrophic impact is severe among the vulnerable communities like Uraly Kuruman. There are important differences in the incidence of catastrophic payments across tribal communities. It is generally higher among the low income communities as they rely more on out-of-pocket expenditure for financing of health care. The computed concentration indices reveal the disproportionate concentration of out-of-pocket health care payments on the poorer households. The share of out-of-pocket expenditure that goes to the purchase of

medicines is high, in spite of the fact that majority of the tribal households utilise public health care facilities. There is large prevalence of high spending outlier households among the poorer communities like Paniyan and Irular. The habitat of the tribal household, the presence of chronic and/or acute episodes, use of private health care facilities for out-patient treatment and the enrolment in health insurance were found to be important determinants of catastrophic health expenditure. Even though significantly higher proportions of tribal households were enrolled in RSBY, its utilisation remains a matter of concern. The patterns of coping strategies are found to be different from financing of health care for the out-patient visit and that of hospitalisation. Tribal households relied more on borrowing to finance hospitalisation expenses than the out-patient visit. The hospitalisation and presence of acute ailments in the household significantly increased the probability of indebtedness as a result of health expenditure. To conclude, it should be asserted that the large prevalence of financial catastrophe is not necessarily related to only disease; but it also indicates the poor functioning of financing of health care mechanism in the state. Despite, its creditable achievements in the macro health indicators, it is evident that the state of Kerala has failed to provide financial protection from large health care payments to its marginalised communities like scheduled tribes.

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CHAPTER 8
SUMMARY AND CONCLUSION

Financing of health care is acknowledged as the crucial determinant that influences the health outcomes in a country. It involves the mobilisation, accumulation and allocation of money to cover the health needs of the people in a country's health system. The significance of financing of health care emerges from the fact that health care utilisation is a response to an unforeseen and unsolicited shock and it can be sufficiently costly and represents a threat to the welfare of households, especially the poor. If the health expenditure is large relative to the resources of the household, it can even become catastrophic in nature. Kerala is widely acclaimed for its impressive health indicators which are comparable even to the developed countries of the world. But it has been argued that the health success story of the state has failed to encompass all sections of the society. With the decline in the role of public provisioning of health care and the resultant changes in the structure of Kerala's health care delivery system, the large majority of vulnerable population in the state are susceptible to catastrophic health expenditure particularly when an earning member falls ill or the household faces a hospitalisation event. With respect to the financing of health care, Kerala has the highest private per capita health expenditure compared to any other state in India.

This study tries to address the gaps in empirical knowledge of the health care financing mechanism employed by the marginalised communities focussing on the tribal communities who are the most disadvantaged and deprived among communities in Kerala. . Out of the 36 tribal communities identified in the state, the study examines the health care and financing pattern of eight prominent non-primitive tribal communities in three tribal concentrated districts of Kerala, namely Wayanad, Idukki and Palakkad. The communities studied were Paniyan, Adiyan, Kuruman, Kurichiyan, Uraly Kuruman, Mala Arayan, Muthuvan and Irular. These eight communities together constitute 51.86 per cent of total tribal population in Kerala. The three districts selected are the main inhabitants of tribal population in

the state and they cover major tribal communities of Kerala as well. Wayanad district which has the highest concentration of tribal community in the state, was chosen for the study of five communities (Paniyan, Adiyan, Kuruman, Kurichiyan and Uraly Kuruman), Idukki district was chosen for two communities (Mala Arayan and Muthuvan) and Palakkad district was chosen for the study of one tribal community (Irular). A multi-stage stratified random sampling was used for selecting samples for the study. A structured interview schedule was used for gathering information from the selected households. The study covered 596 tribal households that guaranteed at least one percent representation of the total households of the eight tribal communities under study. The major objectives of the study were: to find out the status, accessibility and utilisation of health care among the tribal communities; the incidence and intensity of their out-of-pocket spending on health care; the coverage of health insurance schemes; the coping mechanism employed by households and the extent of financial protection enjoyed by the households with respect to payments for health care. The major findings of the study are summarised in the ensuing sections.

8.1 Findings of the Study

The following are the major findings of the study

- There were considerable differences in the educational status and occupational profile among the tribal communities. Further, there exist high inequalities in the distribution of households' landholdings. The Mala Arayan, Kuruman and Kurichiyan communities are found to be far better off compared to others in terms of their level of education and economic status.

- The tribal communities exhibited poor health indicators compared to that of the general population of Kerala. The morbidity prevalence rate was estimated as 250.96 per thousand population. About 72 per cent of tribal households reported at least one ailment during the reference period. The Uraly Kuruman community reported the highest prevalence of morbidity and tribal communities which are low in socio-economic status, reported higher

morbidity rates. The prevalence of ailments was higher among males compared to that of females.

- The highest reported ailment among the tribal communities was fever of unknown origin followed by ailments related to blood pressure. Chronic and life style ailments had a significant presence among the forward tribal communities.

- The annual rate of hospitalisation was 103.70 and it was the highest among the Kuruman community and the lowest among the Muthuvan community. The most important causes for hospitalisation were accidents, injury or fractures and fever. Both the morbidity and hospitalisation rates among the tribal community were higher compared to the population as a whole, demonstrating relatively poor health status of the tribal population.

- There were 42 events of mortality with a lower mean age at death of 56.94 among the tribal communities. The mortality caused by cancer and accidents were higher and 57.14 per cent of the deceased received medical attention before death.

- The analysis of the self assessed health status reveals that 43.20 per cent of tribal households perceive their health status as good or very good reflecting the perception bias among the community.

- The classification of households on the basis of health care need using the criteria of number of elderly and presence of chronic ailments demonstrated that majority of the households fall in the low need category. At the same time, majority of the Mala Arayan community fitted into the very high need category.

- The median days lost due to illness were highest among the Uraly Kuruma community and significant differences existed among the tribal communities.

- A high proportion of the tribal population indulged in the ill health behaviours of the use of tobacco/panmasala and alcohol. The consumption was particularly higher among the backward tribal communities.

- Majority of the households depended on the public provision of drinking water, even though most of the households from economically better off communities had their own well or tube well. The mean distance to the source of drinking water was highest among the Muthuvan community. Only 19.30 per cent of the tribal households had proper latrine facility and one tenth of the community resorted to open defecation. More than two-third of the tribal households used one or the other form of drinking water treatment.

- With respect to the accessibility to health care institutions, the tribal population had to travel an average of 3.69 kms to access primary health centre. The mean distance was the highest among the Adiyan community and there were statistically significant differences in the average distance to the primary health centre among the tribal households. In the provision of in-patient treatment, private hospitals were found to be more accessible than the government hospital.

- Nearly half of the tribal households make use of rented vehicles as the mode of conveyance to health care institutions. The Muthuvan community had the disadvantage of being far off from the institutions and also with respect to the availability of transport facilities.

- With respect to the preference of sample households towards different system of medicine, about 92.11 per cent of the tribal households preferred allopathic form of medicine. The reliance on the traditional tribal medicine was small. Allopathy was the preferred form of treatment for both the aged and children. The most important reasons for the choice of the system of medicine were quick remedy followed by easy access.

- More than 75 per cent of the households sought treatment immediately after the episode of illness. But officials of health department had a different

opinion and they pointed out that late reporting of morbidity was widespread among the tribal communities.

- 60.23 per cent of the households have availed the services of public provisioning of outpatient treatment services during the reference period. The median number of visit was the highest among the Uraly Kuruman community who has the highest prevalence of ailment as well. There were significant differences in the utilisation of public health care facilities among the tribal communities.

- 28.69 per cent of the tribal households have utilised the private health care facilities for outpatient health care treatment. The utilisation of private health care facilities was relatively higher among communities which were socio-economically better-off. There existed significant inter-community differences with respect to the utilisation of private providers as well.

- Almost 80 per cent of households preferred public hospitals for inpatient treatment. The preference towards public providers was very high among the backward communities. At the same time, important reason for the preference of private providers was that they offer better facilities of treatment relative to the public providers and lack of proper care and attention from government institutions.

- There were 269 hospitalisation events among the total population of 2594 under the study, in which, the share of public provider was 77.32 per cent. Tribal households demonstrated significant differences between various providers of inpatient care.

- 36 tribal households constituting 6.21 per cent have experienced the event of delivery during the reference period of one year prior to the survey. More than 80 per cent of these deliveries had taken place in government hospitals. It is, surely, a welcome trend.

- There was wide coverage of immunisation among the tribal households and 79.45 per cent of tribal households had at least one child who utilised the paediatric care services from public institutions.

- The bivariate analysis of the choice of providers by the tribal households proved that households belonging to forward socio-economic category with the literate head, with chronic and/or acute ailments and more immediacy to private facilities had greater likelihood of choosing the private providers for health care treatment.

- With regard to the out-of-pocket health expenditure, it was evident that 71.31 per cent of sample households have experienced it during the reference period. Here also, one can see significant differences among the selected tribal sects.

- The median monthly out-of-pocket health expenditure of tribal household was ₹ 350. The highest average out- of-pocket health expenditure was incurred by the Mala Arayan tribal community. It was high among the forward communities like Mala Arayan, Kurichiyan and Kuruman. There were statistically significant differences in the out-of-pocket health expenditure between and among different tribal communities.

- The direct cost accounted for 59.37 per cent of the total out-of-pocket health expenditures. Further, the cost incurred on transportation represented one third of the total expenditure on health care.

- The average direct health expenditure and cost incurred on travel were highest among the Mala Arayan community, reflecting the higher utilisation of health care facilities and higher economic status of the community.

- While there were significant differences in direct medical expenditure among the tribal communities, there were no statistical differences between the median travel expenditure among them.

- The most significant item in the out-of-pocket health expenditure of the tribal communities was the expenses incurred towards the purchase of medicines followed by the travel expenses. The result was consistent with the revelations of some of the earlier studies. The high proportion of expenditure on medicines points towards the unavailability of essential medicines in the primary health centres and government hospitals.

- The analysis of financial protection of the households using measures of minimum standard approach reveal that catastrophic impact of health care payments was widespread among the tribal communities. Even though forward communities like Mala Arayan and Kurichiyan incur high amounts of out-of-pocket health expenditures, the burden of payment was largely felt by the vulnerable communities. The incidence of financial catastrophe measured by the catastrophic headcount was the greatest among Uraly Kuruman community. About 37.25 per cent of tribal households spend more than ten per cent of their monthly income on health care and thus faced the burden of catastrophic payment. The financial protection from the burden of payments for health care available to the tribal households was meagre as more than one third of the household made catastrophic health payments at ten per cent threshold.

- The intensity of catastrophic payments measured by the payment gap at the threshold of ten per cent was 3.88 indicating that, on an average, the tribal households spend 3.88 per cent beyond the catastrophic threshold. The catastrophic payment gap was dominated by the incidence and displayed the same general pattern as the headcount statistics. Yet, with the increase in the threshold, the burden invariably fell on the richer tribal households.

- The tribal households who have experienced financial catastrophe at ten per cent threshold spend an average 12.04 per cent beyond the threshold as revealed by the mean positive gap. The Paniyan community was the worst hit with mean positive gap of 19.06 per cent at 20 per cent threshold.

- The examination of the progressivity of health care payments using the concentration index showed that there was noticeable concentration of financial catastrophe of health care payments among the poor tribal households at all threshold levels. The calculated indices were negative signifying the uneven concentration of burden on the poor households.

- The analysis of outlier households who spends disproportionally higher than others in the same community reveals that high proportion of Paniyan community incurred large expenditure even though the community spends relatively less on health care. The cut off health expenditure was higher for the forward tribal communities like Mala Arayan, Kurichiyan and Kuruman compared to others.

- The attempt to trace out the key determinants of catastrophic health expenditure shows that habitat of the household has a significant influence on the catastrophic health expenditure meaning that the households living outside the colonies had a greater likelihood of incurring the catastrophic health expenditures. The presence of members suffering from chronic and acute ailments significantly increased the probability of catastrophic health expenditure. The households utilising the private providers for outpatient treatment had a significantly higher probability of incurring catastrophic health expenditure. Further, enrolment in health insurance significantly reduced the likelihood of catastrophic health expenditure.

- The mean expense for the hospitalisation was ₹ 10,107 among the tribal households who have experienced the event. The Mala Arayan community incurred the largest expenditure with the median amount of ₹ 8,250. The average amounts of the forward tribal communities were significantly higher compared to their counterparts.

- Most important components of hospitalisation expenses among the tribal community were the cost of medications, other diagnostic and treatment cost and cost of transportation. These components together constituted more than

86 per cent of the total expense. The share of travel costs were less compared to the outpatient treatment.

- The average expenses towards medications by the tribal households who have experienced the event of hospitalisation were ₹ 4,428. The average diagnostic and other treatment cost incurred during the event of hospitalisation was ₹ 2,954 on an average. While the average expense towards travel cost was ₹1,482.

- The mean expenses towards hospitalised delivery among the tribal community were ₹ 5697. The average expenditure associated with delivery was the highest among the Kurichiyan community.

- The analysis of the coverage of health insurance among the tribal community showed that significantly higher proportions of the tribal households were enrolled in RSBY. The enrolment was comparatively higher among the poorer tribal communities like Uraly Kuruma and Irular. At the same time, 85.10 per cent of tribal households could not utilise the RSBY health card for inpatient treatment. The coverage of health insurance among the tribal community other than RSBY is small at 7.55 per cent.

- It was found that the tribal households employed different strategies to cope with shock of health care payments. Usage of the past savings was the most important coping mechanism for financing the expenses of outpatient care. The households that did not face the incidence of financial catastrophe, were able to manage 91.63 per cent of their outpatient expenditure using their past savings. At the same time, borrowings accounted 30.63 per cent of the coping mechanisms adopted by the households that have faced financial catastrophe.

- The unexpected higher cost incurred towards hospitalisation had resulted in greater indebtedness of the tribal households. Borrowing was one of the major sources of financing of inpatients when hospitalised. About 41.46 per

cent of the households financed their expenses by borrowing and were in debt as a result of hospitalisation.

- With respect to the coping strategies for the hospitalised delivery it was established that 37 per cent of the expenses were financed through borrowing. The share of donations from the friends and relatives was also comparatively high in this case.

- The sources of borrowing to finance health expenditure for the inpatient and outpatient expenses reveals the strong nexus between trading community and tribal folks at the grass root level which can lead to further pauperisation of the community.

- The bivariate analysis of the likelihood of indebtedness on account of health care expenditure showed that tribal households living outside the tribal colonies had a greater probability for indebtedness due to their relatively higher expenditure and easy access to borrowing. Households with the presence of members suffering from acute ailments significantly increased the probability of indebtedness. Similarly, tribal households belonging to the forward tribal communities had lesser likelihood of resorting to borrowing as the coping strategy. From estimated coefficients, it was revealed that the significant reason for indebtedness was hospitalisation.

8.2 Suggestions of the Study

- It is imperative to increase the budgetary share on health care sector, focusing on the primary and secondary care. As the study shows, a majority of the marginalised communities still depend on public providers and a large segment suffers from both communicable and lifestyle diseases, the role of public sector is vital in providing affordable health care to these vulnerable population.

- The health policies targeted for the tribal population should recognise the inherent heterogeneity of the community. Suitable policies need to be framed

for the betterment of the backward communities viz., Uraly Kuruman, Paniyan, Adiyan and Muthuvan.

- Viable health financing system by implementing social health security measures that provide a safety net against the impoverishment from health care payment needs to be evolved.

- The study found that enrolment in the health insurance programme reduced the likelihood of catastrophic health expenditures. This suggests that small scale insurance programmes operating at the community level can be an effective strategy for the protection of the poor tribal households from shocks of payments for health care.

- As a significantly high proportion of heath expenditure of the tribal households goes to the purchase of medicines, ready availability of such medicines at the primary health centre and government hospital should be ensured.

- Despite the extensive coverage of health care institutions in the state, tribal communities like Muthuvan face severe constraints in terms of accessibility. Adequate measures need to be taken for improving accessibility of those communities' living in geographically challenged areas.

- Though the enrolment in the RSBY scheme is high, its utilisation for hospitalised treatment is far from satisfactory. The number of empanelled hospitals should be increased to enlarge the utilisation of the insurance programme in the tribal dominated districts of the state. Further proper awareness must be given to the households about the use of the scheme and the benefits involved.

- The study traces out the wide prevalence of ill health behaviours like the use of tobacco and alcohol among the tribal communities. The poor health indicators of the community are, to a great extent, explained by these habits. Thus, awareness campaign is urgently needed to educate the community about the health consequences of these poor health activities.

8.3 Scope for future research

The present study confines its scope to eight prominent tribal communities. As there are innate differences among the tribal communities, it will be illuminating to study about the status of health and financing of health care of other tribal communities. Further, there is shortage of studies on primitive tribes as well. The impact of health care payments on poverty will provide more insights in the impoverishing effect of health expenditure.

8.4 Conclusion

The study brought out the fact that the tribal population largely remains outliers of Kerala's health success story. The tribal communities reported relatively poor health indicators in terms of high morbidity, hospitalisation and mortality. The accessibility to health care institutions in terms of distance and road connectivity is low among many communities. The out-of-pocket health expenditure is found to be the principal means of financing of health care. Its prevalence is widespread and absorbed large proportion of the household resources especially among the relatively poor tribal communities. The financial protection from health shocks is low and the catastrophic impact is severe among the tribal communities. Regardless of large coverage of health insurance schemes like RSBY, its utilisation remains poor. In fact, members with acute ailments and hospitalisation episodes have become major reasons for the indebtedness of tribal households. The study reiterates the urgent need for revamping the existing mechanisms of financing of health care among the most marginalised communities like tribal folks. It is hoped that the findings of the present study would be able to help the policy makers to frame suitable health financing policies addressed to communities like tribal folks.

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Appendix 1

Structure of the Residential Building of Tribal Communities

Sub Caste	Variable	Description	Number	Percentage
Paniyan	Floor	Mud/cow dusk	38	19.30
		Cement	140	71.10
		Mosaic	2	1.00
		Tiles	17	8.60
	Roof	Grass/leaves	11	5.60
		Sheet	17	8.60
		Tiles	24	12.20
		Concrete	145	73.60
	Number of rooms	One	12	6.10
		Two	51	25.90
		Three	113	57.40
		Four and Above	21	10.70
	Electrification	Status of Electrification	132	67.00
Adiyan	Floor	Mud/cow dusk	0	0
		Cement	26	100.00
		Mosaic	0	0
		Tiles	0	0
	Roof	Grass/leaves	0	0
		Sheet	2	7.70
		Tiles	16	61.50
		Concrete	8	30.80
	Number of rooms	One	0	0
		Two	5	19.20
		Three	9	34.60
		Four and Above	12	46.20
	Electrification	Status of Electrification	19	73.10

Sub Caste	Variable	Description	Number	Percentage
Kuruman	Floor	Mud/cow dusk	2	3.70
		Cement	44	81.50
		Mosaic	3	5.60
		Tiles	5	9.30
	Roof	Grass/leaves	1	1.90
		Sheet	1	1.90
		Tiles	16	29.60
		Concrete	36	66.70
	Number of rooms	One	1	1.90
		Two	8	14.80
		Three	28	51.90
		Four and Above	17	31.40
	Electrification	Status of Electrification	51	94.40
Kurichiyan	Floor	Mud/cow dusk	9	11.50
		Cement	55	70.50
		Mosaic	6	7.70
		Tiles	8	10.30
	Roof	Grass/leaves	2	2.60
		Sheet	7	9.00
		Tiles	29	37.20
		Concrete	40	51.20
	Number of rooms	One	8	10.30
		Two	6	7.70
		Three	20	25.60
		Four and Above	44	56.40
	Electrification	Status of Electrification	72	92.30
	Floor	Mud/cow dusk	8	32.00
		Cement	17	68.00
		Mosaic	0	0

Sub Caste	Variable	Description	Number	Percentage
Uraly Kuruman		Tiles	0	0
	Roof	Grass/leaves	0	0
		Sheet	4	16.00
		Tiles	10	40.00
		Concrete	11	44.00
	Number of rooms	One	2	8.00
		Two	8	32.00
		Three	6	24.00
		Four and Above	9	36.00
	Electrification	Status of Electrification	14	56.00
Mala Arayan	Floor	Mud/cow dusk	1	1.10
		Cement	37	41.10
		Mosaic	20	22.20
		Tiles	32	35.60
	Roof	Grass/leaves	0	0
		Sheet	5	5.60
		Tiles	13	14.40
		Concrete	72	80.00
	Number of rooms	One	0	0
		Two	7	7.80
		Three	15	16.70
		Four and Above	68	75.50
	Electrification	Status of Electrification	89	98.90
Muthuvan	Floor	Mud/cow dusk	18	28.10
		Cement	40	62.50
		Mosaic	1	1.60
		Tiles	5	7.80
	Roof	Grass/leaves	3	4.70
		Sheet	11	17.20

Sub Caste	Variable	Description	Number	Percentage
		Tiles	5	7.80
		Concrete	45	70.30
	Number of rooms	One	0	0
		Two	5	7.80
		Three	43	67.20
		Four and Above	16	25.00
	Electrification	Status of Electrification	26	40.40
Irular	Floor	Mud/cow dusk	10	16.10
		Cement	52	83.90
		Mosaic	0	0
		Tiles	0	0
	Roof	Grass/leaves	1	1.60
		Sheet	5	8.10
		Tiles	7	11.30
		Concrete	49	79.00
	Number of rooms	One	0	0
		Two	8	12.90
		Three	34	54.80
		Four and Above	20	32.30
	Electrification	Status of Electrification	55	88.70
Scheduled Tribe (Combined)	Floor	Mud/cow dusk	86	14.40
		Cement	411	69.00
		Mosaic	32	5.40
		Tiles	67	11.20
	Roof	Grass/leaves	18	3.00
		Sheet	52	8.70
		Tiles	120	20.10
		Concrete	406	68.20
	Number of	One	23	3.90

Sub Caste	Variable	Description	Number	Percentage
	rooms	Two	98	16.40
		Three	268	45.00
		Four and Above	207	34.70
	Electrification	Status of Electrification	458	76.80

Source: Primary data

Appendix 2

Schedule Number [ ][ ][ ] District [ ]

(1)Wayanad (2) Idukki (3) Palakkad

Government College, Kodanchery

Interview Schedule for the study of

FINANCING OF HEALTH CARE AMONG MARGINALISED COMMUNITIES OF KERALA

I. General Household Information

1) Block Panchayath [ ] Gram Panchayath [ ]
   Ward No

2) House Name [ ]
3) Sub Caste [ ] *(1) Paniya (2) Adiya (3) Kuruma (4) Kurichya (5)Urali (6) Malayarayarayan (7) Muthuvan(8) Irula*
4) Gender of Head [ ] *(1) Male (2) Female*
5) Main source of employment [ ]
   (1)None (2) Land and related (3) forest related (4) non agricultural labour (5) estate labour (6) employment guarantee scheme (7) govt / semi govt job (8) agricultural labour (9) animal husbandry (10) small vendor (11) private service (12) others (specify)

6) Land holdings : dry land (in cents)[ ] wetland (in cents)[ ] Total land (in [ ] cents)
7) Monthly Income (in Rs):
8) Type of House [ ]
   (1)Unserviceable kucha (2) serviceable kucha (3) kucha (4)semi pucca (5)pucca

9) Roof ☐

(1)grass/ leaves (2) sheet (3) tiles (4) concrete

10) Wall ☐

(1) leaves (2) mud (3) sheet (4) cement/brick

11) Floor ☐

(1) mud/cow dunk (2) cement (3) mosaic (4) tiles

12) Number of rooms ☐

13) Ownership ☐

(1) own (2) government provided (3) partially govt and own (4)others (specify)

14) Electrified ☐

(1) Yes (2) No

15) Plinth area: _____square feet

16) Place of staying ☐

(1) Scattered (2) ST colony (3)others specify

17) Ration card ☐

(1) Yes (2) No

18) Household members

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Sl No	Relation to Head	age	sex	Marital status	Age at marriage	Education	occupation	Monthly income
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

2: *(1) Head (2) spouse of the head (3) son/daughter (4) son/daughter in law (5) grandchild (6) father/mother in law (7) brother/sister in law (8) other, specify*

4: *(1) Male (2) Female*

5: *(1) married (2) unmarried (3) widowed (4) divorced (5) separated*

7: *(1) No education/ illiterate (2) Primary education (3) High school education (4) above high school, specify*
8: *(1)None (2) Land and related (3) forest related (4) non agricultural labour (5) estate labour (6) employment guarantee scheme (7) govt / semi govt job (8) agricultural labour (9) animal husbandry (10) small vendor (11) private service (12) others (specify)*

II. Health Profile and Morbidity History

1) Number of elderly members (60+) : _____
2) Do any member face chronic episodes(diabetes, cancer, BP, Heart ailments, urinary ailments) ☐
   (1) Yes (2) No
3) Do any member face acute episodes ☐
   (1) Yes (2) No
4) Any physically challenged member ☐
   (1) Nil (2) Mental (3) Physical

5) Morbidity history (last 30 days) as reported

1	**2**	**3**	**4**	**5**
Sl No	Any ailments in last 30 days	Type of ailments	Whether treated	If not treated, reason
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

2: *(1) Yes (2) No*
3: *(1) fever of unknown origin (2) asthma and other respiratory diseases (3) cardiovascular (4) high/low BP (5) skin diseases (6) ear/throat/eye ailments (7)*

kidney/urinary system (8) cancer/tumour (9) TB (10) jaundice (11) chicken pox (12) diseases of mouth/teeth/gum (13) accident/injury/fractures (14) diarrhoea/decentry (15)gynaecological disorders (16) sickle cell anaemia (17) diabetics (18) epilepsy (19) anaemia (20) cerebral parsy (21) arthritis (22) gastro enteric disease (23) liver sirosis (24)migraine (25)mental disease (26) others, specify

4: *(1) Yes (2) No*

5: *(1) ailment not considered serious (2) treatment not available in neighbourhood (3) financial reason (4) others, specify*

6) Details of hospitalisation (during last one year)

1	2	3	4	5	6	7	8	9	10	11
Sl No	Ailments that caused IP care	System of treatment	Type of hospital	Recommended days of treatment	Actually taken days	Expenditure on medicine (Rs)	Doctors fee (Rs)	Other treatment cost (Rs)	Transport cost (Rs)	Lodging/hotel expenses
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										

2: *same code as column 3 of question 5*

3: *(1) allopathy (2) ayurveda (3) homeopathy (4) sidha (5) unani (6) other, specify*

4: *(1) PHC/ CHC (2) Govt Taluk/ district hospital (3) Govt Medical College (4) Private Hospital*

7) Whether continue treatment after discharged from hospital ☐

(1) Yes (2) No

8) If yes, source of treatment after discharge from hospital ☐

(1) PHC/ CHC (2) Govt Taluk/ district hospital (3) Govt Medical College (4) Private Hospital/Clinic (5) Govt doctor's residence (6) residence of other doctors

9) Number of work days lost due to illness during the last 30 days: _____

10) Has any member other than the member who fell ill has not been able to go for work due to ailment of the person ☐

(1) Yes (2) No

11) Level of health care need ☐

(1) Low (2) High (3) Very High

12) Household's own perception about its health ☐

(1) Excellent (2) Very good (3) Good (4) Bad (5) Very bad

13) Mortality record during the last one year

1	2	3	4	5
Sex	Age at death	Cause of death	Place of death	Medical attention before death

1: *(1) male (2) Female*

3: *(1) old age related (2) cancer (3) accident/injury (3) pregnancy related (4) infant death (5) communicable diseases specify (6) other, specify*

4: *(1) Home (2) Government hospital/PHC/CHC/Medical college (3) Private hospital/clinic (4) in course of journey*

5: *(1) Received (2) Not received*

III. Medical Treatment

1)Preference of medical system of treatment ☐

(1) Appeasing gods through rituals (2) traditional/ tribal medicine (3) ayurvedic medicine (4) homeopathic medicine (5) allopathic medicine

2)Preference of medical system of treatment for children (only for households with children of the age <16) ☐

(1) Appeasing gods through rituals (2) traditional/ tribal medicine (3) ayurvedic medicine (4) homeopathic medicine (5) allopathic medicine

3)Preference of medical system of treatment for aged (only for households with aged >60) ☐

(1) Appeasing gods through rituals (2) traditional/ tribal medicine (3) ayurvedic medicine (4) homeopathic medicine (5) allopathic medicine

4) Pattern of utilisation of health care for inpatient treatment ☐

(1) PHC/ CHC (2) Govt Taluk/ district hospital (3) Govt Medical College (4) Private/trust Hospital/clinic (5) pharmacy(6) Govt doctor's residence (7) residence of other doctors

5)Most important reason for selecting a system of medical treatment ☐

(1) Quick remedy (2) no side effect (3) less cost (4) easy access

6) If illness occurs, do you resort to self medication ☐

(1) Yes (2) No

7) The stage at which household visit the doctor ☐

(1) Very beginning (2) after trying over the counter medicines from medical shops (3) after trying tribal medicine (4) when disease gets worsen

8)Most important reason for selecting private hospital/clinic (only for households with code 4 for question 4) ☐

(1) Better facilities/ behaviour (2) doctors (3) accessibility/distance (4) financial reasons (5) other, specify

9)Reason for not using public/government institution (only for households with code 4 for question 4) ☐

(1) Non availability of drugs (2) lack of proper attention (3) lack of trust (4) distance (5) lack of knowledge (6) lack of facilities (7) other, specify

10) Reason for not seeking health care ☐

(1) Financial reason (2) remoteness of health care facilities (3) unavailability of accompanying person (4) other, specify

11) Share of different providers during the last 30 days of outpatient treatment

Type	Number of visits
Public/ Government Hospital, PHC, CHC	
Private formal providers	
Private informal providers	
Total Number of visits	

12) Is there is any change in the system of medical treatment followed by households ☐

(1) Yes (2) No

13) If, yes the reason for change ☐

(1) Duration of healing (2) cost of treatment (3) facility is not available (4) lack of confidence (5) other, specify

14) Would you seek speciality care when ill ☐

(1) Yes (2) No

IV Financing Pattern and Coping Mechanism

1) Pattern of direct OOP expenditure during the last 30 days

Item	**Amount**
Direct medical expenditure (consultation, tests, medicines, surgery)	
Expenditure on transportation	
Expenditure on accommodation	
Miscellaneous expenses	
Total	

2) Most important component of OOP ☐

(1) Purchase of medicines (2) diagnostic tests (3) travel (4) accommodation/hotel expenses (5) consultation fee (6) other, specify

3) Do the household have RSBY health card ☐

(1) Yes (2) No

4) If, yes do they avail treatment using health card ☐

(1) Yes (2) No

5) Do household have any other insurance coverage ☐

(1) Yes (2) No, if yes specify

6) Most important form of coping mechanism to meet OP visit ☐

(1) used savings (2) donations from friends/relatives (3) borrowing (4) sold assets (5) sold consumables (6) other, specify

7) Most important form of coping mechanism to meet hospitalisation expenditure ☐

(1) used savings (2) donations from friends/relatives (3) borrowing (4) sold assets (5) sold consumables (6) other, specify

8) Do household resort to borrowing for treatment ☐

(1) Yes (2) No

9) If yes, sources of borrowing ☐

(1) Friends/relatives (2) merchants (3) money lender (4) bank (5) kudumbashree (6) other, specify

10) Do household sold any productive asset for treatment ☐

(1) Yes (2) No

11) Consequences of indebtedness from health care expenditure ☐

(1) Lost permanent income asset (2) lost educational opportunities (3) suicides (4) sold assets (5) mortgaged assets (6) other, specify

12) Is there any prevailing indebtedness on account of treatment ☐

(1) Yes (2) No

13) Any amount received to be received as reimbursement ☐

(1) Yes (2) No

IV Accessibility

1) Distance to the nearest health sub centre (in kilometres):
2) Distance to the nearest Primary Health Centre (in kilometres):
3) Distance to the nearest Community Health Centre (in kilometres):
4) Distance to the nearest private hospital (in kilometres):
5) Distance to the nearest government hospital (in kilometres):
6) Distance to the nearest ayurvedha hospital (in kilometres):
7) Distance to the nearest homeo hospital (in kilometres):
8) What is the distance to the tarred road (in metres) :
9) Type of conveyance to the health care institution (PHC/CHC) ☐

(1) by walk (2) by bus (3) own vehicle (4) rented vehicle (5) other, specify

10) Frequency of bus service to the next town ☐

(1) less than one hour (2) every hour (3) one in two hours (4) more than two hours

11) What is the time taken to reach bus stop (in minutes):

12) What is the time taken to reach a point to catch a jeep/auto/ any vehicle other than bus (in minutes):

V Child and Maternal Care

1) Whether children received vaccination ☐

(1) Yes (2) No

2) If yes source of vaccination ☐

(1) Government agency (2) private agency (3) other, specify

3) Whether child registered for paediatric care ☐

(1) No (2) in government hospital (3) in PHC/CHC (4) with doctor (5) in private hospital (6) other specify

4) Infant feeding practices

(1) breast feed (2) bottle feed (3) both

5) Details of pregnancy during the last one year

1	2	3	4	5	6	7
Sex of the baby	Weight of child at birth (in Kg)	Whether registered for prenatal care	Place of delivery	If not in the hospital, reason	Cost of delivery	Financing of delivery

1: *(1) male (2) female*

3: *(1) no (2) PHC/CHC/Govt hospital (3) with doctor (4) other, specify*

4: *(1) home (2) government hospital (3) private hospital (4) other, specify*

5: *(1) distance (2) not affordable (3) preference (4) other, specify*

7: *(1) current income (2) used savings (3) donations from friends/relatives (4) borrowing (5) sold assets (6) sold consumables (7) other, specify*

VI Health and Hygiene

1) Do anybody use tobacco/panmasala in the household ☐
   (1) never (2) rarely/sometimes (3) often/always
2) Do anybody use alchohol in the household ☐
   (1) never (2) rarely/sometimes (3) often/always
3) Do anybody use opium/charas in the household ☐
   (1) never (2) rarely/sometimes (3) often/always
4) Major source of drinking water ☐
   (1)own well/tube well (2) public well/tube well (3) public tap (4) public pond (5) river (6) oli (7)other, specify
5) Distance to the source of drinking water (in meters):
6) Is latrine facility is available in the household ☐
   (1) Yes (2) No
7) Status of sanitary latrines ☐
   (1)no latrine (2) without door (3) without roof (4) with roof and door, but no water connection (5) with roof, door and water connection
8) Animal shed in the same premises ☐
   (1) Yes (2) No
9) Do you wash your hands before having food ☐
   (1) rarely (2) sometimes (3) most of the time (4) systematically always
10) Number of square meals a day ☐
   (1) one (2) two (3) three (4) four and above
11) Drinking water treatment ☐
   (1) no treatment (2) boiling (3) cloth screen (4) any disinfectant
12) Do surroundings are waterlogged ☐
   (1) Yes (2) No
13) Do household face threat from wild animals ☐
   (1) Yes (2) No