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**Université de Montréal**

**Gender bias in children's  
health care utilisation in Kerala, India**

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**Mémoire présenté à la Faculté des études supérieures  
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## **ABSTRACT**

A large body of evidence indicates that boys are favoured over girls in India. The Southern State of Kerala is known for its tremendous social progress against gender disparities, as illustrated by its high female-to-sex ratio. Recently, raises in health expenditures have created a high economic burden on households, in a context where no insurance is present. As a result, families are forced to make consumption choices with regards to health. This study analyses gender and social stratification dynamics vis-à-vis health care utilisation outcomes for children based on self-reported episodes of illness. The authors drew on a one-year panel survey data conducted in Northern Kerala to ascertain the extent of gender discrimination in health care utilisation.

Two main patterns have emerged from this study. Firstly, it appears that Keralite boys are twice more likely than girls to be treated, to have shorter delays, and to be seen by a private practitioner when afflicted with a severe episode of illness. Secondly, gender gaps in all outcomes varied across social groups, where girls from low-class, poor and uneducated families were most disadvantaged.

Despite Kerala's affirmative actions for social equity, gender inequalities in health care utilisation among children have persisted. A combined gender and social lens needs to be applied if the health dimension is to be further examined in Kerala. Standard gender analysis of health care utilisation patterns may miss the actual processes at work.

**Key words:** gender discrimination, gender inequalities, child health, social stratification

## RÉSUMÉ

Plusieurs évidences indiquent que les garçons sont favorisés par rapport aux filles en Inde. Le Kerala, état du Sud, est reconnu pour son progrès social dans la lutte contre la discrimination féminine. Récemment, une augmentation des coûts en santé a créé un fardeau économique important sur les ménages en l'absence d'un régime d'assurance. Par conséquent, les familles doivent faire des choix économiques en matière de santé. Cette étude analyse les dynamiques liées au genre et à la stratification sociale par rapport aux extraits d'utilisation de soins de santé parmi les enfants, en se basant sur des épisodes de maladie rapportés. Les auteurs ont utilisé les données d'une étude de panel d'une durée d'un an, effectuée au nord du Kerala pour déterminer le degré de discrimination dans l'utilisation des services de santé.

Les résultats démontrent que les garçons sont systématiquement deux fois plus avantagés que les filles, dans l'avènement d'une visite médicale, avec un plus court délai ainsi qu'avec une propension deux fois plus grande de recourir à des services privés. De plus, les écarts entre filles et garçons varient selon la stratification sociale pour toutes les variables dépendantes.

Malgré les efforts investis, les inégalités de genre en ce qui a trait à l'utilisation des services pour les enfants persistent dans cet état. Afin de mieux comprendre ce phénomène, il est important d'employer un cadre d'analyse incorporant l'interaction entre le genre et la stratification sociale.

Mots-clés : discrimination du genre, inégalités de genre, santé des enfants, stratification sociale

## TABLE OF CONTENTS

APPROVAL FROM CO-AUTHORS.....	iii
ABSTRACT.....	iv
RÉSUMÉ.....	v
TABLE OF CONTENTS.....	vi
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
LIST OF ABBREVIATIONS.....	xi
DEDICATION.....	xii
ACKNOWLEDGEMENTS.....	xiii
1 INTRODUCTION.....	1
2 LITERATURE REVIEW.....	6
2.1 METHODOLOGY OF LITERATURE REVIEW.....	6
2.2 SETTING THE CONTEXT.....	7
2.2.1 <i>Women and female children in India</i> .....	7
2.2.2 <i>The Indian caste system</i> .....	9
2.2.3 <i>Overview of Kerala</i> .....	12
2.2.4 <i>State of Kerala: model of development</i> .....	13
2.3 STATUS OF WOMEN IN KERALA.....	14
2.3.1 <i>Legacies of matriliney</i> .....	14
2.3.2 <i>Women and female children in Kerala today</i> .....	15

2.3.4	<i>Sex preference in the Indian and Keralite contexts</i> .....	17
2.4	GENDER DISCRIMINATION AND HEALTH CARE UTILISATION.....	20
2.4.1	<i>The meaning of gender inequalities and inequities in health</i> .....	20
2.4.2	<i>The pervasiveness of gender discrimination in health care utilisation</i> .....	20
2.4.3	<i>Gender discrimination in health care utilisation in Kerala</i> .....	22
2.5	FACTORS INFLUENCING GENDER GAPS IN HEALTH CARE UTILISATION.....	23
2.5.1	<i>Maternal characteristics</i> .....	23
2.5.2	<i>Sex composition of sibship and birth order of child</i> .....	24
2.5.3	<i>Household socioeconomic status and class</i> .....	26
2.6	KNOWLEDGE GAPS.....	27
3	CONCEPTUAL FRAMEWORK.....	29
3.1	CONCEPTUALISATION.....	29
3.1.1	<i>Health-seeking behaviour</i> .....	29
3.1.2	<i>Framework</i> .....	31
3.2	RESEARCH OBJECTIVES AND HYPOTHESES.....	33
3.2.1	<i>Research objectives</i> .....	33
3.2.2	<i>Hypotheses</i> .....	34
4	METHODS.....	35
4.1	ETHICAL CLEARANCE.....	35
4.2	STUDY POPULATION AND SOURCE OF DATA.....	35
4.2.1	<i>Study site</i> .....	35
4.2.2	<i>Study design</i> .....	37
4.2.3	<i>Data collection</i> .....	38
4.2.4	<i>Sample</i> .....	39
4.3	VARIABLES.....	43
4.3.1	<i>Dependent variables</i> .....	43
4.3.2	<i>Independent variables</i> .....	43



	4.3.3	<i>Sibship characteristics</i> .....	44
4.4		STATISTICAL ANALYSES.....	46
	4.4.1	<i>Descriptive statistical analyses</i> .....	46
	4.4.2	<i>Models for severe episodes of illness as observation units</i> .....	46
	4.4.3	<i>Models for children as observation units</i> .....	47
5		RESULTS: ARTICLE.....	48
6		OTHER DISCUSSION ELEMENTS.....	75
	6.1	HYPOTHESES.....	75
		6.1.1 <i>Gender differences in children's health care utilisation</i> .....	75
		6.1.2 <i>Gender gap variations across social groups</i> .....	76
	6.2	METHODOLOGICAL LIMITATIONS.....	77
		6.2.1 <i>Perception bias</i> .....	77
		6.2.2 <i>Control variables</i> .....	78
		6.2.3 <i>External validity</i> .....	79
		6.2.4 <i>Direction for future research</i> .....	79
	6.3	GENERAL COMMENTS.....	79
7		CONCLUSION.....	81
		REFERENCES.....	83
		APPENDIX 1: CLASSIFICATION OF SYMPTOMS.....	xiv
		APPENDIX 2: OUTPUTS OF STATISTICAL MODELS.....	xvi

## LIST OF TABLES

Table 1: Demographic characteristics of the populations of Kerala and India.....	14
Table 2: Evolution of child sex ratio from 1961-2001.....	17
Table 3: Empirical and operational definitions of dependent variables.....	32
Table 4: Empirical and operational definitions of independent variables.....	33
Table 5: Dependent and independent variables classified by observation unit.....	42
Table 6: Distribution of sibship configurations across sample.....	45
Table 7: Distribution of Severe Episodes of Illness by Diagnostic Categories.....	xv
Table 8: Outputs of models for occurrences of outpatient visits.....	xvi
Table 9: Outputs of models of occurrences of outpatient visits on first day of illness episode.....	xviii
Table 10: Outputs of models of occurrences of private outpatient visits.....	xx
Table 11: Outputs of models of health expenses per severe episode.....	xxii
Table 12: Outputs of models of health expenses per child per year.....	xxiv

## LIST OF FIGURES

Figure 1: Map of India with Kerala highlighted.....	12
Figure 2: Trends in adult sex ratio for India and Kerala by census years.....	15
Figure 3: Conceptual framework.....	31
Figure 4: Episodes of illness within the context of window of observation and censoring..	37
Figure 5: Multilevel structure of panel data.....	39
Figure 6: Episodes of illness recorded in panel survey by severity.....	40
Figure 7: Number of children who fell ill during study period.....	41

## LIST OF ABBREVIATIONS

BJP	Bharatiya Janata Party
FC	Forward Castes
GDI	Gender-Related Development Index
HDI	Human Development Index
OBC	Other Backward Castes
OP	Outpatient
OR	Odds Ratio
SC	Scheduled Castes
ST	Scheduled Tribes
ST/SC	Scheduled Tribes/Scheduled Castes
UNDP	United Nations Development Program
WB	World Bank
WHO	World Health Organization

À Maman et Papa qui m'ont

soutenue jusqu'à la fin

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# 1 INTRODUCTION

In many patriarchal societies, sons are favoured over daughters. This gender preference, largely influenced by the social context, may be expressed in various manners. For example, parents may desire the birth of male rather than female children. In extreme cases, phenomena such as female foeticide and infanticide can unfold as a result of this gender preference. Secondly, sons may benefit from greater access to economic opportunities, education, and health services. Unfortunately, these established gender norms and values counteract with the biological advantage female children have resulting in a lower probability of surviving the first five years for girls in comparison to boys in some parts of the world (1). In addition, "gender discrimination at each stage of the female life cycle contributes to health disparity, sex-selective abortions, neglect of [female] children [...] and poor access to health" services for women and girls (1). The practice of sex-selective abortions occurring globally but more particularly in India, China and South-East Asia, has resulted in a lack of at least 100 million female children, commonly labelled as "missing girls," (2). In India, gender discrimination has been reported to occur widely in Northern states as illustrated by the alarming national female-to-male sex ratio (933 women for 1000 men), which has remained unbalanced for the past 100 years. In some parts of the Indian Union, the sex ratio has fallen as low as 770 women per 1000 men (1). For those female children whom are given the opportunity to live, oftentimes they have poor educational, health and nutritional access (3).

A small but significant body of research has illustrated that gender gap inequalities vary across social groups, being most pervasive among socially disadvantaged communities. Women from poor, less educated, and/or low-class households concomitantly suffer from economic and social exclusion while confronting adverse gender norms (4-7). One study,

in particular, conducted in rural Karnataka, showed that the adult gender gap among poor groups, with respect to non-treatment and discontinuation of treatment, doubles in magnitude compared to non-poor groups (4). Another study in India demonstrated that the female-to-male child mortality ratio among low classes, mostly comprised of indigenous groups, is twice than what is seen among upper classes (5). A cross-sectional survey conducted in India on elderly populations revealed that the gender gap in health care utilisation varied with financial empowerment of older women, being greatest among most economically dependent women (7).

An important policy prescription for ameliorating female children's status in India is to enhance their educational attainment. Human capital theory suggests that education and training are significant determinants of employment and earnings (8). The Southern state of Kerala exhibits top literacy rates among men (94%) and women (88%) in India. In 1997, the UNDP ranked Kerala highest among all Indian states based on the HDI<sup>1</sup> and the GDI<sup>2</sup>. Additionally, Kerala outperforms India in a multitude of social development dimensions. A low infant mortality (16 per 1000 live births), a high life expectancy at birth (73.3) as well as a high adult female-to-male ratio (1058 women for 1000 men) are examples of Kerala's progress in human development in 2005 (9). Thus, it is generally perceived that gender disparities in health are less pervasive albeit present in this state in comparison to India.

Yet other social and health indicators sketch a dismal picture of women in Kerala. A four-fold increase in crimes against women over the past 10 years has been documented. Over 25% of these felonies consisted of either molestation or rape. Sakhi—the Women's Association of Thiruvananthapuram—has flagged the augmentation of physical and sexual

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<sup>1</sup> The HDI measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, knowledge and a decent standard of living.

<sup>2</sup> The GDI is a composite index that measures human development in the same dimensions as the HDI while adjusting for gender inequality in those basic dimensions.



abuse cases against female children reported in local newspapers. Suicide trends in Kerala, for the past decade, suggest that dowry disputes and divorces are primary reasons for suicide in women. Although women in Kerala are far more educated than Indian women (88% for Kerala versus 54% for India), their workforce participation rate (22.9%) is lower than the national average (25.4%). Such information challenges the assumption that minimal gender gap in basic capabilities, as witnessed in Kerala, results in a greater well-being for women and female children. Rather, it shifts the spotlight on the social context that shapes gender roles in Kerala.

For the past two decades, Hindu right-wing and conservative associations, such as the Bharatiya Janata Party (BJP), have emerged on the national and state-level political scenes, giving rise to the *hindutva*<sup>3</sup> movement. A mix of religious and cultural premises that emulates patriarchal as well as nationalistic value-systems influences this school of thought. The repercussions of this macro-influence have impinged on the public and private spheres of Keralite men and women. As a result, concepts such as citizenship, class, gender and race have been renewed.

The reformulation of the aforementioned concepts becomes a crucial element in the overall picture as Kerala has experienced a strong decentralization movement providing a setting where both local government and community participation co-exist. However, consequences of this political amendment have partially resulted in increasing health care expenditures and thus affected health care utilisation patterns—despite the fact that Kerala has the highest density of public and private medical facilities in India. Households are forced to make difficult choices and outweigh the consequences of each option to safeguard the economic assets of the family, in a setting with no insurance is provided and

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<sup>3</sup> This movement seeks to reinvigorate and establish an authentic "Hindu" culture and identity.

expenses are made out-of-pocket. Consequently, an urgency to address considerations around access and utilisation to health care is thus felt.

The paradoxical evolution of Kerala—on one hand, a tremendous progress in human and social development and on the other hand, a rise in violence and crimes against women and female children—compounded with macro-influences such as the *hindutva* movement and increasing health care expenditures heightens the importance of examining potential gender inequalities in health. Few studies have examined gender discrimination in health care utilisation in Kerala. A select few of these have focused on children's health care utilisation patterns; however, they are limited in scope and the yielded results do not converge in a single conclusion.

Given the need for evidence on gender differences, this research study seeks to analyze the phenomenon of gender discrimination in children's health care utilisation patterns in the particular context of Kerala. As the scientific literature has shown, gender discrimination can have lifelong harmful consequences for female children (1). It is thus important to investigate such phenomenon, well knowing that it is prevalent in other states of India. This thesis will proceed in three parts. The first part commences with a brief description of the Indian and Keralite contexts in terms of demographic composition, human and economic development and the historical underpinnings that have contributed to the position of women in Kerala. We then review the existing literature on gender inequalities in children's health care utilisation. It is followed by a proposal of conceptual framework serving as a lens for this study. The second part consists of a description of the methods used in this study and the presentation of yielded results using the format of a scientific paper. The third part discusses the presented results and concludes with policy

and research implications for health care systems of Kerala and other developing countries.

We hope that the results of this study will contribute to a better understanding of gender inequalities in health care utilisation among Keralite children. As opposed to previous cross-sectional studies, longitudinal data are used for analysis. It is our hope that the results of this study will better inform and influence policy-making processes. This research project is a modest attempt at deciphering an understudied research topic in Kerala.

## **2 LITERATURE REVIEW**

In this section, we will review the scientific literature on gender discrimination in health care utilisation among children. The first part details the methods developed to conduct this literature review. The second part consists of a description of the particular context of India and Kerala. We provide an overview of its demographic, economic and social characteristics. The third part begins with a summary of the historical underpinnings resulting in the present status of Keralite women, which is then examined. A discussion on sex preference is also included in this section. The fourth part discusses the relationship between gender and health care utilisation. The fifth part closely examines the care-seeking process and important determinants of health care utilisation pertinent to the Keralite context. Finally, we conclude by identifying some gaps in scientific knowledge about the influence of gender on children's health care utilisation patterns. Throughout this review, an effort is made to systematically position Kerala in relation to India and to highlight the extent of pervasiveness of gender bias in children's health care utilisation within the Keralite and Indian contexts.

### **2.1 METHODOLOGY OF LITERATURE REVIEW**

We conducted this scientific literature review with the intent of identifying determinants of health that influence or modify the gender gap in children's health care utilisation. We searched databases such as Blackwell Synergy, CINAHL, EconLit, MEDLINE, Sociological Abstracts, Studies on Women and Gender Abstracts and Web of Science (ISI). Keywords—with or without combination—included the following: children, gender, gender bias, gender discrimination, gender gap, India, health, health care utilisation, household allocation, Kerala, sex preference, South India and women. We also hand-searched journals such as Gender & Development, Health Care for Women International, Journal of

Human Development, Reproductive Health Matters and Social Science & Medicine. We thus retrieved a total of 104 articles from these searches, of which 44 are included in this literature review, as only articles directly addressing our research study were retained. In addition, we privileged research studies taking place in Southern India. We also consulted gray literature—UNDP, CensusIndia, Census Kerala, WB and WHO reports.

## **2.2 SETTING THE CONTEXT**

### **2.2.1 Women and Female Children in India**

“From many perspectives women in South Asia find themselves in subordinate positions to men and are socially, culturally, and economically dependent on them” (1). Women have limited decision-making power, poor access and control over resources, are restricted in their mobility and are often subjected to violence and abuse.

Authors describe gender discrimination as a life-long process (1). Indeed, gender discrimination occurs at different stages of the life cycle: pre-natal, early childhood, adolescence and adulthood. India is known for its imbalanced sex ratio: indeed, there are on average 933 females for 1000 males and it is known to contribute a large proportion of the “missing girls”<sup>4</sup> (10). A number of studies have also found evidence of gender discrimination across various dimensions. For example, a study looking at the effect of a decline in fertility on gender discrimination shows that in some extreme cases, female children are subjected to infanticide or foeticide (11). In the case of India, a study found that sex differentials in child mortality are 10% higher in Northern than in Southern India, and they attribute this difference to variations between Northern and Southern kinship systems (12). In May 1995, Adithi, a non-governmental organisation working in Bihar,

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<sup>4</sup> The “missing girls” phenomenon refers the lacking 60-100 million of girls due to sex-selective abortion and/or female infanticide.

carried out a study with traditional birth attendants. From the focus group discussions with traditional birth attendants called "dais," it seemed that they were often called on to kill female children (13). Since the advent of diagnostic techniques permitting the recognition of the foetal sex, prenatal selection of male embryos has increased in numbers (1). In 2002, a community-based rural study in Southern India has also demonstrated the high incidence of unsafe abortions (28%) performed mostly by outdated modern methods as well as traditional practices (14). Reasons evoked by women were related to the fact that sex-selective abortions are a taboo subject.

In addition to discrimination in terms of the excessive mortality of females, girls who remain are subjected to other forms of discrimination, such as in the allocation of food and in the access to health services (15). For instance, a cross-sectional survey conducted in the Pune district of the state of Maharashtra shows that significantly more boys (88.9%) than girls (76.5%) were treated by a registered private medical practitioner (OR=2.51) when ill (16). Further evidence and discussion of this type of discrimination will be provided in section 2.4.2. In addition, they are given poor educational opportunities and recently, the literature has shown an increase in the prevalence of mental health illnesses among Indian women (1). Some authors believe that dowry-related disputes may be related to a large proportion of the high suicide rates recorded in India (17).

Gender-based health differences in South Asia are believed to be associated to underlying factors that have been mentioned in the literature for the past two decades: decreasing fecundity, son preference, dowry practices and marginalisation of women in agriculture (11). These factors are linked to the lack of economic and social utility attributed to girls. Indeed, societal norms within the Indian context make the cost of having a daughter so high that families may not be able to cope economically and thus see no income value in

having a daughter. In addition, sons are charged with the responsibility of caring for the parents' needs when they grow older. Attempts to address gender disparities in health care utilisation within the Indian context must take into account these underlying issues. The above is a description of gender differences within the Indian context; the following will further explore documented disparities on the basis of social stratification, which in the case of India, relates to the caste system.

### **2.2.2 The Indian Caste System**

This sub-section provides an overview of the caste system in India as the literature describes this indicator as a fundamental element of comprehension of the Indian context.

The Indian caste system is a traditional social stratification system in which each class is determined by a number of endogamous and hereditary factors. In India, approximately 82% of the population adheres to the caste system (18). An individual's caste is defined by his hereditary membership and specific lifestyle such as a particular occupation (19). In addition, individuals can only marry within his or her own caste. Although the Indian constitution has formally outlawed caste-based discrimination, the caste system still largely influences the Indian social context. The literature is unclear about the origins of the caste system in India: some authors claim that the Indo-Aryan migrants have established it in order to place themselves primarily in higher ranks. However, this fact is oftentimes contested.

According to the ancient Hindu scriptures, there are four *varnas* or classes within society and within each *varna* are different *jatis* or castes. The Brahmins (teachers, scholars and priests), the Kshatriyas (kings and warriors), the Vaishyas (traders) and the Shudras (agriculturists, service providers and some artisan groups) constitute the four *varnas*.

Members of each *varna* belong to different *jatis*. The caste system excludes, however, a group of people that are communally called the “untouchables” (now called Dalits). The Dalits work in what is seen as unhealthy, disgusting or polluting jobs. Oftentimes, Dalits experienced severe forms of poverty and social exclusion. For example, if a member of a higher caste came into physical or social contact with an untouchable, this individual was defiled and had to bathe thoroughly to purge her/himself of the impurity of the untouchable.

Since the abolition of untouchability, the socioeconomic conditions of the lower castes have shown some improvements. They are largely due to increased political power and the establishment of social policies positively discriminating these groups in terms of education, employment and health. For example, untouchables, now called scheduled castes (SC), are allotted reserved places in government employment and educational institutions to increase the relative importance of the SC.

As opposed to the SC, tribes are distinct from the Hindu caste system and there are more than 50 million Indians that belong to tribal communities in India (20). Many tribes have cultural, social and religious practices as well as languages that differ from known groups in India. Tribal populations are essentially found in the forested, hilly and mountainous areas. The Government of India Act of 1935 stipulated that areas with high concentration rates of tribes were classified as “excluded” or “partially excluded” and were as such defined as scheduled tribes (ST). Similar to policies socially benefiting the SC, the ST are also provided with monetary assistance in the form of scholarships and stipends but exhibited the lowest literacy rates in India. Such low rates have been explained by physical inaccessibility as well as language and cultural differences. In spite of the established policies that positively discriminate tribal populations in India, human development



indicators of these populations clearly demonstrate their social disadvantage within the India society.

The Indian government uses a specific classification system of caste used when surveys are being conducted. The high castes are designated as *Forward Castes (FC)* and individuals belonging to this category usually stem from the traditional elites of Indian society. Lower castes are divided into two categories: *Scheduled Castes* previously known as the “untouchables” and *Other Backward Castes (OBC)*. There are also Scheduled Tribes who do not fall within the caste system. The official classification system in India has three categories: Schedules Castes and Scheduled Tribes (SC/ST), OBC and FC.

A previous cross-sectional survey conducted by our team in Kottathara Panchayat (study site) demonstrated lack of sufficient discrimination among caste groups within the Panchayat due to the heterogeneity of these three broad categories (21). Specifically, the Paniya tribal group demonstrated a much higher level of deprivation compared to other tribal groups. For example, although Paniyas represent only 12% of the total Panchayat population, they constitute almost 25% of the households suffer from extreme poverty. Additionally, three quarters of the Paniya families own less than 10 cents of land and 14% own no land at all. As such, a modified classification system is utilized in our study where four instead of three categories are used to designate the caste of the household. The fourth category is solely comprised of Paniyas due to their particular characteristics distinguishing them from the rest of the communities living in Kottathara Panchayat. While the above two sections have provided an overview of the national context, the following is a more detailed description of the Keralite environment.

### 2.2.3 Overview of Kerala

Kerala, one of the four southern states and located in the South-West part of India (see Figure 1), was formed in 1956 as a result of the fusion of three Malayalam-speaking regions: the princely states of Travancore and Cochin as well as the Malabar district of the Madras Presidency. Its land area is 38,863 sq. km, stretching 580 km in length and 30-130 km in breadth. It comprises 3.1% of the total Indian population (31.9 millions) but holds only 1.2% of the total national land, thus accounting for its high population density of 819 persons per sq. km. (17). Kerala has predominantly three religions: Hinduism, Islam and Christianity. Since its inception, Kerala's economy was essentially agrarian since the climate is favourable resulting in high-agricultural produce per hectare. In the Kerala Human Development Report of 2005, it indicates that the primary sector accounts for only 26 percent of the State income and 32 percent of employment (9). The level of urbanization in Kerala is the same as the Indian average (26%), with three out of four people living in rural areas. However, due to Kerala's high population density, the delimitation between urban and rural areas is not always clear. On the political scene, Kerala differs from the rest of the Indian Union partly due to its striking feature of high political activism among and within community members. Presently, the Communist Party of India (CPI) forms the state-level Government and has been ruling this State for the past 50 years.

Figure 1: Map of India with Kerala Highlighted



Source: Kerala HDR (2005)

#### **2.2.4 State of Kerala: “Model of Development”**

Kerala has been characterized as a unique model of development (9, 17). Indeed, it is well-known for its high female literacy (88%), low level of infant mortality (16 per 1000 live births), its high life expectancy at birth (73.3), as well as its high adult female-to-male ratio (1058 women for 1000 men), making this state comparable to industrialized countries in regards to these specific indicators (9) (see Table 1). “Further, Kerala is much ahead of other Indian States in achieving the goal of universalising elementary education,” (9). Kerala ranked first among major Indian states in the Human Development Index in 1981, 1991 and 2001 with a per capita income lower than the national average up until recently<sup>5</sup> (22). Success in achieving high quality of life and tremendous progress in human development without much economic growth raised Kerala to the status of “model of development” and initiated a paradigm shift in development thinking (17). However, the sustainability of such a model has been contested in the literature. Significant drives of the social development of Kerala consisted of Government resource allocations to related infrastructures (i.e. education and health) as well as substantial remittances from non-Keralite residents from other parts of India and abroad. “The feasibility of continued State financing of social services was put under pressure, especially following the fiscal pressure felt across Indian States from the mid-1980s,” (9). Nonetheless, since the late 1980s, a revival of Kerala’s economy occurred when all three sectors—primary, secondary and tertiary—presented an impressive growth momentum. As a result, fears of sustainability were exchanged for a collective reinforcement of the Kerala image of progress in the realms of social and human development.

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<sup>5</sup> According to the 2005 Human Development Report of Kerala, the net domestic product per capita for Kerala is presently higher than the national average. Before the 1990s, the economy of Kerala was not performing as well as India.

Table 1: Demographic characteristics of the populations of Kerala and India

Indicator	Kerala*	India**
Population (in millions)	31.9	1103
Density of population (people/km <sup>2</sup> )	819	324
Urban population (%)	26	27.6
Sex ratio (females/1000 males)	1058	933
Fertility rate (children/childbearing woman)	1.9	2.7
Mean household size (individuals)	4.7	5.3
Per capita income (Indian National Rupees)	22,776	20,989
Human Development Index (HDI)	0.638	0.611
Gender-related Development Index (GDI)	0.825	0.591
Literacy rate, male (%)	94.2	75.6
Literacy rate, female (%)	87.9	54.0
Crude death rate (deaths/1000 midyear population)	6.3	8
Infant mortality rate (deaths/1000 live births)	12	56
Life expectancy at birth, male (in years)	70.9	61
Life expectancy at birth, female (in years)	76	63.5
Hospital beds (per 100000 people)	147	96

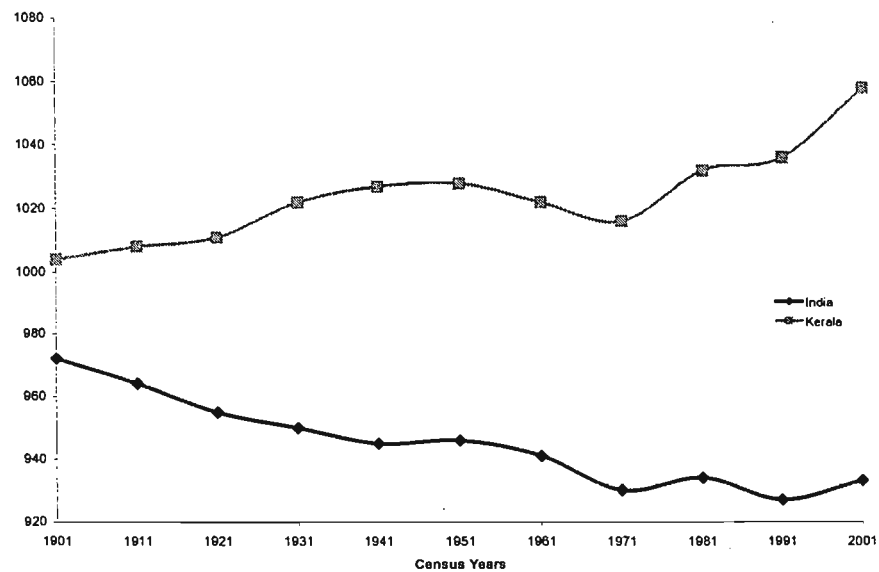
Source: \*Kerala Human Development Report (2005) and \*\*WHO (2005)

## 2.3 STATUS OF WOMEN IN KERALA

### 2.3.1 Legacies of Matriliny

When examining the GDI, Kerala is ranked highest among all Indian states. Several authors refer to increasing adult sex ratios over the past century (see Figure 2) as an indication of tremendous progress achieved in the realm of gender issues, which, according to these authors, confer Keralite women a particular status within society (23). However, one study suggests that this particularly high sex ratio is partially due to high male emigration (mostly young professionals) from Kerala as well as high proportions of women aged above 50 years. Keralite women's status results from a myriad of factors such as a tradition for matrilineal kinship systems, a history of education and strong social mobilization within the political arena.

Figure 2: Trends in Adult Sex Ratio for India and Kerala by Census Years (number of females by 1000 males)



Source: CensusIndia

Although legally dismantled in 1976, the matrilineal tradition has prevailed among some Keralite groups until well into the last century. All groups did not practice matriliney and albeit families were organised through the female line, the household decision-makers were men. Nonetheless, matriliney also meant that women could appear in public, speak to men and show initiative in all domains of life (i.e. economic, familial, political and social). The matrilineal system was instrumental in consolidating the social development of Kerala as it provided a strong platform from which the communism movement expanded (23). Women were also central to these development results as teachers, as educated wives and as political activists. "Matriliney did not make women rulers of their families, but it did allow some of them a remarkable latitude unknown elsewhere in India," (23).

### 2.3.2 Women and Female Children in Kerala Today

Despite the remarkable progress in human development, social and gender differentials in health prevail in Kerala (17, 24). For example, Keralite women's health status varies across caste and socioeconomic position (25). Women originating from scheduled castes

and scheduled tribes have almost 50% greater odds to report restrictions in daily living than women from forward castes (OR=1.45) (25). These conclusions have been drawn from self-reported data. It has also been documented that Keralite women choose to pursue careers that are in line with traditional gender roles such as nursing and primary/secondary education because the nature of the work appears more “natural” to women. Also, several studies have documented a rise (from 200 to 3500 cases) in reported atrocities committed against women in Kerala. In early 2007, the Indian government approved a federal legislation protecting women against domestic violence. Nonetheless, it was not well advertised in Kerala and many women’s associations are attempting to promote the new law within the general population. Indeed, commercials broadcast on state-level television channels have portrayed the new legislation as a disadvantage to men by making statements such as “now, us men, we will have to ask permission to our wives prior to entering the bedroom.” Also, despite the adult sex ratio favouring women, one study suggests that it is partially due to high male emigration (mostly young professionals) from Kerala as well as high proportions of women aged above 50 years (26).

Furthermore, gender differentials in children are also present. For example, a deterioration of survival for female children in 12 districts of Kerala from 1981 to 1991 (26), a decline in the child sex ratio (see Table 2) and a sex ratio at birth favouring boys in 9 districts of Kerala in 1991 (26) suggest that perhaps the social context in which few or no gender disparities were previously recorded has been altered. It is to be noted that biologically speaking, the sex ratio at birth should favour male children over female but a sex ratio higher than 104 boys for 100 girls suggests a preference for the male child. Additionally, young boys have a much more fragile constituency than young girls up until the age of 5 years and more specifically during the first year of life. Thus, it is expected that boys

should naturally exhibit higher mortality rates in the 0-1 year age group. Many authors widely recognise that the sex ratio at birth is, in principle, a factor that contributes to both the level and trend of the overall sex ratio, thus displaying the importance of examining such statistics. Decreasing sex ratios at birth have been a major concern in many different states in India; a large pool of evidence suggests that phenomena such as sex-selection and female infanticide practices have been the cause for such decline in many Indian states.

Table 2: Evolution of Child Sex Ratio from 1961-2001 (Girls per 1,000 Boys Aged 0-6 Years)<sup>6</sup>

YEARS	CHILD SEX RATIO
1961	972
1971	976
1981	970
1991	958
2001	962

Source: Government of Kerala (2007)

### 2.3.3 Sex Preference in the Indian and Keralite Contexts

In India, there is a practice of “patrilocal exogamy” whereby men continue to live and provide support to the parents even after marriage whereas women are expected to live in their husbands’ households (27). The increasing practice of dowry<sup>7</sup> in Kerala and in India reinforce parents’ conception of daughters as financial burdens (28, 29). Girls in India face both natal and mortality inequalities resulting in a national female-to-male ratio of 933 women for 1000 men which has been shown to be associated with sex preference; however, this trend is not noticed in Kerala. “The reduction of female children [in India] has been achieved by foeticide, infanticide, under-reporting of female births, and the abandonment or out-adoption of girls, leading to higher death rates among them,” (30). Sex-selection techniques before conception, neglect of girls, early marriage and

<sup>6</sup> This table demonstrates that prior the 1990s the child sex ratio in Kerala was estimated to be around 970 whereas it approximates 960 since the 1990s.

<sup>7</sup> Dowry is defined as money or property brought by a woman (given by her family) to her husband at marriage

pregnancy, anaemia, sexual violence, poor educational opportunities, malnutrition, unemployment and financial dependence are already identified distal and proximal determinants of gender inequality in health within the Indian context (1).

Due to the high female-to-male sex ratio, several authors believe that male preference is low in Kerala, given the fact that Kerala ranks 12<sup>th</sup> in the index of son preference (31). This index of son preference ranks Indian states on the basis of the mother's gender preference. A score of zero indicates equal preference between boys and girls and any score above zero illustrates a preference for the male child. Elements such as the sharp decline in fertility and the strong preference for a smaller family have been precursors of gender bias in the other states of India including Tamil Nadu (32). The Keralite sex ratio in the 0-1 age-group shows emergence of masculinity (above 104 males for 100 females) in two districts overall (32). When closely examining child sex ratio specific to urban areas, six districts show preference for males. Although Kerala has the highest rate of contraception use of all methods combined (60% compared to 44% for the country as a whole) (30), around 40% of families with one surviving son living opt for sterilisation compared to 27% in India (32). Also, hospital-based data on abortions during the 1976-1995 period illustrate an increase in incidence of this medical intervention among highly educated young women compared to less educated and older women (32). In some contexts, abortion can be used as a contraceptive method (33); however, when utilisation rates for birth control methods are high such as it is in Kerala, availability and usage of sex-selective techniques can be associated to sex-selective abortion resulting from a strong preference for the male child (34).

Some authors believe that male child preference is linked with the shift from a joint family-matrilineal system which gave women property rights and power within the family to a



nuclear family-patriarchal household system (24, 28, 29, 31). Traditionally, families abiding to the matrilineal system of inheritance would be guaranteed land property through their maternal genealogy (28). Land ownership is of particular importance in Kerala due to its high population density resulting in higher costs of land compared to other parts of India. A series of social and legal reforms in the first half of the twentieth century introduced measures privileging the nuclear patriarchal family structure as opposed to the joint matrilineal configuration. Although Kerala women had a legal right over land property, it was achieved within a legal framework of dependence on men as husbands (28). Within the matrilineal family framework, women were able to request a divorce and were also able to remarry on termination of prior marriage (either through death or divorce). In a patriarchal family structure, the notion of severing a woman's ties with the natal house is present, often times accompanied by the practice of dowry—a symbolic representation of the woman's affiliation to the husband's family (28, 29). In order for the woman to marry into a family with high educational and socioeconomic status, she had to provide her future husband with assets (either in the form of jewellery, land, or money) (31). An increasing trend of mothers selling their land to afford their daughter's dowry was also recorded in Kerala (31). Alongside with the practice of dowry, new emerging femininity norms favouring the acquisition of higher education in the perspective of being a "good" wife and mother were becoming popular. Some authors believe that these cultural norms could explain Kerala women's low workforce participation rate (22.9%) compared to the national average (25.4%) as well as manufacturing, trade and services are growing areas of female employment in Kerala as opposed to non-traditional sectors. Furthermore, for the same levels of professional education, women's earnings are lower (24). Finally, for economic autonomy in terms of women's access to and control over household income, one study suggests that women in Gujarat have higher levels of autonomy than those in Kerala despite much lower levels of literacy (35).

## **2.4 GENDER DISCRIMINATION AND HEALTH CARE**

### **UTILISATION**

#### **2.4.1 The Meaning of Gender Inequalities and Inequities in Health**

The distinct roles and behaviours of men and women in a given culture, prescribed by the social norms, give rise to gender differences (36). However, not all differences are considered “unfair” or “unjust” and do not necessarily imply inequity. For example, in Western societies, men and women abide to different dress codes. This difference does not favour one gender over the other and is thus not considered an inequity.

Nonetheless, gender roles and norms can also develop into gender inequalities or bias—differences that are unjust and result in empowering one group to the detriment of the other (36). For instance, in many developing countries, women have less access to education than men. “Both gender difference and gender inequalities can give rise to inequities between men and women” with respect to health (36). Examples such as limited access to health services for women because they require the permission of men and increased vulnerability to HIV transmission for married women are gender inequities. As illustrated by the aforementioned cases, gender can become a major barrier for women in the achievement of well-being and overall good health (36). Ultimately, gender norms and values are intimately linked with the social context in which women evolve.

#### **2.4.2 The Pervasiveness of Gender Discrimination in Health Care Utilisation**

Gender discrimination in resource allocation and subsequently in health care utilisation has been documented in various parts of the world. For example, a longitudinal survey conducted in the Minya region of Egypt showed that girls had twice less odds of having access to high-quality private health services when sick (OR=0.58; p-value<0.001) (37).

This model was adjusted for severity of illness, socioeconomic conditions, maternal characteristics, demographic and social characteristics as well as proximity of services. A cross-sectional survey of 1560 outpatient consultations of under-fives in three African countries (Algeria, Togo and Congo) indicated that girls are 29% to 40% less likely to be taken to a practitioner when ill (p-value<0.05) (38). In a qualitative study conducted in the Volta region of Ghana, parents were more likely to bring boys to a practitioner when ill, as well as invest more money in the treatment of boys than girls.

Moreover, similar examples have been largely documented in Southern and South-East Asian countries. For instance, a multi-level cross-sectional survey conducted in Nepal demonstrated gender differences in reporting an episode of illness and making a decision to seek care. Indeed, among all children, parents reported and used for 11% of all male cases and 9% of all female cases (p-value=0.1) (39). Additionally, parents showed 1.42 greater odds of seeking care for boys than girls (p-value≤0.05) (40). In a cross-sectional survey conducted in the Matlab region of Bangladesh, results indicated that in the event of an illness, parents exhibited greater odds of purchasing over-the-counter medications for boys (OR=1.71; 95% confidence interval [1.27-2.28]) and thrice greater odds of purchasing medications when prescribed by a physician for boys (OR=2.94; confidence interval [1.14-7.73]) (41). In this study, factors pertaining to the child's condition were only retained.

Studies conducted in both Northern and Southern states of India have documented various types of gender discrimination of health care utilisation for children. In a cross-sectional survey across all Indian states, results indicated that girls have significantly lesser odds of being immunized than boys (OR = 0.83, p-value<0.001) (42). In this specific study, results were stratified according to Northern and Southern regions and controlled for demographic, socioeconomic as well as caste characteristics. The degree of gender

discrimination in health care utilisation did not statistically differ from Northern and Southern regions. An econometric analysis of 4333 children across the Indian Union showed that the likelihood of girls being fully vaccinated after controlling for mother's level of education, caste, household consumption, regional differences and access to health services is five percentage points lower than that for boys. Another cross-sectional survey conducted in Punjab shows that parents have twice greater odds of spending money for medicine for boy than for girl infants (OR = 2.34) (15). In West Bengal, a follow-up observational study of 719 children under-five years of age showed that boys were more likely (32.6%) to have an outpatient visit than girls (22.4%; p-value = 0.0013) (16). Parents showed also four times greater odds of spending a sum greater than 30 rupees for boys (OR=4.2; CI: 1.6-10.9). In a cross-sectional survey of 456 children conducted in western India, results indicate that parents had twice greater odds of travelling a distance greater than two kilometres to seek care for a boy than a girl (CI: 1.2-3.2), while adjusting for severity and type of illness, parents' education, occupation and income (43). Parents also had 3.7 greater odds of spending over 50 rupees (CI: 1.6-8.6). Finally, a qualitative study conducted in the state of Tamil Nadu reported that girls were brought later on to the hospital when ill, for given episode and severity of condition although this delay was not quantified (44). The sample consisted of health care professionals working closely with community members (physicians, nurses and midwives). All of this body of evidence highlights the importance of investigating gender discrimination in the Keralite context as it is a phenomenon that is widely prevalent in the world but more specifically in India.

### **2.4.3 Gender discrimination in health care utilisation in Kerala**

There is a lack of literature on gender discrimination in health care utilisation in Kerala to be able to draw conclusions. One study in particular looked at patterns of health care utilisation of children and identified a gender difference in the type of care used when a

child is sick. According to this cross-sectional survey, girls sought care within the alternative provider system in lesser proportions than boys (OR=0.39; p-value=0.006) (45). Evidently, further research is required within the Keralite context as the body of evidence is inconclusive.

## **2.5 FACTORS INFLUENCING GENDER GAPS IN HEALTH CARE UTILISATION**

From the literature review, we have selected a few factors that we find most relevant to gender discrimination in children's health care utilisation. Individual factors such as maternal characteristics and sex-birth-order will be firstly discussed. Household factors such as socioeconomic status and caste end the discussion of this section.

### **2.5.1 Maternal Characteristics**

Maternal characteristics (education, income and occupation) have been widely recognized as a predictor of children's health care utilisation patterns (46, 47). In a cross-sectional survey of 200 Nigerian women who brought their febrile under-five children to a health facility were interviewed; results showed that the mother's occupation was positively correlated with the utilisation of health services for children. However, the maternal educational and occupational statuses as well as the maternal income did not influence the gender gap among children for the utilisation of health services. In another study conducted in the Philippines, results indicated that mothers with a secondary or high educational background were twice more likely to seek care for their children when they had a severe episode of illness as well as in these cases but had no effect on the gender gap.

The influence of maternal characteristics on the gender gap in health care utilisation for children seems to be manifested in the preference for private health care. In a cross-sectional survey conducted in the Minya region of Egypt, it was found that in households where the mother lived in with her in-laws, a greater gender gap was found in the utilisation of private health services for the children (37). The authors hypothesised that women that are living with their in-laws were probably lacking empowerment. Another cross-sectional study examined the effects of social and economic, disease-related and gender variables on the types of care sought for children when ill in Kerala. Results showed that the mother's educational status—defined as illiterate versus all educational level categories—did not influence the choice of provider systems when controlled for household and individual levels (45). Another study using the National Family Health Survey (NFHS) 1992-1993 data for Kerala indicated that maternal education was a predictor for use of private health services. Indeed, "women from better educational and economic backgrounds prefer private providers irrespective of the service they require," (48). However, this study did account for the gender gap in health care utilisation. While the body of evidence indicates that maternal characteristics influence children's health care utilisation patterns, it is unclear how they modify gender gaps.

### **2.5.2 Sex Composition of Sibship<sup>8</sup> and Birth Order of Child**

Recent studies examining intra-household allocation in India have highlighted the importance of sibship sex composition as well as the birth order of the child (42, 49). Within a sibship, not all female children are subjected to identical levels of vulnerability. One specific qualitative study has demonstrated that along with Indian parents' preference for sons is a desire for balanced sex composition of the sibship (42). The sample was mostly comprised of individuals originating from Northern parts of India. For the

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<sup>8</sup> A sibship refers to the group of children that belong to one set of parents.

interviewed parents, sons represented their income and security utilities. Indeed, boys provide financial support to parents by contributing to the family revenue later on in life. On the other hand, the daughter's role within the family is more to provide religious, social or emotional value. Having recognized the gender roles assigned to children compounded with the constant decline in fertility, it becomes intuitive that Indian families strive to balance sex-birth-order characteristics within the sibship. For example, a nuclear family composed of two children is most likely considered ideal if there is one boy and one girl. As such, some authors believe that a girl's vulnerability depends on her birth order as well as the sex composition of the sibship (42). In a study using the data from the 1992-3 and 1998-9 National Family Health Surveys of India showed that boys aged 12-23 months born to mothers with no living sons (and only daughters) have more than twice greater odds to be fully immunized (OR = 2.14; p-value<0.001) as well as to receive treatment for acute respiratory illness and diarrhoea respectively (OR = 2.67; p-value < 0.01; OR = 2.19; p-value < 0.01) than girls born into such families (42).

In a cross-sectional survey conducted in Ghana on son preference and gender differentials, the authors mapped out family configurations in accordance with girl child vulnerability, thus showing that girls born into sibship composed solely of daughters exhibited 25-40% less likelihood to be subjected to gender differential treatment with respect to health care compared to girls born into a sibship where at least one boy was present (49). In a study based on the Indian National Family Health Survey of 1992-1993 showed that girls who are born into a household where there are already two or more daughters with no surviving sons were 38% more likely to be subjected to stunting than girls are first-born children (42). In the case of boys, neglect of male children is seen in families when there are more than two surviving sons as well as no daughter. Typically, the youngest son would be neglected in terms of access to health care and nutrition. In

this particular study, the multivariate models adjusted for episode factors, maternal characteristics, availability of health services, caste and religion, socioeconomic status and geographic region of Indian (North, South, and East). No study incorporating sex-birth-order characteristics has been conducted in Kerala; however, given Keralite families are small-sized, the effect of sibship composition may differ from what has been documented in Northern India.

### **2.5.3 Household Socioeconomic Status and Class**

A review of class and food allocation among children in South Asia indicated that the gender gap in reported malnourishment was more prominent in upper caste and high-income families (girls were thrice more likely to be malnourished than boys in privileged families whereas girls in under-privileged families were only twice more likely to be malnourished than boys) (50). The review sampled research studies across all regions of South Asia, including Southern India. The author suggests that intra-household allocation is rather more influenced by the social norms than the economic assets of the family. A cross-sectional survey was conducted in the Koppal region of Karnataka state looking at the interaction between gender and socioeconomic class (4). The authors wanted to explore this interaction while looking at treatment-seeking behaviours (non-treatment, discontinued and continued treatment) among adults. Overall, results show that women had thrice lesser odds to seek care when ill, independently from their class affiliation (OR=3.23; p-value<0.01). However, when stratified by class, poor women had almost five times lesser odds to seek care when ill compared to non-poor men (OR=4.47; p-value<0.001). In addition, poor women had almost twice more odds to discontinue care than non-poor men (OR=1.54; p-value<0.001). Authors believe that the above-mentioned results are examples of "rationing bias." Gender bias is referred to the social preference of men over women within patriarchal societies. Rationing bias, on the other hand, "is usually



an institutional mechanism intended to ensure a particular distribution of scarce resources across households, independent of their productivity or economic contribution" (4). As such, when in a context where financial resources are scarce, women face a double-deficit when ill, linked to her gender and her socioeconomic class. In a study examining the role of social affiliation, measured by caste, on patterns of health care utilisation among children living in tea plantations of Kerala, results indicate that parents of low-castes were 10% more likely to spend more (499 versus 17 rupees) and seek care outside of the plantations in the advent of non-routine illnesses ( $p$ -value $<0.05$ ) (6). In the case of routine illnesses, parents were 3% less likely to seek care for boys outside of the plantation ( $p$ -value $<0.05$ ).

## **2.6 KNOWLEDGE GAPS**

This literature review has highlighted various insights: Kerala has exhibited tremendous progress in human and social development and yet select social indicators seem to indicate that women and female children are subjected to gender inequalities. However, some gaps remain in the knowledge about the contribution of gender to children's health care utilisation.

First, few studies have examined the role of class and socioeconomic status on gender bias in health care utilisation in the particular context of Kerala. Most of the studies reviewed focused on maternal characteristics, of which results do not converge in a single conclusion. Only one study assessed gender disparities in health care utilisation in Kerala controlling for caste and maternal characteristics. No study examined the influence of social stratification on gender gaps within the Keralite context.

Second, our review did not identify information about the effect of gender on utilisation of private health care. The only study found contrasted the use of allopathic and alternative medicine among Keralite children. Knowing that private health care is increasingly becoming the first choice of Keralite men and women, it is important to identify gender differentials with respect to choice of provider. Additionally, there is limited evidence on the relationship between gender and health care expenditures in Kerala. The constant rise in out-of-pocket expenditures marks the urgency of documenting the role of gender with respect to health care expenditures.

Finally, there is limited evidence of the vulnerability of female children in Kerala. The influence of the *hindutva* movement in a context where health care expenditures are increasing poses questions in regards to gender inequalities in terms of access. Most studies are limited in scope, as they do not explore the frequency, temporality and intensity dimensions of utilisation of health care among children.

## **3 CONCEPTUAL FRAMEWORK**

### **3.1 CONCEPTUALISATION**

#### **3.1.1 Health-Seeking Behaviour**

Although the literature on gender bias in health within the Keralite context is scarce, we can safely assume that health care utilisation patterns in children are a result of a household decision, at least for the first visit (40, 51). In a context where financial resources are limited and health care expenditures are on the rise, parents face difficult choices for their children (52). While illness occurs in individuals, its costs impact the entire household. Also, different members of the household may attach subjective interpretations and meanings to the experience of signs and symptoms of childhood illness (40). The literature on gender discrimination in the South Asian context suggests that sex preference is a particularly important factor influencing the intra-household allocation of resources (50). Indeed, in some Indian communities, this male preference translates in greater utilisation rates for boys in the advent of an episode of illness (3).

The health-seeking process can be dissected into three steps: perception of illness or recognition that the child requires care, the act of seeking medical assistance, and finally the choice of health care provider consulted. Gender bias can be expressed at any point during the health-seeking process and captured through indicators measuring intensity of usage as well as temporal and frequency of utilisation (40). Following is a summary description of the different ways gender bias can be measured through the health-seeking process.

Indicators of reported morbidity for boys and girls allow to appraise parents' recognition that the child requires medical care (40). This type of analysis is informative albeit

restrictive for parents' perception of illness is subjective. For example, if a child is suffering from severe difficult breathing, parents' perception of illness may not exhibit low variability among and within all groups defined by socio-demographic variables (such as poverty, educational status and class).

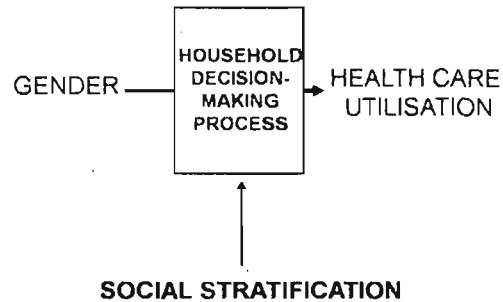
A more sophisticated appraisal of gender inequalities is examining the occurrence of an outpatient visit while incorporating the notion of delay. In this type of analysis, investigators simply look at utilisation of health services as a dichotomous event—if the child has had care or not. Moreover, the type of provider system can also be captured in this type of analysis, going from public to private practitioner or even the consultation of an allied health professional (i.e. traditional birth attendant).

Finally, gender bias in children's health care utilisation can also be measured in terms of health care expenditures, which is intimately linked with the type of health services sought. Health care expenditures refer to consultation, transportation, and treatment costs engendered by the act of seeking medical assistance, but also capture non-medical and informal interventions. High health care expenditures can be associated with usage of sophisticated care (such as ultrasounds) and/or high intensity of usage of care (i.e. visiting the physician many times). In a cross-sectional survey conducted in Kerala on reproductive and child health, it was shown that women from better economic and educational backgrounds prefer to consult private clinicians irrespective of the nature child health care services they require (48). However, gender was not a factor taken into consideration during the statistical analyses of this research study and children suffering from acute respiratory illnesses were sampled.

### 3.1.2 Framework

Figure 3 illustrates our conceptual framework:

Figure 3: Conceptual Framework



Health-seeking behaviour has received considerable attention in recent years and a number of studies have been done in various socio-cultural settings throughout the world (51). Kroeger (53) has provided an excellent review of the methods commonly used for analysing the determinants and pathways of the use of health care. He emphasizes the need for a combined socio-medical and anthropological approach to understand health-seeking behaviour, especially in developing countries. Our framework is inspired from Kroeger's classification of health care utilisation determinants. As opposed to other models, this classification system conceptualises health care utilisation as a complex process influenced by culture, characteristics pertaining to the episode of illness as well as to the health care system (53). It also presents many advantages. Its strong integration of socio-cultural aspects allows for a better translation of health care utilisation patterns in a developing country setting. For example, it is suited to capture data such as consultations to a traditional practitioner or a drug dispenser. Additionally, Kroeger (53) also incorporates the dimension of temporality into its classification system suggesting that factors bear more weight at different stages of the decision-making process.

Our conceptual framework exemplifies the relationship between gender and health care utilisation. In order to facilitate the understanding of our framework, unidirectional arrows were used to demonstrate that gender differences in health care utilisation are a result of a household decision-making process. Our conceptual framework also assumes an interaction between gender and social stratification given the body of evidence that suggests social stratification plays an important role within the Indian context. As stated in the literature review, in a study conducted throughout various Indian states, the gender gap differed across socioeconomic and caste groups.

We hypothesise that various factors affect the household decision-making factors. Among these, sex preference is an element, which has been identified by the literature as a strong contributor to gender inequalities in health care utilisation. In addition to sex preference, factors such as household, individual and episode characteristics are also associated with gender differences in health care utilisation. As such, in order to capture gender differences at different levels, we have identified various dependant variables (see Table 3 for list of dependant variables and Table 4 for independent variables).

**Table 3: Empirical and Operational Definitions of Dependant Variables**

ASPECT	EMPIRICAL DEFINITION	OPERATIONAL DEFINITION
Variable of place	Type of health services utilised	Binomial variable: public outpatient visit, private outpatient visit.
Variables of intensity	Occurrence of outpatient visit	Binomial variable: no outpatient visit, occurrence of outpatient visit.
	Total expenses incurred for a single episode of illness	Continuous variable: total expenses incurred per severe episode of illness in rupees.
	Total annual health expenditures for each child	Continuous variable: total health expenses incurred for children that have had at least one episode of illness throughout the year.
Variables of time	Delay before first outpatient visit	Binomial variable: outpatient visit did not occur on the first day that the episode of illness started, outpatient visit occurred on the first day that the episode of illness started.

Table 4: Empirical and Operational Definitions of Independent Variables

LEVEL	EMPIRICAL DEFINITION	OPERATIONAL DEFINITION
Episode characteristics	Condition of illness	Categorical variable: undifferentiated febrile conditions, acute respiratory illnesses, acute diarrheal diseases and other conditions.
	Duration of episode of illness	Continuous variable: length of episode of illness in days.
Individual characteristics	Age	Categorical variable: less than 5 years of age, 6 to 15 years of age.
	Presence of a chronic disease	Binomial variable: child has a chronic illness, child does not have a chronic illness.
Household characteristics	Class	Categorical variable: Paniya, other Scheduled Castes/Scheduled Tribes and Other Backward Castes, Forward Castes.
	Poverty (land ownership)	Binomial variable: household holds less than or equal to 10 cents of land, household holds more than 10 cents of land.
	Size of household	Continuous variable: number of members within each household (i.e. living under the same roof)
	Size of sibship	Continuous variable: number of children within each household (i.e. living under the same roof)
	Employment status of household head	Binomial variable: household head is employed, household head is not employed.
	Education level of household head	Categorical variable: household head has no or primary-level education, household head has secondary-level or more education.

## 3.2 RESEARCH OBJECTIVES & HYPOTHESES

### 3.2.1 Objectives

(1) To measure the degree of gender inequalities while acknowledging that Kerala's social progress may act as a buffer against discriminatory trends towards female children.

(2) To investigate the extent to which economic constraints exacerbate female discrimination within social strata that perform poorly on economic and social indicators. Two units of observation (episodes of illness and children) will be used to investigate health care utilisation outcomes for children aged 15 years and less.

### 3.2.2 Hypotheses

Given the aforementioned objective, the following we have developed the following two hypotheses:

1. We believe that there are gender differences in health care utilisation patterns for episodes of illness as well as when comparing Keralite children (two levels of analysis);
2. We also believe that these gender differences may be translated differently across social groups.



## 4 METHODS

In this chapter, ethical clearance, study site and design of our study will be examined. Following this section, the methods we employed to meet our research objectives and answer our research questions will be discussed.

### 4.1 ETHICAL CLEARANCE

Our study was conducted under the scope of a greater research project, *Access to Health Care and Basic Minimum Services in Kerala*, co-lead by my academic advisor Dr Slim Haddad. This project obtained ethical approbation from both the *Comité d'Éthique en Recherche de la Faculté de Médecine de l'Université de Montréal* (CERFM 47(03) 4#88) and Centre for Development Studies in April 2003. Our study was also granted ethical approbation by the CERFM (CERFM (07)#237) for an additional qualitative component, which is not included in this Master's thesis.

### 4.2 STUDY POPULATION AND SOURCE OF DATA

#### 4.2.1 Study Site

This study has been conducted in a territorial decentralised unit, Kottathara Panchayat, located in the district of Wayanad in Northern Kerala, India. The following is a short description of the study setting.

Wayanad is a mountainous district located in Northern Kerala. It is essentially rural by nature and covers an area of 2,131 km<sup>2</sup>. It is considered one of the poorest districts of Kerala. The Keralite Rural Development Department conducted a poverty survey in 1998-1999 and estimated the proportions of individuals living below the poverty line to be 50% in Wayanad, which is significantly higher than the state average (37%). In contrast to the rest

of the state, the economy of Wayanad heavily relies on agricultural activities. Indeed, the majority of workers are hired in the agricultural sector. However, Wayanad has been facing economic hardships due to recent declines in agricultural prices (especially for coffee and pepper which are the main farming crops of Wayanad) as well as a severe drought experienced in 2003.

Kottathara Panchayat has a total area of 31.75 km<sup>2</sup> and is located less than 20 km away from Kalpetta, the district headquarters. According to the 2001 state-level census, Kottathara Panchayat comprises 3360 households for a total population of 16,613 individuals (8254 males and 8359 females) and total density of 523 individuals per km<sup>2</sup>. In Wayanad, the proportion of Tribes compared to the general population is 17% whereas in Kerala this proportion equates to 1%. There are a number of different tribal populations living in Wayanad: Paniyas, Kurichiars, Kurumas, Irulas and Kattunayakkas.

In Kottathara Panchayat, the percentage of Scheduled Castes is quite low (3%) whereas there is a high percentage of Scheduled Tribes (28%), predominantly from the Paniya and Kurichiar tribes. There is heterogeneity present among these groups in terms of socioeconomic status and quality of life. For example, the Paniyas are landless, and have few assets, while the Kurichiars own land and are considered to be at a higher level of "modernisation."

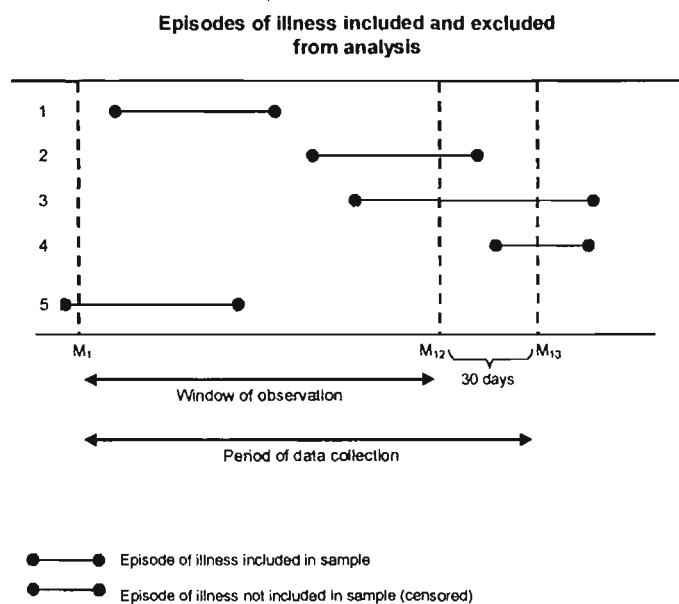
Public institutions are uniformly distributed across Kottathara Panchayat of which the Panchayat office is centrally located. A post office is situated beside the Panchayat office. There is one primary health centre and four health sub-centers. Homeopathic and Ayurvedic dispensaries are located near the primary health centre. There are 20 kindergarten (Anganwadi) centers, 4 primary schools and one high school in Kottathara

Panchayat. Around 10 ration shops can be found that sell basic goods such as rice, kerosene, sugar and wheat. Finally, two bank branches can be found in Kottathara Panchayat.

#### 4.2.2 Study Design

This study uses data generated through a panel survey conducted from September 2003 to October 2004. The goal of this survey is to provide longitudinal data on household health risk, needs, expenditures and access to health care services. Most studies with similar objectives employ cross-sectional study designs. While these designs have their merit, they are not reliable in collecting accurate information relating to past events. The problems stem from the individual's inability to accurately recollect past events and that treatment of censored episodes poses considerable difficulties. On the other hand, panel surveys allow for tracking of episodes over time. Consequently, statistical analyses are conducted on uncensored data. In the case of this panel survey, an additional month was allotted to data collection to maximize the generation of uncensored data (see Figure 4 for more details).

Figure 4: Episodes of Illness within the Context of Window of Observation and Censoring



### 4.2.3 Data Collection

A complete list of all houses in Kottathara Panchayat was consolidated from the various documentations made available at the institutions of health department (i.e. health sub-centers and primary health centre). Each house was allotted a number. Participating houses were selected through a circular systematic random sampling method. With an objective to get a significant number of households that can represent a general picture of the Panchayat, the sample size was determined to be 17%. The obtained house numbers were firstly arranged in a circular manner. The sampling started with a random number and subsequently, every sixth number was included in the sample. The process was continued till the number of samples chosen was equal to the calculated 17% of the respective ward. Special consideration was given to the tribal population during sampling procedures (rationale discussed in section 4.2.4). The original sample thus included 401 general and 110 tribal houses. The generated list was shared among Anganwadis<sup>9</sup> and they were requested to associate each house number to a given household. Their identification process showed that some of the building numbers were either non-residential or no longer existed. It was deduced that the basic list followed for selecting the panel was not an updated one. Therefore, new sample numbers were selected through a circular random sampling method up until 17% of the total households were identified in each ward.

As a panel survey requires rigorous and regular field level data collection and monitoring, the selection of surveyors was done with utmost care. Anganwadis were thought to be the best choice of surveyors given their high-level of involvement within the Panchayat. A total of 20 Anganwadis were recruited and attended a one-day training session. They were also invited to undergo a pre-test where each surveyor was asked to survey two households.

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<sup>9</sup> Anganwadis are kindergarten teachers. They are active community workers that interact with all Panchayat families on a daily basis.

This step enabled the research team to address any future problems that may have arisen throughout the data collection process.

The main tool used for data collection was a family health diary, which was given to each participating household. The first pages of the health diary recorded basic family and individual details. The following pages were designed to capture all episodes of illness, where information such as symptoms, type of services utilized, and health expenditures were entered. In each household, a literate member was assigned the task to record all episodes of illness and related information in the diary. Among tribal households, this task was accomplished by the Anganwadis. All diaries were reviewed and checked on a bi-weekly basis by field supervisors.

#### **4.2.4 Sample**

Among the 3352 households residing in Kottathara Panchayat, panel data collectors surveyed a total of 555 households. These households were composed of an average 5.4 household members with an average of 2.2 children (defined as individuals aged 15 and under) per household. These statistics are similar to the population in which it was found that the average household has 4.8 members, including 1.4 children. Throughout the study period, 10 households did not complete the entire data collection process, yielding in an attrition rate of less than 2%.

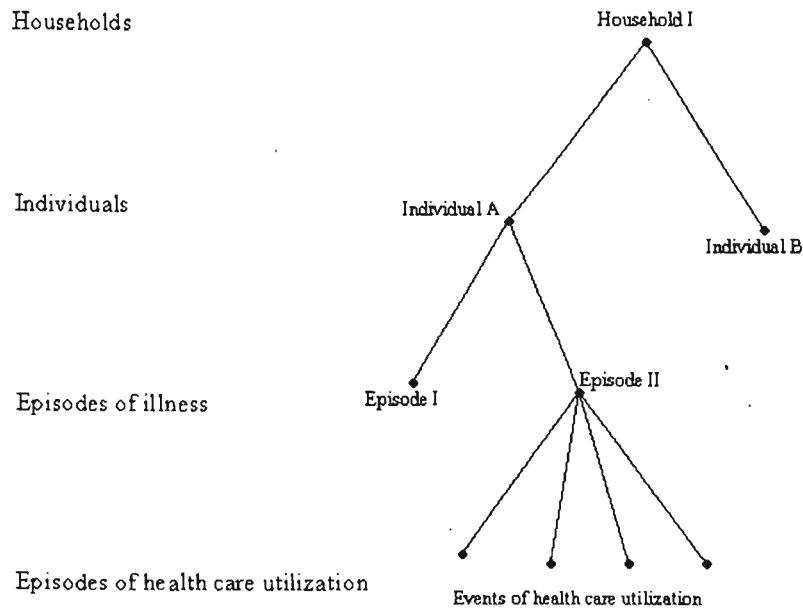
By design, tribal households are overrepresented in our panel survey. The over sampling of this specific group was elaborated in order to obtain better insight of their health and health utilisation patterns. Because the Paniya group is composed of tribal households that tend to be economically disadvantaged, some statistics highly correlated with class groups

(such as poverty status, education, and land ownership) will be biased. As a result, we need to apply weights to obtain more representative results.

The weights were constructed by taking the ratio of the percentage distribution of each caste group (population ratio over sample ratio). This ratio illustrates by how much, proportion-wise, each group's distribution within the sample needs to be readjusted or weighed in order to be in the range of the true population distribution. Using this procedure, we obtain the following weights for each caste group: 0.43 for Paniyas, 1.12 for other Scheduled Tribes/Scheduled Castes, 1.2 for Backward Castes and 1.28 for Forward Castes.

The panel data is structured in such a way that three levels of analysis are possible: household, individual and episode of illness levels. Each household is composed of at least one individual and each of these individuals may or may not have experienced an episode. Figure 5 illustrates the multilevel structure of the panel data. In Figure 5, household I is composed of individuals A and B. Individual A experienced 2 episodes of illness: episode 1 did not lead to any utilisation of health care services while episode 2 consumed four health care services. Individual B did not experience any episodes of illness over the duration of the survey. In considering the multilevel structure of the study design, data for health care utilisation may therefore be analyzed at the household level (utilisation of health care per household), at the individual level (utilisation of health care per individual) and at the episode level itself (for example, what are the characteristics of the episode that lead to the utilisation of health care services).

Figure 5: Multilevel Structure of the Panel Data



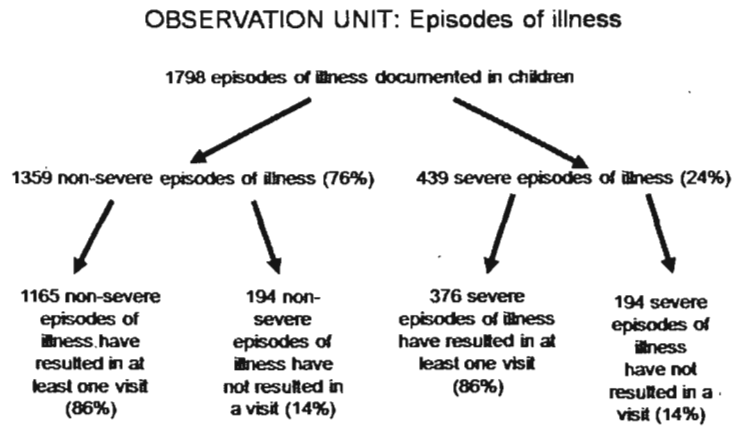
Source: CDS and UdeM (2006)

As stated in our research hypotheses, we want to examine gender differences at both episode and individual levels. As such, our statistical analyses will be performed on two distinct analysis units: severe episodes of illness and children whom have sought out outpatient care when falling ill. Below is a short description of the sample for each analysis unit.

Among the 555 households that were surveyed, a total of 879 children were followed for a twelve-month period. A total of 1798 episodes of illness were recorded among children only. Episodes of illness were classified by severity using two indicators: bedriddenness and restriction of activities of daily living. Only severe episodes of illness were selected for data analysis purposes in order to minimize perception bias exhibited by parents. If

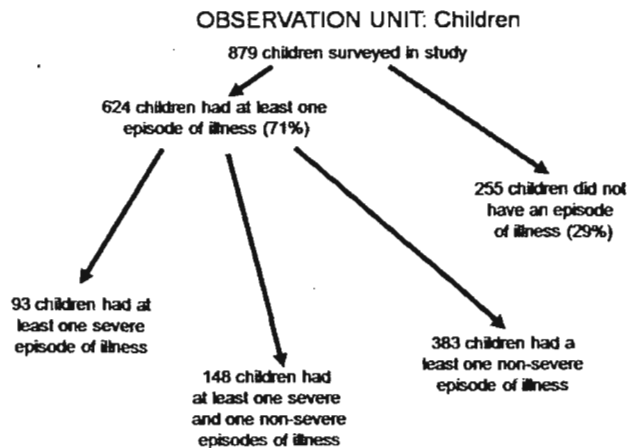
parents or the child responded “yes” to either of the two above-mentioned indicators, then the episode of illness was considered severe. In total, 439 severe episodes of illness were recorded during the survey period (see Figure 6).

Figure 6: Episodes of Illness Recorded in Panel Survey by Severity



For the entire duration of the study period, there were 624 children who fell ill at least once. This group of children is our second observation unit (see Figure 7).

Figure 7: Number of Children who Fell Ill during Study Period





## 4.3 VARIABLES

### 4.3.1 Dependant Variables

From the aforementioned conceptual framework, there are three types of dependant variables that can be used to measure gender inequalities in health care utilisation: variables of place, of intensity and of time. The combination of all three dimensions of health care utilisation will allow us to assess the presence of gender inequalities at the various stages of the household decision-making process. Total consumption was measured by the amount spent for health care throughout the episode (medical and non-medical costs). Below is a chart outlining the studied dependant and independent variables stratified by the observation unit used (see Table 5).

Table 5: Dependant and Independent Variables Classified by Observation Unit

OBSERVATION UNIT	DEPENDANT VARIABLES	INDEPENDENT VARIABLES
Severe episodes of illness	<ul style="list-style-type: none"> <li>Occurrence of outpatient visit</li> <li>Outpatient visit occurred on first day of episode</li> <li>Outpatient visit occurred in a private medical facility</li> <li>Total health expenditures per episode</li> </ul>	<ul style="list-style-type: none"> <li>Condition of illness (see Appendix 1 for details of how variable was constructed)</li> <li>Duration of episode of illness</li> <li>Age</li> <li>Presence of chronic disease</li> <li>Class</li> <li>Land ownership</li> <li>Size of household</li> <li>Sibship size</li> <li>Employment status of household head</li> <li>Education level of household head</li> </ul>
Children who have had at least one episode of illness throughout the study period	<ul style="list-style-type: none"> <li>Total annual health expenditures per child</li> </ul>	<ul style="list-style-type: none"> <li>Age</li> <li>Presence of chronic illness</li> <li>Class</li> <li>Land ownership</li> <li>Size of household</li> <li>Sibship size</li> <li>Employment status of household head</li> <li>Educational level of household head</li> </ul>

### 4.3.2 Independent Variables

From the aforementioned conceptual framework, independent variables are stratified into three levels: episode, individual and household. This stratification is inherent to the structure of the panel survey data. Episode-level characteristics include factors of illness morbidity (type of diagnosis and duration of episode of illness). Most previous studies examining research questions related to gender differentials in children's health care

utilisation have incorporated indicators that do not clearly measure illness morbidity. Oftentimes, the major symptom will be used as a proxy for diagnosis. Additionally, few studies focus only on severe episodes of illness and use self-reported data to qualify the episode as severe. For example, in the case of children, the questionnaire will incorporate questions directly asking parents to rate the episode as severe. Not negating the importance of using self-reported data, the perception bias inherent to this type of data restricts the validity of a classification of symptoms to form diagnostic categories. Subsequently, comparison between different diagnostic profiles becomes difficult. To explore possible variations in gender gaps across social groups, three variables were created that combined respectively gender with class, poverty and education levels and were used as predictor variables.

#### **4.3.3 Sibship characteristics**

An extensive body of evidence points at the importance of sibship composition in the analysis of gender differences in resource allocation (see section 2.5.2 for more details). Indeed, a girl's vulnerability to gender discrimination goes beyond her gender and is partly due to her birth-order characteristics. However, the bulk of evidence on sibship composition has concentrated on examining such behaviour in societies where the expected average family size is greater than three (54). In a study examining the gender gap in stunting and in immunization for children in India, sex-birth-order characteristics played a significant role in families with at least three children (42). In families with less than three children, the gender gap did not significantly vary across the various sibship compositions. In our sample, the mean sibship size is 2.2 and 66% of participating households have three or less than three children (see Table 6 for sibship distribution across sample). Provided that the scientific evidence has shown a link between sex-birth-order characteristics and gender differences, we have undertaken discussions with key

informants in the field and with various experts on gender issues in Kerala on this particular topic. Unfortunately, our findings were inconclusive. While each expert acknowledged that in a context such as the Punjabi one, where sibship composition evidently carries a role in understanding gender differences in health, in the Keralite context, such conclusion could not be drawn. The main reasons cited were the low fertility rate and the relatively small desired sibship size. Additionally, a study conducted in Kerala on the use of spacing method before sterilization among couples indicated that 44% of couples wanted a maximum of two children (55). Given that no clear indication has to how sex-birth-order characteristics influence gender differences in Kerala, we did not include sibship composition in our analyses. However, we have included sibship size as the number of children per family directly affects the intra-household allocation process of limited resources.

Table 6: Distribution of Sibship Configurations across Sample

SIBSHIP CONFIGURATIONS	FREQUENCY
<b>Sibship Size=1 (23%)</b>	
M	65
F	58
<b>Sibship Size=2 (28%)</b>	
MM	43
FF	42
MF	34
FM	31
<b>Sibship Size=3 (15%)</b>	
MMM	13
MMF	11
MFM	6
MFF	2
FFF	10
FFM	17
FMM	9
FMF	12
<b>Sibship Size=4 (10%)</b>	
MMMM	1
MMMF	1
MMFM	0
MMFF	0
MFFF	0
MFFM	3
MFMF	0
MFMM	1
FFFF	4
FFFM	4
FFMF	1
FFMM	1
FMMM	3
FMMF	3
FMFM	3
FMFF	3

## **4.4 STATISTICAL ANALYSES**

### **4.4.1 Descriptive Statistical Analyses**

Univariate and bivariate analyses with each dependant variable were conducted using independent variables stemming from all three levels. For a combination of continuous and categorical variables, student T-tests and ANOVA tests were performed. To compare categorical variables, Pearson's chi-squares were calculated to measure the significance of the association. This step enabled to grasp a better sense of the effect of each independent variable on dependent variables. Additionally, distributions of continuous and categorical variables were assessed the categorisation process of certain variables.

Multicollinearity was tested within each level of independent variables with a greater emphasis on household characteristics. High correlations between class, land ownership, educational status of household head and employment status of household head was found (25). Similar results were also confirmed through our analyses. All calculations were performed using the Intercooled STATA 9.2 version.

### **4.4.2 Models for Severe Episodes of Illness as Observation Units**

Multilevel linear regression (log expenses) and logit models (binomial variables) were performed for all outcome variables while adjusting for episode characteristics (illness condition, duration) and the presence of chronic disease. Other possible modifiers such as the child's age or the size of the family remained statistically non-significant for all models and were not further considered. All models accounted for the oversampling of Paniyas and performed using MLwiN version 2.02 given the hierarchical structure of the data (episodes being nested in individuals who are in return nested in families). The need for statistical models that take account of the sampling scheme is well recognized and it has been shown that the analysis of survey data under the assumption of a simple random

sampling scheme may give rise to misleading results (56). Models were built incrementally and included only statistically significant variables. Our multilevel models indicated that the variance at the individual was non-existent and thus the household and individual levels were merged into one single level throughout our analyses.

#### **4.4.3 Models for Children as Observation Units**

Possible gender differences in annual health expenditures per child were also investigated while using a similar approach. Health-related expenses throughout the year were aggregated for all 624 children that had at least one episode of illness. The same models were used but only individual-level and household-level control variables were included, such as age, number of episodes of illness and presence of chronic disease.

## **5 RESULTS: ARTICLE**

**Article: Gender bias in children's health  
care utilisation: Evidence from Kerala**

## CONTRIBUTION OF STUDENT AND CO-AUTHORS

### **Contribution of student (first author):**

The student has planned and conducted secondary data analyses as well as written this article.

### **Contribution of co-authors:**

Slim Haddad has participated in the planning and implementing of the primary project as well as in the analysis and write-up of article.

Delampady Narayana has participated in the planning and implementing of the primary project as well as in the write-up of article.

Pierre Fournier has participated in the analysis and write-up of article.

## Gender bias in children's health care utilisation: Evidence from Kerala

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### Competing interest statement:

All authors declare that the answer to the questions on your competing interest form are all "no" and therefore have nothing to declare.

### Contributors' statement:

Riswana Soundardjee has planned the secondary study, conducted the analyses and is responsible for writing the article (guarantor).



Slim Haddad and Delampady Narayana are responsible for the planning and conduct of the primary study, have participated in the secondary study, analyzed the data and written the article.

Pierre Fournier has participated in planning the secondary study, analyzing the data and writing the article.

Ethics approval:

This project obtained ethical approbation from both the *Comité d'Éthique en Recherche de la Faculté de Médecine de l'Université de Montréal* (CERFM 47(03) 4#88) and Centre for Development Studies in April 2003.

Funding:

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Role of funding source:

The sponsors of this study had no role in the study design, data collection, data analysis, data interpretation, writing of the report, or the decision to submit for publication.

Running head:

Gender bias in children's health care utilisation in Kerala

Conflict of interest:

All authors certify that they have no sources of funding which may benefit from or be affected in any way the publication of this article, and that no potential conflicts of interest exist.

Statement of the independence of researchers from funders:

The research was funded by the International Development Research Centre (IDRC), a Canadian Crown Corporation whose mandate is to support researchers from the developing world in their contributions to build healthier, more equitable, and more prosperous societies. The researchers certify that they have been in no way constrained by the funding organisation, whether in terms of the methodology, the conclusions, or the dissemination of the results. The researchers had full control of the primary data.

Acknowledgments:

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**Abstract***Objectives:*

To measure the extent of gender differences in patterns of health care utilisation among children (aged  $\leq 15$  years) and to ascertain how these gender differences vary across social groups (class, poverty and education levels).

*Design:*

One-year longitudinal multilevel panel survey conducted in 2003 recorded episodes of illness and subsequent events of health care utilisation among 555 households that comprised 879 children.

*Setting:*

The study site was a Panchayat (territorial decentralised unit) located in the northern district of Wayanad, Kerala.

*Participants:*

A total of 439 severe episodes of illness occurred among 241 children and 624 children had at least one episode throughout the study period.

*Main outcome measures:*

Among severe episodes, gender differences in occurrence of outpatient visits, in time delays, in preference of private over public services and in health expenses were measured. Among children, total annual health expenses per child were analysed by gender.

*Results:*

Boys persistently show twice greater odds of having an outpatient visit (95% CI: 0.27 to 0.91), of seeing a practitioner within shorter time delays (95% CI: 0.32 to 0.77) and of utilising higher-quality health services (95% CI: 0.32 to 0.77), independently from their economic and social condition. When stratified across social groups, the gender gap persists for the first two outcomes but is most pervasive among socially disadvantaged groups, where it doubles for the occurrence of an outpatient visit. On average, for a single severe episode of illness, parents spent 147 rupees for a boy while only 118 rupees were spent for a girl. Significant gender gaps in health expenditures per episode and per child per year are seen among middle-class and uneducated families, where much less is spent for girls on average.

*Conclusions:*

Gender and social group characteristics are two inter-related sources of inequality that can interact with each other: being a poor girl amplifies the pervasiveness of gender discrimination. This study reiterates the necessity to examine inequalities in the utilisation of health services through a combined social and gender lens. Standard sex-segregation analysis may not provide an accurate, yet complete, portrayal of how gender bias is translated into discrimination.

## Gender bias in children's health care utilisation: Evidence from Kerala

### Introduction

A large body of evidence indicates that boys are favoured over girls in several Asian, North African and Middle Eastern countries (1). This gender preference may be expressed in various manners (2), of which female foeticide and infanticide constitute extreme forms (3). For surviving girls, gender bias translates in discrimination and deprivation of opportunities essential to their well-being (3). With respect to health care utilisation, girls' disadvantage is firstly manifested in parents' greater propensity in buying health services for their ill son. Several studies in South Asia have demonstrated boys' greater odds of utilising health services (4-8) and being immunized (8, 9). Secondly, gender differences are also noted in shorter time delays in seeking care for male children (6, 10). In a study in West Bengal, both patterns were observed: boys were more likely (32.6%) to have an outpatient visit than girls (22.4%) and had greater odds of seeing a practitioner within 12 hours of start of illness (OR = 4.9) (6). Thirdly, male preference can also transpire in the choice of provider where boys may benefit from higher-quality, and yet more costly, health services (4, 6, 7, 11). In the Minya region of Egypt, a study showed that girls utilise private services 50% less often than boys (OR = 0.54) (11). Finally, the degree of male preference is also reflected in the sum of efforts and sacrifices endorsed by parents in travelling greater distances and financially investing more for their son's health needs (12).

A small but significant body of research has illustrated that gender gap inequalities vary across social groups, being most pervasive among socially disadvantaged communities. Women from poor, less educated, and/or low-class households concomitantly suffer from

economic and social exclusion while confronting adverse gender norms (13-16). One study, in particular, conducted in rural Karnataka, showed that the adult gender gap among poor groups, with respect to non-treatment and discontinuation of treatment, doubles in magnitude compared to non-poor groups (13). Another study in India demonstrated that the female-to-male child mortality ratio among low classes, mostly comprised of indigenous groups, is twice than what is seen among upper classes (14). A cross-sectional survey conducted in India on elderly populations revealed that the gender gap in health care utilisation varied with financial empowerment of older women, being greatest among most economically dependent women (16).

This paper aims to analyze patterns of gender discrimination in children's health care utilisation in the Southern State of Kerala, India. With its impressive advances in human development, the Keralite government is known for its affirmative actions against gender- and caste-based discrimination (see Table 1) (17). As a result, Keralite women bear a privileged status compared to Indian women, that stems from legacies of matrilineal kinship systems and education policies (18). Moreover, Kerala's health care system, established on public-action and policy-assisted development, is characterised with a widespread coverage of health services to reduce physical access barriers for socially disadvantaged populations (19). Recently, the health system has been experiencing increases in health expenditures, more so within the private sector, which attracts approximately 75% of system-users (20, 21). While private facilities are preferred by Keralites for their perceived high quality of care, they are also very costly, especially in a setting where no formal insurance system is available (22). Consequently, poorer segments of population bear a high burden of health care costs. In some instances, out-of-pocket expenditures for health care amount to 40%-70% of the total household income (19).

[Insert Table 1 here]

It is often assumed that gender disparities in Kerala are not as blatant as in Northern states as a result of the tremendous social progress; however, the recent unaffordability of health care fosters an environment where households will be obliged to make consumption choices (19). To our knowledge, no studies have investigated gender gaps in children's health care utilisation among social groups in Kerala. On one hand, this state counts a number of successes to ameliorate the condition of female children, such as the high female literacy rate. In such circumstances, we can expect high utilisation rates of health services and less competition for scarce resources as seen in societies with a low-fertility rate. On the other hand, the resurgence of patriarchal value-systems through the *hindutva* movement raises concerns as it shapes a social context where girls are put at a disadvantage. As a result, we may witness that within a single household, the distributive process of limited resources may only reflect traditional hierarchies, based on age and gender.

The purpose of this study is thus two-fold: (1) to measure the degree of gender inequalities while acknowledging that Kerala's social progress may buffer against discriminatory patterns towards female children and (2) to investigate the extent to which economic constraints exacerbate female discrimination within social strata that perform poorly on economic and social indicators. Two units of observation (episodes of illness and children) will be used to investigate health care utilisation outcomes for children aged 15 years and less.

## Study Setting

This study was conducted in Wayanad, a northern district of Kerala. Agricultural activities are the main workforce occupation of the region. The study site is Kottathara Panchayat (territorial decentralised unit) with a multireligious and multicasite population. Its land area is 31.75 km<sup>2</sup> with a population of 16 110 individuals. Approximately 43% of households are classified as below poverty line (BPL) and around 15% of residents have never been enrolled in school. Kottathara Panchayat has one primary health centre (PHC), four sub-centres as well as few homeopathic and Ayurvedic dispensaries. Private health care institutions are located in the neighbouring Panchayat.

Over one third of the Kerala's tribal population resides in the district of Wayanad for a total concentration of 17% of its population. Tribes, who are distinct from the Hindu caste system, are indigenous groups with different cultural, social and religious practices, who suffer from social and economic exclusion. The caste/tribe affiliation of the study site is 35% of Forward Castes (FC), 34% of Other Backward Castes (OBC) and 31% of Scheduled Castes/Scheduled Tribes (SC/ST), of which one particular tribe, the Paniyas, demonstrates a much higher level of deprivation compared to others. Approximately 90% of Paniyas are below the poverty line as well as perform poorly on most social indicators. Paniyas constitute 12% of the total Kottathara Panchayat population.

## Methods

### *Data source and study population:*

Data used for this analysis come from a one-year panel survey of 555 households realised in 2003-2004. The survey aimed at providing reliable data on health needs, expenditures



and utilisation of health care services. Every episode of illness and episode of health care of each household member was tracked and documented, thus minimizing censoring and recalling biases. One assigned literate family member recorded information pertaining to episodes of illness and of subsequent health care utilisation in a diary given at their disposal. A surveyor reviewed and checked all diaries on a biweekly basis. Anganwadis (i.e. Kindergarten teachers) took on the surveying role on the basis of their solid relationship with the community with a strong interest in population health.

The main characteristics of the participating households, children, and recorded episodes of illness are presented in Table 2. Participating families were selected through a circular systematic random sampling process and Paniyas were over-represented. Only 10 households did not complete the entire data collection cycle, ending with a remarkable attrition rate of less than 2%. There were a total of 879 children nested in 545 households. Approximately half of these children were girls and 45% were less than five-years old. No statistically significant difference was noted between boys and girls in terms of socio-demographic characteristics and reported illness (see Table 2). A total of 1798 episodes of illness were recorded among these children, of which 439 were considered severe because they induced bedriddenness and/or restriction in performing activities of daily living. Condition of illness was derived from a classification of reported symptoms using the WHO Integrated Management of Childhood Illness given the prevalence of chronic illness within the sample is less than 3% (23).

*Variables and analysis of episodes of illness:*

Three binomial indicators were used to explore gender differences in health care utilisation within a given episode of illness: occurrence of at least one outpatient visit (OP), OP visit occurring on first day of episode, OP visit to a private practitioner (perceived as higher-

quality yet more costly services), and in health expenditures. Total consumption was measured by the amount spent for health care throughout the episode (medical and non-medical costs). Analyses were restricted to severe episodes of illness to lessen perception bias inherent to reported health data. To explore possible variations in gender gaps across social groups, three variables were created that combined respectively gender with class, poverty and education levels. Multilevel linear regression (log expenses) and logit models (binomial variables) were performed for all outcome variables while adjusting for episode characteristics (illness condition, duration) and the presence of chronic disease. Other possible control variables such as the child's age remained statistically non-significant for all models and were not further considered. All models accounted for the oversampling of Paniyas and performed using MLwiN version 2.02 given the hierarchical structure of the data (episodes being nested in individuals who are in return nested in families). Models were built incrementally and included only statistically significant variables.

[Insert Table 2 here]

*Variables and analysis of children:*

Possible gender differences in annual health expenditures per child were also investigated while using a similar approach. Health-related expenses throughout the year were aggregated for all 624 children that had at least one episode of illness. The same models were used but only individual-level and household-level control variables were included, such as age, number of episodes of illness and presence of chronic disease.

## Results

### *Utilisation of health services per episode of illness (severe):*

Boys and girls presented similar distributions for incidence of episodes, illness condition, and duration of episode (see Table 2). Among the 439 severe episodes of illness recorded, at least one outpatient visit occurred in 333 episodes. There were higher occurrences of outpatient visits in episodes suffered by boys (87%) than girls (64%). A higher proportion of these visits took place on the same day as the episode began if a boy (33%) than a girl (20%). Visits within the private sector were more likely in episodes among boys (57%) while only 37% for girls. All of these differences are statistically significant at a five percent level.

Models confirmed the aforementioned gender disparities after having controlled for episode, children and family characteristics. The adjusted odd ratios are presented in Table 3. Odds of outpatient visits occurrences were twice less if an episode was suffered by a girl (adjusted OR=0.50; [0.27 to 0.91]). Amid visits, girls also presented 50% less odds to seek care on the first day of the episode (adjusted OR=0.50; [0.32-0.77]) and to consult a private medical practitioner (adjusted OR=0.50; [0.32-0.77]).

When stratified across class, the gender gap persists for the first two outcomes but is most pervasive among socially disadvantaged groups, where it doubles for the occurrence of an outpatient visit. When low-class girls are brought to a health facility, they also arrive with a much greater delay than high-class ones. In terms of OP visit in a private facility, a significant gender gap is noted among other OT/BC. No gender differences are seen among high classes. Similar patterns are seen when examining gender gaps stratified by poverty level and by education status of household head. Girls whose household head has

practically no education or who are poor tend to have a visit four times less than boys living in similar families. Once girls are brought to a facility, the gender gap is less strong although girls are still disadvantaged. Significant gender differences for OP visit to a private practitioner are among educated and non-poor families. All models were adjusted for condition, length (log) in days of episode, and presence of chronic illness.

[Insert Table 3 here]

*Expenses for health care per episode and annual expenses per child:*

Figures 1a, 1b and 1c show the distributions of observed mean health expenditures per episode, stratified by class, poverty and education. On average, parents spent 147 rupees for a severe episode of illness suffered by a boy and 118 rupees for a girl. Gender gap variations are noticeable across the mentioned social groups. The pattern is comparable, although stronger, when we consider annual health expenses per child. Parents spent an average of 412 rupees for boys and 301 rupees for girls. When we only consider children who had at least one episode of illness, expenses for boys are 30% higher than for girls (457 vs. 323 rupees). The gender gap is observable among each social stratum (figures 1d, 1e, and 1f). Interestingly, the small gender gap is seen among Paniyas.

[Insert figure 1 here]

Multilevel regression models for health expenditures (log) per episode and for annual health expenses (log) per child yielded similar results. As such, we have chosen to only present results of models performed on annual health expenses (log) per child. For this analysis, children who had at least one episode of illness throughout the year were retained and results were centered on the observed annual health expenditure for FC

boys. Coefficients were contrasted using the intervals and tests function provided in the MLwiN software package. Overall, no gender gap between boys and girls was noted. At equal conditions, health expenses varied significantly across social groups. They were significantly inferior among socially disadvantaged children (from Paniya, poor and uneducated families).

Models M1, M2, and M3 have permitted to test the interaction between social stratification and gender, using three indicators. The comparison of coefficients shows that there are no significant difference between boys and girls of Paniyas and Forward Castes households. However, significantly more is spent for boys than girls in middle-class families (M1, Table 4). M3 shows that there is a significant gap between boys and girls of uneducated families. The lack of significant gender gap in poor households is believed to be attributed to a lack of statistical power.

## **Discussion**

The present study attempted to take a snapshot of gender inequalities across the frequency, intensity and temporality dimensions of health care utilisation. Accounting for the total health expenditures per episode as part of the analysis also permitted to include any informal health-seeking actions, such as the buying of additional non-prescribed medications, in which a gender preference may be seen. Our findings are based on data generated through a one-year panel survey with a particularly low attrition rate (<2%). Such design allows for the production of uncensored data while controlling for potential memory bias inherent to self-reported health information, reinforcing the reliability of drawn inferences.

Two main patterns in children's health care utilisation have emerged in this study. Firstly, it appears that boys and girls are not treated equally when afflicted with a severe episode of illness. Boys are persistently twice more likely to have an outpatient visit, to see a practitioner within shorter time delays and to utilise higher-quality health services, independently from their economic and social condition. We believe that a lack of statistical power explains why no differences are noted when analyzing health expenditure patterns. These findings converge with those of other published studies on India and other parts of the developing world (4-12). The magnitude of measured gender discrimination is comparable to what has been documented in Northern India, where boy-to-girl likelihood ratio for various health care utilisation outcomes varies from two to four (4-12). Such results are in line with recently document patterns of increasing female discrimination in Kerala (24, 25). A four-fold increase in reported crimes against women over the past decade has been documented (24). Authors whom have published extensively on women's status in Kerala have hypothesised that albeit their high literacy rate, they suffer from a lack of empowerment as illustrated by their low work participation rate (22.9%) (25). Finally, recent discussions on documented juvenile sex ratio trends have alluded to the possibility of sex-selective abortion (26). Such changes highlight women's precarious societal position, knowing that patriarchal norms are renewed in India, as illustrated by the *hindutva* movement.

Findings also suggest that the pervasiveness of gender gaps is most found – even doubled in some instances – among low-class, poor and uneducated families across all health care utilisation outcomes, for severe episodes and for children. These consumption choices may result from an expression of a *rationing bias*. Integral to a survey conducted on treatment-seeking and health consumption practices in the neighbouring state of Karnataka, Iyer et al. (13) have studied rationing bias through a gendered lens. This

concept refers to the mechanism by which households ensure a particular distribution of scarce resources among members. Such decision-making process is based on hierarchies – which is gender in this case – and can lead to the detriment of female children. Thus, girls from low-class, poorer and less educated families are most subjected to gender discrimination due to extensive economic constraints. On the other hand, individuals belonging to families of higher classes, higher education levels and that are propertied are able to create an economic safeguard at the household level. In this context, no distributive allocation process takes place with respect to health care utilisation and thus no rationing bias is expressed in any of the measured outcomes. Our findings add to the existing body of evidence that social group characteristics interact, as defined by class, poverty and education, where evidently greatest marginalisation occurs at the bottom.

Among Paniya families, significant gender differences are seen in health care utilisation outcomes but not in health expenditures per episode as well as per child per year. Such pattern may reflect the situation of extreme poverty prevalent in this tribe. Approximately 85% of Paniyas households are below the poverty line and their average yearly per capita income is less than 5,000 rupees, which is 30% less than other tribal communities. Around 14% of these families are landless, 71% are uneducated, and only 24% have access to electricity. Finally, 18% of Paniyas do not have regular access to safe water on a daily basis. Their high-level of deprivation is not seen in any other group identified in our study. Paniya families are subjected to extreme economic marginalisation; less than five percent of their income is allotted to health care purchases. In this case, the rationing bias might be expressed through other outcomes (frequency and delay) where the scarce resource distributed across family members is time away from income-generating activities such as farming. We refer to such behaviour as *overrationing*, which occurs in circumstances where we see a cumulated effect of different types of marginalisation, mainly social and

economic.

## **Conclusion**

Although this study was carried in a particular rural region of Kerala, important points for further reflection are retained. Health services in Kerala are costly in a setting where no formal insurance system protects families from catastrophic out-of-pocket expenditures (19). As the burden of health care costs will become heavier on the shoulder of families, we can expect that economic and gender inequalities to be reproduced among the poor and vulnerable. Preventing and removing financial barriers to health care may be a good entry point in addressing discrimination in treatment-seeking operated by rationing. In cases where extreme economic and social marginalisation is noticed, such as among Paniyas, economic-sensitive interventions aiming at reinforcing basic capabilities for their well-being while alleviating access barriers to health care need to be considered. Despite a relatively small number of studies on this particular topic, the findings of our study highlight the need to concomitantly address economic and social disparities if greater gender equity in the utilisation of health services is to be achieved.



Table 1: Basic Indicators: Kerala and India.

Indicator	Kerala*	India**
Population (in millions)	31.9	1103
Sex ratio (females/1000 males)	1058	933
Fertility rate (children/childbearing woman)	1.9	2.7
Mean household size (individuals)	4.7	5.3
Per capita income (Indian National Rupees)	22.776	20.989
Human Development Index (HDI)	0.638	0.611
Gender-related Development Index (GDI)	0.825	0.591
Literacy rate, male (%)	94.2	75.6
Literacy rate, female (%)	87.9	54.0
Infant mortality rate (deaths/1000 live births)	16	56
Life expectancy at birth, male (in years)	70.9	61.0
Life expectancy at birth, female (in years)	76.0	63.5

Source: \*Kerala Human Development Report (2005) and \*\*WHO (2005)

Table 2: Sample Characteristics: Households, Children and Episodes of Illness

<b>Level 3: Households</b>	<b>All (n=545)</b>		
<i>Class (head of household)</i>			
Paniyas (tribes)	142 (26%)		
Other tribes & Other Backward castes	241 (44%)		
Forward Castes	164 (30%)		
<i>Poverty level</i>			
Land owned ≤ 10 cents	153 (28%)		
<i>Education of head of household</i>			
None/primary	414 (76%)		
<i>Size of sibship</i>			
Mean (Median)	2.2 (2)		
<b>Level 2: Children</b>	<b>All (n=879)</b>	<b>Female (n=438)</b>	<b>Male (n=441)</b>
<i>Age distribution</i>			
Age 0-5 years	395 (45%)	195 (45%)	200 (45%)
<i>Chronic disease</i>			
Presence of chronic disease	26 (3%)	16 (4%)	10 (2%)
<i>Episodes of illness per child per year</i>			
All episodes	3.1	3.2	3.0
Severe episodes	1.8	1.8	1.8
<b>Level 1: Episodes of illness recorded (severe episodes only) during the one-year follow-up</b>	<b>All</b>	<b>Female</b>	<b>Male</b>
<i>Severe episodes</i>			
As percentage of total number of episodes	439 (100%)	215 (49%)	224 (51%)
	24%	12%	12%
<i>Illness Condition*</i>			
Undifferentiated febrile conditions	61 (14%)	31 (14%)	30 (13%)
Acute respiratory illnesses	215 (49%)	106 (49%)	109 (49%)
Acute diarrhoeal diseases	75 (17%)	41 (18%)	34 (16%)
Other conditions	88 (20%)	44 (20%)	44 (20%)
<i>Duration in days*</i>			
Mean (Median)	11 (7)	12 (7)	9 (7)

In bold: significant difference between female and male.

\*: Out of all severe episodes

Table 3: Gender Gaps in Health Care Utilisation across Social Groups (Adjusted Females-to-Males Odd Ratios)

Group / Subgroup	Outcome		
	Occurrence of outpatient visit*	Visit on first day of episode**	Visit to a private practitioner**
Gender Gap (All categories grouped)	<b>0.50 (0.27 to 0.91)</b>	<b>0.50 (0.32 to 0.77)</b>	<b>0.50 (0.32 to 0.77)</b>
<b>Class</b>			
Paniya (tribal)	<b>0.21 (0.07 to 0.59)</b>	<b>0.34 (0.13 to 0.83)</b>	0.76 (0.31 to 1.87)
Other tribes and backward castes	0.57 (0.20 to 1.60)	<b>0.46 (0.23 to 0.96)</b>	<b>0.35 (0.17 to 0.70)</b>
Forward castes	2.38 (0.60 to 9.44)	0.81 (0.39 to 1.69)	0.56 (0.26 to 1.19)
<b>Poverty status (Land ownership)</b>			
≤ 10 cents of land	<b>0.27 (0.10 to 0.70)</b>	0.58 (0.25 to 1.31)	0.59 (0.27 to 1.30)
> 10 cents of land	0.81 (0.36 to 1.85)	<b>0.47 (0.28 to 0.80)</b>	<b>0.46 (0.27 to 0.78)</b>
<b>Education level of household head</b>			
None/primary education	<b>0.30 (0.14 to 0.66)</b>	<b>0.37 (0.17 to 0.79)</b>	0.67 (0.35 to 1.28)
High school and above	0.52 (0.17 to 1.56)	0.59 (0.31 to 1.11)	<b>0.41 (0.21 to 0.79)</b>

&Based on multilevel models adjusting for episode characteristics (illness condition, sibship size, presence of chronic disease)

\*: Among all severe episodes (n=439)

\*\* : Among severe episodes with at least one outpatient visit (n=333)

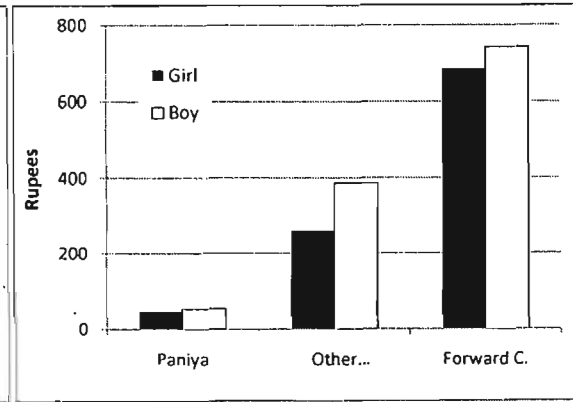
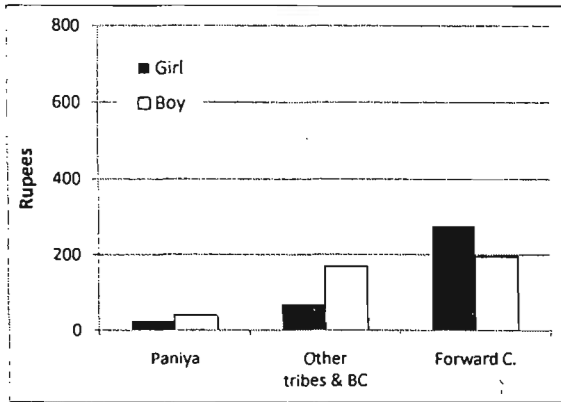
**Figure 1: Distribution of health expenses per episode and per child per year**

Expenses per episode across social groups

Total expenses per child per year across social groups

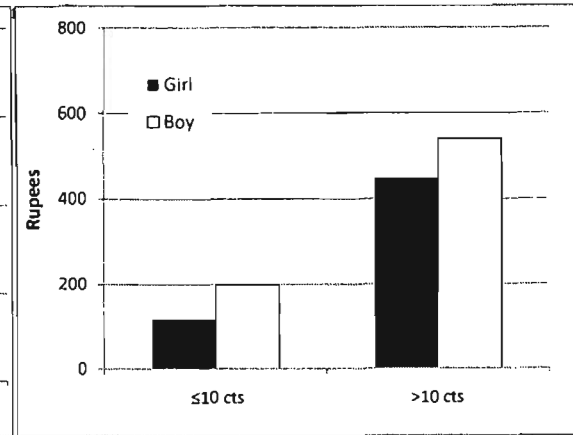
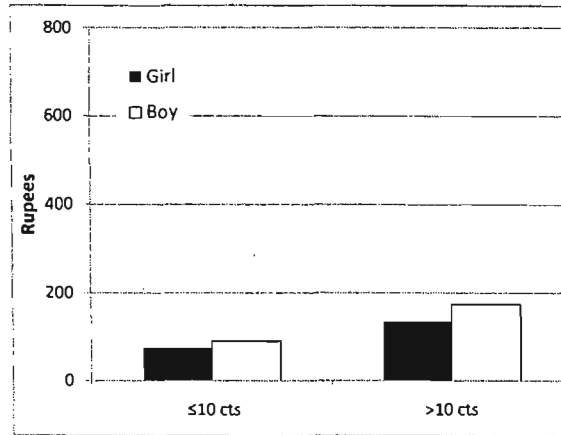
1a: Exp. per episode by class

1d Exp per child by class



1b. Exp. per episode by poverty level (land ownership)

1e. Exp. per child by poverty level (land ownership)



1.c Exp. per episode by education level of head

1.f Exp. per child by education level of head

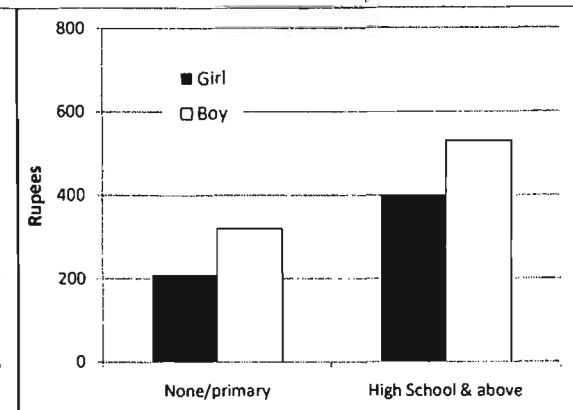
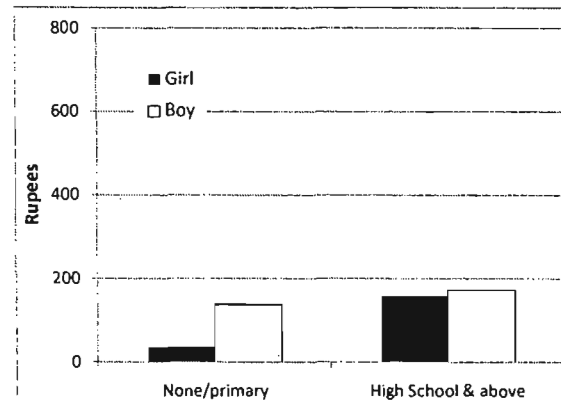


Table 4: Gender Differences in Health Care Expenses per Child per Year

Independent variable	Coefficients and SE			
	M0	M1	M2	M3
<i>All children</i>				
Girls	-0.284 (0.172)			
Boys	Reference			
<i>Gender * Caste</i>				
Girl & Paniya (tribal)	-	<b>-3.085 (0.273)</b>	-	-
Boy & Paniya (tribal)	-	<b>-3.053 (0.283)</b>	-	-
Girl & Other Tribe /Backward caste	-	<b>-0.512 (0.238)</b>	-	-
Boy & Other Tribe/Backward caste	-	-0.110 (0.241)	-	-
Girl & Forward Caste	-	-0.220 (0.277)	-	-
Boy & Forward Caste	-	Reference	-	-
<i>Gender * Poverty status (Land ownership)</i>				
Girl & land owned by family ≤ 10 cents	-	-	<b>-1.807 (0.227)</b>	-
Boy & land owned by family ≤ 10 cents	-	-	<b>-1.382 (0.239)</b>	-
Girl & land owned by family > 10 cents	-	-	-0.005 (0.210)	-
Boy & land owned by family > 10 cents	-	-	Reference	-
<i>Gender* Education level of household head</i>				
Girl & Head None/primary level	-	-	-	<b>-1.457 (0.244)</b>
Boy & Head None/primary level	-	-	-	<b>-0.946 (0.240)</b>
Girl & Head High school and above	-	-	-	-0.104 (0.247)
Boy & High school and above	-	-	-	Reference

Model: Linear regression. Dependent variable: log health expenditures per child.

Adjustment: presence of chronic illness, log number of episodes per child, age, sibship size. Coefficients are not included in table for clarity purposes.

Sample: children with at least one episode (n=624)

$R^2_{M0}=0.01$ ;  $R^2_{M1}=0.60$ ;  $R^2_{M2}=0.31$ ;  $R^2_{M3}=0.31$ .

## References

1. Tursz A, Crost M. An epidemiological study of gender issues in health care seeking behaviour and care of under five children in developing countries. *Revue d'épidémiologie et de santé publique*. 1999;47:133-156.
2. Tisdell C, Regmi G. Prejudice against female children: economic and cultural explanations, and Indian evidence. *International Journal of Social Economics*. 2005;32:541-53.
3. Das Gupta M. Selective discrimination against female children in rural Punjab, India. *Population and Development Review*. 1987;13:77-100.
4. Pokhrel S, Snow R, Dong H et al. Gender role and child health care utilization in Nepal. *Health Policy*. 2005;74:100-9.
5. Pokhrel S, Sauerborn R. Household decision-making on child health care in developing countries: the case of Nepal. *Health Policy and Planning*. 2004;19:218-33.
6. Pandey A, Sengupta PG, Monday SK et al. Gender differences in healthcare-seeking during common illnesses in a rural community of West Bengal, India. *Journal of Health, Population and Nutrition*. 2002;20:306-11.
7. Ganatra B, Hirve S. Male bias in health care utilization for under-fives in a rural community in western India. *Bulletin of the World Health Organization*. 1994;72:101-4.
8. Mishra V, Roy TK, Retherford RD. Sex differentials in childhood feeding, health care and nutritional status in India. *Population and Development Review*. 2004;30:269-95.
9. Pande RP. Selective gender differences in childhood nutrition and immunization in rural India: the role of siblings. *Demography*. 2003;40:395-418.

10. Jacob ME, Abraham S, Surya S et al. A community health program in rural Tamil Nadu, India. The need for gender justice for women. *Reproductive Health Matters*. 2006;14:101-8.
11. Yount KM. Maternal resources, proximity of services, and curative care of boys and girls in Minya, Egypt. *Population Studies*. 2004;58:345-55.
12. Hossain MM, Glass RI. Parental son preference in seeking medical care for children less than five years of age in a rural community of Bangladesh. *Journal of Public Health*. 1988;78:1349-50.
13. Iyer A, Sen G, George A. The dynamics of gender and class in access to health care: evidence from rural Karnataka, India. *International Journal of Health Services*. 2007;37:537-54.
14. Subramanian SV, Nandy S, Irving M et al. The mortality divide in India: the differential contributions of gender, caste and standard of living across the life course. *American Journal of Public Health*. 2006;96:818-25.
15. Subramanian SV, Smith GD, Subramanyam M. Indigenous health and socioeconomic status in India. *PLoS Medicine*. 2006;3:1794-804.
16. Roy K, Chaudhuri A. Influence of socioeconomic status, wealth and financial empowerment on gender differences in health and healthcare utilization in later life: evidence from India. *Social Science & Medicine*. 2008;66:1951-62.
17. Deshpande A. Does caste still define disparity? A look at inequality in Kerala, India. *The American Economic Review*. 2000;90:322-5.
18. Chacko E. Marriage, development, and the status of women in Kerala, India. *Gender and Development*. 2003;11:52-9.
19. Narayana D. High health achievements and good access to health care at great cost: the emerging Kerala situation. In: Haddad S, Baris E, Narayana D, eds. *Safeguarding the health sector in times of macroeconomic instability*. Policy

- lessons for low- and middle-income countries*. Trenton, USA: African World Press and International Development Research Centre; 2008:198-224.
20. Bhat R. Characteristics of the private medical practice in India: a provider perspective. *Health Policy and Planning*. 1999;14:26-37.
  21. Dilip TR. Understanding the level of morbidity and hospitalization in Kerala, India. *Bulletin of the World Health Organization*. 2000;80:746-51.
  22. Lévesque JF, Haddad S, Narayana D, Fournier P. Outpatient care utilization in urban Kerala, India. *Health Policy and Planning*. 2006;21:289-301.
  23. Gove S. Integrated management of childhood illness by outpatient health workers: technical basis and overview. *Bulletin of the World Health Organization*. 1997;75:7-24.
  24. Panda P, Agarwal B. Marital violence, human development and women's property status in India. *World Development*. 2005;33:823-50.
  25. Eapen M, Kodoth P. Family structure, women's education and work: re-examining the 'high status' of women in Kerala. In: Mukhopadyay S, Surdarshan R, eds. *Tracking gender equity under the socioeconomic reforms*. New Delhi, India: Kali for Women, 2003:227-67.



## **6 OTHER DISCUSSION ELEMENTS**

The discussion portion of our article included in Chapter 5 provides insight on the significance of the obtained results and policy implications that thus derive. The following discussion will touch upon our research hypotheses as well as methodological challenges. We will end this chapter with general remarks on the studied phenomenon.

### **6.1 HYPOTHESES**

#### **6.1.1 Gender Differences in children's Health Care Utilisation**

It appears that, from our models, boys and girls are treated differently when they are ill. From the analyses conducted on severe episodes of illness, results show that gender significantly contributes to explaining differences in different dimensions of health care utilisation. Indeed, from all severe episodes, boys exhibited twice greater odds to have an outpatient visit. Among episodes with at least one outpatient visit, boys had twice greater odds to consult a private practitioner as well as seek care on the first day of the severe episode of illness. However, expenses incurred by a severe episode of illness as well as annual expenditures per child did not differ across gender. These findings converge with those of other published studies on India, particularly on Northern states, and other parts of the developing world (4-7, 16, 37, 39-45). To our knowledge, this study is the first to show significant differences among boys and girls within Kerala. Given the body of evidence suggesting that Keralite women and female children are more exposed to gender-based violence and subsequent loss of empowerment, our results reinforce the growing concerns around gender inequalities in health care utilisation.

### 6.1.2 Gender Gap Variations across Social Groups

Our findings illustrate the differential variation of gender disparities in children's health care utilisation across class, poverty and education levels. While low-class parents financially invest much less in their children's health when compared to high-class parents for a given severe episode of illness, gender differences are noted among middle-class and uneducated families. Among uneducated families, we see a similar trend: much less is spent for their children in comparison with educated families. A significant gender gap is also present. Among poor families, no significant gender gap was found but we believe that it is due to a lack of statistical power due to our small sample size (439 severe episodes). As for annual health expenditures per child, our results indicate that no gender difference can be detected among low-class and high-class households but gender differences occurred among the middle-class and uneducated families.

In poor and uneducated families, economic constraints are higher, leading to a high rationing of scarce resources among household members, as explained in Chapter 5 (4). This intra-household allocation process proceeds on hierarchies based, generally, on gender and age. While in theory its objective is to achieve equity among members, in a context where male preference prevails, it leads to the disproportionate disadvantage of girls that belong to poor and uneducated families (58). In non-poor and educated families, significant differences were seen for time delays and visits to a private practitioner only, where in both instances, female children have 50% lesser odds than boys. While in such families resources may not be as limited as in the latter ones, such discrimination is a result of more of a *pure bias*, which stems from traditional beliefs and practices.

Finally, as explained in Chapter 5, we see significant gender gaps among low-class families across all outcomes except health expenses (per episode and per child on annual basis). In this case, we believe that Paniyas' high level of deprivation results in a quasi-absence of economic assets, not enabling these households to adhere to a distributive process of money. The *over-rationing*, as we refer to it in the article, occurs on available resources of time dedicated on income-generating activities. In a particular segment where many risk factors are cumulated – poverty, lack of education, and extensive social exclusion – such pattern may be recognised.

Although our findings stem from a single research study, it enabled us to reaffirm the necessity to further explore gender differentials in children's health care utilisation. Our findings are based on a longitudinal study that presents a remarkable low attrition rate. The differential manifestation of a gender gap in health care expenditures among and between social groups is quite interesting because it implies that the gender dimension of health should be examined within a particular social frame. In order to have better insight into gender and power inequities, sex-segregated data analyses are insufficient and need to incorporate concepts of class, equity and race (see results chapter for more detailed discussion of results).

## **6.2 METHODOLOGICAL LIMITATIONS**

### **6.2.1 Perception Bias**

Although this research study has been conducted using longitudinal data, it still presents a few limitations. As explained in the methods section, gender differentials can be identified at different steps of the household decision-making process. In order to minimise the perception bias inherent to the data, we have chosen to concentrate on severe episodes of illness only. This perception bias stems from parents' ability and comprehension of the

disease process of acute episodes of illness. In theory, the decision to seek health services occurs when the child's parent assess the need for health care by appraising the condition of the episode of illness. However, although minimised, this perception bias is still present, which has implications for drawing inferences. For example, our findings have demonstrated that gender is a statistically significant factor contributing to delays in seeking care. Considering that a perception bias is still present, parents may exhibit more diligence in noticing any health changes in boys than in girls.

Discussions with community health workers on the field indicated that mothers might be more sensitive to any changes occurring in the health status of young boys as opposed to girls. Additionally, boys tend to play outside during the day or after school whereas girls need to attend to their household chores instead of playing with other children. As a result, community health workers state that mothers develop a higher sensitivity to boys as they are potentially more "exposed" to any harmful germs. Descriptive analyses of our data clearly show that there is no gender difference in the incidence of episode of illness. Nonetheless, it is important to acknowledge that this perception bias is inherent to the data.

### **6.2.2 Control Variables**

A second limitation of this research study is the unavailability of data pertaining to mothers within a household. Variables such as the household head's educational and occupation statuses can be extracted from the panel survey database. However, the database did not provide any information on mother's education or occupation statuses. Several studies examining gender differentials in children's health care utilisation in India have incorporated variables pertaining to the child's mother in addition to other household characteristics—such as caste and household income—into their statistical models.

### **6.2.3 External Validity**

As described in the methods section, the district of Wayanad has a high concentration of tribal populations making it different from the rest of the state of Kerala. This factor has implications for external validity of the results obtained from this research study. Indeed, during a field visit to collect background information, key actors such as Keralite researchers and community stakeholders have raised the issue of the particular social context of Wayanad. From these discussions, it seems that a similar study contrasting different districts is necessary prior to making inferences to the state level.

### **6.2.4 Directions for Future Research**

In the previous sections of this discussion, we have mentioned several methodological limitations, which need to be considered for future research. As highlighted in the discussion of the article, panel surveys have an appropriate design for the study of health care utilisation patterns. Thus, we suggest that future research exploring gender differentials in health care utilisation adopt a similar design but incorporate indicators that are lacking in our study. In addition, it would be interesting to see if gender differentials are also present when comparing clinical data, such as stunting or anaemia. It would provide us with an indication of the pervasiveness of gender discrimination in Kerala, while accounting for social stratification.

## **6.3 GENERAL COMMENTS**

Our study is one of few which explore the relation between gender and health care utilisation within the Keralite context. In the literature, we can see a dismal portrayal of female condition, whereby some authors believe that Keralite women benefit from a particularly high status compared to Indian women. Other authors and organisations working in the Keralite context acknowledge the presence of gender disparities (25).

Considering this ambiguity compounded with our findings, this issue merits to be further explored in different dimensions of human development in Kerala.

It is important to remember that Keralite families are more and more endorsing a high burden of health care costs. Indeed, this state is facing constantly rising health care expenditures, which is instrumental considering that recent studies have demonstrated that individuals in Kerala exhibit high rates of health care utilisation and a strong preference for private health services. In addition, the impact of the *hindutva* movement is being felt within the Keralite context. Discussions with Keralite community organisations working with women have indicated that despite women's high education status, they are more and more subjected to abuse and violence.

All of the aforementioned elements interact and may be translated differently across various social groups. As such, a combined gender and social lens needs to be applied if the health dimension is to be further examined in Kerala. Standard gender analysis of health care utilisation patterns may miss, or even mask, the actual processes at work.

## 7 CONCLUSION

Our study enabled us to bring forward new elements to a research area that has been relatively understudied. The findings of our study raised the importance of further exploring the gender dimension in health within the Keralite context. The present literature on gender discrimination in Kerala pertain to the distal determinants of health, such as education and employment, but our study is one of the few looking at health care utilisation within the Keralite context. Although this study is specific to Kerala, several clues can be gathered and applied to settings where a progress in human development is noted albeit belonging to the developing world.

Our study attempted to determine the extent of gender disparities in health care utilisation across social groups. As discussed, parents are forced to make choices knowing that health care expenditures are constantly rising and that boys represent an income utility. In understanding the interplay of the aforementioned factors, we are in a better position to comprehend then pervasiveness of inequalities in health and health care utilisation. Interestingly, when investigating health expenditures using both analysis units, the findings of this study that the gender dimension of health cannot be independently studied from the particular context of India and Kerala, as the gender gap differed across social groups.

The results of this study can be used to influence policy-making in raising the importance of addressing gender inequalities in health care utilisation. As findings pertain to different dimensions of health care utilisation, policy-makers and health professionals will be able to identify the channels (i.e. public health institutions) whereby they can reach out to young girls and families. These conclusions can provide a greater insight into better comprehending the vulnerability of young girls in a similar patriarchal context.

Furthermore, they highlight the importance of studying the gender gap in health care utilisation and in health within the Keralite context. It would be interesting to conduct a study examining the gender gap in the health status of children, to further explore the influence of gender.



## REFERENCES

1. Fikree FF, Pasha O. Role of gender in health disparity: the South Asian context. *BMJ*. 2004;328:823-6.
2. Milliez JM. Sex-selection for non-medical purposes. *Reproductive Biomedicine Online*. 2007;14:2374.
3. Gideon H. A baby is born in the Punjab. *American Anthropologist*. 1962;64:1220-34.
4. Iyer A, Sen G, George A. The dynamics of gender and class in access to health care: evidence from rural Karnataka, India. *International Journal of Health Services*. 2007;37:537-554.
5. Subramanian SV, Nandy S, Irving M et al. The mortality divide in India: the differential contributions of gender, caste, and standard of living across the life course. *American Journal of Public Health*. 2006;96:818-25.
6. Subramanian SV, Smith GD, Subramanyam M. Indigenous health and socioeconomic status. *PLoS Medicine*. 2006;3:1794-804.
7. Roy K, Chaudhuri A. Influence of socioeconomic status, wealth and financial empowerment on gender differences in health and healthcare utilization in later life: evidence from India. *Social Science & Medicine*. 2008;66:1951-1962.
8. Mitra A, Singh P. Human capital attainment and female labor force participation – the Kerala puzzle. *Journal of Economic Issues*. 2006;40:779-98.
9. Centre for Development Studies. *Kerala Human Development Report 2005*. Thiruvananthapuram, India: Government of Kerala. 2005:1-199.
10. Jha PRK, Vasa P, Dhingra N et al. Low male-to-female sex ratio of children born in India: national survey of 1.1 million households. *Lancet*. 2006;367:211-8.
11. Das Gupta M, Mari Bhat PN. Fertility decline and increased manifestation of sex bias in India. *Population Studies*. 1997;51: 307-15.

12. Dyson T, Moore M. On kinship structure, female autonomy, and demographic behaviour in India. *Population and Development Review*. 1983;9:35-60.
13. Murthy RK. Fighting female infanticide by working with midwives: an Indian case study. *Gender and development*. 1996;4:20-7.
14. Varkey P, Balakrishna PP, Prasad JH et al. The reality of unsafe abortion in a rural community in South India. *Reproductive Health Matters*. 2000;8:83-91.
15. Das Gupta M. Selective discrimination against female children in rural Punjab. *Population and Development Review*. 1987;13:77-100.
16. Ganatra B, Hirve S. Male bias in health care utilization for under-fives in a rural community in western India. *Bulletin of the World Health Organization*. 1994;72:101-4.
17. Michael EJ, Singh B. Mixed signals from Kerala's improving health status. *The Journal of the Royal Society for the Promotion of Health*. 2003;123:33-8.
18. Government of India. *Census of India*. New Delhi, India: Government of India; 1991.
19. Beteille A. *Caste, class and power: changing patterns of stratification in a Tanjore villa*. New Delhi, India: Oxford University Press; 1996.
20. Bhengra R, Bojoy CR, Luithui S. *The adivasis of India*. London, United Kingdom: Minority Rights Group International; 1999.
21. Narayana D, Haddad S, Mohindra K et al. *General profile of Kottathara Panchayat*. Montréal, Canada: Université de Montréal; 2005.
22. Narayana D. High health achievements and good access to health care at great cost: the emerging Kerala situation. In: Haddad S, Baris E, Narayana D, eds. *Safeguarding the health sector in times of macroeconomic instability. Policy lessons for low- and middle-income countries*. Trenton, USA: African World Press and International Development Research Centre; 2008:198-224.

23. Jeffrey R. Legacies of matriliney: the place of women and the "Kerala model." *Pacific Affairs*. 2005;77:647-64.
24. Eapen M, Kodoth P. Family structure, women's education and work: re-examining the 'high status' of women in Kerala. In: Mukhopadyay S, Surdarshan R, eds. *Tracking gender equity under the socioeconomic reforms*. New Delhi, India: Kali for Women, 2003:227-67.
25. Mohindra KS, Haddad S, Narayana D. Women's health in a rural community in Kerala, India: do caste and socioeconomic position matter? *Journal of Epidemiology and Community Health*. 2006;60:1020-6.
26. Rajan SI, Sudha S, Mohanachandran P. Fertility decline and worsening gender bias in India: is Kerala no longer an exception? *Development and Change*. 2000;31:1085-92.
27. Borooah VK. Gender bias among children in India in their diet and immunisation against disease. *Social Science & Medicine*. 2004;58:1719-31.
28. Kodoth P, Eapen M. Looking beyond gender parity: gender inequalities of some dimensions of well-being in Kerala. *Economic and Political Weekly*. 2005;July 23:3278-86.
29. Kodoth P. Fostering insecure livelihoods; dowry and female seclusion in left developmental contexts in West Bengal and Kerala. *Economic and Political Weekly*. 2005;June 18:2543-54.
30. Bandyapadhyay M. Missing girls and son preference in rural India: looking beyond popular myth. *Health Care for Women International*. 2003;24:910-26.
31. Chacko E. Marriage, development, and the status of women in Kerala, India. *Gender and Development*. 2003;11:52-9.
32. Patel V. Adverse juvenile sex ratio in Kerala. *Economic and Political Weekly*. 2002;June 1.

33. Zavier F, Padmadas. Use of a spacing method before sterilization among couples in Kerala, India. *International Family Planning Perspectives*. 2000;26:29-35.
34. Fuse K, Crenshaw EM. Gender imbalance in infant mortality: a cross-national study of social structure and female infanticide. *Social Science & Medicine*. 2006;62:360-74.
35. Visaria L. Regional variations in female autonomy and fertility and contraception in India. In: Jeffrey R, Basu AM, eds. *Girl's schooling, women's autonomy and fertility change in South Asia*. New Delhi, India: Sage Publication; 1996.
36. World Health Organization. *What is a gender-based approach to public health?* 2007; [cited 2007 April 20]; Available from <http://www.who.int/features/ga/56/en/index.html>.
37. Yount KM. Maternal resources, proximity of services, and curative care of boys and girls in Minya, Egypt. *Population Studies*. 2004;58:345-55.
38. Tursz A, Crost M. An epidemiological study of gender issues in health care seeking behaviour and care of under five children in developing countries. *Revue d'épidémiologie et de santé publique*. 1999;47:133-156.
39. Pokhrel S, Snow R, Dong H et al. Gender role and child health care utilization in Nepal. *Health Policy*. 2005;74:100-9.
40. Pokhrel S, Sauerborn R. Household decision-making on child health care in developing countries: the case of Nepal. *Health Policy and Planning*. 2004;19:218-33.
41. Hossain MM, Glass RI. Parental son preference in seeking medical care for children less than five years of age in a rural community of Bangladesh. *Journal of Public Health*. 1988;78:1349-50.
42. Pande RP. Selective gender differences in childhood nutrition and immunization in rural India: the role of siblings. *Demography*. 2003;40:395-418.

43. Pandey A, Sengupta PG, Monday SK et al. Gender differences in healthcare-seeking during common illnesses in a rural community of West Bengal, India. *Journal of Health, Population and Nutrition*. 2002;20:306-11.
44. Jacob ME, Abraham S, Surya S et al. A community health program in rural Tamil Nadu, India. The need for gender justice for women. *Reproductive Health Matters*. 2006;14:101-8.
45. Pillai RK, Williams SV, Glick HA et al. Factors affecting decisions to seek treatment for sick children in Kerala, India. *Social Science & Medicine*. 2003;57:1719-31.
46. Bhuiya A, Streatfield K. Mothers' education and survival of female children in a rural area of Bangladesh. *Population Studies*. 1991;45:253-64.
47. Olaogun A, Adebayo AA, Ayandiran OE et al. Effects of mothers' socio-economic status on the management of febrile conditions in their under five children in a resource limited setting. *International Health and Human Rights*. 2006;6:1.
48. Dilip, TR. Utilisation of reproductive and child health care services: some observations from Kerala. *Journal of Health Management*. 2002;4:19-30.
49. Garg A, Murdoch J. Sibling rivalry and the gender gap: Evidence from child health outcomes in Ghana. *Journal of Population Economics*. 1998;11:471-93.
50. Miller BD. Social class, gender and intrahousehold food allocations to children in South Asia. *Social Science & Medicine*. 1997;44:1685-95.
51. D'Souza RM. Role of health-seeking behaviour in child mortality in the slums of Karachi, Pakistan. *Journal of Biosocial Sciences*. 2003;35:131-44.
52. Sauerborn R, Adams A, Hien M. Household strategies to cope with the economic cost of illness. *Social Science & Medicine*. 1996;43:291-301.
53. Kroeger A. Anthropological and socio-medical health care research in developing countries. *Social Science & Medicine*. 1983a;17:147-61.

54. Park CB, Cho NH. Consequences of son preference in a low-fertility society: Imbalance of the Sex Ratio at Birth in Korea. *Population and Development Review*. 1995;21:59-84.
55. Zavier F, Padmadas SS. Use of a spacing method before sterilization among couples in Kerala, India. *International Family Planning Perspectives*. 2000;26:29-35.
56. Reise SP, Ventura J, Nuechterlein KH et al. An illustration of multilevel factor analysis. *Journal of Personality Assessment*. 2005;82:126-36.
57. Gove S. Integrated management of childhood illness by outpatient health workers: technical basis and overview. *Bulletin of the World Health Organization*. 1997;75:S7-24.
58. Behrman JR. Intra-household allocation of resources: Is there a gender bias? In: Department of Economic and Social Affairs – Population Division, eds. *Too young to die: genes or gender?* New York, USA: United Nations, 1998:223-42.

## APPENDIX I: CONDITION OF ILLNESS

In the original questionnaire used in the panel survey, participants were requested to report all experienced symptoms throughout each episode of illness. They were given a list of potential symptoms (such as fever and cough) and were also given the opportunity to add any symptom not previously listed. Although data on symptoms provide invaluable information on each episode of illness, the correlates of the full spectrum of symptoms must be considered for medical treatment. Given this fact, it is thus reasonable to assume that morbidity indicators solely based on symptoms may be limited in reliability compared to indicators composed of diagnostic categories (57). Additionally, given the low rate of chronic illness morbidity within the sample (<3%), the majority of episodes of illness can be examined independent from each other, as the likelihood of repeated events related to a chronic illness is low. Among the children that suffer from a chronic illness, asthma and tuberculosis were the two main reported diseases. Morbidity of cardio-vascular diseases and diabetes was not recorded within the studied sample.

Symptoms were classified using the World Health Organization's Integrated Management of Childhood Illnesses. During a field visit, health care providers and key actors on the field (such as mothers) were requested to validate the formed diagnostic categories. Three main categories emerged from the classification of symptoms: acute respiratory illnesses, acute diarrheal diseases, and undifferentiated febrile conditions. An acute respiratory illness was defined as a combination of a body temperature greater than 38 degrees Celsius (i.e. fever) and a respiratory symptom such as cough or difficulty breathing. Acute diarrheal diseases were defined as a combination of watery stools (frequency of at least three times a day) and gastrointestinal symptoms such as abdominal pain or vomiting. Acute diarrheal diseases may also exhibit fever depending on the severity of the condition.

Undifferentiated febrile conditions included episodes of illness where the child suffered from a fever but did not fit the description of an acute respiratory illness or an acute diarrheal disease. A fourth category encompassing episodes of illness not fitting the above-mentioned categories was also created (see Table 7 for more details).

**Table 7: Percentage Distribution of Severe Episodes of Illness by Diagnostic Categories (n=439)**

Condition of Illness	N	%
Undifferentiated febrile conditions	61	14
Acute respiratory illnesses	215	49
Acute diarrheal diseases	75	17
Other conditions	88	20



## APPENDIX II: OUTPUTS OF STATISTICAL MODELS

Table 8: Outputs of Models for Occurrences of Outpatient Visits

Independent variables	Coefficients and SE			
	M0	M1	M2	M3
<i>All children</i>				
Girls	-0.698 (0.307)	-	-	-
Boys	Reference	-	-	-
<i>Gender * Caste</i>				
Girl & Paniya (tribal)	-	-1.394 (0.514)	-	-
Boy & Paniya (tribal)	-	0.190 (0.594)	-	-
Girl & Other Tribe /Backward caste	-	-0.103 (0.493)	-	-
Boy & Other Tribe/Backward caste	-	0.465 (0.567)	-	-
Girl & Forward Caste	-	0.871 (0.701)	-	-
Boy & Forward Caste	-	Reference	-	-
<i>Gender * Poverty status (Land ownership)</i>				
Girl & land owned by family ≤ 10 cents	-	-	-1.633 (0.430)	-
Boy & land owned by family ≤ 10 cents	-	-	-0.312 (0.492)	-
Girl & land owned by family > 10 cents	-	-	-0.205 (0.419)	-
Boy & land owned by family > 10 cents	-	-	Reference	-
<i>Gender* Education level of household head</i>				
Girl & Head None/primary level	-	-	-	-1.721 (0.549)

Boy & Head None/primary level	-	-	-	-0.513 (0.538)
Girl & Head High school and above	-	-	-	-0.660 (0.565)
Boy & High school and above	-	-	-	Reference
<b>Control variables</b>				
<i>Illness Condition</i>				
Undifferentiated febrile conditions	Reference	Reference	Reference	Reference
Acute respiratory illnesses	-0.664 (0.524)	-0.646 (0.546)	-0.712 (0.553)	-0.704 (0.536)
Acute diarrheal diseases	-0.372 (0.608)	-0.555 (0.631)	-0.651 (0.636)	-0.545 (0.623)
Other conditions	-0.566 (0.576)	-0.741 (0.598)	-0.767 (0.603)	-0.742 (0.592)
<i>Chronic Illness</i>	-1.276 (0.641)	-1.824 (0.683)	-1.333 (0.674)	-1.484 (0.663)
<i>Sibship Size</i>	-0.406 (0.116)	-0.229 (0.134)	-0.318 (0.122)	-0.303 (0.124)
<b>Random effects for multiresponse model for occurrence of outpatients on start day of episode</b>				
$V_{0k}$	0.655 (0.501)	0.731 (0.530)	0.838 (0.537)	0.816 (0.528)
$V_{1k}$	0.048 (0.270)	0.026 (0.271)	0.079 (0.274)	0.034 (0.267)
$V_{0k} * V_{1k}$	0.707 (0.407)	0.600 (0.432)	0.783 (0.414)	0.666 (0.421)
<b>Random effects for multiresponse model of occurrence of private outpatient visit</b>				
$V_{0k}$	0.390 (0.469)	0.420 (0.495)	0.499 (0.500)	0.495 (0.490)
$V_{1k}$	0.567 (0.284)	0.613 (0.291)	0.584 (0.284)	0.606 (0.287)
$V_{0k} * V_{1k}$	-0.179 (0.367)	0.137 (0.394)	-0.148 (0.381)	0.188 (0.385)

Table 9: Outputs of Models of Occurrences of Outpatient Visits on First Day of Illness Episode

Independent variables	Coefficients and SE			
	M0	M1	M2	M3
<i>All children</i>				
Girls	-0.702 (0.226)	-	-	-
Boys	Reference	-	-	-
<i>Gender * Caste</i>				
Girl & Paniya (tribal)	-	-0.502 (0.452)	-	-
Boy & Paniya (tribal)	-	0.590 (0.377)	-	-
Girl & Other Tribe /Backward caste	-	-0.753 (0.357)	-	-
Boy & Other Tribe/Backward caste	-	0.014 (0.347)	-	-
Girl & Forward Caste	-	-0.210 (0.376)	-	-
Boy & Forward Caste	-	Reference	-	-
<i>Gender * Poverty status (Land ownership)</i>				
Girl & land owned by family ≤ 10 cents	-	-	-0.752 (0.369)	-
Boy & land owned by family ≤ 10 cents	-	-	-0.203 (0.315)	-
Girl & land owned by family > 10 cents	-	-	-0.753 (0.273)	-
Boy & land owned by family > 10 cents	-	-	Reference	-
<i>Gender* Education level of household head</i>				
Girl & Head None/primary level	-	-	-	-1.200 (0.419)
Boy & Head None/primary level	-	-	-	-0.200 (0.295)
Girl & Head High school and above	-	-	-	-0.531(0.322)
Boy & High school and above	-	-	-	Reference

## Control variables

*Illness Condition*

Undifferentiated febrile conditions

Reference

Reference

Reference

Reference

Acute respiratory illnesses

-0.166 (0.339)

-0.259 (0.343)

-0.120 (0.342)

-0.165 (0.340)

Acute diarrheal diseases

0.487 (0.388)

0.468 (0.388)

0.547 (0.392)

0.486 (0.389)

Other conditions

0.095 (0.388)

0.098 (0.388)

0.129 (0.391)

0.050 (0.389)

*Chronic Illness*

-0.108 (0.625)

-0.218 (0.629)

-0.107 (0.628)

-0.224 (0.617)

*Sibship Size*

-0.211 (0.104)

-0.218 (0.110)

-0.210 (0.106)

-0.178 (0.107)

## Random effects

 $V_{0k}$ 

0.655 (0.501)

0.731 (0.530)

0.838 (0.537)

0.816 (0.528)

 $V_{1k}$ 

0.048 (0.270)

0.026 (0.271)

0.079 (0.274)

0.034 (0.267)

 $V_{0k} * V_{1k}$ 

0.707 (0.407)

0.600 (0.432)

0.783 (0.414)

0.666 (0.421)

Table 10: Outputs of Models of Occurrences of Private Outpatient Visits

Independent variables	Coefficients and SE			
	M0	M1	M2	M3
<i>All children</i>				
Girls	-0.698 (0.221)	-	-	-
Boys	Reference	-	-	-
<i>Gender * Caste</i>				
Girl & Paniya (tribal)	-	-0.826 (0.430)	-	-
Boy & Paniya (tribal)	-	-0.545 (0.403)	-	-
Girl & Other Tribe /Backward caste	-	-0.487 (0.341)	-	-
Boy & Other Tribe/Backward caste	-	0.565 (0.367)	-	-
Girl & Forward Caste	-	-0.585 (0.388)	-	-
Boy & Forward Caste	-	Reference	-	-
<i>Gender * Poverty status (Land ownership)</i>				
Girl & land owned by family ≤ 10 cents	-	-	-0.806 (0.351)	-
Boy & land owned by family ≤ 10 cents	-	-	-0.275 (0.326)	-
Girl & land owned by family > 10 cents	-	-	-0.770 (0.269)	-
Boy & land owned by family > 10 cents	-	-	Reference	-
<i>Gender* Education level of household head</i>				
Girl & Head None/primary level	-	-	-	-0.995 (0.375)
Boy & Head None/primary level	-	-	-	-0.592 (0.313)
Girl & Head High school and above	-	-	-	-0.898 (0.338)
Boy & High school and above	-	-	-	Reference

## Control variables

*Illness Condition*

Undifferentiated febrile conditions

Reference

Reference

Reference

Reference

Acute respiratory illnesses

-0.456 (0.316)

-0.347 (0.322)

-0.388 (0.316)

-0.430 (0.318)

Acute diarrheal diseases

0.542 (0.380)

0.612 (0.389)

0.620 (0.381)

0.598 (0.384)

Other conditions

0.286 (0.363)

0.231 (0.369)

0.348 (0.363)

0.284 (0.366)

*Chronic Illness*

-0.716 (0.636)

-0.857 (0.665)

-0.741 (0.642)

-0.717 (0.638)

*Sibship Size*

-0.333 (0.100)

-0.294 (0.111)

-0.336 (0.102)

-0.322 (0.103)

## Random effects

 $V_{0k}$ 

0.390 (0.469)

0.420 (0.495)

0.499 (0.500)

0.495 (0.490)

 $V_{1k}$ 

0.567 (0.284)

0.613 (0.291)

0.584 (0.284)

0.606 (0.287)

 $V_{0k} * V_{1k}$ 

-0.179 (0.367)

0.137 (0.394)

-0.148 (0.381)

0.188 (0.385)

Table 11: Outputs of Models of Health Expenses per Severe Episode

Independant variables	Coefficients and SE			
	M0	M1	M2	M3
<i>All children</i>				
Girls	-0.394 (0.225)	-	-	-
Boys	Reference	-	-	-
<i>Gender * Caste</i>				
Girl & Paniya (tribal)	-	-2.350 (0.365)	-	-
Boy & Paniya (tribal)	-	-2.112 (0.353)	-	-
Girl & Other Tribe /Backward caste	-	-0.693 (0.308)	-	-
Boy & Other Tribe/Backward caste	-	0.246 (0.320)	-	-
Girl & Forward Caste	-	0.491 (0.348)	-	-
Boy & Forward Caste	-	Reference	-	-
<i>Gender * Poverty status (Land ownership)</i>				
Girl & land owned by family ≤ 10 cents	-	-	-0.806 (0.351)	-
Boy & land owned by family ≤ 10 cents	-	-	-0.275 (0.326)	-
Girl & land owned by family > 10 cents	-	-	-0.770 (0.269)	-
Boy & land owned by family > 10 cents	-	-	Reference	-
<i>Gender* Education level of household head</i>				
Girl & Head None/primary level	-	-	-	-1.940 (0.359)
Boy & Head None/primary level	-	-	-	-0.916 (0.303)
Girl & Head High school and above	-	-	-	-0.370 (0.333)
Boy & High school and above	-	-	-	Reference

## Control variables

*Illness Condition*

Undifferentiated febrile conditions

Reference

Reference

Reference

Reference

Acute respiratory illnesses

-0.287 (0.293)

-0.129 (0.274)

-0.200 (0.289)

-0.309 (0.284)

Acute diarrheal diseases

0.777 (0.347)

0.634 (0.325)

0.769 (0.342)

0.685 (0.339)

Other conditions

0.319 (0.330)

0.103 (0.311)

0.322 (0.326)

0.214 (0.322)

*Chronic Illness*

1.117 (0.618)

0.745 (0.543)

1.121 (0.595)

1.024 (0.599)

*Sibship Size*

-0.465 (0.096)

-0.148 (0.093)

-0.414 (0.094)

-0.351 (0.096)

## Random effects

 $u_{0j}$ 

1.980 (0.402)

0.935 (0.326)

1.676 (0.381)

1.751 (0.376)

 $e_{0ij}$ 

2.586 (0.327)

2.716 (0.325)

2.615 (0.328)

2.498 (0.315)



Table 12: Outputs of Models of Health Expenses per Child per Year

Independent variables	Coefficients and SE			
	M0	M1	M2	M3
<i>All children</i>				
Girls	-0.284 (0.172)	-	-	-
Boys	Reference	-	-	-
<i>Gender * Caste</i>				
Girl & Paniya (tribal)	-	-3.085 (0.273)	-	-
Boy & Paniya (tribal)	-	-3.053 (0.283)	-	-
Girl & Other Tribe /Backward caste	-	-0.512 (0.238)	-	-
Boy & Other Tribe/Backward caste	-	-0.110 (0.241)	-	-
Girl & Forward Caste	-	-0.220 (0.277)	-	-
Boy & Forward Caste	-	Reference	-	-
<i>Gender * Poverty status (Land ownership)</i>				
Girl & land owned by family ≤ 10 cents	-	-	-1.807 (0.227)	-
Boy & land owned by family ≤ 10 cents	-	-	-1.382 (0.239)	-
Girl & land owned by family > 10 cents	-	-	-0.005 (0.210)	-
Boy & land owned by family > 10 cents	-	-	Reference	-
<i>Gender* Education level of household head</i>				
Girl & Head None/primary level	-	-	-	-1.457 (0.244)
Boy & Head None/primary level	-	-	-	-0.946 (0.240)
Girl & Head High school and above	-	-	-	-0.104 (0.247)
Boy & High school and above	-	-	-	Reference

## Control variables

<i>Log number of episodes</i>	1.815(0.189)	1.412 (0.157)	1.529 (0.179)	1.684 (0.184)
<i>Chronic Illness</i>	0.868 (0.489)	0.693 (0.403)	1.170 (0.459)	1.056 (0.474)
<i>Sibship Size</i>	-0.263 (0.066)	-0.056 (0.057)	-0.171 (0.063)	-0.191 (0.065)
<i>Age</i>	-0.233 (0.179)	-0.731 (0.150)	-0.351 (0.168)	-0.417 (0.175)

## Random effects

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$e_{oi}$	4.613 (0.259)	3.119 (0.177)	4.036 (0.226)	4.305 (0.241)
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