# Out-of-Pocket and Catastrophic Expenditure on Health in Cambodia

## Cambodian Demographic Health Survey 2005 and Socio-Economic Surveys 2004 & 2007 Analysis


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# Executive Summary

## Background

Cambodia is one of the lowest-income countries in South-East Asia and the world, with a current population of over 14 million. The country has undergone major changes over the past few decades in terms of economic, social, and human development. In these years of greater political stability, levels of economic growth have been high. Such rapid economic development has enabled the government to significantly increase health spending. In addition, the amount of external funding has also increased, although to a lesser extent. This has resulted in significant improvements in public health infrastructure and service delivery. This positive trend is also reflected in the increase of total health expenditure (THE) in the country and in the private health sector.

Out-of-pocket health spending (OOP) is still a major financing source of the health system despite the increase in public funding. Previous statistics show that OOP reached as high as 60% of THE in 2008 or US$25 per capita per year when health-related transport costs were included. In Cambodia, public and private health care providers charge user fees in exchange for health services at quite different rates. The public sector is strongly subsidised and in primary-level care the aim of user fees is not cost-recovery but rather the provision of incentives for health workers and the reduction of incentives for grey payments. However, in secondary and tertiary-level care, user fees at public facilities cover a substantial proportion of running costs. Prepayment in private facilities is virtually non-existent and unregulated user fees are the rule. Cambodians also purchase drugs and medical care directly from private pharmacies, drug stores, traditional healers and other non-medical providers.

An overreliance on OOP has been demonstrated, in cross-country analysis conducted by organisations such as the World Health Organisation, to correlate closely with high incidence of financial catastrophe and impoverishment. In Cambodia, a closer look has not yet been taken at the evidence available on financial catastrophe and its relation to health expenditure. Nevertheless, the Royal Government of Cambodia (RGC) is very aware of the challenges represented by direct and indirect health expenditure for the population and has supported and initiated a number of social health protection (SHP) initiatives directing different sections of the population towards the target of universal coverage. The largest and most studied instrument is Health Equity Funds (HEF) which covered over 1 million poor beneficiaries in 2008. Other initiatives include, on a smaller scale, Community Based Health Insurance (CBHI). The RGC has also initiated the establishment of social health insurance funds for the formal sector, planned for launch in 2011-2012.

International evidence from countries such as China suggests that the introduction of SHP mechanisms does not always result in a reduction of average OOP for households and THE. However, these mechanisms have been shown to protect households from catastrophic expenditure. It is therefore important to assess catastrophic health expenditure incidence as a separate issue quite independently of OOP. Data from studies such as the Cambodian Socio-Economic Surveys (CSES) provide an opportunity for such analysis.

This study aims to support the RGC in its efforts to ensure equitable access to quality health care for all the people of Cambodia by 2015 as outlined in the draft Master Plan for Social Health Protection and the 2008 Strategic Framework for Health Financing (SFHF). It provides detailed information on access to health services and the health care-seeking behaviour of various population groups. Importantly it sheds new light on the level and distribution of OOP and its impact on catastrophic health expenditure and subsequent impoverishment in Cambodia, using methods developed by the World Health Organisation. The study presents the results of an analysis of health care utilisation and spending patterns and the determinants of catastrophic health spending, using data from the 2004 and 2007 CSES. Data from the Cambodian Demographic and Health Survey (CDHS) 2005 were also processed in order to generate more information on direct medical and related transport costs. The results for CDHS and CSES are presented separately given limited comparability across survey type.

## Results - CDHS 2005

The CDHS 2005 inquired on illness in the previous month (30 days) and corresponding health care-seeking behaviour coupled with expenditure on health treatment and associated transportation costs. It contained no questions on income or consumption, making it impossible to estimate impoverishment or household catastrophic impact using this study.

The ***incidence of illness*** among the population was found to be 1.82 episodes per capita per year[1]. This incidence varies by population group with higher incidence among women, the elderly, children aged under 5 and the poorest quintile. Around 44% of the individuals reported ill considered their condition as being slightly ill while a similar proportion reported themselves as moderately ill. Only 12% considered their condition as seriously ill.

One proxy indicator of potential barriers to health care access is the proportion of ill individuals who do not use health care services. Given equal access, the proportion should be relatively similar across population groups. However, in 2005, this proportion was much higher for the poorest quintile as well as for the oldest groups among the population, reflecting potentially higher barriers to access (see Figure 1). After controlling for other factors such as severity of illness, this study confirms the significant effects of age, income, and household head status on decisions affecting health care use. Individuals reporting serious illness and children under 5 years old or living in higher-quintile households were more likely to seek health care when ill. Increased health care-seeking decisions when ill were also a factor in households where heads had received higher education or were male.

Individuals living outside Phnom Penh were significantly more likely to make more than one visit per illness episode. Approximately half of all health care visits in the country in 2005 were to private health facilities. Another quarter were to public facilities while the remaining one quarter were to non-medical providers such as pharmacies, drug stores, traditional healers and monks.

A detailed analysis of the utilisation pattern for the first health care-seeking visit was conducted to assess preference/***choice of provider*** among different population groups. Even though there were no statistically significant differences in provider choice between the sexes, there were significant variations by age group and economic status (Figure 2). When controlling for other factors, children aged under 5 were shown to be more likely to be taken to health centres than to pharmacies, drug stores or treated at home when sick. The highest quintile was less likely to choose health centres and much more likely to seek treatment at private and public hospitals. Individuals in Phnom Penh were also more likely to choose hospital and private clinic care than other providers.

The CDHS results indicate that an ***average*** of 81,048 Riels[2] was spent out-of-pocket for health per capita per year in 2005, with large variation across individuals. The average amount of spending for individuals who sought care in the past month was 48,538 Riels with average monthly bills for those who reported positive spending rising to 51,067 Riels. The higher amount is because 5.7% of those seeking care paid nothing on their first visit. Large variations in OOP per capita by sub-group are also found as shown in Figure 3. Individuals in the higher economic quintiles spent more as well as those living in Phnom Penh and the oldest age group for people above 60 (60+).

The average OOP per visit by provider category is shown in Figure 4. Spending at private hospitals was much higher than for any other provider category. This was followed by public hospitals, private clinics, and home care/visits. Average OOP per visit at health centres was the lowest category followed by pharmacies and drug stores. Average health spending at private facilities was over 50% higher than at public facilities.

The average household spent 405,996 Riels[3] in 2005 with important variations. The majority of this expenditure was at private facilities. Figure 5 illustrates the composition of average OOP per household by provider categories.

The average household spent 40,104 Riels[4] per year on health related ***transportation*** in 2005, which represents approximately 10% of average OOP. This is a substantial amount in a national figure. When analysed by economic quintile, the average transport costs for the first visit were

1 Incidence over one month, 0.1519 per capita, multiplied by 12

2 Average out-of-pocket expenditure over one month, 6,754 Riels per capita, multiplied by 12

3 Average out-of-pocket expenditure over one month, 33,833 Riels per household, multiplied by 12

4 Average health related transport expenditure over one month, 3,342 Riels per household, multiplied by 12

Figure 1: Annual incidence of illness, first visit and percentage of ill individuals that did not seek care by population sub-group [in %; in number of episodes per year] - Source: CDHS 2005

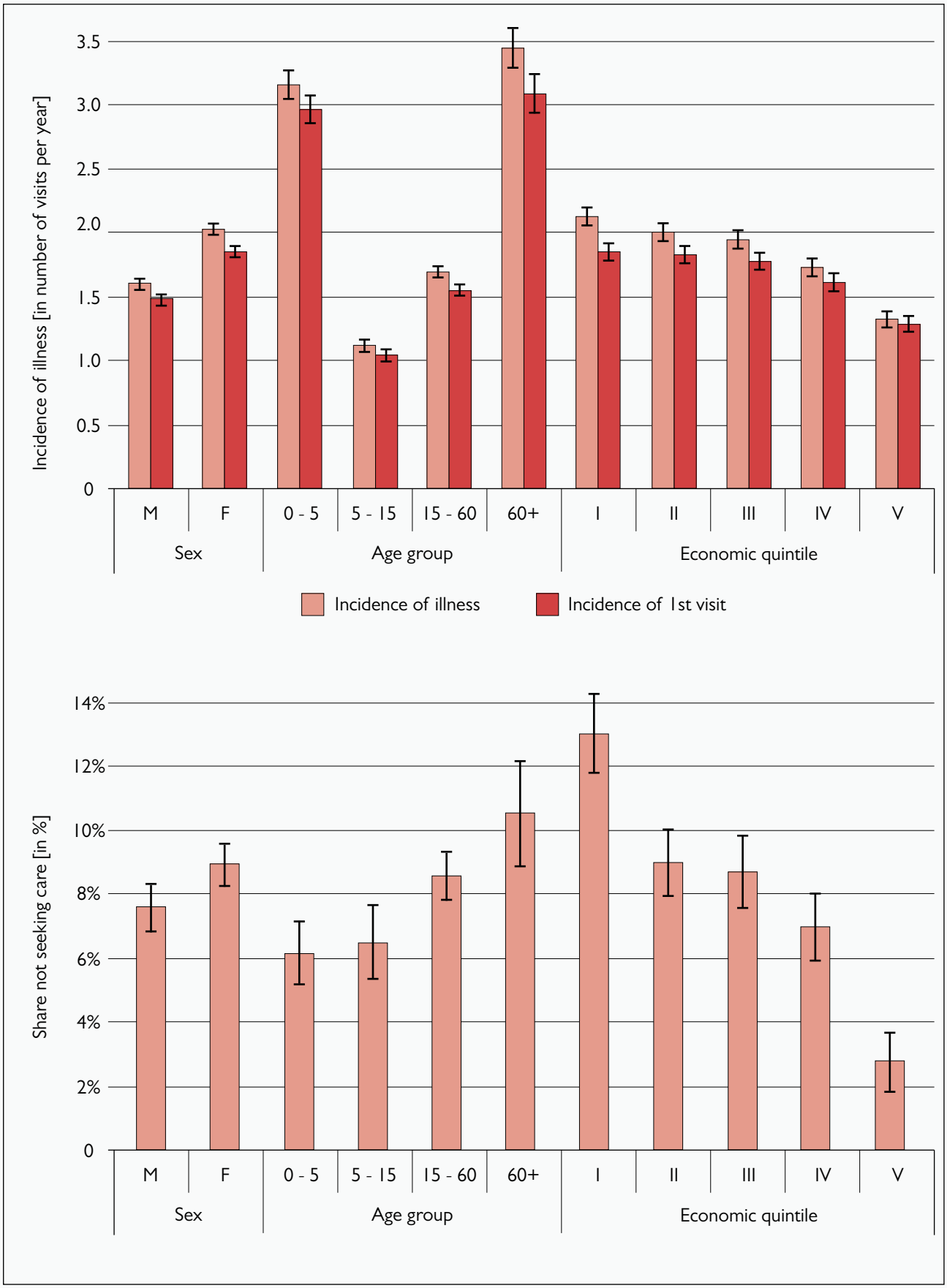


Figure 2: Choice of providers by economic quintile [in %] - Source: CDHS 2005

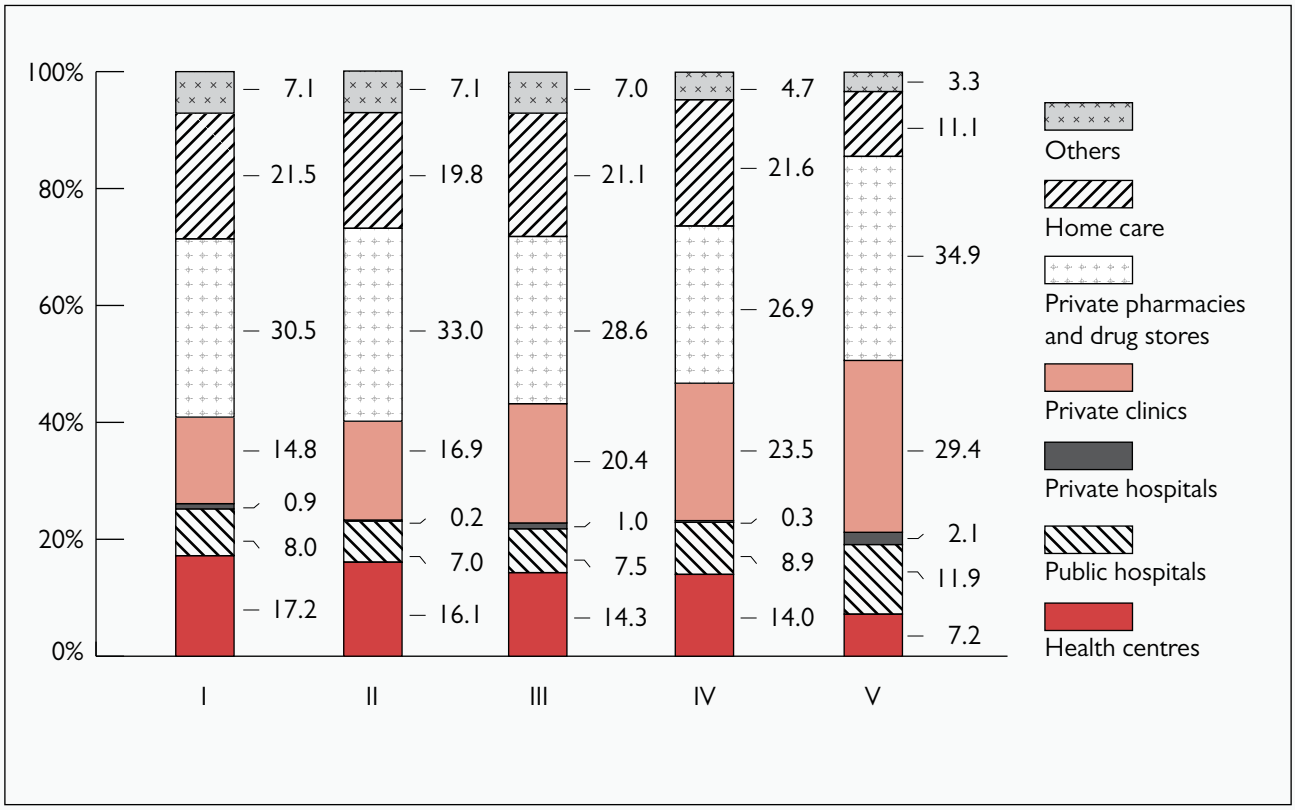



Figure 3: Average annual out-of-pocket expenditure per capita by sub-group [in Riels] - Source CDHS 2005

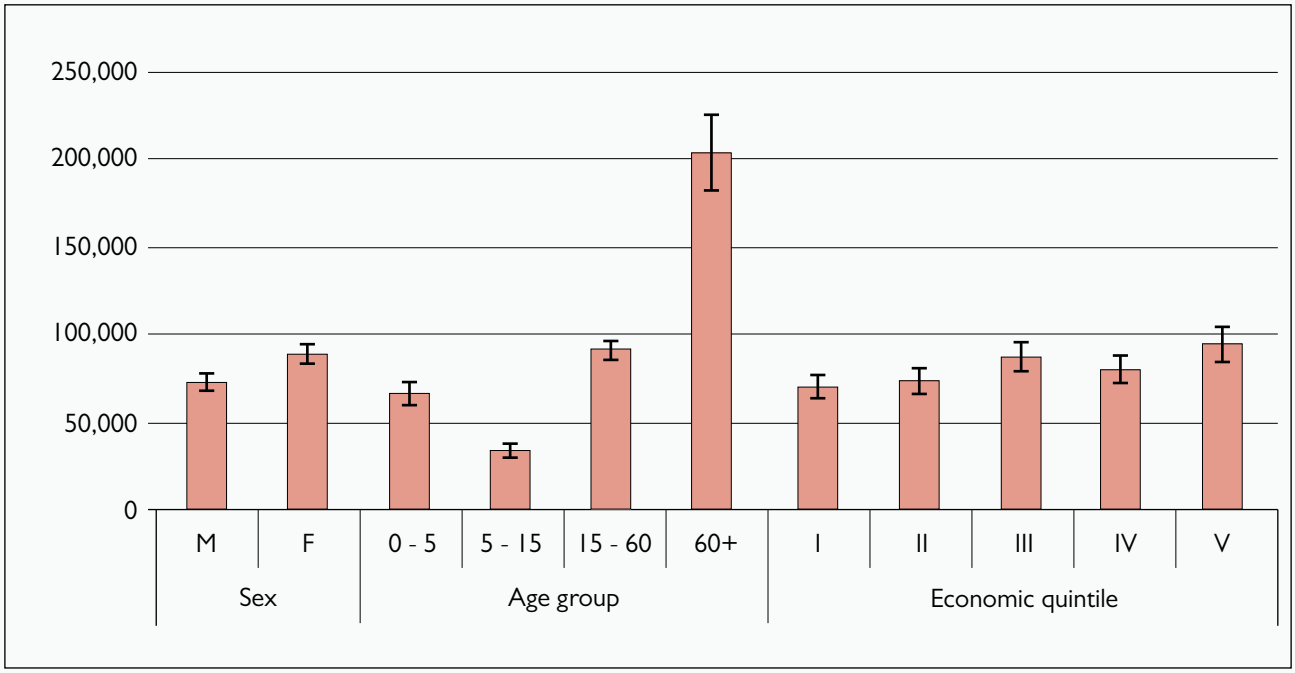
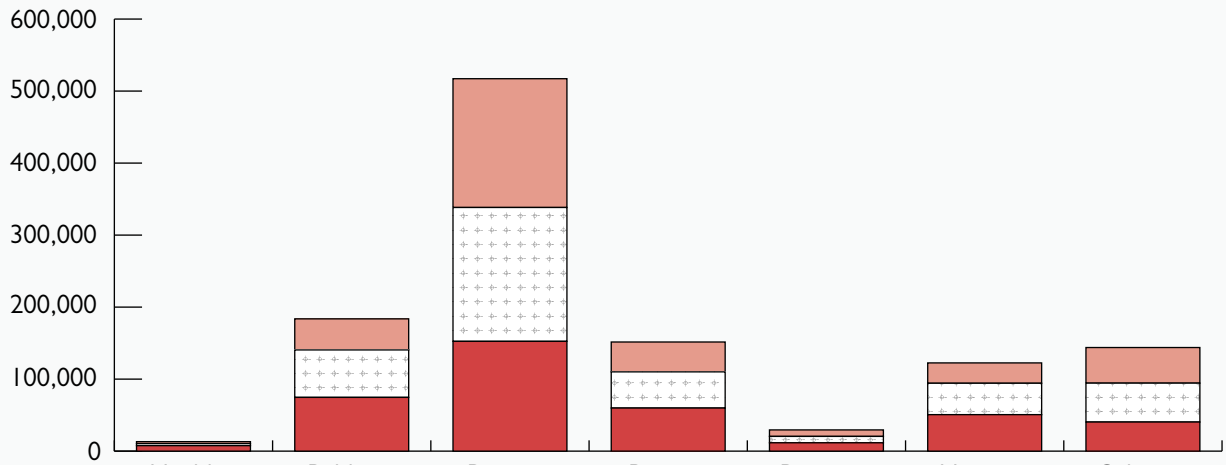
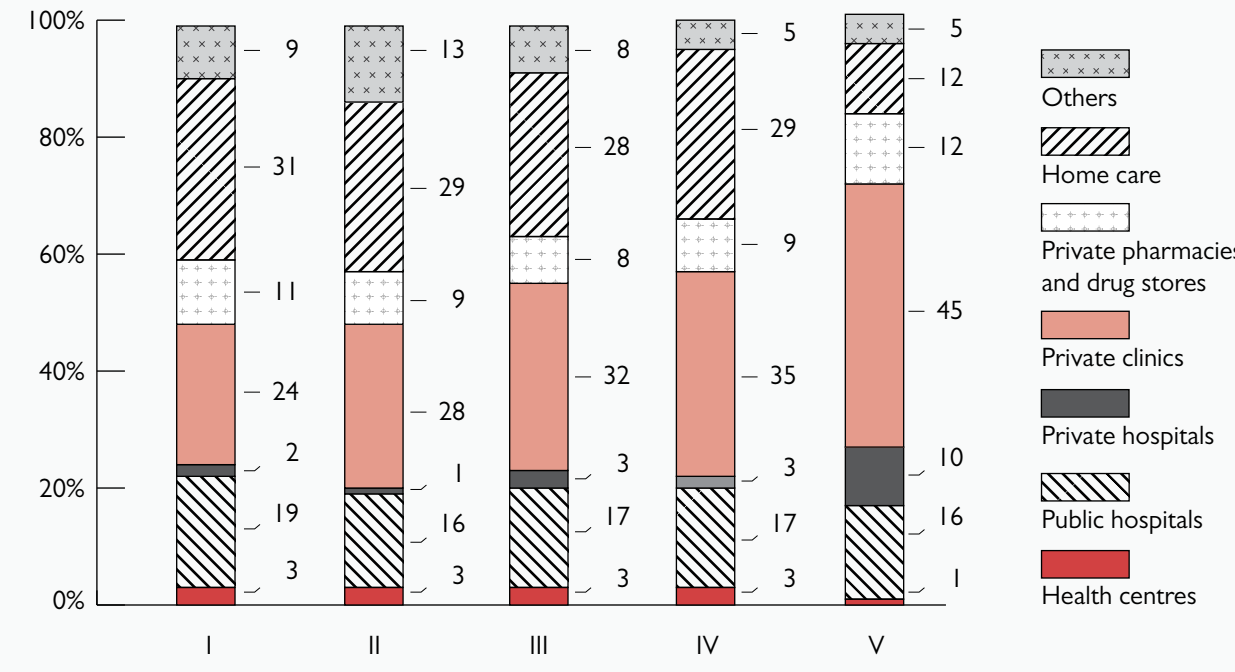


Figure 4: Average out-of-pocket expenditure per visit by provider in one month [in Riels] - Source: CDHS 2005




| | Health centres | Public hospitals | Private hospitals | Private clinics | Private pharmacies and drug stores | Home care | Others |
|---|---|---|---|---|---|---|---|
| 3rd visit | 2,710 | 43,161 | 178,824 | 41,477 | 9,012 | 28,251 | 49,452 |
| 2nd visit | 2,830 | 65,879 | 185,885 | 50,226 | 8,850 | 43,598 | 54,007 |
| 1st visit | 7,628 | 74,648 | 152,471 | 59,849 | 11,615 | 50,671 | 40,418 |

Figure 5: Share of average out-of-pocket expenditure per household by provider category and economic quintile [in %] - Source: CDHS 2005



at similar level across economic quintiles, reflecting heavier burdens (higher share of income) for the poorer groups. There were also significant differences in travel costs to reach different types of health care provider, possibly arising from structural/organisational issues within the health system such as the geographical distribution of health care facilities.

## Results - CSES 2004 and 2007

On average, the incidence of ***illness*** among the population in CSES 2004 and 2007 was 2.41 and 1.99 episodes per year[5] respectively. The average incidence of reported illness varied according to sex and age. Females, young children (aged under five), and the elderly (aged 60 and over) had higher incidences of illness episodes. The difference between economic quintiles was less prominent but the incidence of illness among the lowest quintile was significantly lower than other economic quintiles, especially for 2007. Figure 6 illustrates the reported incidence of illness and the percentage of ill individuals not seeking care in 2004 and 2007.

Table 1 shows the statistics for those seeking health care in 2004 and 2007. About ninety percents of those reported ill in 2004 sought some form of care, ranging from health facility visits to purchase of drugs and visit to monks or traditional healers. The number increased in 2007 to 91.5 percent. In both years, only a little over half of all those reported ill visited medical health care providers. Most of increased care sought in 2007 therefore occurred outside medical care facilities. The annual number of outpatient visits was 0.69 and 0.61 per capita in 2004 and 2007 respectively. The annual incidence of hospitalisation was 78 and 74 per 1000/population in 2004 and 2007 respectively. Over 5% of individuals who sought medical care were hospitalised in 2004 and 2007. The average numbers of inpatient days per admission were 6.07 and 5.67 for 2004 and 2007 respectively. The differences in inpatient incidence and patient lengths between 2004 and 2007 were however not statistically significant. Comparing male and female health care-seeking behaviour, men sought care and were hospitalised less frequently than women. Similar to CDHS results, children and elderly had higher incidences of health care seeking.

5 Average incidence of illness over the 4 weeks, 0.185 and 0.153 episodes per person respectively, multiplied by 365/28

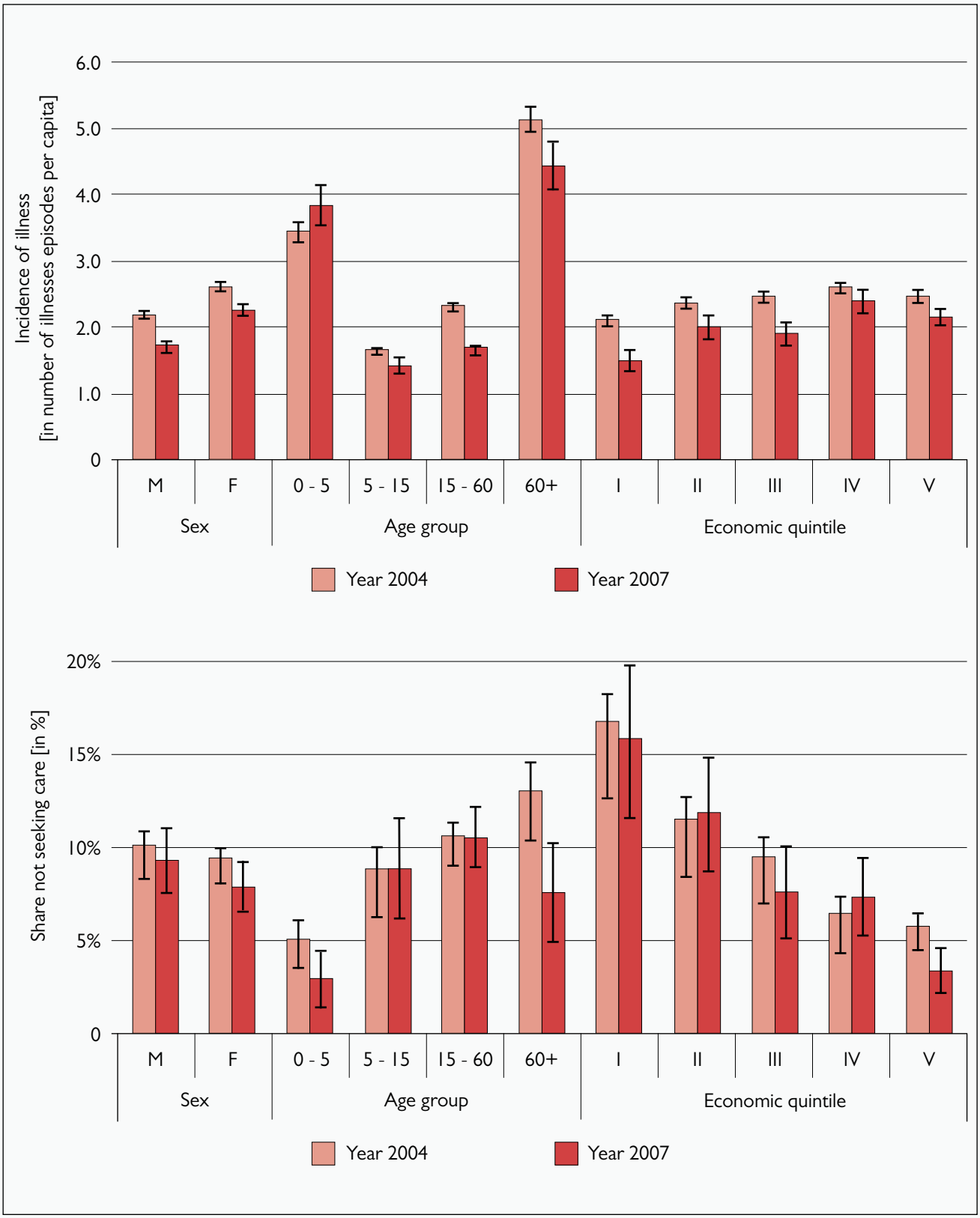
The proportion of ill people seeking medical care and outpatient visits increased in almost all population subgroups. There were also improvements in hospitalisation services over time as the incidence of hospitalisation and the average inpatient days increased in 2007 in the 3 lowest quintiles. Medical care consumption became more equitable with a higher increase in outpatient visits and inpatient admission rates among poorest households than among other higher groups. Nevertheless, the highest quintile still used medical care (both outpatient and inpatient services) more often than other lower economic status groups. Over the same period, the incidence of hospitalisation among young children and the elderly who got ill also increased.

Analysis of the two surveys reveals that the ***choice of health care providers*** varied over time. The share of health care visits at public providers was roughly the same at 16.7% and 16.1% in 2004 and 2007 respectively. However, the proportion of use of private pharmacies and drug stores increased from 31.6% to 44.3% over the same period. The proportion of people using private clinics reduced from 26.1% to 20.3% (see Figure 7). Reliance on health care providers varied across population subgroups and seems to have changed between 2004 and 2007. The two lowest quintiles chose public providers more frequently in 2007, a change mainly driven by health centre use (Figure 8).

In 2004, the choice of providers was quite similar among the three lowest economic quintiles. The two highest quintiles used hospitals and private clinics proportionally more than other provider types (see Figure 9). The highest quintile also used proportionally more private pharmacies and drug stores. The pattern across quintiles in 2007 was more difficult to discern as the median quintile used proportionally more pharmacies and drug stores than the other quintile groups. Nevertheless, the two highest quintiles still used more hospitals and private clinics than the poorer quintiles. The biggest differences across economic quintiles were observed in the use of private hospitals (see Figure 10).

On average, annual OOP per capita was 59,673 Riels and 55,663 Riels in 2004 and 2007 respectively (see Table 2). The average OOP among those who sought care in the past month however increased from 29,796 Riels to 32,093 Riels over the same period. The apparent reduction in annual OOP per capita, although not statistically significant, is due mainly to in 2007 there was lower proportion of people getting ill and seek care and there were greater number of people seeking care who paid nothing. This suggests that user fee exemptions increased over the two time periods.

Figure 6: Average annual* incidence of illness and percentage of ill individuals not seeking care by population sub-group [in %; in number of illnesses episodes] - Source: CSES 2004 and 2007




*Calculated from 4 weeks figures multiplied by 365/28

Figure 7: Percentage of health care provider choice by health care provider type [in %] – Source: CSES 2004 and 2007

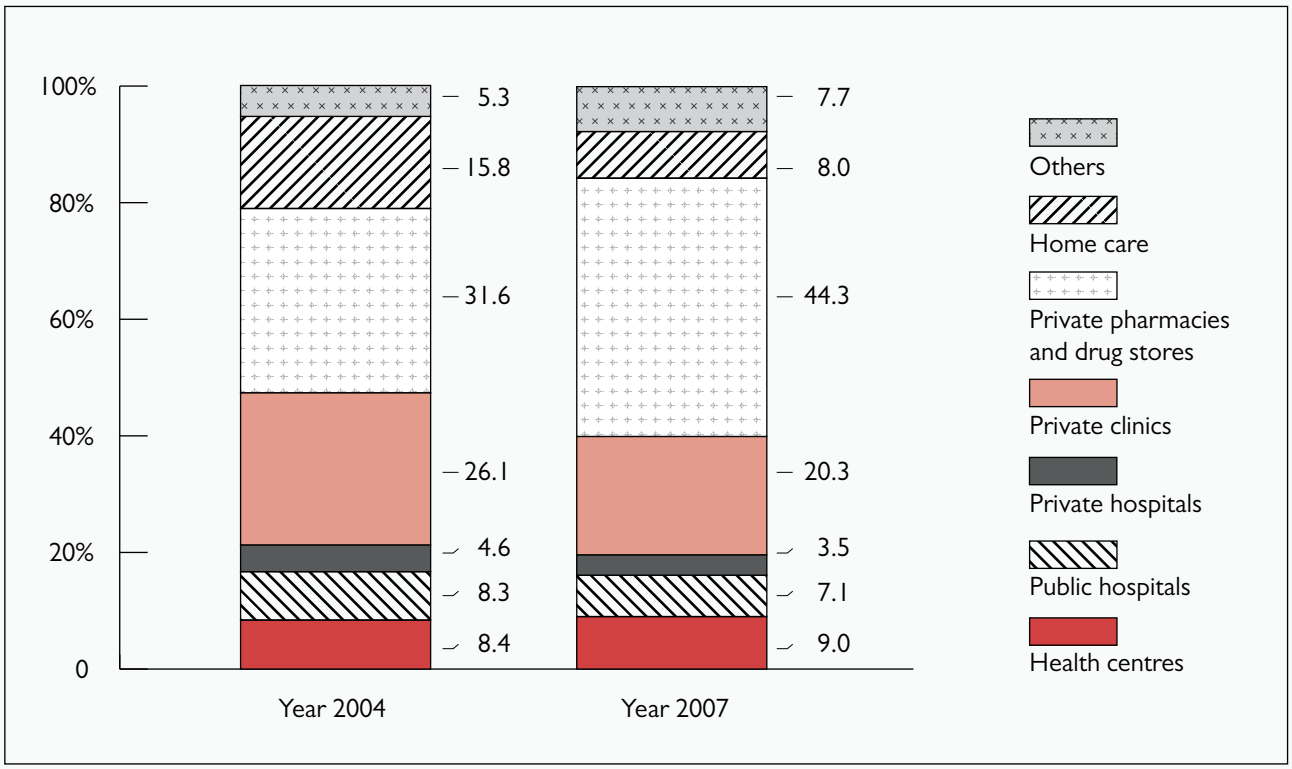



Figure 8: Percentage of health care sought by provider type and economic quintile [in %] – Source: CSES 2004 and 2007

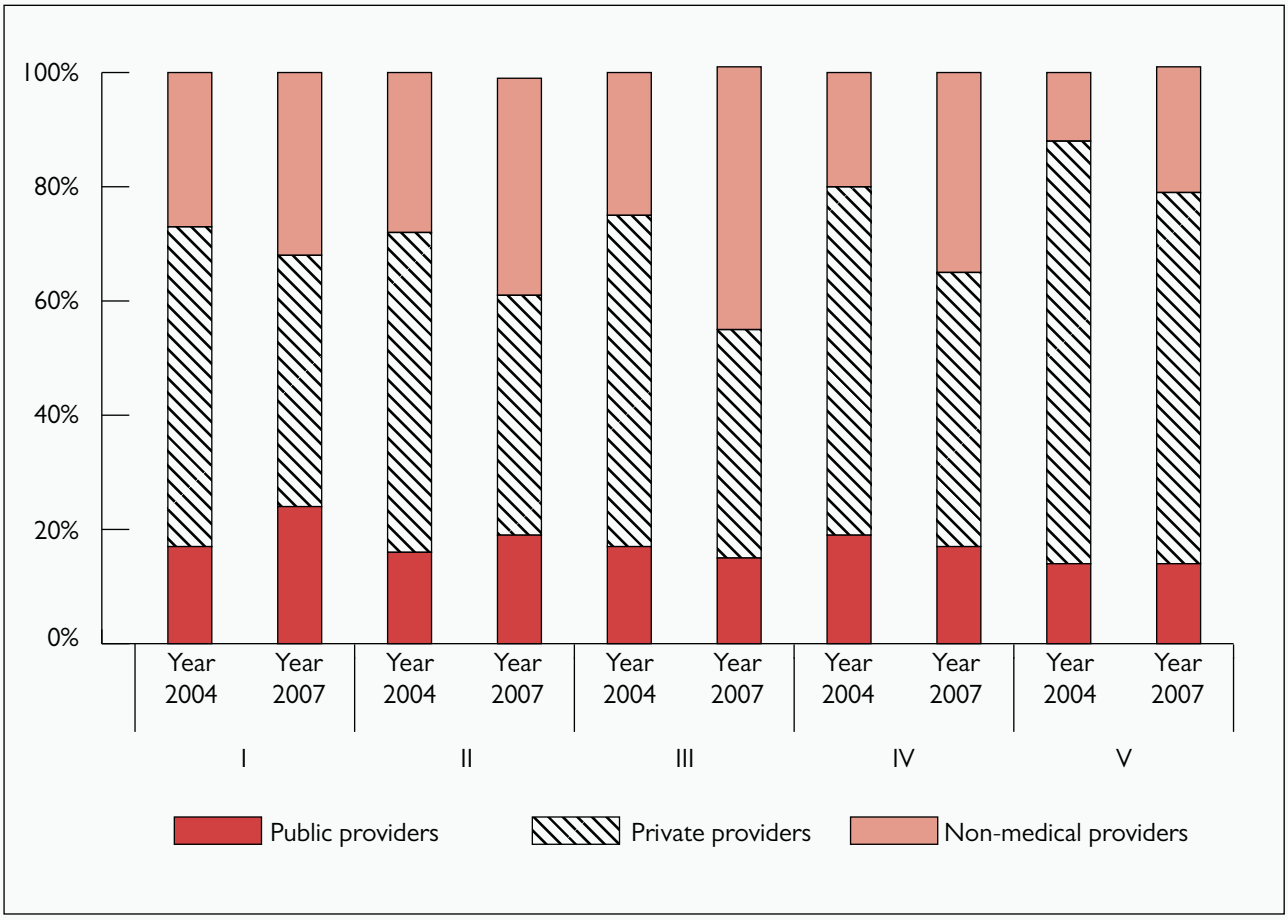


Figure 9: Percentage of health care sought at health centres and public hospitals by sub-group [in %] – Source: CSES 2004 and 2007

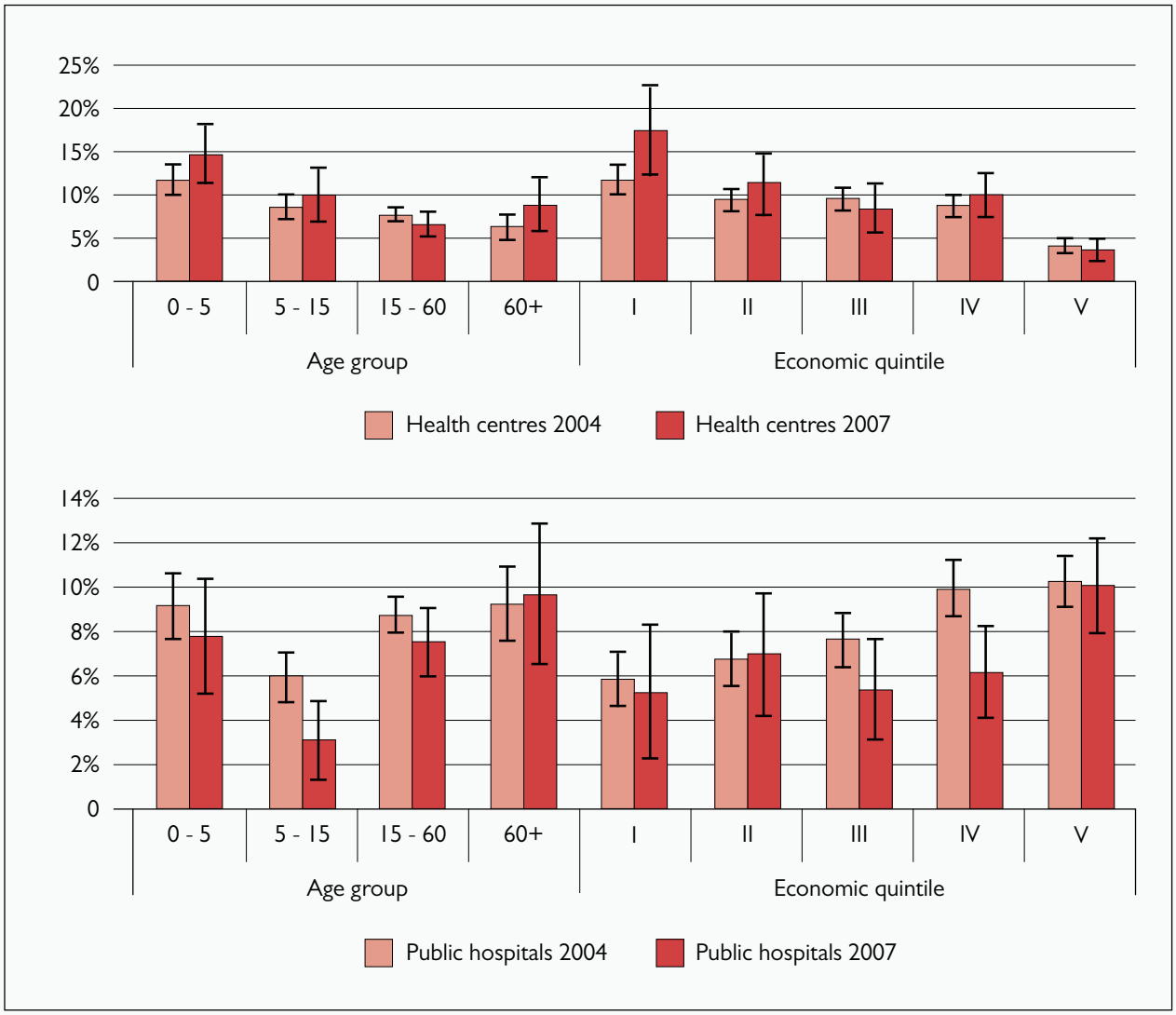



Figure 10: Percentage of health care sought at private hospitals by sub-group [in %] – Source: CSES 2004 and 2007

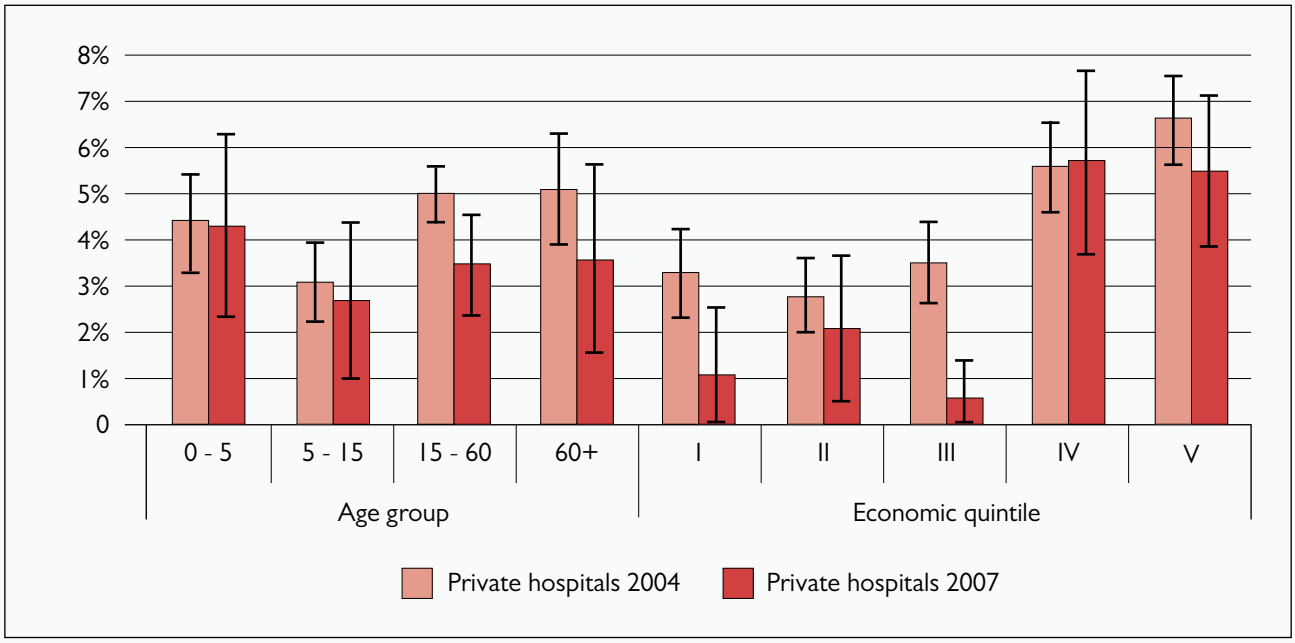


Figure 11: Average out-of-pocket expenditure per capita in the previous month by sub-group [in Riels] - Source: CSES 2004 and 2007

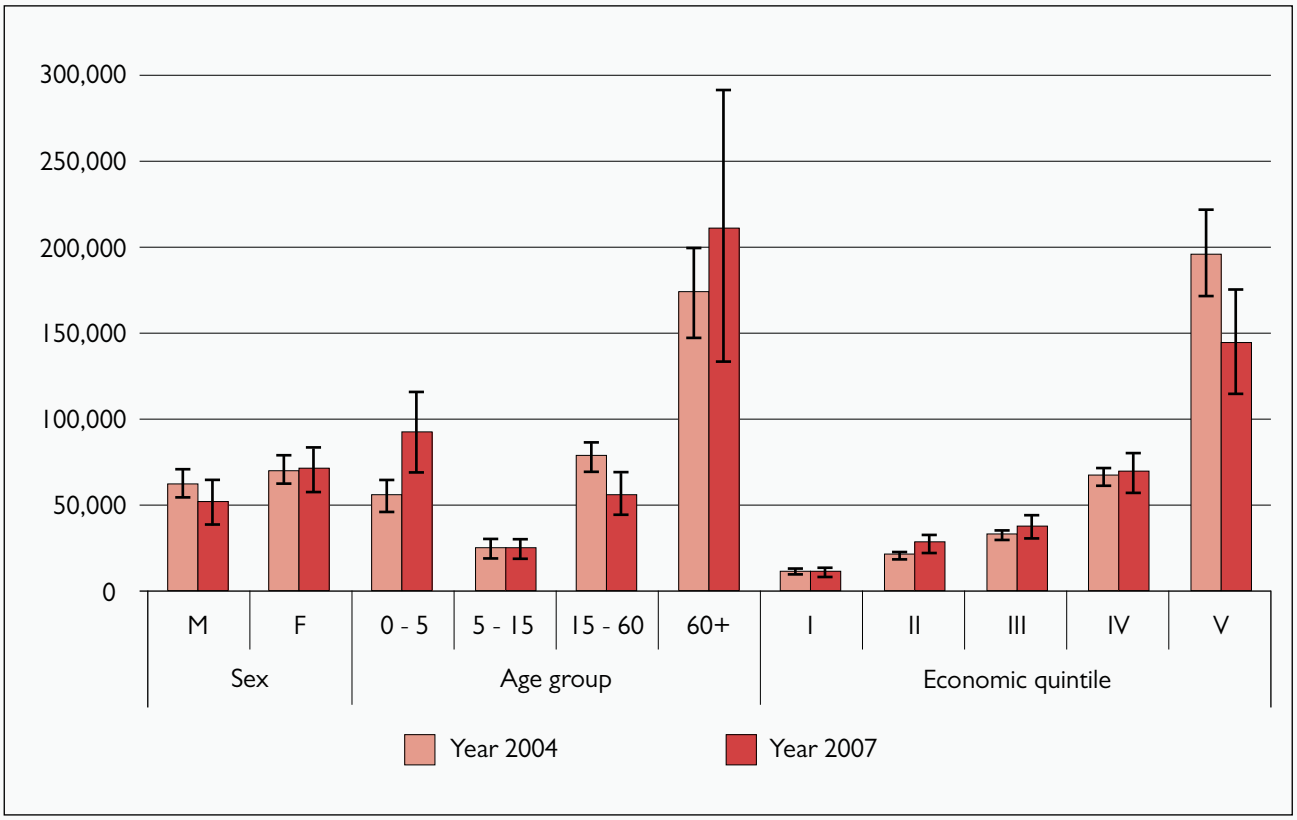



Figure 12: Average out-of-pocket expenditure per capita in the past month among those seeking care by provider type [in Riels] - Source: CSES 2004 and 2007

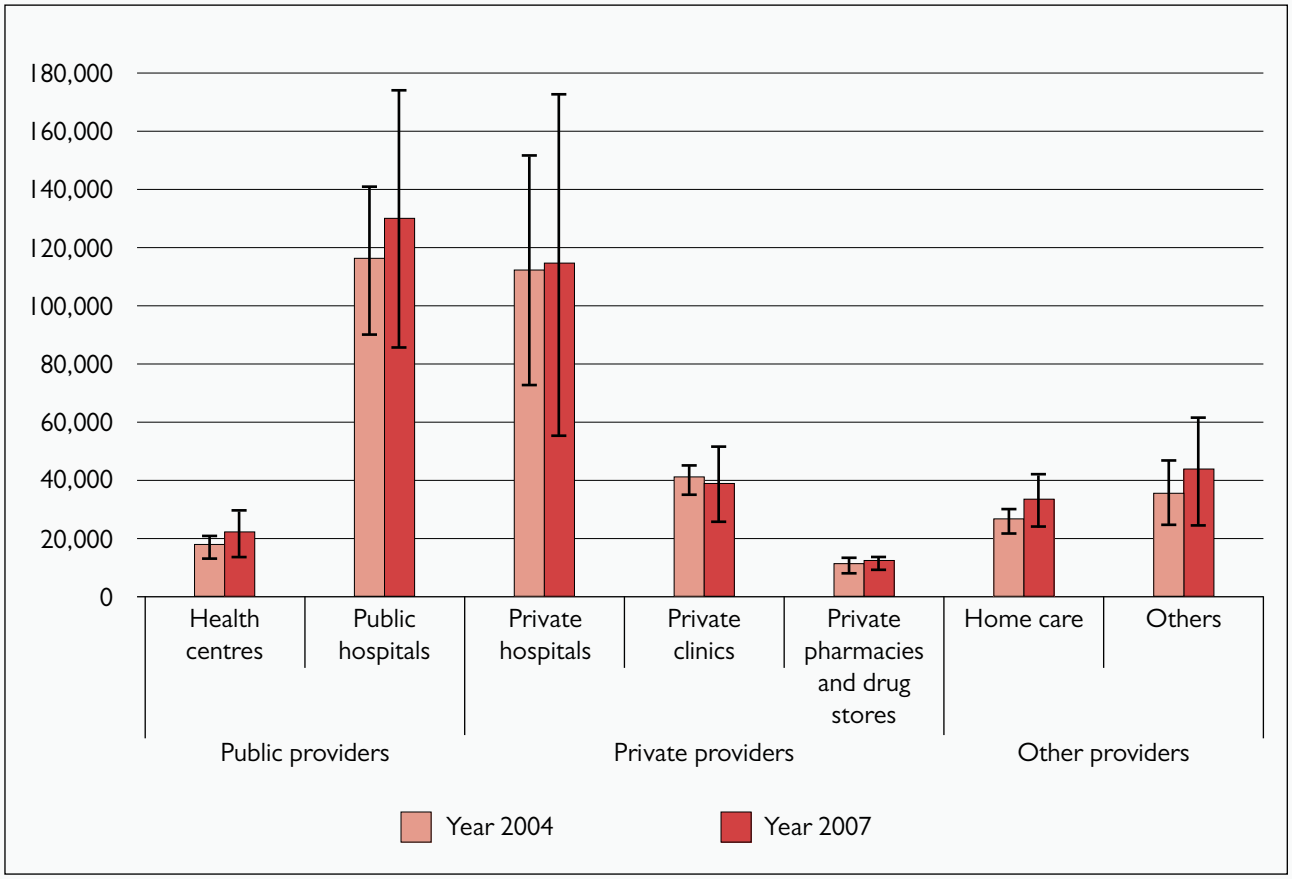


Table 1: Average percentage of health care-seeking in the last 4 weeks - Source: CSES 2004 and 2007

| | 2004 | 2007 |
|---|---|---|
| Share of all reported ill seeking care/treatment | 90.3% | 91.5% |
| Share of all reported ill using medical providers | 52.2% | 55.2% |
| Share of all reported ill seeking outpatient care | 28.8% | 30.4% |
| Share of hospitalisation among all who reported seeking medical care/treatment | 5.3% | 5.8% |
| Average number of outpatient visits per 1000 capita | 691 | 613 |
| Average number of inpatient visits per 1000 population | 78 | 74 |
| Average number of inpatient days per admission | 6.07 | 5.67 |

*Calculated from 4 weeks figures multiplied by 365/28

Table 2: Average annual* and monthly out-of-pocket expenditure per capita by year [in Riel] - Source: CSES 2004 and 2007

| | 2004 | 2007 |
|---|---|---|
| Whole population (annually) | 59,673 | 55,663 |
| Whole population (monthly) | 4,970 | 4,636 |
| among those seeking care | 29,796 | 32,093 |
| among those with positive oop | 30,500 | 33,033 |
| among those with outpatient visit only | 22,336 | 22,369 |
| among those with hospitalisation | 230,758 | 266,875 |

*Calculated from monthly figure by multiplying with 365/30.4

The average amount of OOP per capita also varies across population groups. Women paid more than men and the elderly had a higher average OOP per capita than children or other age groups (Figure 11). When comparing economic quintiles, the highest quintile spent more than others. Trends across sub-groups are thus similar in the CSES and CDHS data. The ratio of average OOP per capita from the highest to the lowest quintile was around 18:1 in 2004. The difference still existed in 2007 but the ratio decreased to 13:1.

Among all types of health providers, average OOP for individuals who sought care in the previous 4 weeks was highest in hospitals. It was 130,906 Riels at public hospitals and 115,223 Riels at private hospitals in 2007 (see Figure 12). An increase in average expenditure for all categories was observed between 2004 and 2007, except for private clinics. Differences for this last category were however not statistically significant (from 41,026 Riels in 2004 to 39,026 Riels in 2007).

The average ***OOP per household*** in 2004 was 308,221 Riels[6] with large variations. The corresponding average for 2007 was 256,280 Riels[7]. Annual average OOP per household by economic group are presented in Figure 13. OOP per household was much higher in the higher quintiles with the ratio of average OOP per household from highest to lowest quintile reaching almost 20:1 in 2004, decreasing to 14:1 in 2007. This difference was less pronounced when considering only households that spent on health (14:1 in 2004 and 10:1 in 2007).

The share of average household OOP spent at various type of heath services is shown in Figure 14. The pattern is similar for 2004 and 2007 with a low share of outpatient visits and very few inpatient visits in the poorest quintile. The share of household OOP spent on inpatient care further increased in the higher quintiles.

6 Average out-of-pocket expenditure over the 4 weeks, 25,671 Riels, multiplied by 365/30.4

7 Average out-of-pocket expenditure over the 4 weeks, 21,345 Riels, multiplied by 365/30.4

Figure 13: Average annual* out-of-pocket expenditure per household by economic quintile [in Riels] - Source: CSES 2004 and 2007

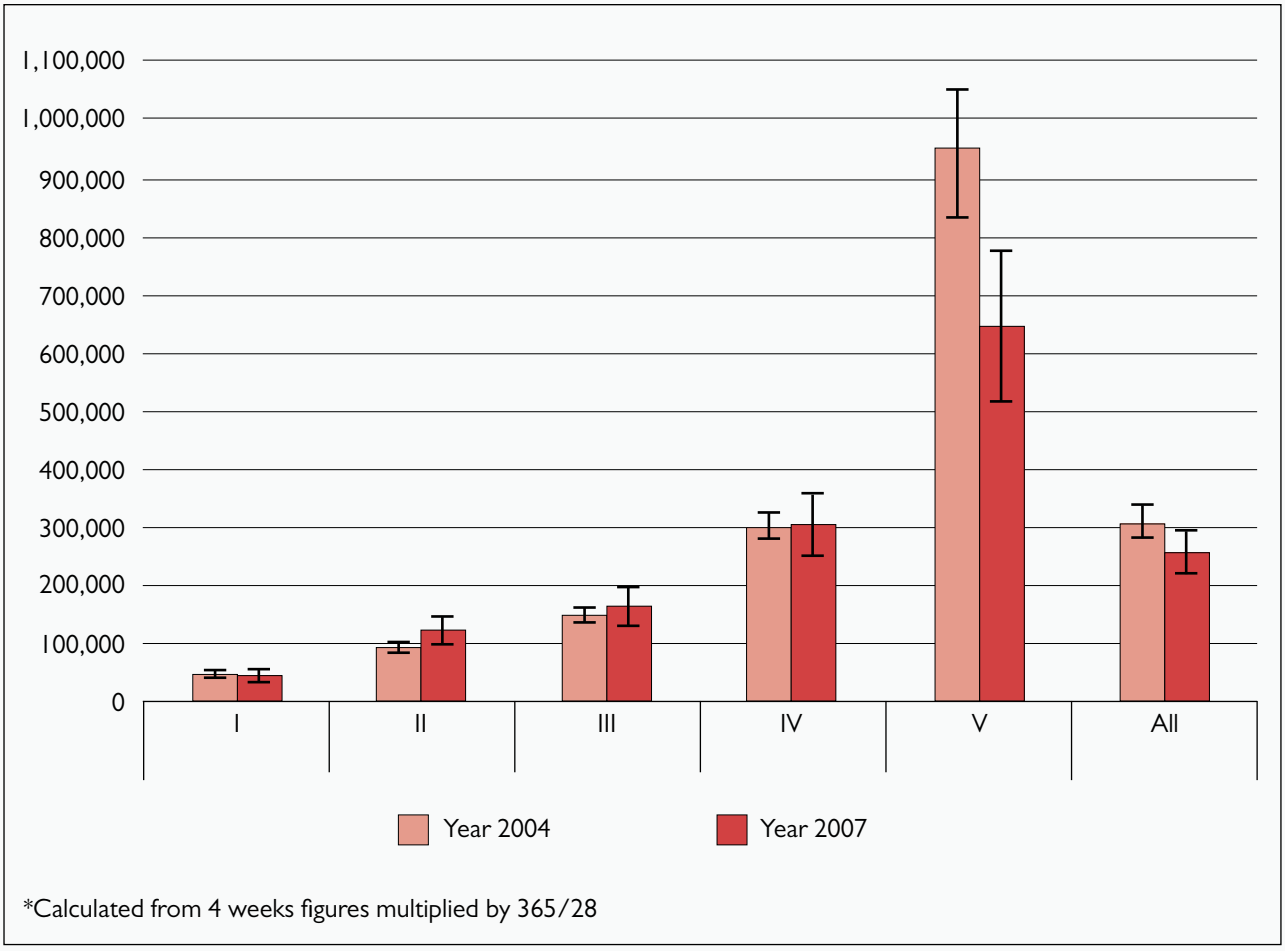



Figure 14: Percentage of out-of-pocket expenditure of households spent on outpatient (OPD), inpatient (IPD), and other visits [in %] - Source: CSES 2004 and 2007

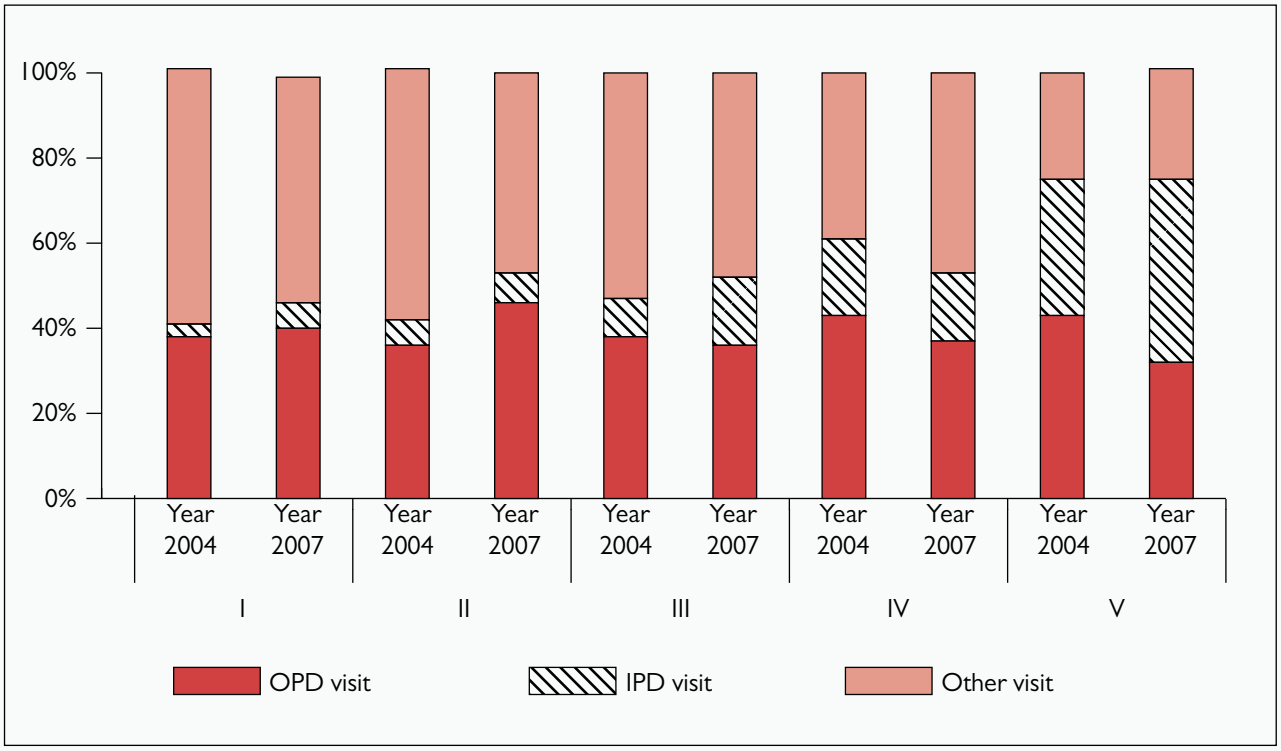
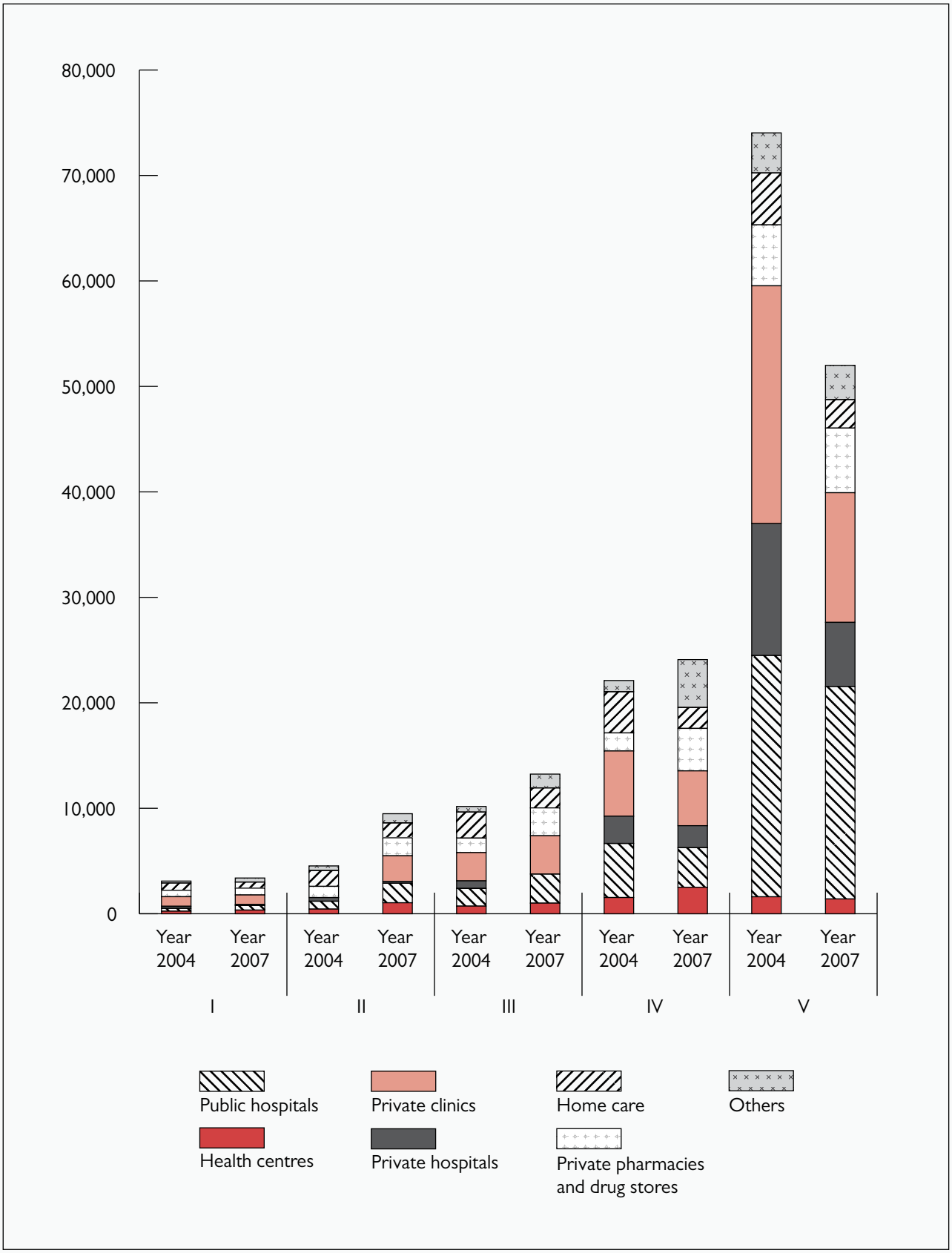


Figure 15: Cumulative monthly household out-of-pocket expenditure by provider type and economic quintile [in Riel] - Source: CSES 2004 and 2007



The ***cumulative monthly OOP*** (total reported expenditure for health) in 2004 and 2007 is illustrated in Figure 15 with classification by quintile and by provider type. The amount of health spending at private facilities accounted for around half of all out-of-pocket spending in both years. The share of spending at public sector facilities increased in 2007 to 35% from 30% in 2004 while the share of spending at non-medical providers almost doubled from 8% to 15%. Spending at public hospitals and private clinics together accounted for over 50% of cumulative household health spending. The share of OOP from the highest quintile also decreased from 62% in 2004 to 50% in 2007.

***Catastrophic health expenditure***, defined as households spending over 40% of their capacity-to-pay on OOP, significantly reduced across all economic quintiles between 2004 and 2007. Incidence of catastrophic expenditure fell significantly from 6.2% to 4.3% over this period (see Figure 17). In addition, the incidence of ***impoverishment through health*** spending (households becoming poor as a result of health expenditure) also decreased from 3% to 2.5%. The incidence of debt from illness also decreased from 5.3% to 4%.

Despite identifying differences in the magnitude of the effect, the data from the two surveys show relatively similar results in terms of the determinants of households' catastrophic spending and of debts from illness. Households with a hospitalised member experienced a significantly higher risk of debt and catastrophic health spending. After controlling for disease patterns and hospitalisation, the analyses found that households living in rural areas had a higher chance of catastrophic payments and debts from illness. Households with more members were less likely to experience catastrophic health expenditure. Higher-quintile households had less chance of incurring medical debts. The 2004 data also suggest that households in the 3rd, 4th, and 5th quintiles and households with children aged under 5 were more likely to experience catastrophic health expenditure. Having a male or educated (at least to secondary level) head of household had a protective effect on both catastrophic health spending and debt.

## Conclusion

The annual incidence of reported ***illness*** in Cambodia was found to be around 1.85 to 2.41 in the three surveys, with lower incidence in 2007 compared to 2004. Over the same period, the incidence of illness decreased in almost all subgroups (except for children under 5). In both years, the elderly and children aged under 5 reported more illnesses compared to other age groups. Among the ill, individuals in higher economic groups sought care more and there were differences in the ratio of care-seeking among those reported ill by age group and geographical location.

Overall ***health care access*** improved from 2004, as shown in the increasing share of ill individuals who sought care in 2007 with greater increase among lower quintiles. The lowest economic quintile experienced the biggest increase with regard to the percentage of ill people seeking medical care, the incidence of outpatient visits and the ratio of hospitalisation among the ill. Nevertheless, the gaps between the lower and higher quintiles remained, especially for inpatient care with the hospitalisation rate of the lowest quintile at less than half that of the highest quintile.

Pharmacies, drug stores and private clinics were the most common places sought for ***health care services***. After controlling for type/level of illness, many significant factors affected the choice of providers, including geographical location, economic quintile, and age group. People in rural areas demonstrated significantly higher use of health centres and home care and lower use of hospitals. People in the capital used significantly more private hospitals and private clinics. The higher quintiles also used more pharmacies, drug stores and hospital care. From the CSES surveys, children under 5 were significantly less likely to receive care at home compared to other age groups. And in 2004, female individuals used health centres more than males.

Several factors explain the improvement in health care access in Cambodia. Rapid economic growth over the past decade has resulted in increased consumption capacity and reduction in poverty among Cambodian households. The poverty headcount index based on the national poverty line decreased from 35% in 2004 to 30% in 2007. However, evidence also suggests the positive role of social health protection schemes such as HEF and CBHI in the improvements in access and utilisation of health care over the study period.

On average the amount of ***out-of-pocket health expenditure*** per capita and per year was found to be between 59,673 Riels and 55,663 Riels in 2004 and 2007 respectively. The amount was less than the figure derived from CDHS 2005 (81,048 Riel most probably due to the difference in sampling and data collection methods. Nevertheless, there were significant variations in the level of spending between age groups and by economic status. Higher quintiles and older age groups spent more as they also used health services more. The average level of OOP was lower at public sector health facilities compared to private facilities (including non-profit private hospital) and much higher for hospital settings than other provider types. Average OOP per capita for transportation costs was found to represent a significant proportion of expenditure for health in the CDHS. The level varied by health care provider type but accounted overall for about 9% of total health-related costs or 10% of OOP expenditure.

The incidence of ***catastrophic health expenditure*** decreased from 6% in 2004 to 4.3% in 2007 despite the increase in health care use. Increase in household capacity-to-pay over time contributed to a lower catastrophe rate. Additionally, in poor households the introduction of HEF and CBHI schemes is likely to have played a significant role in protecting vulnerable groups. The level of ***indebtedness*** of households through health care expenditure also decreased from 5.3% to 4% over the same period and the incidence of ***impoverishment*** through health spending (households becoming poor as a result of health expenditure) also decreased from 3% to 2.5%.

This study confirms the significant improvement in health care access and financial protection against the cost of care in Cambodia at a time of increasing economic and social development. Despite such improvement, the findings from our analyses also highlight significant variations in health care access and financial protection across population groups. The rate of health care use was lower among the lowest quintile group and households in rural areas were more prone to medical cost indebtedness and catastrophic risk. All of this deserves special attention and policy responses.

The needs of Cambodia's rural populations were already recognised by the RGC and special attention is being given to address the lower health care utilisation for this segment of the population. The ***Cambodia Strategic Framework for Health Financing 2008-2015*** could be instrumental in guiding the development of health care financing systems in the country to respond to such challenges. It aims to remove the financial and other barriers to access to health services for the poor and to protect the poor and non-poor alike from the effects of catastrophic expenditure on health care. The Framework will create the path and outline the steps towards the achievement of ***universal coverage*** in the longer term (beyond 2015).

The ongoing development of social security schemes for formal sector private employees and civil servants will contribute to concrete developments in the formal sector. The challenges will be higher for informal and rural populations where coverage expansion is generally more difficult. Further detailed studies may be necessary to identify feasible strategies to improve the accessibility of the health care service and to successfully expand the coverage of health insurance such as the Health Equity Funds for the poor. Additional resources would be necessary to enable the expansion and harmonisation of Health Equity Funds and Community Based Health Insurance to be explored in order to improve the efficiency and equity of available resources. Other non-financial barriers to utilisation could also be an important factor determining health care access, especially among rural Cambodian populations, and these should be addressed.

Figure 16: Average capacity to pay per month and average out-of-pocket expenditure as a share of capacity-to-pay of households by economic quintile [in Riels; in %] - Source: CSES 2004 and 2007

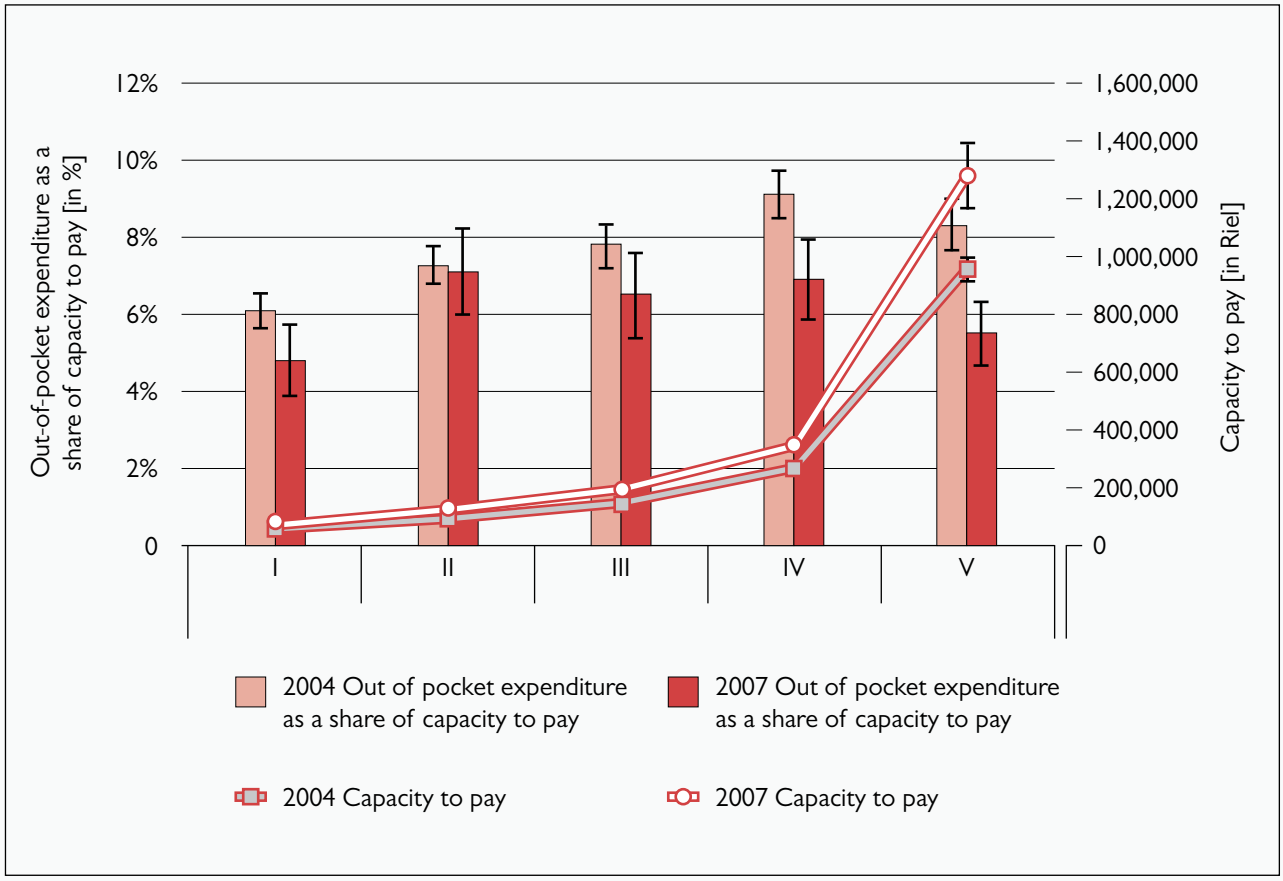



Figure 17: Percentage of economic quintile experiencing catastrophic health expenditure [in %] - Source: CSES 2004 and 2007

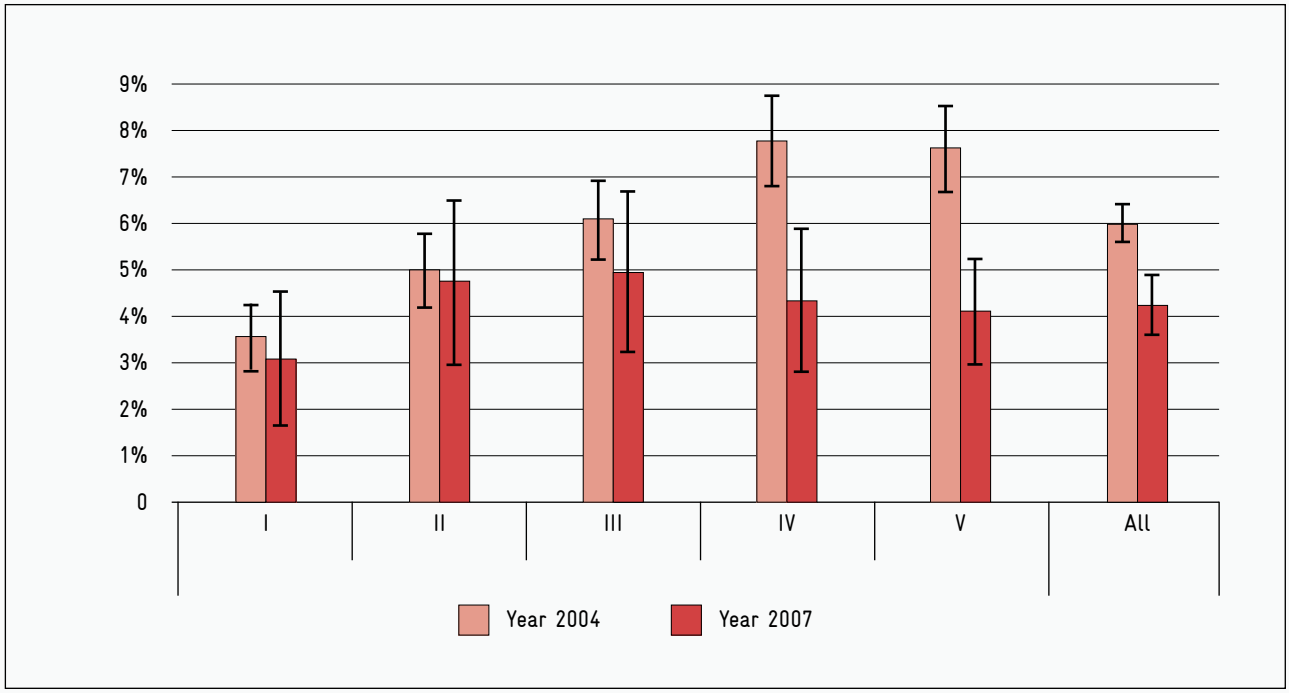


Table 1. Basic database information used in the analysis and source of data by type of surveys

| | CSES 2004 | CSES 2007 | CDHS 2005 |
|---|---|---|---|
| Interview period | October 2003 to December 2004 | January 2007 to December 2007 | 2005 |
| Sample size | | | |
| Household | 15,000* | 3,593 | 14,243 |
| Individuals | 74,719 | 17,439 | 73,010 |
| Recall period | Previous 4 weeks | Previous 4 weeks | Previous month |
| Data availability | | | |
| Illness | q14a06 | q14ac06 | sh68 |
| Type of illness | q14a07 | q14ac07a to a14ac07e | sh68 |
| Health care-seeking | q14a08 | q14ac09 | sh69, sh73, sh77 |
| Type of providers | q14a09 | q14ac10 | sh70, sh74, sh78 |
| Hospitalised | q14a10 | q14ac11 | N/A |
| Days hospitalised | q14a11 | q14ac12 | N/A |
| Health spending | q14a12 | q14ac13 | sh72, sh76, sh80 |
| Health related transport expenses | N/A | N/A | sh71, sh75, sh79 |
| Overall consumption | Yes (see Table 2 below) | Yes (see Table 2 below) | N/A |
| Economic status quintiles | from consumption | from consumption | from wealth index[a] |
| Insurance/equity fund membership | N/A | N/A | N/A |

Note:
N/A = not available
[a] Readily available in the CDHS dataset

# Introduction

Cambodia is a developing country in South-East Asia with a population of over 14 million. The country has experienced major changes over the past few decades in terms of economic, social and human development. With increasing political stability, the rate of economic growth has been high (almost 10% per year over the past decade). It is still on track to achieve most of the Millennium Development Goals (MDGs) in many indicators, with a considerable improvement in life expectancy and infant and under-5 mortality rates[8] in particular.

With rapid economic development, the country has seen a significant rise in government health spending over the past two decades. The amount of funding support from external development partners has also increased. There has been a great deal of positive change in health infrastructure and health service delivery to the population.

Nevertheless, out-of-pocket health spending (OOP) is still a major source of financing within the Cambodian health system, despite the increase in government donor funding (Cambodia Health Financing Report 2008). Statistics from previous years show that OOP potentially reached as high as 60% of total health expenditure in 2008 or US$25 per capita per year when health-related transport costs are also included (CDHS2005). In Cambodia, public and private health care providers charge user fees in exchange for health services, albeit at quite different rates. Private providers rely on user fees as their main income while OOP constitutes a much smaller proportion of the revenues of public providers. Cambodians also purchase drugs and medical care directly from private pharmacies, drug sellers, and other traditional and non-medical healers. An estimate by the Macroeconomics and Health team in 2006 showed that about 30% of total OOP went to public health services and about 70% to private providers.

A high OOP share of overall health spending was shown in the global level analyses to be highly correlated with high incidence of financial catastrophe and impoverishment within households (Xu et al 2007). In Cambodia, there have been a number of health financing initiatives to help improve financial access and move various sections of the population away from OOP payments . These include the Health Equity Funds (HEF) and, with much smaller coverage, Community Health Financing Schemes. The number of HEF schemes increased from 29 in 2007 to 47 in 2008, with over 1 million beneficiaries.

However, recent findings from smaller-scale household surveys suggest an increase in household health spending in some areas of the country despite the Health Equity Funds (CHFR2008). There has been no systematic evaluation of the impact of these initiatives. Moreover, no recent data on OOP and health spending impacts on households are available to provide the necessary evidence for policy making related to health financing and health system reform.

It is therefore important to have an analysis of health spending using newly released national representative data from the Cambodian Socio-Economic Survey (2007). This study aims to provide baseline information on access to health services, the level and distribution of out-of-pocket health payment, the impact of health payment on poverty and the incidence and determinants of catastrophic health expenditure among Cambodian households. It uses 2007 CSES data in comparison to two earlier surveys: the Cambodian Socio-Economic survey (CSES) 2004 and the Demographic and Health Survey (CDHS) 2005.

The study is part of an overall review of the Cambodian health financing system initiated by the Ministry of Health (MoH) of the Royal Government of Cambodia (RGoC). It is expected that the findings from this analysis will inform policy makers and development partners in their support for the RGoC's efforts to ensure equitable access to quality health care for all the people of Cambodia by 2015 as outlined in the draft Master Plan for Social Health Protection and the 2008 Strategic Framework for Health Financing (SFHF) Data.

This study utilises data from two types of surveys: the Cambodian Demographic and Health Survey (CDHS) for 2005 and the Cambodian Socio-Economic surveys (CSES) for 2007 and 2004.

8 UNDP, http://www.un.org.kh/undp/CMDGs/How-does-Cambodia-measure-up-now.html

## The Cambodian Demographic and Health Survey 2005

Similar to other Demographic and Health Surveys, the CDHS contains data related to health, education, rural development, and gender obtained from over 14,000 households with a total population of over 66,000. It uses the same methodology as in over 80 other countries so the quality is generally high, involving an interview schedule and structure that has been extensively field-tested and used.

Data on household members' illnesses, health seeking behaviour and health spending are available in the household schedule of the CHDS interview. This household schedule was completed for every household in the sample and also contains basic socio-demographic information on all household members. The survey asked each member in turn about the incidence of illness in the previous month and their health care-seeking behaviour in relation to such illness (up to 3 health providers/treatment/care options per episode of illness) as well as health spending for each treatment/care-seeking episode. Information on transport costs, unavailable in the socio-economic surveys, is also available in this database for each episode of treatment/care.

One limitation of the CDHS, particularly for the present study, is the lack of data on household consumption. Consequently, no estimation of catastrophic impact and impoverishment from health spending can be made. Nevertheless, an index on the socioeconomic status (wealth index) of each household is provided in the database, derived from information on household assets and amenities. This index can then be used to rank households into quintiles for subgroup analysis of health care-seeking behaviours and health spending patterns.

## The Cambodian Socio-Economic Surveys 2004 and 2007

The CSES 2004 & 2007 are surveys on household income, consumption, and asset ownership. The 2004 CSES has data on 15,000 households interviewed from October 2003 to December 2004 with information covering over 70,000 individuals. The 2007 CSES provides data on household consumption for 3,593 households (of a total 4,488) interviewed during the calendar year 2007. Data on the remaining 895 households interviewed during the period October-December 2006 were not available to the researcher.

Estimates of household consumption can be calculated using two distinct sources according to methods used in the Cambodia Poverty Profile, i.e., the monthly diaries of household consumption and household "recall" questions on household consumption. The only difference is that an imputation of estimated rent value for non-property owning households with no reported rent was not included in our analysis. The consumption data rely on different reference periods for various components so the analysis adjusts for these differences accordingly. Details on data source, reference period, and conversion factor for each consumption component are provided in Table 2 below.

The CSES surveys also contain questions on household members' illness and health care-seeking behaviour in the previous 4 weeks. However, these questions concern only about the health care providers usually consulted by each member who fell ill (not those specific to the reported episode of illness). Nevertheless, there were questions on hospitalisation and the number of days spent in hospital as well as totals spent in the previous 4 weeks (not specific to each provider or care-seeking episode).

One limitation in these two surveys concerns household expenditure on health care consumption. By design, only spending by household members who reported having been ill, injured or had a health problem during the previous 4 weeks is included. Health care expenditure by members with no health problems during the same recall period is not included. Therefore, the total amount of health care spending by each household calculated by these CSES surveys tends to be an underestimate.

Table 2. Components of household consumption expenditure, their reference period and information sources

| | 2004 CSES | | | 2007 CSES | | |
|---|---|---|---|---|---|---|
| | Source of information | Period | Day[a] | Source of information | Period | Day[a] |
| 1.Food & beverages | Section 1D: questions 1-16, 18-20 (excludes tobacco) | Previous 7 days | 7 | Section 1B: questions 1-16, 18-20 (excludes tobacco) | Previous 7 days | 7 |
| 2. Clothing & footwear | Section 7B, question 1 | Previous 6 months | 182.5 | Section 1C, question 9 | Previous 6 months | 182.5 |
| 3. Housing & utilities | | | | | | |
| Actual rent paid | Section 3, question 28 | Month | 30.4 | Section 4, question 25a (2007) or question 27a (2006) | Month | 30.4 |
| Estimated rent[c] | Section 8, question 6 for owner-occupied housing | Month | 30.4 | Section 8, question 6 for owner-occupied housing | Month | 30.4 |
| Hotel/accommodation | Diary, items 9407, 9415 | Month | 29-31[b] | Diary, items 6210, 6211 | Month | 28-31[b] |
| Housing maintenance & repairs | Section 3, question 29 | Month | 30.4 | Section 4, question 26 (2007) or question 28 (2006) | Month | 30.4 |
| Water charges | Section 3, question 17 | Month | 30.4 | Section 4, question 16 (2007) or question 17 (2006) | Month | 30.4 |
| Sewage & waste water disposal | Section 3, question 21 | Month | 30.4 | Section 4, question 20 (2007) or question 21 (2006) | Month | 30.4 |
| Garbage collection | Section 3, question 22 | Month | 30.4 | Section 4, question 21 (2007) or question 22 (2006) | Month | 30.4 |
| Electricity & Fuel | Section 3, question 24 a to g | Month | 30.4 | Section 4, question 23 (2007) or 24 (2006) a to g | Month | 30.4 |
| 4. Household furnishings and operations | Section 7B, question 2 | Last 6 months | 182.5 | Section 1C, question 10 and question 11 | Last 12 months | 365 |
| 5. Medical care | Section 14, question 12[d] | Previous 4 weeks | 28 | Section 14, question 13 | Previous 4 weeks | 28 |
| 6. Transportation and communications | Diary, items 7111-8081 | Month | 29-31[b] | Diary, items 5010-5180 | Month | 28-31[b] |
| 7. Recreation | Section 7B, question 3 | Year | 365 | Section 1C, question 12 and question 15 | Year | 365 |
| 8. Education | Section 2, questions 14H | Year | 365 | Section 2, questions 15H | Year | 365 |
| 9. Personal care & effects | | | | | | |
| Personal care | Diary, items 9513-9721, 9805, 9813 | Month | 29-31[b] | Diary, items 6220-6250 | Month | 28-31[b] |
| Personal effects | Section 7B, question 4 | Year | 365 | Section 1C, question 14 | Year | 365 |
| 10. Tobacco | Section 1D, question 17 | Last 7 days | 7 | Section 1B, question 17 | Last 7 days | 7 |
| 11. Miscellaneous | Section 7B, question 5 | Year | 365 | Section 1C, question 16 | Year | 365 |

Note: [a] Number of days in reference period (used as conversion factor); [b] number of days subject to days in a calendar month that the diary exercise took place; [c] Estimated by households not paying rent, no imputation; [d] for members reporting illness, injury or health problem in the previous 4 weeks only

# Methods

Descriptive statistics analysis was used to account for illness and health care-seeking behaviour. The sample weight was used to achieve the overall estimation for the country as well as for population subgroup. For the 2005 CDHS, where only sample weights at household level are available, it is assumed that all individuals in each household have equal sample weight. For the CSES 2004 and 2007, individual sample weights were used for individual level analyses (e.g. care-seeking, provider choices) and household sample weights were used for household level analyses (e.g. catastrophic incidence, etc.)

Both the estimation of household capacity to pay and the catastrophic and impoverishment analysis follow the methods described in the 2005 WHO document , "Distribution of health payments and catastrophic expenditures: Methodology", by Ke Xu. Details of the methods and assumptions used in the analysis as well as any specific adjustment for the three datasets in this analysis are given in the 5 sections below.

## Illness and health care-seeking behaviour

The incidence of illness in the population can be estimated based on the reported number of individuals who reported having had illness, injury or health problems in the previous 4 weeks or the previous 30 days (for the CSES and CDHS surveys respectively). Survey weights were applied in order to calculate national figures based on the average number of episodes of illness per capita.

Average number of illness episodes per capita

$$= \sum_i (w_i * ill_i) / \sum_i (w_i) ;$$

when $ill_i$ = 0, 1 and $w_i$ = individual weight

In addition to the incidence of overall illness, statistics by illness subgroup are also calculated. The 2004 and 2007 CSES surveys contain information on illness type as reported by the respondents e.g. headache, fever, malaria. This study recategorised the 41 types of illness into 10 subgroups in order to analyse the incidence by subgroup (Table 3). The information on these subgroups is further used in the health spending and catastrophic determinant analysis. The 2005 CDHS database does not provide detailed information on illness types. However, the extent of illness as perceived by the respondents is reported according to three scales, i.e. serious, moderate, or slight. These three subgroups of illness severity were then used in the subgroup analysis for 2005 CDHS.

The CSES questionnaire is able to capture at most one episode of illness per individual sample. However, the 2005 CDHS allows for more than one episode of illness per individual sample. In the latter cases, all episodes are counted in the incidence calculation.

Percentage of care/treatment sought among all episodes of illness was calculated based on the number of those reported to have had illness, injury or health problems and the number who sought care or treatment for such illness[9]. The 2005 CDHS reported up to 3 visits of care-seeking per episode of illness so the statistics for each visit of care-seeking were also calculated.

Share of individual care-seeking among all those reporting illness

$$= \sum_i (w_i * seekcare_i) / \sum_i (w_i * ill_i);$$

when $seekcare_i$ = 0, 1 for CSES2004 & 2007

or $$= \sum_i (w_i * seekcarek_i) / \sum_i (w_i * ill_i);$$

when $seekcarek_i$ = 0, 1 and $k$=1,2,3 (visit) for CDHS2005

In addition to the incidence of health care-seeking in general, statistics for three specific types of care were also analysed. These include outpatient (OP) care, inpatient (IP) care, and non-OP and non-IP care. Both survey questionnaires for CSES 2004 & 2007 include specific questions on hospitalisation, so those answering yes to this question were considered as using inpatient care (Table 4). Because there is no specific question in the survey on outpatient use, an individual is considered to use an outpatient ser-

9 We also include individuals who had out-of-pocket health spending over the last month as care-seeking individuals even though they may not report that in the specific question.

Table 3. Subgroups of type of illness based on Cambodian Socio-Economic (CSES) 2004 and 2007 surveys

| | Corresponding CSES Illness Codes |
|---|---|
| 1. Stomach ache | 01=stomachache |
| 2. Back pain | 02=back pain |
| 3. Headache, ear & eye pain | 03 =headache, 04=ear pain, 05=eye pain |
| Fever | 06=fever |
| 5. Diarrhoea | 07=diarrhoea |
| 6. Common cold | 08=cold & cough without rapid or difficult breathing |
| 7. Severe respiratory diseases | 09-12=cold & cough with rapid or difficult breathing, bronchitis, pleurisy, tuberculosis |
| 8. Other non-communicable diseases | 13=diabetes,14=disease of urinary system, 15=disease of the heart, 17=hypertension, 23=cancer, 24=gynecological disorders |
| 9. Other infectious diseases | 16=measles, 18=typhoid fever, 19=dengue fever, 20=chickenpox, 21=meningitis, 22=encephalitis, 29=leprosy, 30=malaria, 35=aids |
| 10. Others | 25=avitaminosis and other nutritional deficiencies, 26=anaemia, 27=jaundice, 28=skin disorder, 31=food-borne disease, 32=water-borne disease, 33=mental disorders, 34=dropsy (swollen belly), 36=mine injury, 37=road accident, 38=other injury, 39=antenatal care, 40=postnatal care, 41=other care need (specify) |

Table 4. Definition of outpatient and inpatient for CSES 2004 and CSES 2007

| | CSES 2004 | CDHS 2005 | CSES 2007 |
|---|---|---|---|
| Outpatient (OP) | Answer "No" to the hospitalisation question and specify place of care: health centre, private clinic, public/private hospital, or doctor's or nurse's home | N/A | Answer "No" to the hospitalisation question and specify place of care: health centre, private clinic, public/private hospital, health posts, or doctor's or nurse's home |
| Inpatient (IP) | Answer "Yes" to the hospitalisation question and specify place of care: health centre, private clinic, public/private hospital, or doctor's or nurse's home | N/A | Answer "Yes" to the hospitalisation question and specify place of care as: health centre, private clinic, public/private hospital, or doctor's or nurse's home |
| Non OP, Non IP | Care-seeking that is not considered as OP nor IP care | N/A | Care-seeking that is not considered as OP nor IP care |

vice if s/he is ill and seeks care without hospitalisation at selected medical providers, namely health centres, private clinics, public and private hospitals, or at a doctor's or nurse's home. All other care-seeking visits that are not OP or IP are considered as Non-OP, Non-IP visits.

CDHS 2005 includes no question on hospitalisation so it is not possible to classify care-seeking places into OP or IP. The number of outpatient visits and incidence of hospitalisation and number of inpatient days were therefore estimated for 2004 CSES and 2007 CSES only. The statistics include:

Per capita outpatient (OP) visits (among population)

$$= \sum_i (w_i * \text{OP } visit_i) / \sum_i (w_i); \text{ when OP } visit_i = 0, 1$$

Incidence of hospitalisation among those who sought care

$$= \sum_i (w_i * hospitalised_i) / \sum_i (w_i * seekcare_i);$$
$$\text{when } hospitalised_i \text{ and } seekcare_i = 0, 1$$

Incidence of hospitalisation (among population)

$$= \sum_i (w_i * hospitalised_i) / \sum_i (w_i);$$
$$\text{when } hospitalised_{ii} = 0, 1$$

Average inpatient days per admission

$$= \sum_i (w_i * inpatient\ days_i) / \sum_i (w_i * hospitalised_i)$$

Average inpatient days per capita

$$= \sum_i (w_i * inpatient\ days_i) / \sum_i (w_i)$$

## Place of treatment or care

Both the CSES and CDHS contain data on the place of treatment. However, in the CSES the question concerned the provider usually consulted for care. In the CDHS the question specifically detailed the provider of each episode of care-seeking so that up to 3 providers are enumerated for up to 3 episodes of care-seeking activity per illness.

Despite being the same type of survey, the codes for different provider types are not the same for CSES 2004 and CSES 2007. The CSES 2004 includes 14 provider codes while the CSES 2007 has 18 codes. The provider categories in CSES 2007 are similar to those of CDHS 2005. The list of provider types from each survey and their corresponding codes in the databases are provided in Table 5.

In this analysis, the types of provider from CSES and CDHS were reclassified into 7 groups for comparability across surveys. The groups are (1) health centres, (2) public hospitals, (3) private hospitals, (4) private clinics, (5) drug stores, (6) home care, and (7) others. The data were further categorised into public, private and non-medical providers. The list of members of each health care provider group by survey year is provided in Table 6. The list of members of each health care provider category by survey year is shown in Table 7.

Summary statistics on the use of each place/subgroup of treatment or care are calculated as a proportion of overall care/treatment sought.

Provider share

$$= \sum_i (w_i * provider_{mi}) / \sum_i (w_i * seekcare_{ki});$$
$$\text{when } provider_{mi} = 0, 1; \text{ m=1,..,6; and k=1,2,3}$$

# Household health spending

In addition to illness and health care-seeking behaviour, the level of out-of-pocket spending for care and treatment and the level of spending on transport to receive such care are of interest to health funding policy analysts.

## Out-of-pocket health expenditure

OOP health payments are those made by households at the point at which they receive health services. The CSES contains data on how much was spent on medical care in the previous 4 weeks and the CDHS contains data on the cost of treatment for each episode of treatment/care-seeking. It is assumed that the spending reported in the surveys was out-of-pocket with no reimbursement deduction from individual's health insurance or other sources.

For CDHS 2005, the amount of spending for each illness and health care-seeking episode is available so that detailed analysis can be conducted by illness episode and type of provider. The CSES 2004 and 2007 questionnaires asked only about total amount of health care spending on each household member in the previous 4 weeks. No detailed information is therefore available on the amount spent per specific episode of illness or health care provider. For this analysis, it is assumed that all health spending by an individual concerned the reported illness episode (only one illness episode per person) and that the entirety was spent at the reported provider (the individual's usual place of care).

Table 5. List of health care providers and corresponding codes in the survey databases

| | CSES 2004 | CDHS 2005 | CSES 2007 |
|---|---|---|---|
| 1 | 04 National Hospital | 11 National hospital (pp) | 1 National hospital (PP) |
| 2 | 03 Provincial Hospital | 12 Provincial hospital (rh) | 2 Provincial hospital (RH) |
| 3 | 02 Referral (or District) Hospital | 13 District hospital (rh) | 3 District hospital (RH) |
| 4 | 01 Health Centre | 14 Health centre | 4 Health centre |
| 5 | | 15 Health post | 5 Health post |
| 6 | | 16 Outreach | 6 Outreach |
| 7 | | 17 Other public | 7 Other public |
| 8 | 05 Private Hospital | 21 Private hospital | 8 Private hospital |
| 9 | 06 Private Clinic | 22 Private clinic | 9 Private clinic |
| 10 | 08 Dedicated drug store | 23 Private pharmacy | 10 Private pharmacy |
| 11 | 07 Doctor's or nurse's Home | 24 Home/office of trained health worker/nurse | 11 Home/office of trained health worker/nurse |
| 12 | 10 Patient's home/own home | 25 Visit by trained health worker/ nurse | 12 Visit by trained health worker/ nurse |
| 13 | | 26 Other private medical | 13 Other private medical |
| 14 | 09 Other shop selling drugs | 31 Shop/market | 14 Shop selling drugs/market |
| 15 | 11 Healer/herbalist | 32 Kru khmer/Shaman | 15 Kru khmer/ Shaman |
| 16 | 13 Monk | 33 Monk/religious leader | 16 Monk/religious leader |
| 17 | 12 Traditional midwife | 34 Traditional birth attendant | 17 Traditional birth attendant |
| 18 | 14 Other | 96 Other | 18 Other |

Table 6. Groups of health care providers and the corresponding survey codes

| | CSES 2004 | CDHS 2005 | CSES 2007 |
|---|---|---|---|
| 1. Health centres | 01 Health Centre | 14 Health centre | 4 Health centre |
| 2. Public hospitals | 02 Referral/District Hospital<br>03 Provincial Hospital<br>04 National Hospital | 11 National hospital (pp)<br>12 Provincial hospital (rh)<br>13 District hospital (rh) | 1 National hospital (PP)<br>2 Provincial hospital (RH)<br>3 District hospital (RH) |
| 3. Private hospitals | 05 Private Hospital | 21 Private hospital | 8 Private hospital |
| 4. Private clinics | 06 Private Clinic<br>07 Doctor's or Nurse's Home | 22 Private clinic<br>24 Home/office of trained health worker/nurse | 9 Private clinic<br>11 Home/Office of trained health worker/nurse |
| 5. Private pharmacies and drug stores | 08 Dedicated drug store<br>09 Other shop selling drugs | 23 Private pharmacy<br>31 Shop/market | 10 Private pharmacy<br>14 Shop selling drugs/market |
| 6. Home care | 10 Patient's home/ own home | 25 Visit of trained health worker/nurse | 12 Visit of trained health worker/nurse |
| 7. Others | 11 Healer/herbalist<br>12 Traditional midwife<br>13 Monk<br>14 Other (specify) | 15 Health post<br>16 Outreach<br>17 Other public<br>26 Other private medical<br>32 Kru khmer/shaman<br>33 Monk/religious leader<br>34 Traditional birth attendant<br>96 Other | 5 Health post<br>6 Outreach<br>7 Other public<br>13 Other private medical<br>15 Kru khmer/ Shaman<br>16 Monk/religious leader<br>17 Traditional birth attendant<br>18 Other |

Table 7. Categories of health care providers and the corresponding survey codes

| | CSES 2004 | CDHS 2005 | CSES 2007 |
|---|---|---|---|
| 1. Public | 01 Health Centre<br>02 Referral (or District) Hospital<br>03 Provincial Hospital<br>04 National Hospital | 11 National hospital (pp)<br>12 Provincial hospital (rh)<br>13 District hospital (rh)<br>14 Health centre<br>15 Health post<br>16 Outreach<br>17 Other public | 1 National hospital (PP)<br>2 Provincial hospital (RH)<br>3 District hospital (RH)<br>4 Health centre<br>5 Health post<br>6 Outreach<br>7 Other public |
| 2. Private | 05 Private Hospital<br>06 Private Clinic<br>07 Doctor's or Nurse's Home<br>08 Dedicated drug store<br>10 Patient's home | 21 Private hospital<br>22 Private clinic<br>23 Private pharmacy<br>24 Home/office of trained health worker/nurse<br>25 Visit of trained health worker/ nurse<br>26 Other private medical | 8 Private hospital<br>9 Private clinic<br>10 Private pharmacy<br>11 Home/Office of trained health worker/nurse<br>12 Visit of trained health worker/ nurse<br>13 Other private medical |
| 3. Non-medical sector | 09 Other shop selling drugs<br>11 Healer/herbalist<br>12 Traditional midwife<br>13 Monk<br>14 Other | 31 Shop/market<br>32 Kru khmer/Shaman<br>33 Monk/religious leader<br>34 Traditional birth attendant<br>96 Other | 14 Shop selling drugs/market<br>15 Kru khmer/ Shaman<br>16 Monk/religious leader<br>17 Traditional birth attendant<br>18 Other |

Two levels of estimation are included, i.e. at individual level and household level. Average OOP per illness episode, by illness type, provider type and age group were calculated at an individual level using individual sample weights.

oop per episode of illness

$$= \sum_i (w_i * oop_i) / \sum_i (w_i * ill_i)$$

oop per episode of illness by illness type

$$= \sum_i (w_i * oop_i) / \sum_i (w_i * illtype_i)$$

oop per episode of illness by providerm

$$= \sum_i (w_i * oop_i * provider_{mi}) / \sum_i (w_i * provider_{mi})$$

oop per episode of illness by agegroupn

$$= \sum_i (w_i * oop_i * agegrp_n) / \sum_i (w_i * agegrp_n)$$

The total cumulative amount of OOP for the country and average OOP per household were calculated at household level using household sample weights.

household oop (ooph)

$$= \sum_i (oop_i)$$

total oop

$$= \sum_h (w_h * oop_h)$$

average oop per household

$$= \sum_h (w_h * oop_h) / \sum_h (w_h)$$

In addition to average household level of health spending, the proportion and/or total amount of OOP at various provider types or provider groups were calculated. Amounts of household OOP by subgroups of household members, e.g. those aged below 5, between 5 and 65, and 65 and over were also calculated. For CSES data, the amounts spent at outpatient, inpatient, or non-OP/non-IP care were also calculated separately.

## Health-related transportation expenses

The 2005 CDHS provides data beyond the cost of treatment. It includes the cost data of round-trip transport for care/treatment purposes for each care-seeking episode. Expenditure on health-related transportation (toop) was then calculated as average cost per capita using individual level data and individual sample weights.

average toop per visit

$$= \sum_i (w_i * toop_i * seekcarek_i) / \sum_i (w_i * seekcarek_i))$$

average toop per visit by provider typem

$$= \sum_i (w_i * toop_i * providerm_i) / \sum_i (w_i * providerm_i)$$

The cumulative total of transportation expenses and overall share of transport expenses in total OOP were calculated using household level data and household sample weights.

household $toop_h$

$$= \sum_i (toop_i)$$

cumulative toop

$$= \sum_h (w_h * toop_h)$$

## Household capacity to pay and poverty level

Estimation of household capacity to pay is necessary to catagorise the amount of health payment at catastrophic level. To calculate capacity to pay, data on household consumption expenditure (a) and food expenditure (b) were used to estimate household subsistence spending (d). The lack of consumption variables in the 2005 DHS therefore prohibits catastrophic and impoverishment analysis for 2005.

All consumption variables (e.g. overall consumption, food, health) were converted into a monthly figure (30.4 days). It was assumed that the inflation rate over the months during the survey period was minimal so the analysis did not adjust for inflation.

### Household consumption expenditure

Household consumption expenditure (exp) comprises both monetary and in-kind payment on all goods and services, and the money value of the consumption of home-made products. Data on consumption are only available in the 2004 CSES and 2007 CSES. The components of consumption expenditure included in this analysis are shown in Table 2 in the previous section.

### Food expenditure

Household food expenditure (food) is the amount spent on all foodstuffs by the household plus the value of the family's own food production consumed within the household. Because food expenditure is used for subsistence estimation in the analysis, household consumption of alcoholic beverages, tobacco, food consumed from home (e.g. hotel and restaurants) and prepared meals bought outside and eaten at home were not included in food expenditure (food). However, those consumption items were included in the household consumption expenditure (exp).

### Poverty line and household subsistence spending

According to the WHO method, a food share-based poverty line (pl) was used to estimate household subsistence (se). This poverty line is defined as the weighted average of equivalised food expenditure of the households whose food expenditure share of total household expenditure is between the 45th and 55th percentile of the population.

The household equivalence scale is defined as:

$$eqsize_h = hhsize_h^{\beta}$$

where $hhsize_h$ is the household size. The value of the parameter $\beta$ is 0.56 according to WHO's estimation. Equivalised food expenditure is therefore household food expenditure divided by the equivalent household size.

Subsistence spending was calculated from by multiplying the equivalent household size.

### The household's capacity to pay

The household capacity to pay (ctp) is defined as a household non-subsistence spending. For households with food expenditure lower than subsistence spending ($se_h > food_h$), non-food expenditure is used as non-subsistence spending.

$$ctp_h = exp_h - se_h \text{ if } se_h <= food_h$$

$$ctp_h = exp_h - food_h \text{ if } se_h > food_h$$

### Poverty level

A household is regarded as poor ($poor_h$) when its per capita household expenditure is smaller than the nationally defined per capita poverty line ($pl_h$) which includes food and non-food components. The poverty line varies according to the geographical location of the household whether it is in Phnom Penh, other urban, or other rural areas. The poverty line per capita per day for 2004 for Phnom Penh, other urban and other rural areas is 2,351, 1.952, and 1,753 Riels respectively. The poverty line per capita per day for 2007 for Phnom Penh, other urban, and other rural areas is 3,092, 2,704, and 2,367 Riels respectively. The household poverty incidence was calculated using household poverty status and household weight while the poverty headcount (individual) was calculated using the household member's poverty status (same as household status) and individual weight.

$$poor_h = 1 \text{ if } (exp_h / hhsize_h) < pl_h$$

$$poor_h = 0 \text{ if } (exp_h / hhsize_h) \geq pl_h$$

## Catastrophic health spending, impoverishment, and medical indebtedness

### Out-of-pocket health payments share of household capacity to pay

The burden of health payments is defined as out-of-pocket payment as a percentage of a household's capacity to pay (oopctp).

$oopctp_h = oop_h / ctp_h$

### Catastrophic health expenditure

Catastrophic health expenditure (cata) is defined as a household's total out-of-pocket health payments equalling or exceeding 40% of a household's capacity to pay or non-subsistence spending. The threshold of 40% may change according to a country's specific situation. The dummy variable on catastrophic health expenditure was constructed with value 1 indicating a household with catastrophic expenditure, and 0 without catastrophic expenditure.

$cata_h = 1$ if $oop_x / ctp_x \geq 0.4$

$cata_h = 0$ if $oop_x / ctp_x < 0.4$

### Fairness in Financial Contribution index

The distribution of household financial contribution (FFC) across households was also summarised using the Fairness of Financial Contribution (FFC) index. The FFC is based on the mean of the cubed absolute difference between the oopctp of each household and the oopctp norm.

The index is of the form:

$$FCC = 1 - \sqrt[3]{\frac{\sum_{h=1}^{n} w_k |oopctp_k - oopctp_o|^3}{\sum w_k}}$$

where

$$oopctp_o = \frac{\sum w_h ctp_h}{\sum w_k ctp_k}$$

The FFC ranges between 0 and 1. The fairer the health financing system, the closer FFC will be to 1.

### Impoverishment

A non-poor household is impoverished by health payments when it becomes poor after paying for health services. To assess the extent of impoverishment (impoor) in the population, a dummy variable on the poverty impact of health payments ($impoor_h$) was created. It equals 1 when household expenditure is equal to or higher than subsistence spending but is lower than subsistence spending after deducting out-of-pocket health payments, and 0 otherwise.

$impoor_h = 1$ if $\exp_h / hhsize_h \geq pl_h$ and $(exp_h - oop_h) / hhsize_h < pl_h$,

$impoor_h = 0$ otherwise

### Indebtedness through illness

The incidence of debts from illness among Cambodian households was calculated for 2004 and 2007 using the CSES 2004 and CSES 2007 databases. The average level of debt per household and the distribution of debt by economic quintile were estimated. Additionally, the characteristics of households with indebtedness through illness were explored to identify the determinants of such indebtedness.

## Subgroup Analysis

Wherever feasible, analysis for population subgroups was conducted to demonstrate the pattern of health care-seeking behaviour, health spending, and catastrophic impacts. The subgroup analysis includes the following.

### Expenditure quintile

Households were grouped into quintiles (quintile) using equivalised per capita household expenditure (eqexph). Equivalised per capita expenditure equals total household expenditure divided by equivalent household size as follows:

$eqexp_h = exp_h / eqsise_h$

For the 2005 CDHS data where household expenditure is not available, a wealth index based on household ownership of assets was constructed and used to group households into quintiles.

Household weight was considered when grouping the population by quintile.

### Urban rural groups

Three groups of household geographical location (region) were used in the analysis: capital, other urban and other rural. "Capital" refers to both urban and rural areas of Phnom Penh . "Other urban" includes all other urban areas outside Phnom Penh. Similarly, "other rural" covers all rural areas outside Phnom Penh. Summary statistics for each of these geographical groups were calculated and household weight was used.

### Others e.g.

Analyses of individual level statistics were also conducted whenever feasible including by subgroups such as sex (male/female) and age group (under 5, 5 to 15, 15 to 60, and over 60 years old).

## Determinant analyses

In addition to the descriptive analyses to explore the patterns of health care-seeking and health care spending using the CSES and CDHS datasets, further analyses to identify key determinants of health care-seeking behaviour and determinants of health spending were conducted. The specific models used in the analyses are presented below.

### Determinants of care-seeking

The random effects logistic model[10] was used to analyse the determinants of health care-seeking at individual level. Both individual level and household level covariates are included in the models.

For CDHS, the individual characteristics include: sex, age, and reported degree of illness. Household characteristics include: household income quintile, household size, the education level and sex of the family head, geographical location. The reference categories in the model are female, 0-5 years old, slightly ill, poorest quintile, head has no education, female head, and located in the capital location. The analyses were conducted separately for first, second, and third visits.

For CSES, the covariates are the same as for CDHS except for the reported degree of illness where the reported type of illness was used instead. The reference category is also the same except for the illness type where 'other illness' is the reference illness category. A Chow test was conducted to explore the validity of combining 2004 and 2007 datasets together in one analysis versus having two separate analyses.

### Determinants of provider choice

For provider choice analyses, a multinomial logit regression model (mlogit in STATA) was used for individual level analysis with control for clustering effect using robust standard error. The same sets of individual level and household level covariates as in the health care-seeking determinant analyses were included in the models. A Chow test was also conducted for 2004 and 2007 CSES data.

### Determinants of positive health spending and the level of health spending

The analyses of health care spending were conducted separately between the determinants of having positive health spending and the determinants of level of health spending. In the analyses of positive health spending, a random effects logistic model* was used to identify key determinants of an individual having positive out-of-pocket spending. The same sets of individual level and household level covariates as in the health care-seeking determinant analyses were included except for the CSES data where an additional variable on hospitalisation was also included. A Chow test was also conducted to test the validity of combining 2004 and 2007 CSES datasets.

The analyses of the determinants of the level of health spending were conducted using the logistic model with robust standard error. In the analyses, the level of OOP health spending by each individual was logarithmically transformed. The same sets of covariates were utilised as in the determinants of positive health spending (with hospitalisation variable for CSES data). A Chow test was also conducted for CSES data.

10 A random effects model was chosen to allow for unobservable random heterogeneity that would otherwise not be captured in the simple regression. The analysis requires an assumption that the unobserved random effects after conditioning on all other covariates has a normal distribution with mean zero and variance v2.

## Determinants of catastrophic health spending

The analyses of the catastrophic determinants were done only for the CSES data where information on a household's capacity to pay is available. It employed a random effects logistic model using data at household level with key covariates similar to the previous determinant analyses. However, because it was conducted at household level, individual level characteristics were captured as dummy variables that include having a hospitalised member, having an elderly member, having a child member under 5, and having members with certain illness types. A Chow test was conducted to check the possibility of combining the 2004 and 2007 datasets.

## Determinants of indebtedness through illness

Analyses of the determinants of indebtedness through illness were conducted only for those CSES data where information on household indebtedness is available. It employed a random effects logistic model using data at household level with key covariates similar to the previous determinant analyses. However, because conducted at household level, individual level characteristics were captured as dummy variables that include having a hospitalised member, having an elderly member, having a child member under 5, and having members with certain illness types. A Chow test was conducted to check the possibility of combining 2004 and 2007 datasets.

# Results

The final numbers of observations included in the analysis are presented in Table 8. For CSES 2004 with 15,000 sample households, 16 households were excluded from the analyses because of their lack of data on food expenditure and health care- seeking behaviour. The final sample size equals 14,984 households and 74,719 individuals. For CSES 2007, one household does not have health care-seeking behaviour and health spending information. This household is still included in the analysis but the amount of its health care expense and frequency of health care utilisation were assumed to be zero. Only 17,401 out of 17,439 individuals have health care- seeking behaviour data. For CDHS 2005, there are 73,010 individuals in the database. However, five of them have more than one illness record (got sick twice) so the total number of observations reached 73,015.

Based on these observations and their respective sample weights, it is possible to calculate total population and the number of households and average household size. Summary statistics from the three surveys are provided in Table 8. Because there are significant differences between CDHS and CSES in terms of survey questions, recall period, and answer options, the results are shown separately for the analyses of the two types of surveys. The first part of this section presents the findings from the analyses of CDHS 2005. The subsequent part shows the analysis results from CSES 2004 and CSES 2007.

## Results from the Cambodian Demographic Health Survey 2005

The CDHS 2005 contains survey questions on individual illness in the previous month and corresponding health care-seeking behaviour and out-of-pocket spending for treatment and for transport. It does not contain questions on income or consumption so it is not possible to estimate impoverishment or household catastrophic impact. The results from the analyses are presented in two sections. The first is related to illness and health care-seeking behaviour. The second concerns health care spending including transport expenses.

Table 8. Summary data from the three surveys

| | CSES | | CDHS |
|---|---|---|---|
| | 2004 | 2007 | 2005 |
| Number of household observations | 14,984 | 3,593 | 14,243 |
| Total households (sum of household weights) | 2,599,166 | 2,629,487 | 2,843,436 |
| Number of individual observations | 74,719 | 17,401 | 73,015 |
| Total population (sum of individual weights) | 13,400,000 | 13,200,000 | 14,200,000 |
| Average household size | 4.97 | 4.81 | 5.01 |
| Geographic characteristics (households) | | | |
| % Households in Capital | 7.95% | 6.30% | 8.28% |
| % Households in other urban areas (outside capital) | 10.25% | 10.07% | 9.96% |
| % Households in other rural areas (outside capital) | 81.79% | 83.62% | 81.75% |
| Demographic characteristics | | | |
| % Male | 48.60% | 48.50% | 47.70% |
| % Aged 0 - 5 | 11.40% | 9.60% | 11.10% |
| % Aged 5 - 15 | 26.80% | 23.80% | 26.50% |
| % Aged 15 - 60 | 56.50% | 60.10% | 55.70% |
| % Aged 60+ | 5.30% | 6.50% | 6.80% |

Note: Percentage of sub-group

# 1. Illness and health care-seeking behaviour

## 1.1 Incidence of illness

On average, the incidence of illness in the previous 30 days among the population in CDHS 2005 is.1519 or approximately 152 per 1,000 population. This means there were approximately 2.16 million people who fell ill in an average month in 2005. Among them, around 44% were slightly ill and a similar proportion were moderately ill. Only 12% reported being seriously ill (Table 9).

The incidence of illness for population subgroups differs between male and female and age groups. Males have lower incidence of illness than females while children under 5 and the elderly aged over 60 have higher incidences than the other two age groups. However, the incidence of illness is relatively similar among the first few economic quintiles as no statistically significant difference was found between these groups, although the two higher quintiles have significantly lower incidences of illness. The details are presented in Table 12 and Figure 1.

## 1.2 Health care-seeking behaviour

On average 91.5% (s.e. 0.27%) of those who fell ill sought care. Approximately 26.7% (s.e. 0.42%) sought care at least twice and 10.4% (s.e. 0.29%) sought care three times. Around 70% (s.e. 0.44%) of those ill first sought care from medical care providers. The statistics of health care-seeking by number of visits and by degree of illness are shown in Table 10 and Table 11 respectively.

### Health care-seeking among population groups

Table 12 presents the incidence of illness and first health care-seeking visit by sex, age group, and economic status (quintiles). As with the incidence of illness, certain visit incidence patterns correspond to the incidences of illness. Female individuals, children under 5, and the elderly aged 60 and over sought care more than other groups. The differences between economic quintile are smaller with the lowest incidence of first visit in the highest group.

One proxy indicator of potential barriers to health care access is the proportion of ill individuals who do not use health care services. With equal access, the proportion should be relatively similar across population groups. However, in 2005, this proportion was much higher for the poorest quintile as well as among the oldest groups of the population, reflecting the potentially higher barriers to access they faced (see ).

### Determinants of care-seeking among those with similar illnesses: control for illness, age and sex

Table 13 presents the estimates from regression analyses of individual data using three models for three health care-seeking visits. 11,132 individuals reported illness in CDHS 2005. Individuals who reported being slightly or moderately ill sought care less frequently than those reported as seriously ill. Children under 5 were more likely to make a first visit than other age groups and individuals in richer households were also significantly more likely to make a first visit. Individuals in households with a male or educated (primary or secondary and higher) head of household were also more likely to seek care than those with female head or uneducated head. Individuals living outside Phnom Penh had a significantly higher chance of making 2nd and 3rd visits.

## 1.3. Choice of health care providers

### Health care utilisation by different kinds of facilities and services

Approximately half of the visits were to private health facilities. A quarter were to public facilities and the remaining quarter were to non-medical providers such as stores selling drugs, traditional healers and monks (Figure 2). The proportion of medical sector use was higher for the 1st visit while the proportion of non-medical use increased for the 2nd and 3rd visits.

Figure 3 provides more detail of provider choice by presenting the share of each visit in 7 provider categories. Visits to pharmacies and/or other stores selling drugs constituted the most common choice, followed by private clinics and home visits by health staff. Visits to health centre and public hospitals amounted only to one seventh and one eleventh of all visits respectively. The share of care sought at private hospitals was much smaller at less than 1 percent of all provider choices (Table 14).

Table 9. Incidence of self-reported illness within the previous 30 days - Source: CDHS 2005

| | Mean |
|---|---|
| Average illness episode per capita | 0.1519 |
| (s.e.) | (0.0013) |
| % of Illness classified as: | |
| Serious illness | 12.2% |
| Moderate illness | 43.4% |
| Slight illness | 44.3% |

Table 10. Percentage of care-seeking that are one, two, or three visits - Source: CDHS 2005

| | Percentage |
|---|---|
| Sought care once | 70.8% |
| Sought care twice | 17.9% |
| Sought care three times | 11.4% |

Table 11. Percentage of individuals with illness who sought care by degree of illness - Source: CDHS 2005

| | At least 1 visit | At least 2 visits | Had 3 visits |
|---|---|---|---|
| Serious | 96.2% | 40.1% | 15.8% |
| Moderate | 93.8% | 27.3% | 9.8% |
| Slight | 87.9% | 23.1% | 9.8% |

Table 12. Percentage of health care-seeking and hospitalisation by population group - Source: CDHS 2005

| | Sex | | Age group | | | | Economic quintile | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | F | 0 - 5 | 5 - 15 | 15 - 60 | 60+ | I | II | III | IV | V |
| Incidence of illness | 0.133 | 0.169 | 0.263 | 0.093 | 0.141 | 0.287 | 0.177 | 0.167 | 0.162 | 0.144 | 0.110 |
| s.e. | (0.0019) | (0.0018) | (0.0048) | (0.0021) | (0.0017) | (0.0067) | (0.0030) | (0.0030) | (0.0031) | (0.0030) | (0.0027) |
| Incidence of 1st visit | 0.123 | 0.154 | 0.247 | 0.087 | 0.129 | 0.257 | 0.154 | 0.152 | 0.148 | 0.134 | 0.107 |
| s.e. | (0.0018) | (0.0019) | (0.0047) | (0.0020) | (0.0017) | (0.0065) | (0.0029) | (0.0029) | (0.0029) | (0.0030) | (0.0026) |

Table 13. Results from regression analysis using random effects logistic model on health care-seeking – Source: CDHS 2005

| | 1st visit | | 2nd visit | | 3rd visit | |
|---|---|---|---|---|---|---|
| | Coef | P>z | Coef | P>z | Coef | P>z |
| Other rural | -0.34 | 0.51 | **1.04** | **0.00** | **1.94** | **0.00** |
| Other urban | -0.03 | 0.96 | **0.80** | **0.01** | **1.63** | **0.00** |
| Household size | 0.03 | 0.33 | 0.02 | 0.36 | 0.03 | 0.23 |
| Head Prim Edu | **0.70** | **0.00** | 0.23 | 0.06 | **0.44** | **0.01** |
| Head Sec Edu | **1.06** | **0.00** | **0.43** | **0.01** | **0.63** | **0.00** |
| Head male | **0.42** | **0.02** | **0.35** | **0.00** | **0.45** | **0.01** |
| Aged 5 - 15 | **-0.52** | **0.01** | -0.21 | 0.10 | -0.16 | 0.40 |
| Aged 15 - 60 | **-1.00** | **0.00** | **0.40** | **0.00** | **0.79** | **0.00** |
| Aged 60 + | **-1.28** | **0.00** | 0.16 | 0.30 | **0.96** | **0.00** |
| Male | 0.12 | 0.29 | -0.08 | 0.29 | -0.06 | 0.57 |
| 2nd Quintile (II) | **0.93** | **0.00** | 0.19 | 0.16 | -0.11 | 0.56 |
| 3rd Quintile (III) | **1.08** | **0.00** | **0.33** | **0.02** | -0.23 | 0.22 |
| 4th Quintile (IV) | **1.57** | **0.00** | **0.43** | **0.00** | -0.25 | 0.22 |
| 5th Quintile (V) | **2.32** | **0.00** | 0.27 | 0.14 | 0.06 | 0.79 |
| Moderately ill | **-1.06** | **0.00** | **-0.96** | **0.00** | **-0.75** | **0.00** |
| Slightly ill | **-2.58** | **0.00** | **-1.77** | **0.00** | **-1.11** | **0.00** |
| Constant | **5.11** | **0.00** | **-3.22** | **0.00** | **-7.09** | **0.00** |
| /lnsig2u | 2.19 | | 1.91 | | 2.02 | |
| sigma_u | 2.99 | | 2.60 | | 2.75 | |
| rho | 0.73 | | 0.67 | | 0.70 | |
| log likelihood | -3077.6 | | -5651.0 | | -3045.0 | |

Note:
Coef, coefficient;
head prim education, head of household with primary level education;
head sec education, head of household with secondary level education.

Figure 1: Annual incidence of illness, first visit and percentage of ill individuals that did not seek care by population sub-group [in %; in number of episodes per year] – Source: CDHS 2005

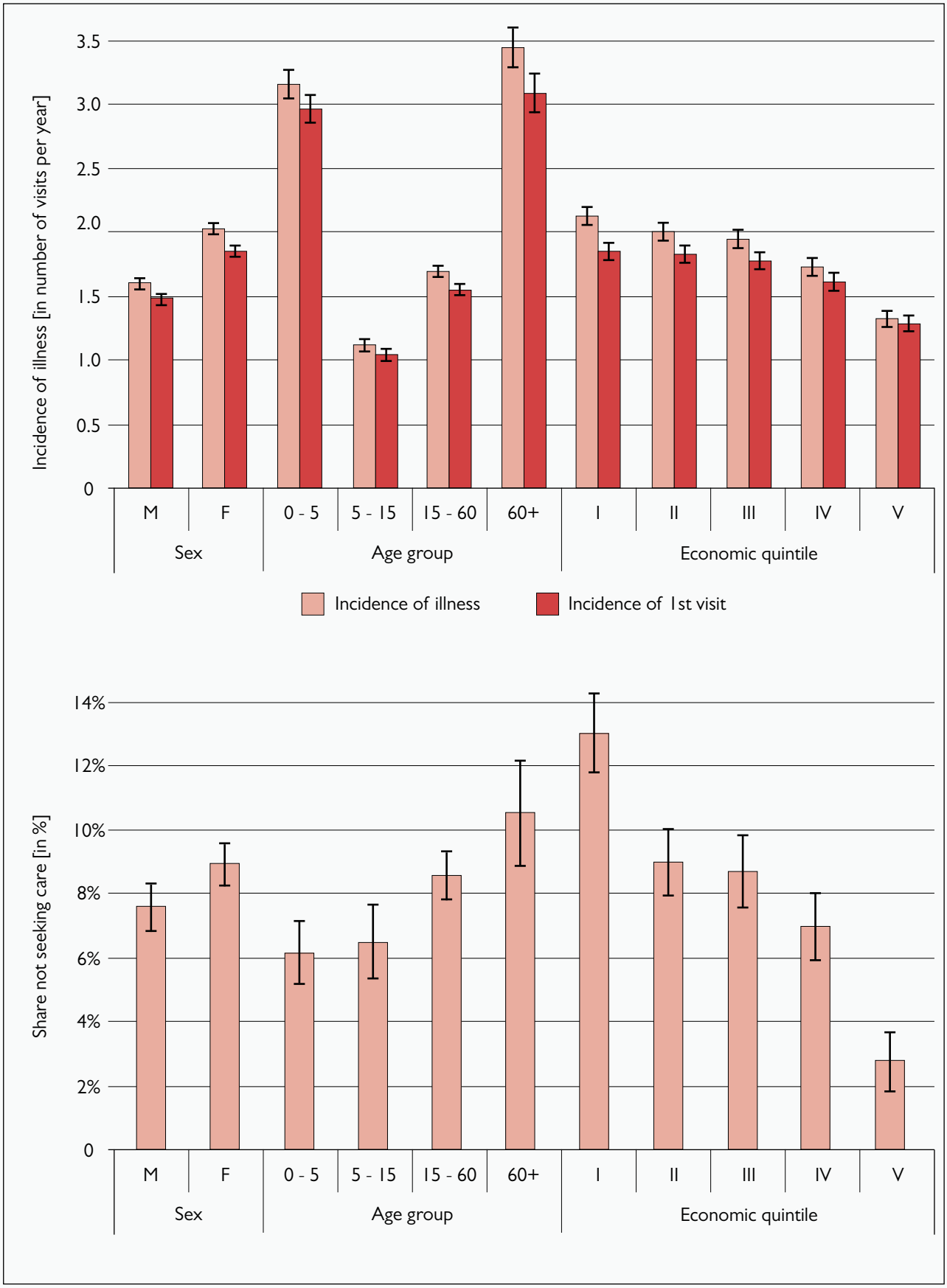


Figure 2: Percentage of provider type for each visit [in %] - Source: CDHS 2005

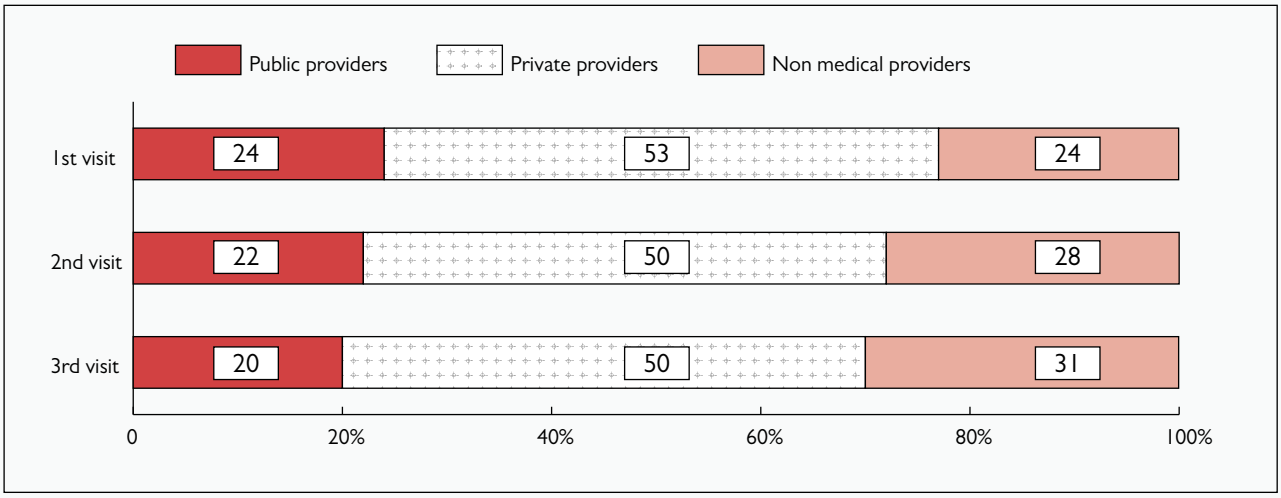



Figure 3: Percentage of all health care providers by type and health care-seeking episode [in %] - Source: CDHS 2005

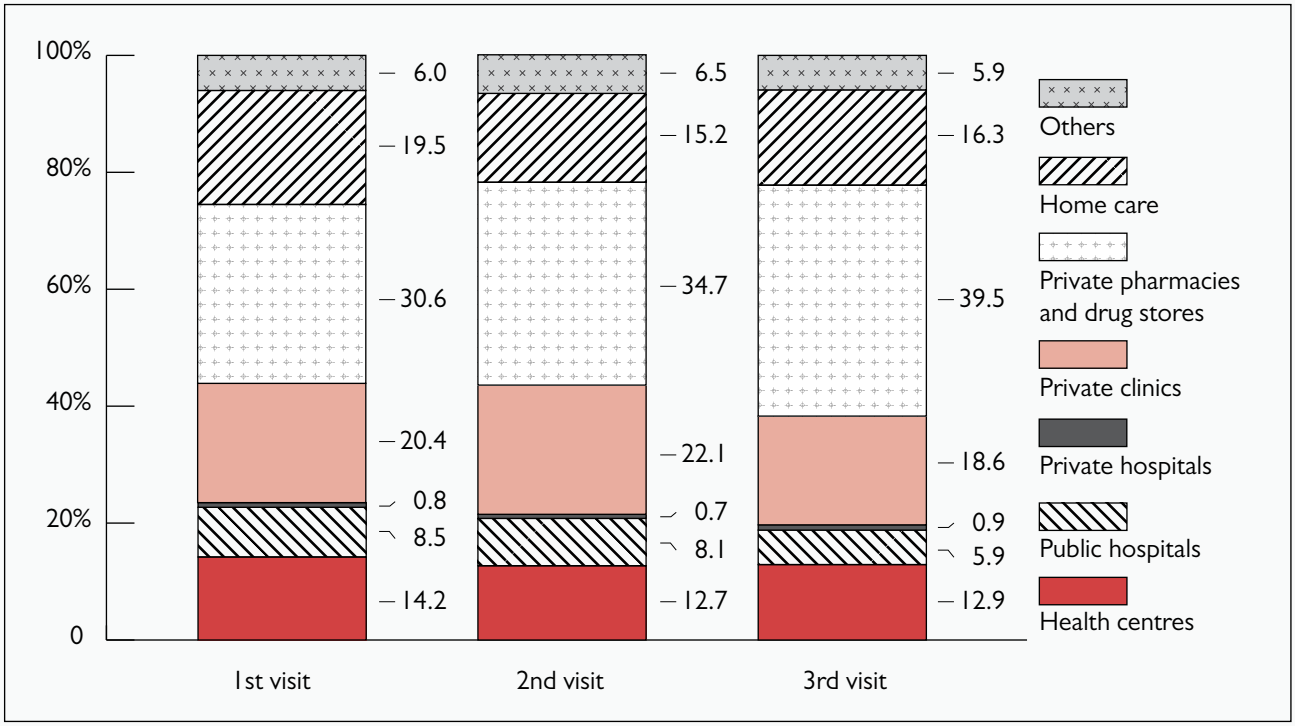



Table 14. Percentage of different provider category as a proportion of each visit - Source: CDHS 2005

| | 1st visit | 2nd visit | 3rd visit |
|---|---|---|---|
| Health centres | 14.16 | 12.73 | 12.85 |
| Public hospitals | 8.48 | 8.08 | 5.93 |
| Private hospitals | 0.84 | 0.72 | 0.89 |
| Private clinics | 20.4 | 22.05 | 18.58 |
| Private pharmacies and drug stores | 30.63 | 34.68 | 39.54 |
| Home care | 19.46 | 15.17 | 16.32 |
| Others | 6.04 | 6.57 | 5.88 |

Note: Pearson chi2(12) = 167.8194 Pr = 0.000

### Health care utilisation patterns for the first care-seeking visit by different population groups

There is no significant difference in provider choice by sex (Table 15). However, there are significant differences in the proportion of provider choice by age group and economic status (Figure 4 and Table 16). Children under 5 use health centres more than other age groups. The elderly aged 60 and above use home care more than other age groups.

Per economic quintile, the highest group paid a higher proportion of visits to hospitals and private clinics compared to other economic groups who had a higher proportion of health centre and home visits (Figure 5 and Table 17). The higher groups also made a higher proportion of visits to private sector facilities. Poorer groups made a higher proportion of visits to non-medical providers (Figure 6).

### Determinants of provider choice

Analyses of determinants of provider choices show that, with the health centre as a reference group, an individual's sex, age and reported level of illness, as well as household economic status, and geographical location are significant explanatory variables for provider choice (Table 18). Being a child under 5 contributes to significantly lower chance of using drug store and home care. The higher quintile has a significantly lower chance of using health centres than other provider categories. Those with reported severe illness have a higher chance of using all categories of health provider except for drug stores when compared to those reported moderately or slightly ill. Being in Phnom Penh also contributes to a higher chance of using public hospitals and private hospitals and clinics.

Table 15. Proportion of provider choice for first care-seeking visit by sex - Source: CDHS 2005

| | Sex | |
|---|---|---|
| | Female | Male |
| Health centres | 14.8% | 13.3% |
| Public hospitals | 8.8% | 8.1% |
| Private hospitals | 0.7% | 1.0% |
| Private clinics | 20.1% | 20.8% |
| Private pharmacies and drug stores | 30.1% | 31.3% |
| Home care | 19.6% | 19.3% |
| Others | 5.9% | 6.2% |

Note: Pearson chi2(6) = 9.0722 Pr = 0.170

Figure 4: Choice of providers by age group [in %] - Source: CDHS 2005

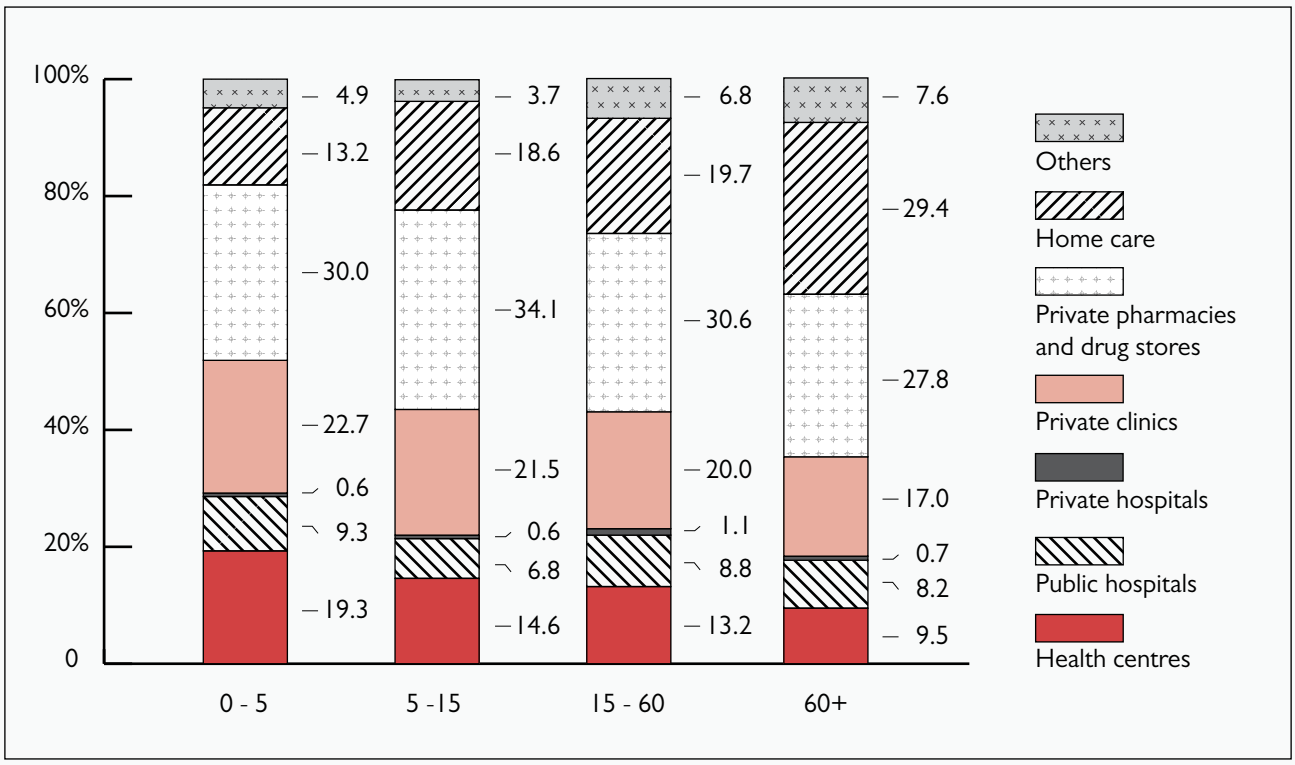



Table 16. Choice of providers for the first care-seeking visit by age group - Source: CDHS 2005

| | Age group | | | |
|---|---|---|---|---|
| | **0 - 5** | **5 - 15** | **15 - 60** | **60 +** |
| Health centres | **19.3%** | 14.6% | 13.2% | 9.5% |
| Public hospitals | **9.3%** | 6.8% | 8.8% | 8.2% |
| Private hospitals | 0.6% | 0.6% | **1.1%** | 0.7% |
| Private clinics | **22.7%** | 21.5% | 20.0% | 17.0% |
| Private pharmacies and drug stores | 30.0% | **34.1%** | 30.5% | 27.8% |
| Home care | 13.2% | 18.6% | 19.7% | **29.3%** |
| Others | 4.9% | 3.7% | 6.8% | **7.6%** |

Note: Pearson chi2(18) = 194.9627 Pr = 0.000

Figure 5: Choice of providers by economic quintile (in %) - Source: CDHS 2005

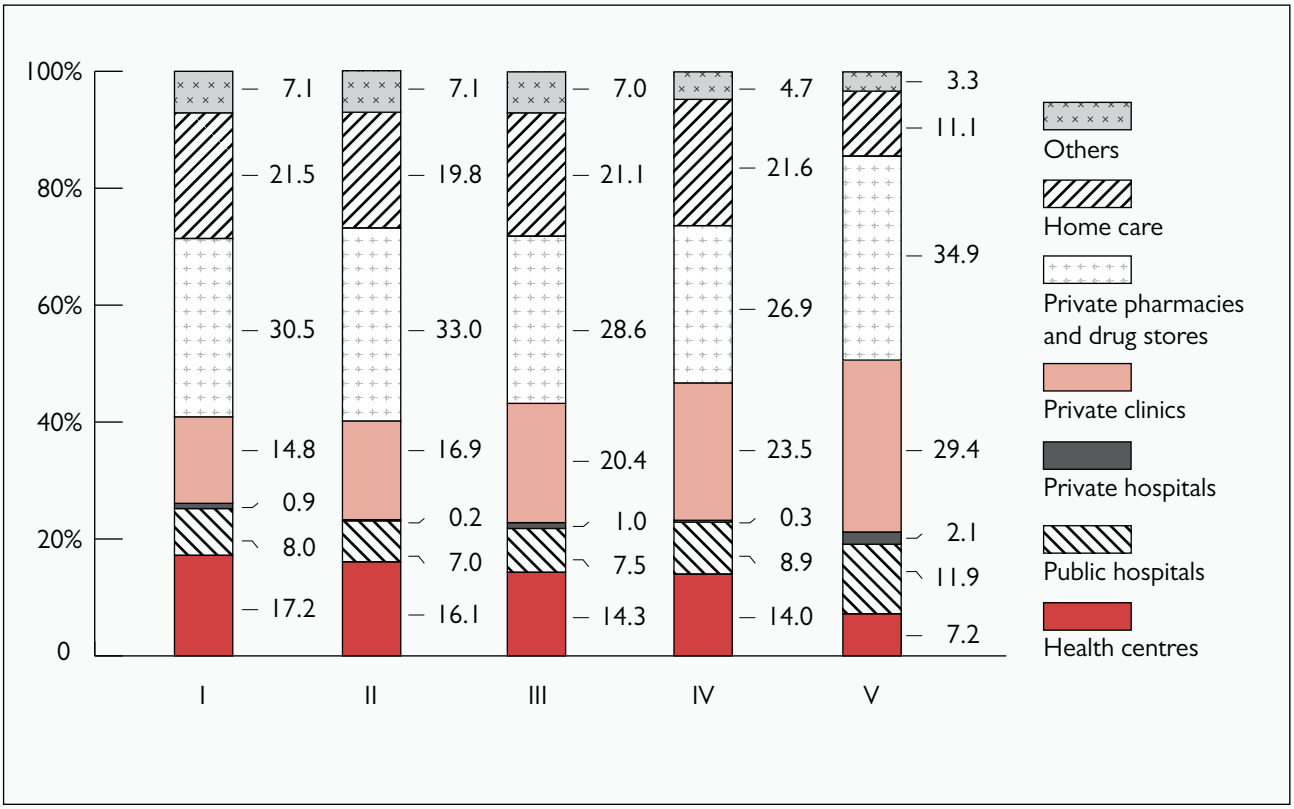



Table 17. Choice of providers for the first care-seeking visit by economic quintile - Source: CDHS 2005

| | Economic quintile | | | | |
|---|---|---|---|---|---|
| | I | II | III | IV | V |
| Health centres | 17.2% | 16.1% | 14.3% | 14.0% | 7.2% |
| Public hospitals | 8.0% | 7.0% | 7.5% | 8.9% | 11.9% |
| Private hospitals | 0.9% | 0.2% | 1.0% | 0.3% | 2.1% |
| Private clinics | 14.8% | 16.9% | 20.4% | 23.5% | 29.4% |
| Private pharmacies and drug stores | 30.5% | 33.0% | 28.6% | 26.9% | 34.9% |
| Home care | 21.5% | 19.8% | 21.1% | 21.6% | 11.1% |
| Others | 7.1% | 7.1% | 7.0% | 4.7% | 3.3% |

Note: Pearson chi2(24) = 406.3288 Pr = 0.000

Figure 6: Choice of providers by economic quintile [in %] - Source: CDHS 2005

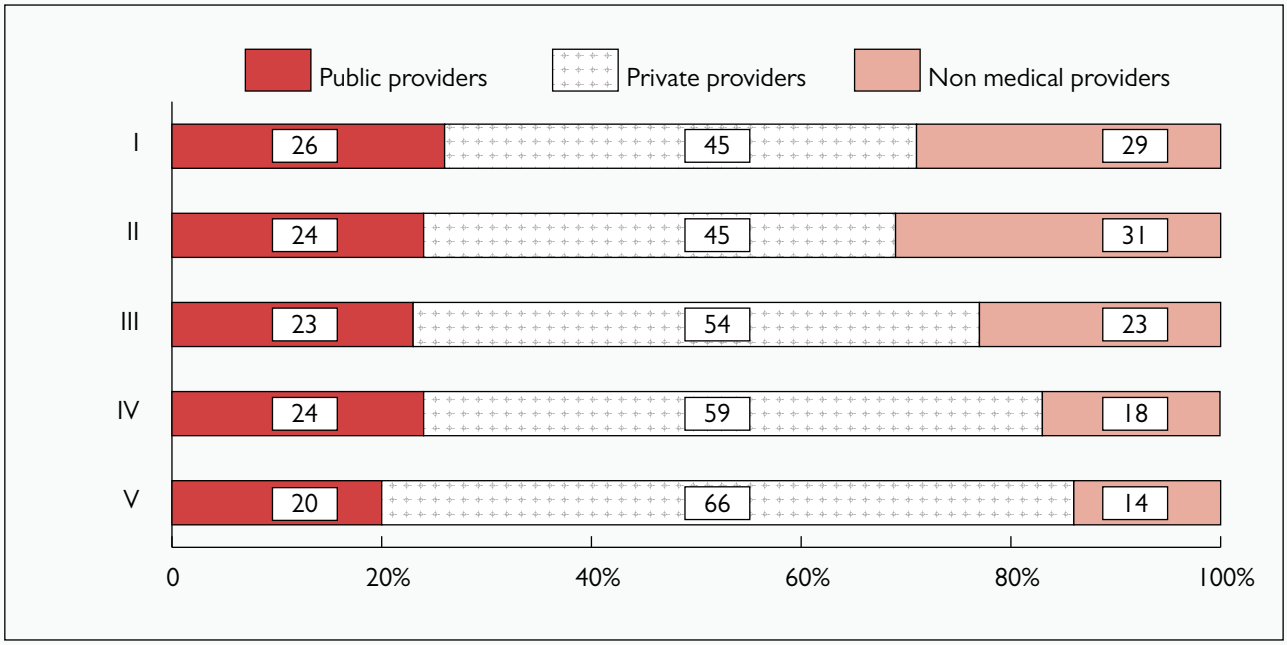



Table 18. Regression estimates for mlogit model of provider choice - Source: CDHS 2005

| | Public Hospital | | Private Hospital | | Private Clinic | | Drug Store | | Home care | | Others | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef | P>z | Coef | P>z | Coef | P>z | Coef | P>z | Coef | P>z | Coef | P>z |
| Male | 0.06 | 0.540 | 0.44 | 0.060 | **0.16** | **0.030** | **0.22** | **0.000** | **0.14** | **0.050** | **0.19** | **0.050** |
| Aged 5 - 15 | -0.02 | 0.890 | 0.21 | 0.640 | 0.06 | 0.550 | **0.40** | **0.000** | **0.42** | **0.000** | **0.04** | **0.780** |
| Aged 15 - 60. | 0.14 | 0.230 | **0.74** | **0.030** | 0.02 | 0.860 | **0.45** | **0.000** | **0.55** | **0.000** | **0.52** | **0.000** |
| Aged 60 + | 0.19 | 0.300 | 0.45 | 0.370 | 0.07 | 0.620 | **0.66** | **0.000** | **1.20** | **0.000** | **0.91** | **0.000** |
| 2nd Quintile (II) | 0.05 | 0.730 | -0.59 | 0.190 | 0.03 | 0.800 | 0.00 | 0.970 | -0.08 | 0.400 | -0.13 | 0.320 |
| 3rd Quintile (III) | 0.12 | 0.390 | 0.52 | 0.130 | **0.32** | **0.000** | -0.01 | 0.910 | 0.06 | 0.540 | 0.02 | 0.860 |
| 4th Quintile (IV) | **0.39** | **0.010** | -0.27 | 0.530 | **0.54** | **0.000** | -0.02 | 0.840 | 0.21 | 0.060 | **-0.35** | **0.030** |
| 5th Quintile (V) | **1.21** | **0.000** | **1.45** | **0.000** | **1.50** | **0.000** | **0.73** | **0.000** | **0.48** | **0.010** | 0.03 | 0.880 |
| Moderately ill | **-1.31** | **0.000** | **-1.38** | **0.000** | **-0.42** | **0.000** | **0.60** | **0.000** | **-0.40** | **0.000** | **-0.34** | **0.020** |
| Slightly ill | **-2.81** | **0.000** | **-2.87** | **0.000** | **-0.98** | **0.000** | **1.26** | **0.000** | **-0.79** | **0.000** | **-0.64** | **0.000** |
| Household size | 0.01 | 0.640 | **0.14** | **0.000** | 0.00 | 0.950 | 0.03 | 0.070 | 0.01 | 0.640 | 0.03 | 0.120 |
| Head Prim Ed | 0.04 | 0.730 | 0.28 | 0.390 | **0.22** | **0.020** | 0.05 | 0.510 | 0.14 | 0.120 | 0.03 | 0.780 |
| Head Sec Ed | -0.03 | 0.830 | 0.13 | 0.730 | **0.40** | **0.000** | -0.09 | 0.400 | -0.02 | 0.850 | -0.18 | 0.270 |
| Head male | -0.01 | 0.910 | 0.00 | 1.000 | 0.08 | 0.400 | 0.16 | 0.060 | 0.10 | 0.320 | 0.00 | 0.990 |
| Other rural | **-1.81** | **0.000** | **-2.50** | **0.000** | **-1.15** | **0.000** | **-1.16** | **0.000** | -0.23 | 0.540 | **-0.85** | **0.050** |
| Other urban | **-1.47** | **0.000** | **-1.49** | **0.000** | **-1.14** | **0.000** | -0.49 | 0.130 | -0.20 | 0.610 | -0.57 | 0.190 |
| Constant | **2.06** | **0.000** | -1.21 | 0.190 | **1.13** | **0.000** | -0.03 | 0.930 | -0.03 | 0.950 | -0.22 | 0.680 |

Note: health centre use as a reference provider category

# 2. Health care spending

## 2.1 Out-of-pocket expenditure

### Average out-of-pocket expenditure per person

The average Cambodian spent 6,754 Riels in a month in 2005. The variation is, however, very large with standard error of 150. Of this amount, 5,114 Riels were for the first visit and 1,271 and 368 riels for the 2nd and 3rd visits respectively.

The average spending per individual who sought care during the survey period (one month) was 48,538 Riels (s.e. 988). If only those with positive health spending were included in the calculation, the average spending per individual would be 51,067 Riels (s.e. 1,035). Of those making a first visit, 5.7% paid nothing (i.e. zero OOP).

### Average out-of-pocket expenditure per capita by subgroup

Figure 7 and Table 19 and 20 show average OOP per capita for various population subgroups. Male individuals have lower OOP on average than female individuals at 6,051 (s.e. 206) and 7,395 (s.e. 217) Riels respectively. The elderly aged 60 and above have much higher average OOP per capita than other age groups. There is also a level OOP gradient across the economic quintile with higher level for higher economic status.

### Average out-of-pocket expenditure per visit by provider category (how much spent per visit)

Those who reported serious illness had higher average OOP per person than those reporting moderate or slight illness (Table 21). The average OOP per visit by provider category and its standard error are shown in Table 22. Note the much higher amounts per visit at private hospitals than at other provider categories followed by public hospitals, private clinics, and home care/visit. The average OOP expenditure per visit at health centres is lowest, followed by pharmacies and drug stores. Health spending at private facilities is over 50% higher than at public facilities (Table 23).

### Average out-of-pocket expenditure per household

The average household spent 33,833 Riels (s.e. 797) a month on health in in 2005. Spending at private health facilities is a major share of overall average health spending per household especially for higher quintiles (Figure 8 and Table 24). Spending at private clinics and for care at home constituted major proportions of average OOP per household (Figure 9 and Table 25). The majority of average household OOP was for member(s) aged 5 to 60 (Table 26).

## 2.2 Determinants of positive health spending and determinants of level of health spending

Table 27 shows the results from two models in order to explore the determinants of individuals with positive health spending and the determinants of OOP expenditure level

Being slightly ill involves a lower chance of having positive OOP and lower OOP levels . On the contrary, being in the higher quintiles contributes to a higher chance of having positive OOP and higher OOP levels . The household head's education at primary or higher level is a significant determinant of having positive OOP but has no significant effect on OOP level. Living in Phnom Penh has a significant positive effect on of health spending level but not on the chance of having positive OOP.

Interestingly, having a male head of household entails a higher chance of having positive health spending but also contributes to lower level of health spending. On the contrary, being in the non-child category entails a lower chance of having positive OOP but contributes to higher OOP levels.

## 2.3 Transport costs for health care related utilisation

On average, a person spent 667 Riels a month on transport to seek care. Among these, the 1st, 2nd, and 3rd visits cost 472, 146, and 49 Riels respectively. When calculated per visit, the average transport cost for care-seeking is around 3,000-3,600 Riels per visit or approximately one tenth of average OOP per visit (Table 28). When analysed by economic quintile (Table 29), the average transport cost for the first visit is relatively similar across quintiles. However, the difference between rich and poor quintiles is much higher for the 3rd visit. There are also big differences across provider type (Table 30), with the highest transport cost for public and private hospitals and lowest costs for home care and health centres.

At household level, average transport cost is at 3,342 per household per month. This is 9.9% of average OOP per household. Statistics by quintile are provided in Table 31.

Figure 7: Average annual out-of-pocket expenditure per capita by sub-group [in Riels] - Source CDHS 2005

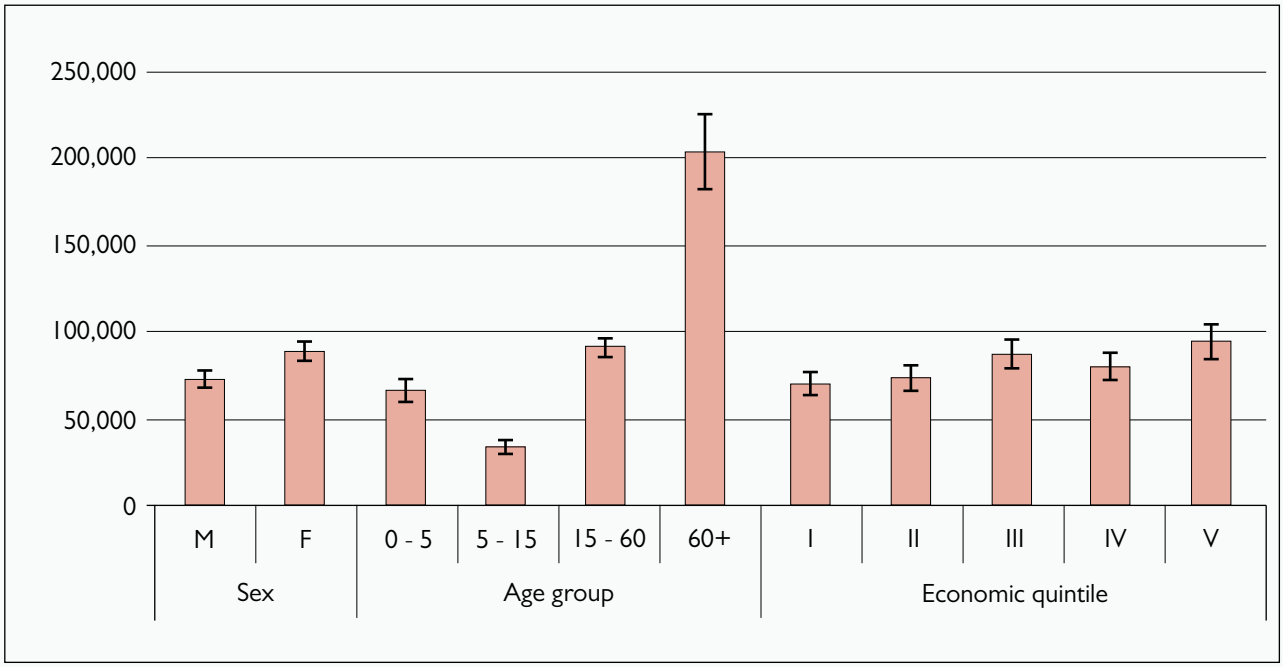



Table 19. Average out-of-pocket expenditure per capita by subgroup [in Riels] - Source: CDHS 2005

| | By Sex | | By age group | | | |
|---|---|---|---|---|---|---|
| | M | F | 0 - 5 | 5 - 15 | 15 - 60 | 60+ |
| Average OOP per capita | 6,051 | 7,395 | 5,520 | 2,784 | 7,649 | 16,996 |
| (s.e.) | (206) | (217) | (282) | (168) | (228) | (912) |

Table 20. Average out-of-pocket expenditure per capita and average OOP per household by economic quintile [in Riels] - Source: CDHS 2005

| | Economic quintile | | | | |
|---|---|---|---|---|---|
| | I | II | III | IV | V |
| Average OOP per capita | 5,824 | 6,137 | 7,265 | 6,650 | 7,885 |
| (s.e.) | (261) | (307) | (335) | (345) | (423) |
| Average OOP per household | 28,438 | 29,834 | 35,608 | 34,474 | 41,328 |
| (s.e.) | (1,373) | (1,578) | (1,715) | (1,916) | (2,314) |

Table 21. Average out-of-pocket expenditure per capita by degree of illness [in Riels] - Source: CDHS 2005

| | Mean | (s.e.) |
|---|---|---|
| Serious | 138,135 | (4,816) |
| Moderate | 51,239 | (1,321) |
| Slight | 11,801 | (443) |

Figure 8: Average out-of-pocket expenditure per household by provider type and economic quintile (in Riels) - Source: CDHS 2005

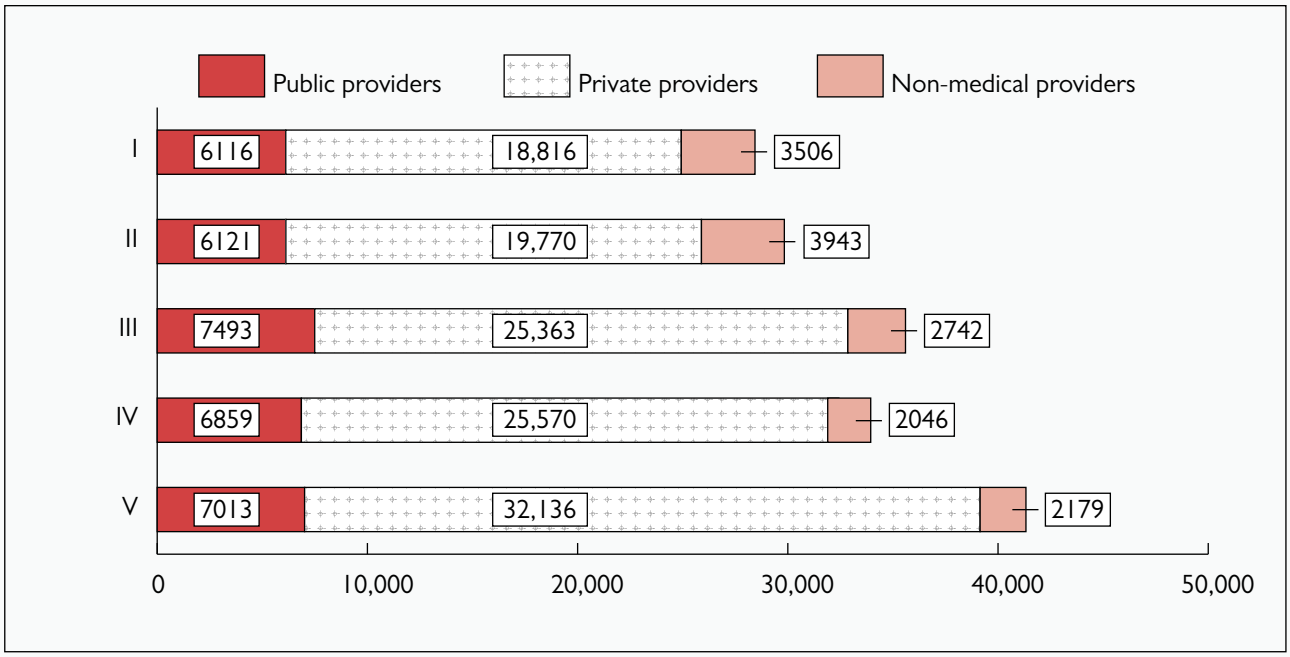



Table 22. Average out-of-pocket expenditure per visit by provider category (in Riels) - Source: CDHS 2005

| | 1st visit | | 2nd visit | | 3rd visit | |
|---|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | Mean | (s.e.) |
| Health centres | 7,628 | (790) | 2,830 | (456) | 2,710 | (938) |
| Public hospitals | 74,648 | (4,109) | 65,879 | (7,718) | 43,161 | (9,301) |
| Private hospitals | 152,471 | (15,936) | 185,885 | (26,569) | 178,824 | (45,783) |
| Private clinics | 59,849 | (2,012) | 50,226 | (3,364) | 41,477 | (5,478) |
| Private pharmacies and drug stores | 11,615 | (423) | 8,850 | (671) | 9,012 | (1,169) |
| Home care | 50,671 | (1,761) | 43,598 | (3,717) | 28,251 | (3,965) |
| Others | 40,418 | (3,062) | 54,007 | (7,301) | 49,452 | (10,994) |

Table 23. Average out-of-pocket expenditure per visit by provider category (in Riels) - Source: CDHS 2005

| | 1st visit | | 2nd visit | | 3rd visit | |
|---|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | Mean | (s.e.) |
| Public providers | 32,171 | (1,624) | 26,477 | (2,963) | 14,971 | (3,086) |
| Private providers | 50,491 | (1,112) | 43,238 | (2,070) | 32,660 | (2,897) |
| Non-medical providers | 10,780 | (598) | 13,939 | (1,803) | 13,493 | (2,475) |

Table 24. Average out-of-pocket per household by provider type and economic quintile (in Riels) - Source: CDHS 2005

| | Economic quintile | | | | | All |
|---|---|---|---|---|---|---|
| | I | II | III | IV | V | |
| Public providers | 6,116 | 6,121 | 7,493 | 6,859 | 7,013 | 6,714 |
| Private providers | 18,816 | 19,770 | 25,363 | 25,570 | 32,136 | 24,214 |
| Non-medical providers | 3,506 | 3,943 | 2,742 | 2,046 | 2,179 | 2,903 |
| **Total** | **28,438** | **29,834** | **35,598** | **34,475** | **41,328** | **33,831** |

Figure 9: Average out-of-pocket expenditure per household by provider category and economic quintile [in Riels] – Source: CDHS 2005

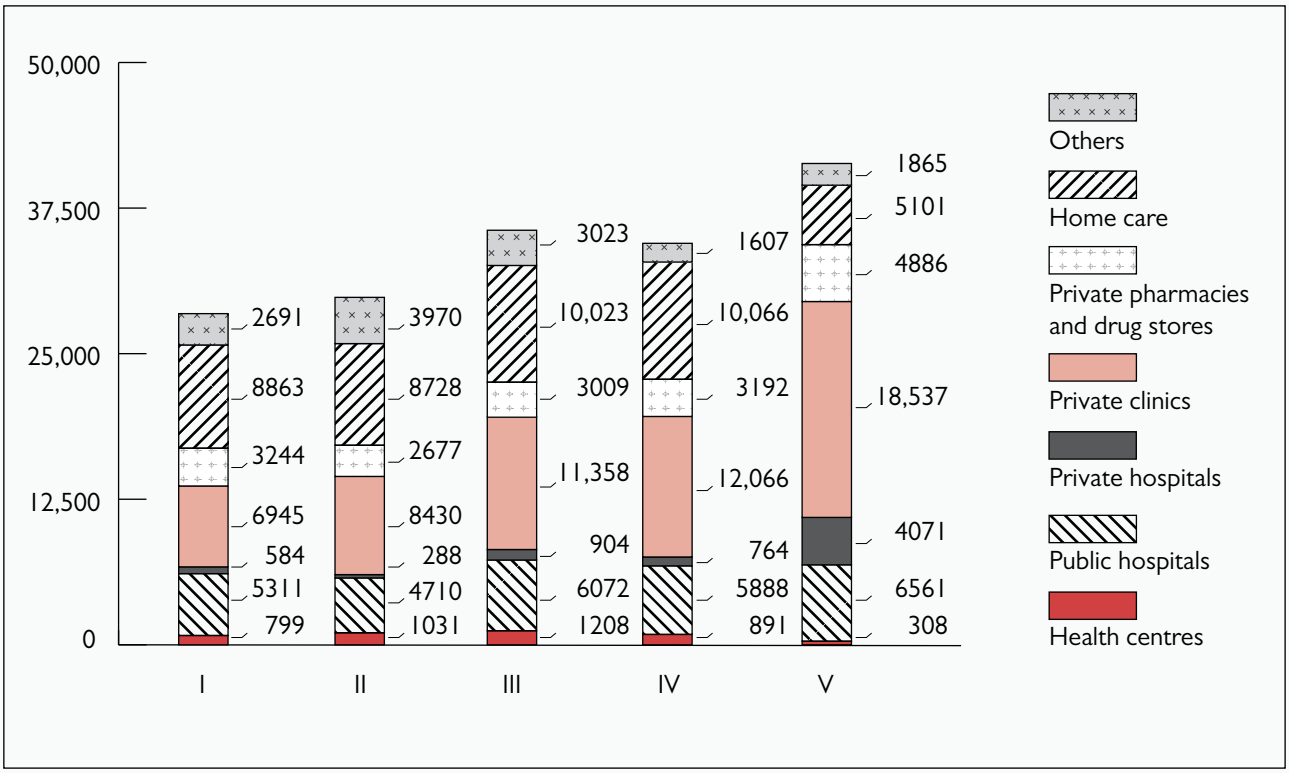



Table 25. Share of average OOP per household by provider category and economic quintile [in Riels] – Source: CDHS 2005

| | Economic quintile | | | | | All |
|---|---|---|---|---|---|---|
| | I | II | III | IV | V | |
| Health centres | 799 | 1,031 | 1,208 | 891 | 308 | 854 |
| Public hospitals | 5,311 | 4,710 | 6,072 | 5,888 | 6,561 | 5,695 |
| Private hospitals | 584 | 288 | 904 | 764 | 4,071 | 1,294 |
| Private clinics | 6,945 | 8,430 | 11,358 | 12,066 | 18,537 | 11,370 |
| Private pharmacies and drug stores | 3,244 | 2,677 | 3,009 | 3,192 | 4,886 | 3,385 |
| Home care | 8,863 | 8,728 | 10,023 | 10,066 | 5,101 | 8,581 |
| Others | 2,691 | 3,970 | 3,023 | 1,607 | 1,865 | 2,653 |
| **All** | **28,437** | **29,834** | **35,597** | **34,474** | **41,329** | **33,832** |

Table 26. Average out-of-pocket per household by age group of spenders and household economic quintile [in Riels] – Source: CDHS 2005

| | Economic quintile | | | | | All |
|---|---|---|---|---|---|---|
| | I | II | III | IV | V | |
| Aged 0 – 5 | 4,058 | 3,029 | 2,529 | 3,033 | 2,613 | 3,058 |
| Aged 5 – 65 | 22,139 | 22,686 | 28,412 | 26,637 | 33,965 | 26,674 |
| Aged 65 + | 2,241 | 4,119 | 4,667 | 4,803 | 4,750 | 4,100 |
| **All** | **28,438** | **29,834** | **35,608** | **34,473** | **41,328** | **33,832** |

Table 27. Estimates from regression models on positive health spending and health spending levels – Source: CDHS 2005

| | Positive health spending | | Level of health spending | |
|---|---|---|---|---|
| | Coef. | P>z | Coef. | P>z |
| Other rural | 0.17 | 0.660 | **-0.80** | **0.000** |
| Other urban | 0.24 | 0.530 | **-0.75** | **0.000** |
| Household size | 0.03 | 0.250 | 0.01 | 0.400 |
| Head Prim Edu | **0.61** | **0.000** | -0.05 | 0.300 |
| Head Sec Edu | **1.08** | **0.000** | -0.07 | 0.230 |
| Head male | **0.36** | **0.020** | **-0.10** | **0.030** |
| Aged 5 to 15 | -0.02 | 0.890 | 0.07 | 0.090 |
| Aged 15 to 60 | -0.27 | 0.040 | **0.45** | **0.000** |
| Aged 60+ | **-0.52** | **0.010** | **0.62** | **0.000** |
| Male | 0.03 | 0.740 | 0.03 | 0.210 |
| 2nd Quintile (II) | **0.84** | **0.000** | 0.06 | 0.230 |
| 3rd Quintile (III) | **0.93** | **0.000** | **0.22** | **0.000** |
| 4th Quintile (IV) | **1.21** | **0.000** | **0.32** | **0.000** |
| 5th Quintile (V) | **1.50** | **0.000** | **0.67** | **0.000** |
| Moderately ill | -0.33 | 0.070 | **-1.20** | **0.000** |
| Slightly ill | **-0.96** | **0.000** | **-2.46** | **0.000** |
| Constant | **2.53** | **0.000** | **11.36** | **0.000** |

Note:

Coef, coefficient;

head prim education, head of household with primary level education;

head sec education, head of household with secondary level education.

Table 28. Average transport costs per visit [in Riels] - Source: CDHS 2005

| | 1st visit | | 2nd visit | | 3rd visit | |
|---|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | Mean | (s.e.) |
| Average TOOP per visit | 3,391 | (124) | 3,602 | (286) | 3,095 | (428) |
| Average OOP per visit | 36,756 | (727) | 31,275 | (1,347) | 23,271 | (1,755) |
| toop % (toop+oop) | 8.4% | | 10.3% | | 11.7% | |

Table 29. Average transport cost per visit by quintile [in Riels] - Source: CDHS 2005

| | 1st visit | | 2nd visit | | 3rd visit | |
|---|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | Mean | (s.e.) |
| 1st Quintile (I) | 3,051 | (201) | 3,007 | (518) | 1,327 | (240) |
| 2nd Quintile (II) | 2,939 | (238) | 3,066 | (518) | 2,764 | (843) |
| 3rd Quintile (III) | 3,477 | (264) | 3,840 | (792) | 2,591 | (806) |
| 4th Quintile (IV) | 3,917 | (372) | 3,866 | (593) | 3,164 | (698) |
| 5th Quintile (V) | 3,739 | (337) | 4,589 | (743) | 7,045 | (2,050) |

Table 30. Average transport cost per person per visit by type of provider [in Riels] - Source: CDHS 2005

| | 1st visit | | 2nd visit | | 3rd visit | |
|---|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | Mean | (s.e.) |
| Health centres | 1,610 | (174) | 1,053 | (96) | 867 | (132) |
| Public hospitals | 16,134 | (929) | 18,738 | (2,732) | 15,543 | (4,554) |
| Private hospitals | 11,712 | (2,757) | 14,862 | (8,021) | 6,427 | (3,017) |
| Private clinics | 4,076 | (224) | 4,223 | (399) | 4,831 | (931) |
| Private pharmacies and drug stores | 1,044 | (50) | 1,056 | (93) | 812 | (87) |
| Home care | 827 | (89) | 579 | (96) | 635 | (167) |
| Others | 6,368 | (1,034) | 7,104 | (1,642) | 11,622 | (3,937) |

Table 31. Average transport cost per household in comparison to out-of-pocket per household by quintile - Source: CDHS 2005

| | OOP | | TOOP | | TOOP % |
|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | (TOOP+OOP) |
| 1st Quintile (I) | 28,438 | (1,373) | 3,060 | (216) | 9.7% |
| 2nd Quintile (II) | 29,834 | (1,578) | 3,089 | (284) | 9.4% |
| 3rd Quintile (III) | 35,608 | (1,715) | 3,609 | (328) | 9.2% |
| 4th Quintile (IV) | 34,474 | (1,916) | 3,754 | (372) | 9.8% |
| 5th Quintile (V) | 41,328 | (2,314) | 3,217 | (329) | 7.2% |
| **All** | **33,833** | **(797)** | **3,342** | **(137)** | **9.0%** |

# Results from the Cambodian Socio-Economic Surveys 2004 and 2007

## 1. Illness and health care-seeking behaviour

### 1.1 Illness

#### Incidence of illness over the Previous 4 weeks (Cambodian Socio-Economic Surveys)

On average, the incidence of illness in the previous 4 weeks (28 days) among the population in CSES 2004 and 2007 is 0.185 and 0.153 respectively. These are equivalent to approximately 185 and 153 per 1,000 population respectively (Table 32).

#### Reported type of illness

The shares of various types of illness in 2004 and 2007 do not differ widely. Among those reported ill over the previous 4 weeks, the common cold is the most common cause of illness at around one third in both 2004 and 2007. The second common cause is fever (one fifth) followed by headache or eye/ear pain (one ninth). Table 33 reports the shares of various key illness types in 2004 and 2007.

#### Those falling ill in the previous month: by gender, age group, and quintile

The average incidence of reported illness varies according to sex and age group for both 2004 and 2007 (Table 34). Females, young children (under five), and elderly (60 and over) demonstrate a higher incidence than their counterparts. The difference between economic quintiles is less prominent but the incidence of illness among the poorest quintile is lower than the other quintiles especially for 2007. When comparing 2004 and 2007, most population subgroups have lower incidence except young children (aged under 5).

### 1.2. Health care-seeking behaviour

#### Incidence of health care-seeking

Table 35 shows the health care-seeking statistics from the 2004 and 2007 surveys. About ninety percent of those reported ill in 2004 sought care in any form ranging from health provider visits to purchase of drugs and visits to monks or traditional healers. The number increased in 2007 to 91.5 percent. In both years, only a little more than half of all those reported ill visited health care providers.

The average number of outpatient visits per capita in the past 4 weeks was 53 per 1,000 population in 2004 and 47 per 1,000 population in 2007.

The average incidence of hospitalisation was 60 per 10,000 in 2004 and decreased to 57 per 10,000 population in 2007. Approximately thirty percent of those reportedly ill made outpatient visits. Around five to six percent of care-seeking episodes require hospitalisation. The average numbers of inpatient days were 6.07 and 5.67 days for 2004 and 2007 respectively.

#### Health care-seeking among population groups

When comparing male and female health care-seeking behaviour , males tend to seek care less than females though the difference is minimal (Table 36). Comparing the two surveys, health care-seeking incidence decreased in 2007 among males more than the changes among females.

When exploring across age groups, children under five and the elderly aged 60 and above demonstrated higher health care use than the other age groups (Table 37). The difference also increased over time as the incidence of health care use among these two groups increased in 2007. Worth noting is the over 40% increase in hospitalisation incidence in young children and the elderly and the over 80% increase in inpatient days of the elderly. The other two age groups had lower incidences of most types of health care-seeking behaviour in 2007 than 2004.

Across quintiles, poorer households sought care and used health care services (outpatient and hospitalisation) less than higher households (Table 38). However, the gaps in hospitalisation service decreased over time with significant increase in the incidence of hospitalisation and the average inpatient days in 2007 among the poorest quintiles.

When evaluating health care-seeking behaviour only among those reported ill, we see that the proportion seeking care increased over time in all population subgroups (Table 39 – 41). The proportion seeking medical care and outpatient visits also improved in almost all population subgroups except for those in the 3rd and 4th quintiles. The rate of hospitalisation among the ill became less unequal over time with a big increase in hospitalisation in the

Table 32. Average illness episode over the three surveys per capita - Source: CSES 2004 and 2007

| | 2004 | 2007 |
|---|---|---|
| Average illness episode per capita | 0.185 | 0.153 |
| (s.e.) | (0.0014) | (0.0027) |

Table 33. Percentage of illness episode by reported illness type - Source: CSES 2004 and 2007

| Illness Type | 2004 | 2007 |
|---|---|---|
| Common cold | 27.2% | 31.4% |
| Fever | 19.3% | 17.1% |
| Headache or eye/ear pain | 11.0% | 11.5% |
| Selected Non-Communicable Diseases | 6.9% | 7.8% |
| Selected infectious diseases | 6.3% | 5.2% |
| Severe respiratory illness | 6.1% | 5.2% |
| Stomach ache | 4.2% | 3.6% |
| Diarrhoea | 3.7% | 4.3% |
| Back pain | 3.1% | 4.1% |
| Others | 12.0% | 9.8% |

Table 34. Average incidence of illness by gender, age group, and economic quintile (individual weighted) - Source: CSES 2004 and 2007

| | 2004 | | 2007 | |
|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) |
| Sex | | | | |
| Male | 0.168 | (0.0020) | 0.131 | (0.0037) |
| Female | 0.201 | (0.0020) | 0.174 | (0.0040) |
| Age group | | | | |
| Aged 0 to 5 | 0.264 | (0.0052) | 0.295 | (0.0115) |
| Aged 5 to 15 | 0.126 | (0.0024) | 0.109 | (0.0049) |
| Aged 15 to 60 | 0.177 | (0.0018) | 0.127 | (0.0032) |
| Aged 60 and over | 0.395 | (0.0072) | 0.341 | (0.0141) |
| By economic quintile | | | | |
| 1st Quintile (I) | 0.162 | (0.0031) | 0.114 | (0.0062) |
| 2nd Quintile (II) | 0.182 | (0.0032) | 0.153 | (0.0069) |
| 3rd Quintile (III) | 0.189 | (0.0032) | 0.146 | (0.0066) |
| 4th Quintile (IV) | 0.200 | (0.0033) | 0.184 | (0.0068) |
| 5th Quintile (V) | 0.190 | (0.0030) | 0.165 | (0.0048) |

Table 35. Health care-seeking in the previous 4 weeks - Source: CSES 2004 and 2007

| | 2004 | 2007 |
|---|---|---|
| Share of all reported ill seeking care/treatment | 90.30% | 91.50% |
| (s.e.) | (0.25%) | (0.54%) |
| Share of all reported ill using medical providers | 52.20% | 55.20% |
| (s.e.) | (0.42%) | (0.97%) |
| Number of outpatient visit per capita | 0.05 | 0.05 |
| (s.e.) | (0.0008) | (0.0016) |
| Number of outpatient visit per illness | 0.29 | 0.3 |
| (s.e.) | (0.0038) | (0.0090) |
| Incidence of hospitalisation among all population | 0.01 | 0.01 |
| (s.e.) | (0.0003) | (0.0006) |
| % of hospitalisation among all medical care-seeking episodes | 5.30% | 5.80% |
| (s.e.) | (0.26%) | (0.59%) |
| Number of inpatient days per admission | 6.07 | 5.67 |
| (s.e.) | (0.287) | (0.607) |

Table 36. Incidence of health care-seeking and hospitalisation among all population by sex - Source: CSES 2004 and 2007

| | 2004 | | 2007 | | Change % |
|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | |
| Female | | | | | |
| Seeking care | 0.182 | (0.0020) | 0.166 | (0.0039) | -9% |
| Use medical care | 0.105 | (0.0016) | 0.098 | (0.0031) | -7% |
| Hospitalised | 0.006 | (0.0004) | 0.007 | (0.0009) | 9% |
| Inpatient days | 0.036 | (0.0034) | 0.040 | (0.0072) | 13% |
| Outpatient visits | 0.059 | (0.0012) | 0.055 | (0.0024) | -8% |
| Male | | | | | |
| Seeking care | 0.151 | (0.0019) | 0.121 | (0.0036) | -20% |
| Use medical care | 0.087 | (0.0015) | 0.071 | (0.0028) | -19% |
| Hospitalised | 0.006 | (0.0004) | 0.005 | (0.0008) | -19% |
| Inpatient days | 0.037 | (0.0035) | 0.026 | (0.0062) | -28% |
| Outpatient visits | 0.047 | (0.0011) | 0.039 | (0.0021) | -17% |

Table 37. Incidence of health care-seeking and hospitalisation among all population by age groups - Source: CSES 2004 and 2007

| | 2004 | | 2007 | | Change % |
|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | |
| Aged 0 - 5 | | | | | |
| Seeking care | 0.251 | (0.0051) | 0.291 | (0.0114) | 16% |
| Use medical care | 0.159 | (0.0043) | 0.190 | (0.0099) | 19% |
| Hospitalised | 0.012 | (0.0013) | 0.017 | (0.0032) | 44% |
| Inpatient days | 0.047 | (0.0068) | 0.056 | (0.0185) | 20% |
| Outpatient visits | 0.095 | (0.0034) | 0.108 | (0.0078) | 13% |
| Aged 5 - 15 | | | | | |
| Seeking care | 0.114 | (0.0023) | 0.102 | (0.0048) | -11% |
| Use medical care | 0.065 | (0.0018) | 0.059 | (0.0037) | -9% |
| Hospitalised | 0.003 | (0.0004) | 0.002 | (0.0008) | -11% |
| Inpatient days | 0.019 | (0.0034) | 0.012 | (0.0045) | -37% |
| Outpatient visits | 0.034 | (0.0013) | 0.034 | (0.0029) | 1% |
| Aged 15 - 60 | | | | | |
| Seeking care | 0.158 | (0.0018) | 0.119 | (0.0031) | -25% |
| Use medical care | 0.089 | (0.0014) | 0.066 | (0.0024) | -26% |
| Hospitalised | 0.006 | (0.0004) | 0.004 | (0.0006) | -28% |
| Inpatient days | 0.038 | (0.0033) | 0.026 | (0.0049) | -33% |
| Outpatient visits | 0.049 | (0.0010) | 0.036 | (0.0018) | -27% |
| Aged 60 + | | | | | |
| Seeking care | 0.343 | (0.0070) | 0.320 | (0.0139) | -7% |
| Use medical care | 0.197 | (0.0058) | 0.202 | (0.0119) | 2% |
| Hospitalised | 0.011 | (0.0015) | 0.015 | (0.0037) | 44% |
| Inpatient days | 0.082 | (0.0168) | 0.153 | (0.0479) | 86% |
| Outpatient visits | 0.104 | (0.0045) | 0.107 | (0.0092) | 3% |

Table 38. Incidence of health care-seeking and hospitalisation among all population by economic quintile - Source: CSES 2004 and 2007

| | 2004 | | 2007 | | Change % |
|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | |
| 1st Quintile (I) | | | | | |
| Seeking care | 0.135 | (0.0029) | 0.104 | (0.0060) | -23% |
| Use medical care | 0.070 | (0.0022) | 0.056 | (0.0045) | -21% |
| Hospitalised | 0.002 | (0.0004) | 0.004 | (0.0012) | 93% |
| Inpatient days | 0.009 | (0.0025) | 0.011 | (0.0052) | 27% |
| Outpatient visits | 0.040 | (0.0017) | 0.034 | (0.0035) | -16% |
| 2nd Quintile (II) | | | | | |
| Seeking care | 0.161 | (0.0031) | 0.142 | (0.0067) | -12% |
| Use medical care | 0.082 | (0.0023) | 0.073 | (0.0050) | -10% |
| Hospitalised | 0.003 | (0.0005) | 0.004 | (0.0013) | 28% |
| Inpatient days | 0.016 | (0.0035) | 0.018 | (0.0071) | 13% |
| Outpatient visits | 0.047 | (0.0018) | 0.046 | (0.0040) | 0% |
| 3rd Quintile (III) | | | | | |
| Seeking care | 0.171 | (0.0031) | 0.138 | (0.0064) | -19% |
| Use medical care | 0.088 | (0.0023) | 0.068 | (0.0047) | -23% |
| Hospitalised | 0.004 | (0.0005) | 0.004 | (0.0011) | 5% |
| Inpatient days | 0.019 | (0.0038) | 0.026 | (0.0114) | 36% |
| Outpatient visits | 0.050 | (0.0018) | 0.035 | (0.0034) | -30% |
| 4th Quintile (IV) | | | | | |
| Seeking care | 0.187 | (0.0032) | 0.173 | (0.0066) | -7% |
| Use medical care | 0.114 | (0.0026) | 0.103 | (0.0053) | -10% |
| Hospitalised | 0.008 | (0.0007) | 0.007 | (0.0015) | -15% |
| Inpatient days | 0.044 | (0.0053) | 0.038 | (0.0098) | -14% |
| Outpatient visits | 0.065 | (0.0020) | 0.060 | (0.0042) | -8% |
| 5th Quintile (V) | | | | | |
| Seeking care | 0.179 | (0.0030) | 0.161 | (0.0048) | -10% |
| Use medical care | 0.127 | (0.0026) | 0.117 | (0.0042) | -8% |
| Hospitalised | 0.012 | (0.0009) | 0.009 | (0.0012) | -27% |
| Inpatient days | 0.092 | (0.0087) | 0.067 | (0.0127) | -27% |
| Outpatient visits | 0.064 | (0.0019) | 0.057 | (0.0030) | -11% |

Table 39. Percent of health care-seeking and hospitalisation among those reported ill by sex - Source: CSES 2004 and 2007

| | 2004 | | 2007 | | Change % |
|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | |
| Female | | | | | |
| Seeking care | 90.6% | (0.33%) | 92.1% | (0.68%) | 2% |
| Use medical care | 52.4% | (0.56%) | 56.4% | (1.25%) | 8% |
| Hospitalised | 3.1% | (0.19%) | 3.9% | (0.49%) | 26% |
| Inpatient days | 17.8% | (1.65%) | 23.2% | (4.11%) | 30% |
| Outpatient visits | 29.5% | (0.51%) | 31.4% | (1.17%) | 7% |
| Male | | | | | |
| Seeking care | 89.9% | (0.39%) | 90.7% | (0.90%) | 1% |
| Use medical care | 52.0% | (0.64%) | 54.3% | (1.54%) | 4% |
| Hospitalised | 3.4% | (0.23%) | 3.6% | (0.58%) | 4% |
| Inpatient days | 21.9% | (2.06%) | 20.2% | (4.84%) | -8% |
| Outpatient visits | 27.9% | (0.58%) | 29.8% | (1.42%) | 7% |

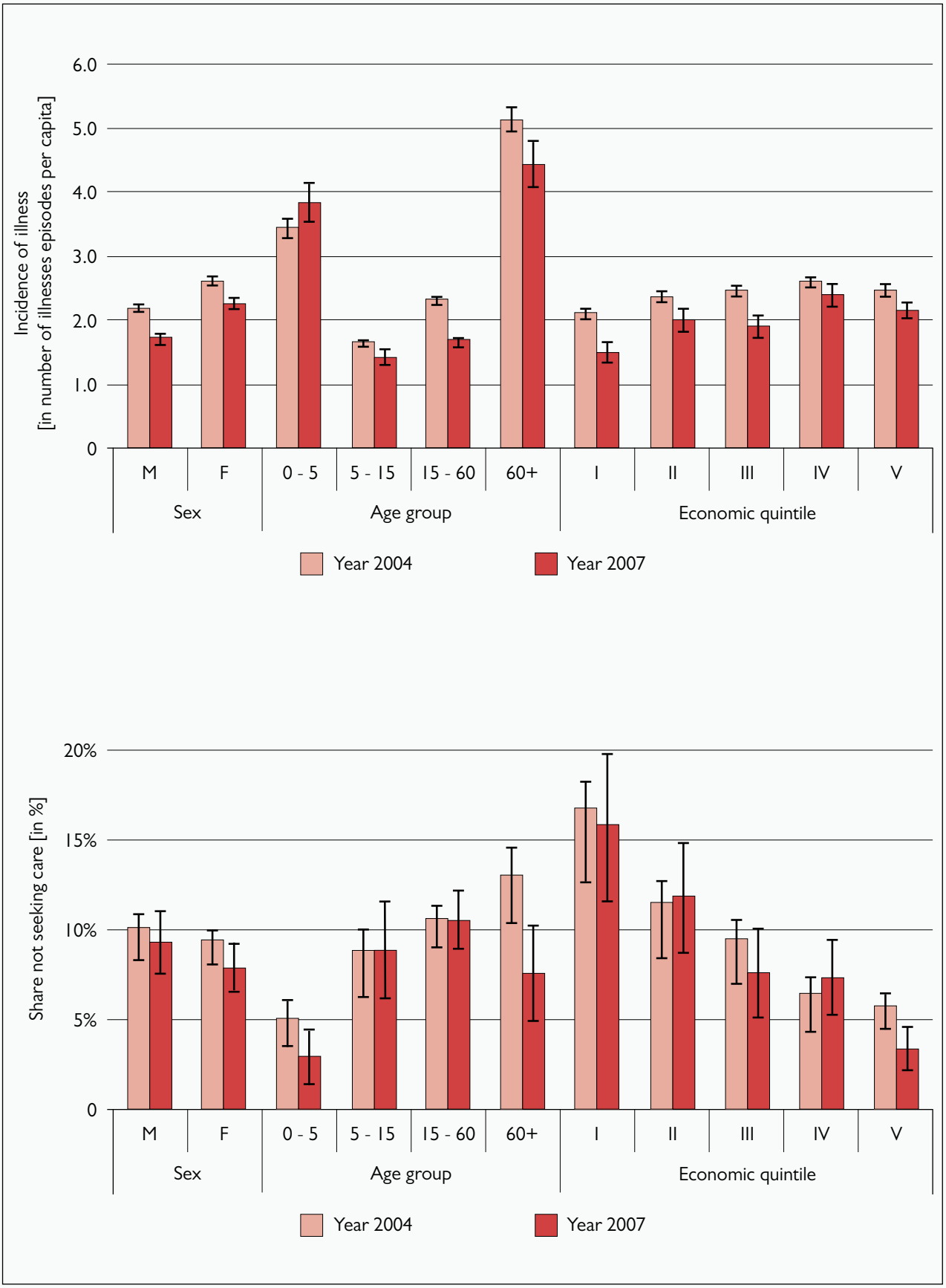
Table 40. Incidence of health care-seeking and hospitalisation among those reported ill by age groups - Source: CSES 2004 and 2007

| | 2004 | | 2007 | | Change % |
|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | |
| Aged 0 - 5 | | | | | |
| Seeking care | 94.9% | (0.50%) | 97.1% | (0.79%) | 2% |
| Use medical care | 60.3% | (1.11%) | 64.2% | (2.23%) | 7% |
| Hospitalised | 4.4% | (0.47%) | 5.6% | (1.08%) | 29% |
| Inpatient days | 17.9% | (2.54%) | 19.1% | (6.28%) | 7% |
| Outpatient visits | 36.0% | (1.09%) | 36.5% | (2.24%) | 1% |
| Aged 5 - 15 | | | | | |
| Seeking care | 91.1% | (0.58%) | 91.1% | (1.38%) | 0% |
| Use medical care | 51.4% | (1.02%) | 53.7% | (2.41%) | 4% |
| Hospitalised | 2.2% | (0.30%) | 2.2% | (0.72%) | 3% |
| Inpatient days | 15.0% | (2.74%) | 10.8% | (4.14%) | -28% |
| Outpatient visits | 26.9% | (0.90%) | 31.2% | (2.24%) | 16% |
| Aged 15 - 60 | | | | | |
| Seeking care | 89.3% | (0.35%) | 89.4% | (0.84%) | 0% |
| Use medical care | 50.5% | (0.57%) | 51.9% | (1.37%) | 3% |
| Hospitalised | 3.3% | (0.20%) | 3.3% | (0.49%) | 0% |
| Inpatient days | 21.4% | (1.84%) | 20.0% | (3.87%) | -7% |
| Outpatient visits | 27.8% | (0.51%) | 28.3% | (1.23%) | 2% |
| Aged 60 + | | | | | |
| Seeking care | 86.9% | (0.78%) | 92.4% | (1.36%) | 6% |
| Use medical care | 50.0% | (1.16%) | 59.2% | (2.52%) | 18% |
| Hospitalised | 2.7% | (0.38%) | 4.5% | (1.07%) | 67% |
| Inpatient days | 20.8% | (4.21%) | 44.9% | (14.01%) | 116% |
| Outpatient visits | 26.3% | (1.02%) | 31.3% | (2.38%) | 19% |

Table 41. Incidence of health care-seeking and hospitalisation among those reported ill by economic quintile - Source: CSES 2004 and 2007

| | 2004 | | 2007 | | Change % |
|---|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) | |
| 1st Quintile (I) | | | | | |
| Seeking care | 83.3% | (0.78%) | 84.2% | (2.11%) | 1% |
| Use medical care | 43.5% | (1.04%) | 48.5% | (2.90%) | 12% |
| Hospitalised | 1.1% | (0.22%) | 3.1% | (1.01%) | 173% |
| Inpatient days | 5.3% | (1.54%) | 9.5% | (4.53%) | 80% |
| Outpatient visits | 24.7% | (0.91%) | 29.4% | (2.64%) | 19% |
| 2nd Quintile (II) | | | | | |
| Seeking care | 88.5% | (0.63%) | 88.1% | (1.56%) | 0% |
| Use medical care | 44.8% | (0.97%) | 48.1% | (2.41%) | 7% |
| Hospitalised | 1.9% | (0.27%) | 2.9% | (0.81%) | 53% |
| Inpatient days | 8.6% | (1.90%) | 11.6% | (4.56%) | 34% |
| Outpatient visits | 25.5% | (0.85%) | 30.4% | (2.22%) | 19% |
| 3rd Quintile (III) | | | | | |
| Seeking care | 90.5% | (0.55%) | 92.4% | (1.27%) | 2% |
| Use medical care | 46.8% | (0.94%) | 46.5% | (2.39%) | -1% |
| Hospitalised | 1.9% | (0.26%) | 2.6% | (0.77%) | 36% |
| Inpatient days | 10.1% | (1.98%) | 17.8% | (7.61%) | 76% |
| Outpatient visits | 26.6% | (0.83%) | 24.2% | (2.05%) | -9% |
| 4th Quintile (IV) | | | | | |
| Seeking care | 93.5% | (0.45%) | 92.6% | (1.06%) | -1% |
| Use medical care | 56.7% | (0.90%) | 55.8% | (2.02%) | -2% |
| Hospitalised | 4.1% | (0.36%) | 3.8% | (0.78%) | -7% |
| Inpatient days | 22.1% | (2.63%) | 20.8% | (5.28%) | -6% |
| Outpatient visits | 32.3% | (0.85%) | 32.5% | (1.91%) | 1% |
| 5th Quintile (V) | | | | | |
| Seeking care | 94.2% | (0.41%) | 96.6% | (0.63%) | 3% |
| Use medical care | 66.8% | (0.82%) | 71.1% | (1.56%) | 6% |
| Hospitalised | 6.5% | (0.43%) | 5.5% | (0.79%) | -16% |
| Inpatient days | 48.2% | (4.41%) | 40.5% | (8.21%) | -16% |
| Outpatient visits | 33.7% | (0.82%) | 34.7% | (64%) | 3% |

Figure 10: Annual incidence of illness and percentage of ill individuals not seeking care by population sub-group [in %; in number of illnesses episodes] – Source: CSES 2004 and 2007



two lower quintiles and a decrease in the two highest quintiles. There was also a big increase in the length of inpatient stay for the elderly.

Figure 10 summarises the annual reported incidence of illness and the percentage of ill individuals that not seeking care in 2004 and 2007. Females, young children (under five), and the elderly (aged 60 and over) had higher incidences of illness episodes. The differences between economic quintiles were less prominent but the incidence of illness among the lowest quintile is significantly lower than other economic quintiles, especially for 2007. The proportion of ill individuals who did not seek care reduced marginally across almost all population subgroups. Although not statistically significant, the decline is biggest among the children under five and the elderly 60 years and over.

### Determinants of care-seeking

Table 42 shows the results from regression analysis using a random effect logistic model on individual care- seeking. The analysis was done separately for 2004 and 2007 data because the Chow test rejected the use of combined data. The random effect model was used to capture household level unobservable effects. The analysis controlled for various type of reported illness.

Table 42. Results from random effect logistic regression analysis on health care-seeking – Source: CSES 2004 and 2007

| | 2004 | | 2007 | |
|---|---|---|---|---|
| | Coef. | P>z | Coef. | P>z |
| Other rural | **-1.326** | **0.000** | -0.860 | 0.159 |
| Other urban | **-1.679** | **0.000** | -0.714 | 0.254 |
| Household size | -0.053 | 0.074 | -0.119 | 0.089 |
| Head Prim Ed | 0.279 | 0.052 | -0.656 | 0.629 |
| Head Sec Ed | **0.847** | **0.025** | 4.215 | 0.297 |
| Head Male | 0.199 | 0.197 | 0.438 | 0.202 |
| Aged 5 – 15 | **-0.777** | **0.000** | **-1.897** | **0.000** |
| Aged 15 – 60 | **-0.830** | **0.000** | **-1.997** | **0.000** |
| Aged 60 + | **-1.054** | **0.000** | **-1.431** | **0.014** |
| Male | **-0.306** | **0.001** | **-0.809** | **0.001** |
| 2nd Quintile (II) | **0.941** | **0.000** | **1.122** | **0.013** |
| 3rd Quintile (III) | **1.295** | **0.000** | **1.642** | **0.001** |
| 4th Quintile (IV) | **1.779** | **0.000** | **2.333** | **0.000** |
| 5th Quintile (V) | **1.913** | **0.000** | **2.671** | **0.000** |
| Stomach ache | **0.579** | **0.020** | **-1.445** | **0.016** |
| Back pain | -0.888 | 0.000 | -1.218 | 0.055 |
| Head/eye/ear pain | -0.031 | 0.855 | -0.761 | 0.111 |
| Fever | **1.645** | **0.000** | **1.652** | **0.010** |
| Diarrhoea | **1.529** | **0.000** | -1.080 | 0.118 |
| Common cold | **0.362** | **0.020** | -0.481 | 0.289 |
| Severe respiratory disease | **1.134** | **0.000** | -0.139 | 0.833 |
| Non communicable disease | 0.286 | 0.165 | **-1.193** | **0.025** |
| Communicable disease | **1.572** | **0.000** | 1.560 | 0.077 |
| Constant | **4.815** | **0.000** | **6.252** | **0.000** |
| Log sig sq. u | 1.986 | | 1.855 | |
| Sigma u | 2.699 | | 2.528 | |
| Rho | 0.689 | | 0.660 | |

Note:
Coef, coefficient;
head prim education, head of household with primary level education;
head sec education, head of household with secondary level education.

Figure 11: Percentage of care sought from public or private health care providers [in %] - Source: CSES 2004 and 2007

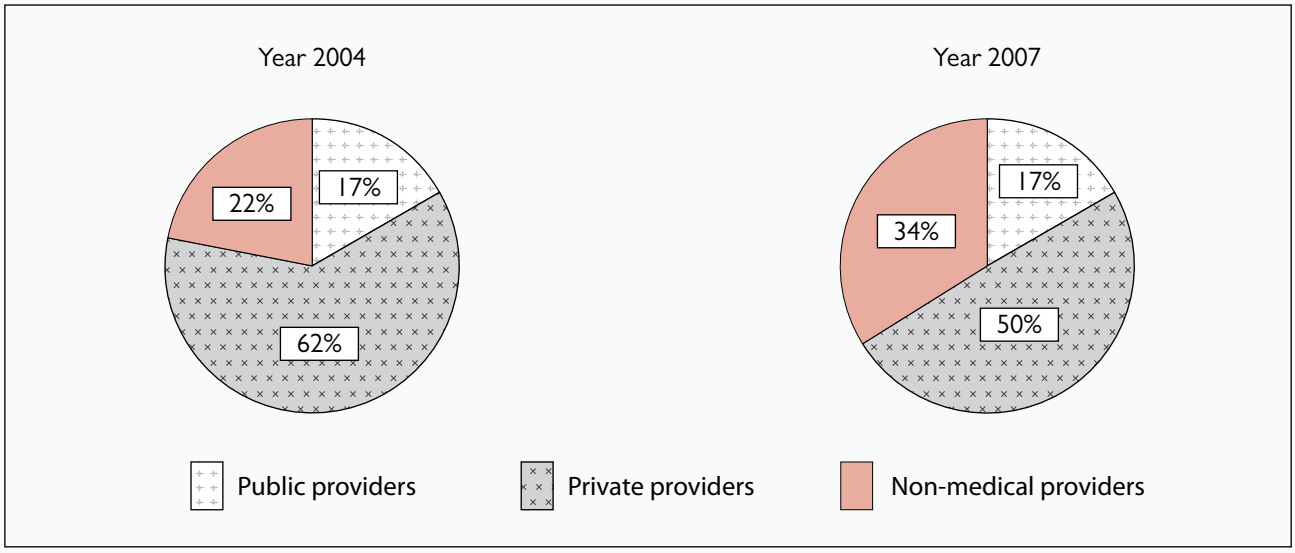
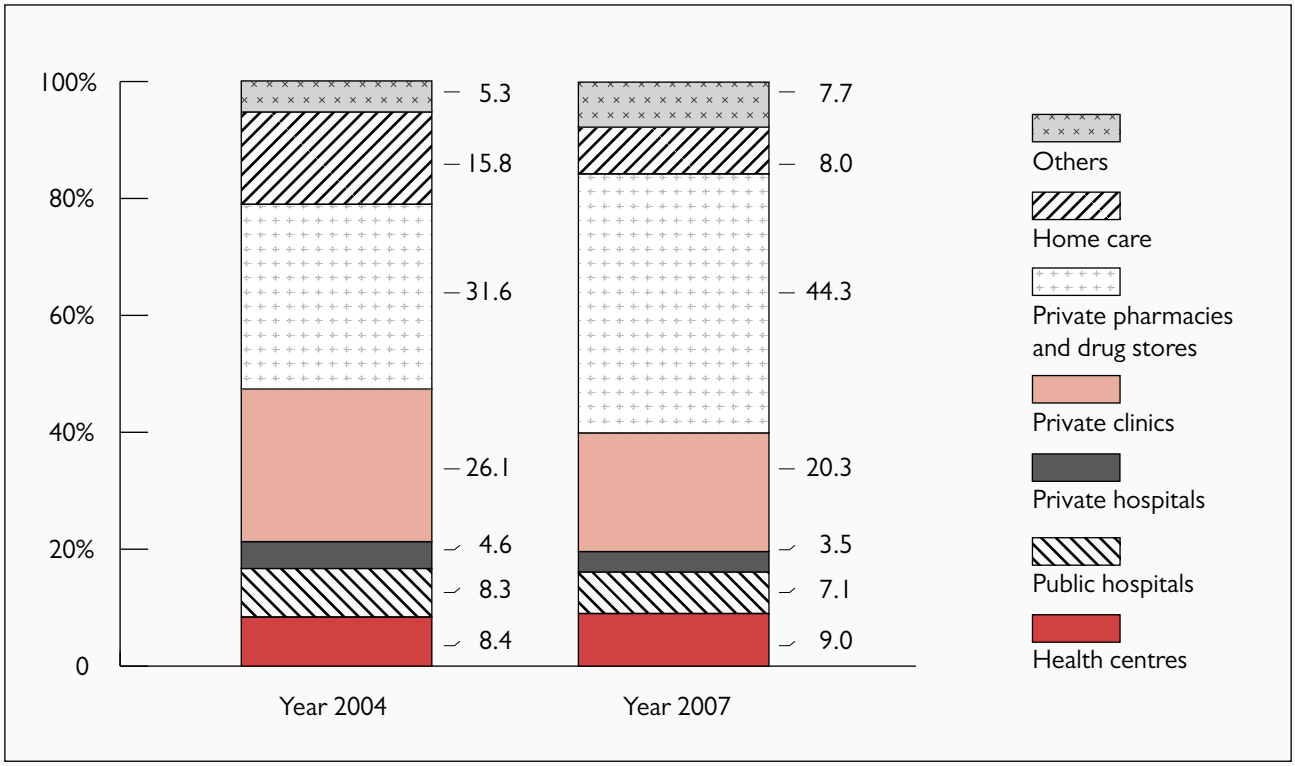



Table 43. Percentage of health care sought by provider type - Source: CSES 2004 and 2007

| | 2004 | 2007 |
|---|---|---|
| Health centres | 8.4% | 9.0% |
| Public hospitals | 8.3% | 7.1% |
| Private hospitals | 4.6% | 3.5% |
| Private clinics | 26.1% | 20.3% |
| Private pharmacies and drug stores | 31.6% | 44.3% |
| Home care | 15.8% | 8.0% |
| Others | 5.3% | 7.7% |

Figure 12: Health care provider choice by year [in %] - Source: CSES 2004 and 2007



Despite differing in the magnitude of the effect, the data from the two survey years show very similar results in terms of trends in the impact of various determinants on individuals' health care-seeking behaviour (Table 40). For both years, children or males are less likely to seek care and fall ill from infectious diseases. Being in higher quintiles increases the likelihood of seeking care. The characteristics of the head of the household (education/sex) have no important effect on health care-seeking.

An analysis of 2004 data where there are more observations in the dataset also shows other significant independent variables. Living in the capital leads to increased probability of seeking care while having bigger household size or being ill from common cold, headache, or back pain decreased the likelihood in 2004.

## 1.3. Choice of health care providers

### Health care utilisation by different kinds of facilities and services

Analysis of the two surveys shows that the choice of health care providers varies over the year (Figure 11). The share of health care sought at public providers was roughly the same over the period, at 17 percent of all care sought. In 2004, around 62 percent of all care sought was at private providers but this proportion decreased to 50 percent in 2007. The use of non-medical providers also decreased from 37 to 34 percent.

When exploring in detail by provider type, there was a big increase in the use of pharmacies and stores selling drugs (from 31.6 to 44.3 percent) and a decline in home care and the use of hospitals and private clinics. There was an increase in the share of health centre use and other providers. Figure 12 and Table 43 show the share of health care-seeking at various provider types in 2004 and 2007.

### Health care utilisation by different facilities and services for population groups

The choice of health care providers also varies across population subgroups. When explored across age groups, findings from both years show that children used health centres and private clinics more than other age groups while the elderly used home care more than other age groups (Figure 13 and Table 44). However, there is no significant change in the pattern of use across age groups between 2004 and 2007.

Figure 14 and Table 45 show the share of health providers used by different economic quintiles in 2004 and 2007. For 2004, the choice of providers was quite similar for the three poorest quintiles. The other two highest quintiles were different in having a higher share of hospital and private clinic use as against a lower share of health centre use. The richest quintile also used drug stores more. The pattern across quintiles in 2007 was more difficult to discern as the median quintile had a very high share of drug store use compared to other quintile groups. Nevertheless, the two highest quintiles still demonstrated higher use of hospitals and private clinics than the other poorer quintiles.

The share of health care providers by group is presented in Figure 15 and Table 46. In 2004, public sector providers accounted for about one sixth of all health care-seeking choices while the private sector accounted for around two-fifths. The highest quintile group was very different in its much bigger share of private sector use at around two thirds of all care-seeking. The pattern changed in 2007. The two poorest quintiles had a bigger share of public sector providers and a lower share of private sector providers. The higher quintiles had a smaller share of both public and private providers. All quintiles used an increasing share of non-medical providers. The percentages of health care sought across the group at three types of medical facilities, namely health centres, public hospitals and private hospitals are highlighted in Figure 16.

Table 44. Percentage of care by health care provider type by age group - Source: CSES 2004 and 2007

| | 2004 | | | | 2007 | | | |
|---|---|---|---|---|---|---|---|---|
| | 0 - 5 | 5 - 15 | 15 - 60 | 60 + | 0 - 5 | 5 - 15 | 15 - 60 | 60 + |
| Health centres | 11.7% | 8.5% | 7.6% | 6.3% | 14.7% | 9.9% | 6.6% | 8.8% |
| Public hospitals | 9.1% | 5.9% | 8.7% | 9.2% | 7.7% | 3.1% | 7.5% | 9.6% |
| Private hospitals | 4.4% | 3.1% | 5.0% | 5.1% | 4.3% | 2.7% | 3.5% | 3.6% |
| Private clinics | 28.7% | 25.3% | 25.7% | 24.9% | 20.8% | 23.4% | 19.3% | 19.4% |
| Private pharmacies and drug stores | 28.6% | 34.1% | 32.3% | 28.9% | 41.8% | 47.0% | 45.9% | 38.9% |
| Home care | 14.1% | 18.4% | 14.7% | 19.1% | 6.3% | 8.0% | 7.7% | 11.6% |
| Others | 3.5% | 4.6% | 6.0% | 6.5% | 4.5% | 5.8% | 9.6% | 8.1% |

Table 45. Percentage of care by health care provider type by economic quintile - Source: CSES 2004 and 2007

| | 2004 | | | | | 2007 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | V | I | II | III | IV | V |
| Health centres | 11.7% | 9.4% | 9.5% | 8.8% | 4.2% | 17.4% | 11.3% | 8.4% | 9.9% | 3.6% |
| Public hospitals | 5.8% | 6.7% | 7.6% | 9.9% | 10.2% | 5.2% | 6.9% | 5.3% | 6.1% | 10.0% |
| Private hospitals | 3.3% | 2.8% | 3.5% | 5.6% | 6.6% | 1.1% | 2.1% | 0.6% | 5.7% | 5.5% |
| Private clinics | 22.4% | 24.6% | 24.1% | 26.4% | 30.9% | 19.4% | 21.2% | 16.1% | 18.3% | 24.7% |
| Private pharmacies and drug stores | 33.0% | 32.3% | 30.8% | 26.8% | 35.4% | 35.4% | 38.4% | 54.3% | 41.2% | 47.8% |
| Home care | 17.5% | 18.1% | 18.8% | 17.8% | 8.4% | 12.1% | 9.4% | 7.6% | 8.5% | 5.3% |
| Others | 6.4% | 6.0% | 5.6% | 4.8% | 4.4% | 9.4% | 10.6% | 7.6% | 10.3% | 3.0% |

Table 46. Percentage of care by group of health care providers by economic quintile - Source: CSES 2004 and 2007

| | 2004 | | | | | 2007 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | V | I | II | III | IV | V |
| Public providers | 17.4% | 16.1% | 17.1% | 18.7% | 14.4% | 23.6% | 19.2% | 14.5% | 17.3% | 13.6% |
| Private providers | 55.6% | 56.4% | 57.5% | 61.3% | 74.0% | 44.3% | 42.4% | 39.5% | 47.6% | 64.9% |
| Non-medical providers | 27.0% | 27.5% | 25.4% | 20.0% | 11.7% | 32.1% | 38.4% | 46.0% | 35.1% | 21.5% |

Figure 13: Percentage of care by type of health care providers by age group – Source: CSES 2004 and 2007

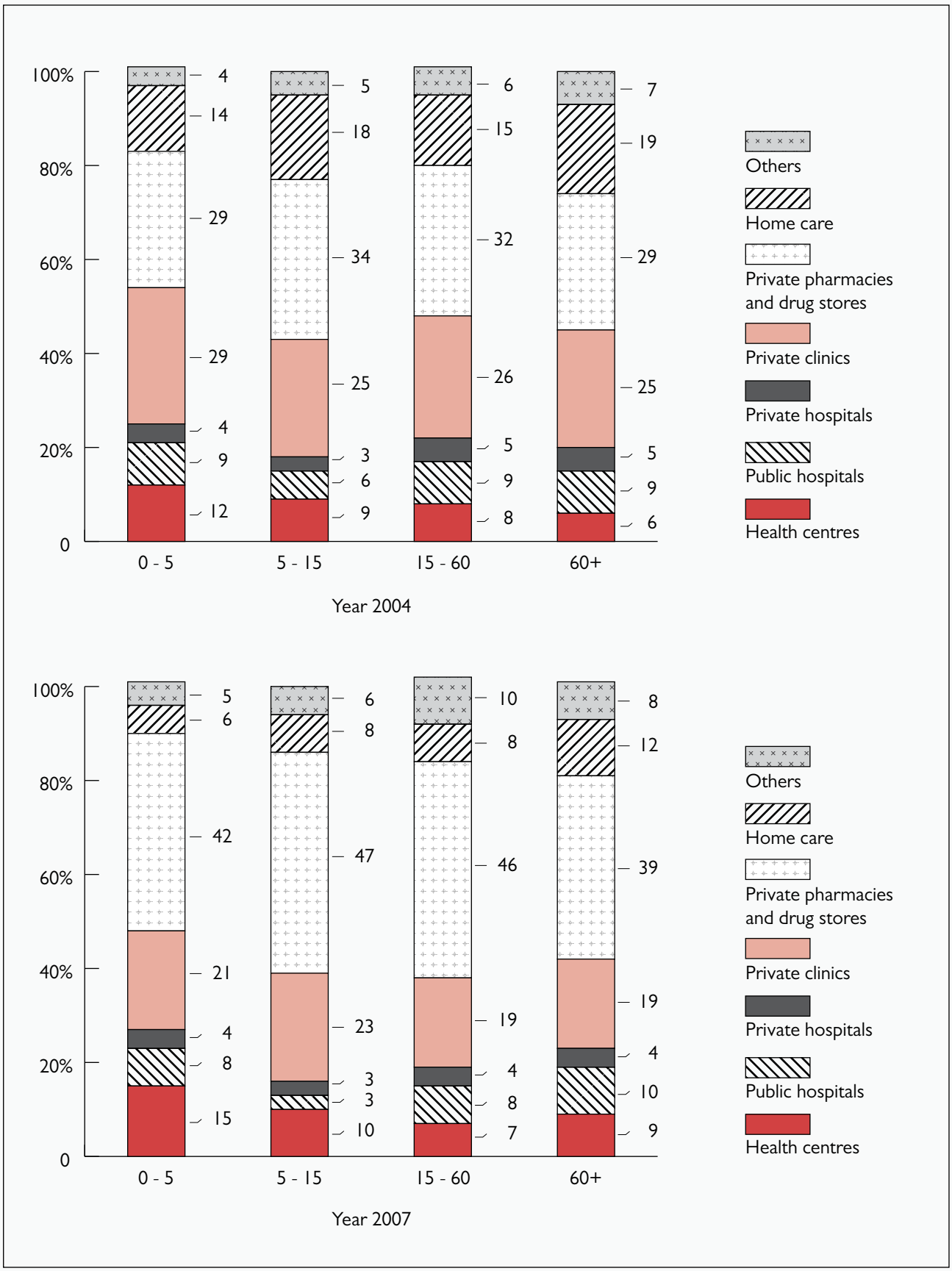


Figure 14: Percentage of care by type of health care provider by economic quintile – Source: CSES 2004 and 2007

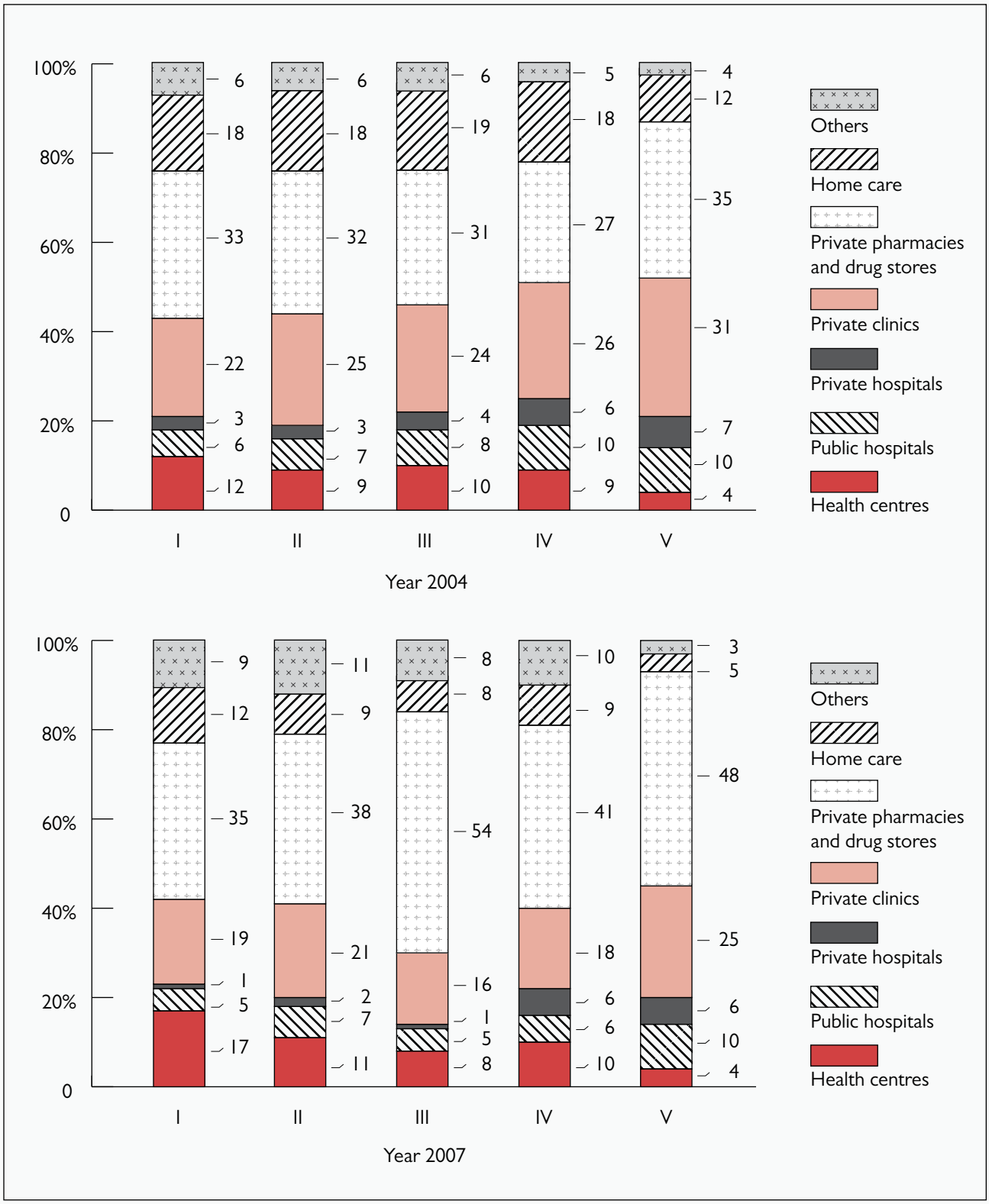


Figure 15: Percentage of care by group of health care providers by economic quintile – Source: CSES 2004 and 2007

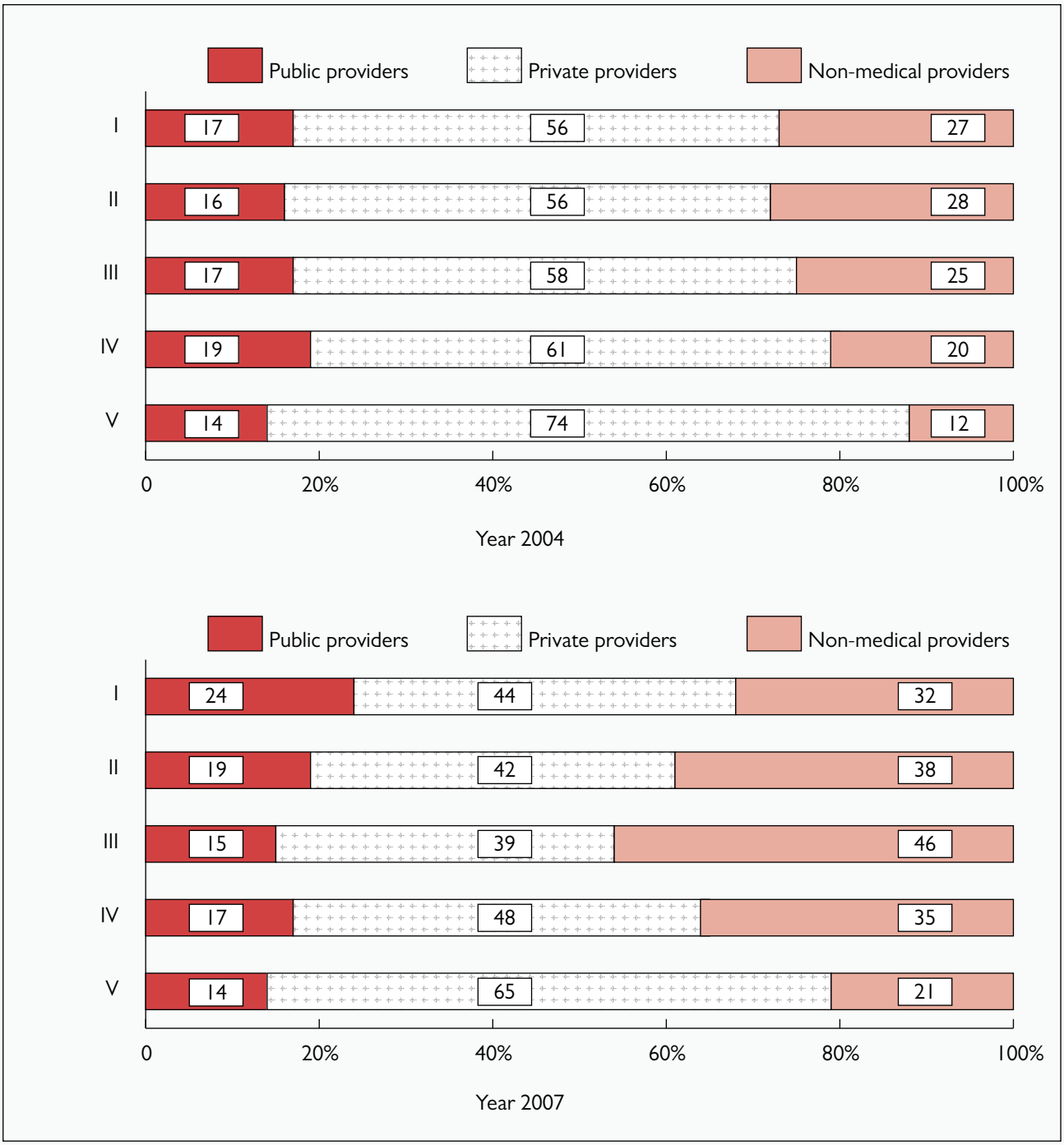


Figure 16: Percentage of health care sought at health centres, public hospitals and private hospitals by subgroups [in %] – Source: CSES 2004 and 2007

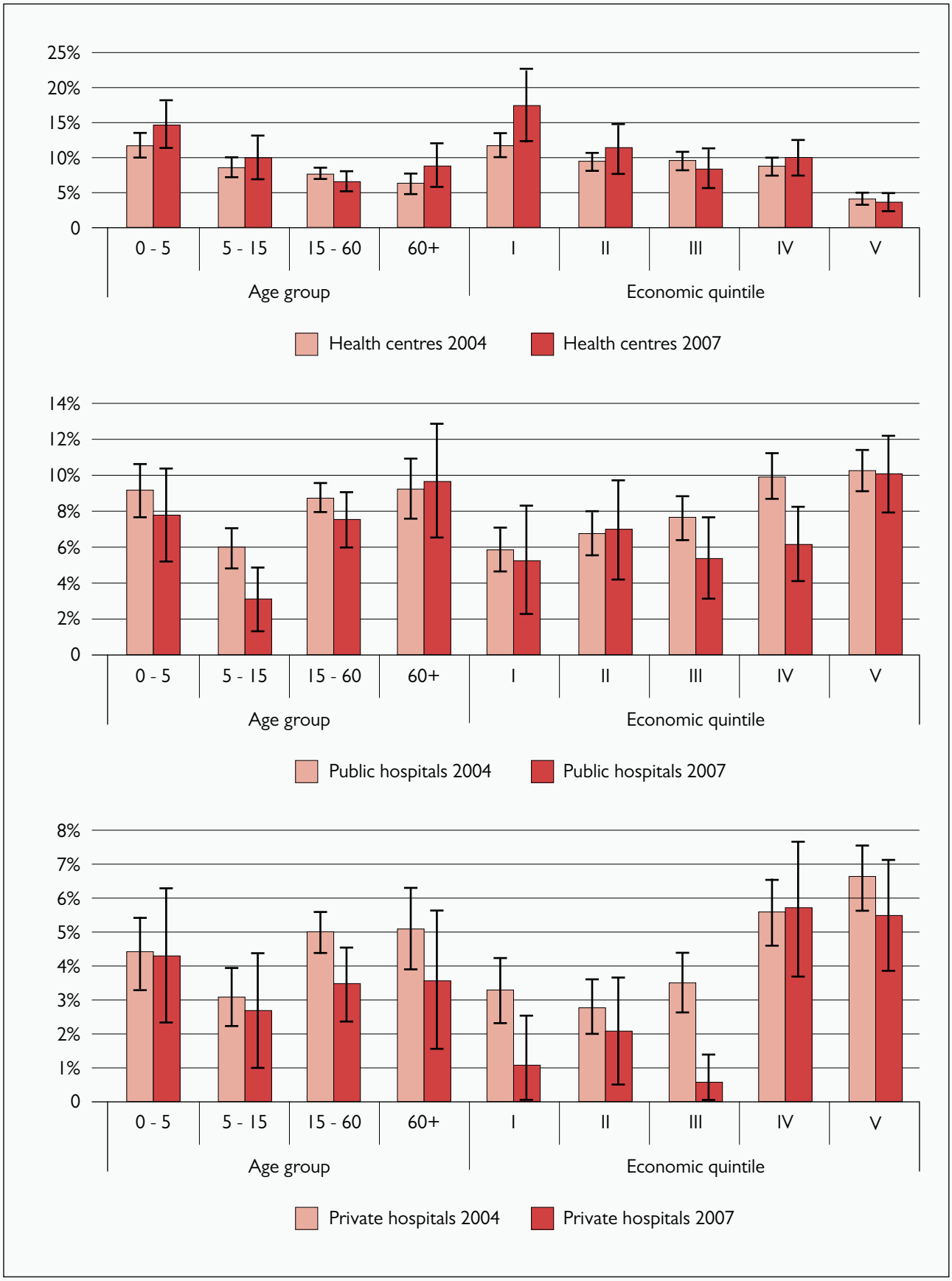


Table 47. Regression estimates for the model of provider choice in 2004 - Source: CSES 2004 and 2007

| | Public Hospitals | | Private Hospitals | | Private Clinics | | Private pharmacies and drug stores | | Home care | | Others | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef | P>z | Coef | P>z | Coef | P>z | Coef | P>z | Coef | P>z | Coef | P>z |
| Other rural | **-1.30** | **0.000** | **-1.43** | **0.000** | **-1.51** | **0.000** | **-2.41** | **0.000** | **0.90** | **0.010** | **-0.98** | **0.001** |
| Other urban | -0.72 | 0.018 | -0.23 | 0.459 | **-0.95** | **0.001** | **-1.70** | **0.000** | **0.92** | **0.014** | **-0.73** | **0.032** |
| Household size | 0.03 | 0.193 | 0.04 | 0.209 | 0.01 | 0.572 | -0.01 | 0.791 | 0.05 | 0.035 | 0.05 | 0.128 |
| Head Prim Ed | **-0.33** | **0.006** | -0.14 | 0.295 | -0.13 | 0.184 | **-0.27** | **0.005** | **-0.45** | **0.000** | **-0.39** | **0.004** |
| Head Sec Ed | -0.03 | 0.907 | -0.02 | 0.955 | -0.11 | 0.623 | **-0.54** | **0.017** | -0.43 | 0.109 | -0.48 | 0.144 |
| Head male | 0.07 | 0.604 | 0.17 | 0.309 | -0.03 | 0.775 | 0.10 | 0.394 | 0.08 | 0.543 | 0.06 | 0.684 |
| Aged 5 - 15 | -0.24 | 0.193 | -0.11 | 0.630 | 0.17 | 0.235 | **0.44** | **0.002** | **0.53** | **0.001** | **0.52** | **0.016** |
| Aged 15 - 60 | -0.14 | 0.356 | 0.16 | 0.389 | 0.18 | 0.144 | **0.49** | **0.000** | **0.47** | **0.001** | **0.50** | **0.010** |
| Aged 60 + | -0.01 | 0.960 | 0.34 | 0.179 | **0.43** | **0.015** | **0.71** | **0.000** | **1.04** | **0.000** | **0.75** | **0.003** |
| Male | **0.43** | **0.000** | 0.11 | 0.409 | **0.21** | **0.019** | **0.23** | **0.008** | **0.28** | **0.004** | **0.29** | **0.018** |
| 2nd Quintile (II) | 0.36 | 0.057 | 0.02 | 0.930 | **0.31** | **0.029** | 0.24 | 0.077 | 0.24 | 0.101 | 0.10 | 0.584 |
| 3rd Quintile (III) | 0.29 | 0.112 | 0.15 | 0.506 | 0.18 | 0.177 | 0.04 | 0.745 | 0.18 | 0.218 | -0.17 | 0.348 |
| 4th Quintile (IV) | **0.72** | **0.000** | **0.70** | **0.001** | **0.39** | **0.004** | -0.03 | 0.799 | **0.36** | **0.013** | -0.08 | 0.672 |
| 5th Quintile (V) | **1.05** | **0.000** | **1.17** | **0.000** | **0.90** | **0.000** | **0.34** | **0.037** | **0.42** | **0.017** | 0.25 | 0.246 |
| Stomach ache | -0.28 | 0.381 | 0.43 | 0.213 | 0.52 | 0.052 | **0.71** | **0.007** | 0.58 | 0.038 | -0.59 | 0.081 |
| Back pain | -0.66 | 0.061 | -0.57 | 0.204 | -0.11 | 0.714 | 0.14 | 0.640 | -0.29 | 0.355 | **-1.02** | **0.007** |
| Head/eye/ear pain | -0.45 | 0.051 | -0.09 | 0.730 | 0.12 | 0.546 | **0.94** | **0.000** | 0.09 | 0.685 | **-0.58** | **0.014** |
| Fever | **-1.06** | **0.000** | -0.27 | 0.236 | 0.16 | 0.311 | **0.54** | **0.001** | 0.21 | 0.242 | **-1.10** | **0.000** |
| Diarrhoea | **-0.80** | **0.012** | -0.43 | 0.269 | 0.31 | 0.212 | 0.42 | 0.099 | 0.46 | 0.088 | **-1.11** | **0.003** |
| Common cold | **-1.27** | **0.000** | **-0.89** | **0.000** | 0.13 | 0.397 | **0.86** | **0.000** | 0.22 | 0.198 | **-1.62** | **0.000** |
| Severe respiratory disease | -0.24 | 0.230 | -0.16 | 0.533 | -0.37 | 0.047 | **-0.58** | **0.003** | **-0.50** | **0.016** | **-1.46** | **0.000** |
| Non communicable disease | 0.12 | 0.571 | 0.16 | 0.522 | 0.10 | 0.603 | -0.15 | 0.457 | -0.15 | 0.505 | -0.35 | 0.127 |
| Communicable disease | -0.06 | 0.766 | 0.45 | 0.069 | 0.15 | 0.447 | **-0.58** | **0.007** | 0.37 | 0.070 | **-0.64** | **0.008** |
| Constant | 0.95 | 0.017 | -0.17 | 0.701 | 1.83 | 0.000 | 2.51 | 0.000 | -1.40 | 0.002 | 0.62 | 0.155 |

Note: health centre as a reference category

### Determinants of provider choice

Further analysis to explore the determinants of provider choice was conducted using a multiple logistics model with robust standard error. The analysis was conducted separately for 2004 and 2007 data because the Chow test rejected the use of combined data. The analysis was conducted using individual-level data and controlled for degree of illness by including reported types of illness in the models.

The 2004 analysis show that individuals living outside the capital used health centres and home care more than public hospitals, private clinics, or drug stores. Those in the highest quintiles used health centres less than poorer groups. Larger households also used home care more than health centres. Older individuals were more likely to use drug stores, home care and other sources while male individuals used health centres less than most other sources. Households with more highly educated heads were also less likely to use drug stores than health centres. The regression estimates are shown in Table 47.

Analysis of the 2007 survey also shows similar results with fewer significant determinants due to fewer observations in the dataset. People living outside the capital use health centres more than private hospitals, private clinics, or drugs stores. Households in higher quintiles were less likely to use health centres than other sources. Individuals aged 15 to 60 also used health centres less than other sources except hospital care. The regression estimates are shown in Table 48.

Table 48. Regression estimates for the model of provider choice in 2007 – Source: CSES 2004 and 2007

| | Public Hospitals | | Private Hospitals | | Private Clinics | | Private pharmacies and drug stores | | Home care | | Others | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | P>z | Coef. | P>z | Coef. | P>z | Coef. | P>z | Coef. | P>z | Coef. | P>z |
| Other rural | -0.82 | 0.135 | **-2.00** | **0.000** | **-1.55** | **0.002** | **-1.41** | **0.003** | 1.21 | 0.119 | -0.69 | 0.218 |
| Other urban | -1.10 | 0.051 | **-3.09** | **0.000** | **-1.73** | **0.001** | **-1.41** | **0.004** | 1.05 | 0.175 | -1.55 | 0.012 |
| Household size | -0.05 | 0.427 | 0.07 | 0.299 | -0.07 | 0.119 | 0.02 | 0.708 | 0.04 | 0.467 | -0.10 | 0.059 |
| Head Prim Ed | -0.42 | 0.717 | 0.83 | 0.516 | 0.47 | 0.587 | -0.95 | 0.265 | -2.02 | 0.083 | -1.79 | 0.137 |
| Head Sec Ed | -1.64 | 0.338 | -0.31 | 0.872 | -1.81 | 0.200 | -1.95 | 0.133 | -2.74 | 0.187 | -1.61 | 0.413 |
| Head male | 0.29 | 0.350 | 0.70 | 0.063 | 0.02 | 0.937 | -0.01 | 0.950 | 0.17 | 0.550 | 0.45 | 0.134 |
| Aged 5 - 15 | -0.31 | 0.440 | -0.07 | 0.884 | 0.33 | 0.232 | 0.40 | 0.126 | **0.75** | **0.031** | 0.36 | 0.367 |
| Aged 15 - 60 | 0.24 | 0.453 | 0.06 | 0.876 | 0.52 | 0.034 | **0.76** | **0.001** | **1.03** | **0.001** | **0.88** | **0.012** |
| Aged 60 + | 0.11 | 0.785 | -0.23 | 0.645 | 0.21 | 0.536 | 0.51 | 0.103 | **1.28** | **0.001** | 0.63 | 0.154 |
| Male | 0.27 | 0.265 | 0.02 | 0.953 | 0.22 | 0.253 | 0.22 | 0.228 | 0.25 | 0.258 | 0.12 | 0.604 |
| 2nd Quintile (II) | 0.40 | 0.334 | 0.62 | 0.397 | 0.43 | 0.138 | 0.47 | 0.089 | 0.01 | 0.987 | 0.58 | 0.122 |
| 3rd Quintile (III) | 0.75 | 0.083 | -0.77 | 0.515 | **0.74** | **0.019** | **1.32** | **0.000** | 0.54 | 0.139 | **0.81** | **0.041** |
| 4th Quintile (IV) | 0.54 | 0.181 | **1.82** | **0.006** | **0.60** | **0.040** | **0.79** | **0.004** | 0.45 | 0.190 | 0.68 | 0.065 |
| 5th Quintile (V) | **1.95** | **0.000** | **2.46** | **0.001** | **1.65** | **0.000** | **1.88** | **0.000** | **1.24** | **0.002** | 0.84 | 0.056 |
| Stomach ache | -0.55 | 0.494 | 0.02 | 0.980 | 0.42 | 0.491 | 0.77 | 0.164 | 0.21 | 0.766 | -0.90 | 0.229 |
| Back pain | 0.61 | 0.439 | 0.33 | 0.760 | 0.63 | 0.389 | 1.13 | 0.098 | 0.89 | 0.253 | 0.68 | 0.352 |
| Head/eye/ear pain | -0.12 | 0.798 | 0.54 | 0.381 | 0.26 | 0.530 | 0.46 | 0.222 | 0.13 | 0.779 | -0.57 | 0.197 |
| Fever | -0.26 | 0.570 | 0.20 | 0.741 | **0.79** | **0.035** | **0.77** | **0.027** | **1.08** | **0.012** | -0.21 | 0.602 |
| Diarrhoea | -0.78 | 0.193 | **-13.74** | **0.000** | -0.08 | 0.862 | -0.04 | 0.926 | 0.52 | 0.335 | **-1.59** | **0.016** |
| Common cold | **-1.05** | **0.017** | 0.38 | 0.465 | 0.41 | 0.231 | **0.84** | **0.008** | -0.18 | 0.665 | **-1.57** | **0.000** |
| Severe respiratory disease | 0.14 | 0.781 | 0.18 | 0.793 | 0.29 | 0.508 | -0.10 | 0.810 | -0.16 | 0.780 | **-1.27** | **0.026** |
| Non communicable disease | 0.76 | 0.109 | 1.13 | 0.058 | 0.51 | 0.251 | -0.21 | 0.628 | 0.46 | 0.362 | -0.30 | 0.533 |
| Communicable disease | 0.24 | 0.636 | 0.61 | 0.377 | 0.84 | 0.054 | -0.39 | 0.374 | 0.56 | 0.283 | -0.41 | 0.423 |
| Constant | -0.09 | 0.915 | -1.68 | 0.117 | 1.18 | 0.092 | 0.91 | 0.173 | -2.97 | 0.002 | 0.35 | 0.672 |

Note: health centre as reference group

# 2. Health care spending

## 2.1 Out-of-pocket expenditure

In addition to illness and health care-seeking behaviour, the CSES provides data on health spending at individual level. However, unlike CDHS, it does not contain questions on transport expenses specific to health care use. Data on health spending are available at individual level. There was no information on the number of visits per individual but assuming that each individual made only one visit, the per capita statistics of OOP among individuals who sought care could also be taken to represent average OOP per visit.

### Out-of-pocket expenditure per capita in the last month

The average Cambodian spends over 4,500 Riels per month on health care (Table 49). The amount declined from 2004 to 2007 (4,970 and 4,636 respectively) due to fewer people getting ill. However, the average amount of OOP among people who sought care increased from 29,796 to 32,093 Riels over the same period. The average level of OOP among those who were hospitalised was much higher at over 200,000 Riels per person and increased over time from 230,758 Riels in 2004 to 266,875 Riels in 2007.

### Out-of-pocket expenditure per capita for population subgroups

The average amount of spending per capita also varies across population groups. Females spent more on average than males in both 2004 and 2007. The elderly also had higher average monthly OOP per capita than children and other age groups (Table 50). When comparing across economic quintiles, the higher quintile spent more per capita on health care than poorer quintiles (Table 51). The ratio of average OOP per capita per month between the highest and lowest quintiles in 2004 was around 18:1 with an average of 14,760 Riels for the highest group versus 805 Riels in the lowest group. The spending gradient across quintiles remained in 2007 but the difference between the highest and lowest quintiles decreased to only 13:1. Figure 17 demonstrates graphically these differences in out-of-pocket expenditure per capita across sub-groups in monthly terms for both 2004 and 2007.

Table 49. Monthly out-of-pocket expenditure per capita in nominal term [in Riel] - Source: CSES 2004 and 2007

| | 2004 | 2007 |
|---|---|---|
| OOP per capita (average across all population) | 4969.8 | 4636.44 |
| (s.e.) | (213.17) | (356.43) |
| OOP per capita among those who sought care | 29,796 | 32,093 |
| (s.e.) | (1,246) | (2,413) |
| OOP per capita among those with positive OOP | 30,500 | 33,033 |
| (s.e.) | (1,275) | (2,475) |
| OOP per capita among those with outpatient visit | 22,336 | 22,369 |
| (s.e.) | (949) | (1,245) |
| OOP per capita among those with hospitalisation | 230,758 | 266,875 |
| (s.e.) | (21,772) | (46,505) |

Table 50. Average out-of-pocket expenditure per capita by age group and sex [in Riel] - Source: CSES 2004 and 2007

| | Sex | | Age group | | | |
|---|---|---|---|---|---|---|
| | M | F | 0 - 5 | 5 - 15 | 15 - 60 | 60+ |
| Average OOP per capita (2004) | 4,686 | 5,237 | 4,139 | 1,847 | 5,856 | 13,056 |
| (s.e.) | (299) | (304) | (364) | (212) | (337) | (1,044) |
| Average OOP per capita (2007) | 3,884 | 5,344 | 6,908 | 1,833 | 4,167 | 15,858 |
| (s.e.) | (527) | (483) | (915) | (211) | (455) | (3082) |

The average OOP per person for different types of illness was also calculated for 2004 and 2007. The patterns are quite similar for the 10 illness groups across the two survey years. Spending per person was highest for those reportedly ill with NCDs and CDs and lowest for those with common colds. The statistics are presented in Table 52 below.

### Average out-of-pocket expenditure by provider group per person among those who sought care

Table 53 presents the average amount of OOP per person per month for each provider group for the two survey years. It is based only on those who sought care in the Previous 4 weeks and it is assumed that the entire OOP expenditure of each person was spent wholly at the provider of choice indicated in each person's answer in the survey. The average OOP per person per month among those who sought care at public sector providers (public hospitals and health centres) in 2004 was 66,797 Riels. The corresponding number for private sector providers (including hospitals, clinics, home care, and pharmacies) was 35,971 Riels. The figures for public and private providers were similar in 2007 but with a very high increase in average OOP among those using non-medical providers (including monks, traditional healers, and purchasing drugs at other stores).

More details of health care providers and corresponding average health spending per capita for those who sought care in the Previous 4 weeks and indicated their preferred provider type are given in Table 54. The pattern was similar for 2004 and 2007. Average OOP was highest in the public and private hospitals at over 110,000 Riels per person per month. The lowest was at pharmacies and other stores selling drugs at just over 10,000 Riels per person per month followed by health centres at around 20,000 Riels.

Figure 17: Average monthly out-of-pocket expenditure per capita by sub-group [in Riel] - Source: CSES 2004 and 2007

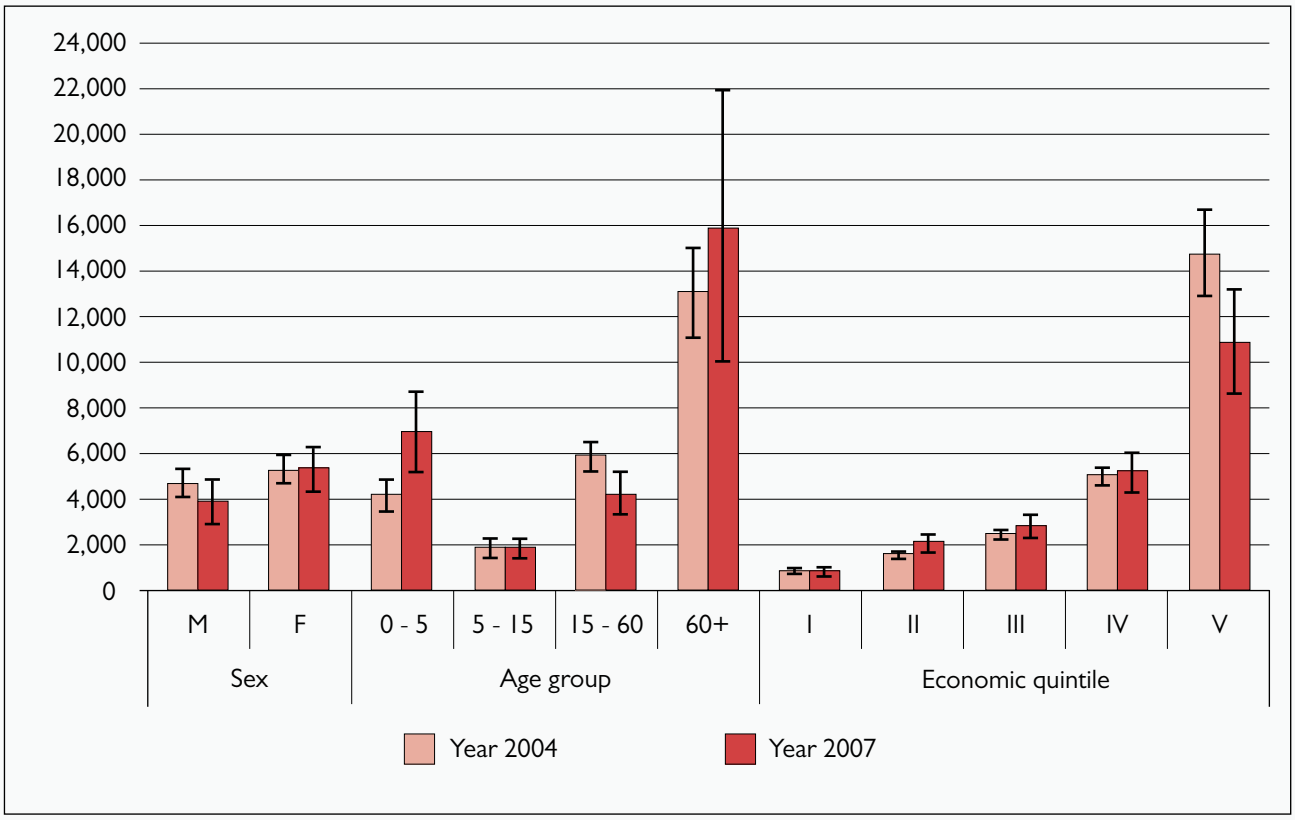


Table 51. Average out-of-pocket expenditure per capita by quintile [in Riel] - Source: CSES 2004 and 2007

| | Quintile | | | | |
|---|---|---|---|---|---|
| | 1st Quintile (I) | 2nd Quintile (II) | 3rd Quintile (III) | 4th Quintile (IV) | 5th Quintile (V) |
| Average OOP per capita (2004) | 805 | 1,564 | 2,412 | 4,982 | 14,760 |
| (s.e.) | (34) | (64) | (96) | (192) | (966) |
| Average OOP per capita (2007) | 803 | 2,072 | 2,778 | 5,149 | 10,835 |
| (s.e.) | (87) | (192) | (278) | (454) | (1192) |

Table 52. Average out-of-pocket expenditure per capita by reported illness [in Riels] - Source: CSES 2004 and 2007

| | 2004 | | 2007 | |
|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) |
| Stomach ache | 29,700 | (7,148) | 23,958 | (5,847) |
| Back pain | 18,980 | (5,177) | 19,840 | (3,197) |
| Head/eye/ear pain | 13,484 | (1,226) | 18,833 | (4,271) |
| Fever | 12,045 | (938) | 17,427 | (1,495) |
| Diarrhoea | 15,235 | (1,712) | 13,824 | (2,374) |
| Common cold | 6,090 | (272) | 6,716 | (404) |
| Severe respiratory diseases | 41,469 | (4,586) | 44,317 | (6,740) |
| Non communicable diseases | 62,049 | (4,255) | 84,036 | (18,443) |
| Communicable diseases | 69,944 | (4,991) | 88,835 | (11,076) |
| Others | 64,854 | (7,212) | 71,886 | (12,639) |

Table 53. Average out-of-pocket expenditure per person among those who sought care by provider group [in Riels] - Source: CSES 2004 and 2007

| | 2004 | | 2007 | |
|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) |
| Public providers | 66,797 | (6,747) | 67,837 | (10,558) |
| Private providers | 35,971 | (2,464) | 36,934 | (3,624) |
| Non-medical providers | 14,460 | (1,152) | 47,411 | (2,410) |

Figure 18: Average out-of-pocket expenditure per capita by provider type in the previous 4 weeks among those seeking care [in Riel] - Source: CSES 2004 and 2007

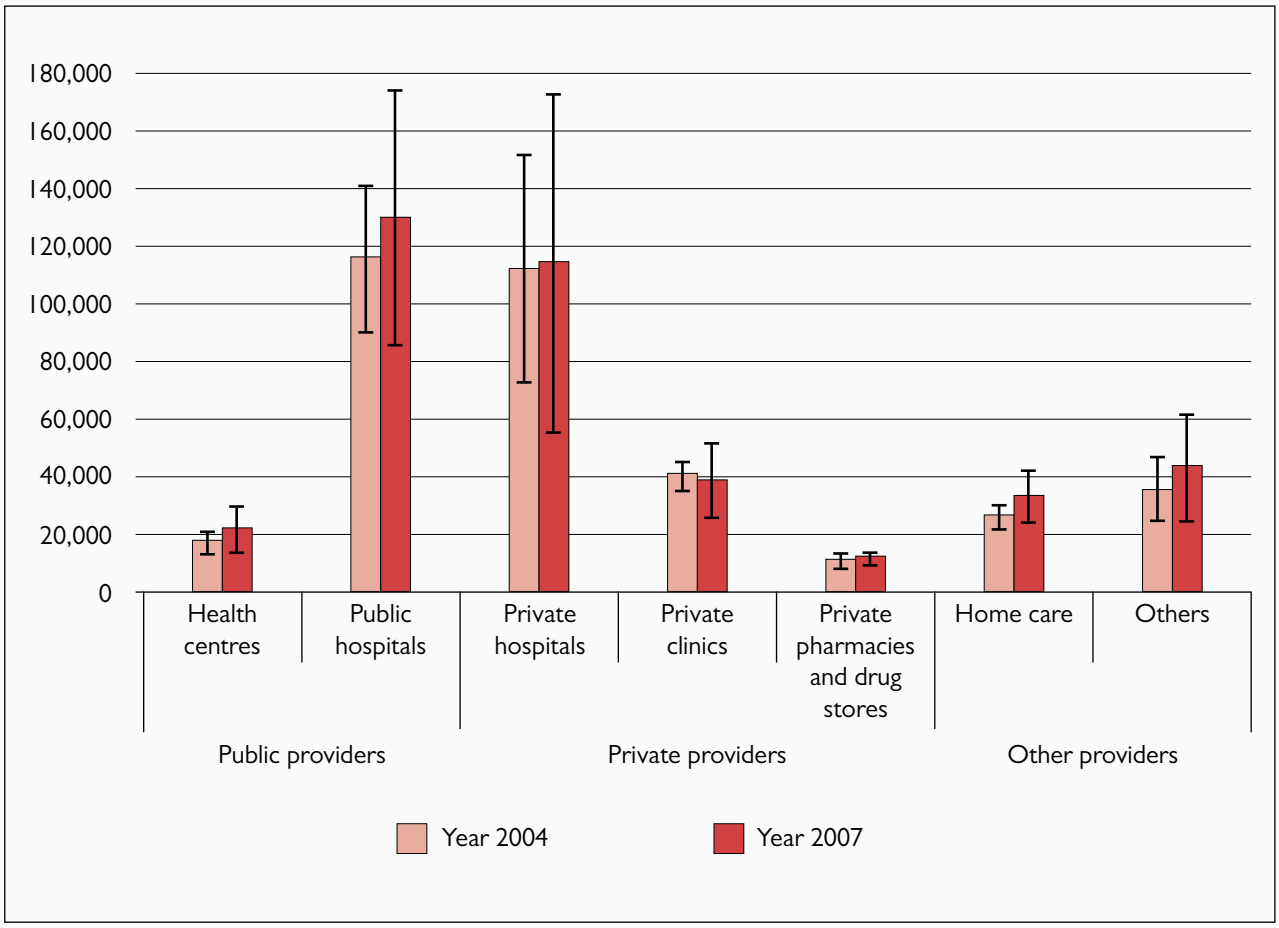



Table 54. Average out-of-pocket expenditure by provider type per person among those seeking care [in Riels] - Source: CSES 2004 and 2007

| | 2004 | | 2007 | |
|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) |
| Health centres | 17,704 | (1,855) | 22,355 | (3,990) |
| Public hospitals | 116,241 | (12,953) | 130,906 | (23,091) |
| Private hospitals | 112,931 | (20,412) | 115,223 | (30,164) |
| Private clinics | 41,026 | (2,335) | 39,026 | (6,711) |
| Private pharmacies and drug stores | 10,567 | (730) | 12,117 | (1,018) |
| Home care | 26,869 | (1,686) | 33,754 | (4,374) |
| Others | 36,249 | (5,378) | 44,085 | (9,161) |

### Average out-of-pocket expenditure per household and per household with positive out-of-pocket expenditure, by year

The amount of health spending was also calculated at household level (as a summation of members' OOP). The average OOP per household in 2004 was 25,671 Riels (s.e.=1,128). The corresponding statistic for 2007 is 21,345 Riels (s.e. = 1,566). Similar to individual-level statistics, OOP per household is much higher in the higher quintiles with a ratio of average OOP per household from highest to lowest quintile of around 20:1 in 2004, decreasing to 14:1 in 2007. The average OOP per household by quintile and its standard error values are provided in Table 55. Table 56 gives further statistics on average OOP per household but only for households with positive health spending by quintile.

### Out-of-pocket expenditure per household by economic quintile

Table 57 presents the share of household OOP attributed to three age groups. Since most household members belong to the group aged between 5 and 65, the majority of the health spending comes from this age group. The pattern is similar across the year and across quintiles but with a significantly higher share of OOP from the elderly age group in the highest quintile. Comparison over time from 2004 to 2007 shows that the share of OOP by children under five increased across all quintiles while the share of OOP by elderly members increased only in the two lowest quintiles and in the highest quintile.

Table 58 shows the share of average household OOP at various types of health service or health provider. Table 56 presents the share of OOP for outpatient (OP), inpatient (IP), and others (Non-OP-IP, including those not specifying their care-seeking places). The pattern is similar for 2004 and 2007 with a low share of OP and very low IP in the poorest quintile. The share of average household OOP from IP increased in higher quintiles with the highest IP share in the higher quintile.

Table 59 and 60 present the share of OOP by health care provider group and type. Note that in these two tables, because a number of individuals do not report their health care-seeking places but have positive OOP, the amounts of average OOP per household when summed up across provider type/group by quintile are therefore smaller than average OOP from previous tables. As shown in Table 59, poorer households spent a lower share of their household OOP at public facilities compared to higher quintiles in 2004. The situa-

Table 55. Average out-of-pocket expenditure per household by economic quintile [in Riels] – Source: CSES 2004 and 2007

| | 2004 | | 2007 | |
|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) |
| 1st Quintile (I) | 3,988 | (188) | 3,821 | (403) |
| 2nd Quintile (II) | 7,848 | (344) | 10,308 | (985) |
| 3rd Quintile (III) | 12,418 | (514) | 13,703 | (1,398) |
| 4th Quintile (IV) | 25,086 | (977) | 25,343 | (2,207) |
| 5th Quintile (V) | 79,032 | (5,150) | 53,616 | (5,565) |
| **Total** | **25,671** | **(1,128)** | **21,345** | **(1,566)** |

Table 56. Average out-of-pocket expenditure for household with positive out-of-pocket by economic quintile [in Riels] – Source: CSES 2004 and 2007

| | 2004 | | 2007 | |
|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) |
| 1st Quintile (I) | 10,492 | (430) | 11,182 | 980) |
| 2nd Quintile (II) | 17,389 | (675) | 23,087 | 1,886) |
| 3rd Quintile (III) | 25,902 | (949) | 34,127 | 2,983) |
| 4th Quintile (IV) | 49,528 | (1,711) | 54,026 | 4,068) |
| 5th Quintile (V) | 151,485 | (9,508) | 121,493 | 12,362) |
| **Total** | **54,876** | **(2,359)** | **50,819** | **(3,575)** |

Table 57. Average share of household out-of-pocket expenditure by age group and by economic quintile [in %] - Source: CSES 2004 and 2007

| | 2004 | | | | | 2007 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1st Quintile (I) | 2nd Quintile (II) | 3rd Quintile (III) | 4th Quintile (IV) | 5th Quintile (V) | 1st Quintile (I) | 2nd Quintile (II) | 3rd Quintile (III) | 4th Quintile (IV) | 5th Quintile (V) |
| 0 - 5 | 18% | 13% | 10% | 12% | 5% | 26% | 24% | 17% | 16% | 12% |
| 5 - 65 | 72% | 77% | 78% | 78% | 82% | 58% | 59% | 76% | 78% | 61% |
| 65+ | 10% | 10% | 12% | 11% | 13% | 17% | 17% | 8% | 6% | 27% |

Table 58. Average share of household out-of-pocket expenditure at various type of visit by economic quintile [in %] - Source: CSES 2004 and 2007

| | 2004 | | | 2007 | | |
|---|---|---|---|---|---|---|
| | Outpatient | Inpatient | Others | Outpatient | Inpatient | Others |
| 1st Quintile (I) | 38% | 3% | 60% | 40% | 6% | 53% |
| 2nd Quintile (II) | 36% | 6% | 59% | 46% | 7% | 47% |
| 3rd Quintile (III) | 38% | 9% | 53% | 36% | 16% | 48% |
| 4th Quintile (IV) | 43% | 18% | 39% | 37% | 16% | 47% |
| 5th Quintile (V) | 43% | 32% | 25% | 32% | 43% | 26% |

Table 59. Average share of household out-of-pocket expenditure at each type of provider by economic quintile [in %] - Source: CSES 2004 and 2007

| | 2004 | | | 2007 | | |
|---|---|---|---|---|---|---|
| | Public providers | Private providers | Non-medical providers | Public providers | Private providers | Non-medical providers |
| 1st Quintile (I) | 17% | 65% | 19% | 26% | 55% | 19% |
| 2nd Quintile (II) | 19% | 64% | 17% | 31% | 49% | 20% |
| 3rd Quintile (III) | 24% | 63% | 13% | 30% | 50% | 21% |
| 4th Quintile (IV) | 30% | 61% | 8% | 27% | 51% | 22% |
| 5th Quintile (V) | 33% | 60% | 6% | 42% | 49% | 10% |

Table 60. Average share of household out-of-pocket expenditure at each type of provider by economic quintile [in %] - Source: CSES 2004 and 2007

| | 2004 | | | | | 2007 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | V | I | II | III | IV | V |
| Health centres | 8% | 7% | 7% | 7% | 2% | 10% | 11% | 8% | 10% | 3% |
| Public hospitals | 9% | 12% | 17% | 23% | 31% | 13% | 20% | 21% | 16% | 39% |
| Private hospitals | 6% | 6% | 7% | 12% | 17% | 3% | 2% | 0% | 9% | 12% |
| Private clinics | 29% | 27% | 26% | 28% | 30% | 26% | 26% | 27% | 22% | 24% |
| Private pharmacies and drug stores | 19% | 17% | 14% | 8% | 8% | 19% | 18% | 20% | 17% | 12% |
| Home care | 23% | 24% | 24% | 18% | 7% | 17% | 15% | 14% | 8% | 5% |
| Others | 6% | 7% | 5% | 5% | 5% | 11% | 9% | 10% | 19% | 6% |

Figure 19: Percentage of total cumulative out-of-pocket expenditure by public, private, and non-medical health care providers - Source: CSES 2004 and 2007

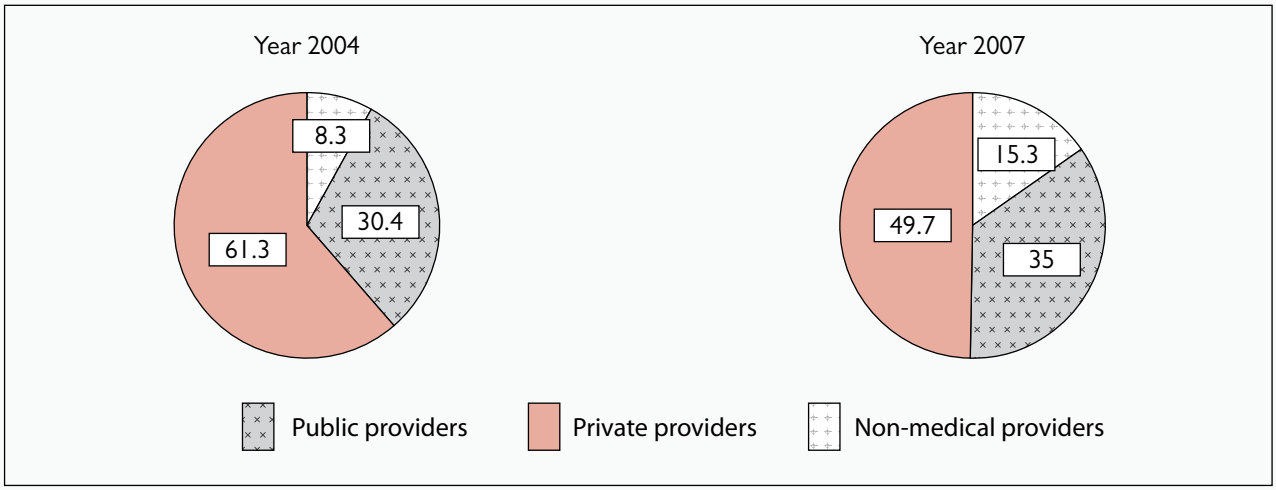



Figure 20: Percentage of total cumulative out-of-pocket expenditure by type of health care provider - Source: CSES 2004 and 2007

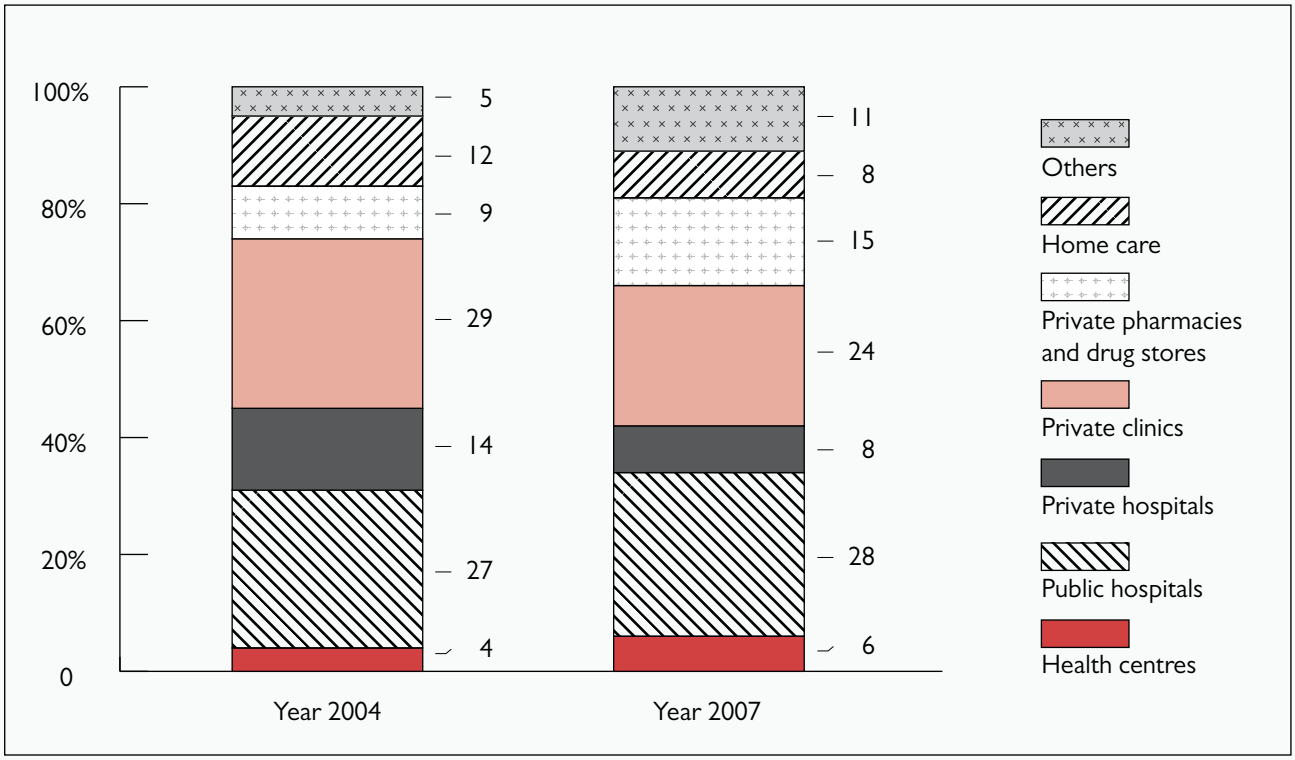
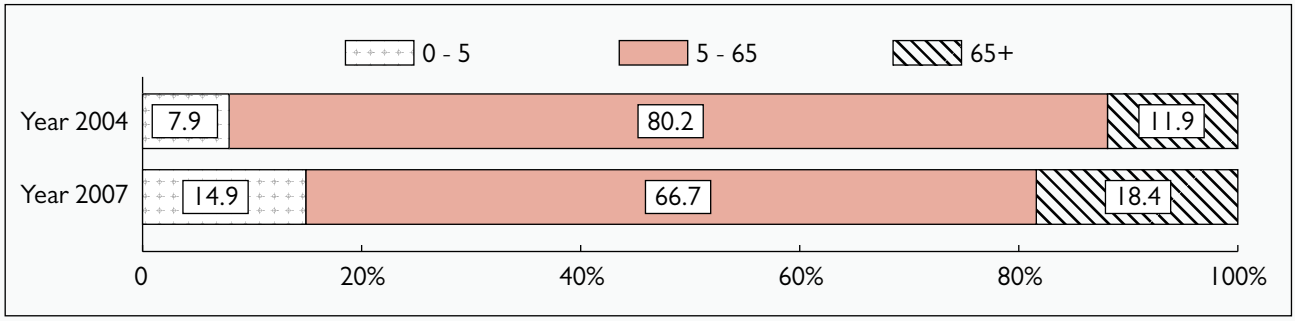



Figure 21: Percentage of total cumulative out-of-pocket expenditure by age group - Source: CSES 2004 and 2007



tion then changed and in 2007 the share of household health spending at private facilities decreased in all groups with an increasing share of health spending at non-medical facilities. However, when investigating by provider group, as shown in Table 60, there is a clear pattern across two years. The share of health centre spending decreased significantly in the highest quintile. The share of hospital health spending increased over higher quintiles while the share of spending at private clinics tended to be relatively similar across quintiles.

### Share of total cumulative out-of-pocket expenditure by facility type or population group and by year

In addition to the share of average household OOP, the analysis of the 2004 and 2007 survey calculated the cumulative total of household OOP using household weights and identified the share of these cumulative values by provider type and group as well as by population subgroup.

Figure 19 shows the share of cumulative OOP in 2004 and 2007. Health spending in the private sector accounted for about half of all out-of-pocket spending in both years. The share of spending in the public sector increased in 2007 to 35 percent from 30 percent in 2004 while the share of spending at non-medical providers almost doubled from 8 to 15 percent.

Figure 20 presents the share of cumulative spending by provider type. Spending at public hospitals and private clinics together accounted for over 50 percent of cumulative household health spending. The share of cumulative OOP at private hospitals and home care decreased from 14 percent in 2004 to 8 percent in 2007 and from 12 percent to 8 percent respectively. However, the share of cumulative OOP at stores selling drugs increased from 9 percent to 15 percent.

In addition, the share of cumulative OOP by children and elderly increased from 2004 to 2007 as shown in Figure 21. The share of OOP from the richest quintile also decreased from 62 percent in 2004 to 50 percent in 2007 (Figure 22). The share of cumulative OOP for each provider type by quintile is shown in Figure 23.

## 2.2 Determinants of health spending

### Determinants of having positive out-of-pocket expenditure

Table 61 shows the results of a regression analysis using a random effect logistic model on having positive out-of-pocket spending using combined 2004 and 2007 data. The random effect model was used to capture unobservable household-level effects. A Chow test was also conducted and it confirmed that the two datasets can be combined for this analysis as there is no significant difference for key explanatory variables between the two datasets.

Figure 22: Percentage of total cumulative out-of-pocket expenditure by economic quintile – Source: CSES 2004 and 2007

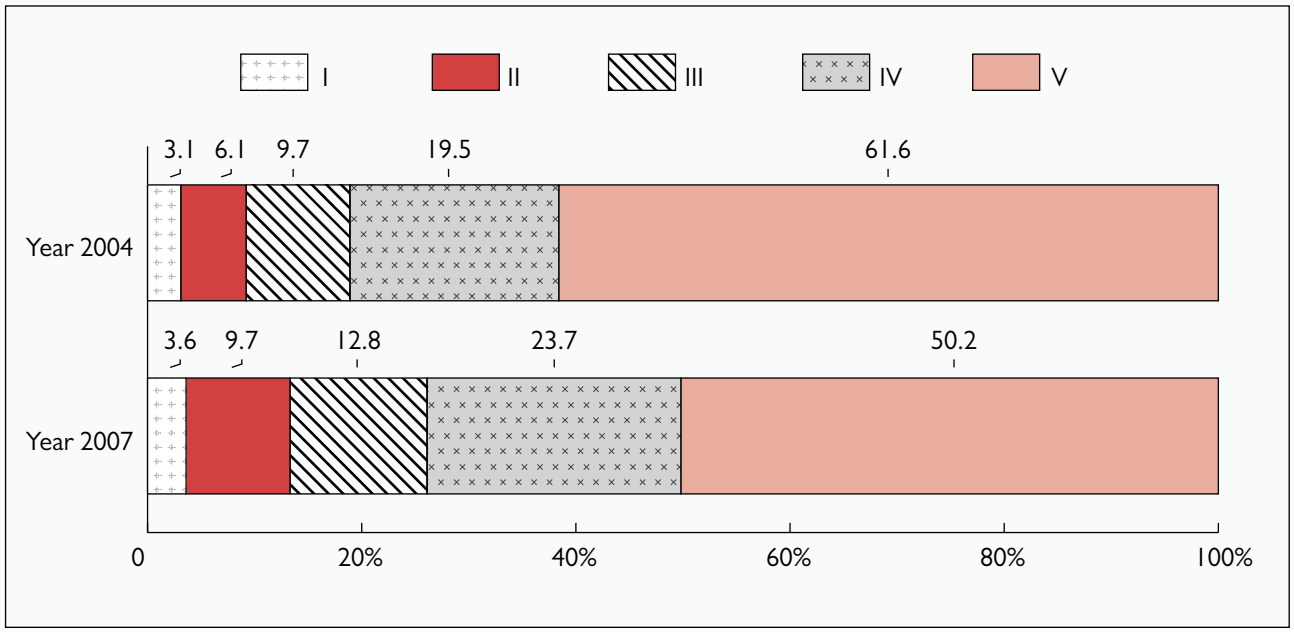


Figure 23: Cumulative average household health spending by provider group and by economic quintile (in Riels) – Source: CSES 2004 and 2007

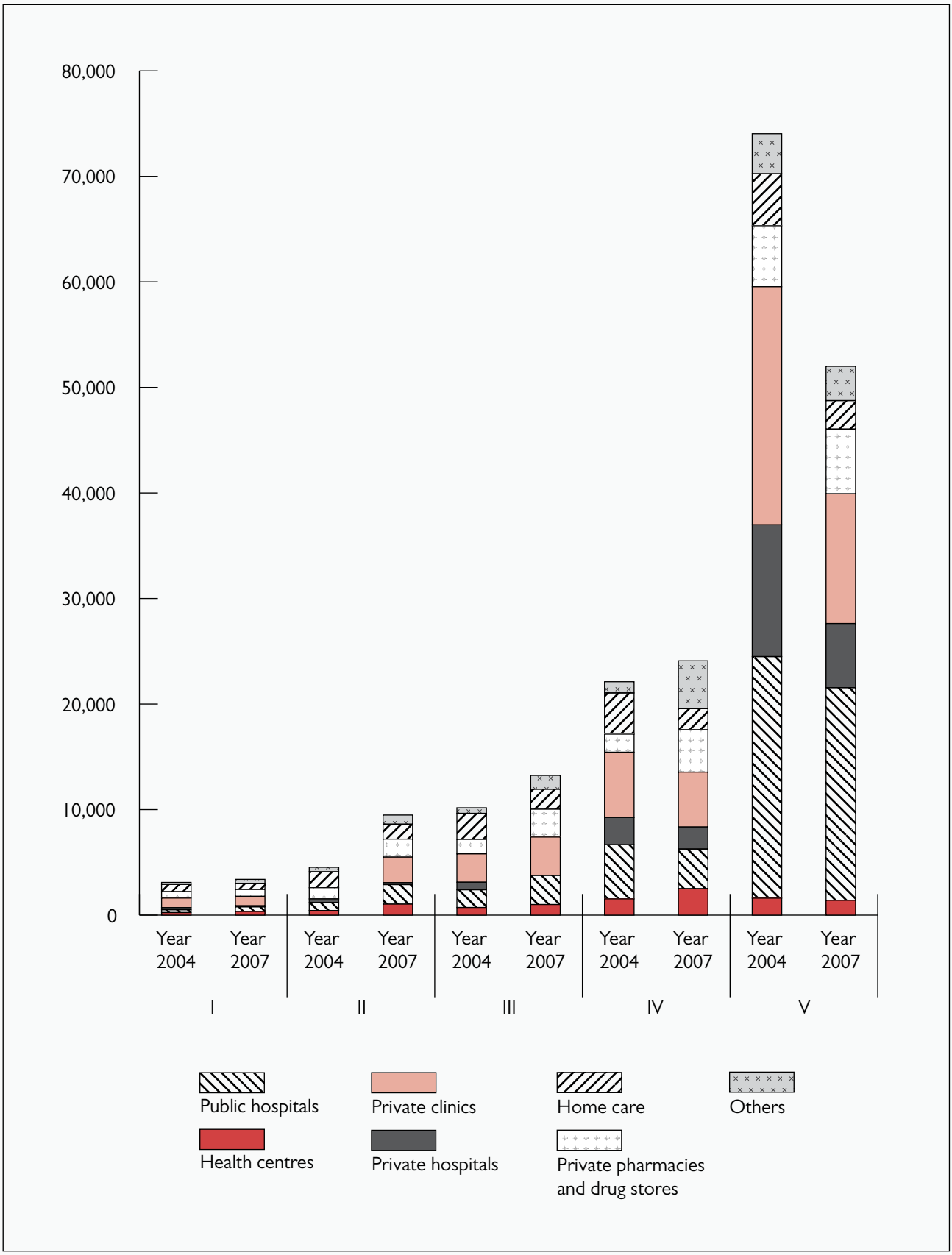


Table 61. Determinants of household having positive out-of-pocket spending - Source: CSES 2004 and 2007

| | Coef. | P>z |
|---|---|---|
| Hospitalised | **1.843** | **0.000** |
| Other rural | **-0.756** | **0.001** |
| Other urban | **-1.071** | **0.000** |
| Household size | **-0.057** | **0.020** |
| Head Prim Ed | 0.085 | 0.497 |
| Head Sec Ed | 0.614 | 0.049 |
| Head Male | **0.278** | **0.027** |
| Aged 5 - 15 | **-0.471** | **0.002** |
| Aged 15 - 60 | **-0.499** | **0.000** |
| Aged 60 + | **-0.577** | **0.001** |
| Male | **-0.302** | **0.000** |
| 2nd Quintile (II) | **0.842** | **0.000** |
| 3rd Quintile (III) | **1.326** | **0.000** |
| 4th Quintile (IV) | **1.679** | **0.000** |
| 5th Quintile (V) | **1.983** | **0.000** |
| Stomach ache | **0.524** | **0.012** |
| Back pain | **-0.706** | **0.000** |
| Head/eye/ear pain | 0.248 | 0.091 |
| Fever | **1.616** | **0.000** |
| Diarrhoea | **1.349** | **0.000** |
| Common cold | **0.606** | **0.000** |
| Severe respiratory disease | **0.681** | **0.000** |
| Non communicable disease | 0.074 | 0.660 |
| Communicable disease | **1.233** | **0.000** |
| Year 2007 | 0.181 | 0.200 |
| Constant | **3.322** | **0.000** |
| Ln sig2u | 1.855 | |
| Sigma u | 2.528 | |
| Rho | 0.660 | |

The table shows that almost all factors have a significant effect on the likelihood of spending out of pocket except the year. Those household-level factors which are positive determinants include: belonging to higher quintiles; the head of the household having completed secondary or higher education; and living in the capital. However, having a bigger-sized household is less likely to lead to positive OOP.

For individual factors, it shows as expected that being hospitalised increases the likelihood of having positive OOP. Being female or a child under five are both more likely to lead to positive OOP. Only falling ill with back pain is less likely to lead to positive OOP. Falling ill for other reasons is more likely to lead to positive OOP, except for head/eye/ear pain, and NCDs which show no significant effect.

### Determinants of the level of out-of-pocket expenditure

Further analysis to explore the determinants of the level of health spending was done using a logistics model with robust standard error. The analysis was conducted separately for 2004 and 2007 data because the Chow test rejected the use of combined data. There was no significant random household effect so robust standard error models were used to control for cluster effect. Only individuals with positive OOP were included in the analysis and the level of health spending was logarithmically transformed to be used as the outcome variable.

The findings on the determinants of level of health spending from 2004 and 2007 datasets are mostly similar (Table 62). All significant estimators show the same sign for both years.

Table 62. Determinants of OOP level for household with positive OOP – Source: CSES 2004 and 2007

| Log OOP level | 2004 | | 2007 | |
|---|---|---|---|---|
| | Coef. | P>z | Coef. | P>z |
| Hospitalised | **1.677** | **0.000** | **1.714** | **0.000** |
| Other rural | -0.055 | 0.187 | **-0.252** | **0.002** |
| Other urban | -0.074 | 0.105 | **-0.387** | **0.000** |
| Household size | 0.004 | 0.513 | **-0.032** | **0.004** |
| Head Prim Ed | -0.018 | 0.453 | -0.086 | 0.705 |
| Head Sec Ed | 0.050 | 0.323 | -0.284 | 0.513 |
| Head Male | **-0.087** | **0.002** | -0.038 | 0.500 |
| Aged 5 – 15 | **-0.198** | **0.000** | **-0.367** | **0.000** |
| Aged 15 – 60 | **0.156** | **0.000** | **-0.143** | **0.035** |
| Aged 60 + | **0.290** | **0.000** | 0.011 | 0.902 |
| Male | **0.063** | **0.004** | 0.076 | 0.131 |
| 2nd Quintile (II) | **0.296** | **0.000** | **0.595** | **0.000** |
| 3rd Quintile (III) | **0.513** | **0.000** | **0.683** | **0.000** |
| 4th Quintile (IV) | **0.857** | **0.000** | **0.861** | **0.000** |
| 5th Quintile (V) | **1.317** | **0.000** | **1.263** | **0.000** |
| Stomach ache | **-0.602** | **0.000** | **-0.591** | **0.001** |
| Back pain | **-0.802** | **0.000** | **-0.558** | **0.000** |
| Head/eye/ear pain | **-1.023** | **0.000** | **-0.802** | **0.000** |
| Fever | **-0.814** | **0.000** | **-0.616** | **0.000** |
| Diarrhoea | **-0.783** | **0.000** | **-0.798** | **0.000** |
| Common cold | **-1.267** | **0.000** | **-1.276** | **0.000** |
| Severe respiratory disease | 0.046 | 0.440 | 0.118 | 0.405 |
| Non communicable disease | **0.248** | **0.000** | **0.432** | **0.001** |
| Communicable disease | **0.519** | **0.000** | **0.674** | **0.000** |
| Constant | **8.794** | **0.000** | **9.490** | **0.000** |

At individual level, a number of variables have a significant effect on health spending for both years. Being hospitalised entails a significantly higher level of health spending while being aged 5 to 15 entails a lower level of spending compared to the reference group of children under 5. Getting ill from NCDs, or CDS entails a significantly higher level of OOP but being ill with back pain, Stomach ache, common cold, diarrhoea, and certain other symptoms entails a significantly lower level of health spending. Being male or being 15 and above entails a significantly higher level of health spending only for 2004 dataset.

For household level variables, being in the higher quintile entails a higher level of health spending for both years. Some other variables show significant effect only for specific years i.e. living in the capital entailed a higher level of health spending and having a larger household size entailed a lower level of health spending only in 2007. Having male head entailed a significantly lower level of OOP only in 2004.

## 3. Household capacity to pay

The capacity to pay of each household was estimated from its consumption level and food poverty line. Average total consumption per household (exp) increased from 474,488 Riels per month in 2004 to 650,826 Riels per month in 2007, an increase of 37 percent in nominal terms. There was however significant variation in the consumption levels in both years.

The average capacity to pay per household was 300,110 Riels per month in 2004 and 401,217 Riels per month in 2007. This constitutes a one-third increase in nominal terms over the 3-year period. The average share of out-of-pocket health spending in household capacity to pay was at 7.7 percent in 2004 and decreased to 6.1 percent in 2007. The proportion of poor households based on regional pov-

Table 63. Summary statistics on household consumption, capacity to pay, and poverty incidence – Source: CSES 2004 and 2007

| | 2004 | | 2007 | |
|---|---|---|---|---|
| | Mean | (s.e.) | Mean | (s.e.) |
| Total consumption per household (exp) | 474,488 | (4,888) | 650,826 | (17,312) |
| Capacity to pay per household (ctp) | 300,110 | (4,730) | 401,217 | (16,928) |
| OOP shared ctp (oop%ctp) | 7.7% | (0.13%) | 6.1% | (0.23%) |
| Food poverty line (pl) | 86,458 | - | 127,651 | - |
| % Poor households (exp<local pov line) | 31.5% | (0.38%) | 27.3% | (0.74%) |

Table 64. Average level of consumption, capacity to pay, and OOP share of capacity to pay by economic quintile – Source: CSES 2004 and 2007

| | 2004 CSES | | | 2007 CSES | | |
|---|---|---|---|---|---|---|
| | exp | ctp | oopctp | exp | ctp | oopctp |
| 1st Quintile (I) | 168,024 | 54,159 | 6.1% | 236,309 | 71,396 | 4.8% |
| (s.e.) | (997) | (498) | (0.23%) | (3,043) | (1,445) | (0.47%) |
| 2nd Quintile (II) | 250,626 | 88,503 | 7.3% | 350,194 | 119,936 | 7.1% |
| (s.e.) | (1,149) | (704) | (0.25%) | (3,583) | (2,149) | (0.58%) |
| 3rd Quintile (III) | 333,119 | 142,249 | 7.8% | 452,930 | 187,733 | 6.5% |
| (s.e.) | (1,531) | (913) | (0.28%) | (4,555) | (2,795) | (0.58%) |
| 4th Quintile (IV) | 457,871 | 259,120 | 9.1% | 635,674 | 344,915 | 6.9% |
| (s.e.) | (2,167) | (1,499) | (0.32%) | (6,119) | (4,100) | (0.54%) |
| 5th Quintile (V) | 1,163,000 | 956,693 | 8.3% | 1,580,781 | 1,283,717 | 5.5% |
| (s.e.) | (18,471) | (18,293) | (0.33%) | (58,655) | (58,263) | (0.41%) |
| **All** | **474,488** | **300,110** | **7.7%** | **650,826** | **401,217** | **6.1%** |
| **s.e.** | **(4,888)** | **(4,730)** | **(0.13%)** | **(17,312)** | **(16.928)** | **(0.23%)** |

erty lines also decreased from 31.5 percent to 27.3 over the same period (Table 63).

Figure 24 and Table 64 compare the average level of capacity to pay by quintile and the corresponding OOP share of capacity to pay in 2004 and 2007. As shown, ctp increased over the period and the increase was much higher for the highest quintile. The OOP share of ctp increased in higher quintiles in 2004 with the exception of the richest group. For 2007, OOP share of ctp was lower than in 2004 for every quintile with greater reductions in the two highest quintile groups.

## 4. Catastrophic expenditure and poverty impact

### 4.1 Catastrophic expenditure incidence

In 2004, the OOP proportion of ctp of almost 80 percent of households was lower than 10 percent, considered as a low health payment burden. Only 6 percent of the households had an OOP higher than 40 percent of ctp, considered to be a high payment burden constituting a catastrophic level of health spending.

In 2007, the proportion of households with low health payment burdens increased to 82.5 percent while the proportion of households with high payment burdens decreased to 4.3 percent. The reduction in health payment burdens across the period was higher in the lowest and highest quintiles than in other quintile groups. The percentage of households with different levels of health payment burden (four groups according to oopctp) by income quintile are shown in Figure 25.

Over the period, the FFC index increased from 0.777 in 2004 to 0.797 in 2007, indicating a fairer health financing system in Cambodia. Table 65 and Figure 26 show that the reduction in catastrophic health spending incidence applied across all quintiles.

### 4.2 impoverishment

In addition, the incidence of impoverishment from health spending also decreased from 3.0 percent to 2.5 percent in 2007 (Table 65 and 66). The poverty gap difference from OOP also decreased from 46.4% in 2004 to 35.9% in 2007 with no change in the difference in the squared poverty gap after OOP.

Figure 24: Average capacity to pay per month and average out-of-pocket expenditure as a share of household capacity to pay by economic quintile [in Riel; in %] - Source: CSES 2004 and 2007

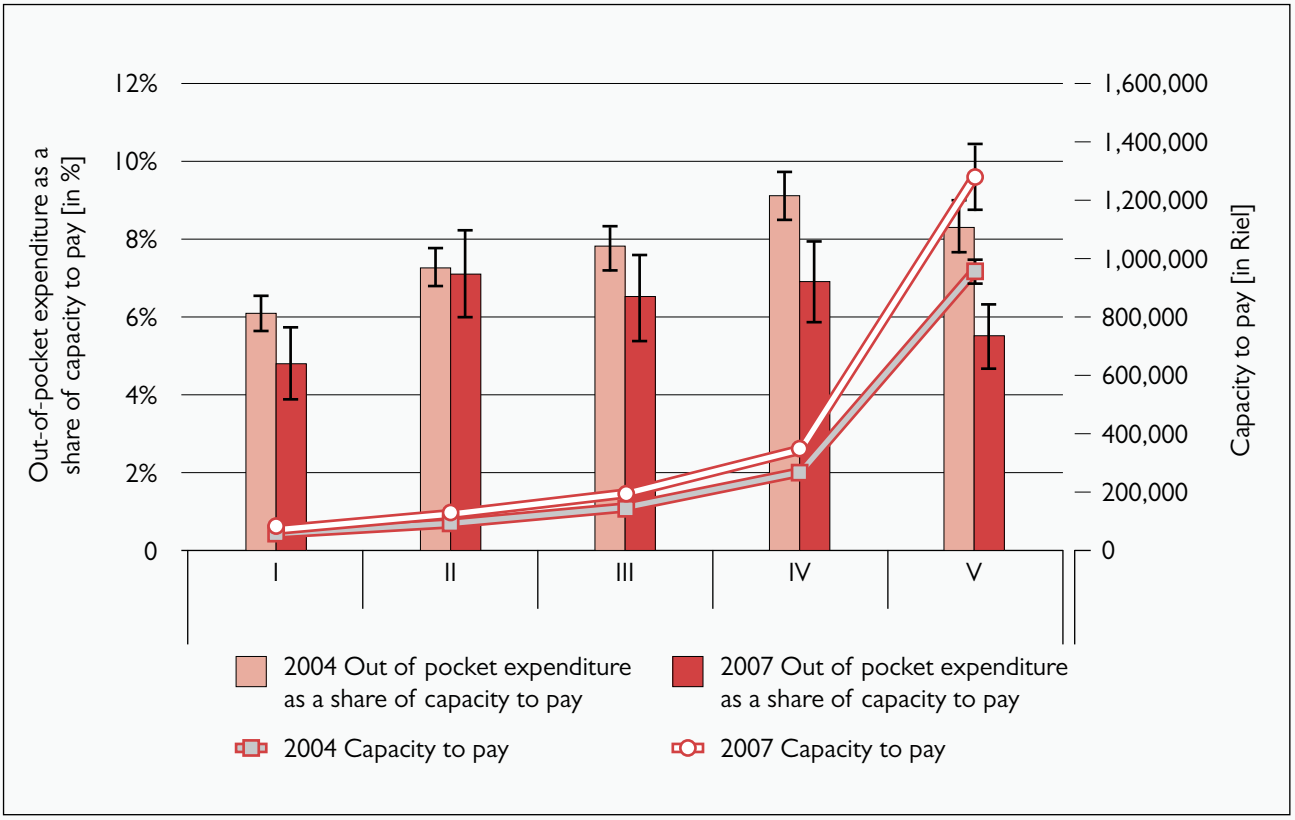


Figure 25: Percentage of household with various levels of out-of-pocket share of capacity to pay by economic quintile [in %] – Source: CSES 2004 and 2007

Figure 26: Percentage of economic quintile experiencing catastrophic health expenditure [in %] – Source: CSES 2004 and 2007

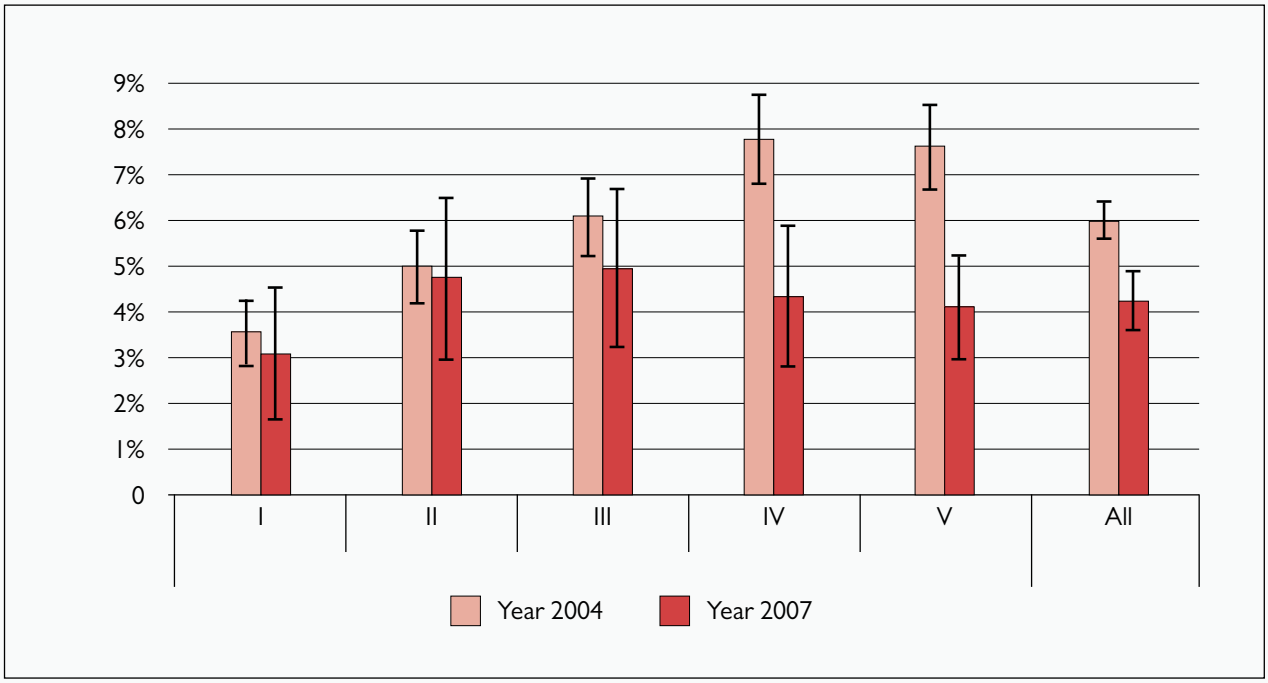



Table 65. Percentage of households with catastrophic health spending and impoverishment by economic quintile [in %] – Source: CSES 2004 and 2007

| | 2004 CSES | | 2007 CSES | |
|---|---|---|---|---|
| | Catastrophic spending | Impoverishment | Catastrophic spending | Impoverishment |
| 1st Quintile (I) | 3.57% | 0.59% | 3.11% | 1.06% |
| 2nd Quintile (II) | 5.03% | 4.52% | 4.77% | 5.58% |
| 3rd Quintile (III) | 6.10% | 5.43% | 4.97% | 4.17% |
| 4th Quintile (IV) | 7.79% | 3.13% | 4.37% | 1.04% |
| 5th Quintile (V) | 7.63% | 1.18% | 4.14% | 0.48% |
| **All** | **6.02%** | **2.97%** | **4.27%** | **2.47%** |

Table 66. Summary statistics on poverty head count and poverty gap – Source: CSES 2004 and 2007

| | 2004 | 2007 |
|---|---|---|
| Poor households before OOP | 31.5% | 27.3% |
| Poor households after OOP | 34.5% | 29.8% |
| Difference in poor households after OOP | 3.0% | 2.5% |
| Average poverty gap before OOP | 25,505 | 26,595 |
| Difference in poverty gap after OOP | 3,297 | 3,112 |
| Normalised poverty gap before OOP | 46.4% | 35.9% |
| Difference in normalised poverty gap after OOP | 6.0% | 4.2% |
| Squared poverty gap before OOP | 2.94% | 3.40% |
| Difference in squared poverty gap after OOP | 0.44% | 0.44% |
| Mean positive gap before OOP | 80,967 | 97,253 |
| Difference in mean positive gap after OOP | 10,467 | 11,379 |

## 4.3 Determinants of catastrophic health payments

Table 67 shows the results of a regression analysis using a random effect logistic model on household catastrophic health payments. The analysis was conducted separately for 2004 data and 2007 data because the Chow test rejected the use of combined data. The random effect model was used to capture unobservable household-level effects. The analysis controlled for various types of reported illness and household age composition.

Despite differing in terms of magnitude of effect, the data from the two survey years show relatively similar results in terms of trends in the impact of various determinants on a given household's catastrophic spending. In both years, having a hospitalised member or being in rural areas is more likely to lead to catastrophic payments. Larger household size is more likely to lead to catastrophic spending.

The 2004 model with more observations in the analysis also shows that households in higher economic quintiles, in the 3rd, 4th, and 5th quintiles, have a higher likelihood of catastrophic spending as well as of having children under 5 years old. Having a male head or a head with at least secondary education leads to lower likelihood of catastrophic health payments.

Table 67. Estimation results from models on determinants of catastrophic health spending household

| | 2004 | | 2007 | |
|---|---|---|---|---|
| | Coef. | P>z | Coef. | P>z |
| Having a hospitalised member | **2.415** | **0.000** | **1.739** | **0.000** |
| Other rural | **1.472** | **0.000** | **0.679** | **0.031** |
| Other urban | 0.659 | 0.066 | 0.267 | 0.415 |
| Household size | **-0.123** | **0.000** | **-0.101** | **0.000** |
| Head Prim Ed | -0.167 | 0.087 | -0.413 | 0.358 |
| Head Sec Ed | -0.539 | 0.028 | -2.409 | 0.142 |
| Head Male | **-0.315** | **0.002** | -0.064 | 0.597 |
| Aged 60 + | -0.016 | 0.876 | (omitted) | |
| Aged 0 - 5 | **0.173** | **0.050** | (omitted) | |
| 2nd Quintile (II) | 0.256 | 0.078 | 0.200 | 0.235 |
| 3rd Quintile (III) | **0.459** | **0.001** | 0.149 | 0.380 |
| 4th Quintile (IV) | **0.594** | **0.000** | -0.088 | 0.624 |
| 5th Quintile (V) | **0.729** | **0.000** | -0.034 | 0.855 |
| Stomach ache | **1.701** | **0.000** | **0.946** | **0.000** |
| Back pain | **0.882** | **0.000** | 0.146 | 0.558 |
| Head/eye/ear pain | 0.231 | 0.279 | **0.610** | **0.006** |
| Fever | **0.487** | **0.000** | 0.172 | 0.306 |
| Diarrhoea | **0.636** | **0.000** | **0.456** | **0.001** |
| Common cold | **0.656** | **0.000** | 0.388 | 0.093 |
| Severe respiratory disease | 0.039 | 0.711 | -0.029 | 0.845 |
| Non communicable disease | **1.688** | **0.000** | **0.557** | **0.003** |
| Communicable disease | **1.334** | **0.000** | **0.792** | **0.000** |
| Others | **2.221** | **0.000** | **1.537** | **0.000** |
| Constant | **-5.107** | **0.000** | **-2.535** | **0.000** |
| LnSig2u | -2.667 | | -3.283 | |
| Sigma u | 0.264 | | 0.194 | |
| Rho | 0.021 | | 0.036 | |

Table 68. Comparison of average amount of household health spending at various provider types between catastrophic spending households and non-catastrophic spending households in 2007 - Source: CES 2007

| | Non catastrophic spending | | Catastrophic spending | | Ratio of catastrophic vs. non-catastrophic | |
|---|---|---|---|---|---|---|
| | Amount [in Riels] | Share [in %] | Amount [in Riels] | Share [in %] | Amount [in Riels] | Share [in %] |
| Health centres | 657 | 6% | 14,805 | 6% | 23 | 1.0 |
| Public hospitals | 1,467 | 14% | 102,614 | 43% | 70 | 3.2 |
| Private hospitals | 1,127 | 10% | 14,191 | 6% | 13 | 0.6 |
| Private clinics | 2,806 | 26% | 51,423 | 22% | 18 | 0.8 |
| Private pharmacies and drug stores | 2,502 | 23% | 14,836 | 6% | 6 | 0.3 |
| Home care | 1,031 | 10% | 17,078 | 7% | 17 | 0.8 |
| Others | 1,193 | 11% | 21,613 | 9% | 18 | 0.8 |
| **Total** | **10,784** | **100%** | **236,559** | **100%** | **22** | **1.0** |

Table 69. Summary statistics on household indebtedness through illness - Source: CSES 2004 and 2007

| | 2004 | 2007 |
|---|---|---|
| Incidence of indebtedness through illness | 5.3% | 4.0% |
| (s.e.) | (0.18%) | (0.33%) |
| Average amount of debt from illness per household [in Riels] | 30,467 | 47,386 |
| (s.e.) | (4,241) | (11,026) |
| Average amount of debt from illness among households with debt from illness [in Riels] | 579,123 | 1,198,838 |
| (s.e.) | (79,351) | (283,844) |

Table 70. Summary statistics on household indebtedness through illness by economic quintile - Source: CSES 2004 and 2007

| | 2004 | | 2007 | |
|---|---|---|---|---|
| | Share having debt from illness [in %] | Average amount of debt from illness [in Riels] | Share having debt from illness [in %] | Average amount of debt from illness [in Riels] |
| 1st Quintile (I) | 6.2% | 17,224 | 3.8% | 53,044 |
| (s.e.) | (0.5%) | (2,160) | (0.8%) | (36,690) |
| 2nd Quintile (II) | 6.1% | 23,602 | 5.9% | 35,092 |
| (s.e.) | (0.4%) | (3,246) | (1.0%) | (9,710) |
| 3rd Quintile (III) | 5.6% | 31,225 | 4.3% | 50,251 |
| (s.e.) | (0.4%) | (4,510) | (0.8%) | (18,590) |
| 4th Quintile (IV) | 4.9% | 29,841 | 3.6% | 66,876 |
| (s.e.) | (0.4%) | (7,601) | (0.7%) | (39,531) |
| 5th Quintile (V) | 3.5% | 50,451 | 2.1% | 31,668 |
| (s.e.) | (0.3%) | (18,017) | (0.4%) | (11,013) |
| **All** | **5.3%** | **30,467** | **4.0%** | **47,386** |

Table 71. Estimation results from model on determinants of household indebted from illness

| | Coef. | P>z |
|---|---|---|
| Having a hospitalised member | 0.846 | 0.000 |
| Other rural | 0.659 | 0.090 |
| Other urban | -0.102 | 0.799 |
| Household size | 0.007 | 0.696 |
| Head Prim Ed | -0.178 | 0.052 |
| Head Sec Ed | -0.770 | 0.008 |
| Head Male | -0.179 | 0.042 |
| Elderly member | -0.301 | 0.005 |
| Aged 0 - 5 | 0.111 | 0.170 |
| 2nd Quintile (II) | -0.015 | 0.885 |
| 3rd Quintile (III) | -0.134 | 0.221 |
| 4th Quintile (IV) | -0.235 | 0.038 |
| 5th Quintile (V) | -0.528 | 0.000 |
| Stomach ache | 0.649 | 0.000 |
| Back pain | 0.194 | 0.228 |
| Head/eye/ear pain | -0.004 | 0.984 |
| Fever | 0.014 | 0.901 |
| Diarrhoea | 0.404 | 0.000 |
| Common cold | 0.427 | 0.010 |
| Severe respiratory disease | 0.203 | 0.024 |
| Non communicable disease | 0.769 | 0.000 |
| Communicable disease | 0.725 | 0.000 |
| Others | 0.742 | 0.000 |
| Year 2007 | -0.258 | 0.019 |
| Constant | -3.615 | 0.000 |
| LnSig2u | -2.218 | |
| Sigma u | 0.330 | |
| Rho | 0.032 | |

Table 68 presents the share of average health spending at various health providers and compares households facing catastrophic health spending with those not facing catastrophic health spending. Catastrophic households spend more money in general but the difference is particularly prominent at public hospitals. Almost half (43 percent) the average health expenditure of catastrophic households is spent at public hospitals. It is also worth noting that they also spend almost one fourth at private clinics.

## 5. Debt from illness

### 5.1 Incidence of indebtedness through illness

Analysis of the CSES 2004 data on household indebtedness showed that 5.3 percent of households had debts resulting from illness in 2004 (Table 69). The average amount debt per household resulting from illness for all households was 30,467 Riels. However, the average level of debt from illness among households indebted from illness was 579,123 Riels. In 2007, the incidence of indebtedness through illness decreased to 4 percent. However, the average amount of debt from illness per household increased.

In assessing the incidence and level of debt by quintile, the analysis shows that in 2004 the incidence of debt from illness was lowest in the lowest quintile even though the average amount of debt from illness was highest in this group. In 2007, the incidence of indebtedness through illness was lower in all economic quintiles with the biggest decline in the lowest quintile. The average level of debt was higher than in 2004 in almost all quintiles except the highest group.

### 5.2 Determinants debt from illness

Table 71 shows the results from a regression analysis using a random effect logistic model on household catastrophic health payments. The analysis combined 2004 and 2007 data. A Chow test was also conducted and it confirmed that the two datasets can be combined for this analysis as there are no significant difference for key explanatory variables between the two datasets. A random effect model was used to capture household level unobservable effects. The analysis controlled for various type of reported illness and household age composition.

The analysis found that having a hospitalised member is more likely to lead to indebtedness through illness. Having educated or male head of household reduced the chance of indebtedness through illness as well as having an elderly member in the household. The analysis also shows that households in 4th and 5th quintiles have significantly lower chance of indebtedness through illness than the poorest quintile. The risk of indebtedness through illness also decreased significantly in 2007 compared to 2004.

## 6. Subgroup analysis

### 6.1 By region

Data from 2004 and 2007 show that households in Phnom Penh have a much higher average level of total consumption and capacity to pay than households in other urban or rural areas. Because health spending is not proportionately higher to reflect this difference in capacity to pay, the average OOP share of ctp, the catastrophic incidence, and impoverishment from OOP in Phnom Penh are therefore lower than in the other regions (Table 72).

There were improvements over the period from 2004 to 2007 in the reduction of the health payments burden and catastrophic incidence as well as impoverishment from health payments in all three regions. However, the improvement in Phnom Penh was greater than in other regions (Table 73, 74 and Figure 27). Because health spending did not increase to the same extent as the increase in capacity to pay, the average OOP share of ctp, the catastrophic incidence, and impoverishment from OOP in Phnom Penh therefore decreased to a greater extent than those of the other regions.

In 2007, only 5% of households in Phnom Penh spent more than 10% of their capacity to pay on health compared to over 15% in other urban or rural areas. The catastrophic incidence was 1.1 percent in Phnom Penh, lower than 2.7 percent in other urban areas and 4.7 percent in other rural areas.

The incidence of indebtedness through illness decreased in 2007 compared to 2004 levels in all regions. However, the incidence in rural areas was still much higher than in Phnom Penh or other urban areas. The average level of indebtedness through illness increased in the regions outside Phnom Penh although there were high variations in the debt level in all regions.

Table 72. Summary statistics on consumption, capacity to pay, and catastrophic incidence by region – Source: CSES 2004 and 2007

| | 2004 | | | 2007 | | |
|---|---|---|---|---|---|---|
| | Phnom Penh | Oth urban | Oth rural | Phnom Penh | Oth urban | Oth rural |
| Average consumption per household (exp) | 1,264,244 | 663,839 | 373,958 | 1,757,346 | 950,035 | 531,309 |
| (s.e.) | (28,678) | (19,107) | (3,671) | (56,112) | (51,190) | (18,921) |
| Average capacity to pay per household (ctp) | 1,059,586 | 474,309 | 204,424 | 1,454,150 | 683,002 | 287,842 |
| (s.e.) | (28,264) | (18,765) | (3,490) | (55,424) | (50,331) | (18,509) |
| Average OOP per household (oop) | 58,065 | 26,165 | 22,460 | 27,539 | 25,798 | 20,342 |
| (s.e.) | (6,577) | (3,432) | (1,113) | (5,126) | (5,300) | (1,766) |
| Average OOP share of ctp (oop%ctp) | 5.0% | 5.6% | 8.3% | 2.1% | 5.2% | 6.6% |
| (s.e.) | (0.30%) | (0.28%) | (0.15%) | (0.24%) | (0.46%) | (0.30%) |
| Catastrophic incidence | 2.9% | 3.8% | 6.6% | 1.1% | 2.7% | 4.7% |
| (s.e.) | (0.45%) | (0.42%) | (0.23%) | (0.38%) | (0.65%) | (0.45%) |
| Impoverishment from OOP | 0.1% | 1.1% | 2.8% | 0.0% | 1.5% | 2.6% |
| (s.e.) | (0.23%) | (0.29%) | (0.17%) | (0.23%) | (0.60%) | (0.34%) |
| Incidence of indebtedness through illness | 2.4% | 2.7% | 5.9% | 1.7% | 1.7% | 4.4% |
| (s.e.) | (0.41%) | (0.35%) | (0.22%) | (0.47%) | (0.52% | (0.43%) |
| Average amount of debt from illness | 77,607 | 14,123 | 27,933 | 17,239 | 16,447 | 53,387 |
| (s.e.) | (42,793) | (3,270) | (2,609) | (6,065) | (7,353) | (15,220 |

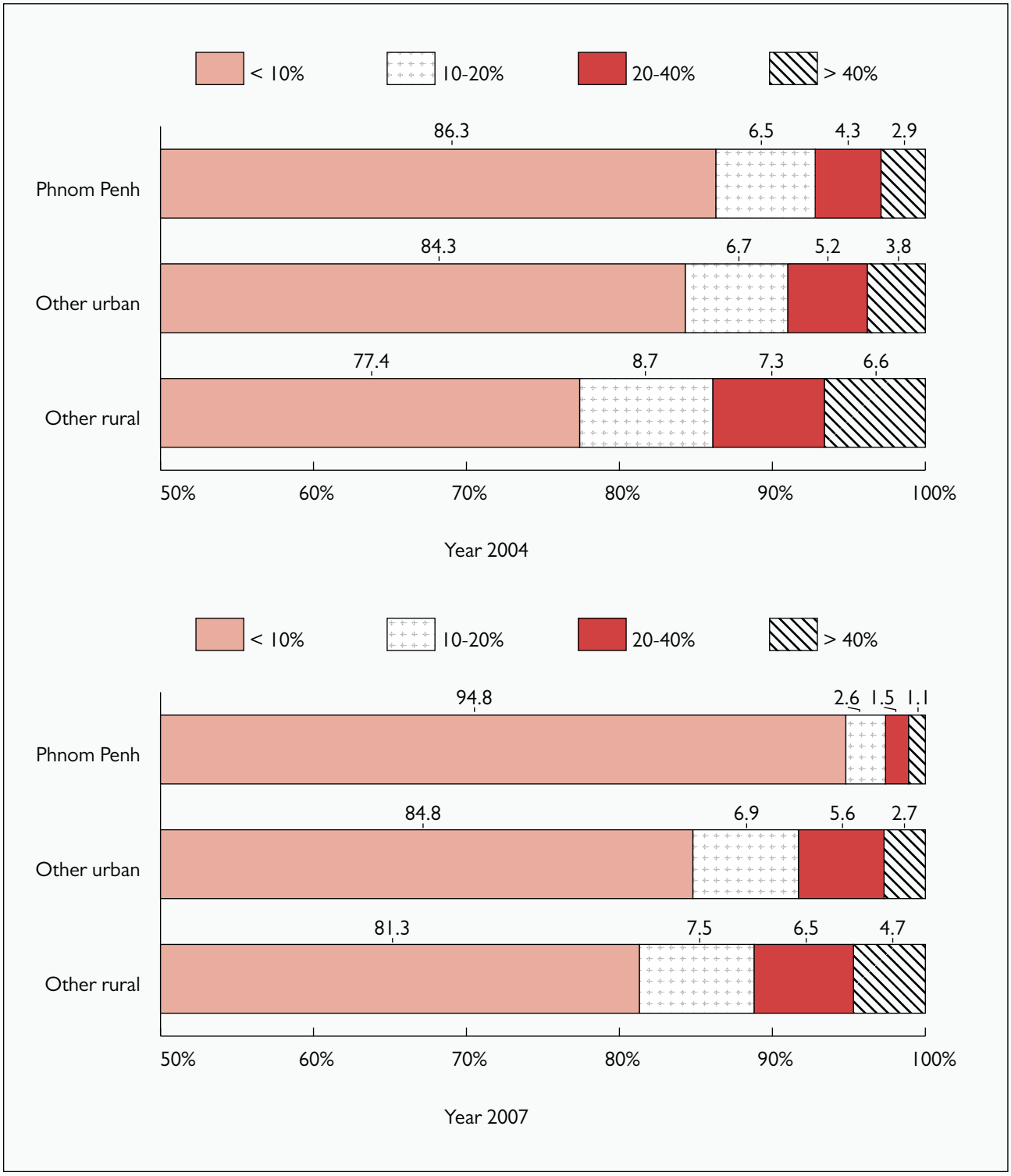
Table 73. Change in key statistics over the period from 2004 to 2007 by region [in %] – Source: CSES 2004 and 2007

| | Phnom Penh | Oth urban | Oth rural |
|---|---|---|---|
| Consumption expenditure | 39% | 43% | 42% |
| Capacity to pay | 37% | 44% | 41% |
| Out-of-pocket expenditure | | | |
| Out-of-pocket share of capacity to pay | -59% | -8% | -21% |
| Catastrophic health expenditure | -63% | -29% | -29% |
| Impoverishment | -100% | 34% | -5% |

Table 74. Share of households with various levels of out-of-pocket share of capacity to pay by region [in %] – Source: CSES 2004 and 2007

| | 2004 CSES | | | | 2007 CSES | | | |
|---|---|---|---|---|---|---|---|---|
| | <10% | 10-20% | 20-40% | >=40% | <10% | 10-20% | 20-40% | >=40% |
| Phnom Penh | 86.3% | 6.5% | 4.3% | 2.9% | 94.8% | 2.6% | 1.5% | 1.1% |
| Other urban | 84.3% | 6.7% | 5.2% | 3.8% | 84.8% | 6.9% | 5.6% | 2.7% |
| Other rural | 77.4% | 8.7% | 7.3% | 6.6% | 81.3% | 7.5% | 6.5% | 4.7% |

Figure 27: Percentage of households with various levels of out-of-pocket share of capacity to pay by region - Source: CSES 2004 and 2007



# Discussion

Analysis of CSES 2004 and 2007 and CDHS 2005 reveals a number of interesting results related to illness patterns, health care-seeking behaviour, and health spending. The incidence of reported illness in Cambodia was found to be around 0.15 to 0.19 in the data from all three surveys. There were big differences in illness incidences between age groups with higher incidence among the elderly and children under 5. The incidences were relatively similar between economic groups. When assessed over time, over the period from 2004 to 2007 the incidences decreased in almost all subgroups (except for children under 5).

## Health care-seeking behaviours

Among the ill, several factors were found to be associated with their health care-seeking behaviour. This analysis showed that individuals in higher economic quintiles sought care more and that there were differences in the ratio of care-seeking among those reported ill according to age group and geographical location. Determinant analysis using multivariate regression technique controlling for level or type of illness and age group confirms the significant role of economic status and geographical location in explaining the health care-seeking decision in addition to biomedical characteristics such as age, sex, and type of illness.

Overall health care access improved as shown in the share of the reportedly ill population who sought care in 2007, an increase from 2004. The increase is also pro-poor as shown in the larger increase among poorer quintiles. The poorest quintile experienced the biggest increase in terms of the percentage of ill people seeking medical care, the incidence of outpatient visits and the ratio of hospitalisation among the ill. Nevertheless, the gaps between low and high quintiles still exist, especially for inpatient care. The ratio of hospitalisation between the highest quintile and the lowest quintile was as high as almost 6 to 1 in 2004. It improved in 2007 but the hospitalisation rates in the three poorest quintiles were still around half that of the richest quintile.

Drug stores and private clinics were the most common providers of health care services in all three years of the study. However, the patterns of provider choice differed between age groups and economic levels. After controlling for type/level of illness, the regression analyses identified many significant factors, including geographical location, economic quintiles, and age groups in determining the choice of health care provider. People in rural areas demonstrated significantly higher use of health centres and home care and lower use of hospitals. People in the capital used private hospitals and private clinics significantly more. The higher quintiles also used drug stores and hospital care more. From the CSES surveys, children under 5 were significantly less likely to receive care at home compared to other age groups. And in 2004, female individuals used health centres more than males.

Several of these factors may be attributable to improvements in health care access in Cambodia. Rapid economic growth over the past decade has resulted in increased consumption capacity and reduction in poverty among Cambodian households. The poverty headcount index based on the national poverty line decreased from 35% in 2004 to 30% in 2007[11]. Per capita household consumption also increased, averaging 21 percent in real terms for the population as a whole. Even though the increase in consumption was unequal, the two poorest quintiles still enjoyed an over 10 percent increase in real terms over the same period.

Government investment in the health care sector has increased substantially over the past decade. A number of health facilities have been built or renovated to improve geographical access to health services in the public sector. Almost 200 health centres in 5 provinces were built or renovated in the late 1990s and early 2000s under the BHS project, providing an estimated 2.4 million people with better access[12]. The average distance to a nearest health centre was reduced by 36 percent from 7 kilometres to 4.5 kilometres for households in the poorest quintiles[13]. The introduction of many health care financing schemes in the country could also influence the financial accessibility of beneficiary house-

11 World Bank 2009, Poverty profile and trends in Cambodia 2007: Findings from the Cambodia Socio-Economic Survey (CSES), Report No. 48618-KH, p. vii

12 World Bank 2004, Project Performance Assessment Report – Kingdom of Cambodia Disease Control and Health Development Project (CR. N005-KH), April 21, 2004, Report No. 28648-KH, Washington DC, p. 10

13 World Bank 2009, ibid, page viii

holds. The policy on user fee exemption shown to be implemented mostly at health centres may contribute to lower financial barriers to health care there, resulting in higher use among the lower-income population. However, the lack of data on health insurance coverage of individuals and health financing policy coverage in the CSES and CDHS surveys prevents us from making the detailed analysis required for a rigorous assessment of the health financing and health care access impact of these policies.

## Health spending

On average the amount of out-of-pocket spending on health in the CSES data was almost 4,500 Riels per capita. The amount is less than the amount identified in CDHS 2005 (6,754 Riels) with the variation most likely due to the difference in recall period and the ways the questions were framed. Nevertheless, data from all three surveys show that there are variations in the average amount of spending between age groups and by economic status as shown in consumption/wealth quintiles.

The CDHS 2005 data also provided information on average out-of-pocket spending per visit by provider type. On average, spending at public sector providers accounted for around 60 percent of spending at private providers. The average cost of a visit to health centres is much less than to private clinics (7,628 vs. 59,849 Riels for the first visit). Expenditure at private hospitals is also about twice the average OOP at public hospitals (152,471 Riels versus 74,648 Riels).

The CDHS 2005 also showed that transportation costs might constitute a significant proportion of expenditure for health, which may be neglected when assessing out-of-pocket health spending. It accounted for about 9% of total health related costs or 10% of OOP. Transport costs also varied by type of health care provider and interestingly travel to public hospitals cost more than to private hospitals.

Analysis of determinants of health spending, after controlling for illness type/severity and age sex characteristics, also shows that economic status is a statistically significant factor in having positive health spending as well as in the level of health spending. This is not surprising given the higher incidence of health care utilisation in the higher quintiles shown early and their higher preference than other quintile groups for private health care providers.

## Catastrophic health spending incidence

The 2004 and 2007 CSES also revealed that less than 10 percent of Cambodian households spent more than 10 percent of their capacity to pay on OOP. The incidence of catastrophic health spending in 2004 was 6 percent — higher than the 1999 number (5.02%) presented in an earlier study[14]. The increase in the incidence of catastrophic health spending households could be due to many factors including an increase in health care use as well as the introduction of user fees in the late 1990s[15]. Nevertheless, the proportion of catastrophic households decreased to 4.3 percent in 2007. The results from the analysis of household indebtedness through illness confirm this finding with a significantly lower incidence 2007. Potential contributing factors to such reduction include the increase in household consumption and capacity to pay and the introduction of health care financing schemes such as the health equity funds and community based health insurance. Further analysis is required to identify statistically significant determinants of such changes in 1999 to 2004 and 2004 to 2007.

A number of factors were shown to have significant effects on the chance of catastrophic health spending. As expected, households with members with serious illness or undergoing hospitalisation incurred a higher risk of catastrophic spending in both the 2004 and 2007 data. After controlling for illness patterns, it remained the case that households in rural areas were more prone to catastrophic risk while bigger household (more members) faced less risk. The 2004 CSES also identified households in higher economic quintiles and households with members under 5 years old, female heads of household, or heads of household with only primary education or lower as facing significantly higher risk than others.

The significant effect of rural geographical areas on catastrophic risk deserves special attention. Since catastrophic incidence is defined based on the level of health spending in relation to capacity to pay, the interpretation of determining factors needs to consider three interrelated components, namely: capacity to pay, the accessibility

14 Xu K et al (2003) Household catastrophic health expenditure: a multicountry analysis. Lancet, 362: 111-17

15 MOH Cambodia (2008) Annual Health Financing Report 2008, 20 March 2009.

and utilisation of health services, and the level of health spending. In many low-income developing countries, the level of catastrophic spending in certain populations such as low economic status groups is low because of their limited access to and utilisation of health care. The importance of rural geographical location in the Cambodian context is therefore a cause for concern given the lower health care utilisation identified earlier for these populations. The persistently higher incidence of indebtedness through illness for both 2004 and 2007 in the rural region covered in this study, when compared to the capital or other urban areas, also confirms the weakness in financial protection mechanisms in those areas. Lower capacity to pay in the region is probably an important reason among this group as economic development in the country is mainly concentrated in the capital and urban areas. During the 2004-2007 period, per capita consumption per day in real terms in Phnom Penh and other urban areas increased by 36% and 27% respectively but the increase was only 13% in other rural areas[16]. The reduced average level of health spending and catastrophic incidence between 2004 and 2007 in Phnom Penh—at a much higher proportion than in other rural areas—also calls for further research and policy analysis.

## Limitations

There were a number of limitations in analysing the Cambodia CSES and CDHS data. As mentioned earlier, the data itself lacks detail on health insurance coverage so the analysis could not specifically identify the effect of health insurance on health care-seeking behaviour and health spending patterns. Future surveys should attempt to include more questions on health insurance coverage to allow for detailed analysis for policy use.

Neither are the data from CSES and CDHS exempt from bias which is common to the analysis of questionnaire surveys. The use of a one-month recall period for health care events may not be adequate to capture the randomness of illness episodes but expanding the recall period might increase the chances of under reporting through respondents forgetting events in the more distant past. There is also the possibility that a respondent may not have used health care in the last month but still have reported the amount of medical care spending based on an average month.

Another limitation in the design of the questionnaire was related to the sequence of the health-related section in the questionnaire as a whole. In the CSES, the section on health care was positioned almost at the end of the questionnaire so the relevant questions were asked late in the interview session when the respondents were possibly already tired. The difference was visible in the CSES 2007 where health care spending questions were included in two sections, at the beginning of the questionnaire as part of the overall consumer expenditure section (Section 1C) and near the end of the questionnaire as part of the health section (Section 14). The average value of health care consumption from Section 1C was shown to be much higher than the value calculated from Section 14. In our analysis, the data from the latter part of the questionnaire were used because CSES 2004 does not contain health spending questions in the early part of the questionnaires. This may explain why the value of health spending found in CDHS is much higher than CSES.

The analysis related to health care-seeking and spending at various health care providers from 2004 and 2007 CSES also relied on the assumption that the reported place of frequent health care use was the sole place where all the visits reported by an individual occurred. Nevertheless, the assumption is not far removed from reality given that the findings from CDHS 2005 showed that more than 70 percent of population had used only one place of care in the previous month.

16 World Bank (2009) ibid, p. ix

# Annex

Summary of key statistics and list of statistically important determinants of health care-seeking and spending and catastrophic health spending households

Table I. List of key montly statistics from CSES 2004 and 2007 for all population and for lowest and highest economic quintiles - Source: CSES 2004 and 2007

| | All | | | Lowest quintile | | | Highest quintile | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2004 | 2007 | Change | 2004 | 2007 | Change | 2004 | 2007 | Change |
| Incidence of reported illness per capita | 0.185 | 0.153 | -17.00% | 0.162 | 0.114 | -29.00% | 0.190 | 0.165 | -14.00% |
| (s.e.) | (0.001) | (0.003) | | (0.003) | (0.006) | | (0.003) | (0.005) | |
| % seek care among the ill | 90.29% | 91.54% | 1.39% | 83.26% | 84.23% | 1.16% | 94.20% | 96.59% | 2.54% |
| (s.e.) | (0.25%) | (0.54%) | | (0.78%) | (2.11%) | | (0.41%) | (0.63%) | |
| Outpatient visits among the ill | 28.80% | 30.40% | 6.00% | 24.70% | 29.40% | 19.00% | 33.70% | 34.70% | 3.00% |
| (s.e.) | (0.38%) | (0.90%) | | (0.91%) | (2.64%) | | (0.82%) | (1.64%) | |
| Hospitalisation among the ill | 3.23% | 3.76% | 16.23% | 1.15% | 3.13% | 173.06% | 6.52% | 5.49% | -15.81% |
| (s.e.) | (0.15%) | (0.37%) | | (0.22%) | (1.01%) | | (0.43%) | (0.79%) | |
| Average inpatient days among the ill | 0.2 | 0.22 | 12.00% | 0.05 | 0.09 | 80.00% | 0.48 | 0.41 | -16.00% |
| (s.e.) | (0.01) | (0.03) | | (0.02) | (0.05) | | (0.04) | (0.08) | |
| % of health care-seeking at public facilities | 16.70% | 16.90% | 1.00% | 17.40% | 23.60% | 36.00% | 16.10% | 13.60% | -16.00% |
| % of health care-seeking by provider type | | | | | | | | | |
| Health centres | 8.40% | 9.00% | 8.00% | 11.70% | 17.40% | 49.00% | 4.20% | 3.60% | -15.00% |
| Public hospitals | 8.30% | 7.10% | -15.00% | 5.80% | 5.20% | -9.00% | 10.20% | 10.00% | -2.00% |
| Private hospitals | 4.60% | 3.50% | -23.00% | 3.30% | 1.10% | -66.00% | 6.60% | 5.50% | -17.00% |
| Private clinics | 26.10% | 20.30% | -22.00% | 22.40% | 19.40% | -13.00% | 30.90% | 24.70% | -20.00% |
| Private pharmacies and drug stores | 31.60% | 44.30% | 40.00% | 33.00% | 35.40% | 7.00% | 35.40% | 47.80% | 35.00% |
| Home care | 15.80% | 8.00% | -49.00% | 17.50% | 12.10% | -31.00% | 8.40% | 5.30% | -37.00% |
| Others | 5.30% | 7.70% | 45.00% | 6.40% | 9.40% | 47.00% | 4.40% | 3.00% | -30.00% |
| Average OOP per household | 25671.00 | 21345.00 | -17.00% | 3988.00 | 3821.00 | -4.00% | 79032.00 | 53616.00 | -32.00% |
| % household OOP at public providers | 30.50% | 38.30% | 26.00% | 16.60% | 33.10% | 99.00% | 25.80% | 41.50% | 60.00% |
| % household OOP at private providers | 61.20% | 54.30% | -11.00% | 64.60% | 60.50% | -6.00% | 55.40% | 48.70% | -12.00% |
| % household OOP at non-medical providers | 8.30% | 7.40% | -10.00% | 18.70% | 6.40% | -66.00% | 18.70% | 9.80% | -48.00% |
| % of household OOP at a provider | | | | | | | | | |
| Health centres | 3.90% | 6.20% | 57.00% | 7.90% | 10.30% | 30.00% | 2.20% | 2.70% | 24.00% |
| Public hospitals | 26.60% | 28.30% | 7.00% | 8.70% | 13.10% | 50.00% | 30.90% | 38.80% | 25.00% |
| Private hospitals | 14.10% | 8.30% | -42.00% | 6.20% | 2.80% | -55.00% | 16.90% | 11.70% | -31.00% |
| Private clinics | 29.40% | 23.90% | -19.00% | 29.30% | 26.40% | -10.00% | 30.50% | 23.60% | -22.00% |
| Pharmacies and stores | 9.10% | 14.80% | 63.00% | 19.50% | 19.10% | -2.00% | 7.80% | 11.80% | 51.00% |
| Home care | 11.70% | 8.40% | -28.00% | 22.60% | 17.20% | -24.00% | 6.70% | 5.20% | -22.00% |
| Others | 5.20% | 10.10% | 95.00% | 5.80% | 11.20% | 92.00% | 5.10% | 6.20% | 22.00% |
| Catastrophic health spending households | 6.00% | 4.30% | -28.00% | 3.60% | 3.10% | -14.00% | 7.60% | 4.10% | -32.00% |
| Incidence of indebtedness through illness | 5.30% | 4.00% | -25.00% | 6.20% | 3.80% | -39.00% | 3.50% | 2.10% | -32.00% |

Table II. A summary list of statistically significant variables from determinant analyses

| Determinants | 2007 | 2004 | 2005 |
|---|---|---|---|
| Health care-seeking | | | |
| Higher chance | Higher quintiles | Higher quintiles | Higher quintiles |
| | | | Head Prim/Sec Edu |
| | | | Head Male |
| Lower chance | Older age groups | Older age groups | Older age groups |
| | | Outside capital | Outside capital (for 2nd & 3rd visits) |
| | | | Moderate/Slight ill |
| Provider Choice | | | |
| | Capital - higher use of private hosp, private clinics, and drug stores | Rural - higher use of health centre & home care | Rural - higher use of health centre, lower use of hospitals |
| | Higher - more hospital & drug purchase | Higher - more hospital & drug purchase | Higher - more hospital & drug purchase |
| | Aged under 5 - less home care | Aged under 5 - less home care | |
| | | Male - less health centre | |
| Positive health spending | | | |
| Higher chance | Higher quintiles | | Head Prim/Sec Edu |
| | Capital | | Head Male |
| | Head Sec Edu, Male | | Higher quintiles |
| | Hospitalised | | |
| Lower chance | Male | | Older age groups |
| | Bigger household size | | Slight ill |
| | Older age groups | | |
| Level of health spending | | | |
| Higher chance | Higher quintiles | Higher quintiles | Older age groups |
| | Hospitalised | Hospitalised | Higher quintiles |
| | Capital | Elderly, adults | |
| | | Males | |
| Lower chance | Bigger household size | Head Male | Outside capital |
| | | Teenagers | Head Male |
| | | | Moderate/Slight ill |
| Catastrophic health spending | | | |
| Higher chance | Hospitalised | Hospitalised | |
| | Rural | Rural | |
| | | Higher quintiles | |
| | | Have under-5 years old child | |
| Lower chance | Bigger household size | Bigger household size | |
| | | Head Sec Edu, Male | |
| Debts from illness | | | |
| Higher chance | Hospitalised | | |
| | Rural ($p<0.1$) | | |
| Lower chance | Head education, Male | | |
| | Elderly members | | |
| | Higher quintiles | | |

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In collaboration with

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A partnership in:

P4H Social Health Protection Network