Health Policy and Planning, 32, 2017, 1267–1284
doi: 10.1093/heapol/czx085
Advance Access Publication Date: 17 July 2017
Original Article

Demand for private healthcare in a universal public healthcare system: empirical evidence from Sri Lanka

Asankha Pallegedara[1,2] and Michael Grimm[2,3,4,*]

[1]Department of Industrical Management, Wayamba University of Sri Lanka, Kuliyapitiya, Sri Lanka, [2]Chair of Development Economics, University of Passau, Innstrasse 29, 94032 Passau, Germany, [3]International Institute of Social Studies, Erasmus University Rotterdam, Kortenaerkade 12, 2518 AX Den Haag, The Netherlands, and [4]IZA, Schaumburg-Lippe-Straße 5-9, 53113 Bonn, Germany

*Corresponding author. Chair of Development Economics, University of Passau, Innstrasse 29, 94032 Passau, Germany. E-mail: michael.grimm@uni-passau.de

Accepted on 16 June 2017

Abstract

This paper examines healthcare utilization behaviour in Sri Lanka with special emphasis on the choice between costly private and free public healthcare services. We use a data set that combines nationwide household survey data and district level healthcare supply data. Our findings suggest that even with universal public healthcare policy, richer people tend to use private sector healthcare services rather than public services. We also find significant regional and ethnic discrepancies in healthcare access bearing the risk of social tensions if these are further amplified. Latent class analysis shows in addition that the choice between private and public sector healthcare significantly differs between people with and without chronic diseases. We find in particular that chronically ill people rely for their day-to-day care on the public sector, but for their inpatient care they turn more often than non-chronically ill people to the private sector, implying an additional financial burden for the chronically ill. If the observed trend continues it may not only increase further the health-income gradient in Sri Lanka but also undermine the willingness of the middle class to pay taxes to finance public healthcare.

Keywords: Healthcare demand and supply, private healthcare, Sri Lanka, latent class analysis

Introduction

Sri Lanka has a universal public healthcare system which pursues health equity among all citizens. The system is state-funded and anyone can in principle use outpatient and inpatient services in public hospitals for free without restriction. The universal public healthcare system seems to contribute to good health outcomes in particular in comparison to some other developing and even developed countries. The infant mortality rate and the maternal mortality rate stand at 8 per 1,000 live births (UNICEF 2014) and 29 per 100 000 live births (WHO et al. 2013), respectively. Life expectancy at birth is 75 years indicating exceptional health outcomes for a country with a per capita gross domestic product of US$3800 in 2015 (World Bank 2015).

As in many other developed and developing countries, private healthcare services co-exist with the public services, providing both outpatient and inpatient care. Private healthcare in Sri Lanka is a mainly profit-oriented business which can range from informal private practice by doctors in the after-hours of their regular working hours in the public sector in a poor rural area to a state of art private hospital providing sophisticated care for upper middle class in a rich urban area. Private services seem to cater the growing demand for the healthcare by the Sri Lankan population. What exactly is driving this demand has not yet been studied in detail, but it may have to do with limited supply of public services, rising income, social status as well as a perceived higher quality of private services including possibly more flexible opening hours and shorter waiting times.

Much attention is given to the role of private healthcare especially in low and middle income countries (Saksena *et al.* 2012). Some argue that private healthcare is motivated by profit maximization and does not guarantee equitable access for the whole population (Oxfam International 2009; Rannan-Eliya and Sikurajapathy

KEY MESSAGES

- The use of private outpatient and inpatient healthcare is strongly correlated with income.
- Chronically ill persons use for outpatient care mostly the public sector, but for in-patient care rather the private sector; this is costly and seems to be need-driven.
- There are significant regional discrepancies in the usage of private and public sector healthcare, which seems to depend on supply side factors as well as ethnic and cultural differences.

2009). Contrary to that, some believe private healthcare has positive effects on health outcomes providing greater efficiency, responsiveness, quality and consumer choice (Preker *et al.* 2000; Loevinsohn and Harding 2005; Patouillard *et al.* 2007; Liu *et al.* 2008; Bhattacharyya *et al.* 2010). Although there is not yet any conclusive evidence on the relative advantage of private sector over public sector healthcare provision, no government can ignore the role played by the private sector (Bustreo *et al.* 2003; Preker 2007; Hanson *et al.* 2008; Meessen *et al.* 2011; Saksena *et al.* 2012).

There is however a growing empirical research that tries at least to understand the driving forces of private sector healthcare demand (Propper 2000; Deb and Trivedi 2002; Fabbri and Monfardini 2003; Atella *et al.* 2004; Bago d'Uva 2005, 2006; Atella and Deb 2008; Bago d'Uva and Jones 2009; Lostao *et al.* 2014). Most of these papers look at richer country contexts and mainly examine the determinants of healthcare utilization both in the public and private sector with an emphasis on the role of income, gender, health status, social class, economic activities, education as well as supply side factors such as number of available doctors, number of hospital beds and waiting times. Yet, only little research on this topic has been conducted on developing countries (Bhatia and Cleland 2001; Saksena *et al.* 2012; Shayo *et al.* 2016). In the Sri Lankan context, two studies, one by Rannan-Eliya et al. (2015b) and one by Rannan-Eliya et al. (2015a), have recently compared the quality of clinical care and patient satisfaction in public and private outpatient primary care services and the quality of inpatient clinical care in public and private hospitals in Sri Lanka. They find that the public and private sector perform similarly in both outpatient and inpatient clinical care, but private sector patients receive better quality care with respect to non-clinical matters such as doctors and other workers' interpersonal communication and with respect to cleanliness of the hospital wards. However, their study does not model and analyse the healthcare choice behaviour explicitly, but only compares the quality indicators of public and private sector outpatient and inpatient care using patients' data.

This paper examines the determinants of healthcare utilization and models the choice between private and public healthcare with a focus on both demand side and supply side factors. Although we cannot directly assess the quality difference between public and private services, but if private services are used despite free public care it is likely that people do so, because they perceive the quality of the private sector as better and possibly trust it more. If this is indeed the case then such inequalities may not only undermine the financing of public sector healthcare through general taxes, it may also come with rising health inequalities in relation to income and social status. Specifically, we model the individual healthcare choices between the public and private sector for outpatient and inpatient services. We focus in particular on the role played by income, socio-economic and demographic characteristics, health status and supply side healthcare quality and quantity indicators. Latent class analysis (LCA) is used to reveal behavioural patterns across distinct population groups.

The paper is organized as follows. The 'Methods' section describes the methods. The 'Results' section presents the study findings. The 'Discussion' section interprets and discusses the findings in relation to other studies. The 'Conclusion' section concludes the study.

Methods

Background

The Sri Lankan healthcare system is administered and regulated through the Ministry of Health. Health services are provided by both the public and the private sector. Table 1 shows the distribution of health facilities in the country.

Public sector health services are free or nearly free to the whole population through the network of government hospitals. All curative health services linked to outpatient visits, routine specialist clinic visits as well as inpatient services in the normal wards in the public sector are provided free of charge. Medicines if they are available in the hospital or medical centre are also provided free of charge or can be bought at discounted prices in the state pharmaceutical corporation's 'Osu Sala' outlets. The ancillary health services such as medical laboratory tests and imaging services can also be obtained free of charge but usually providers have long waiting lists.

In contrast, private sector healthcare services are profit-oriented business ventures and patients need to pay fees for every service. According to Amarasinghe et al. (2015), there are 125 private hospitals in Sri Lanka (numbers refer to 2011) and 51% of them are located in the Western province. Interestingly, the bulk of the medical doctors in private hospitals work part-time. For example, in 2011, 92% of medical doctors in private hospitals worked part-time, i.e. they worked in the private sector on top of their regular full-time position in the public sector (Amarasinghe *et al.* 2015). In addition to private hospitals, many private clinics and dispensaries provide only outpatient services. These private clinics and dispensaries are mainly run by government medical officers in their off-duty hours. Only in exceptions they are run by full time private general practitioners (Rannan-Eliya *et al.* 2003). While usual medical diagnostic test facilities are provided by private sector hospitals and some diagnostic medical laboratory centers, imaging services such as X-rays, ultra sound scans, computerized tomography (CT) and magnetic resonance imaging (MRI) scans are only available in the larger private hospitals. Supply of medicines is conducted by both the public sector medical supplies division of the Ministry of Health and private sector pharmaceutical companies. While 52% of annual medicine volumes are supplied by the public sector, over 76% total spending on medicine is from the private sector. This is mainly due to higher unit prices of medicine that need to be paid by the private sector (Amarasinghe *et al.* 2015).

Table 1. Distribution of health facilities by type, level and region

Urban/Rural	Province	Public				Private	
		Primary	Secondary	Tertiary	Total	Share of hospitals (%)	Share of hospital beds (%)
Urban	Western	41	10	25	76	51	65
Urban	Central	89	5	12	106	8	9
Urban	North Western	56	6	2	64	9	6
Urban	Sabaragamuwa	44	6	6	56	2	2
Urban	Southern	50	8	6	64	8	8
Rural	Northern	54	8	5	67	8	6
Rural	Eastern	53	15	4	72	8	4
Rural	North Central	44	5	3	52	2	
Rural	Uva	57	6	2	65	3	
Total		488	69	65	622	100	100

Note that we consider Western, Central, North Western, Sabaragamuwa and Southern provinces as urban provinces. The Northern, Eastern, North-Central and Uva provinces are considered rural. This classification differs from the urban, rural and estate sector classification in the HIES data.

Sources: Public sector hospitals distribution is based on annual health bulletin 2014 published by the Ministry of health, nutrition and indigenous medicine, Sri Lanka. Private sector hospitals distribution is based on Amarasinghe et al. (2015).

Conceptual framework

The conceptual framework underlying this paper is based on Andersen's behavioural model of healthcare utilization (Andersen 1968; Andersen and Newman 1973). According to his initial model developed in 1968, an individual utilizes healthcare based on a function of predisposing, enabling and need based characteristics. Predisposing characteristics represent the socio-cultural characteristics of individuals that exist prior to their illness such as demographics, social structure and health beliefs. Enabling characteristics include resources available within the family such as economic status, social relationships and location of residence and the community such as access and availability to health services and waiting time. Need based characteristics refer to immediate healthcare use that consists of both perceived needs based on symptoms and disabilities and clinically evaluated needs.

The initial model has been expanded later in order to acknowledge the importance of other related factors such as the quality of the healthcare system, the external environment, measures of healthcare use, personal health practices and consumer satisfaction (Andersen 1995, 2008).

Based on the Andersen's model, we assume that healthcare utilization in Sri Lanka is mainly determined by demand, which in turn follows from individual's preferences, their income, their healthcare needs and the costs of access which are in turn related to healthcare supply. In line with the economics literature we assume that income and costs enter the budget constraint. In other words, households make an optimal choice, given their preferences, their income and the prices of those goods they draw utility from. Preferences provide an ordering of alternative choices based on their relative utility, they are determined purely by taste factors and are independent of prices, income or the availability of goods (Mas-Colell *et al.* 1995). In this paper, we focus explicitly on the difference between public and private formal healthcare supply, which are treated as imperfect substitutes. There might be quality differences between both as well as differences in the costs of access.

Hence, if healthcare needs arise, individuals have to make a choice between public and private healthcare services providers. This is illustrated in Figure 1. Private care is typically associated with much higher direct treatment costs than public care, however private costs might be associated with lower indirect costs, if for instance, the travel time is shorter, the waiting time is shorter and the quality is better. Quality may differ because the health workers may work according to a different incentive structure or because the private sector can offer medicines, tests and other auxiliary services that the public sector cannot provide. The underlying individual preferences with respect to private and public healthcare might be driven by beliefs regarding quality differences, health-related attitudes, values, culture, trust and knowledge towards the healthcare system. These factors might in turn be related to individuals' demographic and socio-economic characteristics, e.g. older or rural people may have different attitudes than younger and urban people.

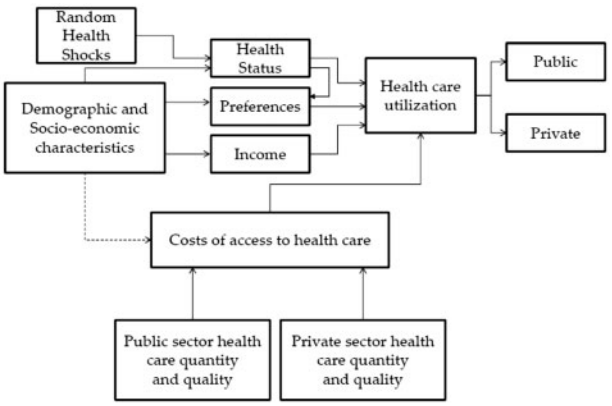

Figure 1. Conceptual framework. *Source*: Authors' own representation

The costs of access to healthcare play plausibly a major role with respect to healthcare utilization even if consumers are less price sensitive when it comes to healthcare compared to other consumption goods (Ringel *et al.* 2002). We assume that the cost of access to healthcare is determined by public funding targeted at public sector healthcare. More funding should lead to a higher level of healthcare both in terms of quantity and quality and hence a lower price for instance through reduced waiting times; although consumers' may realize that this comes at the cost of higher taxes. This should however matter only little for demand as for each single individual there is no direct link between the quantity and quality of public healthcare and paid taxes. This is different in the private sector where people directly pay for the services received. Here, individuals consider the availability, accessibility, quality as well as opportunity costs of time. Again, the costs of access to healthcare will vary with

Table 2. Proportion of healthcare utilization by demographic characteristics

Demographic characteristics	Outpatient treatment (%)				Inpatient treatment (%)			
	Public	Private	Public and Private	No use	Public	Private	Public and Private	No use
Male	12.1	10.5	2.9	74.5	7.6	0.5	0.2	91.7
Female	15.0	11.6	3.6	69.8	8.7	0.6	0.2	90.5
Sinhala	13.6	13.2	3.6	59.6	8.0	0.5	0.2	91.3
Tamil	14.1	6.2	2.5	77.3	9.5	0.6	0.3	89.6
Muslim	12.9	8.8	3.4	74.9	6.5	0.5	0.3	92.8
Urban	10.5	12.5	2.1	74.9	6.5	0.8	0.2	92.5
Rural	14.7	10.9	3.8	70.5	8.8	0.5	0.3	90.4
Estate	15.1	8.2	2.6	74.1	8.3	0.1	0.1	91.5

Source: Authors' calculation based on HIES data.

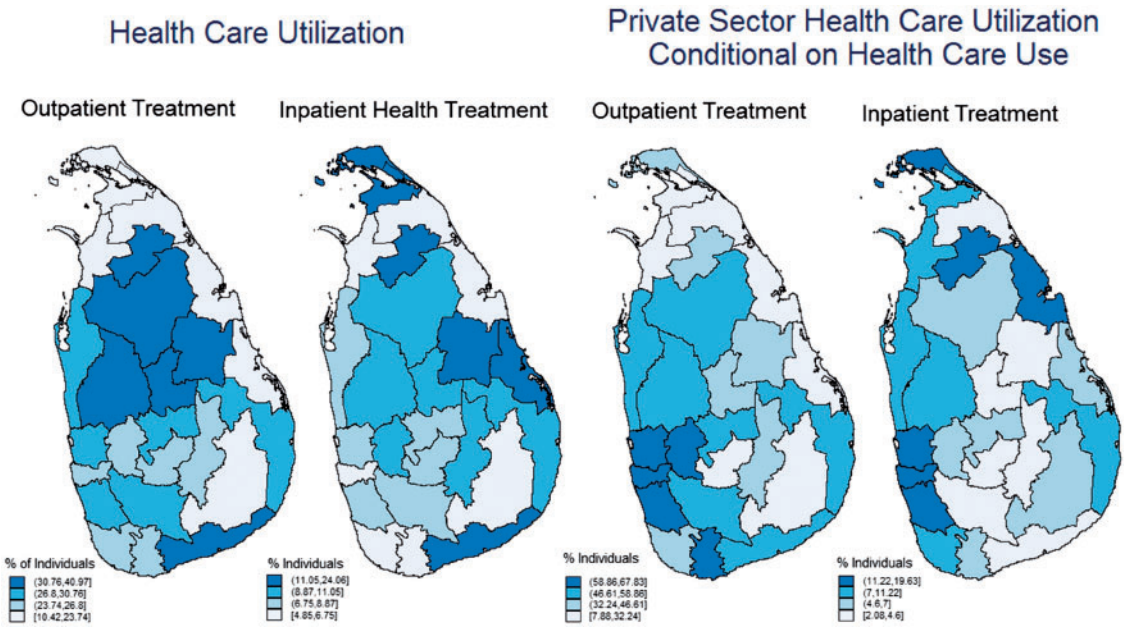

Figure 2. Health-care utilization and private sector healthcare utilization conditional on healthcare use across districts. *Source*: Authors' representation based on HIES data

demographic and socio-economic characteristics of individuals, including gender, for example because people differ in their opportunity cost of time and the location they live.

Data

We rely on two data sources: household income and expenditure survey data (HIES) and annual health statistics (AHS). HIES is a cross sectional household survey conducted by the Department of Census and Statistics (DCS) of Sri Lanka. The HIES is nationally representative. This study uses the latest wave (HIES 2012/13). The special feature of HIES 2012/13 is that it covers all districts in the country. Previously several northern and eastern districts had been excluded from the surveys due to the civil conflict. HIES generally collects data in 12 consecutive monthly rounds to capture seasonal variations in income, expenditure and consumption from a random sample of 25 000 housing units. In addition to the standard modules covering demographic characteristics, household income and expenditure data, the HIES 2012/13 gathered also data on health.

The AHS data is published by the Medical Statistics Unit (MSU) of the Ministry of Health (MOH). On an annual basis it gathers public sector health data on four major areas; morbidity, mortality, resource availability and services provision. It can capture trends and regional variations (MOH 2012). In this study, we mainly use district level AHS data on public sector healthcare supply and usage. We combine HIES data and AHS data at the district level.

Table 2 shows individual healthcare seeking behaviour by demographic characteristics characteristics. The survey covers only healthcare in the public and private for-profit sector. Services by faith-based institutions and traditional healers are not included. Women in general tend to seek more outpatient and inpatient healthcare than men. Compared to Sinhalese, both Tamils and Muslims are less likely to utilize private outpatient healthcare. Yet there is no difference with respect to private inpatient healthcare. Individuals in the urban sector use more private outpatient healthcare compared to individuals in the rural or estate sector.[1] Figure 2 shows the distribution across districts. Detailed summary statistics

and more details about the used data and variables can be found in the Supplementary Appendix.

Empirical specification

Based on our conceptual framework, we envision patients engaging in a sequential decision-making process. First, we assume that individuals decide to seek healthcare when healthcare needs arise. Next conditional on seeking healthcare, they can choose receiving healthcare from the public or the private sector. Formally, we use in each case a probit model to analyse these two sequential decisions.

$$\Pr(Y_{ijk} = 1) = \Phi(\alpha C_{ijk} + \beta X_{jk} + \gamma D_j + \delta R_k + \varepsilon_{ijk}) \quad (1)$$

$$\Pr(S_{ijk} = 1) = \Phi(\alpha C_{ijk} + \beta X_{jk} + \gamma D_j + \delta R_k + \varepsilon_{ijk}) \quad \text{if } Y_{ijk} = 1 \quad (2)$$

Where Y stands for the binary outcome variable of healthcare utilization, $Y_{ijk} = 1$ if individual i from household j in district k utilizes healthcare and 0 otherwise. S stands for the binary outcome variable of private formal sector healthcare utilization, $S_{ijk} = 1$ if individual i from household j in district k utilizes private sector healthcare and 0 otherwise. C_{ijk} denotes a set of individual i characteristics of household j in district k. X_{jk} represents a set of characteristics of household j in district k. D_j is a set of supply side characteristics of household j. R_k stands for a set of supply side characteristics in district k. ε_{ijk} is an independently and identically distributed error term. We use robust standard errors that account for intra-household correlations.

We estimate the above models separately for outpatient and inpatient admissions as individuals may behave differently for outpatient and inpatient care. In order to capture gender differences, we also estimate these regressions separately for men and women. This is preferable over just introducing gender as a covariate as this would still force the effects of all other covariates to be the same for men and women, i.e. we would assume the same behavioural pattern for both and just account for a level difference. We believe there are good reasons to believe that these patterns are different. For example, the effect of distance to the nearest public hospital may differently affect men's and women's healthcare choice.

We assume that healthcare utilization is influenced by both demand side factors and supply side factors. Demand side factors include three sets of variables: individual and household sociodemographic characteristics and individual health status. Supply side factors include five sets of variables (Gravelle *et al.* 2003; Morris *et al.* 2005): factors related to the quality of public sector healthcare supply at the district level, the quantity of public sector healthcare supply at the district level, the use of healthcare services at the district level, the accessibility of public sector healthcare facilities at the household level and the accessibility of private sector healthcare facilities at the household level.

In addition, we conduct an LCA to elicit whether there are any specific behavioural patterns of utilizing healthcare among population subgroups. LCA is increasingly used in empirical analysis of healthcare utilization (Deb and Trivedi 1997, 2002; Atella *et al.* 2004; Bago d'Uva 2005, 2006; Bago d'Uva and Jones 2009; Schmitz 2012) as it can account for heterogeneity that cannot be captured fully by usual covariates in the estimation models. We use health status indicators with respect to chronic diseases such as heart diseases, hypertension, cancer, diabetics, asthma and natural disability to identify the latent classes. Based on these indicators we estimate a model with three latent classes. Following the literature (Atella et al. 2004; Nylund *et al.* 2007), we used the Bayesian information criterion (BIC), the consistent Akaike information criterion (CAIC) and the adjusted BIC as model selection criteria to determine the number of classes that is the most suited to explore the patterns of both outpatient and inpatient healthcare demand.

Results

Determinants of healthcare utilization

Outpatient healthcare utilization

Table 3 reports the marginal effects of the coefficients for outpatient healthcare utilization. Column (1) shows the results for the pooled model; column (2) and (3) show the results for males and females separately. The pooled model suggests that older individuals are significantly less likely to use outpatient care. This effect is mainly driven by men. The results also show that there is a strong income effect; richer individuals are significantly more likely to use outpatient healthcare. Individuals in urban areas are less likely to use outpatient healthcare compared to individuals in rural and estate areas. We also find lower outpatient healthcare usage among the Tamil population. Women, individuals in households with higher educated household heads and respondents suffering from chronic diseases or a disability are substantially more likely to seek outpatient healthcare. Larger households use less outpatient care, yet the more children a household has the higher the demand for outpatient care.

Turning to the supply side factors, we find that the time needed to access the nearest clinic increases outpatient healthcare utilization, yet the effect is very small and only significant for women. Intuitively, we would obviously expect a negative effect, but unobserved differences in healthcare needs that are correlated with remoteness might explain this finding. Public sector hospital beds and public sector doctors per 100 000 population are associated with a lower usage of outpatient healthcare. Yet, public sector gynaecologists and the number of nurses per 100 000 population have statistically positive effects on outpatient healthcare utilization. We also find different signs with respect to outpatient attendance, clinic visits and inpatient admissions per 100 000 population. Although we focus here on both public and private outpatient care, we would expect negative signs associated with these variables if congestion was an issue. Yet, we only find a negative effect associated with outpatient attendance per 100 000 population, whereas we find positive effects associated with public clinic visits and public sector inpatient admissions.

Private outpatient healthcare utilization

In Table 4, we present the marginal effects associated with private sector outpatient healthcare utilization conditional on individuals who used outpatient healthcare. Age is negatively associated with the usage of private outpatient healthcare. Individuals from high income households are more likely to use private outpatient healthcare. The income elasticity of 0.22 suggests that a 1% increase in income is associated with an increase in the probability of using private outpatient healthcare by 0.22%. Compared to urban and rural areas, individuals in the estate areas are less likely use private outpatient care even controlling for income. Women and chronically ill individuals also tend to use less private outpatient care despite using more outpatient care in general. The education level of the household head as well as more adult household members is positively correlated with the probability of using private sector outpatient healthcare.

Table 3. Determinants of outpatient healthcare utilization (probit model)

	(1) Pooled	(2) Males only	(3) Females only
Age (years)	−0.0005***	−0.0013***	0.0002
	(0.0001)	(0.0001)	(0.0001)
Household monthly expenditure (ln)	0.0357***	0.0359***	0.0363***
	(0.0038)	(0.0048)	(0.0049)
Urban (dummy)	−0.0388***	−0.0291***	−0.0478***
	(0.0056)	(0.0069)	(0.0072)
Estate (dummy)	0.0071	0.0068	0.0085
	(0.0097)	(0.0123)	(0.0122)
Tamil (dummy)	−0.0293***	−0.0319***	−0.0271***
	(0.0077)	(0.0097)	(0.0098)
Muslim (dummy)	−0.0038	−0.0212**	0.0124
	(0.0078)	(0.0094)	(0.0101)
Female (dummy)	0.0421***		
	(0.0033)		
Age of the household head (years)	−0.0001	0.0004*	−0.0005*
	(0.0002)	(0.0002)	(0.0002)
Household head's education (years)	−0.0019***	−0.0021***	−0.0019**
	(0.0006)	(0.0007)	(0.0007)
Household size	−0.0265***	−0.0253***	−0.0308***
	(0.0022)	(0.0028)	(0.0027)
Chronic disease or disability (dummy)	0.4574***	0.4565***	0.4555***
	(0.0060)	(0.0087)	(0.0075)
Number of adults in the household	0.0229***	0.0254***	0.0179***
	(0.0041)	(0.0050)	(0.0053)
Number of children in the household	0.0498***	0.0551***	0.0447***
	(0.0035)	(0.0043)	(0.0046)
Number of females in the household	−0.0058**	−0.0041	−0.0009
	(0.0026)	(0.0035)	(0.0033)
Time to nearest public hospital (ln)	−0.0091*	−0.0065	−0.0113
	(0.0053)	(0.0068)	(0.0069)
Time to nearest maternity home (ln)	0.0003	−0.0009	0.0011
	(0.0053)	(0.0069)	(0.0068)
Time to nearest public dispensary (ln)	−0.0053	−0.0031	−0.0067
	(0.0053)	(0.0065)	(0.0068)
Time to nearest private dispensary (ln)	0.0000	−0.0028	0.0023
	(0.0042)	(0.0052)	(0.0053)
Time to nearest clinic (ln)	0.0120***	0.0079	0.0158***
	(0.0041)	(0.0050)	(0.0052)
Time to nearest MOH office (ln)	0.0061	0.0078	0.0046
	(0.0046)	(0.0056)	(0.0059)
Number of beds per 1000 population (ln)	−0.0734***	−0.0425*	−0.1014***
	(0.0192)	(0.0241)	(0.0256)
Number of medical beds per 1000 population (ln)	−0.0377**	−0.0421**	−0.0324*
	(0.0146)	(0.0182)	(0.0187)
Number of surgical beds per 1000 population (ln)	−0.0175	0.0013	−0.0332**
	(0.0126)	(0.0159)	(0.0162)
Number of doctors per 100 000 population (ln)	−0.1810***	−0.1974***	−0.1636***
	(0.0242)	(0.0301)	(0.0318)
Number of physicians per 100 000 population (ln)	0.0167	−0.0021	0.0324
	(0.0161)	(0.0202)	(0.0209)
Number of surgeons per 100 000 population (ln)	−0.0322*	−0.0043	−0.0580**
	(0.0189)	(0.0237)	(0.0247)
Number of gynaecologists per 100 000 population (ln)	0.0775***	0.0710***	0.0826***
	(0.0122)	(0.0153)	(0.0160)
Number of nurses per 100 000 population (ln)	0.0426***	0.0435***	0.0412***
	(0.0108)	(0.0136)	(0.0142)
Public sector outpatient attendance per 100 000 population (ln)	−0.0643***	−0.0635**	−0.0633**
	(0.0234)	(0.0290)	(0.0303)
Public sector clinic visits per 100 000 population (ln)	0.0616***	0.0389*	0.0794***
	(0.0184)	(0.0230)	(0.0239)
Public sector inpatient stays per 100 000 population (ln)	0.2115***	0.2093***	0.2142***
	(0.0348)	(0.0430)	(0.0453)
Observations	72 885	34 300	38 585
Pseudo R-squared	0.107	0.0988	0.113

Robust standard errors clustered by household level in parentheses.
***$P < 0.01$, **$P < 0.05$, *$P < 0.1$.
Source: Authors' calculation based on HIES and AHS data.

Table 4. Determinants of private sector outpatient healthcare utilization conditional on outpatient healthcare use (probit model)

	(1) Pooled	(2) Males only	(3) Females only
Age (years)	−0.0016***	−0.0019***	−0.0013***
	(0.0002)	(0.0003)	(0.0003)
Household monthly expenditure (ln)	0.2211***	0.2176***	0.2243***
	(0.0095)	(0.0125)	(0.0109)
Urban (dummy)	−0.0139	−0.0029	−0.0221
	(0.0131)	(0.0171)	(0.0154)
Estate (dummy)	−0.0463**	−0.0594**	−0.0340
	(0.0210)	(0.0275)	(0.0248)
Tamil (dummy)	−0.0030	−0.0220	0.0124
	(0.0173)	(0.0229)	(0.0204)
Muslim (dummy)	−0.0041	−0.0244	0.0102
	(0.0180)	(0.0239)	(0.0215)
Female (dummy)	−0.0192***		
	(0.0069)		
Age of the household head (years)	−0.0002	−0.0009	0.0003
	(0.0004)	(0.0006)	(0.0005)
Household head's education (years)	0.0064***	0.0059***	0.0067***
	(0.0013)	(0.0017)	(0.0014)
Household size	−0.0442***	−0.0457***	−0.0445***
	(0.0046)	(0.0063)	(0.0053)
Chronic disease or disability (dummy)	−0.0907***	−0.0893***	−0.0914***
	(0.0097)	(0.0143)	(0.0119)
Number of adults in the household	0.0342***	0.0312***	0.0355***
	(0.0089)	(0.0114)	(0.0104)
Number of children in the household	0.0061	−0.0005	0.0112
	(0.0083)	(0.0108)	(0.0099)
Number of females in the household	0.0040	0.0079	0.0045
	(0.0060)	(0.0086)	(0.0071)
Time to nearest public hospital (ln)	0.0437***	0.0267	0.0573***
	(0.0124)	(0.0164)	(0.0143)
Time to nearest maternity home (ln)	−0.0081	0.0216	−0.0303**
	(0.0121)	(0.0166)	(0.0142)
Time to nearest public dispensary (ln)	0.0352***	0.0062	0.0565***
	(0.0118)	(0.0160)	(0.0140)
Time to nearest private dispensary (ln)	−0.0564***	−0.0522***	−0.0591***
	(0.0094)	(0.0126)	(0.0110)
Time to nearest clinic (ln)	−0.0179**	−0.0203*	−0.0165
	(0.0090)	(0.0121)	(0.0105)
Time to nearest MOH office (ln)	−0.0194*	−0.0105	−0.0267**
	(0.0102)	(0.0140)	(0.0120)
Number of beds per 1000 population (ln)	−0.1068**	−0.1313**	−0.0888*
	(0.0455)	(0.0622)	(0.0522)
Number of medical beds per 1000 population (ln)	−0.2149***	−0.2719***	−0.1713***
	(0.0329)	(0.0445)	(0.0384)
Number of surgical beds per 1000 population (ln)	0.0531*	0.0786**	0.0317
	(0.0286)	(0.0390)	(0.0334)
Number of doctors per 100 000 population (ln)	−0.1578***	−0.2381***	−0.0925
	(0.0564)	(0.0747)	(0.0670)
Number of physicians per 100 000 population (ln)	−0.1198***	−0.1472***	−0.0977**
	(0.0366)	(0.0481)	(0.0433)
Number of surgeons per 100 000 population (ln)	0.1351***	0.1824***	0.0962*
	(0.0440)	(0.0580)	(0.0525)
Number of gynaecologists per 100 000 population (ln)	−0.0808***	−0.0649*	−0.0924***
	(0.0275)	(0.0363)	(0.0326)
Number of nurses per 100 000 population (ln)	0.2087***	0.2208***	0.1999***
	(0.0240)	(0.0318)	(0.0284)
Public sector outpatient attendance per 100 000 population (ln)	0.0819	0.1387*	0.0448
	(0.0535)	(0.0713)	(0.0629)
Public sector clinic visits per 100 000 population (ln)	0.1224***	0.1731***	0.0837*
	(0.0418)	(0.0555)	(0.0499)
Public sector inpatient stays per 100 000 population (ln)	−0.0571	−0.0597	−0.0608
	(0.0855)	(0.1183)	(0.0974)
Observations	20 821	8942	11 879
Pseudo R-squared	0.103	0.108	0.101

Robust standard errors clustered by household level in parentheses.

***$P < 0.01$, **$P < 0.05$, *$P < 0.1$.

Source: Authors' calculation based on HIES and AHS data.

Easy access to private sector health facilities seems to increase the use of private sector outpatient care. The shorter the time needed to reach the nearest private sector healthcare facility the higher the usage. Estimated coefficients for district level public sector healthcare supply indicators such as number of beds and the number of doctors per 100 000 population are highly statistically significant and show the expected negative sign, except for the number of nurses per 100 000 population. Districts with a well-developed public healthcare sector seek less usage of private outpatient care. Finally, we find that congestion, measured by higher public clinic visits per 100 000 population, is associated with significant higher private sector outpatient healthcare utilization.

Inpatient healthcare utilization

Table 5 reports the marginal effects associated with inpatient admissions. In contrast to what we found for outpatient healthcare, inpatient healthcare use increases with age. It also increases with household income. Compared to rural areas, individuals in urban and estate areas are less likely to seek inpatient healthcare, as are Tamils (similar to what we found for outpatient care). While women are more likely to seek inpatient treatments, education of the household head matters mainly for men. People with chronic diseases are also more likely to use inpatient healthcare as are households with more children.

The coefficient associated with the number of available surgical beds per 1000 population is statistically significant and positive. In contrast, we find inpatient care being higher in those districts with fewer public sector doctors and surgeons per population.

Private inpatient healthcare utilization

To analyse the choice behaviour between private and public inpatient admissions, we show in Table 6, the marginal effects of private sector inpatient admissions conditional on individuals who used inpatient healthcare.

Again we find a strong income gradient. The estimated income elasticity of 0.07 suggests that 1% increase in income is associated with a 0.07% increase in the probability of using private inpatient care. Even after controlling for income and public healthcare supply, we still find a strong negative coefficient for people living in the estate areas. In contrast to outpatient healthcare, there is no significant difference between males and females. The education level of the household head seems to matter especially for women's usage of private inpatient care. Tamils are also more likely to use private inpatient care as are individuals from smaller families. People with chronic diseases or disabilities are more likely to utilize private inpatient care. Most of the coefficients for supply side factors are not statistically significant, suggesting that these factors are not very relevant for the choice between private and public impatient care.

Income effects associated with private healthcare utilization

As we found substantial income effects associated with the choice between private and public healthcare, we further illustrate how demand for private healthcare varies with income by calculating predicted probabilities of using private care at different income deciles holding all other variables at their mean. This is shown in Figure 3. It can be seen that there is an increasing trend of using private care across the income distribution, in particular for outpatient care, where the predicted probability of using private care increases from about 20% to about 80%.[2] For inpatient care, recall, the general usage level is lower; we note an increase from about 3–10% over the first nine deciles. Only in the last decile the usage probability increases to 20%. We do not find any striking differences by gender.

Regional differences in healthcare utilization

To explore regional differences, we re-estimate the model of Equation (2) adding district effects using Colombo as the reference. This in turn implies that we drop all district-specific variables from the regression as these effects are now captured by the fixed effect. The results are illustrated for private outpatient and inpatient healthcare in Figures 4 and 5.

These results suggest that districts in the northwest and southern regions have higher private sector outpatient healthcare utilization relative to the Colombo district. Districts situated in the northern, eastern and central regions have lower private sector outpatient healthcare utilization.

Districts in northern and eastern regions have higher private sector inpatient healthcare use than Colombo despite the lower supply of health facilities in these districts. Finally, districts in the central and southern parts of the country have lower rates of private sector inpatient healthcare utilization compared to the Colombo district.

Exploring heterogeneity in healthcare utilization using LCA

Table 7 reports the estimated average probabilities of belonging to each of the three latent classes separately for outpatient visits and inpatient admissions. For outpatient healthcare, 89, 8 and 3% of the sample are attributed to class one, class two and class three. Similarly, for inpatient healthcare 88, 8 and 4% of the sample are attributed to class one, class two and class three. According to the estimated item response probabilities for each latent class, respondents in the class one, class two and class three can be referred as people not chronically ill (class one), people suffering from hypertension (class two) and people suffering from heart diseases (class three).

The results of the multinomial logit model are shown in Table 8. For the users of outpatient healthcare, it appears that Tamils are more likely to be in the class with the not chronically ill rather than in the class of people suffering from hypertension. Also the probability of being in the not chronically ill class is positively correlated with a larger number of adult family members in the household. This probability is also higher in districts with a higher utilization of public inpatient care. In contrast, urban and estate sector individuals are more likely to be in class three (with heart disease) compared to class two (with hypertension). For users of inpatient healthcare, the most important determinant of being in the class of not chronically ill people compared to the class with hypertension is ethnic affiliation. Finally, relative to those in the hypertension class, the class with heart disease is also largely dominated by Tamils and individuals who live in the urban sector.

In Table 9, we present the marginal effects of private outpatient healthcare utilization estimated separately for three classes. We only show the results using the pooled sample, i.e. men and women combined. We find that most coefficients differ quite significantly over the three classes. The income effect is somewhat an exception as it is quite similar in all three classes indicating that individuals with higher income are more likely to use private outpatient healthcare. Age has a sizeable negative impact on private sector outpatient healthcare usage only for the individuals of latent class one (not chronically ill) indicating that younger people with no chronic diseases are less likely to use private outpatient healthcare. Similarly,

Table 5. Determinants of inpatient healthcare utilization (probit model)

	(1) Pooled	(2) Males only	(3) Females only
Age (years)	0.0006***	0.0005***	0.0006***
	(0.0001)	(0.0001)	(0.0001)
Household monthly expenditure (ln)	0.0103***	0.0075***	0.0125***
	(0.0019)	(0.0026)	(0.0025)
Urban (dummy)	−0.0146***	−0.0168***	−0.0125***
	(0.0028)	(0.0037)	(0.0038)
Estate (dummy)	−0.0137***	−0.0142**	−0.0134**
	(0.0044)	(0.0056)	(0.0058)
Tamil (dummy)	0.0207***	0.0191***	0.0213***
	(0.0047)	(0.0060)	(0.0060)
Muslim (dummy)	−0.0045	−0.0048	−0.0041
	(0.0043)	(0.0055)	(0.0055)
Female (dummy)	0.0084***		
	(0.0020)		
Age of the household head (years)	−0.0003***	−0.0002*	−0.0004***
	(0.0001)	(0.0001)	(0.0001)
Household head's education (years)	−0.0008***	−0.0011**	−0.0006
	(0.0003)	(0.0004)	(0.0004)
Household size	−0.0081***	−0.0056***	−0.0103***
	(0.0011)	(0.0015)	(0.0014)
Chronic disease or disability (dummy)	0.1630***	0.1792***	0.1519***
	(0.0051)	(0.0075)	(0.0065)
Number of adults in the household	−0.0007	0.0009	−0.0018
	(0.0021)	(0.0026)	(0.0027)
Number of children in the household	0.0286***	0.0086***	0.0450***
	(0.0018)	(0.0023)	(0.0023)
Number of females in the household	−0.0027*	−0.0007	−0.0048***
	(0.0014)	(0.0019)	(0.0018)
Time to nearest public hospital (ln)	−0.0031	0.0006	−0.0065*
	(0.0029)	(0.0037)	(0.0038)
Time to nearest maternity home (ln)	−0.0014	−0.0053	0.0024
	(0.0029)	(0.0038)	(0.0038)
Time to nearest public dispensary (ln)	−0.0002	0.0014	−0.0018
	(0.0026)	(0.0035)	(0.0036)
Time to nearest private dispensary (ln)	0.0043*	0.0082***	0.0008
	(0.0023)	(0.0029)	(0.0030)
Time to nearest clinic (ln)	0.0039*	0.0005	0.0069**
	(0.0021)	(0.0028)	(0.0028)
Time to nearest MOH office (ln)	0.0010	−0.0027	0.0044
	(0.0026)	(0.0033)	(0.0033)
Number of beds per 1000 population (ln)	−0.0004	−0.0028	0.0023
	(0.0100)	(0.0130)	(0.0134)
Number of medical beds per 1000 population (ln)	−0.0067	−0.0095	−0.0043
	(0.0074)	(0.0098)	(0.0099)
Number of surgical beds per 1000 population (ln)	0.0308***	0.0312***	0.0301***
	(0.0068)	(0.0087)	(0.0088)
Number of doctors per 100 000 population (ln)	−0.0318**	−0.0350**	−0.0280*
	(0.0125)	(0.0166)	(0.0167)
Number of physicians per 100 000 population (ln)	0.0156*	0.0224**	0.0100
	(0.0082)	(0.0112)	(0.0110)
Number of surgeons per 100 000 population (ln)	−0.0309***	−0.0308**	−0.0308**
	(0.0098)	(0.0129)	(0.0129)
Number of gynaecologists per 100 000 population (ln)	0.0108*	0.0128	0.0084
	(0.0064)	(0.0086)	(0.0086)
Number of nurses per 100 000 population (ln)	−0.0096	−0.0071	−0.0119
	(0.0059)	(0.0077)	(0.0077)
Public sector outpatient attendance per 100 000 population (ln)	−0.0005	0.0012	−0.0035
	(0.0121)	(0.0161)	(0.0160)
Public sector clinic visits per 100 000 population (ln)	0.0190*	0.0127	0.0245*
	(0.0102)	(0.0131)	(0.0128)
Public sector inpatient stays per 100 000 population (ln)	0.0303*	0.0247	0.0351
	(0.0175)	(0.0235)	(0.0225)
Observations	72 885	34 300	38 585
Pseudo R-squared	0.0811	0.0890	0.0810

Robust standard errors clustered by household level in parentheses.

***$P < 0.01$, **$P < 0.05$, *$P < 0.1$.

Source: Authors' calculation based on HIES and AHS data.

Table 6. Determinants of private sector inpatient healthcare utilization conditional on inpatient healthcare use (probit model)

	(1) Pooled	(2) Males only	(3) Females only
Age (years)	−0.0002	0.0003	−0.0006**
	(0.0002)	(0.0002)	(0.0003)
Household monthly expenditure (ln)	0.0673***	0.0625***	0.0716***
	(0.0053)	(0.0073)	(0.0069)
Urban (dummy)	−0.0011	−0.0027	0.0003
	(0.0084)	(0.0114)	(0.0106)
Estate (dummy)	−0.0452***	−0.0498***	−0.0394***
	(0.0092)	(0.0111)	(0.0132)
Tamil (dummy)	0.0259*	0.0240	0.0266
	(0.0139)	(0.0191)	(0.0172)
Muslim (dummy)	0.0319**	0.0437*	0.0245
	(0.0156)	(0.0226)	(0.0184)
Female (dummy)	0.0004		
	(0.0058)		
Age of the household head (years)	0.0008**	0.0001	0.0011***
	(0.0003)	(0.0004)	(0.0004)
Household head's education (years)	0.0036***	0.0020*	0.0048***
	(0.0008)	(0.0012)	(0.0010)
Household size	−0.0135***	−0.0097**	−0.0155***
	(0.0032)	(0.0041)	(0.0041)
Chronic disease or disability (dummy)	0.0353***	0.0308***	0.0387***
	(0.0081)	(0.0111)	(0.0106)
Number of adults in the household	−0.0003	0.0017	−0.0013
	(0.0062)	(0.0082)	(0.0077)
Number of children in the household	−0.0031	0.0006	−0.0064
	(0.0056)	(0.0082)	(0.0069)
Number of females in the household	0.0072*	0.0058	0.0060
	(0.0041)	(0.0057)	(0.0052)
Time to nearest public hospital (ln)	0.0061	0.0079	0.0046
	(0.0078)	(0.0111)	(0.0097)
Time to nearest maternity home (ln)	−0.0021	−0.0060	−0.0006
	(0.0086)	(0.0124)	(0.0106)
Time to nearest public dispensary (ln)	0.0096	0.0136	0.0077
	(0.0083)	(0.0121)	(0.0105)
Time to nearest private dispensary (ln)	−0.0130**	−0.0154*	−0.0112
	(0.0062)	(0.0083)	(0.0079)
Time to nearest clinic (ln)	−0.0035	−0.0041	−0.0033
	(0.0066)	(0.0084)	(0.0085)
Time to nearest MOH office (ln)	−0.0101*	−0.0103	−0.0095
	(0.0061)	(0.0086)	(0.0074)
Number of beds per 1000 population (ln)	0.0511	0.0394	0.0612
	(0.0344)	(0.0519)	(0.0388)
Number of medical beds per 1000 population (ln)	0.0313	0.0248	0.0363
	(0.0246)	(0.0330)	(0.0306)
Number of surgical beds per 1000 population (ln)	0.0114	0.0389	−0.0112
	(0.0209)	(0.0279)	(0.0258)
Number of doctors per 100 000 population (ln)	0.0359	0.0096	0.0577
	(0.0445)	(0.0627)	(0.0566)
Number of physicians per 100 000 population (ln)	0.0224	0.0258	0.0170
	(0.0277)	(0.0394)	(0.0360)
Number of surgeons per 100 000 population (ln)	−0.0397	−0.0349	−0.0395
	(0.0310)	(0.0440)	(0.0405)
Number of gynaecologists per 100 000 population (ln)	0.0173	0.0201	0.0131
	(0.0220)	(0.0305)	(0.0282)
Number of nurses per 100 000 population (ln)	−0.0414**	−0.0388*	−0.0414*
	(0.0169)	(0.0223)	(0.0216)
Public sector outpatient attendance per 100 000 population (ln)	−0.0896**	−0.0970*	−0.0848*
	(0.0380)	(0.0545)	(0.0465)
Public sector clinic visits per 100 000 population (ln)	−0.0406	−0.0508	−0.0307
	(0.0291)	(0.0389)	(0.0370)
Public sector inpatient stays per 100 000 population (ln)	0.0149	0.0424	−0.0150
	(0.0441)	(0.0660)	(0.0533)
Observations	6567	2866	3701
Pseudo R-squared	0.135	0.128	0.149

Robust standard errors clustered by household level in parentheses.
$^{***}P < 0.01$, $^{**}P < 0.05$, $^{*}P < 0.1$.
Source: Authors' calculation based on HIES and AHS data.

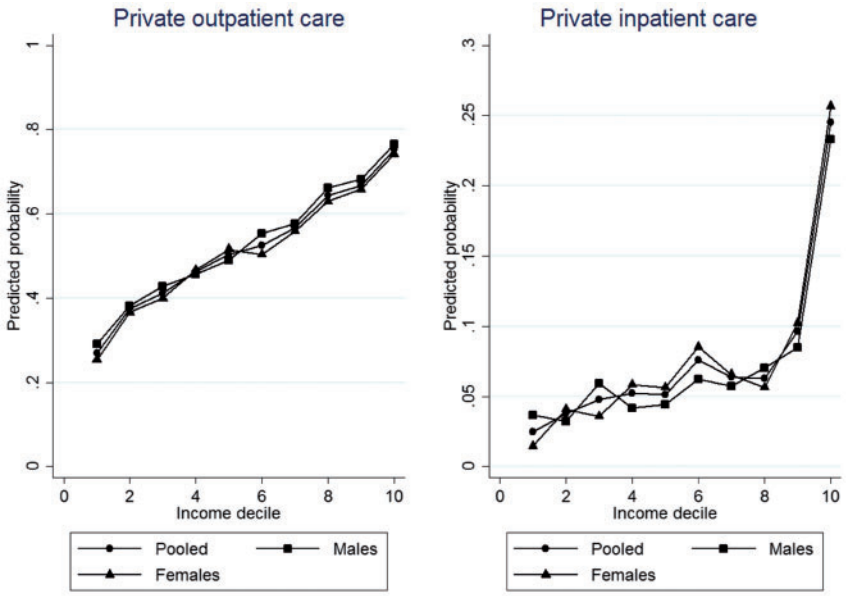

Figure 3. Predicted probabilities on using private sector healthcare by income deciles. *Source*: Authors' representation based on simulated income effects while holding all other variables at their mean

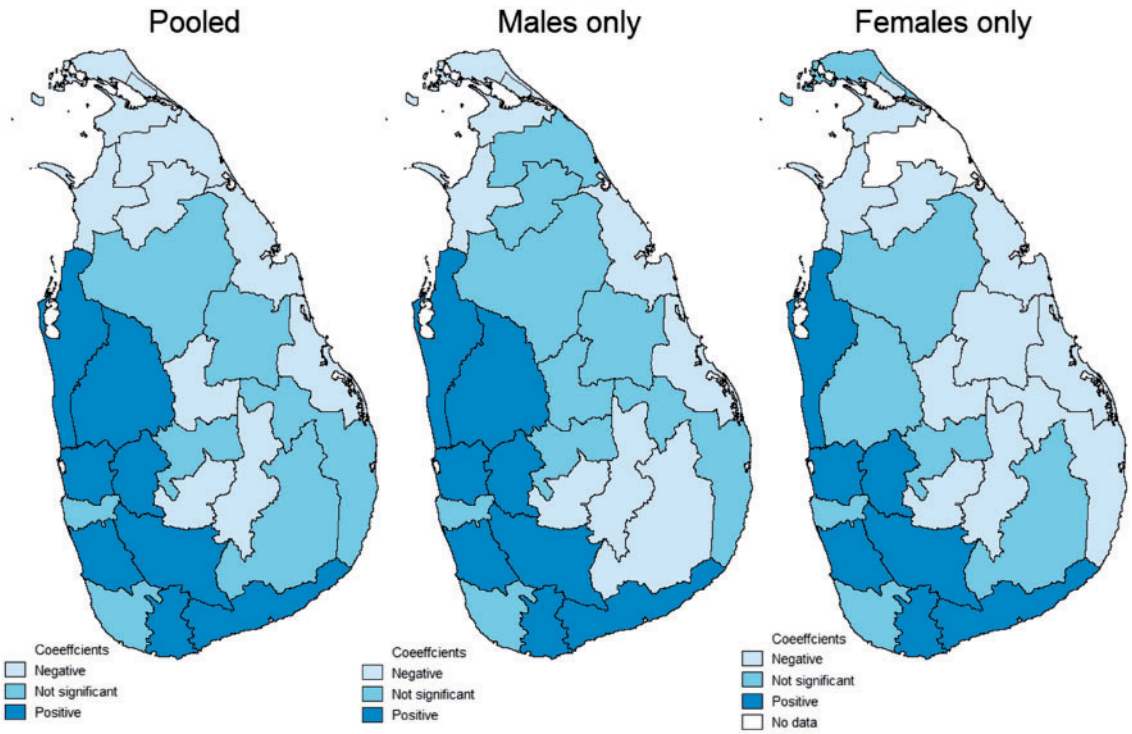

Figure 4. District effects of private sector outpatient healthcare utilization conditional on outpatient healthcare use and covariates with Colombo as the reference district. *Source*: Authors' representation based on estimated district effects

females who belong to class one (not chronically ill) are less likely to seek private sector outpatient healthcare. Overall, household size is negatively correlated with the usage of private outpatient healthcare again with different orders of magnitude across classes. Easy accessibility of private sector health facilities increases the private sector outpatient healthcare across different classes but respondents who suffer from heart diseases are more responsive.

Table 10 reports the marginal effects of private sector inpatient healthcare utilization. Similar to outpatient healthcare, household income is highly significant and positive across all classes confirming individuals with high income seek private sector inpatient healthcare regardless of their chronic health conditions. Urban individuals from class two (hypertension class) are less likely to use private inpatient healthcare compared to individuals in the other two classes.

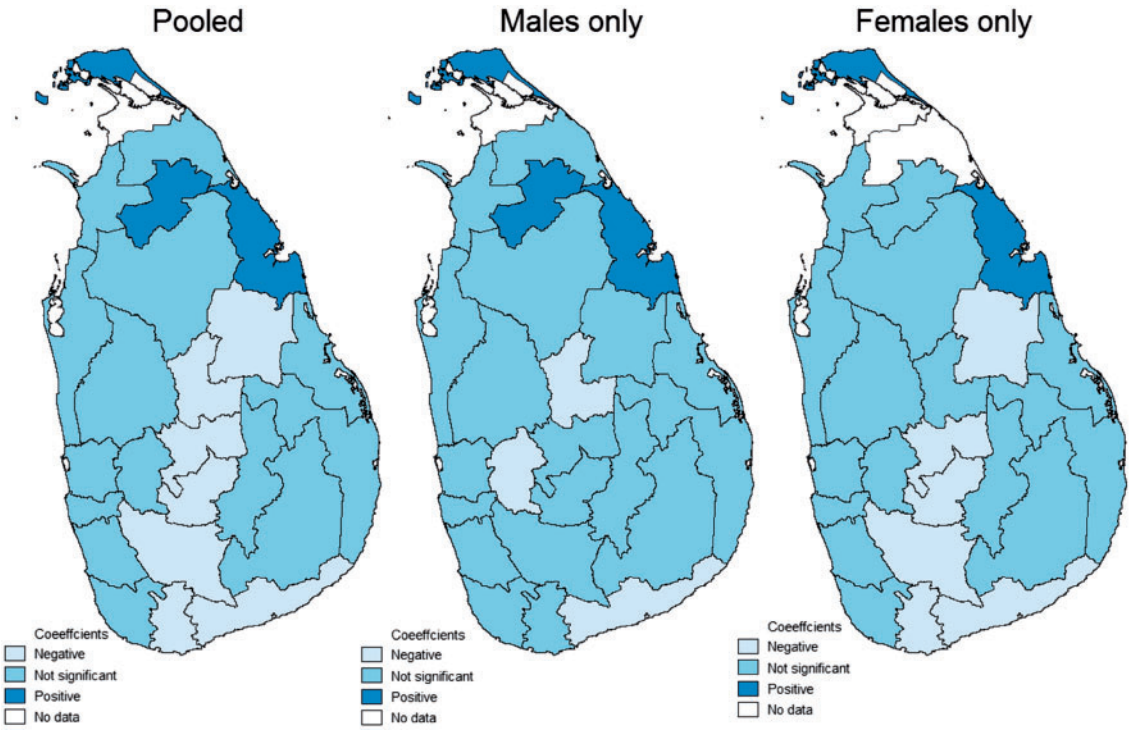

Figure 5. District effects of private sector inpatient healthcare utilization conditional on inpatient healthcare use and covariates with Colombo as the reference district. *Source*: Authors' representation based on estimated district effects

Table 7. Probabilities of belonging to each latent class conditional on healthcare utilization

Outpatient healthcare		Inpatient healthcare	
Latent class	Probability (π)	Latent class	Probability (π)
Class 1	0.8898	Class 1	0.8794
Class 2	0.0806	Class 2	0.0784
Class 3	0.0296	Class 3	0.0422

Source: Authors estimation using HIES data.

Being in an estate sector negatively affects the use of private inpatient care for individuals in class one (not chronically ill). Household size only matters for individuals belonging to the group of not chronically ill persons. Similar to outpatient care, easy accessibility of private sector health facilities increases the private inpatient care except for individuals in class one (not chronically ill). Compared to outpatient healthcare, district level supply side factors do not have much effect on utilizing private sector inpatient healthcare. Overall, the evidence suggests that the income effect on using private healthcare is consistent across classes and people who suffer from more severe chronic diseases are clearly more sensitive to supply side factors.

Discussion

We found that income was a key determinant of demand for both outpatient and inpatient care, as has been reported elsewhere (Van Doorslaer *et al.* 1997; Gerdtham and Johannesson 2000; Morris *et al.* 2005; Bonfrer *et al.* 2014). However, we also find that households tend to substitute public healthcare with private healthcare as their income increases. Similar evidence has for instance been reported by the SHIELD project for Ghana, South Africa and Tanzania (McIntyre and Mills 2012). As Rannan-Eliya et al. (2015b) argued in the case of Sri Lanka, this shift to private care is likely to be driven by non-clinical quality aspects of treatments such as doctors and other workers' interpersonal communication and consultation time as well as quality aspects of physical facilities like cleanliness and the luxurious environment. Moreover, the analysis above showed that the quality in terms of service availability and quantity of public sector health services affects the usage of private sector healthcare at least for outpatient treatments; people tend to use private outpatient health facilities more often if they live closer to them.

We do not find general evidence for congestion in the healthcare sector, yet we find that congestion, measured by higher public clinic visits per 100 000 population, is associated with significant higher private sector outpatient healthcare utilization. The results also indicated a positive correlation between the travel time needed to the next clinic and the use of outpatient care. This is counterintuitive to what one would expect, yet the effect is very small and only exists for women. This correlation is also not present for smaller types of healthcare facilities. Hence, we suspect unobserved healthcare needs correlated with remoteness to drive this correlation. Indeed, clinics refer dominantly to maternity and infancy health clinics that are operated by the public sector. Pregnancy health check-ups, child vaccinations and weight check-ups are conducted free of charge in these facilities. Women in Sri Lanka, more than in many other countries in the sub-region, are in general aware of the importance of these exams and may know that they and their children are at a higher risk of contracting health problems than women and children in urban areas. This may explain the positive correlation between

Table 8. Estimates for posterior probability of belonging to class one and class three (multinomial logit model)

	Outpatient		Inpatient	
	Class 1	Class 3	Class 1	Class 3
Constant	4.759***	2.388	4.119	1.642
	(1.725)	(3.188)	(3.171)	(5.010)
Age (years)	−0.04***	−0.007***	−0.042 ***	−0.009 **
	(0.001)	(0.002)	(.002)	(0.004)
Household monthly expenditure (ln)	−0.079 **	−0.109 *	−0.027	−0.094
	(0.032)	(0.058)	(0.055)	(0.088)
Urban (dummy)	−0.05	0.179 **	0 .013	0.344 **
	(0.051)	(0.088)	(0.094)	(0.146)
Estate (dummy)	0.05	0.039 **	−0.127	0.153
	(0.091)	(0.161)	(0.160)	(0.235)
Tamil (dummy)	0.226 ***	0.2	0.414 ***	0.574 ***
	(0.075)	(0.130)	(0.133)	(0.198)
Muslim (dummy)	−0.032	−0.195	0.059	0.005
	(0.073)	(0.136)	(0.135)	(0.218)
Female (dummy)	−0.211 ***	−0.432 ***	−0.353 ***	−0.448 ***
	(0.040)	(0.070)	(0.072)	(0.112)
Age of the household head (years)	−0.005 **	−0.004	0.002	−0.004
	(0.002)	(0.003)	(0.003)	(0.005)
Household head's education (years)	−0.001	0.002	−0.001	0.004
	(0.005)	(0.009)	(0008)	(0013)
Household size	0.014	0.021	0.021	0.047
	(0.018)	(0.032)	(0.033)	(0.051)
Number of adults in the household	0.071 **	−0.108 *	−0.013	−0.010
	(0.032)	(0.059)	(0.059)	(0.093)
Number of children in the household	−0.054	−0.116 *	0 .105	0.015
	(0.036)	(0.065)	(0.064)	(0.099)
Number of females in the household	−0.021	0.009	−0.065	−0.076
	(0.025)	(0.044)	(0.046)	(0.071)
Time to nearest public hospital (ln)	0.012	−0.058	−0.082	−0.219
	(0.050)	(0.089)	(0.089)	(0.143)
Time to nearest maternity home (ln)	−0.054	0.1	−0.148	−0.130
	(0.050)	(0.086)	(0.091)	(0.143)
Time to nearest public dispensary (ln)	0.063	0.126	0.075	0.405
	(0.048)	(0.086)	(0.087)	(0.139)
Time to nearest private dispensary (ln)	0.008	−0.146**	0.087	0.055
	(0.037)	(0.066)	(0.065)	(0.102)
Time to nearest clinic (ln)	−0.008	−0.102	0.039	−0.241**
	(0.037)	(0.064)	(0.065)	(0.097)
Time to nearest MOH office (ln)	−0.043	−0.021	−0.014	0.084
	(0.041)	(0.074)	(0.071)	(0.112)
Number of beds per 1000 population (ln)	−0.049	0.39	−0.248	−0.219
	(0.203)	(0.375)	(0.362)	(0.576)
Number of medical beds per 1000 population (ln)	−0.049	0.023	−0.048	−0.010
	(0.136)	(0.247)	(0.233)	(0.373)
Number of surgical beds per 1000 population (ln)	−0.118	0.242	−0.093	−0.207
	(0.119)	(0.211)	(0.203)	(0.318)
Number of doctors per 100 000 population (ln)	−0.204	0.243	−0.062	0.188
	(0.229)	413	(0.422)	(0.665)
Number of physicians per 100 000 population (ln)	0.257 *	−0.063	0.185	0.271
	(0.147)	(0.268)	(0.272)	(0.438)
Number of surgeons per 100 000 population (ln)	0.072	−0.222	−0.077	−0.613
	(0.179)	(0.323)	(0.318)	(0.513)
Number of gynaecologists per 100 000 population (ln)	−0.249 **	−0.187	−0.005	0.374
	(0.114)	(0.206)	(0.203)	(0.328)
Number of nurses per 100 000 population (ln)	0.001	−0.023	0.073	0.245
	(0.102)	(0.186)	(0.175)	(0.276)
Public sector outpatient attendance per 100 000 population (ln)	−0.114	−0.201	0.124	0.119
	(0.209)	(0.383)	(0.371)	(0.589)
Public sector clinic visits per 100 000 population (ln)	−0.261	−0.377	−0.014	−0.135
	(0.180)	(0.318)	(0.304)	(0.476)
Public sector inpatient stays per 100 000 population (ln)	0.747**	0.271	0.014	−0.445
	−0.30	(0.564)	(0.511)	(0.807)

Base class is class two. Number of observations for outpatient care is 20 790 and for inpatient care is 6551.

***$P < 0.01$, **$P < 0.05$, *$P < 0.1$.

Source: Authors' calculation based on HIES and AHS data.

Table 9. Marginal effects of private outpatient healthcare utilization covariates by latent classes

	Class 1 (Pooled)	Class 2 (Pooled)	Class 3 (Pooled)
Age (years)	−0.0021***	0.0002	−0.0015
	(0.0002)	(0.0014)	(0.0016)
Household monthly expenditure (ln)	0.2196***	0.2287***	0.2240***
	(0.0100)	(0.0265)	(0.0424)
Urban (dummy)	−0.0139	−0.0230	−0.0609
	(0.0139)	(0.0355)	(0.0564)
Estate (dummy)	−0.0509**	−0.0027	−0.0617
	(0.0219)	(0.0703)	(0.1108)
Tamil (dummy)	−0.0001	−0.0254	0.0334
	(0.0182)	(0.0572)	(0.0926)
Muslim (dummy)	−0.0021	0.0492	−0.2098**
	(0.0187)	(0.0554)	(0.0835)
Female (dummy)	−0.0240***	0.0070	0.0666
	(0.0075)	(0.0267)	(0.0440)
Age of the household head (years)	−0.0002	−0.0030**	0.0022
	(0.0005)	(0.0013)	(0.0022)
Household head's education (years)	0.0061***	0.0094***	0.0148**
	(0.0013)	(0.0034)	(0.0062)
Household size	−0.0451***	−0.0520***	−0.0396*
	(0.0048)	(0.0131)	(0.0211)
Number of adults in the household	0.0352***	0.0367*	0.0524
	(0.0097)	(0.0220)	(0.0379)
Number of children in the household	0.0053	0.0566**	0.0349
	(0.0086)	(0.0275)	(0.0455)
Number of females in the household	0.0060	−0.0004	−0.0171
	(0.0063)	(0.0172)	(0.0283)
Time to nearest public hospital (ln)	0.0390***	0.0614	0.1449**
	(0.0129)	(0.0373)	(0.0636)
Time to nearest maternity home (ln)	−0.0050	−0.0501	−0.0557
	(0.0128)	(0.0364)	(0.0614)
Time to nearest public dispensary (ln)	0.0314**	0.0681*	0.0491
	(0.0124)	(0.0349)	(0.0554)
Time to nearest private dispensary (ln)	−0.0560***	−0.0606**	−0.0726*
	(0.0099)	(0.0265)	(0.0420)
Time to nearest clinic (ln)	−0.0184*	0.0200	−0.0325
	(0.0095)	(0.0263)	(0.0389)
Time to nearest MOH office (ln)	−0.0102	−0.0865***	−0.0609
	(0.0107)	(0.0306)	(0.0483)
Number of beds per 1000 population (ln)	−0.1686***	−0.1716	0.0503
	(0.0579)	(0.1409)	(0.2751)
Number of medical beds per 1000 population (ln)	−0.2144***	−0.2811***	−0.4082**
	(0.0352)	(0.1019)	(0.1791)
Number of surgical beds per 1000 population (ln)	0.0519*	0.2083**	0.0924
	(0.0311)	(0.0861)	(0.1435)
Number of doctors per 100 000 population (ln)	−0.1503**	−0.1361	−0.6855**
	(0.0593)	(0.1652)	(0.3297)
Number of physicians per 100 000 population (ln)	−0.0946**	−0.4392***	−0.4463**
	(0.0390)	(0.1005)	(0.1960)
Number of surgeons per 100 000 population (ln)	0.1172**	0.5624***	0.5064**
	(0.0481)	(0.1279)	(0.2304)
Number of gynaecologists per 100 000 population (ln)	−0.0821***	−0.2456***	0.2089
	(0.0289)	(0.0808)	(0.1465)
Number of nurses per 100 000 population (ln)	0.2097***	0.0712	0.0427
	(0.0262)	(0.0779)	(0.1371)
Public sector outpatient attendance per 100 000 population (ln)	0.0987*	0.0125	−0.1292
	(0.0577)	(0.1461)	(0.2723)
Public sector clinic visits per 100 000 population (ln)	0.1377***	0.0217	0.4403**
	(0.0439)	(0.1321)	(0.2218)
Public sector inpatient stays per 100 000 population (ln)	−0.0418	0.3883*	0.3302
	(0.1050)	(0.2070)	(0.3578)
π	0.8898	0.0807	0.0295
Observations	18 501	1676	613
Pseudo R-squared	0.0978	0.125	0.128

Robust standard errors in parentheses.

$^{***}P < 0.01$, $^{**}P < 0.05$, $^{*}P < 0.1$.

Source: Authors' calculation based on HIES and AHS data.

Table 10. Marginal effects of private inpatient healthcare utilization covariates by latent classes

	Class 1 (Pooled)	Class 2 (Pooled)	Class 3 (Pooled)
Age (years)	0.0001	0.0003	−0.0009
	(0.0002)	(0.0008)	(0.0008)
Household monthly expenditure (ln)	0.0670***	0.0499***	0.0570***
	(0.0056)	(0.0133)	(0.0204)
Urban (dummy)	0.0064	−0.0464***	−0.0178
	(0.0091)	(0.0146)	(0.0268)
Estate (dummy)	−0.0500***	−0.0259	0.0271
	(0.0089)	(0.0235)	(0.0554)
Tamil (dummy)	0.0187	0.0567	0.0318
	(0.0142)	(0.0540)	(0.0457)
Muslim (dummy)	0.0351**	−0.0037	−0.0345
	(0.0164)	(0.0310)	(0.0231)
Female (dummy)	−0.0016	−0.0151	0.0336
	(0.0062)	(0.0182)	(0.0235)
Age of the household head (years)	0.0009***	−0.0004	0.0000
	(0.0003)	(0.0007)	(0.0010)
Household head's education (years)	0.0031***	0.0062***	0.0057*
	(0.0009)	(0.0022)	(0.0029)
Household size	−0.0145***	−0.0047	−0.0108
	(0.0033)	(0.0083)	(0.0099)
Number of adults in the household	−0.0023	0.0205	−0.0107
	(0.0066)	(0.0134)	(0.0260)
Number of children in the household	−0.0031	0.0074	−0.0113
	(0.0058)	(0.0176)	(0.0182)
Number of females in the household	0.0070*	0.0061	0.0160
	(0.0041)	(0.0113)	(0.0144)
Time to nearest public hospital (ln)	0.0016	0.0297	−0.0094
	(0.0081)	(0.0214)	(0.0290)
Time to nearest maternity home (ln)	0.0069	−0.0991***	0.0591
	(0.0089)	(0.0276)	(0.0414)
Time to nearest public dispensary (ln)	0.0037	0.0611**	0.0369
	(0.0084)	(0.0278)	(0.0373)
Time to nearest private dispensary (ln)	−0.0081	−0.0323**	−0.0457**
	(0.0065)	(0.0145)	(0.0194)
Time to nearest clinic (ln)	−0.0080	0.0454**	0.0174
	(0.0071)	(0.0198)	(0.0218)
Time to nearest MOH office (ln)	−0.0077	−0.0204	−0.0531*
	(0.0063)	(0.0153)	(0.0289)
Number of beds per 1000 population (ln)	0.0721*	0.1045	−0.0627
	(0.0374)	(0.0924)	(0.1652)
Number of medical beds per 1000 population (ln)	0.0347	0.0125	−0.0924
	(0.0260)	(0.0581)	(0.1099)
Number of surgical beds per 1000 population (ln)	0.0151	−0.0122	0.1036
	(0.0222)	(0.0596)	(0.0838)
Number of doctors per 100 000 population (ln)	0.0262	0.1749*	−0.2042
	(0.0490)	(0.0936)	(0.1885)
Number of physicians per 100 000 population (ln)	0.0323	0.0495	−0.1307
	(0.0299)	(0.0676)	(0.0980)
Number of surgeons per 100 000 population (ln)	−0.0641*	0.0148	0.1546
	(0.0335)	(0.0784)	(0.1190)
Number of gynaecologists per 100 000 population (ln)	0.0295	−0.0928*	0.1147
	(0.0233)	(0.0512)	(0.0916)
Number of nurses per 100 000 population (ln)	−0.0329*	−0.0884*	−0.0848
	(0.0180)	(0.0470)	(0.0618)
Public sector outpatient attendance per 100 000 population (ln)	−0.1055***	0.0393	−0.1983
	(0.0409)	(0.0997)	(0.1536)
Public sector clinic visits per 100 000 population (ln)	−0.0409	−0.1601**	0.1871
	(0.0299)	(0.0793)	(0.1178)
Public sector inpatient stays per 100 000 population (ln)	0.0054	−0.0861	0.2634
	(0.0465)	(0.1222)	(0.2930)
π	0.8794	0.0784	0.0422
Observations	5,764	512	275
Pseudo R-squared	0.136	0.235	0.246

Robust standard errors in parentheses.

***$P < 0.01$, **$P < 0.05$, *$P < 0.1$.

Source: Authors' calculation based on HIES and AHS data.

travel time (or remoteness) and usage. More generally, this also confirms what other authors have emphasized previously, healthcare choices are very complex and they are correlated with gender, perceptions of quality, women's knowledge and cultural norms and beliefs (Kroeger 1983; Pokhrel and Sauerborn 2004; Shaikh and Hatcher 2005). We also find that conditional on income (and all the other covariates) higher educated persons are less likely to seek healthcare suggesting that they are healthier. We believe this is plausible and in line with the literature: they are likely to have less risky jobs and invest more in preventative measures including better and healthier food and consume less tobacco and alcohol (Cutler and Lleras-Muney, 2012; Hosseinpoor *et al.*, 2012; Bosdriesz et al., 2014). Yet, more educated individuals tend to use more often private care suggesting that higher education is associated with a better sense for quality or a higher preference for quality and possibly also higher time costs and hence value particularly shorter waiting times.

The LCA showed that the choice between private and public sector care significantly differs between people with and without chronic diseases. We find especially that chronically ill people rely for their day-to-day care on the public sector, probably also for cost reasons, but for their inpatient care they turn more often than non-chronically ill people to the private sector. It may have to do with shorter waiting times, for example to get a surgery, and better quality care. This is worrying as it penalizes chronically ill persons financially, i.e. persons who anyway because of their illness may have already a limited capacity to generate income.

We also see higher outpatient healthcare usage in rural areas and estate areas which might be an indication of the in general less favourable health environment in these areas such as unsafe drinking water, low quality sanitation as well as lower knowledge of basic health practices. It is partly also a reflection of a possible substitution of inpatient care by outpatient care. This was for example also found by Liu et al. (2007) for rural China. Yet, we find lower usage rates of private healthcare, which at least partly also has to do with the lower density of private healthcare facilities in rural areas compared to urban areas. The analysis of regional differences suggests that districts in the northwest and southern regions have higher private sector outpatient healthcare utilization relative to the Colombo district. This might be due to the fact that these districts provide a lower supply of public sector healthcare (MOH 2012).

We also find some interesting patterns along ethnic lines. Tamils who live predominantly in the northern and eastern regions seem to differ in their healthcare seeking behaviour from the predominantly Sinhalese in other areas as they use over proportionally private inpatient healthcare. Indeed, the literature confirms that different ethnic and religious groups often show clearly distinct healthcare usage behaviours (Kroeger 1983; Adamson *et al.* 2003). The literature also shows that people of different ethnic groups even rate their own health differently (Menec *et al.* 2007). Individual norms and beliefs, prior experience, trust and confidence, opportunity costs, healer-patient communication barriers also affect the individual healthcare choice behaviour (Gilson 2003; Russell 2005; Ozawa and Walker 2011). In the case of Tamils, limited trust in public healthcare institutions and discrimination might be particularly important issues and may explain their higher demand for private inpatient healthcare services (Mayer 2004, 2005).

Conclusion

Our findings have two important implications. First, even with universal public healthcare policy, richer individuals tend to use private sector health services. If this trend continues it may not only increase the income-health gradient in Sri Lanka but it may also lead to a situation where richer people and the middle class completely opt out from the public healthcare system. Consequently, it may undermine their willingness to pay taxes to finance public healthcare which may negatively affect the sustainability of the public sector healthcare system. Second, regional and ethnic discrepancies still exist both on the demand side and the supply side, again despite the universal public healthcare policy. This obviously bears the risk of triggering popular perceptions of ethnic and regional discrimination that may provoke ethnic tensions, in particular in an ethnically heterogeneous country like Sri Lanka and where a long civil war ended only recently.

Supplementary data

Supplementary data are available at *HEAPOL* online.

Acknowledgements

We thank two anonymous referees as well as the editor for very useful and constructive comments and suggestions. We also thank the department of census and statistics of Sri Lanka for providing the data.

Funding

Asankha Pallegedara has benefitted from a Georg Forster Research Fellowship awarded by the Alexander von Humboldt Foundation, Germany.

Conflict of interest statement. None declared.

Notes

1. The 'Estate sector' refers to people that live and work in the upcountry tea plantations and are mostly descendants of the 'imported' indentured labor from South India by the British colonizers in early 19th century.
2. Note that the shares of people using private outpatient care are 27% in the poorest income quintile and 75% in the richest income quintile. For impatient care these shares are 4 and 28% respectively.

References

Adamson J, Ben-Shlomo Y, Chaturvedi N, Donovan J. 2003. Ethnicity, socio-economic position and gender—do they affect reported health—care seeking behaviour? *Social Science & Medicine* **57**: 895–904.

Amarasinghe S, De Alwis S, Saleem S, Ranna-Eliya R, Dalpatadu S. 2015. *IHP Technical Reports Series, Number 2: Private Health Sector Review 2012*. Colombo: Institute for Health Policy.

Andersen RM. 1968. Families' use of health services: a behavioral model of predisposing, enabling and need components. PhD Dissertation. http://docs.lib.purdue.edu/dissertations/AAI6902884/, accessed 17 July 2016.

Andersen R, Newman JF. 1973. Societal and individual determinants of medical care utilization in the United States. *The Milbank Memorial Fund Quarterly. Health and Society* **51**: 95–124.

Andersen RM. 1995. Revisiting the behavioral model and access to medical care: does it matter? *Journal of Health and Social Behavior* **36**: 1–10.

Andersen RM. 2008. National health surveys and the behavioral model of health services use. *Medical Care* **46**: 647–53.

Atella V, Brindisi F, Deb P, Rosati FC. 2004. Determinants of access to physician services in Italy: a latent class seemingly unrelated probit approach. *Health Economics* **13**: 657–68.

Atella V, Deb P. 2008. Are primary care physicians, public and private sector specialists substitutes or complements? Evidence from a simultaneous equations model for count data. *Journal of Health Economics* **27**: 770–85.

Bago dUva. T. 2005. Latent class models for use of primary care: evidence from a British panel. *Health Economics* **14**: 873–92.

Bago d'Uva T. 2006. Latent class models for utilisation of healthcare. *Health Economics* **15**: 329–43.

Bago d'Uva T, Jones A. 2009. Health-care utilisation in Europe: new evidence from the ECHP. *Journal of Health Economics* **28**: 265–79.

Bhatia JC, Cleland J. 2001. Health-care seeking and expenditure by young Indian mothers in the public and private sectors. *Health Policy and Planning* **16**: 55–61.

Bhattacharyya O, Khor S, McGahan A *et al*. 2010. Innovative health service delivery models in low and middle income countries—what can we learn from the private sector? *Health Research Policy and Systems* **8**: 24.

Bonfrer I, van de Poel E, Grimm M, Van Doorslaer E. 2014. Does the distribution of healthcare utilization match needs in Africa? *Health Policy and Planning* **29**: 921–37.

Bosdriesz JR, Mehmedovic S, Witvliet MI, Kunst AE. 2014. Socioeconomic inequalities in smoking in low and mid income countries: positive gradients among women? *International Journal for Equity in Health* **13**: 14.

Bustreo F, Harding A, Axelsson H. 2003. Can developing countries achieve adequate improvements in child health outcomes without engaging the private sector? *Bulletin of the World Health Organization* **81**: 886–95.

Cutler DM, Lleras-Muney A. 2012. Education and Health: Insights from International Comparisons. NBER Working Papers 17738, National Bureau of Economic Research, Inc.

Deb P, Trivedi PK. 1997. Demand for medical care by the elderly: a finite mixture approach. *Journal of Applied Econometrics* **12**: 313–36.

Deb P, Trivedi PK. 2002. The structure of demand for healthcare: latent class versus two-part models. *Journal of Health Economics* **21**: 601–25.

Fabbri D, Monfardini C. 2003. Public vs. private healthcare services demand in Italy. *Giornale Degli Economisti e Annali Di Economia* **62**: 93–123.

Gerdtham UG, Johannesson M. 2000. Income-related inequality in life-years and quality-adjusted life-years. *Journal of Health Economics* **19**: 1007–26.

Gilson L. 2003. Trust and healthcare as a social institution. *Social Science & Medicine* **56**: 1452–68.

Gravelle H, Sutton M, Morris S *et al*. 2003. Modelling supply and demand influences on the use of healthcare: implications for deriving a needs-based capitation formula. *Health Economics* **12**: 985–1004.

Hanson K, Gilson L, Goodman C *et al*. 2008. Is private healthcare the answer to the health problems of the world's poor? *PLoS Medicine* **5**: e233.

Hosseinpoor AR, Bergen N, Kunst A, Harper S, Guthold R, Rekve D, d'Espaignet ET, Naidoo N, Chatterji S. 2012. Socioeconomic inequalities in risk factors for non-communicable diseases in low-income and middle-income countries: results from the World Health Survey *BMC Public Health* **12**: 912.

Kroeger A. 1983. Anthropological and socio-medical healthcare research in developing countries. *Social Science & Medicine* **17**: 147–61.

Liu M, Zhang Q, Lu M, Kwon CS, Quan H. 2007. Rural and urban disparity in health services utilization in China. *Medical Care* **45**: 767–74.

Liu X, Hotchkiss DR, Bose S. 2008. The effectiveness of contracting-out primary healthcare services in developing countries: a review of the evidence. *Health Policy and Planning* **23**: 1–13.

Loevinsohn B, Harding A. 2005. Buying results? Contracting for health service delivery in developing countries. *Lancet* **366**: 676–81.

Lostao L, Blane D, Gimeno D, Netuveli G, Regidor E. 2014. Socioeconomic patterns in use of private and public health services in Spain and Britain: implications for equity in healthcare. *Health & Place* **25**: 19–25.

Mas-Colell A, Whinston M, Green J. (1995). *Microeconomic Theory*. Oxford: Oxford University Press.

Mayer M. (2004) Reinterpreting ethnic tensions in Sri Lanka. In: Hussain Ameena (ed). *Race: Identity, Caste and Conflict in the South Asian Context*. Colombo: International Centre for Ethnic Studies.

Mayer M. (2005) Reflection on social development in Sri Lanka. In: Hettige ST, Mayer M (eds.). *Perspectives for Social Development in Sri Lanka*. Colombo: Social Policy Analysis Research Centre.

McIntyre D, Mills A. 2012. Research to support universal coverage reforms in Africa: the SHIELD project. *Health Policy and Planning* **27**: i1–i3.

Meessen B, Bigdeli M, Chheng K *et al*. 2011. Composition of pluralistic health systems: how much can we learn from household surveys? An exploration in Cambodia. *Health Policy and Planning* **26**: i30–44.

Menec VH, Shooshtari S, Lambert P. 2007. Ethnic differences in self-rated health among older adults a cross-sectional and longitudinal analysis. *Journal of Aging and Health* **19**: 62–86.

Ministry of Health Sri Lanka (MOH). 2012. *Annual Health Bulletin 2012*. Colombo: MOH.

Morris S, Sutton M, Gravelle H. 2005. Inequity and inequality in the use of healthcare in England: an empirical investigation. *Social Science and Medicine* **60**: 1251–66.

Nylund KL, Asparouhov T, Muthen BO. 2007. Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. *Structural Equation Modeling: A Multidisciplinary Journal* **14**: 535–69.

Oxfam International. 2009. *Blind optimism challenging the myths about private healthcare in poor countries*, https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/bp125-blind-optimism-0902_14.pdf, accessed 19 July 2016.

Ozawa S, Walker DG. 2011. Comparison of trust in public vs private healthcare providers in rural Cambodia. *Health Policy and Planning* **26**: i20–9.

Patouillard E, Goodman C, Hanson K, Mills A. 2007. Can working with the private for-profit sector improve utilization of quality health services by the poor? A systematic review of the literature. *International Journal for Equity in Health* **6**: 17.

Pokhrel S, Sauerborn R. 2004. Household decision-making on child healthcare in developing countries: the case of Nepal. *Health Policy and Planning* **19**: 218–33.

Preker AS. 2007. *Public Ends, Private Means: Strategic Purchasing of Health Services*. Washington DC: World Bank Publications.

Preker AS, Harding A, Travis P. 2000. "Make or buy" decisions in the production of healthcare goods and services: new insights from institutional economics and organizational theory. *Bulletin of the World Health Organization* **78**: 779–90.

Propper C. 2000. The demand for private healthcare in the UK. *Journal of Health Economics* **19**: 855–76.

Rannan-Eliya RP, Jayawardhane P, Karunaratne L. 2003. Private primary care practitioners in Sri Lanka. In: Yazbeck S, Peters DH (eds). *Health Policy Research in Asia: Guiding Reforms and Building Capacity*. Washington DC: World Bank.

Rannan-Eliya R, Sikurajapathy L. 2009. Sri Lanka: "Good Practice" in Expanding Health Care Coverage. In: Gottret P, Schieber GJ, Waters HR (eds). *Good Practices in Health Financing Lessons from Reforms in Low- and Middle-Income Countries*. Washington DC: The World Bank, 311–354.

Rannan-Eliya RP, Wijemanne N, Liyanage IK *et al*. 2015a. Quality of inpatient care in public and private hospitals in Sri Lanka. *Health Policy and Planning* **30**: i46–58.

Rannan-Eliya RP, Wijemanne N, Liyanage IK *et al*. 2015b. The quality of outpatient primary care in public and private sectors in Sri Lanka-how well do patient perceptions match reality and what are the implications? *Health Policy and Planning* **30**: i59–74.

Ringel JS, Hosek SD, Vollaard BA, Mahnovski S. 2002. *The Elasticity of Demand for Health Care. A Review of the Literature and Its Application to the Military Health System*. California: RAND National Defense Research Institute.

Russell S. 2005. Treatment-seeking behaviour in urban Sri Lanka: trusting the state, trusting private providers. *Social Science & Medicine* **61**: 1396–407.

Saksena P, Xu K, Elovainio R, Perrot J. 2012. Utilization and expenditure at public and private facilities in 39 low-income countries. *Tropical Medicine & International Health* **17**: 23–35.

Schmitz H. 2012. More healthcare utilization with more insurance coverage? Evidence from a latent class model with German data. *Applied Economics* **44**: 47–58.

Shaikh BT, Hatcher J. 2005. Health seeking behaviour and health service utilization in Pakistan: challenging the policy makers. *Journal of Public Health* **27**: 49–54.

Shayo EH, Senkoro KP, Momburi R *et al*. 2016. Access and utilisation of healthcare services in rural Tanzania: a comparison of public and non-public facilities using quality, equity, and trust dimensions. *Global Public Health* **11**: 407–22.

United Nations Children's Fund (UNICEF). 2014. *The State of the World's Children 2014 in Numbers: Every Child Counts*. New York: UNICEF.

Van Doorslaer E, Wagstaff A, Bleichrodt H *et al*. 1997. Income-related inequalities in health: some international comparisons. *Journal of Health Economics* **16**: 93–112.

WHO, UNICEF, UNFPA, The World Bank, United Nations Population Division. 2013. *Trends in Maternal Mortality: 1990 to 2013 Estimates by WHO, UNICEF, UNFPA*. Geneva: The World Bank and the United Nations Population Division.

World Bank. 2015. *World Development Indicators*. Washington DC: World Bank.