

INTRODUCTORY NOTES

1

1.1 PROJECT

The National Household Health Expenditure Survey 1996 (NHHES96) was conceived as a project to obtain some information and understanding of what was an important source of health financing – *the expenditure incurred “out of their own pockets” by the population of Malaysia for the purpose of maintaining their health or treating their illnesses*. Other sources of health financing were the portion of the national budget allocated to “health”, medical and health benefits provided by employers as part of a worker’s remuneration package, and health insurance.

It was felt that there was a dearth of data and information about this source of health financing and in view of policies to streamline the operations of various government agencies by various means, it was necessary to understand the position and relative importance of this particular sector which contributes to the financing of health and health care.

The objectives, methodology and results of this NHHES96 project are stated in a series of “outputs” (para 1.3 below) produced by the NHHES96 research team. (*qv*).

1.2 TEAM

The NHHES96 research team was composed of a collection of individuals with differing expertise who collectively were interested in this matter of health financing from various aspects. Six of the academic staff component of the team were from the Department of Social and Preventive Medicine (SPM), Faculty of Medicine and one was from the Department of Community Dentistry (CD), Faculty of Dentistry. Thus the academic staff component of the team was formed from:

Dr. Atiya Abdul Sallam	Medical Statistics	SPM
Dr. Htunn Myint Latt	Epidemiology	SPM
Dr. Hamidah Abd Karim	Medical Demography/Family Health	SPM
Dr. Jason S.T.Teoh	Health Service Management	SPM
Dr. Nabilla Al-Sadat bte Abd Mohsein	Health Economics	SPM
Dr. Raja Latifah Raja Jalalludin	Community Dentistry	CD
Dr. Soe Nyunt-U (until 1.9.98)	Health Economics	SPM

The two other members of the nine-person NHHES96 team were drawn from the technical staff of the SPM :

Ms Lim Jock Hua	Medical Laboratory Technology	SPM
Ms Lee Pek Ling	Computer Programming	SPM

To conduct the field and the data compilation phases of the project, some 200 temporary workers were employed to augment the team and deployed to collect data in the field, to enter the data into the computer system created, to check and clean the data set so obtained, and to retrieve the data required for analysis by the NHHES96 team.

1.3 OUTPUTS

The "outputs" of the NHHES96 project is in the form of reports of work done, results obtained, and the analysis thereof. In March 1997, when preliminary results were obtained from the data collected during the field phase (April – June 1996) of the project, the following reports were produced:

1. Report on the National Household Health Expenditure Survey 1996 ,
Vol. 1 – Background
2. Report on the National Household Health Expenditure Survey 1996,
Vol 2 – Project
3. Report on the National Household Health Expenditure Survey 1996,
Vol 3 – Outputs

This was followed in May 1997 by a summary of the above volumes entitled:

1. NHHES'96 – SUMMARY OF PRELIMINARY RESULTS - Background,
Aims, Method and Summary of Preliminary Results (Based on Aggregated
Data).

This current volume represents the *final output of the NHHES96 project* and contains the following :

1. INTRODUCTORY NOTES
2. PENINSULAR MALAYSIA – Summary Report of Findings
3. SABAH AND SARAWAK – Report of Findings
4. ANNEXES
 - A. Peninsular Malaysia – Acute Ambulatory Care
 - B. Peninsular Malaysia – Hospitalisation
 - C. Peninsular Malaysia – Maternity Care
 - D. Peninsular Malaysia – Health Supplements
 - E. Peninsular Malaysia – Dental Care
 - F. Peninsular Malaysia – Other Health Needs
 - G. Technical Report on Multi-level Analysis

All the outputs mentioned above are "stand-alone" volumes reporting on a specific matter or a specific section of the total project. The current final volume is a compilation of stand-alone documents which explains a particular topic or subject matter.

It is, therefore, to be noted by the reader that there will be some necessary repetition of common areas as each volume was conceived to be complete in itself. It also should be noted that if further data is needed, these may be contained in the various reports produced earlier and the reader is referred to these.

1.4 FUTURE STUDIES

It had been noted at the start of the NHHES96 project, that there were four main sources contributing to the financing of health and health care for the population of Malaysia. The contribution by the allocations for health in the national budget is well-known and documented. The NHHES96 project has provided data and information about the portion financed by out-of-pocket expenses incurred by the population. The part played by contributions from medical/health benefits from employers and from payments from health insurance schemes largely remain unknown. Studies in these two areas will provide further information which will serve perhaps to complete the picture of health financing in Malaysia.

The NHHES96 project represents a cross-sectional view of the household expenditures on health and health care for the year 1996. Since this matter of expenditure is a dynamic one, depending on the economic climate of the country, it is felt that similar studies should be conducted at appropriate intervals to establish trends if possible.

The NHHES96 project has collected an enormous amount of data and much can still be analysed from the existing data set as the above reports are mainly focussed on the social and demographic aspects of the study. It seems possible that further studies along other lines can be carried out on the existing data set.

1.5 END-NOTE

With this final report, the NHHES96 project is considered as concluded. It is hoped that if any of the above suggestions for future studies be acceptable for implementation, new teams can be formed to plan and implement such projects. It is felt that, with the ever-changing economic environment faced by the nation, these further studies should be conducted by inter-linked multi-agency teams to allow for a better understanding of the Malaysian health economics situation

NATIONAL HOUSEHOLD HEALTH EXPENDITURE SURVEY 1996 (NHHES'96)

PENINSULAR MALAYSIA

SUMMARY REPORT OF FINDINGS

**Acute Ambulatory Care
Hospitalisation
Maternity Care
Care for Long Standing Illnesses
Health Supplements
Dental Care
Eye Care**

**NHHES'96 TEAM
DEPARTMENT OF SOCIAL AND PREVENTIVE MEDICINE
FACULTY OF MEDICINE, UNIVERSITY OF MALAYA**

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- ❖ The Ministry of Health and its institutes and staff at the peripheral services all over Malaysia for local assistance.
- ❖ The Department of Statistics Malaysia for advice on the sampling methodology and the sampling frame which form the basis of this survey.
- ❖ The District Offices and their staff and the Royal Malaysian Police at the district level for help and advice in the actual conduct of the survey.
- ❖ The University Malaya for allowing this study to be realised, for allowing the recruitment of its students to assist in the field work and for its administrative staff who helped in expediting work connected with this project.
- ❖ Many others have helped in this survey to make its various phases run smoothly and it would not be possible to mention all individually. To all who helped in this project – our grateful thanks.

NHHES'96 Research Team.

INTRODUCTION

1

“Health care should meet the needs of a nation, satisfy the demands of many groups in the population, and adapt flexibly to the rapidly changing capabilities of modern medicine. It should not pose an impossible financial burden on families and the national economy. It must be sufficient for today, yet sustainable to meet the uncertainties of the future.”

- Peter Berman, 1995

In almost all the countries throughout the world, health care costs have been rising as the national incomes of these countries grow. The positive correlation between the growth in national income and health expenditures was shown by a summary of the studies for both high income and less affluent countries (Dunlop & Martins, 1985). The study suggested that total health care spending to be a normal good, whereby it is probably elastic with respect to income, in an aggregate sense. This income elastic demand signals the likelihood for further increases in health expenditures of these countries in future.

The reasons for this are complex but include rising rates of health care utilisation stemming from increased education, better transportation, increased expectations, costly advances in medical technology and a lack of incentives for cost-containment. At the same time, inefficiencies in resource use such as the inappropriate use of highly trained medical personnel, the use of inappropriate technologies, and poor management and administrative practices, are all too common. There is also the future prospect of coping with the needs of an increasing proportion of the ageing population which have added to the crisis of financing social security schemes and balancing precarious government welfare budgets from a shrinking tax base.

This pressure of increasing costs of health and medical services has led to various cost-containment measures and critical reexamination of existing health care systems throughout the world. The choices made today will determine the pace of mortality decline, the costs that will be faced, and the structure of future health care systems.

1.1 Health Transition in Malaysia

The process of development in Malaysia has led to significant demographic and socio-economic transformations. The population of Malaysia has almost trebled over the past four decades, growing from a population of 7.4 million in 1957 to 20.7 million in 1995.

Rapid development has transformed the mainly rural agricultural society to an increasingly urbanized industrial society. The percentage of population in urban areas have increased from 24.5% in 1957 to 55.6% in 1996. Concomitantly the percentage of population employed in the agricultural sector has decreased from 52% in 1970 to 16.5% in 1996 (Ministry of Health, 1996) whilst female labour force participation has increased from 36% in 1957 to 47.2% in 1996. (Government of Malaysia, 1996a).

Rapid economic growth saw the country's Gross National Product (GNP) per capita increased from RM1,106 in 1970 (Government of Malaysia, 1971) to RM 11,255 in 1996; and the incidence of poverty among Malaysians has reduced from 16.5% in 1990 to 8.9% in 1995 (Government of Malaysia, 1996a). Rapid expansion of educational facilities has increased literacy rates and decreased educational disparities between males and females (Government of Malaysia, 1996).

All these factors have led to great improvements in the standard of living, bringing mortality rates down dramatically in Malaysia. Crude death rates declined from 12.4 per 1000 population in 1957 to 4.6 per 1000 population in 1996. Infant mortality rate (IMR) also fell from 76 per 1000 livebirths to 9.1 per 1000 livebirths and the expectation of life at birth increased from 57 years to 71.7 years over the same period. (Vital Statistics, 1957; Ministry of Health, 1996)

Fertility decline followed soon after and the crude birth rate (CBR) fell from 46 per 1000 population in 1957 to 26.3 per 1000 population in 1996. (Vital Statistics, 1957; Ministry of Health, 1996)

As Malaysia undergoes '*demographic transition*', declines in fertility levels has brought about changes in the population age structure. At the same time with increasing numbers of people surviving until adulthood, an increasing portion of the population is at risk of non-communicable, chronic health problems. This has led to a change in the morbidity and mortality pattern from one of mainly infectious diseases to one where chronic degenerative and non communicable diseases predominate. Thus Malaysia is also currently experiencing '*epidemiologic transition*' (Omran AR, 1971; Omran AR, 1983).

Apart from demographic and epidemiologic transitions, socio-economic development also bring about changes in life-style, behaviour and environment which leads to *changing patterns of risk* to the population. (Kjellstrom, Tord, and Rosenstock, 1990). In Malaysia the process of urbanization, industrialization and mechanization have brought about an increase in injuries from motor vehicles, industrial accidents and toxic chemical poisoning. Increase in the use of tobacco has been associated with high incidence of lung cancer, ischaemic heart disease and chronic obstructive pulmonary disease. Other behavioural risk factors which include sedentary life style and diets containing high saturated fats are also associated with obesity, diabetes mellitus, hypertension and

ischaemic heart disease. Changes in patterns of sexual behaviour brought about by changes in social values are associated with increase in sexually transmitted diseases (STDs) and acquired immunodeficiency syndrome (AIDS).

At the same time sudden economic setbacks, escalating costs in health service combined with wide disparity in health conditions of social classes may lead to stagnation or even decay in the health advances that had been achieved. This may lead to further widening of disparities between subgroups of population, social classes and regions, leading to '*epidemiologic polarization*' (Frenk J, Bobadilla JL, Sepulveda J, and Cervantes ML (1989)). In Malaysia epidemiologic polarization seems to be occurring among the urban population whereby increases in the private sector and escalating health services costs coupled with a lack of emphasis in the development of a comprehensive public urban health services have created larger disparity gap in accessibility to health services between the urban rich and the urban poor.

The changes in the disease pattern brought on by the process of development is termed the *Health Transition*. The factors that influence it are:

- demographic transition,
- epidemiologic transition,
- changing patterns of risk to the population, and
- epidemiologic polarization;

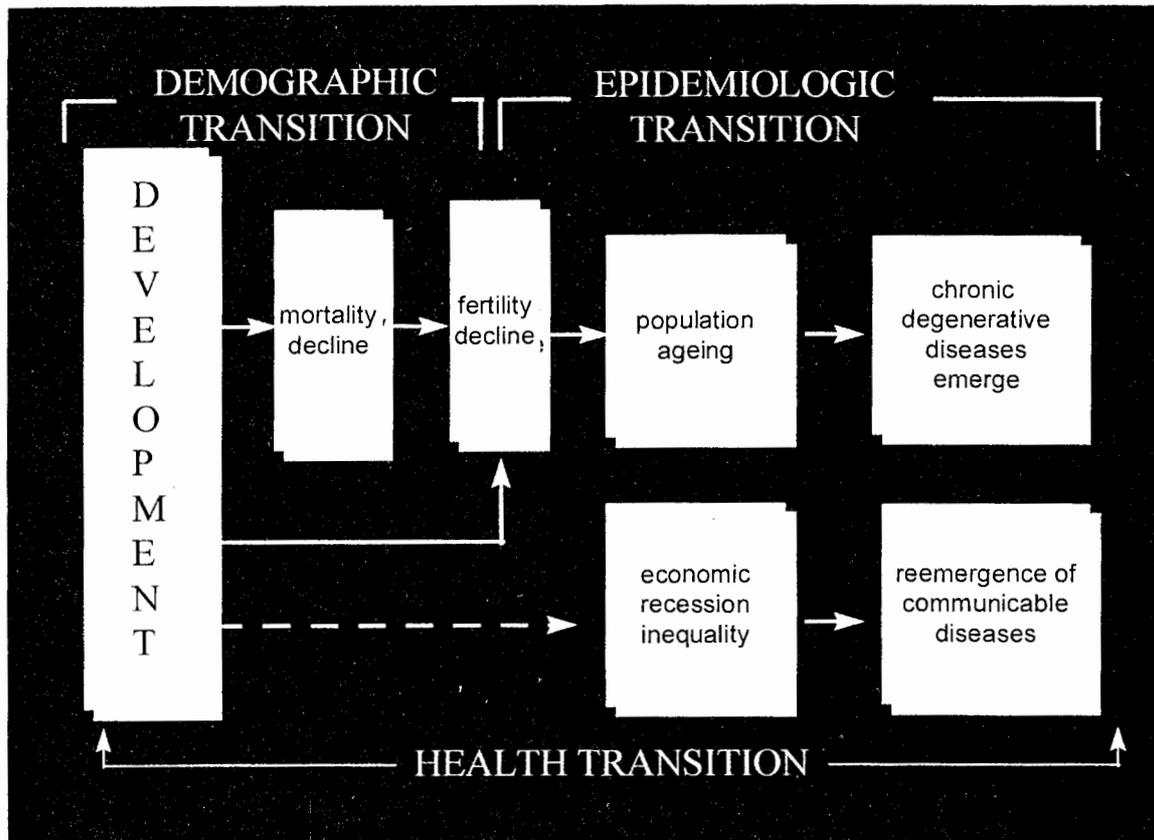
and the inter-relationships among them are summarised in Figure 1.1 However, the process of development need not be associated with disease patterns seen in most Western populations. The disease pattern that we will face in the future will depend on the rate and extent each of the factors are allowed to influence the health transition. It will also depend on the choices made by Malaysia as it considers alternative health sector reform strategies when it undergoes this health transition.

As Malaysia continues in its path of aiming to be a developed nation by the year 2020, its population is projected to grow from 21.1 million in 1996 to about 31.5 million in the year 2020. Its population age-structure is projected to change with a declining proportion of young population and an increasing proportion of elderly population. Problems of chronic non-communicable disease will emerge and slowly predominate whilst problems related to reproduction and communicable diseases are still being tackled. At the same time as the population develop their demand for health services will increase not only in terms of quantity, but also in terms of quality. Thus the health sector will have to meet several challenges. Faced with the commitment of trying to improve the health of the nation in the presence of complex health conditions, increases in medical technology, limited resources and at the same time upholding social justice and equity, priorities will have to be made. It is imperative that these priorities be made based on solid demographic and epidemiologic information.

These effects coupled with the "abnormal" economics of the health care industry will lead to an escalation of costs and will consume a large portion of the nation's riches if left unchecked. Thus, there is a need for a health sector reform in Malaysia; especially in the financing aspect of this sector. The form it is to take will depend on the adequacy, timeliness and quality of data and information available to form a firm data-base in order to understand the situation and to act as a

platform for strategic planning. It will also depend on a political will to back-up the reforms proposed. Whatever, the choices the planners make today will determine the pace of health improvement for vast numbers of the population, the costs that will be borne, and the health care institutions that will be bequeathed to future generations.

Figure 1.1 Relationships among Demographic, Epidemiologic and Health Transitions.



Source: Mosley WH, Bobadilla JL and Jamison DT (1993)

1.2 Malaysian Health Care System

When the country gained independence in 1957, one of the chief concerns of the National Government was to improve the socio-economic conditions of the rural population who constituted more than 75% of the total population. It was recognized that rural upliftment could be achieved only through a co-ordinated and an integrated four-pronged attack against poverty, ignorance, apathy and ill-health. Since then, health programs development has become an integral component of the socio-economic growth of the country.

A comprehensive rural health service programme was developed over the years improving accessibility and equity of health services to the population. At the same time private services continued to grow especially in the urban areas.

In Malaysia, there is a dual system of health care delivery. The public sector is run by the Government while the private system is provided by the voluntary and private hospitals and practitioners. The health care delivery system comprises of primary health care provision at Maternal and Child Health clinics, various public outpatient clinics and private practitioners' clinics; and secondary and tertiary specialist care in the public and private hospitals.

Malaysia has been experiencing a very rapid economic growth of 8-9% per annum in the last decade leading to increased expenditures for health care. Malaysia's health care services are changing from a largely public-sector-provided system financed largely by general revenue sources to a seemingly, increasingly popular private sector services which are financed through a fee-for-service process.

The unprecedented growth of the private sector, seen by the increase in the number of private hospitals and private clinics, in the recent years, has serious implications on the public sector and the overall health care costs. With higher remuneration in the private sector, it had been able to draw doctors and other health personnel from the public sector resulting in acute shortages therein.

Further, the positive linkage between the health status of the labor force and economic growth restrains the government from reducing investments in the health needs of the country. However, as Malaysia industrializes, competing demands for the scarce resources of the economy implies that there is a need to consider alternative options for financing health care.

Various studies on health financing have been undertaken by the Government, but a conclusive scheme has yet to be drawn up. This is mainly because there are still many unresolved issues such as cost to be borne by the consumer and the cost of administering a financing scheme, accessibility to health care, efficiency and the provision of quality health care (EPU, 1996). Nevertheless, in the recently released Seventh Malaysian Plan (7MP – 1996-2002, Government of Malaysia, 1996), a statement in its chapter on "Health" stated that to increase the efficiency of services and to retain qualified and experienced manpower, the corporatization and privatization of public hospitals as well as medical services would be implemented during the plan period.

As stated by in a document issued by the Economic Planning Unit (EPU) of the Prime Minister's Office (Government of Malaysia, 1996), the current challenges being faced by the Government is the development of a health sector within the realms of the macro policies of the Government in such a way that :

- there is containment of the size of the public sector
- the private sector becomes the engine of growth
- there is emphasis on efficiency
- there is equity in the distribution and accessibility of services
- privatization of public sector services is continued.

There are many conditions to be fulfilled prior to the development of the above health care sector in Malaysia; among them are:

- devising mechanisms for selecting priorities
- setting achievable targets and
- development of monitoring instruments for assessing the functioning of health care institutions.

This would require a consolidated information and data system in order to facilitate and support decision making and policy formulation (Government of Malaysia, 1996a). The future Malaysian Health Care System is expected to optimize the utilization of available resources in the public and private sectors as well as at the individual level. Thus, this future system must continue to provide quality services efficiently and be as cost-effective as much as possible.

This means a strategic health care reform encompassing all levels of health care i.e. promotive, preventive, curative and rehabilitative and directed to all ages of the community will have to be instituted soon to prevent the decaying of our health services and thus affecting the Malaysian's overall health status. What is needed for a dynamic reform is the acquisition of adequate, relevant, timely and statistically clean data which will be able to provide the planners with basic information and assumptions to base their models on.

1.3 Household Health Expenditures

To plan for an orderly and socially most effective and efficient health care sector for the future, it is necessary to have a complete picture of the financing and expenditure pattern of the health care services, covering all the sectors involved in its delivery, both public and private. Financial data are the only convenient measure which enables all resources to be included in an overall view of the situation. Health planners and managers can only assess economic efficiency if they know about total spending from all sources (Griffiths & Mills, 1983). In most instances, however, the detailed financial information about the private health care sector is not available for the health policy makers and health planners.

Household income is ultimately the source of most health care financing, but direct expenditures constitute a specific category of financing and may usefully be considered separately. Included in this category are any payments the consumer may make directly to health care providers such as fees for services, or prices paid for goods and supplies (Hoare & Mills, 1986). All expenditures on health such as in-patient and out-patient care in public and private hospitals, clinics, health centers, etc., private practitioners, traditional practitioners, dental services, ophthalmic services, drugs and health related supplies, and transport required to use health services should be included in this category of direct household expenditure on health.

Recent studies have shown that this form of financing is by far, more common and more important than was hitherto thought. Direct expenditures are not limited to high income groups and in many

instances low income groups have been observed to devote a large proportion of their income on health care, sometimes displacing expenditures for other basic necessities of life (Hoare & Mills, 1986).

Direct household expenditures are not independent of other sources of finance. Government services may charge user fees (often nominal) for certain services. Even with insurance coverage, there is often a requirement for some degree of co-payment, which tends to increase the amount that would otherwise have been spent on health. Health insurance benefits may also have an upper ceiling, and households may have to pay directly for their health care requirements in excess of this level (Hoare & Mills, 1986). It is necessary to understand the inter-relationship of these various sources of finance for health care utilization in order to construct a proper policy formulation in financing the health sector.

Household expenditures on health are also greatly influenced by :

- changes in the health care financing structure.
- changes in the economy of the country.
- changes in consumption pattern.
- changes in the utilization patterns which are partly influenced by education, health-seeking behaviours, cultural beliefs, information technology and economic opportunities available to the present day family.

Several studies on household health expenditure have been done in both developed as well as developing countries. These studies have demonstrated that health service spending provided by Government expenditures and by Ministry of Health expenditures, if taken alone is grossly misleading as it does not reflect the private expenditures (Griffiths & Mills, 1983). At the same time the measurement of private sector expenditures is clearly inadequate in the developing countries (Murray et al, 1994). Household surveys seemed to provide the most reliable assessment of private spending on health, even though they often exhibited some systematic sampling and non-sampling bias which can be adjusted to yield a more reliable estimates.

There had been only a few studies in which the household health utilization and expenditure was examined in Malaysia over the years. One of the first and the only published study in this area of household health utilization and expenditure in Malaysia was Heller, 1982. He concluded that Malaysia had developed a health care delivery system which had been effective in reaching the most disadvantaged groups in the society. A wider perspective of health expenditure in relation to other expenditures can be found in "Public Expenditure in Malaysia" (Meerman, 1979).

A more detailed description of the above study (Heller, 1976) reported that the average cash outlay for a visit to a government health facility was 19 cents (US) and for a private visit, \$2.30(US). The average travel time to a government clinic was about 23 minutes and to a private clinic, about 29 minutes. Travel time to a government clinic was a much larger percentage of the total cost of a visit (travel cost plus cash cost) than was travel time to a private clinic. He discovered that travel time had a negative (but statistically insignificant) impact on the total number of outpatient visits to both public and private sources of care. The mean waiting and examination time for government clinics was found to be 42 minutes and 31 minutes for private clinics. Heller found, however, that waiting

time was not an impediment to use. He suggested as an explanation that patients may have looked on waiting time as a chance to socialize. It was found that the total demand for outpatient care from all sources was insensitive to the cash price.

There was a Malaysia Health Services Financing study in 1985 (unpublished report prepared by Westinghouse Health System, September 1985). The study did not cover community/household health expenditure which left a big gap in the expenditure and financing data on traditional medicine, household expenditure on drugs and medical appliances, and household expenditure on transportation and other costs of utilizing the public and private facilities. The 1986/87 National Health and Morbidity Survey also had only limited data on total household health expenditure (unpublished report by the Ministry of Health, 1987). Especially, the household expenditure on hospitalization cannot be analyzed because of the short recall period for the survey which is a necessity for a morbidity-based survey study.

Household Health Expenditure studies are complimentary to the Health Sector Financing and Expenditure studies. It is necessary to have expenditure information from both the consumers and providers to map out a complete health sector financing and expenditure patterns for health policy review and strategic health planning decisions. Eventually the household income will be the ultimate source of health finance irrespective of the mechanisms and the final burden of utilization of health care services, whether public or private, will still be on the households. For countries like Malaysia with a rapidly expanding private health care sector and the possibility of privatisation of public hospitals, it is a necessary to understand the characteristics of household health care utilization and expenditure. Only then, can socially effective and efficient decisions on health sector reform be made to safeguard the accessibility of services to underprivileged groups.

1.4 Rationale for the Survey

Recognising the importance of understanding the characteristics of household health care utilization and expenditure so as to ensure that the principles of equity, social justice and fairness is incorporated into the Malaysian health sector reform, the Economic Planning Unit of the Prime Ministers' Department commissioned a group of researchers from the University of Malaya to conduct the National Household Health Expenditure Survey 1996 (NHHES'96).

AIMS AND OBJECTIVES

2

2.1 Aim

The main aim of the National Household Health Expenditure Survey 1996 (NHHES96) is to provide in-depth data and information on household health expenditures in Malaysia and some aspects of the utilisation of health services. Demographic, social, economic and health factors that may influence expenditures will also be investigated.

2.2 Objectives

The specific objectives of the survey are:

- a. to determine the proportion of the population utilising the health care services in terms of:
 - i) types of services such as traditional care, modern scientific medical care, allopathic care and self-medication;
 - ii) public, private and mix of health care services;
 - iii) promotive, preventive, curative and rehabilitative levels of care; and
 - iv) specific health conditions prevalent in the population of interest to health planners such as infectious diseases, oral diseases, cardiovascular diseases, accidents and injuries etc.
- b. to assess the various levels of household health expenditure on these services by the population,
- c. to determine the demographic, social and economic factors and health conditions that best explains the variations in the utilisation pattern and household health expenditure,
- d. to make recommendations to address social inequity in relation to utilisation of health services and its expenditure.

METHODOLOGY

3

3.1 Coverage and the survey frame

Geographically, the NHHES'96 covered the whole of Malaysia. However, only the population residing in non-institutional Living Quarters were canvassed. The institutional population (estimated to be less than 3% of the total population was excluded due to its transient nature which could give rise to operational problems).

The sample for the NHHES'96 for Peninsular Malaysia was based on a sub-sample of Enumeration Blocks (Ebs) which were selected for the Government of Malaysia Labour Force Survey (LFS) conducted in 1995. The LFS is an annual household survey conducted by the Department of Statistics mainly to measure and monitor the employment situation in the country. Details are given in Volume 2 of the Preliminary Report of the NHHES96.

The samples for Sabah and Sarawak were obtained on a purposive basis. The descriptions and findings of these two areas will be dealt with in their own summary reports.

3.2 Sample size

The sample size for Peninsular Malaysia was estimated based on the assumption that 10% of the private households spent 5% or more of their total household income on health. Therefore, the estimated number of households required for the project was about 11,384 households. These households were allocated to states proportionate to the population of the state when compared to the total population of Peninsular Malaysia.

3.3 Questionnaire design

A questionnaire for the collection of the required data by means of face-to-face interviews with selected households was designed by the NHHES'96 team. This consisted of a printed package with 11 'forms'. Each of these forms contained detailed questions of one aspect of the survey. The questionnaires were pre-tested during a pilot project (funded by the China Medical Board of New York) conducted in Kuala Langat District, Selangor in early August 1994. Based on experiences gained during this pilot project, the design of the questionnaire was modified to make it easier to apply and various procedures for the main NHHES'96 were formulated.

3.4 Organisation

The NHHES'96 project team employed, trained and organised a group of 200 survey workers of various categories to implement the field phase of the project. Each defined region of Peninsular Malaysia was covered by one field team which was made up of about 10 to 12 enumerators with one research officer. The research officer was assisted by the field team leader in the field.

3.5 Conduct of interviews (primary method of data collection)

Face-to-face interviews with heads of selected households by NHHES'96 project interviewers was the primary method of data collection. This entailed the sending of interviewers to all areas in which the selected EBs and LQs were located. Only private households were interviewed. Each selected household was approached a maximum of three times to secure an interview or to consider it as a non-response.

3.6 Data management

All raw data collected and checked in the field were compiled in the NHHES96 headquarters. These data were entered into a computer network system set-up to deal with incoming data. The data was cleansed and then analyses of the data were made by the use of standard and customised computer software.

FINDINGS

4

The NHES96 had collected a vast amount of data and to present all the findings is not possible. The background, method, and preliminary results have already been reported in Volume I, II and III of Project Report (January 1997). A summary of the preliminary results based on total household health expenditure without considering expenditure in various aspects of health needs was produced in May 1997. Draft reports of each sector of the study were completed in January 1998. However, it is felt that a stand-alone summary report highlighting the major findings should be issued; hence this report.

The findings will be presented according to the areas under investigation, thus the following sections:

- Acute ambulatory care
- Hospitalization
- Maternity care
- Care for Long standing illnesses
- Health supplements
- Dental care
- Eye care

The findings in each of these topic areas will be displayed under three sequential headings, namely,

- Findings : containing the main findings in each topic area
- Implications : containing statements which cite what is felt to be the “message” of the findings to policy makers
- Suggestions : presenting what is felt to be necessary policies to be made or actions to be taken to further improve on the equity of the Malaysian health services and facilities in the future

4.1 ACUTE AMBULATORY CARE

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>1. During the two-week recall period, an estimated 2.9 million episodes of acute conditions involving ambulatory care were reported.</p> <p>Acute ambulatory care made up the largest share (35.7% or RM843 million) of out-of-pocket expenditure.</p> <p>A majority of episodes of acute care (61.2%) were paid in full by households.</p> <p>Employers subsidized or paid for 10.3% of all the episodes.</p> <p>23.0% of episodes at private facilities and 2.3% at public facilities were paid for or subsidised by employers..</p>	<p>Primary medical care for acute ambulatory conditions imposes a heavy burden on health care resources.</p> <p>Relative to other health components, ambulatory care is perceived as more of a necessity than a luxury good and thus households are willing to pay for ambulatory care.</p> <p>A proportion of these episodes can be prevented through promotive and preventive strategies.</p> <p>A proportion of these episodes may not be necessary if the population are more informed on health issues and are informed of the appropriate indications and time to seek care.</p>	<p>Primary health care covering acute care must be recognised as a necessity and must be made available to all the population.</p> <p>As private sectors tend to grow with increase in demand, the government must ensure that the health care resources are evenly distributed; ensuring that services are still available in areas where demand maybe small.</p> <p>Preventive and promotive strategies are still the most effective way to promote a healthy society and thus needs to be strengthened.</p> <p>A more liberal and effective health information and education system utilising new technologies in mass communication need to be developed in order to create a well informed society on health.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>2. The poor and socially disadvantaged reported a higher proportion of episodes of acute care. They also spent more on acute conditions.</p> <p>Age-group 55 years and above, female, those from rural, lower educated, lower income households had higher episodes per 1000 population.</p> <p>Households in rural areas, the elderly, the lower income group, the less educated and the unemployed spent more.</p>	<p>Assuming that seeking of care is associated with morbidity, the poor and socially disadvantaged are more likely to suffer from ill-health.</p> <p>The socially disadvantaged are also less likely to be subsidised when receiving acute ambulatory care and thus spent more. With escalating costs in health care, the poor and socially disadvantaged may experience hardship.</p>	<p>Any future health services reform must provide a safety net for the socially disadvantaged.</p> <p>Health care for the socially disadvantaged must be secured to ensure equity and accessibility in health or this may lead to widening of disparity gap and affect their productivity.</p>
<p>3. The socially advantaged paid proportionately less for acute conditions.</p> <p>The better educated, higher income groups, government and private employees paid proportionately less for acute conditions in private facilities.</p>	<p>The socio-economically advantaged group are most likely to receive subsidised care at private facilities.</p>	<p>The government should concentrate efforts on providing services to the majority and to the poor. The socially advantaged are well covered by their employers.</p> <p>Employers must share part of the government responsibility to provide for their employees and their dependants, irrespective of their position.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>4. Private facilities were the most frequently utilised sources of care for Acute Conditions.</p> <p>Private care costs more for certain sectors in the community.</p> <p>Private facilities were most frequently utilised in most states, regardless of strata, ethnicity, household size/type, educational level or employment status. There was higher utilisation of private facilities among the urban, Chinese, tertiary educated, higher income, privately employed headed households.</p> <p>Urban areas, more developed states, Chinese, higher income and tertiary educated, private employees paid more per episode when using private facilities.</p> <p>Care at private facilities involved shorter travelling and waiting time compared to public facilities.</p>	<p>The role of private practitioners in ambulatory care needs to be recognised and enhanced.</p> <p>High cost of acute care was associated with high utilisation of private facilities.</p> <p>High cost for certain sectors may suggest :</p> <ol style="list-style-type: none"> a. inappropriate use of services like people seeking primary care at specialist clinics. b. high fees charged by private care providers based on a person's ability to pay. c. higher overheads raising costs in more developed states <p>Households are willing to pay for acute ambulatory care at private facilities probably because it involves shorter travelling and waiting time.</p>	<p>Integration of private primary health care facilities into the already established public primary care system will allow the providers to optimise resources and avoid duplication of services.</p> <p>Government needs to play a regulatory role in the monitoring, quality control and auditing of primary care services.</p> <p>Clear referral system must be developed to discourage public from seeking primary care from specialists as this will lead to escalation of costs and inappropriate uses of resources.</p> <p>The government needs to recognise the people are willing to pay for health but wants shorter waiting and travelling time, and quality services. It is possible to establish a cost sharing mechanism through a system of compulsory social insurance.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>5. Public facilities were utilised in 20.1% of all episodes of acute care.</p> <p>Utilisation at public facilities involved high subsidy - 58.0% of episodes at public facilities had no out-of-pocket expenditures.</p> <p>It was the most frequently utilised facilities in Kelantan (31.8%), Pahang (29.5%) and Trengganu (28.9%). There was very low utilisation rate in developed states (9.4% to 13.1% in more developed states). Government employees, single member households utilised public facilities more.</p> <p>Urban, Chinese, working adults, tertiary educated, higher income group had low utilisation rate of public facilities for acute care.</p> <p>79.3% of episodes from government employees, 60.0% of episodes from the top income group, 82.0% of episodes from the tertiary educated and 51.3% of episodes from private employees cost nothing in out-of-pocket expenses.</p>	<p>The less developed states and certain categories of people are still dependent on public facilities for ambulatory care. These states do not have a well developed private primary practitioner system and thus are dependent on the public facilities.</p> <p>Utilisation of private facilities seems to suggest that it might have been supplier-induced.</p> <p>The socially advantaged seem to be also heavily subsidised by the government.</p>	<p>A health service reform system should include relocation and redeployment of resources and a review of public-private mix.</p> <p>If the population is covered by a health-financing scheme based on capitation, then this may be a stimulus for growth of the private sector in the less developed states.</p> <p>The utilisation pattern reflects that private practitioners are accepted as primary care providers, thus the government can divert resources to develop other untouched areas of services such as care for the elderly and adolescents.</p> <p>More effort should be taken to ensure that subsidies aimed at poverty assistance or based on equity grounds are met, through the institution of a compulsory social health insurance scheme. scheme.</p> <p>If a health financing mechanism is in place, all medical care provided through the financing scheme must be paid for but should not involve out-of-pocket expenditure.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>6. A high proportion of episodes (34.1%) were treated by preparation available at home, or purchased from shops or pharmacies.</p> <p>More common among rural, Kelantan and Pahang, single-member households, lower income groups, less educated and self-employed headed households.</p>	<p>The need to educate the public in the appropriateness of self-medication and of over-the-counter purchase of drugs.</p>	<p>There needs to be improvements in the information sharing system on the use of various medicines. The benefits and potential side-effects of the medicines that are commonly used in self-medication must be made available to a wide audience so that informed choices can be made.</p> <p>There should be tight regulations and enforcement of over-the-counter sale of drugs; as well as better regulation or prohibition of indiscriminate advertising of over the counter drugs.</p> <p>Self-medication may be encouraged only if the population is well informed of its appropriateness and knows of its limitations and side-effects.</p> <p>Higher rates of self-medication among the lower socio-economic group may reflect less accessibility to services for these sub-groups. This needs to be addressed as these subgroups may also be the least informed on the appropriateness of self-medication.</p>

4.2 HOSPITALIZATION

FINDINGS	IMPLICATIONS	SUGGESTIONS
1. More than 80% of all the hospitalization episodes in the one year study period occurred in the public hospitals	Heavy workload for the public hospitals as compared to the private sector. This also shows that there is easy accessibility for public hospital services in Peninsular Malaysia.	To have policies to encourage a better mix of public-private utilization in the future. Whatever health sector reform that occurs must ensure that good accessibility is still maintained and improved further.
2. The group of population currently utilising public facilities for hospitalization are the population from rural areas, less developed states, large families, Malay households, lower household income, households headed by government employees and persons with lower educational levels.	Any alterations in the organization, pricing policy and status quo of the current health care system will have an impact on these groups of the population.	A socially equitable health financing scheme should be formulated to ensure health services will remain accessible to the indigent when any health sector reform is instituted such as the corporatization of public hospitals.
3. Higher utilization of private facilities occurred in certain population groups such as Chinese households with higher educational levels and in the urban population.	This could possibly be related to higher expectations and higher amount of disposable income; which in turn would encourage opportunistic private-for-profit health care providers to emerge to provide services to these groups of population. If this situation is left unchecked and not balanced by any government intervention, the indigent will be further disadvantaged in accessibility to similar private facilities as compared to the non-indigent.	This is where the policy planners will have to create a balance in which both disadvantaged groups and the more advantaged groups are to be served if the "Health for All" program is to be successful. Nevertheless, corporatisation of public hospitals can be carried out in certain districts where the population are less disadvantaged e.g. urban areas with a majority of Chinese households of higher educational status. These hospital charges can be at commercial rates if the services are comparable and of acceptable standards to the community. To be more equitable, these corporatised hospitals can have a "public wing" to provide services for the indigent who are present in these areas.

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>4. Private hospitalization is thirty times more expensive per day compared to hospitalization in public facilities.</p>	<p>Private facilities are therefore only accessible in terms of affordability to a small group of population.</p>	<p>To make the private sector more accessible to more groups of population, the government will have to regulate and monitor the prices and charges which are currently not substantiated and are unchecked. A form of standard payment schemes based on Diagnostic Related Groups (DRG) will be useful in setting and controlling the prices in the private sector.</p>
	<p>The overall difference in out-of-pocket expenditures in the two sectors is too great. It is possible that there is over-subsidization by the public sector.</p>	<p>As the government is under a lot of economic constraints and resources for health services are limited, it should look into ways of reducing subsidization of the hospital services in the country. This can be done by reviewing the user charges currently applied on the community using the services. There should be some form of standardization of prices of services in both sectors as to disallow too drastic a difference between the two sectors. This can be done by offering formal basic or essential health care packages at the cost of which are not influenced by the source of health care and regardless of the differences in degree of "added luxury" at where the services are given, the prices remains equal.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
5. Preference for private facilities when expenses are paid by someone else.	If the privatization policy is to be a reality in the health sector and to be accepted by the population at large, a health financing scheme must first be in place prior to the implementation of this policy. It would be easier for the population to accept corporatization or privatization of public hospitals if the financing scheme ensures equal coverage in both sectors.	A health financing scheme that would be acceptable to the population currently is "employment based" whereby more than one third of the population in Peninsular Malaysia is currently covered with this scheme. A health savings scheme or a social / national health insurance will also be acceptable as contributions will be made by both the individual and the employer.
6. It has been found that 66% of those who go to public hospitals still pay out-of-pocket for their hospitalization. This, however nominal, will pose a burden particularly to the indigent.	Out-of-pocket payment is a burden whether in public or private facilities.	A health financing scheme should be formulated before rising costs of health care results in the deterioration of the existing health care services

4.3 MATERNITY CARE

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>1. Reproductive Care imposes a heavy burden on health care resources.</p> <p>The 336,000 deliveries involved 4 million visits and 1.3 million days of hospitalization.</p> <p>Deliveries occurred in 9% of females in reproductive age groups (15-49years). Fertility was higher among socially disadvantaged groups in the population; i.e. rural women, females of lower educational level, females from lower income households and Malay ethnic group.</p>	<p>In view of the young population age-structure, reproductive care will continue to exert a heavy demand on health care resources for the next few decades in spite of declining fertility.</p> <p>There is greater need for reproductive services among the socially disadvantaged groups. Thus to maintain equity, accessibility to maternity services must be ensured to all.</p>	<p>Maternity / Neonatal Care must continue to be priority area in health services. It must be recognized that it will impose a heavy demand on health care resources.</p> <p>Any health sector reform must ensure that the needs of the indigent population are met. A basic <i>mother and baby package</i> must be defined for maternity care.</p> <p>Safe motherhood programmes have the potential to close disparity gaps as they can improve the well-being of the next generations</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>2. Majority of delivery care and antenatal care were at public facilities</p> <p>70.5 % of deliveries and 71.5% of antenatal care were at public facilities.</p> <p>Public facilities were utilized by a majority of the population but predominantly by Malays, Indians and lower income and lower educated households.</p>	<p>The public sector is heavily burdened with the provision of maternity services. If plans to corporatise or privatize the public hospitals and clinics go through, it is imperative that this does not jeopardize the accessibility of populations, especially the indigent, to basic reproductive care.</p> <p>As 50% of doctors are in private services, overburdening of the public sector does not reflect optimal utilization of resources.</p>	<p>Before the public services can be corporatised or privatised, a health financing mechanism must be in place to ensure that accessibility to services are maintained, especially to the indigent.</p> <p>Ways to utilise resources more effectively must be sought. Better partnerships between public and private sectors has to be developed to ensure improved accessibility, efficiency, equity and quality care.</p> <p>Private primary care practitioners should be utilised for routine antenatal and postnatal care to ease the burden of public sector and to improve accessibility.</p>
<p>3. 92% of deliveries were institutionalised deliveries (70.5 % public facilities, 21.7% private facilities and 7.8% home and traditional facilities).</p>	<p>Currently there is good accessibility and utilization for safe delivery services.</p> <p>However there is still a need to understand the behaviour of the small population group who utilizes home /traditional facilities</p>	<p>Whatever health sector reform that occurs must ensure that good accessibility is still maintained and improved further.</p> <p>Need to study further the reasons for utilising home/traditional facilities and target appropriate education messages to this group.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>4. Utilisation of private services for deliveries were mainly among the urban, Chinese, higher income households, better educated females.</p> <p>Of those who went to private hospitals, 85.3% were not subsidised</p> <p>Chinese and better educated households tend to spend more on maternity care</p> <p>Private sector maternity care and delivery care can cost between 29 to 80 times more than similar care at public sector services.</p>	<p>Some subgroups of the population are willing to pay for private maternity services even when the cost is many times greater than public facilities.</p> <p>Very large differences in cost between private and public sectors encourage a majority of middle income group to opt for public services.</p>	<p>The government should tap on this willingness to pay through a system of cost-sharing by direct or indirect means.</p> <p>The government should encourage greater participation of private sector in maternity care.</p> <p>There should be little difference in the cost as well as services provided at public and private facilities under <i>the basic package for maternity care</i> covered under a National Health Package.</p> <p>People can be made to pay extra for "comforts" not defined in the basic package if implemented.</p> <p>Thus even corporatised hospitals can provide facilities with added comfort for which users can pay extra.</p>
<p>5. Home and traditional care was the commonest source of care for the postnatal period.</p> <p>66.5% of respondents utilised home/traditional resources for the post-natal period, 22.5% utilised public facilities, 10.0% used private facilities</p>	<p>Roles of traditional practitioners in postnatal care needs to be recognized</p>	<p>Need to understand why people used home /traditional facilities for post-natal care.</p> <p>To encourage better understanding and cooperation between the modern and traditional practitioners and encourage their participation in promoting better reproductive health.</p> <p>Better monitoring and regulation of traditional practitioners need to be considered.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>6. Complications requiring hospitalisations were commoner in government hospitals</p> <p>Complications in pregnancy requiring hospitalization were commoner among lower socio-economic groups.</p> <p>Complications among them were probably more severe.</p>	<p>The socially disadvantaged are more likely to experience complications during pregnancy that may require more specialized care.</p>	<p>Therefore there is a need to ensure that the indigent group has accessibility to different levels of services and with adequate provisions for prompt referral.</p> <p>Provision of services at both public and private facilities should be identified and criteria for transfer should be based on the need for more specialized care rather than ability to pay.</p>
<p>7. Length of Stay (LOS) for delivery in private facilities were longer than in government hospitals.</p>	<p>Length of stay in public facilities may be very much shortened because of overcrowding which may make premature early discharges a necessity. This may affect the quality of care received.</p> <p>Private hospitals may on the other hand increase length of stay unnecessarily. This may lead to increase in cost and inefficient utilization of resources.</p>	<p>Minimum recommended length of stay for normal deliveries should be agreed upon and defined if the basic <i>mother and baby package</i>.</p> <p>Payment to private hospitals should be based on a package for normal delivery and independent of length of stay.</p>
<p>8. Maternity care was generally highly subsidized.</p> <p>81% of the deliveries were subsidized. 10.8% of the women did not pay anything for maternity care whilst 58% spent less than RM200.</p>	<p>Maternity care is a highly subsidized commodity. Out-of-pocket expenditure does not reflect true cost of goods.</p>	<p>The government should not provide subsidy for majority but look at options for cost sharing, by direct or indirect means. Subsidy should be for the indigent.</p>

4.4 LONG STANDING ILLNESS

FINDINGS	IMPLICATIONS	SUGGESTIONS
1. 5.9 % of the Total Household Health Expenditure was spent on the treatment for the chronic illnesses.	The expenditure on the treatment for the long standing chronic illnesses is a substantial amount. It places a heavier burden on the old aged people and households with old aged people.	Ambulatory treatment for long standing chronic illnesses among the elderly should be financed by the government and included in the basic health care package for this disadvantaged group in any future health system and financing reforms.
2. 6.9% of all individuals had used the health service for the treatment of long standing illnesses.	The main choices for the consumers are the public and private providers.	For those under the age of 60 and working, employers should be contributing to the care of its workforce with cost sharing by the employees.
3. Age is an important determinant. With increasing age more and more people reported the utilisation and expenditure of treatment for long standing illnesses. These users reached 23.4% of those who are in the age group of 50-59 years and 28.0% of those 60 years and above.	Traditional practitioners are still used in the areas where there is a strong cultural and traditional belief systems.	Under any future health system and financing reforms, long term care for chronic illnesses needs to be integrated with uniformed payment mechanisms for similar treatments and investigations irrespective of the point of usage.
4. Households with old aged people also spent more on the treatment for long standing illnesses.		Deductibles or co-payment by the patients can be considered depending on the employment and socio-economic status.
5. 55.8% of the utilisation episodes were at the government facilities, 43.2% at the private facilities and the remaining 1.0% at the facilities of the traditional practitioners.		Traditional practitioners should be encouraged to regulate themselves with active support from the government. Special emphasis on the safety, proper production and marketing of traditional medicines may be necessary.
6. People who used the government facilities paid relatively a small amount compared to those who used the private facilities or traditional practitioners.		

4.5 HEALTH SUPPLEMENTS

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>1. Purchase of "Health Supplements" is common among households in Peninsular Malaysia (67.0% of households).</p> <p>86.0% of purchases were unprescribed at shops and pharmacies.</p>	<p>Possible injudicious/improper/over-use with possibility of harmful effects (adverse reactions).</p> <p>Uncontrolled/unsupervised purchasing of "Health supplements".</p> <p>Drug interactions.</p>	<p>Regulatory and monitory measures on sales, marketing and labelling of "Health Supplements" need to be strengthened, e.g. Claims made in advertisements, sales through direct selling etc.</p> <p>Medical practitioners should be made aware of their patient's history of taking over-the-counter drugs.</p>
<p>2. Purchases were more common among Chinese, higher income households and households headed by persons with higher educational level.</p>	<p>Perception that consuming health supplements is: "A world of good to one's health" and is "Worth the investment".</p>	<p>Encourage informed choice through multisectoral approach : Recruit relevant agencies to educate the public in a concerted fashion with the best available information. There is also a need to consider specific socio-economic groups.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>3. Health Supplements accounts for one fifth (RM548 million) of the total household health expenditure, second only to expenditure on acute ambulatory care.</p> <p>“Chinese health supplements” was the most expensive.</p>	<p>May demonstrate a willingness to pay to keep oneself “healthy”.</p> <p>If there is evidence to suggest that their use is not beneficial then it is a waste of resources. Currently there is a lack of information on this.</p>	<p>This attitude should be viewed positively and harnessed in any health financing scheme.</p> <p>Nevertheless, the national policy should continue to emphasise a healthy diet in a health lifestyle, and discourage reliance on health supplements.</p> <p>Sales of health supplements, if found to be inefficacious, dangerous and not cost-effective, need to be reviewed.</p> <p>Integration of traditional and modern medicine where appropriate, acceptable and proven cost-effective (since it is culturally acceptable and it also allows better control of the use of the Chinese and traditional health supplements).</p> <p>As an immediate measure to curb household expenditure, only professionally prescribed health supplements to be included in any health package under a national health financing scheme.</p> <p>Funding agencies should encourage local research on the efficacy and cost-effectiveness of “health supplements” particularly traditional types.</p>

4.6 DENTAL CARE

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>1. Not counting episodes seen by the school dental program, 35.0% of dental care episodes were seen at public clinics and 65.0% were attended to at private facilities.</p>	<p>People seemed willing to pay for care at private facilities (However, hardship in purchasing dental care was not established).</p>	<p>A study to investigate this behaviour and reasons for it (e.g. waiting time, comfortable waiting area etc).</p> <p>Corporatise and improve efficiency at public clinics.</p> <p>Public-private integration with a regulatory body to look into the interest of the community and the providers including establishing a fee schedule.</p> <p>Establish a national health financing scheme at the same time with the inclusion of dental care as part of a basic package.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>2. 45.0% of the dental episodes of the elderly were at private facilities</p> <p>The elderly spent the highest amounts for dental care per episode, being 54 times the unsubsidised rate and 37 times the subsidised rate of the 13-17 year old age group.</p> <p>42.0% of episodes from low income households were seen at private facilities and were fully paid by the households.</p> <p>Household income was inversely related to expenditure in public facilities.</p>	<p>Possible inequity in accessing health care for the socially disadvantaged groups.</p> <p>However, 'inequity' lacks a proper operational definition.</p> <p>Those who could afford to pay are spending less; possibly those in the low income household group needed more complex treatment.</p>	<p>There is a need to operationally define the achievable degree of equity for health and health care (e.g. measures of equity). A gradual improvement for equity should be planned for the future.</p> <p>Provide dental health protection for the elderly and low income families perhaps by some form of social health insurance.</p> <p>Other community resources, NGOs and Voluntary Organisations can be harnessed to support health strategies for the socially disadvantaged groups.</p> <p>Tax rebates for these patients and private facilities may be considered.</p> <p>Strengthen health promotion targeting the low socio-economic groups.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>3. Of the episodes treated at public facilities, a substantial proportion were given free treatment. 72.0% of episodes reported by households headed by government employees were free.</p> <p>Some 30.6% of all dental care episodes were seen under the school dental service.</p> <p>Privately employed headed households had the highest percentage (34.5%) of subsidised care.</p> <p>31.3% of all the other episodes (excluding school dental service) had free treatment at public facilities were reported by the top household quintile income group.</p>	<p>Stress on resources in the Ministry of Health facilities.</p> <p>High service load borne by public facilities.</p> <p>A high percentage of rich households, households of government and private employees and school children benefit from public expenditure.</p>	<p>Initiate cost recovery by direct and or indirect means e.g.</p> <ul style="list-style-type: none"> a Set up School Health Fund where parents make nominal contribution annually. b Corporatisation of School Dental Services. c Mandatory inclusion of basic dental care under employees health benefit scheme or any national health financing scheme. d Review the charges at public facilities. e Public-private integration where preventive/promotive care including screening done by public services and curative care by private sector.

FINDINGS	IMPLICATIONS	SUGGESTIONS
4. A considerable proportion of the curative episodes were cared for at public facilities (besides the school dental service)	Besides preventive and promotive activities, public facilities have to cope with a considerable proportion of curative care. Curative care are generally more expensive and labour intensive.	Shift curative care to the private sector (curative care to continue only in training institutions) with continuing support for chairside dental health education. Private facilities are also encouraged to do clinical preventive procedures. Redirect resources in public facilities to preventive measures and oral health promotion. Reduce personnels to management duties. Optimise use of supporting staff like allowing dental nurses to work under supervision in private clinics (under the integration scheme) to reduce treatment cost.

4.7 EYE CARE

FINDINGS	IMPLICATIONS	SUGGESTIONS
1. Direct out-of-pocket Expenditure on Eye Care represented 6.9% of the Total Household Health Expenditure.	As a percentage of the Total Household Health Expenditure, 6.9% is quite substantial.	There is not much of a policy option for the government with reference to the provision and financing of eye care.
2. 7.7% of the Total population in the survey reported utilisation and expenditure on eye care.	Currently, there is practically no choice for consumers in terms of utilisation and no other health financing mechanism is relevant except the consumers' direct payment out-of-pocket for the purchase of this service.	There is a need to reduce the financial burden on the individuals and households who glasses for visual acuity reasons. The government can encourage more local production of frames and optical quality glass and other iens by giving incentives to the local and foreign investments in this area.
3. 97.9% of all the glasses or contact lens purchased were from the private facilities.		
4. The mean expenditure for the purchase of a new glasses or contact lens was RM 177.12 and the median was RM 150.00. There was not much of a difference among the various socio-economic and demographic factors.		In order to formulate a sound policy, a market survey on the optical companies in the country is required.
5. 96.1% of the purchase of new glasses or contact lens were paid by the direct out-of-pocket expenditure by the persons themselves.		

OVERALL FINDINGS

5

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>1. An estimated RM2.8 billion per year was spent on health by households in 1996.</p> <p>62.4% of this expenditure was spent at private facilities.</p> <p>61% of these was for curative care, mainly for acute conditions (35.7%).</p>	<p>Households are paying a large quantum for health. The annual household health expenditure for 1996 is greater than the operating budget of the Ministry of Health in 1995, which was RM2.2 billion.</p> <p>Thus, health expenditure provided by Ministry of health alone gives a grossly misleading picture of spending. for health.</p>	<p>In order to improve economic efficiency in the health sector, policy makers and health planners need to know about total spending from <i>all</i> sources.</p> <p>Whilst the findings of this National Household Expenditure Survey will give an insight to the utilization pattern and expenditure at household level, further data on health sector financing are still needed to complete the picture.</p> <p>A national health sector financing study should be carried out.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>2. Public facilities were the most utilised source of care for hospitalisation, maternity care and care for long standing illnesses.</p>	<p>This implies a heavy burden on public health resources, leading to :</p> <ul style="list-style-type: none"> • escalation of costs in public spending on health. • deterioration of quality of services in public sector. • exodus of medical personnel to the private sector. • differential accessibility to services between subgroups of the population. 	<p>There is a need to improve allocative efficiency in health resources. Better partnership between public and private sectors need to be fostered to ensure improved accessibility, efficiency, equity and quality of care.</p> <p>To create an environment of less dependence on the public sector, some form of health financing mechanism must be in place to ensure that the population has accessibility to services in both public and private sources.</p> <p>A health service reform should include relocation and redeployment of resources and a review of public-private mix.</p>
	<p>As 50% of doctors are in the private sector, over burdening of the public sector represents maldistribution of expertise.</p>	<p>There is a need to get greater participation from the private sector especially for primary care.</p>
	<p>Households are willing to pay for acute ambulatory care, vision and purchase of health supplements.</p>	<p>The Government should tap this willingness to pay and establish a cost sharing mechanism through a system of compulsory social insurance.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
3. The poor and socially disadvantaged reported a higher proportion of episodes for which health care was sought.	Assuming that seeking of care is associated with morbidity, the poor and socially disadvantaged are more likely to suffer from ill-health.	Any future health care reform must provide health care for the socially disadvantaged, to ensure equity and accessibility in health, or this may lead to widening of disparity gap and affect their productivity.
They mostly utilise public facilities for their care.	The socially disadvantaged groups are dependent on public facilities	Health care is a necessity rather than a luxury good. A socially equitable health financing scheme should be formulated to ensure health services will remain accessible to the indigent when any health sector reform is instituted such as the corporatization of public hospitals or clinics.
Less developed states of Kelantan, Pahang and Trengganu are more dependent in public facilities compared to the more developed states.	Growth of the private sector in less developed states may be enhanced if a health financing mechanism based on capitation fee is established.	The government must develop a basic health care package for all Malaysians and identify areas which will be covered by the package.
4. Health Care services in public facilities are almost free and involve very little out-of-pocket expenditures	Even those who can afford to pay are subsidised at public facilities. This leads to escalation of cost and with growing demand, it may not be possible to sustain a free public health sector indefinitely.	Risks and resources should be pooled among a larger group of persons with different probabilities of requiring care through a system of compulsory social insurance. When the process of solidarity is compulsorily applied to health-related risks, each individual can expect to receive <i>as of right</i> appropriate medical care whenever it is needed (Charles Normand and Axel Weber, 1994; Social Health Insurance). Whatever the supply, any medical care provided through the financing scheme must be paid for but should not involve out-of-pocket expenditure.

FINDINGS	IMPLICATIONS	SUGGESTIONS
<p>5. Utilisation of private services were commoner among the urban, Chinese, higher income and better educated households.</p>	<p>Some subgroups of the population are willing to pay for private care even when the cost is many times greater than in public facilities.</p>	<p>To uphold the principle of equity, and better utilisation of resources, accessibility to <i>basic</i> services at private and public facilities should be made available to all though some form of a health financing scheme.</p>
	<p>Some subgroups have better accessibility to a wider choice of services through their ability or willingness to pay.</p>	<p>There should be little difference in the cost as well as services provided at public and private facilities under the <i>basic package</i> covered under the health financing scheme. A capitation fee should be paid to the provider of services. A capitation fee is preferred to fee-for-service as it will encourage providers to invest more on preventive and promotive strategies which are more cost-effective.</p>
		<p>People can be made to pay extra for 'comfort' not defined in the basic package both at private or corporatised hospitals.</p>

FINDINGS	IMPLICATIONS	SUGGESTIONS
6. Cost of care at private facilities are many times greater than public facilities.	Large disparity in cost of care at public and private facilities tend to make people utilise the public services more especially if it involves hospitalisation, several visits (as in maternity care) or other chronic diseases.	Efforts must be made to reduce the disparity between public and private sector services both in terms of quality and expenditure. For areas where development of private sector has been slow (as in the less developed states); the role of the public sector in ensuring adequate supply and accessibility of services to these areas must be maintained. A health financing scheme may also stimulate the growth of the private sector in the less developed states.

From the foregoing sections, the main findings of each topic area of the NHHES96 has been presented. It was felt that a section should be devoted to bringing together all these main findings and distill out the essential issues which the survey had identified. In this section, this is done in a familiar fashion of the three sequential headings of findings leading to implications which prompted certain suggestions for action.

END-NOTE

6

In Malaysia, the government's objective in the design of its health policy is to improve longevity and quality of life of its population. One way of achieving this would be to ensure access to appropriate and effective health services.

In line with the government's future plans, Vision 2020, Malaysia's vision for health care is :-

“ Malaysia is to be a nation of healthy individuals, families and communities, through a health system that is equitable, affordable efficient, technologically appropriate, environmentally adaptable and consumer friendly, with emphasis on quality, innovation, health promotion and respect for human and community participation towards an enhanced quality of life”.

The above statement has outlined the broad policy goals for the health sector and thus any health care reform must be designed to meet these goals.

The NHHES96 has highlighted that in spite of a comprehensive network of services and high utilisation of services in the public sector by a large majority of its population, out-of-pocket expenditure by households is as much as the Ministry of Health's annual operating budget. Thus, about half of Malaysia's health spending comes from out-of-pocket expenditures.

Although it is often thought that health spending in private sectors are mainly confined to the rich and the advantaged groups, this survey showed that private care utilisation among the rich do not involve much out-of-pocket expenditure. As shown in the utilisation of acute ambulatory care, it is still the lower income and the poor who pay most for services through out-of-pocket expenditure. Thus, if utilisation of private services is perceived as better, than as incomes grow more people may opt for private services and this may lead to escalation of health costs.

Almost all over the world, existing health care systems are facing the challenge of escalating health care costs. Higher spending on health services does not necessarily lead to greater gains. The government can play an important part in containing health costs through overseeing and control over major human and capital investments in the health system. Better control over the distribution of resources (including hospitals, hospital beds, personnel and expensive medical equipment) to ensure accessibility and unnecessary duplication of resources may bring about improvements in efficiency and cost containment.

At the same time, government funds may best be utilised for public health programs which provide services that yield large social benefits but for which individuals maybe unwilling or not able to pay the full cost. The survey highlighted that public facilities were the main source of

care for preventive care such as immunisation and that the people are more willing to pay for curative services rather than preventive services.

The government should also ensure that the country's neediest citizens have access to priority health services. This survey showed that the indigent are very dependent on public facilities. Thus in any health sector reform, there is strong justification on equity grounds for government subsidies to be targetted towards improving the access of the poor to important health services. Health problems among the indigent may affect their productivity and keep them in poverty. This may create wider disparity gaps and social injustice.

This survey has demonstrated that the high dependence on heavily subsidised public medical and health services may have over-burdened the system leading to possible inefficiency in the health sector and the maldistribution of resources. Better partnership between the private and public sectors should be fostered so that the role of the private sector especially in the provision of primary care services can be enhanced.

Government support to encourage the development of risk-pooling mechanisms can make health services more accessible and efficient. Once a financing mechanism is in place, populations may have better access to a diversity of services (both private and public) and health resources can be utilised more efficiently whatever the supply (private or public). Any medical care provided through the financing mechanism must be paid for but not necessarily through out-of-pocket expenditure.

The choices that Malaysia makes in its health sector reform policy will rest not only on financial and economic analyses. These choices hinge fundamentally on the judgement Malaysia makes about what kind of society it wishes to be and what value it places on social cohesion, poverty alleviation, equity, consumer choice and quality of care. In the right policy-environment, measures that improve economic efficiency in the health sector may also achieve these broader social goals.

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NATIONAL HOUSEHOLD HEALTH EXPENDITURE SURVEY 1996 (NHHES'96)

SABAH AND SARAWAK

Report of Findings

**Acute Ambulatory Care
Hospitalisation
Maternity Care
Health Supplements
Dental Care
Other Health Needs**

**NHHES'96 TEAM
DEPARTMENT OF SOCIAL AND PREVENTIVE MEDICINE
FACULTY OF MEDICINE, UNIVERSITY OF MALAYA**

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INTRODUCTION

1

“Health care should meet the needs of a nation, satisfy the demands of many groups in the population, and adapt flexibly to the rapidly changing capabilities of modern medicine. It should not pose an impossible financial burden on families and the national economy. It must be sufficient for today, yet sustainable to meet the uncertainties of the future.”

- Peter Berman, 1995

In almost all countries throughout the world, health care costs have been rising as the national incomes of these countries grow. The positive correlation between the growth in national income and health expenditures is shown by a summary of the studies for both high income and less affluent countries (Dunlop & Martins, 1985). It was suggested that total health care spending to be a normal good, whereby it is probably elastic with respect to income, in an aggregate sense. This income elastic demand signals the likelihood for further increases in the future health expenditure of these countries.

The reasons for this are complex but include rising rates of health care utilisation stemming from increased education, better transportation and increased expectations, costly advances in medical technology and a lack of incentives for cost-containment. At the same time, inefficiencies in resource use such as the inappropriate use of highly trained medical personnel, the use of inappropriate technologies, and poor management and administrative practices, are all too common. There is also the future prospects of coping with the needs of an increasing proportion of the ageing population which have added to the crisis of financing social security schemes and balancing precarious government welfare budgets from a shrinking tax base.

Under this pressure of increasing costs of health and medical services, it has led to various cost-containment measures and critical reexamination of existing health care systems throughout the world. The choices made today will determine the pace of mortality decline, the costs that will be faced, and institutions and structures of the future health care systems.

1.1 Health Transition in Malaysia

The process of development in Malaysia has led to significant demographic and socio-economic transformations. The population of Malaysia has almost trebled over the past four decades, growing from a population of 7.4 million in 1957 to 20.7 million in 1995.

Rapid development has transformed the mainly rural agricultural society to an increasingly urbanized industrial society. The percentage of population in urban areas have increased from 24.5% in 1957 to 50.8% in 1990. Concomitantly the percentage of population employed in the agricultural sector has decreased from 52% in 1970 to 26% in 1990, whilst female labour force participation has increased from 36% in 1957 to 47% in 1991. (Leete R, 1996)

Rapid economic growth saw the country's Gross National Product (GNP) per capita increased from RM1,106 in 1970 (Government of Malaysia, 1971) to RM 9,786 in 1995; and the incidence of poverty among Malaysians has reduced from 16.5% in 1990 to 8.9% in 1995 (Government of Malaysia, 1996). Rapid expansion of educational facilities has increased literacy rates and decreased educational disparities between males and females (Government of Malaysia, 1996).

All these factors have led to great improvements in the standard of living, bringing mortality rates down dramatically in Malaysia. Crude death rates declined from 12.4 per 1000 population in 1957 to 4.7 per 1000 population in 1990. Infant mortality rate (IMR) also fell from 76 per 1000 livebirths to 12 per 1000 livebirths and the expectation of life at birth increased from 57 years to 71.2 years over the same period. (Vital Statistics, 1957 & 1990)

Fertility decline followed soon after and the crude birth rate (CBR) fell from 46 per 1000 population in 1957 to 28.4 per 1000 population in 1990. (Vital Statistics, 1957 & 1990)

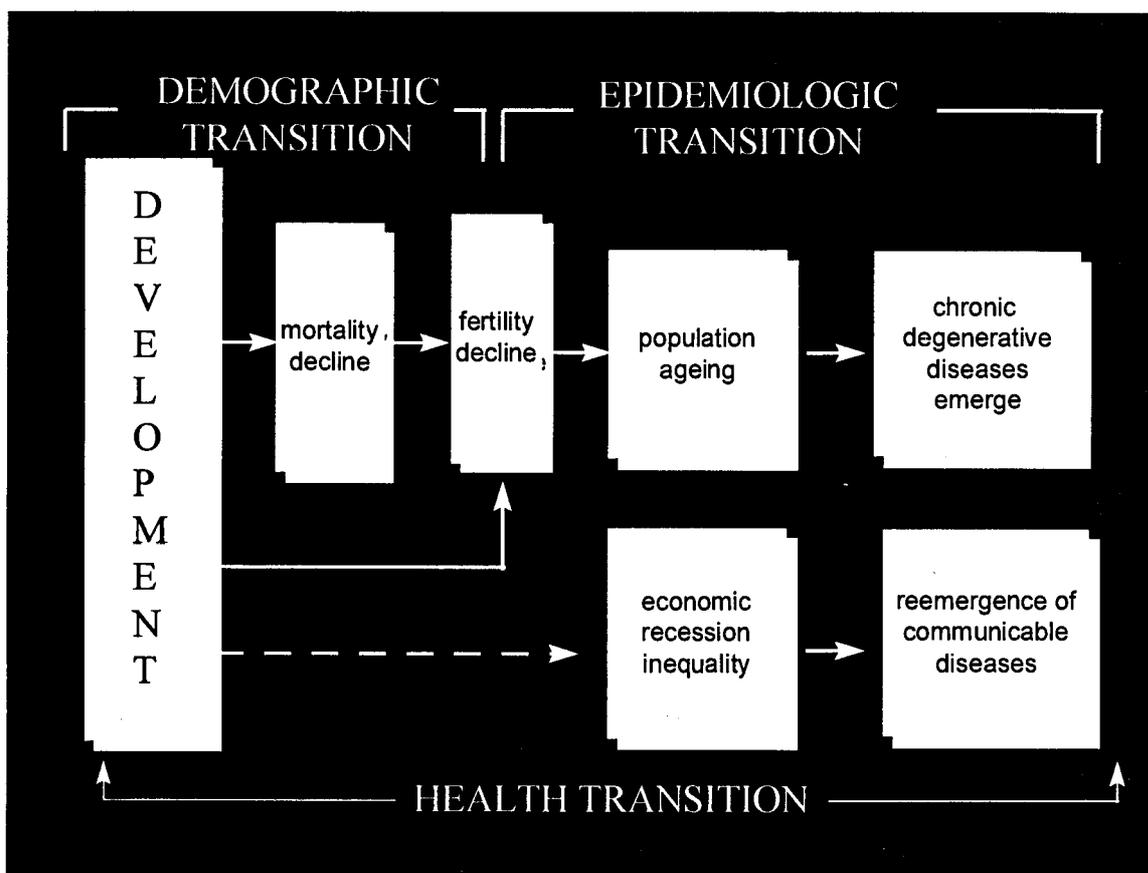
As Malaysia undergoes '*demographic transition*', declines in fertility levels has brought about changes in the population age structure. At the same time with increasing numbers of people surviving until adulthood, an increasing portion of the population is at risk of non-communicable, chronic health problems. This has led to a change in the morbidity and mortality pattern from one of mainly infectious diseases to one where chronic degenerative and non communicable diseases predominate. Thus Malaysia is also currently experiencing '*epidemiologic transition*' (Omran AR,1971; Omran AR,1983).

Apart from demographic and epidemiologic transitions, socio-economic development also bring about changes in life-style, behaviour and environment which leads to *changing patterns of risk* to the population. (Kjellstrom, Tord, and Rosenstock, 1990). In Malaysia the process of urbanization, industrialization and mechanization have brought about increases in injuries from motor vehicles, industrial accidents and toxic chemical poisoning. Increase in the use of tobacco has been associated with high incidence of lung cancer, ischaemic heart disease and chronic obstructive pulmonary disease. Other behavioural risk factors which include sedentary life style and diets containing high saturated fats are also associated with obesity, diabetes mellitus, hypertension and ischaemic heart disease. Changes in patterns of sexual behaviour brought about by changes in social values are associated with increase in sexually transmitted diseases (STDs) and acquired immunodeficiency syndrome (AIDS).

health advances that had been achieved. This may lead to further widening of disparities between subgroups of population and regions, leading to 'epidemiologic polarization' (Frenk J, Bobadilla JL, Sepulveda J, and Cervantes ML (1989)). In Malaysia epidemiologic polarization seems to be occurring among the urban population whereby increases in the private sector and escalating health services costs coupled with lack of emphasis in the development of a comprehensive public urban health services have created larger disparity gap in accessibility to health services between the urban rich and the urban poor.

Thus the changes in the disease pattern brought on by the process of development is termed the Health Transition. The factors that influence it are demographic transition, epidemiologic transition, changing patterns of risk to the population, and epidemiologic polarization. The inter-relationships among them are summarised in Figure 1.1. The process of development need not be associated with disease patterns seen in most Western populations. The disease pattern that we will face in the future will depend on the rate and extent each of the factors are allowed to influence the health transition as well as the choices made by Malaysia as it considers alternative health sector reform strategies as it proceeds through the health transition.

Figure 1.1 Relationships among Demographic, Epidemiologic and Health Transitions.



Source: Mosley WH, Bobadilla JL and Jamison DT (1993)

As Malaysia continues in its path of being a developed nation by the year 2020, its population is projected to grow from 17.5 million in 1990 to about 31.5 million in the year 2020. Its population age-structure is projected to change with a declining proportion of young population and an increasing proportion of elderly population. Problems of chronic non-communicable disease will emerge and slowly predominate whilst problems related to reproduction and communicable diseases are still being tackled. At the same time as the population develops their demand for health services will increase not only in terms of quantity, but also in terms of quality. Thus the health sector will have to meet several challenges. Faced with the commitment of trying to improve the health of the nation in the presence of complex health conditions, increases in medical technology, limited resources and at the same time upholding social justice and equity, priorities will have to be made. It is imperative that these priorities be made based on solid demographic and epidemiologic information.

These effects coupled with the "abnormal" economics of the health care industry will lead to an escalation of costs and will consume a large portion of the nation's riches if left unchecked. Thus, there is a dire need for a health sector reform in Malaysia; especially in the financing aspect of this sector. The form it is to take will depend on the adequacy, timeliness and quality of data and information available to form a firm data-base in order to understand the situation and to act as a platform for strategic planning. It will also depend on political will to back-up the reforms proposed. Whatever, the choices the planners make today will determine the pace of health improvement for vast numbers of the population, the costs that will be borne, and the health care institutions that will be bequeathed to future generations.

1.2 Malaysian Health Care System

When the country gained independence in 1957, one of the chief concerns of the National Government was to improve the socio-economic conditions of the rural population who constituted more than 75% of the total population. It was recognized that rural upliftment could be achieved only through a co-ordinated and an integrated four-pronged attack against poverty, ignorance, apathy and ill-health. Since then, health programs development has become an integral component of the socio-economic growth of the country.

A comprehensive rural health service programme was developed over the years improving accessibility and equity of health services to the population. At the same time private services continued to grow especially in the urban areas.

In Malaysia, there is a dual system of health care delivery. The public sector is run by the Government while the private system is provided by the voluntary and private hospitals and practitioners. The health care delivery system comprises of primary health care provision at Maternal and Child Health clinics, various public outpatient clinics and private medical practitioners' clinics; and secondary and tertiary specialist care in the public and private hospitals.

Malaysia has been experiencing a very rapid economic growth of 8-9% per annum in the last decade, this has led to increased expenditures in health. Malaysia's health care services is changing from a largely public-sector provided system financed largely by general revenue

sources; to an seemingly increasingly popular private sector services which are financed through a fee-for-service process.

The unprecedented growth of the private medical sector, seen by the increase in the number of private hospitals and private clinics, in the recent years, has serious implications on the public sector and the overall health care costs. With higher remuneration in the private sector, it had been able to draw doctors and other medical personnel from the public sector resulting in acute shortages therein.

Further, the positive linkage between the health status of the labor force and economic growth restrains the government from reducing investments in the health needs of the country. However, as Malaysia industrializes, competing demands for the scarce resources of the economy implies that there is a need to consider alternative options for financing health care; apart from federal funding.

Various studies on health financing have been undertaken by the Government, but a conclusive scheme has yet to be drawn up. This is mainly because there are still many unresolved issues such as cost to be borne by the consumer and the cost of administering a financing scheme, accessibility to health care, efficiency and the provision of quality health care (EPU, 1996). Nevertheless, in the recently released Seventh Malaysian Plan (7MP) (Government of Malaysia, 1996), a statement in its chapter on "Health" stated that to increase the efficiency of services and to retain qualified and experienced manpower, the corporatization and privatization of public hospitals as well as medical services would be implemented during the plan period.

As stated by in a document issued by the Economic Planning Unit (EPU) of the Prime Minister's Office (Government of Malaysia, 1996), the current challenges being faced by the Government is the development of a health sector within the realms of the macro policies of the Government in such a way that :

- there is containment of the size of the public sector
- the private sector becomes the engine of growth
- there is emphasis on efficiency
- there is equity in the distribution and accessibility of services
- privatization of public sector services is continued.

There are many conditions to be fulfilled prior to the development of the above health care sector in Malaysia; among them are:

- devising mechanisms for selecting priorities
- setting achievable targets and
- development of monitoring instruments for assessing the functioning of health care institutions.

This would require a consolidated information and data system in order to facilitate and support decision making and policy formulation (Government of Malaysia, 1996a). The future Malaysian Health Care System will optimize the utilization of available resources in the public and private sectors as well as at the individual level. Thus, the system must continue to provide quality services efficiently and as cost-effective as much as possible.

This means a strategic health care reform encompassing all levels of health care i.e. promotive, preventive, curative and rehabilitative and directed to all ages of the community will have to be instituted soon to prevent the decaying of our health services and thus affecting the Malaysian's overall health status. What is needed for a dynamic reform is the acquisition of adequate, relevant, timely and statistically clean data which will be able to provide the planners with basic information and assumptions to base their models on.

1.3 Household Health Expenditures

To plan for an orderly and socially most effective and efficient health care sector for the future, it is necessary to have a complete picture of the financing and expenditure pattern of the health care services, covering all the sectors involved in its delivery, both public and private. Financial data are the only convenient measure which enables all resources to be included in an overall view of the situation, and health planners and managers can only assess economic efficiency if they know about total spending from all sources (Griffiths & Mills, 1983). In most instances, however, the detailed financial information about the private health care sector is not available for the health policy makers and health planners.

Household income is ultimately the source of most health care financing, but direct expenditures constitute a specific category of financing and may usefully be considered separately. Included in this category are any payments the consumer may make directly to health care providers such as fees for services, or prices paid for goods and supplies (Hoare & Mills, 1986). All expenditures on health such as in-patient and out-patient care in public and private hospitals, clinics, health centers, etc., private practitioners, traditional practitioners, dental services, ophthalmic services, drugs and health related supplies, and transport required to use health services should be included in this category of direct household expenditure on health.

Recent studies have shown that this form of financing is by far, more common and more important than was hitherto thought. Direct expenditures are not limited to high income groups and in many instances low income groups have been observed to devote a large proportion of their income on health care, sometimes displacing expenditures for other basic necessities of life (Hoare & Mills, 1986).

Direct household expenditures are not independent of other sources of finance. Government services may charge user fees (often nominal) for certain services. Even with insurance coverage, there is often a requirement for some degree of co-payment, which tends to increase the amount that would otherwise have been spent on health. Health insurance benefits may also have an upper ceiling, and households may have to pay directly for their health care requirements in excess of this level (Hoare & Mills, 1986). It is necessary to understand the inter-relationship of these various sources of finance for health care utilization in order to construct a proper policy formulation in financing the health sector.

Household expenditures on health are also greatly influenced by :

- changes in the health care financing structure.
- changes in the economy of the country.
- changes in consumption pattern.
- changes in the utilization patterns which are partly influenced by education, information technology and economic opportunities available to the present day family.

Several studies on household health expenditure have been done in both developed as well as developing countries. These studies have demonstrated that health service spending provided by Government expenditures and by Ministry of Health expenditures, if taken alone is grossly misleading as it does not reflect the private expenditures (Griffiths & Mills, 1983). At the same time the measurement of private sector expenditures is clearly inadequate in the developing countries (Murray et al, 1994). Household surveys seemed to provide the most reliable assessment of private spending on health, even though they often exhibited some systematic sampling and non-sampling bias which can be adjusted to yield a more reliable estimates.

There had been only a few studies in which the household health utilization and expenditure was examined in Malaysia over the years. One of the first and the only published study in this area of household health utilization and expenditure in Malaysia was Heller,1982. He concluded that Malaysia had developed a health care delivery system which had been effective in reaching the most disadvantaged groups in the society. A wider perspective of health expenditure in relation to other expenditures can be found in "Public Expenditure in Malaysia" (Meerman, 1979).

Heller in the same study also found that the average cash outlay for a visit to a government health facility was 19 cents (US) and for a private visit, \$2.30(US). The average travel time to a government clinic was about 23 minutes and to a private clinic, about 29 minutes. Travel time to a government clinic was a much larger percentage of the total cost of a visit (travel cost plus cash cost) than was travel time to a private clinic. He discovered that travel time had a negative (but statistically insignificant) impact on the total number of outpatient visits to both public and private sources of care. The mean waiting and examination time for government clinics was found to be 42 minutes and 31 minutes for private clinics. Heller found, however, that waiting time was not an impediment to use. He suggested as an explanation that patients may have looked on waiting time as a chance to socialize. It was found that the total demand for outpatient care from all sources was insensitive to the cash price.

There was a Malaysia Health Services Financing study in 1985 (unpublished report prepared by Westinghouse Health System, September 1985). The study did not cover community/household health expenditure which left a big gap in the expenditure and financing data on traditional medicine, household expenditure on drugs and medical appliances, and household expenditure on transportation and other costs of utilizing the public and private facilities. The 1986/87 National Health and Morbidity Survey also had only limited data on total household health expenditure (unpublished report by the Ministry of Health, 1987). Especially, the household expenditure on hospitalization cannot be analyzed because of the short recall period for the survey which is a necessity for a morbidity-based survey study.

Household Health Expenditure studies are complimentary to the Health Sector Financing and Expenditure studies. It is necessary to have expenditure information from both the consumers and providers to map out a complete health sector financing and expenditure patterns for health policy review and strategic health planning decisions. For, eventually the household income will be the ultimate source of health finance irrespective of the mechanisms and the final burden of utilization of health care services, whether public or private, will still be on the households. For countries like Malaysia with a rapidly expanding private health care sector and under the present climate of expansion of the private health care sector and the future role of public hospitals in the Malaysia Incorporated concept, it is a necessity to understand the characteristics and behaviour of household health care utilization and expenditures. Only then, can socially effective and efficient decisions with reference to the regulation of the private health care sector, especially the private hospital sector and to the changing role of public hospitals and the necessary safeguards for the underprivileged groups in the society, be made.

1.4 Rationale for the Survey

Recognising the importance in understanding the characteristics of household health care utilization and expenditures to ensure that not only the principles of efficiency, but also that of equity, social justice and fairness is incorporated into any health sector reform, The Economic Planning Unit of the Prime Ministers' Department commissioned a group of researchers from the University of Malaya to conduct the National Household Health Expenditure Survey 1996 (NHHES'96).

AIMS AND OBJECTIVES

2

The main aim of this survey is to provide information on household health expenditures and some aspects of the utilisation of health services in Sabah and Sarawak. Demographic, social, economic and health factors that might influence expenditures and utilisation were investigated.

2.1 OBJECTIVES

The specific objectives of the survey are:

- a) to determine the proportion of the population utilising the health care services in terms of:
 - i) types of services such as traditional care, modern scientific medical care, allopathic care and self-medication;
 - ii) public, private and mix of health care services;
 - iii) promotive, preventive, curative and rehabilitative levels of care; and
 - iv) specific health conditions prevalent in the population of interest to health planners such as infectious diseases, oral diseases, cardiovascular diseases, accidents and injuries etc.
- b) to assess the various levels of household health expenditure on these services by the population,
- c) to determine the demographic, social and economic factors and health conditions that best explains the variations in the utilisation pattern and household health expenditure,
- d) to make recommendations to address social inequity in relation to utilisation of health services and its expenditure.

METHODOLOGY

3

3.1 Coverage and Sample Size

The National Household Health Expenditure Survey (NHHES'96) covered the whole of Malaysia. Due to logistic constraints, a purposive sample was used in Sabah and Sarawak. Only the coastal and easily accessible districts in these two states were selected. Thus the districts covered in this survey were as follows:

<u>Sabah</u>	<u>Sarawak</u>	
Keningau	Kuching	Bintulu
Kota Kinabalu	Samarahan	Miri
Sandakan	Sri Aman	
Tawau	Sibu	

The selection of enumeration blocks (Ebs) and living quarters (LQs) in these areas was limited to within 5km radius of a district hospital for urban areas and to within 2 km radius of a health centre for the rural areas. Persons residing in institutions were excluded from the survey. The number of EBs and LQs selected for the study were as follows:

<u>State</u>	<u>Number of Ebs</u>			<u>Number of LQs</u>		
	Urban	Rural	Total	Urban	Rural	Total
Sabah	20	19	39	412	388	800
Sarawak	46	29	75	516	684	1200

3.2 Questionnaire Design

A questionnaire for the collection of data by means of face-to-face interviews with selected households was designed by the NHHES'96 team. This consists of a printed package with 11 'forms'. Each of these forms contained detailed questions of one aspect of the survey. The questionnaires were pre-tested during a pilot project (funded by the China Medical Board of New York) conducted in Kuala Langat District, Selangor in early August 1994. Based on experiences gained during this pilot project, the questionnaire was revised for the NHHES'96 project.

3.3 Organisation

The NHHES'96 project team employed, trained and organised a group of about 35 survey workers of various categories to implement the field phase of the project in Sabah and Sarawak. Each defined region was covered by one field team which was made up of about 10 to 12 enumerators with one research officer.

3.4 Conduct of Interviews

Face-to-face interviews with heads of selected households by NHHES'96 project interviewers was the primary method of data collection. This entailed the sending of interviewers to all areas in which the selected EBs and LQs were located. Only private households were interviewed. Each selected household was approached a maximum of three times to secure an interview or to consider it as a non-response. In households where an interview was not secured, relevant household information were obtained from neighbours.

3.5 Data Management

All completed questionnaires which had been checked and edited were packed in batches of fifty (50) and these were sent back to the Headquarters. Upon arrival at Headquarters, these questionnaires were further edited before entering into the computer. The data was cleansed and then analysed using customised computer software and the SPSS package.

3.6 Presentation of Findings

The findings of the survey will be presented by the types of health needs under investigation. Thus the following topics will be covered in this report:

- Acute Ambulatory Care
- Hospitalisation
- Maternity Care
- Health Supplements
- Dental Care
- Other Health Expenditures

It is emphasized that the findings were based on purposive samples of Sabah and Sarawak. Therefore whenever references were made about Sabah and Sarawak in this report, they referred to the study population in the respective states.

ACUTE AMBULATORY CARE

4

This chapter contains information on a *two-week* household expenditure for any acute illness condition that households *sought care or treatment for* but did not involve admission to the hospital. For practical considerations, a two-week recall period was used.

The respondents were asked if anyone in the household had any condition or health need that led him or her to seek treatment or medication but did not involve admission to the hospital in the last two weeks prior to the interview. Any 'unwellness' in which no treatment or medication was sought was excluded from the study. To facilitate recall, the health needs were classified into ten broad categories.

Household members could seek treatment or care for an acute condition from one or more sources of care (self medication at home, shops or pharmacies, traditional, public or private facilities). Details of source of care utilised as well as expenditure incurred for an acute condition were obtained from the respondents. For each episode of care the number of visits to a specific health care facility was recorded. A household member can have one or more episodes of "care for an acute condition" (hereafter referred to as *acute care*). For example, if a household sought care from a traditional facility once and subsequently a private facility twice for the same acute condition, then he is considered to have had two episodes of *acute care* consisting of three visits.

The times spent travelling to and from a health facility and the time spent waiting at the facility for acute care were recorded to assess the accessibility and the hidden cost of 'time' which might influence the choice of care.

The following components of expenditure on acute conditions were recorded: *Treatment expenditure* which included costs of registration, consultation and medicine. *Travelling expenditure* was also recorded but only purchased transport charges were included. Indirect cost such as loss of wages of household members as a consequence of seeking care for acute conditions was recorded under *Other expenditures*.

The sources of financing and subsidy on the expenditure were also inquired.

4.1 REPORTING OF ACUTE CARE

A total of 706 households in the study area of Sabah and 974 households in Sarawak were successfully interviewed. 414 (58.6%) households in Sabah and 636 (65.3%) households in Sarawak reported at least one episode of *acute care* in the two-week recall period.

The rate of reporting of acute care in Sabah was 209.0 episodes per 1000 persons. Household members in the rural areas, the elderly, females, Kadazan and Murut , and the lowest income quintile group reported higher rates of acute care. Tertiary educated headed households and top household income quintile group had lower rate of acute care (Table 4.1.1).

The rate of reported acute care in Sarawak was 247.0 per 1000 persons. There was no urban-rural difference. The elderly, female, the Iban and the lowest income quintile group had higher rate of reporting of acute care. As in Sabah, households with tertiary educated head of households and top household income quintile group had lower rate of acute care (Table 4.4.1).

Common cold accounted for more than 50% of the total episodes of care in each states. Other conditions where care was commonly sought for were "other painful conditions", gastrointestinal problems and skin problems (Table 4.1.2).

Table 4.1.1 Number and Percentage of Episodes and Persons, and Rate of Acute Care by Strata and Household Characteristics.

Household Characteristics	Sabah			Sarawak		
	No. of Episode	No. of Persons in Sample	Episode per 1,000	No. of Episode	No. of Persons in Sample	Episode per 1,000
Strata						
Urban	404	1998	202.2	496	2007	247.1
Rural	482	2241	215.1	796	3224	246.9
Age Group						
0-14	366	1651	221.7	475	1752	271.1
15-29	174	1217	143.0	214	1447	147.9
30-54	233	1047	222.5	426	1569	271.5
55 & above	113	324	348.8	177	463	382.3
Gender						
Male	443	2139	207.1	616	2659	231.7
Female	443	2100	211.0	676	2572	262.8
Ethnicity						
Malay	86	535	160.7	295	1177	250.6
Chinese	122	754	161.8	263	1310	200.8
Kadazan	394	1673	235.5	-	-	-
Bajau	30	143	209.8	-	4	-
Murut	34	100	340.0	-	-	-
Bidayu	-	-	-	162	632	256.3
Iban	-	-	-	497	1735	286.5
Melanau	-	-	-	43	224	192.0
Other Malaysian	209	996	209.8	31	144	215.3
Educ. Head of ousehold						
None/Primary	480	2371	202.4	766	3290	232.8
Lower Secondary	222	922	240.8	268	919	291.6
Upper Secondary	134	653	205.2	229	856	267.5
Tertiary	49	265	184.9	19	118	161.0
Household Income Quintile Group						
1st 20%	184	758	242.7	262	870	301.1
2 nd 20%	153	824	185.7	249	945	263.5
3 rd 20%	166	754	220.2	284	1044	272.0
4 th 20%	172	840	204.8	256	1152	222.2
5 th 20%	166	857	193.7	231	1170	197.4
Employment Status of Head of Household						
Self-Employed	323	1545	209.1	386	1697	227.5
Government Employee	230	1023	224.8	325	1280	253.9
Private Employee	210	996	210.8	373	1414	263.8
Unemployed	123	675	182.2	208	840	247.6
Total	886	4239	209.0	1292	5231	247.0

Table 4.1.2 Number and Percentage of Episodes of Acute Care by Types of Acute conditions, Sabah and Sarawak.

Types of Acute Conditions	Number	Episodes	
			%
Sabah			
Minor accidents	36		4.1
Common cold*	465		52.5
Gastro-intestinal problems**	91		10.3
Asthma	46		5.2
Skin problem	77		8.7
Acute ear problem	13		1.5
Acute eye problem	13		1.5
Mental stress	5		0.6
Other painful conditions***	106		12.0
Other health problems	34		3.8
Total	886		100.0
Sarawak			
Minor accidents	34		2.6
Common cold*	764		59.1
Gastro-intestinal problems**	104		8.0
Asthma	59		4.6
Skin problem	80		6.2
Acute ear problem	16		1.2
Acute eye problem	42		3.3
Mental stress	5		0.4
Other painful conditions***	144		11.1
Other health problems	44		3.4
Total	1292		100.0

* Include fever, cough, flu, running nose, sore throat and headache

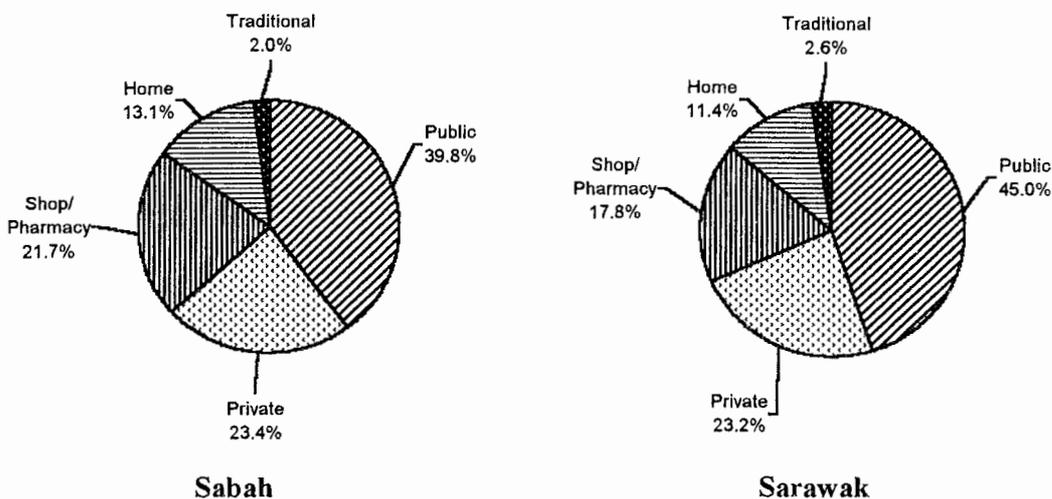
** Include diarrhoea, vomiting worm infestation and abdominal pain

*** Include backache, joint pain etc.

4.2 SOURCE OF CARE

Unlike P. Malaysia where *private* facilities were the most frequently utilised facilities for acute conditions, *public* facilities were the most frequently sought for source of care in Sabah as well as in Sarawak. However, private facilities were utilised in about a quarter of the episodes in both states. In Sabah, shops and pharmacies were as commonly utilised as private facilities for acute conditions. Only a very small proportion of the episodes (2% in Sabah and 2.6% in Sarawak) were treated at traditional facilities (Fig. 4.1).

Fig.4.1 Proportions of Episodes of Acute Care by Sources of Care, Sabah and Sarawak.



In Sabah, private facilities were more frequently utilised among urban dwellers, the Malays and Chinese, tertiary educated headed households and top household income group. Public facilities were more commonly utilised in the rural area, the younger age-groups, the Kadazan, other indigenous groups, households headed by less educated persons and the lower household income groups. Children aged 0-14 years, Malays and Chinese, better educated and top household income group were least likely to self-medicate at home. A high proportions of elderly, Chinese and the unemployed utilised traditional facility for acute care (Table 4.2.1).

In Sarawak, the urban dwellers, the Chinese, the Melanau and higher income households utilised private facilities more than the other facilities. Public facilities were the main source of care for most households *except* for the Chinese, tertiary educated headed households and top household income group. Interestingly, purchase of over the counter drugs at shops or pharmacies was practised by tertiary educated headed households for more than 40% of their episodes. Self medication at home was less common among children, and top household income group (Table 4.4.2).

Table 4.2.1 Percent of Episodes of Acute Care by Source of Care and Household Characteristics, Sabah.

Household Characteristics	Home %	Shop/ Pharmacy %	Public %	Private %	Traditional %	Total No. of Episodes
Geographical location						
Urban	13.1	21.5	30.2	32.4	2.7	404
Rural	13.1	21.8	47.9	15.8	1.5	482
Age Group						
0-14	7.7	17.5	47.0	26.2	1.6	366
15-29	16.1	25.9	40.8	16.7	0.6	174
30-54	15.9	26.6	32.2	24.0	1.3	233
55 & above	20.4	18.6	31.0	23.0	7.1	113
Gender						
Male	12.9	23.7	38.6	22.6	2.3	443
Female	13.3	19.6	41.1	24.2	1.8	443
Ethnicity						
Malay	8.1	26.7	20.9	43.0	1.2	86
Chinese	7.4	27.9	18.9	37.7	8.2	122
Kadazan	13.7	19.0	52.3	14.5	0.5	394
Bajau	10.0	6.7	50.0	33.3	-	30
Murut	11.8	23.5	55.9	5.9	2.9	34
Other Malaysian	17.0	23.3	33.5	24.8	1.5	209
Educ.Head of Household						
None/Primary	15.0	20.4	45.8	16.0	2.7	480
Lower Secondary	12.6	23.0	80.1	24.3	-	222
Upper Secondary	9.7	23.1	27.6	36.6	3.0	134
Tertiary	4.1	24.5	14.3	55.1	.0	49
Household Income Quintile Group						
1st 20%	12.5	25.5	45.7	14.7	1.6	184
2 nd 20%	19.0	18.3	46.4	16.3	-	153
3 rd 20%	11.4	18.7	47.0	21.1	1.8	166
4 th 20%	18.6	23.8	33.1	22.1	2.3	172
5 th 20%	4.8	23.5	21.7	46.4	3.6	166
Employment Status of Head of Household						
Self-Employed	13.9	21.4	43.0	19.5	2.2	323
Government Employee	13.0	17.8	41.3	27.4	0.4	230
Private Employee	12.4	27.1	31.0	28.6	1.0	210
Unemployed	12.2	20.3	43.9	17.1	6.5	123
Total	13.1	21.7	39.8	23.4	2.0	886

Table 4.2.2 Percent of Episodes of Acute Care by Source of Care and Household Characteristics, Sarawak

Household Characteristics	Home %	Shop/ Pharmacy %	Public %	Private %	Traditional %	Total No. of Episodes
Geographical location						
Urban	11.9	22.0	30.0	33.7	2.4	496
Rural	11.1	15.2	54.3	16.8	2.6	796
Age Group						
0-14	8.4	14.3	50.9	25.1	1.3	475
15-29	21.0	19.6	29.4	26.6	3.3	214
30-54	10.6	20.2	43.7	22.8	2.8	426
55 & above	9.6	19.2	50.8	15.8	4.5	177
Gender						
Male	11.4	17.7	45.3	22.2	3.4	616
Female	11.4	17.9	44.7	24.3	1.8	676
Ethnicity						
Malay	10.2	13.9	44.7	26.4	4.7	295
Chinese	12.5	25.9	25.5	32.3	3.8	263
Bidayu	13.6	16.0	54.9	14.2	1.2	162
Iban	9.5	16.7	53.7	18.7	1.4	497
Melanau	11.6	11.6	39.5	37.2	-	43
Other Malaysian	32.3	19.4	29.0	19.4	-	31
Educ.Head of Household						
None/Primary	9.9	15.9	49.1	21.9	3.1	766
Lower Secondary	9.3	23.1	45.5	19.8	2.2	268
Upper Secondary	17.5	14.8	34.1	32.3	1.3	229
Tertiary	10.5	42.1	21.1	26.3	-	19
Household Income Quintile Group						
1st 20%	12.6	17.6	54.6	13.0	2.3	262
2 nd 20%	7.2	18.9	54.2	17.7	2.0	249
3 rd 20%	13.7	14.1	51.4	18.0	2.8	284
4 th 20%	10.9	18.4	40.2	28.1	2.3	256
5 th 20%	1.7	20.3	22.5	42.4	3.0	231
Employment Status of Head of Household						
Self-Employed	10.9	19.7	47.7	19.9	1.8	386
Government Employee	14.5	13.2	50.5	19.7	2.2	325
Private Employee	11.0	22.5	35.7	27.3	3.5	373
Unemployed	8.2	13.0	48.1	27.9	2.9	208
Total	11.4	17.8	45.0	23.3	2.6	1292

Source of Care by Type of Conditions

In Sabah, public facilities were the main sources of care for all acute conditions except for minor accidents and eye problems which were mainly treated at home, shops or pharmacies (Table 4.2.3)

In Sarawak, public facilities were also the main sources of care for all conditions. A substantial proportion of minor accidents were treated at home, shops or pharmacies. Traditional facilities were the least frequently utilised source of care regardless of the type of acute condition. However, about 10% of 'other painful condition' in Sarawak were treated at traditional facilities.

Table 4.2.3 Percentages of Acute Conditions by Source of Care.

Sources of Care/ Type of Health need	Home %	Shop/ Pharmacy %	Public %	Private %	Traditional %	No. of Episodes
Sabah						
Minor accidents	30.6	27.8	27.8	13.9	-	36
Common cold*	8.8	20.6	42.6	25.6	2.4	465
GI problems**	16.5	29.7	36.3	16.5	1.1	91
Asthma	8.7	21.7	37.0	30.4	2.2	46
Skin problem	14.3	32.5	29.9	20.8	2.6	77
Acute ear problem	23.1	-	69.2	7.7	-	13
Acute eye problem	38.5	23.1	30.8	7.7	-	13
Mental stress	20.0	40.0	-	40.0	-	5
Other painful conditions***	21.7	17.9	6.8	20.8	2.8	106
Other health problems	5.9	-	58.8	35.3	-	34
Total	13.1	21.7	39.8	23.4	2.0	886
Sarawak						
Minor accidents	26.5	20.6	32.4	14.7	5.9	34
Common cold*	9.9	20.8	42.1	26.2	0.9	764
GI problems**	6.7	17.3	50.0	23.1	2.9	104
Asthma	8.5	11.9	61.0	15.3	3.4	59
Skin problem	6.3	21.3	53.8	17.5	1.3	80
Acute ear problem	6.3	-	68.8	25.0	-	16
Acute eye problem	16.7	19.3	50.0	11.9	2.4	42
Mental stress	20.0	-	40.0	40.0	-	5
Other painful conditions***	22.2	8.3	42.4	16.7	10.4	144
Other health problems	9.1	4.5	50.0	31.8	4.5	44
Total	11.4	17.8	45.0	23.3	2.6	1292

* Include fever, cough, flu, running nose, sore throat and headache

** Include diarrhoea, vomiting worm infestation and abdominal pain

*** Include backache, joint pain etc.

4.3 TRAVELLING AND WAITING TIME

In Sabah, the total time spent was the most at the public facilities (111 minutes) while that at the traditional facilities was the least (24 minutes). The waiting time (69 minutes) was the longest at the public facilities compared to a waiting time of 3 minutes at the traditional facilities (Table 4.3.1).

In Sarawak, there was no great difference in the travelling and waiting time between the public, private and traditional facilities which involved consultation with a practitioner. Shops or pharmacies were the most accessible in terms of travelling and waiting time.

Table 4.3.1 Mean Travelling and Mean Waiting Time While Seeking Care for Acute Conditions.

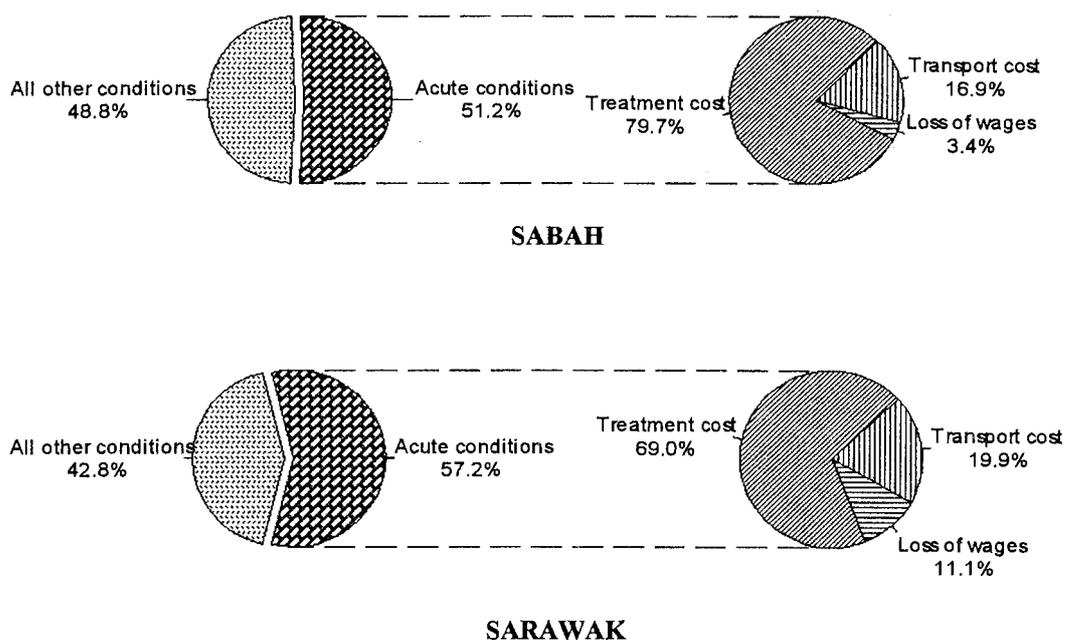
Source of Care	Mean Travelling Time (Min)	Mean Waiting Time (Min)	Mean Total Time (Min)
Sabah			
Private Facilities	45	34	79
Public Facilities	42	69	111
Traditional facilities	21	3	24
Shop/Pharmacy	38	6	44
All Sources	42	43	85
Sarawak			
Private Facilities	44	25	79
Public Facilities	33	44	77
Traditional facilities	35	20	55
Shop/Pharmacy	22	5	27
All Sources	34	31	65

4.4 HOUSEHOLD EXPENDITURE ON ACUTE CARE

The estimated mean health expenditure per person in 1996 for the study population in Sabah was RM114.90. Out of these, an average of RM58.80 (51.2%) was spent on acute conditions. 79.8% of the expenditure for acute conditions was treatment cost, 16.9% was transport cost and 3.4% was cost attributed to loss of wages (Fig. 4.4.1).

The corresponding figures for Sarawak were higher than Sabah. The estimated mean health expenditure per person was RM141.90 of which RM81.20 (57.2%) was spent on acute conditions, a higher proportion was due to transport cost (19.9%) and loss of wages (11.1%)

Fig. 4.4.1 Percentage of Total Expenditure on Acute Condition



Expenditure *Per Episode* by Household Characteristics.

Expenditure for acute care cost about RM10.80 per episodes in Sabah and RM12.70 in Sarawak. As more than 80% of persons reporting acute conditions reported a single episode, mean and median expenditure per person and per episode were relatively close, with expenditure person being slightly larger than per episode. As the general trend of variation was similar, the expenditure variation by geographical and household characteristics will be described at per episode level only.

In Sabah, there was no urban-rural differences in the mean and median expenditure per episode of acute care. Household members in age-group 15-29, Malays, Chinese and Muruts, and those in the highest income quintile group spent more per episode of care. The lowest income quintile group spent more per episode compared to those in the middle income groups. As mentioned previously they also reported a higher rate of episodes of acute care. The private employed and the self-employed headed households also spent more than the government employed and the unemployed headed households (Table 4.4.1).

In Sarawak, the urbanites, young adults aged 15-29, the Chinese, Iban and Malays spent more on per episode of care. Household members in the top household income quintile groups, the tertiary educated and private employed headed households spent much more than those in the other categories. As mentioned previously, they utilised private facilities more than the others.

Table 4.4.1 Mean and Median Expenditure *Per Episode* of Acute Care in Two-Week by Household Characteristics.

Household Characteristics	Sabah		Sarawak	
	Mean RM	Median RM	Mean RM	Median RM
Strata				
Urban	11.40	2.20	19.80	3.00
Rural	10.40	3.00	8.20	0.90
Age-group of Head of Household				
0-14	10.30	2.50	8.50	1.00
15-29	6.80	2.10	20.90	1.40
30-54	10.70	2.00	13.10	1.50
55 & above	19.00	4.60	12.50	1.50
Ethnicity of Head of Household				
Malay	17.07	4.80	11.70	0.60
Chinese	16.80	5.00	19.60	4.00
Kadazan	8.80	2.00	8.60	1.00
Bajau	7.50	1.80	-	-
Murut	9.20	6.00	-	-
Bidayu	-	-	4.10	1.00
Iban	-	-	12.90	1.40
Melanau	-	-	8.00	1.40
Other Malaysian	9.70	2.00	8.60	1.00
Household Income Quintile Group				
1st 20%	13.90	5.00	8.10	1.10
2 nd 20%	6.60	1.00	8.20	1.40
3 rd 20%	8.70	2.00	8.90	0.00
4 th 20%	8.40	2.00	11.40	1.80
5 th 20%	15.10	6.00	28.80	3.20
Educ Level of Head of household				
None/Primary	10.90	3.00	11.10	1.30
Lower Secondary	9.10	2.00	9.70	1.60
Upper Secondary	12.60	3.40	17.90	1.00
Tertiary	12.90	1.20	59.80	3.00
Empl Status of Head of household				
Self-employed	12.60	4.00	12.20	1.60
Government	8.50	2.30	5.70	0.00
Private	12.30	2.90	18.90	2.00
Unemployed	8.20	1.50	13.20	1.40
Total	10.80	3.00	12.60	1.20

Expenditure by Sources of Care and Household Characteristics.

As mentioned previously, expenditure for per episode of acute care cost about RM10.80 in Sabah and RM12.70 in Sarawak. It varied a great deal according to the sources of care and to a lesser extent, the type of conditions. Treatment of acute conditions at public facilities were heavily subsidised and cost minimal, the median expenditure was RM1.20 in Sabah and zero in Sarawak. As expected treatment at private facilities were the most expensive for most conditions. Traditional facilities were very expensive for certain conditions but only a very small proportions were treated at traditional facilities (Table 4.4.2).

Table 4. 4.2 Mean and Median Expenditure Per Episode of Acute Care and Proportions of Episodes at Various Categories of Payment.

Source of Care	Mean (RM)	Median (RM)	Percent of Episodes of Acute Care at various expenditure				Total Episodes
			No out-of-pocket exp. %	>0 - RM10 %	>RM10 - RM20 %	>RM20 %	
Sabah							
Home/Self Medication	0.40	0.00	84.5	15.5	0.0	0.0	116
Shop/Pharmacy	7.20	4.10	3.6	77.6	10.9	7.8	192
Public Facilities	3.90	1.20	28.0	64.3	3.7	4.0	353
Private Facilities	30.40	20.60	18.4	3.4	28.0	50.2	207
Traditional Facilities	26.60	10.00	22.2	33.3	11.1	33.3	18
All Sources	10.80	3.00	27.8	45.9	10.6	15.7	886
Sarawak							
Home/Self Medication	0.50	0.00	89.8	8.8	1.4	0.0	147
Shop/Pharmacy	7.70	3.50	6.1	79.1	7.0	7.8	230
Public Facilities	4.10	0.00	58.3	33.7	4.3	3.6	581
Private Facilities	38.30	18.00	9.3	7.0	45.5	38.2	301
Traditional Facilities	18.40	4.50	27.3	36.4	18.2	18.2	33
All Sources	12.60	1.20	40.4	32.8	14.4	12.4	1292

In Sabah, 28.0% of episodes at public facilities had no out-of-pocket expenditure (Table 4.4.3). Young children aged 0-14 years, Malays, better educated households, higher household income groups and government employees had the highest proportions of episodes which had no out-of-pocket expenditure at the public facilities. Conversely, the Chinese, the less educated (primary level and below), the poorest and the private employees had lower proportion of such episodes.

About 18% of episodes of care at private facilities in Sabah were fully subsidised and did not incur any out-of-pocket expenditure. Households in rural areas, the elderly, the Chinese, the less educated, lower income group and the self-employed had lower proportion subsidised private care.

Table 4.4.3 Proportion of Episodes of Acute Care at various Expenditure by Source of Care and Household Characteristics, Sabah.

	Public Facilities				Private Facilities			
	None %	> 0 - RM10 %	>RM10 %	No of Episode	None %	> 0 - RM10 %	>RM10 %	No of Episode
Strata								
Urban	18.0	77.9	4.1	122	19.1	3.8	77.1	131
Rural	33.3	57.1	9.6	231	17.1	2.6	80.3	76
Agegroup								
0-14	34.9	58.1	7.0	172	18.8	2.1	79.1	96
15-29	14.1	78.9	7.0	71	34.5	0.0	65.5	29
30-54	29.3	61.3	9.4	75	12.5	1.8	85.7	56
55 and above	20.0	71.4	9.6	35	11.5	15.4	73.1	26
Ethnic group								
Malay	61.1	22.2	16.7	18	24.3	2.7	72.9	37
Chinese	8.7	82.6	8.7	23	15.2	4.3	80.5	46
Kadazan	29.1	66.5	4.4	206	24.6	1.8	73.1	57
O. Indigenous Groups	20.6	58.8	20.6	34	25.0	0.0	75.0	12
Educational Level								
None/Primary	24.1	67.3	8.6	220	7.8	3.9	88.3	77
Lower Secondary	30.3	61.8	7.9	89	24.1	5.6	70.3	54
Upper Secondary	45.9	54.1	0.0	37	12.2	0.0	87.8	49
Tertiary	28.6	57.1	0.0	7	48.1	3.7	48.2	27
Household Income Quintile Group								
1 st	17.9	67.9	14.2	84	7.4	3.7	88.9	27
2 nd	38.0	56.3	5.7	71	0.0	12.0	88.0	25
3 rd	16.7	79.5	3.8	78	22.9	2.9	74.2	35
4 th	36.8	56.1	7.1	57	26.3	0.0	73.7	38
5 th	36.1	61.1	2.8	36	23.4	0.0on	76.7	77
Employment Status								
Self-employed	27.3	64.7	8.0	139	6.3	3.2	90.5	63
Government	33.7	58.9	7.4	95	25.4	1.6	73.0	63
Private	18.5	72.3	9.2	65	21.7	5.0	73.3	60
Unemployed	31.5	63.0	5.5	54	23.8	4.8	71.4	21
Total	28.0	64.3	7.7	353	18.4	3.4	78.2	207

In Sarawak, a higher proportion of episodes (58.3%) at public facilities had no out-of-pocket expenditure (Table 4.4.4). The socially advantaged such as the urbanites, better educated and well-off households had a large proportion of episodes which did not incur any expenditure at public facilities. Ironically, those with primary or no education and the poorest had a smaller proportion of such episodes.

In Sarawak, only 9.3% of households received fully subsidised care at private facilities. Households in rural areas, the elderly, the poorest and less educated and poorer households were least likely to received subsidised care at private facilities.

Table 4.4.4 Proportion of Episodes of Acute Care at various Expenditure by Source of Care and Household Characteristics, Sarawak.

	Public Facilities				Private Facilities			
	None	>0 - RM10	>RM10	No of Episode	None	>0 - RM10	>RM10	No of Episode
Strata								
Urban	55.0	36.9	8.7	149	11.4	9.0	79.6	167
Rural	59.5	32.6	7.9	432	6.7	4.5	88.8	134
Agegroup								
0-14	61.6	33.5	4.9	242	6.7	3.4	89.9	119
15-29	50.8	36.5	12.7	63	15.8	15.8	68.4	57
30-54	58.6	31.7	9.7	186	11.3	6.2	82.5	97
55 and above	54.4	36.7	8.9	90	0.0	7.1	92.9	28
Ethnic group								
Malay	68.2	26.5	5.7	132	12.8	6.4	80.8	78
Chinese	47.8	40.3	11.9	67	7.1	10.6	82.3	85
Kadazan	57.7	32.2	10.1	267	9.7	5.4	84.9	93
O. Indigenous Groups	55.7	41.5	2.8	106	7.7	5.1	87.2	39
Educational Level								
None/Primary	52.4	38.3	9.3	376	6.5	8.3	85.2	168
Lower Secondary	62.3	32.8	4.9	122	11.3	7.5	81.2	53
Upper Secondary	79.5	15.4	5.1	78	12.2	4.1	83.7	74
Tertiary	75.0	0.0	25.0	4	40.0	0.0	60.0	5
Household Income Quintile Group								
1 st	44.1	46.2	9.7	143	2.9	20.6	76.5	34
2 nd	54.8	38.5	6.7	135	4.5	0.0	95.5	44
3 rd	69.9	23.3	6.8	146	7.8	3.9	88.3	51
4 th	63.1	30.1	6.8	103	5.6	5.6	88.8	72
5 th	65.4	23.1	11.5	52	17.6	8.2	74.5	98
Employment Status								
Self-employed	53.3	37.0	9.7	184	2.6	14.3	83.1	77
Government	76.8	18.9	4.3	164	6.3	6.3	87.4	64
Private	42.1	51.1	6.8	133	16.7	3.9	80.3	102
Unemployed	59.0	39.0	12.0	100	8.6	3.4	88.0	58
Total	58.3	33.7	8.0	581	9.3	7.0	83.7	301

4.5 SOURCE OF PAYMENT

Choice of source of care in Sabah and Sarawak is determined by many factors including cost to the households which is dependent on whether there are other sources of payment

Out of 886 episodes of acute care in Sabah, household paid in full for 65.9% of the episodes. They paid for 62.6% and 74.9% of the episodes at *private* and *public* facilities respectively. Employers only paid or subsidised 4.7% of the episodes. It is significant to note that relatives and others subsidised 6.7% of episodes. None of the expenditure was financed by health insurance.

Out of the 1292 episodes in Sarawak, households paid in full for 59.8% of episodes. Compare to Sabah, they paid in full for a much higher proportion (88.7%) of episodes at private facilities and a lower proportion (41.3%) of episodes at public facilities. Employers only paid or subsidised 2.3% of the total number of episodes of acute care. The proportions financed by health insurance or relatives and friends were negligible (Table 4.5.1)

Table 4. 5.1 Number and Percentage of Episodes by Sources of Financing and Sources of Care.

Sources of Care	Sources of Financing					Total
	No Payment %	Household %	Employer %	Insurance %	Others %	
Sabah						
Home	98 (84.5)	17 (14.7)	-	-	1 (0.9)	116
Shop/Pharmacy	-	177 (92.2)	2 (1.0)	-	13 (6.8)	192
Public	99 (28.0)	221 (62.6)	14 (4.0)	-	19 (5.4)	353
Private	-	155 (74.9)	26 (12.6)	-	26 (12.6)	207
Traditional	4 (22.2)	14 (77.8)	-	-	-	18
All Sources	201 (22.7)	584 (65.9)	42 (4.7)	-	59 (6.7)	886
Sarawak						
Home	132 (89.8)	14 (9.5)	-	-	1 (0.7)	147
Shop/Pharmacy	-	229 (99.6)	-	-	1 (0.4)	230
Public	339 (58.3)	240 (41.3)	1 (0.2)	-	1 (0.2)	581
Private	-	267 (88.7)	29 (9.6)	2 (0.7)	3 (1.0)	301
Traditional	9 (27.3)	23 (69.7)	1 (3.0)	-	-	33
All Sources	480 (37.2)	773 (59.8)	31 (2.3)	2 (0.2)	6 (0.5)	1292

4.6 SUMMARY

Public facilities were the most frequently utilised facilities for acute conditions in the study population of Sabah and Sarawak. However, private facilities and purchase of over the counter drugs at shops or pharmacies were used for a large proportion of episodes. Self-medication at home were practised in about 10% of the episodes. Traditional facilities were not an important source of care except for painful conditions such as backaches and joint pains in Sarawak.

Acute care at *public facilities* involved very little out-of-pocket expenditure, 28% of episodes in Sabah cost household nothing and median expenditure was RM1.20 per episode. In Sarawak, 58% of episodes treated at public facilities had no household expenditure and the median per episode was zero.

In Sabah households in the study population spent an estimate of RM58.80 per person per year on acute condition which constituted 51.2% of the total out-of-pocket expenditure on health. Transport accounted for about 17% of total cost on acute care. Employers subsidised or paid for only 4.7% of the episodes. A higher proportion of episodes from better educated and higher income households had no out-of-pocket expenditure at public facilities. Elderly persons age 55 and above, less educated headed households, lower household income group and the self-employed were less likely to receive subsidised care at private facilities.

In Sarawak, 57.2% of total out-of-pocket expenditure on health (RM81.20) was extended on acute care. Transport constituted 20% of the expenditure. Employers paid or subsidized less than 3% of episodes. Better educated headed households, higher household income groups and private employees were equally likely to receive free treatment at public facilities as any other. Households in rural areas, elderly persons, less educated, the poorest and the self employed were least likely to receive subsidised care at private facilities.

HOSPITALISATION

5

5.1 UTILISATION OF HOSPITAL SERVICES

Out of the study population of 4,239 persons in *Sabah*, 4.0% reported at least one episode of hospitalisation in the one-year recall period. A total of 201 episodes were reported giving an average of 1.18 episodes per person among those hospitalised. Only 2 episodes were hospitalised at private hospitals and the rest (99%) were at public hospitals.

In *Sarawak*, out of the total of 5,231 persons that were surveyed, 3.9% reported at least one episode of hospitalisation in the same study period. A total of 241 episodes were reported giving an average of 1.18 episodes per person. 90% of these episodes were cared for in the public hospitals and 10% were cared for in the private hospitals.

70.6% of hospitalisation in *Sabah* and 67.2% in *Sarawak* were due to problems which required medical treatments. Problems which required surgery were the reason for admission for 13.4% of the episodes in *Sabah* and 20.3% of admission in *Sarawak* (Table 5.1.1).

Table 5.1.1 Number and Percent of Hospitalised Episodes by Reasons for Hospitalisation.

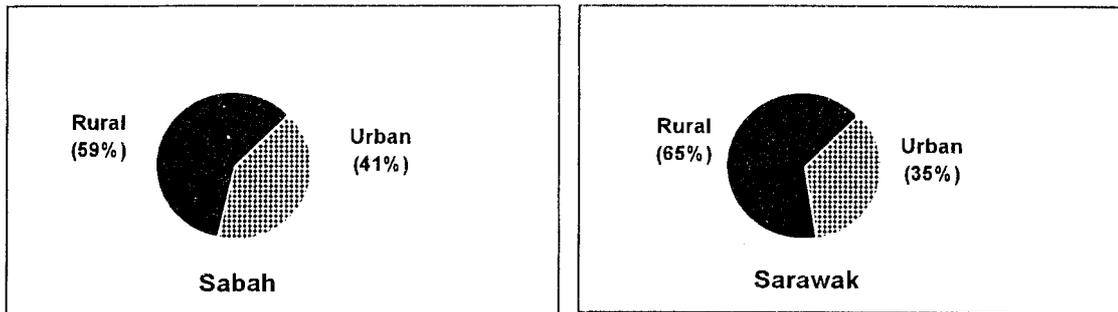
Reason for hospitalisation	Sabah		Sarawak	
	Number	%	Number	%
Accident	32	15.9	28	11.6
Problems required surgery	27	13.4	49	20.3
Stress/mental problems	-	-	2	0.8
Problems required medical treatment	142	70.6	162	67.2
Total	201	100.0	241	100.0

About 15% of the episodes in both states were hospitalised for 1 day, 40% in *Sabah* and 27% in *Sarawak* were hospitalised for 7 days or more. As the number of hospitalisations especially those in the private sector are small, the data is to be interpreted with caution.

Utilisation of Hospital Services by Geographical Location

Of the reported episodes of hospitalisation in Sabah and Sarawak, a higher proportion was from the rural dwellers. 59% of the episodes in Sabah and 65% in Sarawak occurred among rural dwellers (Fig. 5.1.1). In Peninsular Malaysia, only 42% of hospitalisation episodes were from the rural dwellers.

Fig. 5.1.1 Hospitalisation by strata, Sabah and Sarawak.



As mentioned earlier, only two episodes of hospitalisation in Sabah were in private hospitals and both were from the rural areas. In Sarawak, 6 (25%) of the episodes received care at private hospitals were from households from urban areas and the remaining 18 (75%) episodes were from the rural areas.

Utilisation of Hospital Services by Household Characteristics

Hospitalised care was more common among older age-groups in both states, the highest rate was found to be among the 55 years and above age-group. The elderly age-group in Sabah reported a very high rate of hospitalisation compared to their counterparts in Sarawak. Among the ethnic groups, the Chinese in both states reported a lower rate of hospitalisation. The Kadazan in Sabah and the Iban in Sarawak had higher rates of hospitalised care. Rate of hospitalisation was also higher among households headed by primary educated or less educated heads of household and those in the lowest household income quintile group. Households headed by unemployed persons (including the retired) also had the highest rate of hospitalised care (Table 5.1.2)

Table 5.1.2 Number of Episodes of Hospitalised Care Per 1000 Persons, by Household Characteristics, Sabah and Sarawak.

Household Characteristics	Sabah			Sarawak		
	No. of Episode	No. of Persons	Episode per 1,000 persons	No. of Episode	No. of Persons	Episode per 1,000 persons
Strata						
Urban	82	1998	41.0	85	2007	42.4
Rural	119	2241	53.1	156	3224	48.4
Age Group						
0-14	62	1651	37.6	74	1752	42.2
15-29	45	1217	11.5	41	1447	28.3
30-54	62	1047	125.1	81	1569	51.6
55 & above	32	324	172.8	45	463	97.3
Ethnicity						
Malay	28	535	52.3	48	1177	40.8
Chinese	25	754	33.2	45	1310	34.4
Kadazan	94	1673	56.2	-	-	-
Iban	-	-	-	103	1735	59.4
Other Malaysian	54	1217	44.4	45	1005	44.8
Educ.Head of Household						
None/Primary	119	2371	50.2	168	3290	51.1
Lower Secondary	40	922	43.4	31	909	33.7
Upper Secondary	32	653	49.0	38	856	44.4
Tertiary	8	265	30.2	3	118	25.4
Household Income Quintile Group						
1st 20%	44	758	58.0	65	870	74.7
2 nd 20%	39	824	47.3	31	945	32.8
3 rd 20%	37	754	49.1	52	1044	49.8
4 th 20%	27	840	32.1	51	1152	44.3
5 th 20%	42	857	49.0	38	1170	32.5
Employment Status of Head of Household						
Self-Employed	66	1545	42.7	77	1697	45.4
Government Employee	48	1023	46.9	59	1280	46.1
Private Employee	46	996	46.2	61	1414	43.1
Unemployed	41	675	60.7	44	840	52.4
Total	201	4239	47.4	241	5231	46.1

Comparing the utilisation of public and private hospitals in Sarawak, households from the rural areas seemed to have a higher proportion of hospitalisation in private hospitals; 11.5% of the hospitalisation in private hospitals were from population in the rural areas as compared to only 7.1% from population in the urban areas that utilised private hospitals when hospitalisation was deemed necessary. Chinese household (26.7%), household members in the 30-54 years age-group (16.0%), those in the top household income quintile group (26.3%) and the self-employed headed households (16.9%) had higher proportions of private hospital care than the others.

5.2 HOUSEHOLD EXPENDITURE FOR HOSPITALISATION

The total household health expenditure in Sabah in 1996 was RM487,000. Household expenditure on hospitalisation was RM30,900, that is 6.6% of the total household health expenditure. The mean hospitalised expenditure *per episode* in Sabah was RM154 and mean expenditure *per day* was RM38. When compared with hospitalisation expenditure in Peninsular Malaysia, this is much less as the respective figures were RM480 and RM 109. Thus, the expenditure in Sabah was only about 30% of that in Peninsular Malaysia.

The total household expenditure on hospitalisation in Sarawak was RM 70,850. This is 9.5% of the total household health expenditure (RM 742,000) in Sarawak. The mean hospitalised expenditure *per episode* was RM 294 and mean expenditure *per day* was RM72 which were almost double of that in Sabah.

The survey findings in Peninsular Malaysia showed that private hospitalised care was much more expensive than public hospitalised care. Though it is expected that similar finding be found in Sabah, expenditure of private hospitalisation in Sabah would not be discussed further due to the very small number of reported episodes.

Hospitalisation in the private sector in Sarawak was about 24 times more expensive than in the public sector. In addition, a higher proportion of episodes (28.1%) at the public hospitals had no out-of-pocket expenditure compared to only 20% in the private facilities (Table 5.2.1).

Table 5.2.1 Expenditure per day by source of care, Sabah and Sarawak.

Source of care	Mean expenditure per day (RM)	Median expenditure per day(RM)	% with No household expenditure	Total Episodes*
Sabah				
Public sector	13.30	1.90	28.1	198
Private sector	4850.00**	4850.00**	-	1
Sarawak				
Public sector	15.80	6.10	28.1	216
Private sector	575.10	34.30	20.8	24

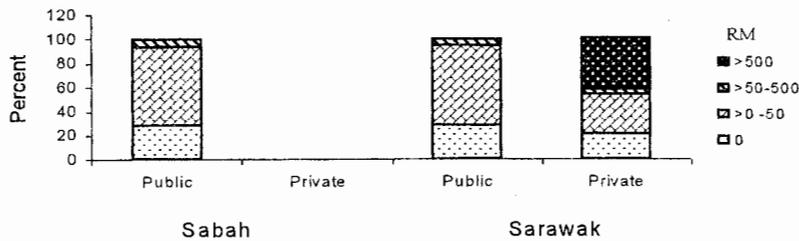
* Episodes with known length of stay only. ** Surgical case based on one episode only.

Expenditure per day of hospitalisation by source of care

The data suggested that out-of-pocket expenditure for hospitalisation in the public hospitals in Sabah and Sarawak was relatively low. The analysis showed that 28.1% of the hospitalisations in the public hospitals in Sabah did not incur any out-of-pocket expenditure. A further 65.3% of the episodes incurred an expenditure of more than zero but less than RM50 per day and only 6.0% of the episodes cost households RM50 or more per day. As there were only two episodes of private hospitalised care, it was not possible to analyse the data any further (Fig. 5.2.1).

The expenditure per day of hospitalisation in public hospitals in Sarawak is very similar to that in Sabah, where out-of-pocket expenditure is very minimal. As in Peninsular Malaysia, private hospitalised care was also very much more expensive in Sarawak. A large proportion (41.7%) of the episodes at private hospitals cost more than RM500 per day and a third of them cost more than zero but less than RM50 per day (Fig.5.2.1).

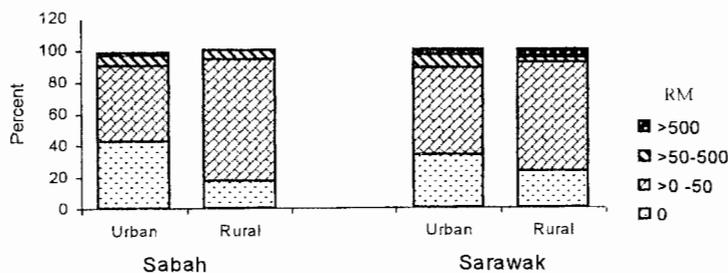
Fig. 5.2.1 Household Expenditure Per Day of Hospitalisation By Source of Care.



Expenditure per day of hospitalisation by Strata.

In both Sabah and Sarawak, hospitalisations seemed to cost more in the rural areas. A lower proportion of the episodes in rural areas had no household expenditure and a higher proportion involved an expenditure of up to RM50 per day compared to the urban areas (Fig 5.2.2)

Fig. 5.2.2 Household expenditure Per Day of Hospitalisation by Strata.



Expenditure per day of hospitalisation by household characteristics.

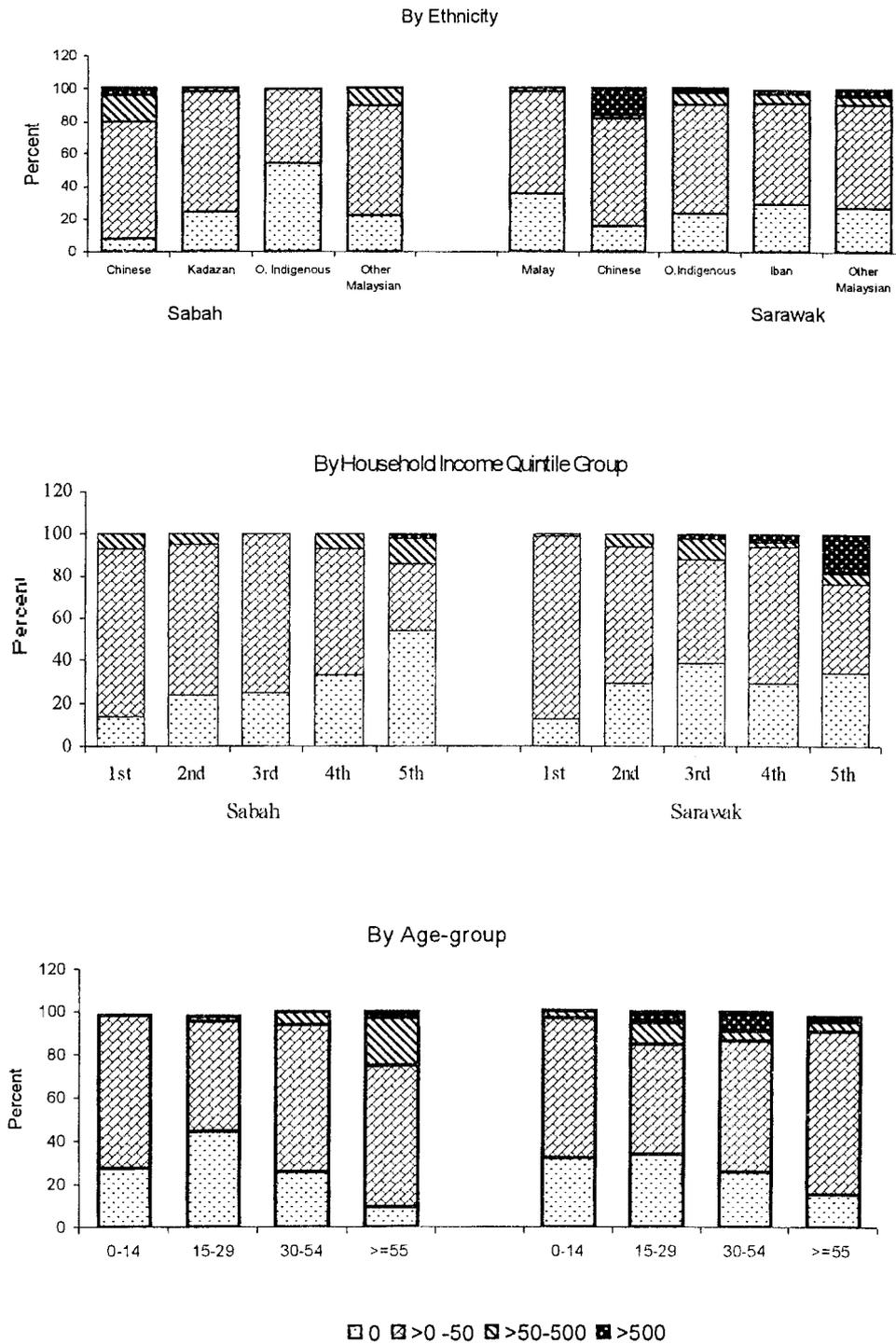
In both Sabah and Sarawak, the Chinese households spent more per day per episodes of hospitalisation. Out of the 10 hospitalised episodes in Sarawak which cost more than RM500 per day, 7 episodes were from Chinese households. They also had lower proportion of episodes which had no out-of-pocket expenditure. In Sabah, the Kadazan seemed to spend more than the other indigenous groups (Bajau and Murut). In Sarawak, other indigenous groups (Bidayu and Melanau) appeared to spend more than the Iban.

In Sabah, household members aged 55 and above had higher expenditure on hospitalisation. They had higher proportions of episodes which cost more than RM50 per day and lower proportions of episodes which had no household expenditure. In Sarawak, those in the 30-54 years age group had higher hospitalisation expenditures than the others. However, the elderly aged 55 and above had the lowest proportion of episodes which cost nothing.

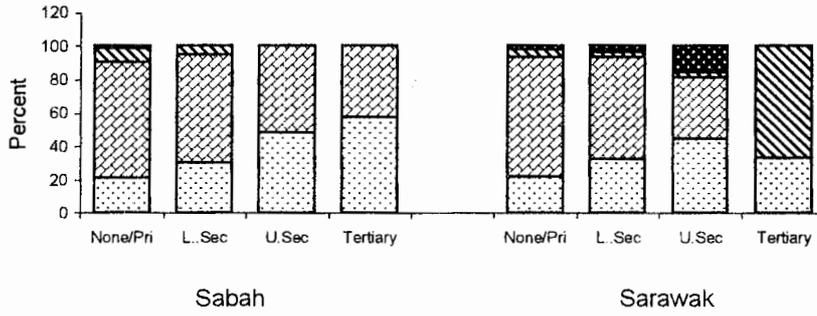
Households in the top household income group spent more on hospitalisation. However, higher income households (especially in Sabah) seemed to be associated with higher subsidy; 52.4% of the episodes in Sabah and 34.2% of episodes in Sarawak from the top income group did not incur any out-of-pocket expenditure.

The less educated and self-employed headed households paid out-of-pocket for more of their episodes of hospitalised care compared to other groups. They had lower proportions of episodes which had no household expenditure. Households headed by tertiary educated persons had higher proportions of episodes which were fully paid for or subsidised by others. As in P. Malaysia, better educated and government employed headed households had higher proportions of episodes which did not cost the households anything.

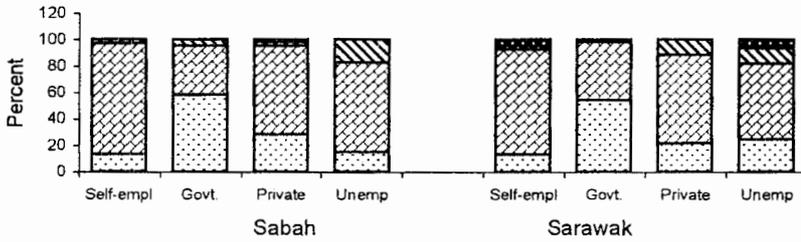
Fig. 5.2.3 Household Expenditure Per Day of Hospitalisation by Household Characteristics



By Educational Level of Head of Household



By Employment Status of Head of Household



0
 >0-50
 >50-500
 >500

5.3 SOURCES OF FINANCING FOR HOSPITALISATION

In Sabah, 17.4% of the episodes had no payment at all. They were fully subsidised either by the government or their employers. Households paid in full for the expenditure of 57.7% of the episodes (including the two episodes which occurred in the private facilities). Employers subsidised or paid for 12.9%, relatives and friends subsidised or paid for 10.0%. It is significant to note that none of the episodes were financed by health insurance (Table 5.3.1).

In Sarawak, 15.4 % of the episodes had no payment at all. Households paid in full for a much higher proportion (68.5%) of the episodes. Employers subsidised or paid for 12.9%, relatives and friends subsidised or paid for 3.3%. None were financed by health insurance or other agencies (Table 5.3.1).

Table 5.3.1 Sources of Financing for hospitalisation, Sabah and Sarawak.

Source of Financing	Sabah		Sarawak	
	Number	%	Number	%
No payment	35	17.4	37	15.4
Household	116	57.7	165	68.5
Employer	26	12.9	31	12.9
Insurance	-	-	-	-
SOCSO	4	2.0	-	-
Others	20	10.0	8	3.3
Total	201	100.0	241	100.0

5.4 SUMMARY

Hospitalised care were reported by about 4% of households in the study population in Sabah and Sarawak. The pattern of utilisation of hospital services were similar in both states. A higher rate of utilisation was reported by households in the rural areas, among the elderly, lower household income group and households headed by the primary level or less educated and unemployed heads of households. The Chinese in both Sabah and Sarawak had the lowest rate of hospitalised care, the Kadazan in Sabah and the Iban in Sarawak had the highest rate of hospitalised care. Public facilities were utilised in 99% of the hospitalised episodes in Sabah and 90% in Sarawak.

Households in rural areas, the Chinese, better educated and higher income group spent more on hospitalisation. In Sarawak, they also utilised private facilities more. In both states, households paid for the majority of episodes of hospitalised care. Employers only paid or subsidised about 13% of the episodes. The socially disadvantaged group (rural households, low household income group, less educated and the unemployed) received less subsidy than the socially advantaged group.

MATERNITY CARE

6

The respondents were asked if anyone in the household had a pregnancy which resulted in a "delivery episode" in the last one year. A *delivery episode* was defined as an event leading to the termination of a pregnancy, whatever its outcome, be it live-birth, still-birth or abortion. Each delivery episode has one *source of care* (private, public or home/traditional source) defined by the facility which the delivery took place. The date of delivery was recorded to ensure that it was within the one year recall period. Pregnancies still in progress were not included.

Each *maternity care* involved care at several points in time. Care during a delivery was defined as *delivery care*. Care received before and after a delivery episode was defined as *antenatal* care and *postnatal* care respectively. Both *antenatal* and *postnatal* care can be obtained from various sources (private, public or home/traditional sources) and a woman may have one or several episodes but also none of either type of care. Some episodes of antenatal or postnatal care may also involve hospitalisation.

Details of *source of care* utilised as well as *expenditure incurred* for antenatal, delivery, postnatal and neonatal care involved in the pregnancy were recorded. For each *episode* of care the number of visits to a specific health care facility was recorded. For example, if a woman attended antenatal check-up at a public clinic five times, and subsequently a private clinic for three times, then she is considered to have had two episodes of antenatal care consisting of eight antenatal visits and a mean number of four visits per episode.

Delivery expenditure can be classified as *subsidised* or *unsubsidised*. An *unsubsidised* delivery is a private delivery which was solely paid for by the household. Any other delivery is regarded as *subsidised*. This includes deliveries at a public hospital and those paid by employer or other sources. Subsidised delivery expenditure is usually minimal and does not reflect the actual cost of care. Unsubsidised delivery expenditure gives a more accurate reflection of actual delivery cost.

As payment made for a delivery or postnatal episode may also involve expenditure for the newborn and cannot be easily separated out, the recorded delivery and postnatal expenditure may be inflated. The actual expenditure for the mother alone for delivery and postnatal care cannot be established. The mother was also asked whether the baby remained in the hospital after the delivery and, if so, details of its extra length of stay and cost were obtained.

6.1 WOMEN WITH DELIVERY EPISODES

There were 123 deliveries by 121 mothers in Sabah and 135 deliveries by 134 mothers in Sarawak, recorded during the survey.

A larger proportion of births occurred among rural households both in Sabah (55.3%) and Sarawak (57.0%). However, the general fertility rate (GFR) which normally tended to be higher among rural women (as in Sabah and Peninsular Malaysia) was found to be higher among urban Sarawak women. General fertility rates in Sabah and Sarawak were higher than Peninsular Malaysia across most characteristics of women and households (Table 6.1.1); being higher in Sabah (111.6 deliveries/1000 females aged 15-49) than Sarawak (96.2 deliveries/1000 females aged 15-49). General fertility rates tended to be higher among the lower educated headed households, lower income group and extended family structure in both Sabah and Sarawak. Age specific fertility rate (ASFR) for women aged less than 20 years were much higher in Sabah (31.5 deliveries/1000 women) and Sarawak (18.8 deliveries/1000 women) compared to Peninsular Malaysia (8.8 deliveries /1000 women). Similarly among women aged 40-49 years, ASFR in Sabah (42.3/1000 women) and Sarawak (51.7/1000 women) were higher than in Peninsular Malaysia (27.5 deliveries/1000 women). GFR was highest among the Murut ethnic group (230.8 deliveries/1000 women aged 15-49) in Sabah and the Melanau ethnic group (200.0 deliveries/1000 women aged 15-49) in Sarawak. GFR among the Malays and Chinese in Sabah and Sarawak were higher than in Peninsular Malaysia (Table 6.1.1).

Table 6.1.1 Number, Percentage and Rate of Deliveries by Characteristics of Women and Households, P. Malaysia.

	Sabah				Sarawak				P. Malaysia
	Deliveries		Women Aged 15-49	GFR per 1000 Women	Deliveries		Women Aged 15-49	GFR per 1000 Women	GFR per 1000 Women
	No.	%			No.	%			
Strata									
Urban	55	44.7	560	98.2	58	43.0	561	103.4	82.1
Rural	68	55.3	542	125.5	77	57.0	843	91.3	140.1
Age- Group									
< 20	8	6.5	254	31.5	5	3.7	266	18.8	8.8
20 - 29	68	55.3	395	172.2	67	49.6	497	134.8	149.2
30 - 39	41	33.3	311	131.8	49	36.3	370	132.4	133.0
40 - 49	6	4.9	142	42.3	14	10.4	271	51.7	27.5
Ethnicity									
Malay	20	16.3	154	129.9	33	24.4	306	107.8	113.1
Chinese	16	13.0	211	75.8	29	21.5	370	78.4	52.9
Kadazan	47	38.2	413	113.8	-	-	-	-	-
Bajau	4	3.3	39	102.6	-	-	-	-	-
Murut	6	4.9	26	230.8	-	-	-	-	-
Bidayu	-	-	-	-	17	12.6	176	96.6	-
Iban	-	-	-	-	37	27.4	449	82.4	-
Melanau	-	-	-	-	12	8.9	60	200.0	-
Other	30	24.3	249	112.5	7	5.2	39	179.5	90.3
Educ. Level									
None/Primary	44	35.7	587	75.0	61	45.3	530	67.9	81.6
L. Secondary	50	40.7	252	198.4	38	28.1	238	159.7	101.1
U. Secondary	22	17.9	181	121.5	35	25.9	248	141.1	93.3
Tertiary	7	5.7	82	85.4	1	0.7	38	26.3	80.8
Emp. Status of Head of Household									
Government	32	26.0	279	114.7	38	28.1	361	105.3	150.8
Private	68	55.3	646	105.3	82	60.8	837	98.0	66.0
Not employed	23	18.7	177	129.9	15	11.1	206	72.8	99.8
Household Type									
Nuclear	52	42.3	528	98.5	61	45.2	724	84.3	86.4
Extended	71	57.7	570	124.6	74	54.8	671	110.3	101.9
Household Income Quintile Group									
1 st 20%	26	21.1	151	172.2	27	20.0	220	122.7	102.8
2 nd 20%	23	18.7	205	112.2	27	20.0	247	109.3	103.7
3 rd 20%	18	14.6	198	90.9	22	16.3	286	76.9	93.5
4 th 20%	26	21.1	232	112.1	25	18.5	311	80.4	86.7
5 th 20%	23	18.8	261	88.1	34	25.2	326	104.3	80.1
Unknown	7	5.7	55	127.3	-	-	14	-	55.0
Total	123	100.0	1104	111.6	135	100.0	1404	96.2	91.0

6.2 SOURCE OF MATERNITY CARE

Out of the 123 deliveries reported in Sabah, a relatively high proportion of 25.2% (n=31) were delivered at home or traditional facilities. The remaining 68.3% (n=84) were delivered at public facilities, whilst 6.5% (n=8) were delivered at private facilities (Table 6.2.1).

In Sabah, home or traditional deliveries were more common among rural (32.3%) than urban (16.4%) dwellers. They were also more common among the household of lower income groups (43% of deliveries in the two lower quintile income groups); and lower educated heads of households.

Although deliveries in private facilities occurred in 6.5% of the deliveries, they were more common among the Chinese (18.7%), higher income group, (21.7% of the 5th quintile income group), better educated heads of households and urban dwellers (9% compared to rural 4.4%).

Table 6.2.1 Source of Care for Deliveries by Characteristics of Households, Sabah and Sarawak.

Characteristics of Household	Sabah							Sarawak						
	Home		Public		Private		Total	Home		Public		Private		Total
	NO	%	NO	%	NO	%	NO	NO	%	NO	%	NO	NO	
Strata														
Urban	9	16.4	41	74.5	5	9.0	55	1	1.7	50	86.2	7	12.1	58
Rural	22	32.3	43	63.2	3	4.4	68	2	2.6	71	92.2	4	5.2	77
Ethnicity														
Malay	6	30.0	13	65.0	1	5.0	20	-	-	32	97.0	1	3.0	33
Chinese	1	6.3	12	75.0	3	18.7	16	1	3.4	24	82.8	4	13.8	29
Kadazan	11	23.4	34	72.3	2	4.3	47	-	-	-	-	-	-	-
Bajau	2	50.0	2	50.0	-	-	4	-	-	-	-	-	-	-
Murut	1	1.7	5	83.3	-	-	6	-	-	-	-	-	-	-
Bidayu	-	-	-	-	-	-	-	2	11.8	15	88.2	-	-	17
Iban	-	-	-	-	-	-	-	-	-	34	91.9	3	8.1	37
Melanau	-	-	-	-	-	-	-	-	-	11	91.7	1	83.3	12
Other	10	33.3	18	60.0	2	6.7	30	-	-	5	71.4	2	28.6	7
Educational Level *														
None/Primary	18	40.9	26	59.1	-	-	44	2	3.3	59	96.7	-	-	61
L. Sec	10	20.0	37	74.0	3	6.0	50	1	2.6	34	89.5	3	7.9	38
U. Sec	3	13.6	16	72.7	3	13.6	22	-	-	28	80.0	7	20.0	35
Tertiary	-	-	5	71.4	2	28.6	7	-	-	-	-	1	100.0	1
Household Income Quintile Group														
1 st 20%	11	42.3	15	55.7	-	-	26	-	-	27	100.0	-	-	27
2 nd 20%	10	43.5	12	52.2	1	4.3	23	1	3.7	26	96.3	-	-	27
3 rd 20%	5	27.8	12	66.7	1	5.5	18	1	4.5	21	95.5	-	-	22
4 th 20%	4	15.4	22	84.6	-	-	26	-	-	23	92.0	2	8.0	25
5 th 20%	-	-	18	78.3	5	21.7	23	1	2.9	24	70.6	9	26.5	34
Unknown	1	14.3	5	71.4	1	14.3	7	-	-	-	-	-	-	-
Total	31	25.2	84	68.3	8	6.5	123	3	2.2	121	89.6	11	8.2	135

* of head of household

Length of stay at the hospital for deliveries in Sabah tended to be the same for both public and private facilities – 1.9 days. Hospital stay was slightly longer among rural households (2.0 days) compared to urban households (1.8 days).

In Sarawak, there were only 3 (2.2%) home or traditional deliveries reported. 121 (89.6%) were delivered at public facilities, and 11 (8.1%) were delivered at private facilities.

Factors that were associated with private deliveries in Sarawak were the higher income group (26.5% of deliveries in the 5th quintile income group delivered at private facilities) and better educated heads of households.

In Sarawak, average length of stay for deliveries at public facilities were longer (2.7 days) compared to private facilities (1.3 days). Hospital stay was longer among rural households (3.4 days) than urban households (1.6 days).

Antenatal care during pregnancy seems to be almost universal in both Sabah and Sarawak. Postnatal care was, however, much lower in Sabah than in Sarawak (Table 6.2.2).

In Sabah, there were 131 episodes of antenatal care for the 123 deliveries, giving an average of 1.07 episodes of antenatal care per delivery. On average, there were 6 antenatal visits per episode of antenatal care. Although only 8 (6.5%) of the deliveries were at private facilities, 22 (16.8%) of the antenatal episodes were at private facilities. A majority 94 (71.8%) of antenatal episodes were at public facilities. For postnatal care, 66 episodes were recorded giving an average of 0.54 episodes of postnatal care per delivery (Table 6.2.2). Each episode of postnatal care had an average of 2.6 visits. Public facilities were the commonest source for postnatal care (56.1%) although a substantial proportion 20 (30.3%) utilised home or traditional facilities.

In Sarawak, there were 171 episodes of antenatal care for the 135 deliveries, giving an average of 1.27 episodes of antenatal care per delivery. On average there were 6.9 antenatal visits per episode of care. A majority 136 (79.5%) of the antenatal episodes were public facilities. For postnatal care, there were 104 episodes giving an average of 0.77 episodes of postnatal care per delivery (Table 6.2.2). Each episode of postnatal care had an average of 2.0 visits. Postnatal care was commonly obtained from public services (76.9%) although home and traditional facilities were utilised in 19.2% of postnatal episodes.

Table 6.2.2 Antenatal and Postnatal Care, Sabah and Sarawak.

	Sabah	Sarawak
No. of deliveries	123	135
No. of antenatal episodes	131	171
Average no. of episodes of antenatal care per delivery	1.07	1.27
Average no. of antenatal visits per episode	6.0	6.9
No. of postnatal episode	66	104
Average no. of episodes of postnatal care per delivery	0.54	0.77
Average no. of postnatal visits per episode	2.6	2.0

Antenatal complications that resulted in hospitalisation were reported in 6 episodes (4.8% of deliveries) in Sabah and 8 episodes (5.9% of deliveries) in Sarawak. All these hospitalisations were at public facilities. The average length of stay per episode of hospitalisation were 3.5 days in Sabah and 3.9 days in Sarawak.

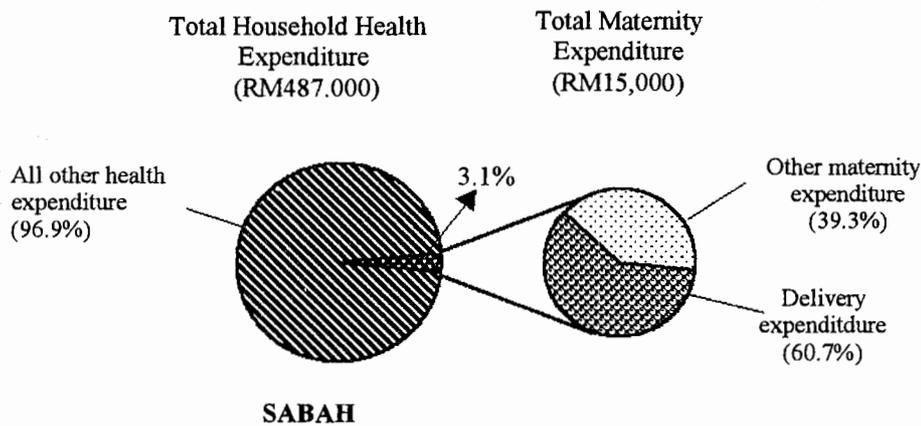
Postnatal complications that resulted in hospitalisation were reported in 8 episodes (6.5% of deliveries) in Sabah and 5 episodes (3.7% of deliveries) in Sarawak. In Sabah, all the postnatal hospitalisation were at public facilities whereas in Sarawak, two out of five (40%) of the episodes were in private facilities. The average length of stay per episode of hospitalisation was 3.0 days in Sabah and 1.0 day in Sarawak.

6.3 EXPENDITURE FOR MATERNITY CARE

This section summarises the expenditure for maternity care for Sabah and Sarawak.

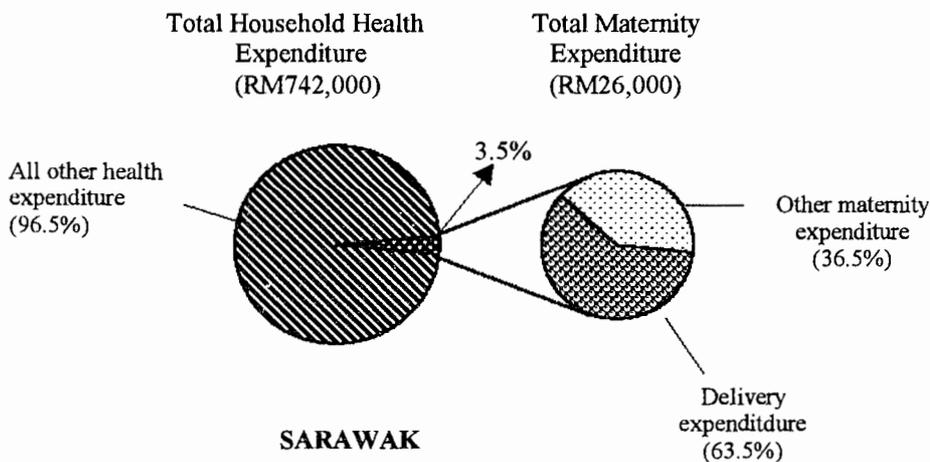
In Sabah, out of a total household expenditure of RM487,000, RM15,000 (3.1 %) was for total maternity expenditure. Delivery expenditure (RM9,000) made up 60.7% of the total maternity expenditure (Fig.6.3.1).

Fig. 6.3.1 Maternity Expenditure as a Proportion of Total Health Expenditure



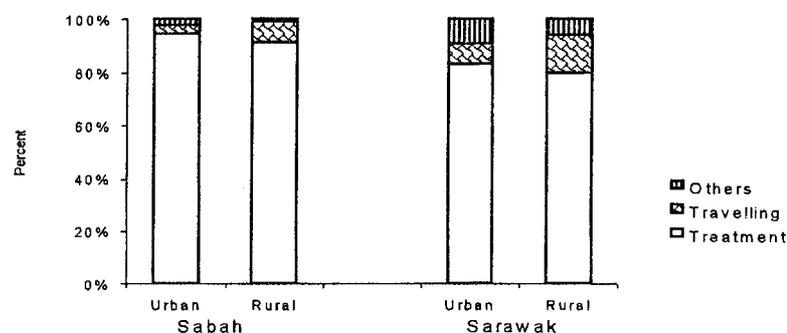
In Sarawak, total maternity expenditure was RM26,000 which was of 3.5% of the total household health expenditure (RM742,000). 63.5% of the total maternity expenditure was for delivery care (Fig. 6.3.2).

Fig. 6.3.2 Maternity Expenditure as a Proportion of Total Health Expenditure



More than 80% of these expenditure were for treatment cost. However, travelling expenditure, especially in Sarawak, contributed to a larger proportion of the total expenditure for rural households as they have to travel longer distances (Fig. 6.3.3). For services in public facilities where there is minimal or no payment for treatment, travelling expenditure contributed to 20.4% and 38.8% the total maternity expenditure for Sabah and Sarawak respectively.

Fig. 6.3.3 Proportionate Bar Chart Showing Components of Maternity Expenditure



As a large proportion of maternity care was subsidised, maternity expenditure tended to be very low and skewed. In Sabah, 57 (46.3%) deliveries involved no out-of-pocket expenditure; 58 (47.2%) deliveries involved expenditure between RM1-200, and 8 (6.5%) paid more than RM200 (Table 6.3.1).

Similarly in Sarawak, 60 (44.4%) of deliveries involved no out-of-pocket expenditure, 66 (48.9%) of deliveries involved expenditure of between RM1-200, and 9 (6.7%) of deliveries involved expenditure of more than RM200 (Table 6.3.1).

Table 6.3.1 Delivery Expenditure for Sabah and Sarawak by Categories of Payment

Categories of Payment	SABAH		SARAWAK	
	Number	%	Number	%
No Payment	57	46.3	60	44.4
RM1 – 200	58	47.2	66	48.9
>RM200	8	6.5	9	6.7
Total	123	100.0	135	100.0

The mean and median expenditure for delivery in Sabah was RM74 and RM6. (Range RM0-RM2,300) whilst that in Sarawak was RM122 and RM10 (Range RM0-RM3,000) respectively (Table 6.3.2).

Table 6.3.2 Mean, Median Delivery Expenditure by Source of Care

	Sabah				Sarawak			
	Home (31)	Public (84)	Private (8)	Total (123)	Home (3)	Public (121)	Private (11)	Total (135)
Mean (RM)	4.3	258.2	825.0	74.0	-	21.5	1,260.6	122.0
Median (RM)	0.0	11.5	550.0	6.0	-	10.0	1,040.0	10.0

Mean delivery expenditure for urban women in Sabah was only slightly higher than rural women (RM78 compared to RM70) but in Sarawak, the mean delivery expenditure for urban women were 2.7 times more than rural (RM190 compared to RM70).

In Sabah, mean and median expenditure for deliveries in private facilities were on average 29 times and 48 times more than public facilities. In Sarawak, the mean and median expenditure for deliveries in private facilities were on average 59 times and 104 times more than public facilities.

Although the mean and median expenditure for deliveries in Sarawak was higher than that in Sabah; its mean and median expenditure for deliveries in public facilities in Sarawak were much lower than that in Sabah. The maximum cost of delivery expenditure in public facilities was RM364 for Sabah and only RM165 in Sarawak.

6.4 SUMMARY

The general fertility rates in Sabah and Sarawak were higher than that in P. Malaysia. In both states, GFR was higher among the lower educated headed households, lower income group and the extended families. The proportion of safe delivery was high in Sarawak but Sabah still had a high proportion of home/traditional deliveries. Public facilities were the most frequently sought for source of maternity care irrespective of household characteristics. Private facilities were common among urban dwellers, Chinese, higher income group and better educated headed households. Antenatal care was almost universal but postnatal care was not as well covered as antenatal care especially in Sabah. 3% of total household health expenditure was spent on maternity care, 60% of these were delivery expenditure. While more than 80% of expenditure was treatment expenditure, travelling expenditure contributed to a larger proportion of total health expenditure for rural households. More than 40% of delivery expenditure in both states were fully subsidised. The mean and median maternity expenditure were RM74 and RM for Sabah, and in Sarawak they were RM122 and RM10 respectively.

HEALTH SUPPLEMENTS

7

7.1 Introduction

Health supplements in the survey refers to products registerable under Phase 2 and 3 of the National Pharmaceutical Control Bureau, Ministry of Health Malaysia. Phase 2 comprised of pharmaceutical products which do not contain scheduled poisons, other than traditional medicines. In this survey, they were labelled as 'Modern health supplements', examples are vitamins, mineral salts and aloe vera products. Phase 3 products were traditional health supplements. In this survey, traditional health supplements were grouped into 'Chinese traditional health supplements' and 'Other traditional health supplements'. For both phases only products for oral consumption were considered. These products can normally be purchased over the counter without prescription.

The unit of interest was a household purchase. A purchase was defined as total household buying of a type of health supplements throughout the recall period of one year. The household may have bought a particular type of health supplement on several occasions. All data concerning these occasions were aggregated to form a household purchase.

The expenditure data described in this report refers to the amount of money paid out-of-pocket by a household when making a purchase. The term expenditure per purchase was adopted. The expenditure component consisted of the cost of the health supplements purchased, cost of traveling to make the purchase and other cost involved such as loss of wages.

7.2 Extent of usage and purchase of health supplements

Health supplements was extensively used by households in Sabah and Sarawak (Table 7.2.1). The usage was however, more prevalent in Sabah (67.7%) than in Sarawak (53.7%). On average, each household who reported purchasing any health supplements made about 1.3 purchases a year. This habit was most prominent among urban households in Sabah.

Of the various types of health supplements purchased, modern health supplements was the most popular. Very few households purchased traditional health supplements.

Table 7.2.1. Distribution of households by strata and type of health supplement Purchased.

Strata	Modern		Chinese		Other trad		Any type		No. of HHs in survey
	n	%	n	%	n	%	n	%	
Sabah	411	58.2	95	13.5	65	9.2	478	67.7	706
Urban	223	63.0	60	16.9	31	8.8	250	70.6	354
Rural	188	53.4	35	9.9	34	9.7	228	64.8	352
Sarawak	430	44.1	126	12.9	56	5.7	523	53.7	974
Urban	184	46.2	59	14.8	23	5.8	220	55.3	398
Rural	246	42.7	67	11.6	33	5.7	303	52.6	576

7.3 Source of purchase

Health supplements were mainly purchased from shops and through direct sales (91% in Sabah and 92.2% in Sarawak) (Table 7.3.1). This is alarming since most of such purchases were unprescribed.

Table 7.3. 2. Distribution of purchases by source.

Source of purchase	No. of purchases	% of purchases
Sabah		
Shops	30783	66.8
Direct selling	11162	24.2
Private facilities	2775	6.0
Home remedy	728	1.6
Public facilities	394	0.9
Traditional	280	0.6
Sarawak		
Shops	41502	53.0
Direct selling	30688	39.2
Private facilities	3102	4.0
Home remedy	1086	1.4
Public facilities	642	0.8
Traditional	1259	1.6

7.4 Purchase of health supplements and demographic and socio-economic attributes

In Sabah household size and household income group have similar influence on purchase of health supplements (Table 7.4.1a). Larger households and households with higher income were more likely to purchase health supplements. There were also high proportion of Chinese, Kadazan and Malay households who purchased health supplements.

In Sarawak, the difference in the proportion of households who purchased health supplements by household size, ethnicity and income group was small (Table 3b). The only obvious disparity was between households in the lowest (37.7%) and highest (69.0%) income group. Household size had a negative effect on the purchase of health supplements. Smaller households were more likely to purchase health supplements compared to larger households.

Table 7.4.1a. Distribution of purchases by demographic and socio-economic attributes of household in Sabah.

Attributes	Number of HH in sample	Number of HH that purchased health supplements	
		n	%
HH size			
1	31	15	48.4
2-4	194	125	64.4
5-7	301	206	68.4
8 and above	180	132	73.3
Ethnicity			
Malay	94	64	68.1
Chinese	144	110	76.4
Kadazan	256	180	70.3
Other indigenous group ¹	42	24	57.1
Others ²	170	100	58.8
HH income group[*]			
1 st	134	76	56.7
2 nd	138	86	62.3
3 rd	132	88	66.7
4 th	131	89	67.9
5 th	134	113	84.3

¹ Includes Bajau and Murut

² Includes Indians, Other Malaysians and Non-Malaysians

* There were 37 households in the sample with unknown income

Table 7.4.1b. Distribution of purchases by demographic and socio-economic attributes of household in Sarawak.

Attributes	Number of HH in sample	Number of HH that purchased health supplements	
		n	%
HH size			
1	42	24	57.1
2-4	353	187	53.0
5-7	419	228	54.4
8 and above	160	84	52.5
Ethnicity			
Malay	197	112	56.9
Chinese	262	150	57.3
Iban	339	172	50.7
Other indigenous group ¹	142	71	50.0
Others ²	34	18	52.9
HH income group[*]			
1 st	199	75	37.7
2 nd	186	98	52.7
3 rd	193	110	57.0
4 th	201	106	52.7
5 th	184	127	69.0

¹ Includes Bidayu and Melanau

² Includes Indians, Other Malaysians and Non-Malaysians

* There were 11 households in the sample with unknown income

Among the head of household attributes, education level appeared to be associated with purchasing of health supplements in Sabah and Sarawak. Households headed by persons with at least upper secondary education were more likely to purchase health supplements (Table 7.4.2a and 7.4.2b).

Table 7.4.2a. Distribution of purchases by demographic and socio-economic attributes of head of household in Sabah.

Attributes	Number of HH in sample	Number of HH that purchased health supplements	
		n	%
Gender			
Male	615	416	67.6
Female	91	62	68.1
Age group (years)			
15-29	77	44	57.1
30-54	449	313	69.7
55 and above	180	121	67.2
Education level *			
None/ primary	361	225	62.3
Lower secondary	164	114	69.5
Upper secondary	124	97	78.2
Tertiary	53	40	75.5
Employment status			
Self-employed	235	157	66.8
Government	172	114	66.3
Private	190	132	69.5
Unemployed	109	75	68.8

* There were 4 households in the sample where the education level of the head of households was unknown

Table 7.4.2b. Distribution of purchases by demographic and socio-economic attributes of head of household in Sarawak

Attributes	Number of HH in sample	Number of HH that purchased health supplements	
		n	%
Gender			
Male	866	471	54.4
Female	108	52	48.1
Age group (years)			
15-29	101	54	53.5
30-54	635	351	55.3
55 and above	238	118	49.6
Education level ¹			
None/ primary	567	277	48.9
Lower secondary	183	105	57.4
Upper secondary	186	117	62.9
Tertiary	29	22	75.9
Employment status			
Self-employed	297	153	51.5
Government	250	149	59.6
Private	276	148	53.6
Unemployed	151	73	48.3

¹ There were 9 households in the sample where the education level of the head of household was unknown

7.5 Household expenditure on health supplements

Based on the sample, household expenditure on health supplements contributed a much smaller proportion to the total household expenditure on health in Sabah (9.5%) and in Sarawak (10.5%) compared to Peninsular Malaysia (22.8%) although health supplements were widely purchased in all the three areas. The small contribution is due to the lower per capita expenditure for health supplements in Sabah (RM10.88) and Sarawak (RM14.96). In Peninsular Malaysia the per capita expenditure was RM37.76.

Very few households paid more than RM500 per year for health supplements in Sabah (3.8%) and Sarawak (6.7%). In both states, households who were more likely to pay more were in urban areas; Chinese and higher income households, households headed by persons with at least upper secondary education (Table 7.5.1a and 7.5.1b).

Table 7.5.1a. Distribution of households in Sabah by expenditure group and household attributes

Attributes	Expenditure group							
	0 payment		>RM0 – RM50		>RM50 – RM500		>RM500	
	n	%	n	%	n	%	n	%
Sabah	66	13.8	229	47.9	165	34.5	18	3.8
Strata								
Urban	22	8.8	106	42.4	109	43.6	13	5.2
Rural	44	19.3	123	53.9	56	24.6	18	3.8
Ethnicity								
Malay	7	10.9	29	45.3	24	37.5	4	6.3
Chinese	10	9.1	41	37.3	52	47.3	7	6.4
Kadazan	35	19.4	94	52.2	48	26.7	3	1.7
O. indigenous group ¹	4	16.7	10	41.7	9	37.5	1	4.2
Others ²	10	10.0	55	55.0	32	32.0	3	3.0
Household income group								
* 1st	17	22.4	45	59.2	14	18.4	0	0.0
2nd	16	18.6	50	58.1	20	23.3	0	0.0
3rd	9	10.2	49	55.7	26	29.5	4	4.5
4th	10	11.2	43	48.3	34	38.2	2	2.2
5th	10	8.8	33	29.2	58	51.3	12	10.6
Education level #								
None/ primary	40	17.8	113	50.2	69	30.7	3	1.3
Lower secondary	12	10.5	62	54.4	36	31.6	4	3.5
Upper secondary	10	10.3	39	40.2	41	42.3	7	7.2
Tertiary	4	10.0	14	35.0	18	45.0	4	10.0
Employment status								
Self-employed	28	17.8	66	42.0	57	36.3	6	3.8
Government	16	14.0	58	50.9	35	30.7	5	4.4
Private	11	8.3	72	54.5	44	33.3	5	3.8
Unemployed	11	14.7	33	44.0	29	38.7	2	2.7

¹ Includes Bajau and Murut

² Includes Indians, Other Malaysians and Non-Malaysians

* There were 37 households in the sample with unknown income

There were 4 households in the sample where the education level of the head of households was unknown

Table 7.5.1b. Distribution of households in Sarawak by expenditure group and household attributes.

Attributes	Expenditure group							
	0 payment		>RM0 – RM50		>RM50 – RM500		>RM500	
	n	%	n	%	n	%	n	%
Sarawak	101	19.3	203	38.8	184	35.2	35	6.7
Strata								
Urban	23	10.5	89	40.5	91	41.4	17	7.7
Rural	78	25.7	114	37.6	93	30.7	18	5.9
Ethnicity								
Malay	36	32.1	36	32.1	35	31.3	5	4.5
Chinese	15	10.0	42	28.0	70	46.7	23	15.3
Iban	34	19.8	85	49.4	51	29.7	2	1.2
O. indigenous group ¹	14	19.7	33	46.5	20	28.2	4	5.6
Others ²	2	11.1	7	38.9	8	44.4	1	5.5
Household income group *								
1st	25	33.3	32	42.7	14	18.7	4	5.3
2nd	27	27.6	46	46.9	25	25.5	0	0.0
3rd	22	20.0	51	46.4	27	24.5	10	9.1
4th	17	16.0	40	37.7	45	42.5	4	3.8
5th	10	7.9	30	23.6	70	55.1	17	13.4
Education level #								
None/ primary	68	24.5	124	44.8	75	27.1	10	3.6
Lower secondary	17	16.2	38	36.2	42	40.0	8	7.6
Upper secondary	14	12.0	34	29.1	56	47.9	13	11.1
Tertiary	1	4.5	6	27.3	11	50.0	4	18.2
Employment status								
Self-employed	29	19.0	67	43.8	48	31.4	9	5.9
Government	32	21.5	58	38.9	51	34.2	8	5.4
Private	21	14.2	56	37.8	60	40.5	11	7.4
Unemployed	19	26.0	22	30.1	25	34.2	7	9.6

¹ Includes Bidayu and Melanau² Includes Indians, Other Malaysians and Non-Malaysians

* There were 11 households with unknown income

There were 9 households where the education level of the head of household was unknown

7.6 Summary

In view of the purposive sample used in the survey, generalisation of the findings to the population in Sabah and Sarawak is limited.

The general impression is household purchase and expenditure pattern of health supplements in Sabah and Sarawak are similar to that in Peninsular Malaysia. The purchase of health supplements was wide spread and accounted for a substantial portion of the Total Household Expenditure on Health. Urban and better-off households were more likely to purchase health supplements. Nevertheless, the habit of purchasing health supplements was also quite common among the socially less advantaged communities such as low income households and households of unemployed person.

Issues raised in the report for Peninsular Malaysia apply for Sabah and Sarawak. Of concern are the rationale of the use of health supplements which was found to be widespread and in most instances purchases were unprescribed. Under normal circumstances, health supplements are unwarranted. The Ministry of Health's effort in pursuing a healthy diet habit in the community overwhelm this fact.

The dispensing and use of health supplements need proper regulatory and monitory measures. Health supplements should be sufficiently labelled to provide consumers information on the contents, benefits and risk associated with a product. This informed choices will lead to an unnecessary waste of monetary resources as well as avoiding potential health hazards.

DENTAL CARE

8

8.1 Introduction

This chapter reports on the findings of the National Household Health Expenditure Survey (1996) specifically pertaining to the utilisation of dental facilities and expenses households paid in utilising these facilities in the states of Sabah and Sarawak.

The methodology of the survey is similar to that in Peninsular Malaysia with the exception that purposive sampling technique was used for Sabah and Sarawak. This limits the generalisation of the data to the population in these two states. Details of the methodology employed has been reported in the Preliminary Report, National Household Health Expenditure Survey 1996 Volume II.

Utilisation was examined across six dimensions. The dimensions were:

1. Geographic location of households: urban/rural, states.
2. Socio-economic attributes of households: size, ethnicity, income.
3. Socio-economic attributes of heads of households: age, educational level, employment status.
4. Socio-economic attributes of household members: gender, age.
5. Outcome-related factors: type and level of treatment received, presence/absence of pain.
6. Source of care: public facilities/private facilities/school program/self-medication.

Household expenditure is an important consideration in the choice of alternative sources of care. Often it is a reason why individuals forgo the need for seeking recommended care. It also assumes a central role in policy change because this burden of cost is amenable to shifts from individuals to the community.

8.2 Reporting of episodes

Table 8.2.1 Rates of dental episodes reported in Sabah and Sarawak

	Episodes per thousand population	
	Sabah	Sarawak
Strata		
Urban	260	249
Rural	211	189
Total	234	211

A total of 706 households (with 4239 household members) were interviewed in Sabah. About 17.1% of the household members in 63.0% of households reported receiving dental care in the year surveyed. There were 992 dental episodes or 234 episodes per 1000 population (Table 8.2.1). The rate of dental episodes was greater in the urban areas. Among household members who reported dental episodes, 73.6% of household members had only single episodes and 19.1% had two episodes during the recall period of one year.

In Sarawak, 974 households with 5231 members were interviewed. About 16.0% of household members in 55.7% of households reported dental episodes. The rate of dental episodes was lower than Sabah at 211 episodes per 1000 population. However, more people in Sarawak had single dental episodes (78.2%) than in Sabah.

In both Sabah and Sarawak, the rate of dental episodes was higher in urban than in rural areas. Almost half the episodes in Sabah (48.3%) and in Sarawak (46.0%) received care from the school dental service. Self medication was uncommon in both states (1.0% in Sabah and 1.4% in Sarawak). These categories of dental episodes were not considered further in this report.

8.3 Utilisation of dental services

Utilisation of dental services was assessed by comparing the distribution of dental episodes by selected demographic and socio-economic attributes of households, heads of households and household members (Table 8.3.1a and 8.3.1b). Generally, in both Sabah and Sarawak the proportion of episodes at private facilities was higher than at public facilities. In Sabah, private facilities were utilised more often by the urban, Chinese and Malay households; households headed by persons with at least upper secondary education and adults aged 18-64 years.

In Sarawak an important difference was noted with respect to utilisation. Private facilities were utilised more by rural households. Besides Chinese households, private facilities were also more likely to be utilised by households of other indigenous group, households headed by persons with at least lower secondary education: male household members and those aged 13-64 years.

In Sabah and Sarawak, the common type of dental treatment reported included dental extractions, fillings and checkups (Table 8.3.2a and 8.3.2b). There were very few episodes of clinical preventive procedures, gum and orthodontic treatment. Complex procedures ('Other') such as root treatment, crowns and minor surgeries were also not common.

Scale and polish, dentures and fillings were commonly sought at private facilities. A relatively high proportion of extractions were sought at public facilities. This was observed in both Sabah and Sarawak.

Table 8.3.1a Distribution of episodes by demographic and socio-economic attributes of household, head of household and household member in Sabah.

Socio-economic attributes	Public facility		Private facility	
	n	%	n	%
Sabah	241	47.9	262	52.1
Geographical location				
Urban	121	37.9	198	62.1
Rural	120	65.2	64	34.8
Ethnicity¹				
Malay	31	39.2	48	60.8
Chinese	23	17.0	112	83.0
Kadazan	123	80.9	29	19.1
Other indigenous group ²	21	67.7	10	32.3
Others ³	42	41.7	60	58.3
Education level of head of household⁴				
None/primary	118	61.1	75	38.9
Lower Secondary	55	51.9	51	48.1
Upper Secondary	49	37.7	81	62.3
Tertiary	15	22.1	53	77.9
Gender of household member				
Men	103	47.7	113	52.3
Women	138	48.1	149	51.9
Age group of household member				
0-5	28	75.7	9	24.3
6-12	43	58.1	31	41.9
13-17	26	59.1	18	40.9
18-64	139	41.1	199	58.9
65+	5	50.0	5	50.0

¹ There were 4 Non-Malaysians

³ Includes 14 Indians and 88 'Other' Malaysians

² Includes 20 Bajaus and 11 Muruts

⁴ There were 6 with unknown education level

Table 8.3.1b Distribution of episodes by demographic and socio-economic attributes of household, head of household and household member in Sarawak.

Socio-economic attributes	Public facility		Private facility	
	n	%	n	%
Sarawak	255	43.8	327	56.2
Geographical location				
Urban	139	51.3	132	48.7
Rural	116	37.3	195	62.7
Ethnicity ¹				
Malay	64	57.7	47	42.3
Chinese	58	29.9	136	70.1
Iban	90	51.7	84	48.3
Other indigenous group ²	33	42.9	44	57.1
Others ³	7	30.4	16	69.6
Education level of head of household ⁴				
None/primary	141	49.1	146	50.9
Lower Secondary	53	41.4	75	58.6
Upper Secondary	54	40.6	79	59.4
Tertiary	4	14.3	24	85.7
Gender of household member				
Men	94	38.5	150	61.5
Women	161	47.6	177	52.4
Age group of household member				
0-5	10	52.6	9	47.4
6-12	19	52.8	17	47.2
13-17	11	45.8	13	54.2
18-64	206	42.5	279	57.5
65+	9	50.0	9	50.0

¹ There were 3 Non-Malaysians² Includes 23 Melanau and 54 Bidayus³ Includes 1 Indian and 22 'Other' Malaysians⁴ There were 6 with unknown education level

Table 8.3.2a Utilisation of dental facilities by type of treatment in Sabah

Type of treatment	Public facility		Private facility	
	n	%	n	%
Checkup	20	50.0	29	50.0
Preventive	0	00.0	2	100.0
Scale & Polish	9	29.0	22	71.0
Fillings	55	46.2	64	53.8
Gum treatment	4	66.7	2	33.3
Extraction	126	54.3	106	45.7
Orthodontic	6	75.0	2	25.0
Denture	12	30.0	28	70.0
Other	0	0	7	100.0

Table 8.3.2b Utilisation of dental facilities by type of treatment in Sarawak

Type of treatment	Public facility		Private facility	
	n	%	n	%
Checkup	39	60.0	26	40.0
Preventive	1	100.0	0	0.0
Scale & Polish	6	37.5	10	62.5
Fillings	43	36.1	76	63.9
Gum treatment	8	44.4	10	55.6
Extraction	138	49.1	143	50.9
Orthodontic	0	0.0	1	100.0
Denture	18	24.3	56	75.7
Other	2	28.6	5	71.4

In both Sabah and Sarawak there is little evidence to support the fact that the people chose public or private facilities when they encounter pain of dental origin (Table 8.3.3). Nevertheless, private facilities seemed to be the choice when faced with non-painful dental conditions. This refers in particular to Sabah where 60.2% of the non-painful episodes were attended to at private facilities compared to 43.4% of painful episodes.

Table 8.3.3 Utilisation of dental facilities by type of condition in Sabah and Sarawak

Type of condition	Public facilities		Private facilities	
	n	%	n	%
Sabah				
Non-painful	103	39.8	156	60.2
Painful	138	56.6	106	43.4
Sarawak				
Non-painful	151	43.6	195	56.4
Painful	104	44.1	132	55.9

Household expenditure for dental care

The small sample size does not permit the division of the dental episodes into subsidised and unsubsidised care. In the following description of expenditure, subsidised and non-subsidised episodes are therefore, considered together.

Subsidised episodes include care received at public facilities (excludes school health service), or at private facilities where part or all of the treatment cost was paid by the patient's or his/ her head of household's employer, insurance scheme or any other party. Unsubsidised care is then care received at a private facility, for which the cost was borne by the patient in full. In Sabah 56.3% of the episodes were subsidised care compared to 47.0% in Sarawak.

Household expenditure on dental care constituted just over 3.0% of total household expenditure on health in Sabah and Sarawak. Based on the sample, the expenditure per capita for dental care in the year surveyed was RM3.84 in Sabah and RM4.36 in Sarawak. These figures are much lower than that in Peninsular Malaysia which was reported to be RM6.64. The lower expenditure per capita is most likely attributed to a lower rate of utilisation (episodes per thousand population) of dental facilities. The rates of dental episodes reported per thousand population was 211 in Sarawak, 234 in Sabah and 269 in Peninsular Malaysia.

Among those who had sought care (excluding care received through school dental service and self-medication) the mean expenditure per episode was RM38.16 in Sarawak and RM31.70 in Sabah. These figures are comparable to that in Peninsular Malaysia (RM36.08).

On average, transport cost made up 7.0% (Sabah) and 6.7% (Sarawak) of total household expenditure on dental care. This proportion is more than four times that in Peninsular Malaysia (1.6%).

About 47.9% of the dental episodes in Sabah and 43.8% in Sarawak were care received at public facilities. However, only 11.7% and 8.7% of the total household dental expenditure in Sabah and Sarawak respectively, were expenditures at these dental facilities.

In examining further the amount of money households in Sabah and Sarawak paid for dental care, the same categories of expenditure used for Peninsular Malaysia is adopted to allow comparison to be made (Table 8.4.1a and 8.4.1b).

Table 8.4.1a Distribution of dental episodes by expenditure group and socio-economic attributes of households, head of households and household members in Sabah.

Attributes	Expenditure group							
	RM0		RM1-RM20		RM21-RM100		>RM100	
	n	%	n	%	n	%	n	%
Household								
Geographic location								
Urban	66	20.7	103	32.3	129	40.0	21	6.6
Rural	14	7.6	113	61.4	46	25.0	11	6.0
Ethnicity¹								
Malay	3	3.8	33	41.8	33	41.8	10	12.7
Chinese	32	23.7	31	23.0	63	46.7	9	6.7
Kadazan	29	19.1	99	65.1	17	11.2	7	4.6
Other indigenous group ²	2	6.5	18	58.1	11	35.5	0	0.0
Others ³	5	27.8	2	11.1	11	61.1	0	0.0
Head of households								
Employment status								
Self-employed	21	12.7	81	49.1	50	30.3	13	7.9
Government	31	23.5	50	37.9	44	33.3	7	5.3
Private	19	12.4	60	39.2	68	44.4	6	3.9
Unemployed	9	17.0	25	47.2	13	24.5	6	11.3
Household member								
Age								
0-5	7	18.9	27	73.0	3	8.1	0	0.0
6-12	21	28.4	32	43.2	21	28.4	0	0.0
13-17	12	27.3	15	34.1	16	36.4	1	2.3
18-64	39	11.5	138	40.8	133	39.3	28	8.3
65+	1	10.0	4	40.0	2	20.0	3	30.0
All households	80	15.9	216	42.9	175	34.8	32	6.4

¹ There were 4 Non-Malaysians

³ Includes 20 Bajaus and 11 Muruts

² Includes 14 Indians and 88 'Other' Malaysians

Most of the episodes cost between RM1-RM20 in both Sabah (42.9%) and Sarawak (39.2%) although quite a high proportion also paid between RM21-RM100 (Sabah 34.8% and Sarawak 35.4%). Among those who paid out-of-pocket for utilising dental facilities in Sabah, urban, Malay and Chinese households; and elderly persons aged more than 64 years paid more per episode of care. In Sarawak, rural and Chinese households; and elderly persons seemed to pay more for per episode of dental care.

The proportion of episodes that did not incur any payment was 15.9% in Sabah and 18.0% in Sarawak. In Sabah, such free episodes were more likely to be in the urban areas, involving households of Chinese and 'Other' ethnic group; households headed by government employees and schoolchildren (6-17 years old). Similarly in Sarawak, episodes that did not incur any cost were more likely to be in urban households and households of government employees. These pattern of expenditure is to be expected as most government employees would stay in urban areas and they have access to public facilities at no charge or at a nominal fee. Malay households and children aged below 13 years were also more likely to receive free dental care in Sarawak

Table 8.4.1b Distribution of dental episodes by expenditure group and socio-economic attributes of households, head of households and household members in Sarawak.

Attributes	Expenditure group							
	RM0		RM1-RM20		RM21-RM100		>RM100	
	n	%	n	%	n	%	n	%
Household								
Geographic location								
Urban	64	23.6	106	39.1	81	29.9	20	7.4
Rural	41	13.2	122	39.2	125	40.2	23	7.4
Ethnicity¹								
Malay	32	28.8	42	37.8	30	27.0	7	6.3
Chinese	20	10.3	73	37.6	81	41.8	20	10.3
Iban	35	20.1	74	42.5	55	31.6	10	5.7
Other indigenous group ²	15	19.5	31	40.3	27	35.1	4	5.2
Others ³	0	0.0	3	75.0	1	25.0	0	0.0
Head of households								
Employment status								
Self-employed	18	12.3	58	39.7	56	38.4	14	9.6
Government	49	31.8	43	27.9	54	35.1	8	5.2
Private	25	13.0	98	50.8	55	28.5	15	7.8
Unemployed	13	14.6	29	32.6	41	46.1	6	6.7
Household member								
Age								
0-5	9	47.4	4	21.1	6	31.6	0	0.0
6-12	19	52.8	12	33.3	5	13.9	0	0.0
13-17	2	8.3	18	75.0	3	12.5	1	4.2
18-64	73	15.1	189	39.0	182	37.5	41	8.5
65+	2	11.1	5	27.8	10	55.6	1	5.6
All households	105	18.0	228	39.2	206	35.4	43	7.4

¹ There were 3 Non-Malaysians

² Includes 23 Melanau and 54 Bidayus

³ Includes 1 Indian and 22 'Other' Malaysians

Table 8.4.2 Distribution of dental episodes by expenditure group and type of treatment in Sabah and Sarawak.

Type of treatment	Expenditure group							
	RM0		RM1-RM20		RM21-RM100		>RM100	
	n	%	n	%	n	%	n	%
Sabah								
Checkup	23	39.7	24	41.4	9	15.5	2	3.4
Preventive	0	0.0	0	0.0	1	50.0	1	50.0
Scale & Polish	7	22.6	12	38.7	11	35.5	1	3.2
Fillings	17	14.3	52	43.7	50	42.0	0	0.0
Gum treatment	4	66.7	2	33.3	0	0.0	0	0.0
Extraction	25	10.8	119	51.3	85	36.6	3	1.3
Orthodontic	1	12.5	2	25.0	5	62.5	0	0.0
Denture	3	7.5	5	12.5	11	27.5	21	52.5
Other	0	0.0	0	0.0	3	42.9	4	57.1
Sarawak								
Checkup	26	40.0	25	38.5	12	18.5	2	3.1
Preventive	0	0.0	1	100.0	0	0.0	0	0.0
Scale & Polish	4	25.0	4	25.0	8	50.0	0	0.0
Fillings	24	20.2	35	29.4	60	50.4	0	0.0
Gum treatment	5	27.8	5	27.8	4	22.2	4	22.2
Extraction	44	15.7	150	53.4	87	31.0	0	0.0
Orthodontic	0	0.0	0	0.0	0	0.0	1	100.0
Denture	0	0.0	8	10.8	35	47.3	31	41.9
Other	2	28.6	0	0.0	0	0.0	5	71.4

Among the common types of treatment reported, dentures were the most expensive procedure (Table 8.4.2). In Sabah, 52.5% and in Sarawak, 41.9% of the 'denture' episodes cost more than RM100 per episode. Since the management of patients for dentures requires more than one episode hence, the payment is relatively much higher than other types of treatment.

In Sabah and Sarawak there was no expenditure involved in about 40% of the 'checkup' episodes and about a quarter of 'scale and polish' episodes. It is most likely that these episodes were in public facilities. It is important to note that these episodes constitutes preventive care.

Table 8.4.3 Distribution of dental episodes by expenditure group and type of condition in Sabah and Sarawak

Type of condition	Expenditure group							
	RM0		RM1-RM20		RM21-RM100		>RM100	
	n	%	n	%	n	%	n	%
Sabah								
Non-painful	52	20.1	93	35.9	85	32.8	29	11.2
Painful	28	11.5	123	50.4	90	36.9	3	1.2
Sarawak								
Non-painful	80	23.1	97	28.0	140	40.5	29	8.4
Painful	25	10.6	131	55.5	66	28.0	14	5.9

The findings on Table 8.4.3 suggests that when people are in pain, the choice of treatment is limited. About half of the painful episodes cost between RM1-RM20. When it concerns their teeth, it is not surprising that people would want an immediate relieve which is often dental extraction or simple fillings. Such treatment are charged RM1 in the public facilities although the fees are waived for children, government employees and their families and the very poor. The current recommended scale of fees for dental extractions and simple fillings in the private facilities is between RM20 - RM40 (Malaysian Dental Association, 1992) although the charges are usually lower.

8.5 Summary

This part of the report documents the utilisation and household expenditure pattern of dental facilities among a convenient sample of households in Sabah and Sarawak. There were no assessment of needs either clinically diagnosed or perceived by the person. For those who may be in need of treatment (such as those with missing teeth) but who did not seek care; no information was solicited. Any estimates and implications drawn are limited by the purposive sample used.

The school dental service plays a very important role in the oral health care of schoolchildren in Sabah and Sarawak. Almost half of the reported episodes were care received through this service. This outreach service must continue to cater to the needs of the young population especially where a good proportion of the population are not accessible to health facilities. However, such programs are very resource intensive. Hence, it is imperative that the strategies employed and the financing mechanism of the program are health promotive, cost-benefit and simultaneously do not present a burden to the consumers and providers. As in the case in Peninsular Malaysia, corporatisation of the service is a possible alternative to consider to increase efficiency whilst keeping within the health policies set by the Ministry of Health. In such an instance the Ministry of Education assumes the role of purchaser where it either wholly pay for the services or impose a nominal household contribution in a cost-sharing exercise. Cost-sharing would encourage community participation and sharing of responsibilities for health. A School Health Fund could be set up incorporating dental care.

Besides the school population, the utilisation pattern of public and private dental facilities is similar to that seen in Peninsular Malaysia. A prominent difference in the observation is the higher proportion of episodes utilising private facilities among rural households in Sarawak compared to urban households. There is no obvious explanation for this unexpected difference observed in Sarawak. However, it is possible that those who were more likely to utilise private dental facilities in Sarawak were employees of logging companies located in the hinterland of Sarawak. The long waiting time at the public facilities is a likely barrier to seeking dental care at such facilities for them (especially if they were daily paid workers). They could also have access to employee's dental health benefits at private facilities.

Households paid more for transport in Sabah and Sarawak when seeking dental care compared to Peninsular Malaysia. Due to the sparse and often difficult terrain patients often have to travel far in varied mode of transport in accessing dental facilities in these two states. In particular, riverine transport is common and may cost a substantial sum especially for those living in the hinterland. This can be further substantiated by the fact that very low proportion of rural households reported no household expenditure involved when seeking care in Sabah (7.6%) and Sarawak (13.2%). It implies that even if these households did not pay for treatment, they had to pay to travel by public transport to the dental facilities.

A small proportion of the dental episodes was wholly subsidised and did not involve any household expenditure. Of concern are those who could participate in cost-sharing but are not making any contribution. This include households of government and private employees as well as those self-employed.

On the other end of the expenditure spectrum, the elderly had to pay the most and it is more likely for dentures. This reflects insufficient dental health protection for the elderly.

In considering any health reform for the states of Sabah and Sarawak the following findings must be considered. The household expenditure per episodes of dental care sought in Sabah and Sarawak are comparable to Peninsular Malaysia. Besides the school dental service, a substantial proportion of episodes did not incur any expenditure or incurred a nominal payment. The government remains the main provider of subsidised dental care and when the outreach school service is considered, the resource implication is enormous. There is insufficient protection for the elderly in seeking dental care. Above these findings, it needs to be emphasised that the sparseness and difficult terrain are barriers to both the consumers and the providers of health care and remain a challenge in drawing up a socially justified National Financing Scheme.

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OTHER HEALTH NEEDS

9

Introduction

This chapter gives a brief report on the utilisation of health services and household expenditure resulting from “other health needs” not mentioned in the previous chapters. The household members were asked whether they had sought care for any health condition or health need listed below which did not require hospitalisation in the last one year prior to the interview.

- Eye care for visual acuity.
- Treatment for chronic or long standing illness (diabetes, high blood pressure, mental illness, cancer etc).
- Routine or annual Medical checkups for specific reasons(job, insurance, education, religious purpose).
- Immunisation
- Other miscellaneous health needs (day care surgery, rehabilitation therapy, institutionalised care etc).

As generalisation of the findings cannot be made to the population of Sabah and Sarawak, only the general distribution of the episodes among the providers and their average expenditures within the study population is highlighted.

Findings

With the exception of "other miscellaneous health needs", more than a quarter of the households sampled had used health services and had incurred expenditures due to various health needs covered in this chapter. However, in terms of the proportion of persons in the households, less than 10% of the total individuals had used and incurred expenditures on these services, with the users of immunisation services having the highest proportion (9.7% in Sabah and 7.1% in Sarawak). 7.2% of the individuals in the study sample in Sarawak reported utilisation of services and expenditure due to chronic long standing illnesses (Table 9.1 and 9.2).

Table 9.1 Proportion of households with Episodes of Care for Various Health Needs, Sabah and Sarawak.

Health need	Sabah		Sarawak	
	No.	%	No.	%
Eye care	215	30.5	276	28.3
Treatment for long standing illness	183	25.9	305	31.3
Medical checkups	199	28.2	223	22.9
Immunization	281	39.8	307	31.5
Other miscellaneous health needs	34	4.8	66	6.8
Total number of households	706	100.0	974	100.0

Table 9.2 Proportion of Persons with Episodes of Care for Various Health Needs, Sabah and Sarawak.

Health need	Sabah		Sarawak	
	No.	%	No.	%
Eye care	265	6.3	331	6.3
Treatment for long standing illness	205	4.8	375	7.2
Medical checkups	296	7.0	291	5.6
Immunization	411	9.7	369	7.1
Other miscellaneous health needs	36	0.8	73	1.4
Total number of Persons	4,239	100.0	5,231	100.0

As a percentage of the total household health expenditure, only long standing illness and eye care gave a substantial contribution to the total. In Sabah, 14.3% and 6.8% of total household health expenditure were attributed to long standing illness and eye care respectively. In Sarawak, the proportions were 6.3% and 4.8% respectively (Table 9.3)

Table 9.3 Proportion of "Other Health Expenditure", Sabah and Sarawak.

Health need	Sabah		Sarawak	
	RM	%	RM	%
Eye care	33,307	6.8	35,350	4.8
Treatment for long standing illness	69,739	14.3	47,057	6.3
Medical checkups	14,311	2.9	16,222	2.2
Immunization	1,513	0.3	3,442	0.5
Other miscellaneous health needs	4,227	0.9	6,313	0.9
Total Household health expenditure	486,894	100.0	742,056	100.0

Expenditures for medical check-up, immunisation and other miscellaneous health needs were represented as a very minor contribution to the total household health expenditures of the households interviewed in our sample.

For the users of the eye care services, the two main providers were the private and the public providers. In Sabah 72.5% of the eye care utilisation were with the private providers and in Sarawak it was 70.1% (Table 9.4). The per episode expenditure of the eye care was quite high, the mean and median expenditure were RM 101.90 and RM60.00 for Sabah and RM 92.10 and RM70.00 for Sarawak (Table 9.5).

Table 9.4 Distribution of episodes by health need and source of care, Sabah and Sarawak.

Health need/ source of care	Home		Public		Private		Trad.		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sabah										
Eye care	15	4.6	75	22.9	237	72.5	-	-	327	100.0
Treatment for long standing illness	-	-	151	66.2	76	33.3	1	0.4	228	100.0
Medical checkups	-	-	193	64.1	108	35.9	-	-	301	100.0
Immunization	-	-	420	89.6	49	10.4	-	-	469	100.0
Other miscellaneous health needs	-	-	17	44.7	19	50.0	2	5.3	38	100.0
Sarawak										
Eye care	26	6.8	89	23.2	269	70.1	-	-	384	100.0
Treatment for long standing illness	-	-	288	72.2	111	27.8	-	-	399	100.0
Medical checkups	-	-	215	73.1	79	26.9	-	-	294	100.0
Immunization	-	-	387	88.8	49	11.2	-	-	436	100.0
Other miscellaneous health needs	-	-	51	68.9	14	18.9	9	12.2	74	100.0

For the treatment of the long standing illnesses the main choice of care for the users was the public facilities; 66.2% in Sabah and 72.2% in Sarawak were treated at public facilities. This was reflected in the comparatively low median expenditures of RM 13.10 for Sabah and RM 6.00 for Sarawak. There was substantial usage of the private providers, 33.3% in Sabah and 27.8% in Sarawak. This influenced the mean per episode expenditures figures to a relatively high level of RM 305.90 in Sabah and RM 117.90 in Sarawak (Table 9.5).

Table 9.5 Distribution of episodes and Mean and Median per episode expenditure for 'Other' Health Expenditure, Sabah and Sarawak.

Health need	Sabah			Sarawak		
	No. of episodes	Mean RM	Median RM	No. of episodes	Mean RM	Median RM
Eye care	327	101.90	60.00	384	92.10	70.00
Treatment for long standing illness	228	305.90	13.10	399	117.90	6.00
Medical checkups	301	47.60	0.80	294	55.20	1.00
Immunization	469	3.20	-	436	7.90	-
Other miscellaneous health needs	38	111.20	23.70	74	85.30	7.30

For the people who had medical check-ups in the last one year, the patterns in both the Sabah and Sarawak were the same as treatment for long standing illnesses. 64.1% of the episodes in Sabah and 73.1% in Sarawak were carried out by the public providers where per episode median expenditures was nominal (RM 0.80 for Sabah and RM 1.00 for Sarawak). A substantial proportion were carried out by the private providers (35.9% in Sabah and 26.9% in Sarawak). This again resulted in a much higher per episode mean expenditures for the medical check-ups with RM 47.60 for Sabah and RM 55.20 for Sarawak.

As immunisation is free of charge in the public health services, a large proportion of the users in the study population in Sabah (89.6%) and Sarawak (88.8%) used public providers. A small proportion of about 10 to 11% of the users used the private providers and paid for the service.

Table 9.6 showed that the per person expenditures figures were a bit higher than the per episode expenditures for the respective categories because of the possibility of a person having more than one episode of utilisation for the specific health needs (Table 9.6).

Table 9.6 Mean and Median Expenditure Per Person with Episode of Care for 'Other' Health Needs, Sabah and Sarawak.

Health need	Sabah		Sarawak	
	Mean	Median	Mean	Median
Eye care	125.70	100.00	106.80	80.00
Treatment for long standing illness	340.20	16.00	125.50	7.00
Medical checkup	48.40	0.80	55.80	1.00
Immunization	3.70	-	9.30	-
Other miscellaneous health needs	117.40	23.70	86.50	8.00

Summary

Household expenditure on long standing illness and eye care constituted a substantial proportion of the total household health expenditure in the study sample of Sabah and Sarawak. Expenditure on medical check-up, immunisation and other miscellaneous health needs represented only a very small proportion of the total out-of-pocket health expenditure. With the exception of eye care, public facilities were still the major source of care in Sabah and Sarawak for most of the health needs covered in this chapter. Expenditure at public facilities especially for immunisation involved either zero expenditure (as in the case of immunisation) or very little out-of-pocket expenditure. The substantial usage of the private providers for long standing illness resulted in its high mean expenditure.

SUMMARY AND CONCLUSIONS

10

- 10.1** Mean household health expenditure per person per year for the study population in Sabah and Sarawak was about RM115.00 and RM142.00 respectively.

About 77% of these was for curative care, mainly for acute ambulatory conditions (more than 50%).

In both states, higher expenditure was reported among urban dwellers, single-member and smaller households, higher income households and where heads of households were tertiary educated. Chinese and Malays in both states, the Muruts in Sabah, the Melanau and the Iban in Sarawak also reported higher expenditure than the other ethnic groups.

- 10.2** Public facilities were the main source of care except for eye care and purchase of health supplements. About 82% of households and 38% of persons in the study sample utilised government facilities.

The poor, less educated and government employees utilised public facilities more than others.

- 10.3** Private facilities were utilised by about 55% of households and 17% of persons. They are more frequently utilised by urban dwellers, Chinese, better educated and higher income groups except for dental care and hospitalisation which had a high proportion of private care in the rural areas in Sarawak.

- 10.4** Self medication at home, purchase of over counter medicine at shops or pharmacies were common sources of care for acute conditions.

- 10.5** Traditional care was utilised in less than 3% of all types of health needs except for Sabah which reported a high proportion (25.2%) of maternity care by traditional practitioners.

- 10.6** About 80% of the total household health expenditure was spent at *private* facilities when only 17% of household members received private care.
- 10.7** The vast difference in treatment expenditure between public and private care probably resulted in the high proportions of hospitalisation and maternity care in public facilities in both states
- 10.8** About 15% to 60% of episodes of care for various health needs were fully subsidised by the government. Employers subsidised or paid for less than 12% of the episodes.
- 10.9** Better educated and higher income groups spent more on health but they were also more likely to receive free treatments, even at *public* facilities. Rural dwellers, the less educated, the poor and the elderly were less likely to received subsidised care at *private* facilities.

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ANNEX A

NATIONAL HOUSEHOLD HEALTH EXPENDITURE SURVEY 1996 (NHHES'96)

PENINSULAR MALAYSIA

Acute Ambulatory Care

Report of Findings

**NHHES'96 TEAM
DEPARTMENT OF SOCIAL AND PREVENTIVE MEDICINE
FACULTY OF MEDICINE, UNIVERSITY OF MALAYA**

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NHHES'96 Research Team.

INTRODUCTION

1

This report contains information on a *two-week* household expenditure for any illness condition that households *sought care or treatment for* but did not involve admission to the hospital. For practical considerations, a two-week recall period was used. The survey inquired about different medical conditions that household members might have suffered from in the two-week prior to the interview.

The data forms part of a larger data set collected under the National Household Expenditure Survey 1996.

In line with the national survey, the aim of this report is to provide baseline information on household expenditure for acute conditions and on some aspects of the utilisation of out-patient services in Malaysia. Demographic, social, economic and health factors that were hypothesised to be associated with the utilisation of health services and its expenditure, were investigated.

Specifically, this report addresses the following questions:

1. Where did individuals seek treatment for acute ambulatory conditions?
2. What factors were associated with the choice of source of care?
3. How much did households spend when seeking care for such conditions?
4. What factors were associated with household expenditure for acute ambulatory care?

It is also hoped that this report will provide baseline data necessary to gauge the current state of utilisation of both the public and private facilities for health needs that did not result in admission to hospitals in P. Malaysia. Coupled with other studies and data, the report on household expenditures on acute ambulatory care may shed some light of the state of expenditure that is spent by on the population on the increasingly popular private sector. This might help policy makers and the monitoring agencies in auditing the prices that currently prevail in the health sector market.

As the data for P. Malaysia is population based and cross-sectional, it is hoped that in the future, time-series expenditure patterns can be collected to allow for more complex modelling and evaluation. It is also hoped that together with other studies, it will be a valuable resource for policy makers in the construction of evidence-based policies in the future.

METHODS

2

2.1 Introduction

The National Household Health Expenditure Survey (NHHES'96) covered the whole of Malaysia. However, only the population residing in non-institutional living quarters (private living quarters) were canvassed. Details of the method utilised in the Survey are given in the General Report.

2.2 Survey instrument

In principle, the instrument designed to collect information on acute ambulatory conditions was similar to the that used for other sectors of health. Form 3 of the survey instrument was used to collect the information on acute conditions (Appendix 1).

2.3 Methodology

In this survey, respondents were asked if anyone in the household had any condition that led him or her to seek treatment or medication but did not involve admission to the hospital in the last two weeks prior to the interview. Any 'unwellness' in which no treatment or medication was sought was excluded from the study. To facilitate recall, the health needs were classified into ten broad categories (Appendix 1). All these health needs were defined as acute conditions.

Household members could seek treatment or care for an acute condition from one or more sources of care (self medication at home, shops or pharmacies, traditional, public or private facilities). Details of source of care utilised as well as expenditure incurred for an acute condition were obtained from the respondents. For each episode of care the number of visits to a specific health care facility was recorded. A household member can have one or more episodes of "care for an acute condition" (hereafter referred to as *acute care*). For example, if a household sought care from a traditional facility once and subsequently a private clinic twice for the same acute condition, then he is considered to have had two episodes of *acute care* consisting of three visits.

The times spent travelling to and from a health facility and the time spent waiting at the facility for acute care were recorded to determine the accessibility and the hidden cost of 'time' which might influence the choice of care.

The following components of expenditure on acute conditions were recorded: *Treatment expenditure* which included costs of registration, consultation and medicine. *Travelling expenditure* was also recorded but only purchased transport charges were included. Indirect cost such as loss of wages of household members as a consequence of suffering from the acute condition was recorded under *Other expenditures*. The sources of financing and subsidy on the expenditure were also inquired.

UTILISATION OF SERVICES

3

3.1 Introduction

This chapter summarises the survey findings about the factors that might influence the choice of services for acute conditions. The utilisation pattern with respect to socio-demographic characteristics were highlighted. To avoid a clutter of digits, and to better reflect the uncertainty about each estimate, all estimates of numbers of episodes are rounded off to the nearest thousand and the mean expenditure has been rounded off to the nearest Ringgit Malaysia (RM).

3.2 Households Reporting of Acute Conditions

The study population consisted of 14,511,000 persons in 2,952,000 households. 16.7% of household members from 1.5 million (52.3%) households reported at least one episode of *acute care* in the two-week recall period. An estimated of 2.98 million episodes of acute care were reported throughout P. Malaysia. Common cold accounted for 55.4% of the total episodes. Other conditions that were more commonly reported were 'other painful condition' (13.8%), skin problem (7.5%) and gastrointestinal problem (7.3%). (Table 3.2.1)

Table 3.2.1 Number and Percentage of Episodes of Acute Care and Persons by Types of Acute Conditions, P. Malaysia.

Types of Acute Conditions	Episodes		Persons	
	Number	%	Number	%
Minor accidents	126,000	4.2	114,000	4.3
Common cold*	1,651,000	55.4	1,503,000	56.3
Gastro-intestinal problems**	217,000	7.3	190,000	7.1
Asthma	115,000	3.9	101,000	3.8
Skin problem	223,000	7.5	210,000	7.9
Acute ear problem	37,000	1.2	34,000	1.3
Acute eye problem	74,000	2.5	64,000	2.4
Mental stress	12,000	0.4	11,000	0.4
Other painful conditions***	410,000	13.8	355,000	13.3
Other health problems	113,000	3.8	88,000	3.3
Total	2,978,000	100.0	2,670,000	100.0

* Include fever, cough, flu, running nose, sore throat and headache

** Include diarrhoea, vomiting worm infestation and abdominal pain

*** Include backache, joint pain etc.

3.3 Demographic characteristics of Persons Reporting Acute Conditions.

In this section, we describe the episodes of acute care and their distribution with respect to various demographic variables.

Of the 2.98 million episodes of acute care, 52.7% occurred in the urban areas but the rate per 1000 persons was higher in the rural areas, 218.8 per 1000 compared to 194.4 per 1000 in the urban areas (Table 3.3.1).

Kelantan has the highest rate (260.2 per 1000) followed by Johor (248.8 per 1000). The lowest rate of acute care were in Selangor and Melaka ((154.9 and 152.7 per 1000 respectively).

Table 3.3.1 Number and Percentage of Episodes and Persons, and Rate of Acute Care by Strata and States.

	Episodes		Persons		Population at risk	Episodes/1,000 population
	Number	%	Number	%		
Strata						
Urban	1,569,000	52.7	1,304,000	53.7	8,071,000	194.4
Rural	1,409,000	47.3	1,126,000	46.3	6,440,000	218.8
State						
Johor	521,000	17.5	421,000	17.3	2,099,000	248.4
Kedah	318,000	10.7	255,000	10.5	1,454,000	218.7
Kelantan	306,000	10.3	245,000	10.1	1,176,000	260.2
Melaka	87,000	2.9	77,000	3.2	572,000	152.7
N.Sembilan	144,000	4.8	118,000	4.8	708,000	203.6
Pahang	220,000	7.4	176,000	7.3	999,000	220.4
P.Pinang	222,000	7.5	178,000	7.4	1,020,000	217.6
Perak	319,000	10.7	261,000	10.8	1,707,000	187.1
Perlis	42,000	1.4	35,000	1.4	187,000	227.0
Selangor	409,000	13.7	348,000	4.3	2,636,000	154.9
Terengganu	183,000	6.1	137,000	5.6	804,000	227.4
W.P.K.L	207,000	7.0	177,000	7.3	1,148,000	180.2
P.Malaysia	2,978,000	100.0	2,429,000	100.0	14,511,000	205.2

Table 3.3.2 shows that the socially disadvantaged groups had higher rates of reporting acute conditions. The older and younger age-groups, females, Malays and households headed by lower educated, lower income and self-employed persons had higher rates of acute care.

Table 3.3.2 Number and Percentage of Episodes and Persons, and Rate of Acute Care by Household Characteristics .

Household Characteristics	Episodes Number	%	Persons Number	%	Population At Risk	Episodes/1,000 population
Age group*						
0-14	1,141,000	38.3	983,000	40.5	5,067,000	225.1
15-29	501,000	16.8	430,000	17.7	3,763,000	133.2
30-54	858,000	28.8	667,000	27.4	4,200,000	204.3
55 & above	478,000	16.1	351,000	14.4	1,481,000	323.1
Gender *						
Male	1,340,000	47.0	1,147,000	47.2	7,327,000	191.0
Female	1,578,000	53.0	1,283,000	52.8	7,184,000	219.8
Ethnicity						
Malay	2,034,000	68.3	1,648,000	67.8	9,091,000	223.7
Chinese	616,000	20.7	502,000	20.7	3,735,000	164.9
Indian	275,000	9.3	232,000	9.6	1,377,000	200.1
Educational Level						
None	1,070,000	35.9	875,000	36.0	3,343,000	320.0
Primary	911,000	30.6	732,000	30.2	4,674,000	194.9
Lower secondary	413,000	13.9	341,000	14.0	2,820,000	146.6
Upper secondary	481,000	16.2	394,000	16.2	2,973,000	161.8
Tertiary	96,000	3.2	83,000	3.4	627,000	153.1
Income Quintile Group						
1 st 20 %	574,000	19.3	445,000	18.3	2,320,000	247.3
2 nd 20 %	576,000	19.3	460,000	18.9	2,812,000	204.7
3 rd 20 %	594,000	20.0	496,000	20.4	2,967,000	200.2
4 th 20 %	609,000	20.0	507,000	20.9	2,971,000	205.1
5 th 20 %	591,000	19.8	492,000	20.2	3,179,000	185.8
Employment Status						
Self employed	366,000	13.0	270,000	11.1	1,479,000	247.4
Government	142,000	4.8	114,000	4.7	721,000	197.3
Private	509,000	17.1	414,000	17.1	2,996,000	169.9
Unemployed	1,961,000	65.9	1,600,000	67.1	9,315,000	210.6
Total	2,978,000	100.0	2,429,000	100.0	14,511,000	205.2

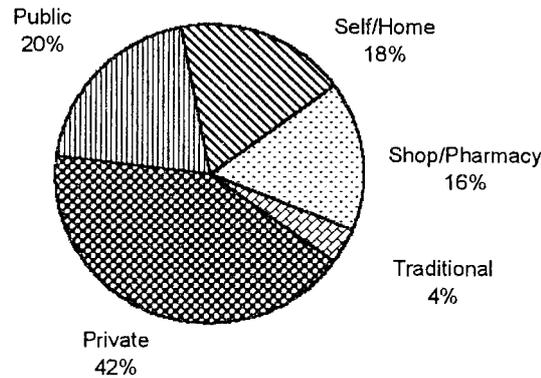
* Characteristic of household members

3.4 Source of Care for Acute Conditions

This section details the utilisation of health care facilities for acute conditions. Household members could seek care for acute conditions at home, shops or pharmacies, traditional facilities, public or private facilities.

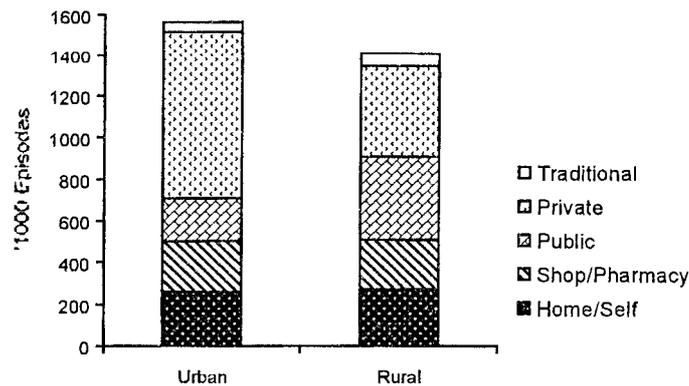
Of the 2.9 million episodes of acute care, 41.9% were cared for at private facilities, 20.1% at public facilities, 17.9% were self medication at home, 16.2% at shops or pharmacies, and 3.9% were at traditional facilities (Fig. 3.4.1).

Fig.3.4.1 Percentage of Acute Conditions by Sources of Care.



Private facilities were the *most frequently* utilised facility for acute conditions in the rural as well as urban areas with a higher proportion in urban areas. 51.5% of the episodes in urban were cared for at private facilities compared to 31.2% in rural areas. Conversely 28% of episodes in rural areas were treated at public facilities compared to 13.0% in the urban areas. There was also a slightly higher proportion of self medication in rural areas (19.4% vs 16.5%). The proportions of episodes that were cared for at shops or pharmacies, and at traditional facilities were about the same in both strata.

Fig. 3.4.2 Acute Conditions by Sources of Care and Strata.



Private facilities were the most frequently sought for facility for acute care in all states except in Kelantan, Pahang and Terengganu. Selangor, W.P.KL. and P. Pinang had the highest proportions of episodes treated at private facilities (61.4%, 53.6% and 52.9%). Kelantan, Pahang and Trengganu had the lowest proportions treated at private facilities (19.9% to 28.3%) (Fig.3.4.3).

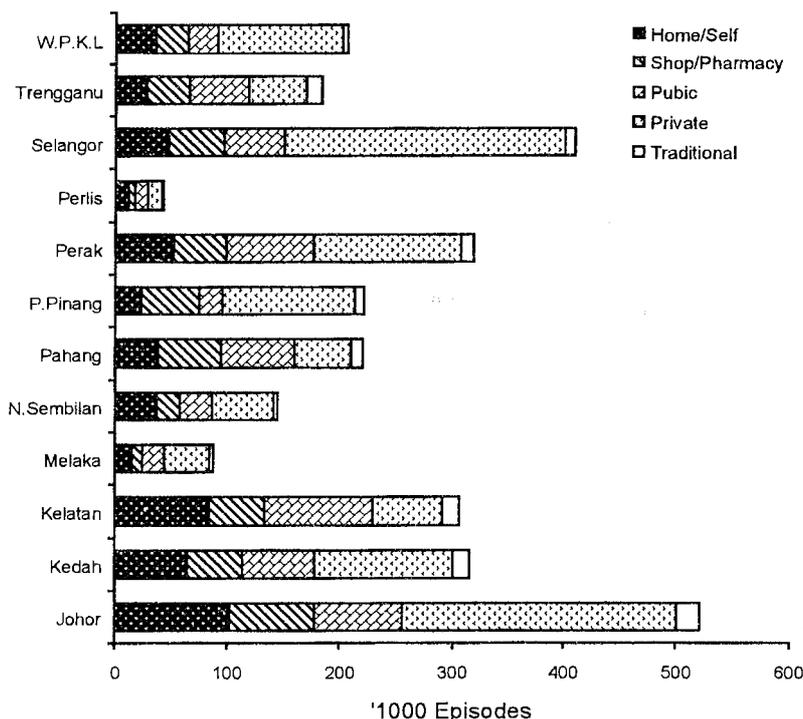
Public facilities were the most frequently utilised facility for acute care in Kelantan, Pahang and Terengganu. About 30% of the episodes at these states were cared for at public facilities. Public facilities were least utilised in Selangor, W.P. K.L and P. Pinang, only 9.4% to 13.1% of their episodes were cared for in public facilities.

Terengganu and Kedah utilised traditional facilities for acute conditions more than the other states, 5 to 7% of their episodes were cared for at traditional facilities.

Kelantan had a higher proportion (27.4%) of episodes that were treated at home while P. Pinang and Selangor had the lowest proportion of self medication at home (10.5% and 11.9% respectively).

Pahang utilised shops or pharmacies more (26.1%), compared to the other states. Shops and pharmacies were least utilised in Malaka (10.5%).

Fig. 3.4.3 Acute Conditions by Sources of Care and States.



Private facilities were the most frequently utilised facility for acute conditions regardless of ethnicity, age-groups, household size or household type, educational level and employment status of heads of households. It was also the most frequent source of care for all income groups except for the lowest quintile group which utilised more of public facilities. As household income and the educational level of heads of household increased, the utilisation of private facilities also increased.

The Chinese, higher household income groups, young working adults, those with tertiary education and private employees were least likely to use public facilities.

Self medication was more common among single-member households, lower household income groups, the less educated and where heads of households were self-employed.

Utilisation of traditional facilities was least common among Indians and households headed by those who were tertiary educated (Fig. 3.4.4 to Fig. 3.4.8).

Fig. 3.4.4 Acute Conditions by Sources of Care and Ethnicity.

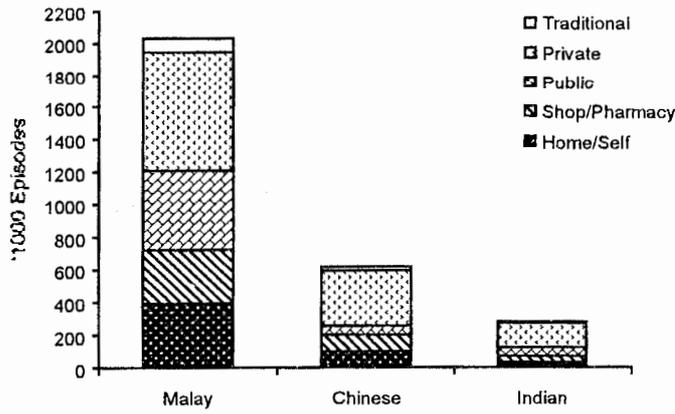


Fig. 3.4.5 Acute Conditions by Sources of Care and Age of Head of Household.

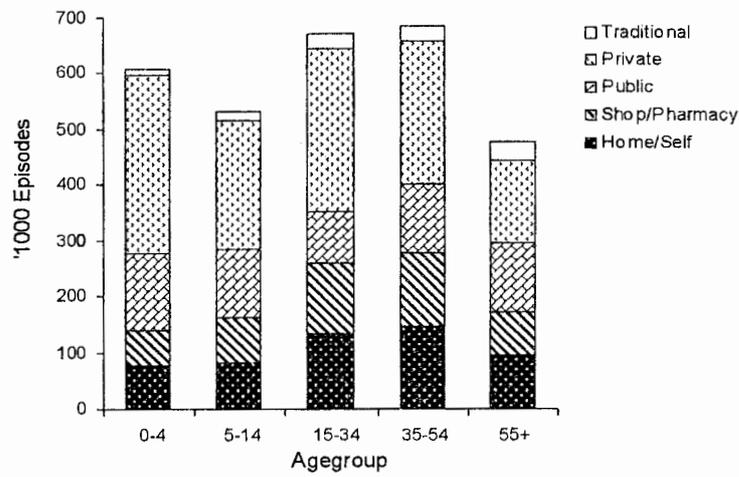


Fig. 3.5.6 Acute Conditions by Sources Care and Household Income.

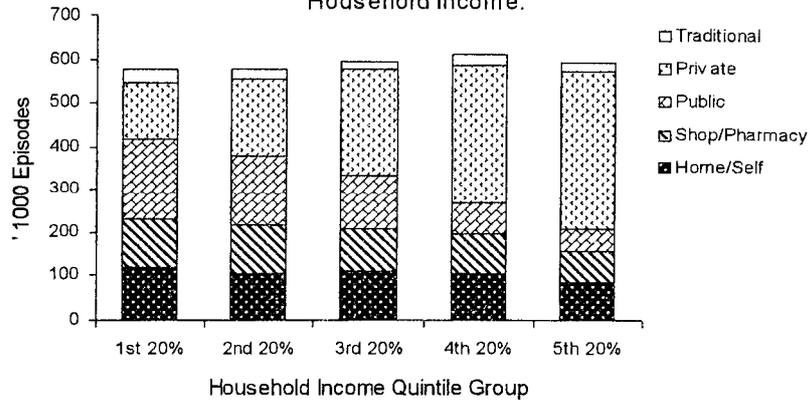


Fig. 3.4.7 Acute Conditions by Sources of Care and Education of Head of Household.

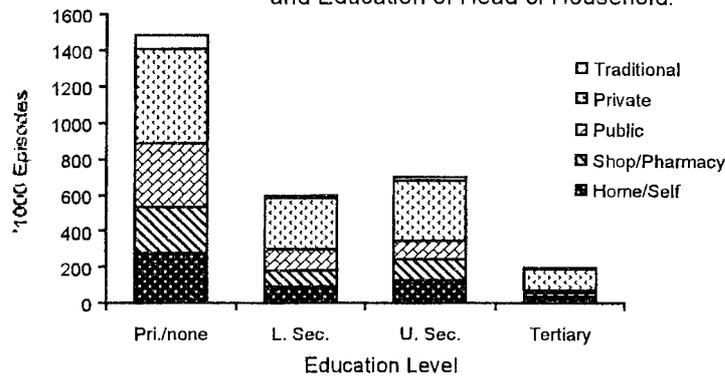


Fig. 3.4.8 Acute Conditions by Sources of Care and Employment Status of Head of Household.

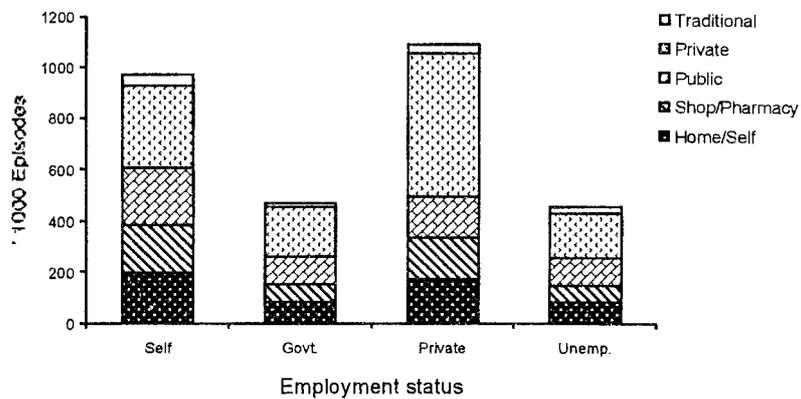


Table 3.4.1 shows the sources of care by type of acute conditions. Private facilities were the main source of care for all acute conditions except for minor accidents and asthma in children aged 0-14; eye problems and mental stress in adult aged 15 and above, and other painful conditions in both children and adults.

Public facilities were the main source of care for asthma in children and eye problems in adults.

A high proportion of minor accidents, mental stress other painful conditions were treated at home.

Traditional facilities were the least frequently utilised source of care for acute conditions. Only 3.9% of the episodes were cared for at traditional facilities. They were mostly utilised for mental stress, other painful conditions and 'other health problems'.

Table 3.4.1 Percentage of Acute Conditions by Source of Care.

Sources of Care/ Type of Health need	Home	Shop/ Pharmacy	Public	Private	Traditional	All Source
Minor accidents	29.3	13.5	18.0	33.9	5.2	126,000
Common cold*	13.8	17.2	19.8	47.9	1.3	1,651,000
GI problems**	19.5	15.2	18.3	44.6	2.5	217,000
Asthma	11.8	7.1	37.9	40.3	2.9	115,000
Skin problem	16.0	20.7	20.2	37.7	5.3	223,000
Acute ear problem	12.5	3.4	28.8	51.5	3.8	37,000
Acute eye problem	21.8	16.4	31.1	27.5	3.1	74,000
Mental stress	33.6	16.4	29.6	8.3	12.1	12,000
Other painful conditions***	33.6	16.0	15.1	22.4	13.0	410,000
Other health problems	11.1	12.8	18.3	49.0	8.8	113,000
Total	17.9	16.2	20.1	41.9	3.9	2,978,000

* Include fever, cough, flu, running nose, sore throat and headache

** Include diarrhoea, vomiting worm infestation and abdominal pain

*** Include backache, joint pain etc.

3.5 Travelling and Waiting Time

The location of the sources of care was also inquired from the respondents. Ninety-five percent of the facilities sought for acute conditions were within the same district of the householders' dwellings. Table 3.5.1 shows the travelling time to and from the sources of care and time waiting at the facilities while seeking care. The total time spent was the most at the public facilities (72 minutes) while that at the shops or pharmacies was the least (24 minutes).

The difference in waiting time alone was even greater, an average of 5 minutes waiting time at the shops or pharmacies compared to 41 minutes at public facilities (Table 3.5.1).

Table 3.5.1 Mean Travelling and Mean Waiting Time While Seeking Care for Acute Conditions.

Source of Care	Mean Travelling Time (Min)	Mean Waiting Time (Min)	Mean Total Time (Min)
Shop/Pharmacy	18	5	24
Public Facilities	30	41	72
Private Facilities	28	24	52
Traditional facilities	40	13	53
All Sources	27	25	52

3.6 Summary

Private facilities were the main source of care for acute conditions (41.9% of the episodes). They were the most frequently utilised facilities in the urban as well as in the rural areas and in all states except in Kelantan, Pahang and Terengganu. They were most frequently utilised regardless of ethnicity, age-groups, household size and household type and regardless of educational level and employment status. The extent of utilisation of private facilities is influenced by better education and increase in household income. Increase in educational level and household income is associated with higher utilisation of private services.

Public facilities were not as frequently utilised for acute conditions as one perceived. Only 20.1% of the episodes were cared for at public facilities. They were the most frequently utilised facility in Kelantan, Pahang and Terengganu; the second most frequently utilised facility among Malays and Indians; children aged 0-14 and adults aged 55 and above. Households in the top household income quintile group, and where heads of households were tertiary educated and privately employed had very low proportions of episodes cared for at public facilities.

Home or self medication was utilised in 17.9% of the total episodes of acute care whereas shops and pharmacies were utilised in 16.2% of the total episodes. If all these sources were considered as off or over the counter treatment, then they made up of 34.1% of care. They were common among lower income quintile groups and those aged 15-54.

Traditional facilities were the least frequently utilised source of care for acute conditions. Only 3.9% of the episodes were cared for at traditional facilities.

HOUSEHOLD EXPENDITURE

4.1 Introduction

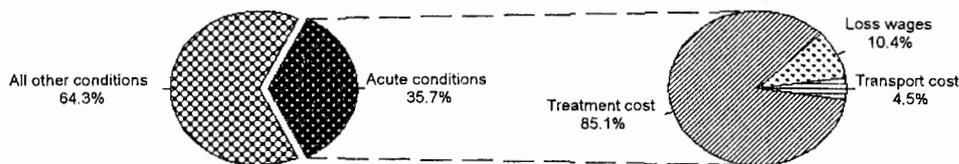
This section summarises household expenditure for acute conditions, that is, the total expenses paid by households for acute conditions. It included cost of treatment, cost of purchased transport to and from the sources of care and loss of wages suffered by household members as a result of acute conditions.

4.2 Percentage of Total Health Expenditure on Acute Conditions.

The total household health expenditure in P. Malaysia in 1996 was RM2.36 billion. Out of these, 35.7% or RM842.8 million was spent on acute conditions.

The estimated mean health expenditure per person in 1996 was RM162.80. Out of this, an average of RM58.10 was spent on acute conditions. 85.1% of the expenditure for acute conditions was treatment cost, 4.5% was transport cost and 10.4% of the cost was attributed to loss of wages (Fig. 4.2.1).

Fig. 4.2.1 Percentage of Total Expenditure on Acute Condition



Total health expenditure and expenditure on acute conditions was higher in the urban areas. However, the *percentage* of expenditure spent on acute conditions was considerably higher in the rural areas (47.4% of total expenditure compared to 30.7% in the urban areas).

Generally, the more developed states of P.Pinang, Selangor and W.P.K.L had higher total health expenditure and higher expenditure on acute conditions. Kelantan and Terengganu had lower total health expenditure and lower expenditure on acute conditions. However, expenditure for acute conditions made up a smaller proportion of total health expenditure for the more developed states but a larger proportion for the less developed states (Table 4.2.1).

Table 4.2.1 Mean Total Health Expenditure and Mean Expenditure per Year on Acute Conditions by Strata and by States.

	Mean Expenditure on on Acute Conditions		Mean Total health expenditure
	RM	%*	RM
<i>Strata</i>			
Urban	63.10	30.7	205.60
Rural	51.80	47.4	109.10
<i>State</i>			
Johor	88.40	44.5	198.70
Kedah	46.90	41.1	114.20
Kelantan	31.30	51.2	61.00
Melaka	45.40	40.6	111.80
N.Sembilan	43.50	34.8	124.90
Pahang	46.30	38.0	121.90
P.Pinang	70.40	27.7	253.90
Perak	53.80	36.9	145.80
Perlis	31.90	38.3	83.50
Selangor	59.80	28.9	206.90
Terengganu	44.70	52.5	85.00
W.P.K.L.	75.10	29.2	257.40
P. Malaysia	58.10	35.7	162.80

* of total health expenditure

4.3 Mean and Median Expenditure Per Person and Per Episode

Expenditure on acute conditions varied among household members in different socio-demographic groups.

As 83.3% of persons reporting acute conditions reported a single episode, values for mean and median incurred per person or per episode were relatively close, with expenditure per person being slightly larger than per episode. As the general trend of variation was similar, the expenditure variation by geographical and household characteristics will be described at per episode level only.

Table 4.3.1 shows that household members in urban, more developed states of Johor, P.Pinang, Selangor and W.P.K.L. spent more per episode of acute care.

Adults aged 55 years and above spent more per person for acute conditions than the younger age groups. Chinese spent more than the Indians, while Malays spent the least. Those in higher household income quintile group spent more than the lower income groups. The unemployed, especially the retirees, also spent more compared to those who were employed (Table 4.3.2)

Table 4.3.1 Mean and Median Expenditure *Per Person* on Acute Conditions in Two-Week by Strata and by States, P. Malaysia.

Strata	Persons		Episodes	
	Mean RM	Median RM	Mean RM	Median RM
Urban	15.00	5.00	12.50	4.00
Rural	11.40	1.50	9.10	1.00
States				
Johor	16.90	5.00	13.70	3.50
Kedah	10.30	2.10	8.30	2.00
Kelantan	5.80	0.40	4.60	0.00
Melaka	12.90	1.20	11.40	1.00
N.Sembilan	10.10	1.00	8.20	1.00
Pahang	10.10	2.00	8.10	1.00
P.Pinang	15.50	8.80	12.40	6.00
Perak	13.50	4.00	11.10	2.00
Perlis	6.60	1.00	5.40	0.80
Selangor	17.40	7.00	14.90	4.00
Terengganu	10.10	2.00	7.60	1.00
W.P.K.L.	18.70	4.50	16.00	4.40
P. Malaysia	13.40	3.00	10.90	2.00

Table 4.3.2 Mean and Median Expenditure *Per Person* and *Per Episode* of Acute Condition in Two-Week by Household Characteristics.

Household Characteristics	Person		Episodes	
	Mean RM	Median RM	Mean RM	Median RM
Age-group of Head of Household				
0-14	10.40	4.00	9.00	3.00
15-29	12.80	1.50	11.00	1.20
30-54	14.70	2.00	11.40	1.20
55 & above	19.60	4.00	14.40	2.00
Ethnicity of Head of Household				
Malay	9.70	1.50	7.90	1.00
Chinese	24.00	12.00	19.60	10.00
Indian	16.40	6.00	13.90	3.00
Household Income Quintile Group				
1st 20%	8.70	1.00	6.80	1.00
2 nd 20%	11.10	1.90	8.90	1.20
3 rd 20%	13.10	3.00	10.90	2.00
4 th 20%	14.10	5.50	11.70	4.50
5 th 20%	19.00	6.00	15.80	4.50
Educ Level of Head of household				
None/Primary	14.60	3.00	11.70	2.00
Lower Secondary	13.20	3.00	10.90	2.00
Upper Secondary	11.00	3.00	9.00	1.60
Tertiary	13.30	4.00	11.80	1.50
Empl Status of Head of household				
Self-employed	13.30	3.00	10.70	2.00
Government	8.60	1.50	7.30	1.00
Private	13.70	3.00	11.30	2.00
Unemployed	17.90	4.00	14.10	2.50
Total	13.50	3.00	10.90	2.00

4.4 Expenditure Per Episode of Acute Condition.

Expenditure on acute conditions varied according to the types of acute conditions. Common cold and eye problem were the least expensive while asthma and 'other health problem' were the most expensive. Expenditure also varied vastly among the various facilities for the same type of condition. Care for minor accident, common cold, gastro-intestinal problem and asthma were most expensive at private facilities. Mental stress and 'other health problem' cost more at the traditional facilities (Table 4.4.1)

Table 4.4.1 Mean Expenditure(RM) Per Episode of Acute Conditions by Type of Conditions.

Type of Acute Conditions	Home	Shop/ Pharmacy	Private	Public	Traditional	All Sources
Minor Accident	0.60	11.30	25.50	7.40	16.60	12.60
Common Cold	1.00	5.30	15.80	2.00	7.40	9.10
Gastro-intestinal problem	0.50	2.60	28.10	3.40	5.60	13.80
Asthma	0.50	10.60	34.60	2.20	19.10	16.20
Skin problem	0.20	9.30	19.10	3.60	10.30	10.40
Ear problem	0.10	6.50	19.90	7.20	20.30	13.30
Eye problem	0.90	4.20	17.70	3.10	13.10	7.10
Mental stress	0.30	1.00	18.90	3.64	58.80	10.00
Other painful condition	1.00	10.30	26.60	2.40	14.80	10.20
Other health problem	0.40	10.60	44.20	6.00	64.10	29.76
Total	0.80	6.60	20.10	2.80	17.60	10.90

Table 4.4.2 shows that the mean and median expenditure per episode of acute care was RM10.90 and RM2.00 respectively. Acute care at home/self medication was the cheapest, followed by care at public facilities. Care for acute conditions at private facilities cost the most while traditional facilities were also expensive.

Table 4.4.2 Mean and Median Expenditure Per Episode of Acute Condition and Proportions of Episodes at Various Categories of Expenditure.

Source of Care	Mean (RM)	Median (RM)	% of Episodes			
			No out-of- pocket exp.	>0 - RM10	>RM10 -20	>RM20
Home/Self Medication	0.80	0.00	84.1	14.3	0.8	0.7
Shop/Pharmacy	6.60	2.50	2.7	84.6	7.5	5.2
Public Facilities	2.80	0.00	59.9	33.6	3.2	3.3
Private Facilities	20.10	15.00	20.7	13.1	40.8	25.4
Traditional Facilities	17.60	5.00	20.7	52.1	11.1	16.1
All Sources	10.90	2.00	37.0	30.6	19.5	12.9

Of the 2.9 million episodes of acute conditions, 37.0% did not incur any out-of-pocket expenditure during the two-week recall period. The proportions varied a great deal among the various facilities.

84.1% of episodes utilised home treatment where the households did not spend any money; 84.6% of episodes at the shops or pharmacist cost less than RM10; 59.9% of the episodes seen at public facilities did not incur any household expenditure; while 40.8% of those treated at private facilities cost between RM10 and RM20 and 52.2% of the episodes at traditional facilities cost less than RM10.

4.5 Expenditure Per Episode of Acute Condition by Source of Care.

This section describes expenditure per episode of acute conditions by sources of care. Fig. 4.5.1 to 4.5.2 refers to the description.

As mentioned previously, household expenditure for acute conditions was dependent upon the type of conditions as well as the source of care utilised. It also varied according to the location of household and household characteristics. These variations in household expenditure were mainly related to the different proportions of the subgroups utilising different sources of care as well as the types of conditions reported in the various subgroups. Thus the following description will focus on variation in expenditure for different sources of care.

As expected, expenditure *per episode* of acute care at the *private facilities* was the most expensive. Households in Selangor, Johor, W.P.K.L and Melaka which had higher utilisation of private facilities also had higher mean expenditure per episode. However, about 15 to 30% of the episodes treated at private facilities in various states did not cost the households any money. The cost of treatment was borne by employers and did not involve out-of-pocket expenditure for the households.

Chinese and Indian households utilised *private facilities* more than the Malays, they also spent more per episode. The proportions that had no out-of-pocket expenditure were 24.1%, 10.0% and 25.1% in Malay, Chinese and Indian households, respectively. Hence smaller proportion of the Chinese had subsidised private care. Children aged 0 to 14 spent more at private facilities.

The extent of utilisation of *private facilities* increased with better education. The data suggests that households headed by those with higher education were associated with less expenditure at private facilities. Mean expenditure per episode was fairly uniform among all educational levels but the proportions of episode costing households nothing, increased from 14% among those with no or primary education to 82% among those with tertiary education. This again was because treatment costs for a higher proportion of the episodes were either subsidised or paid for by their employers.

The proportions of episodes that households paid nothing at private facilities were more in the highest income quintile group (28.6%) compared to 11.4% in the lowest income group. Treatment costs for such episodes were probably paid for by their employers.

Self-employed and unemployed headed households (mainly the retirees) spent more per episode at *private facilities* compared to those households headed by government and private employees. The proportions of episodes costing household nothing in the former group were very low (7.2% and 11.6% respectively) compared to those households with other employment status.

As reported earlier, expenditure for acute conditions at *public facilities* was very little, with a mean and median of RM2.80 and RM0, respectively. The amount paid varied from state to state. Households in Kelantan and Melaka spent less than RM2.00 per episode at public facilities, while those in Kedah and Selangor spent an average of RM4.50 per episode. Households paid nothing in a high proportion of episodes. These proportions also varied a great deal from state to state, from 46.4% in W.P.K.L. to 75.2% in Pahang.

Among the ethnic groups, Malays spent less per episode for acute *at public facilities* compared to Chinese and Indian households. The proportions of episodes that cost households nothing were 63.6%, 39.8% and 42.9% for Malays, Chinese and Indians respectively. However, among the Chinese only 8.3 % of episodes sought treatment at public facilities for acute care.

Utilisation of *public facilities* declined with better education of the head of household. Mean expenditure per episodes and the proportions of episodes, which cost the households nothing, decreased among better educated headed households.

The mean expenditure at public facilities was slightly higher among those in the higher income group, but the proportion that incurred no out-of-pocket expenditure was also higher.

Government employees and retirees paid less at *public facilities* (less than RM2 per episode). The proportions of episodes that government employees did not pay, were also the highest (79.3%). Those episodes that cost households nothing among the private employees and the self-employed were 51.3% and 64.3%, respectively.

Care at *traditional facilities* was generally expensive, being most expensive in Johor and W.P.K.L. (RM23 to RM52); and least expensive in Pahang, Perlis and Terengganu (RM10 to R12).

Among the traditional facilities, expenditure per episode at Malay *traditional facilities* was the lowest. Per episode expenditure at traditional facilities cost much less for the Malays compared to the Chinese and Indians. Proportions of episodes that cost households nothing were 41.8%, 23.5% and 33.9% among the Malays, Chinese and Indians, respectively. Higher income and self-employed headed households spent more at traditional facilities.

Expenditure at *shops or pharmacies* also varied from state to state. Households in W.P.K.L and Melaka spent about an average of RM10. Households in Kelantan, N. Sembilan and Perlis spent less than RM4.00 at shops or pharmacies. Chinese also spent more at *shops or pharmacies compared to Malays and Indians*. The elderly (adults aged 55 and above) also spent more compared to other age groups. The households where the heads of household were retired also spent more at *shops or pharmacies*

Self medication was the cheapest for acute conditions. 71.5% to 96.2% of the episodes in various states did not incur any household expenditure for that episode although the items could have been purchased previously.

Fig. 4.5.1 Expenditure on Acute Condition by Sources of Care and States

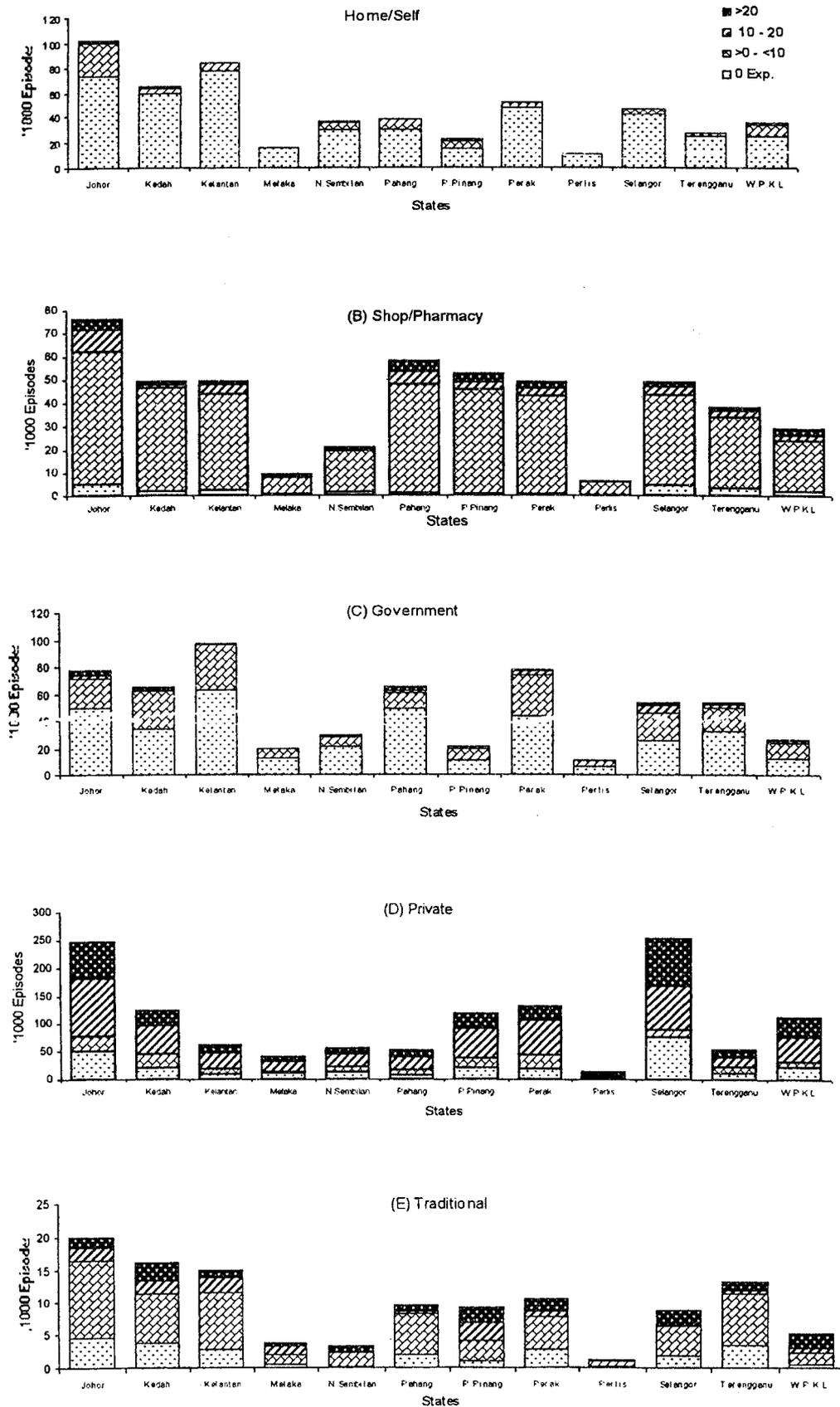
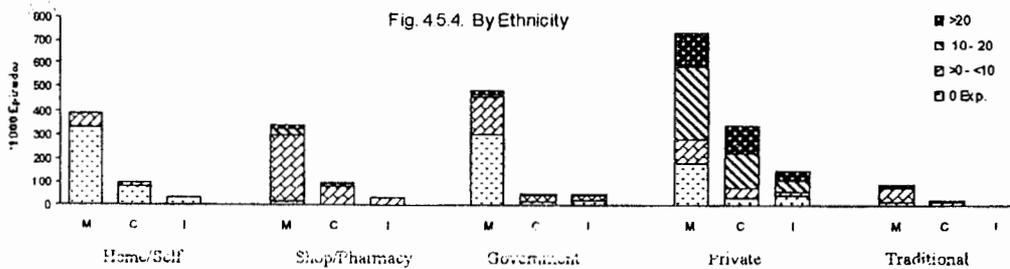
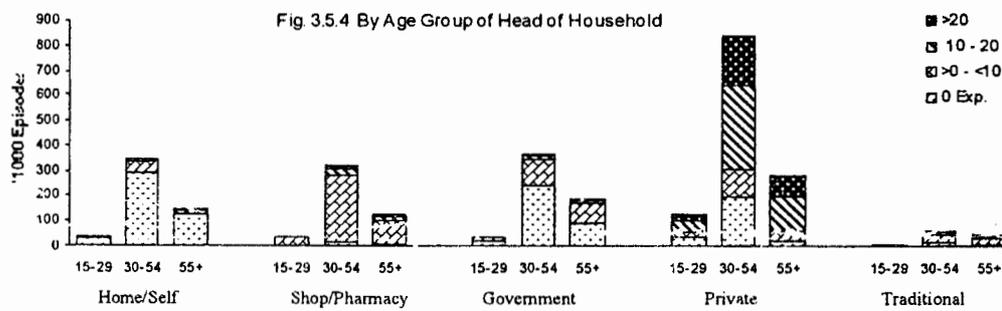
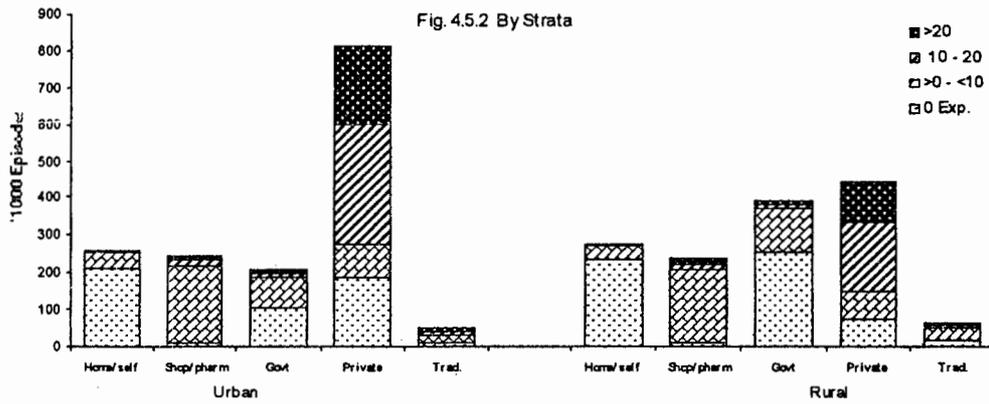
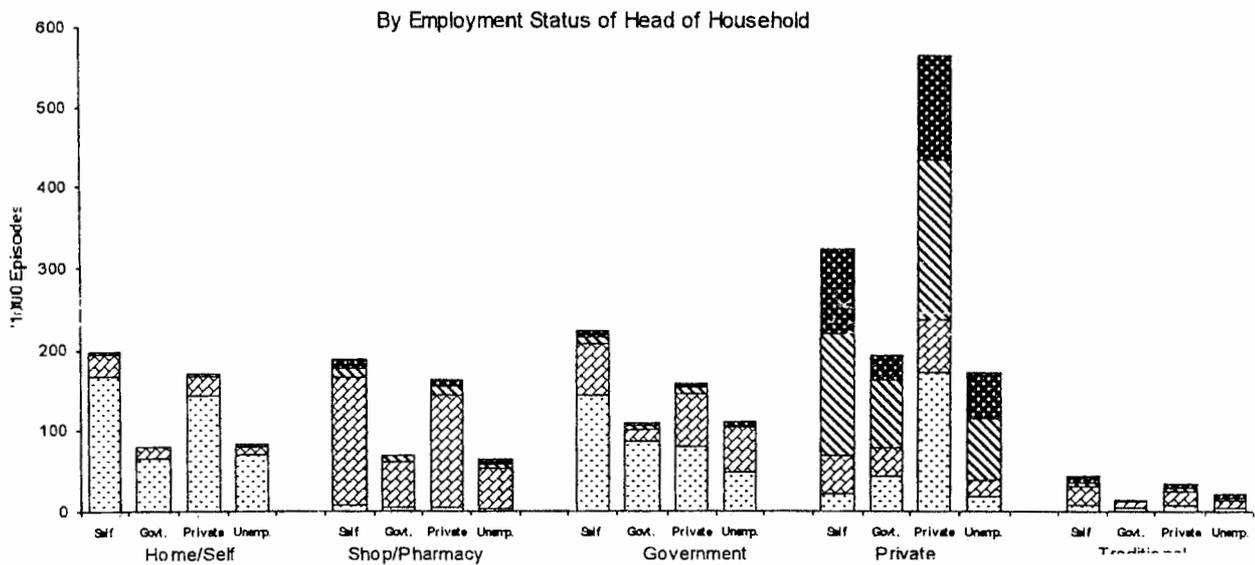
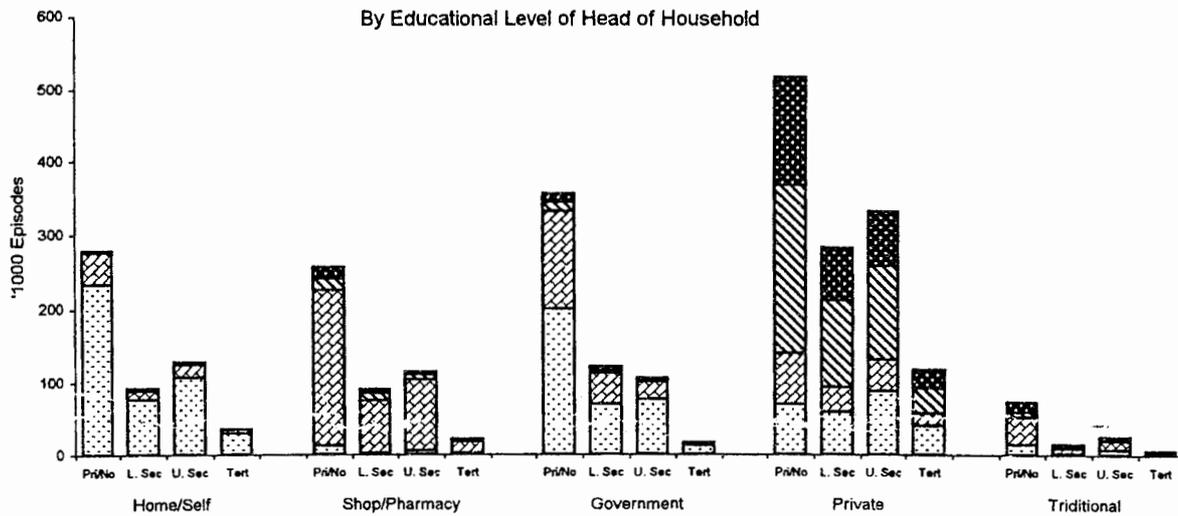
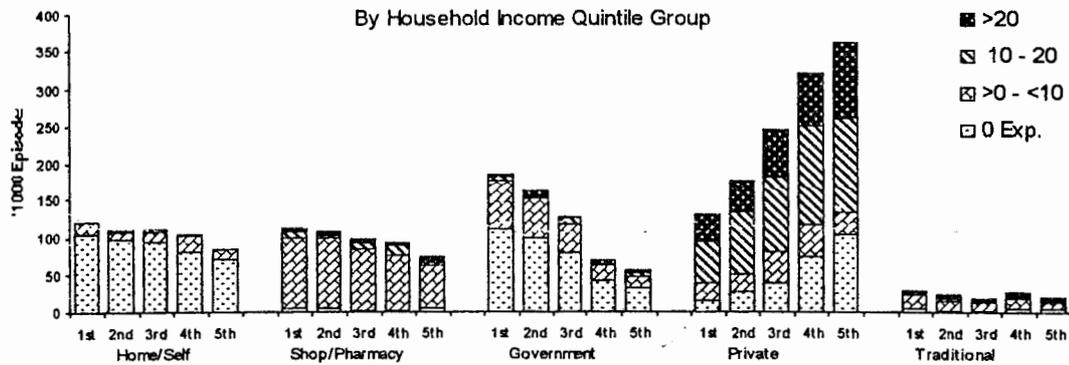


Fig.4.5.2 Expenditure on Acute Conditions By Sources of Care





4.6 Sources of Financing

Choice of source of care is determined by many factors including cost to the household, which is dependent on whether there are other sources of payment.

Expenditure on acute conditions can be classified as *subsidised* or *unsubsidised*. An *unsubsidised* episode is one that was solely paid for by the household. Any other episode is regarded as *subsidised*. This includes episodes at public facilities and those paid by employer or other sources. Subsidised expenditure of acute condition is usually minimal and does not reflect the actual cost of care. Unsubsidised expenditure gives a more accurate reflection of the actual cost of acute care.

As all episodes seen at public facilities were subsidised and expenditure for episodes treated at home, shops or pharmacies were almost fully paid for by households, unsubsidised status was only applicable to episodes at private facilities.

Table 4.6.1 shows the percentages of episodes by source of financing. Out of 2.9 million episodes of acute care, households paid in full for 61.2 % of the episodes. They paid in full for 75.3% and 49.6% of the episodes at *private* and *government facilities* respectively.

Employers paid or subsidised 23.0% of the episodes treated at private facilities and 2.3% of episodes at public facilities.

58% of the episodes at *public facilities* incurred no payment. The majority of episodes treated at home also incurred no payment as the items were probably purchased previously.

Expenditure at the *shops or pharmacies* were all (or almost) paid for by the households and relatives and friends.

Table 4. 6.1 Number and Percentage of Episodes by Sources of Financing and Sources of Care.

Sources of Care	Sources of Financing					Total
	No Payment	Household	Employer	Insurance	Others	
Home/Self	445,800 (84.1)	84,400 (2.8)	1,100 (0.2)	-	1100 (0.2)	532,400
Shop/Pharm	-	470,300 (97.3)	4,300 (0.9)	-	8,600(1.8)	483,200
Private	-	940,000 (75.3)	286,700 (23.0)	470 (0.03)	20,800 (1.7)	1,248,100
Public	347,300 (58.0)	236,800 (49.6)	13,600 (2.3)	-	710 (0.1)	598,400
Traditional	23,200 (20.0)	91,300 (78.5)	-	-	1,800 (1.5)	116,400
All Sources	826,300 (27.4)	1,822,800 (61.2)	305,700 (10.3)	470 (0.01)	33,000(1.1)	2,978,000

4.7 Summary

Households spent an estimated RM842.8 million on acute conditions in 1996. The mean expenditure per person per year was RM58.10. Expenditure on acute conditions constituted 35.7% of the total health expenditure.

The expenditure on acute conditions varied with the type or the severity (or household members' perception of severity) of the conditions. Asthma and 'other health problem' cost more while common cold and eye problems cost less.

Mean expenditure *per person* also varied among households in different socio-demographic groups. Per person expenditure was higher in urban and more developed states. Kelantan and Perlis had the lowest per person expenditure. Adults aged 55 and above spent more. Chinese, lower educated, higher income households and the unemployed especially the retirees, spent more.

Expenditure *per episode* of acute care varied a great deal at the various sources of care. Care at home, shops or pharmacies incurred no consultation fees and therefore were cheaper than those at private or traditional facilities. Expenditure at public facilities was low as they were heavily subsidised. Traditional facilities cost much more than government facilities.

Treatment at *private facilities* was more expensive in urban areas and in the more developed states and least expensive in Kelantan, Pahang and Terengganu. Chinese, less educated, lower income households, self-employed and the unemployed headed households paid more at private facilities.

Treatment at *public facilities* was the cheapest for all conditions when compared with private and traditional facilities. They cost more in urban areas and least in Kelantan. Otherwise expenditure was fairly uniform in all states. Chinese and Indians paid more at public facilities. Better educated and higher income groups, government employees and retirees paid less.

Traditional facilities cost more for mental stress and 'other health problem'. They were also more expensive in urban and the more developed states and least expensive in Kelantan, Pahang, Terengganu and Perlis. Chinese and Indian traditional facilities cost more than Malay traditional facilities. Higher income households and self-employed headed households paid more.

Households paid in full for 61.2% of the total episodes of acute care. 58.0% of the episodes at the *public facilities* incurred no out of pocket expenditure. Employers subsidised or paid for 23.0% of episodes treated at the *private facilities*.

MULTIVARIATE ANALYSIS

5

5.1 Introduction

The Survey inquired about ten different medical conditions that the subjects may have suffered from in the two weeks immediately prior to the interview. For the purposes of multivariate analysis, we have reclassified these conditions into five categories:

1. Fever, cough, flu, common cold, and similar conditions (original category 02)
– 5025 cases;
2. Skin problems and acute ear and eye problems (original categories 05, 06, and 07)
– 1042 cases;
3. Minor accidents and other painful conditions (original categories 01 and 09)
– 1699 cases;
4. Diarrhoea, vomiting, and similar conditions (original category 03)
– 650 cases;
5. Asthma, mental stress, and other problems (original categories 04, 08, and 10)
– 733 cases.

Five categories of *Source of care* are considered:

- A. Home/self
- B. Shop/pharmacy
- C. Public facility
- D. Private facility
- E. Traditional facility.

In general, treatment in private facilities is most expensive, although, where subsidised (by employer, an insurance scheme, or another party), the patient's expenses are often very small, of the same order of magnitude as in public facilities or as for treatment at home and by the patient (Home/self). The expenditure in shops and pharmacies and in traditional facilities tends to be much higher than in public facilities but lower than in private facilities when patients pay for the treatment in full (i.e., in unsubsidised cases).

Separate analyses were carried out for each of the conditions 1–5. For conditions 2, 3, and 5, which were formed by collating two or three original categories each, we allow for systematic differences among these categories by defining the appropriate indicator variables. The age groups (in years) 0–4, 5–14, 15–34, 35–54, and 55 and over are used throughout. The variables *Type of care* and *Length of stay* are not defined for acute conditions.

The analyses and their results have many features in common. To avoid repetitiveness, we concentrate on condition 1, which involves by far the greatest number of episodes, and then point out the differences in the results from the other conditions.

An unsubsidised episode is defined as an episode of health care in a private facility, which was paid for solely by the patient. Since episodes at shops and pharmacies are not associated with any subsidy as such, this definition is no longer well motivated. However, in our modelling we use *Subsidy status* (indicator of subsidy) in conjunction with *Source of care*, and so, in effect, *Subsidy status* represents the difference between expenditure for unsubsidised and subsidised cases in *private* facilities.

Since there are five different types of *Source of care*, in utilisation analysis we seek a description for the pattern of use of private facilities and a separate description for the pattern of use of public facilities. Throughout, we analyze only *Treatment expenditure*.

Information about acute conditions was collected with a recall period of two weeks. This was necessitated by practical considerations. However, collecting data in this way entails two profound problems. First, the period of two weeks prior to the interview may not be a good representation of the acute conditions over the entire year (because of seasonal effects for certain conditions). Second, subjects may report episodes which took place prior to the period of recall. Especially problematic are instances of illnesses which started prior to the beginning of the recall period, but persisted into the period. Related expenses may have been incurred either outside or within the period or recall, or even in both periods.

5.2 Expenditure for treating fever, cough, flu, and similar conditions

More than 5000 episodes of fever, cough, flu, common cold, and of similar conditions were recorded by the Survey. (Nearly one in ten subjects reported an episode.) Almost half of the episodes, 2357 (47%), were treated in private facilities and 1040 (21%) in public facilities.

The (geometric) mean *Expenditure* is RM0.44, reflecting the large proportion of episodes that incurred no expenditure (2789 episodes, that is, 55.5%). Most of the unexplained variation is at the episode level; the episode-level variance estimate, 1.98, corresponds to the typical multiplicative factor 25.5. The district- and state-level variances are 0.056 and 0.057 each, corresponding to typical multiplicative factors of around 1.7 each. *Household income* is strongly associated with *Expenditure*; tenfold increase of *Household income* is associated with 2.15 times greater *Expenditure*. However, *Subsidy status* provides an alternative explanation for these differences; subsidised episodes are associated with 150 times smaller expenditure than unsubsidised cases. Within the two categories of *Subsidy status*, *Household income* is not associated with *Expenditure*. The mean expenditures for the five categories of *Source of care* and for the subsidised and unsubsidised private care are given in Table 5.2.1

Private unsubsidised care is associated with 673 times greater expenditure than private subsidised care. Within these six categories there is little variation among the districts or states, and even the episode-level variance is only 0.54, corresponding to the typical multiplicative factor 5.39.

Table 5.2.1 (Geometric) means of expenditure within the categories of Source of care and for subsidised private and unsubsidised episodes of Acute conditions

Source of care	Mean (in RM)
Home/self	0.03
Shop/pharmacy	1.35
Public	0.03
Private Subsidised	0.02
Private Unsubsidised	18.20
Traditional	2.30

Other background factors, although statistically significant, are of little substantive importance. The mean adjusted expenditure in urban areas is 21.5% higher than in rural areas (estimate – 0.085, standard error 0.027). Ten-fold increase in *Household income* is associated with only 12.7% greater expenditure. The adjusted difference between Chinese and Malays is 27%, and Indians' expenditure is on average only slightly lower than that of Chinese. Episodes in households headed by government or private employees involve expenses about 12% smaller than episodes in households headed by self-employed or unemployed. In view of the average amounts of expenditure, these differences are of little consequence. For completeness, Table 5.2.2 gives the details of the model fit.

Although the analysed category of conditions comprises a variety of everyday illnesses, there is a great deal of uniformity in the *Expenditure* for the resulting episodes and the variation at district- and state-levels is very small.

The analysis of unsubsidised episodes fails to identify any factors that are strongly associated with *Expenditure*. *Expenditure* tends to increase with age; the average *Expenditure* of elderly (aged 55 and over) is about 1.5 times greater than that of children (0–14 year-olds). The expenditures for unsubsidised cases are in a very narrow range; the typical multiplicative factor for episode-level variation is 2.8; the variation at district and state levels is negligible.

Table 5.2.2 Model fit for expenditure for Acute conditions

Parameter	Category	Estimate	Standard error
Constant		0.270	
Source of care	Self/home	0.000	(0.038)
	Shop/pharmacy	1.700	(0.037)
	Public	0.024	(0.044)
	Private	-0.202	(0.098)
	Traditional	1.914	
Subsidy status (private)	Subsidised	0.000	
	Unsubsidised	2.814	(0.037)
Household income		0.052	(0.030)
Area	Urban	0.000	
	Rural	-0.085	(0.027)
Ethnicity	Malay	0.000	
	Chinese	0.103	(0.031)
	Indian	0.089	(0.040)
	Other	0.001	(0.077)
Employment status Of head of household	Self-employed	0.000	
	Government	-0.060	(0.033)
	Private	-0.053	(0.027)
	Unemployed	0.011	(0.036)
Variance components			
Episode		0.537	
District		0.013	(0.004)
State		0.008	(0.005)

5.3 Utilisation for fever, cold, flu, and similar conditions

In the presence of five types of *Source of care*, we carry out separate analyses for exploring which background factors are associated with the selection of care in private facilities on the one hand, and in public facilities on the other. Private facilities were used in 47%, public facilities in 21%, shops or pharmacies in 18%, home/self in 14%, and traditional sources in 1% of episodes.

Care in private facilities is preferred (that is, is selected more often) by Chinese, those living in urban areas, households whose heads have tertiary education, and families (as opposed to single persons). The preference gradually decreases with age. *Household income* is positively associated with preference for private care, but its impact is negligible in comparison with the other factors.

The adjusted difference between Chinese and Malays corresponds to about 0.15 greater probability of using private care by the former (estimate 0.648, standard error 0.085). The adjusted difference of probabilities corresponding to ten times greater income is only about 0.02 (the estimate on the logit scale is 0.088, with standard error 0.027). The estimated logits for the age groups, contrasted against the reference group of 0–4 year olds, are -0.47 (5–14 year-olds), -0.77 (15–34 year-olds), -0.89 (35–54 year-olds), and -0.94 (55+ year-olds); the corresponding standard errors are in the range 0.09–0.12. The variation at the district and state levels is moderate (the relative variance estimates are 0.09 and 0.08, respectively). Kelantan and Pahang stand out as the states with the lowest adjusted probabilities of using private care (logit adjustment of -0.50, corresponding to probabilities reduced by about 0.10).

The analysis for public facilities does not yield exactly the opposite results to those for private facilities because the use of other sources of care is uneven across the population strata defined by the background variables. However, some of the expected patterns of utilisation are present. Chinese, households whose heads have tertiary education, and those living in urban areas are most averse to using public facilities. Households headed by a government employee use public facilities more often than others (probability higher by up to 0.09), working-age adults (15–54 years of age) use public facilities less than other age groups (probability lower by around 0.10).

There is a moderate extent of district- and state-level variation in the adjusted probabilities of using public care (on the logit scale, the corresponding relative variance estimates are equal to 0.08 each). Pahang stands out as the state with the highest adjusted probabilities of using public facilities (logit adjustment of 0.57, corresponding to up to 0.14 difference on the probability scale). Unlike in the analysis for private facilities, Kelantan does not have a very high adjusted rate of using public facilities (its estimated adjustment is 0.22, corresponding to around 0.05 higher probability than the general prediction).

5.4 Expenditure for Other acute conditions

In this section we summarise the results of the analyses for the other four types of acute condition. The sample sizes for these types are smaller than for Fever, cough, flu and similar conditions, and so there is less scope for detailed modelling of the expenditure. In any case, the expenditure is very small for most episodes, and so the results are of less importance.

The mean expenditures for acute conditions 2–5 are in the range RM0.35–0.55. For the types of condition that have been aggregated into a single category there are no important differences except for Mental stress (within type 5), which is associated with much lower expenditure, especially for unsubsidised episodes.

Subsidy status and *Source of care* are the principal predictors of *Expenditure*. Unsubsidised episodes are associated with *Expenditure* almost 1000 times greater than subsidised (private-care) episodes, which are in the same range as episodes of care at public facilities or at home and by the patient him/herself (Home/self). Shops, pharmacies, and traditional sources of care are associated with *Expenditure* around 100 times greater than public facilities (about 10 times smaller than for unsubsidised private care); the corresponding estimates are in the range 1.50–2.30 on the logarithm scale, that is, 32–200 on the multiplicative scale of RM.

Chinese tend to have higher expenditure, about 1.6 times, than Malays, and the expenditure of Indians is similar to that of Malays. Tertiary education of the head of household is associated with higher expenditure, about 1.5 times, for Skin/ear/eye problems and for Diarrhoea and similar conditions (conditions of type 2 and 4). In general, expenditure of elderly (aged 55 and over) is higher than that of the other patients, and that of children (up to 4 years of age) is the lowest. The expenditure of the elderly is about 1.8 times greater than for children, and the expenditure for working-age adults (15–54 years of age) is intermediate. There is a weak indication that households with government employees as heads tend to have lower expenditure than other households do.

The analysis of unsubsidised episodes largely confirms these findings. In particular, Chinese tend to have greater expenditure and the mean expenses for treating mental illnesses are much lower than for other conditions.

The expenditures are very homogeneous; a typical expenditure is 6.5–7.5 times greater or smaller than the average expenditure. After adjusting for the important explanatory variables, the variation at district and state levels is very small.

5.5 Utilisation

Private facilities are the most frequent source of care for all acute conditions except for type 3 (Minor accidents and other painful conditions), which are dealt with at home or by the injured (Home/self) in 34% of cases. Public facilities are the second most frequent source for types 2 (Skin/ear/eye problems) and 5 (Asthma, mental stress, and other problems). Traditional sources are used least frequently for all types of condition, in 1–6% of cases, except for type 3 (Minor accidents and other painful conditions), where they are used in 11% of cases.

Chinese select private facilities more frequently than Indians who in turn select them more frequently than Malays. The difference between Chinese and Malays is most pronounced for types 4 (Diarrhoea and similar conditions) and 5 (Asthma, mental stress, and other problems), corresponding to the difference in probabilities, after controlling for other factors, of up to 0.20. Indians select private facilities with (adjusted) probability of around 0.10 greater than Malays. Households in which the head has tertiary education select private care more frequently than others, especially for conditions of type 2 (Skin/ ear/eye problems) and 4 (Diarrhoea and similar conditions). Families select private care for these conditions more frequently than do single persons. Private care is selected with greater probability in urban than in rural areas, but the difference, after adjustment, is smaller than 0.10 in probability.

Household income is not strongly associated with the probability of selecting private care (at most 0.04 greater probability for tenfold increase in *Household income*). *Household size* and *Employment status* of head of household are not associated with selecting private care. Differences of the probabilities for men and women are small. For Minor accidents and other painful conditions, young adults (15–34 year-olds) select private care with probability 0.10 greater and older adults (aged 35 years or over) with probability almost 0.20 greater than private care is selected for small children (0–4 year-olds). For treatment of mental problems, private care is selected very infrequently.

The between-state variation is substantial for types 3 (Minor accidents and other painful conditions) and 4 (Diarrhoea and similar conditions). In general, even after adjusting for the relevant explanatory variables, the use of private facilities is least frequent in Pahang and most frequent in Selangor.

Utilisation of public facilities for treatment of acute conditions is much more uniform across the states and districts. A possible explanation is that where private facilities are not available the potential clientele seeks care at shops/pharmacies or at sources of traditional care. In most other aspects, the pattern of utilisation of public facilities is a mirror image of the pattern for private facilities.

Thus, Chinese are least likely to select a public facility (probability lower by up to 0.20, and even more for conditions of type 5 for certain combinations of background). Higher education of the head of household is associated with lower probability of using public facilities (by over 0.10 on the probability scale). After controlling for the relevant background variables, public facilities are selected in rural areas with a probability of around 0.10 greater than in urban areas. Government employees and members of their households select public facilities more frequently, by about 0.10 greater probability than self-employed or employees of private enterprises.

Household type, Household size, gender, and Household income are not associated with the probability of selecting a public facility for treating an acute condition. For acute ear and acute eye conditions public facilities are selected more frequently than for skin problems.

5.6 Conclusions

Acute conditions are in general associated with very small *Expenditure*, although episodes, especially of the most common conditions, are very frequent. Home/self, care in public facilities, and private subsidised care are often free of charge, care or purchases in shops/pharmacies or in traditional facilities tend to be of the order of RM1-2, and care in private facilities has mean expenditure around RM20. Private care is selected more often, even after controlling for the relevant background variables, by Chinese, heads of households with tertiary education, and by residents of urban areas. The same sub-populations have the lowest (adjusted) probabilities of using public facilities. Private care is used more often for children. *Household income* is not an important predictor of utilisation after controlling for *Ethnicity, Educational level, and Urbanity*.

A prediction for the entire year, based on the 26-fold multiple of the results from this section of the Survey, is not appropriate because the episodes recorded are likely to cover, in effect, a period longer than two weeks. In any case, the two-week period may not be a good representation of the whole year.

CONCLUSIONS AND IMPLICAITONS 6

Acute conditions involving ambulatory care made up the largest share of total out-of-pocket expenditure on health; costing households an estimated RM843 million or 35.7% of the total household expenditure on health in the year of survey. Private facilities were the most frequently utilised source of care for acute conditions. This explained the high expenditure incurred. Although the actual amount spent per episode is relatively small, the large number of episodes utilised pushes the total expenditure up, leading to a rise in total health cost in Peninsular Malaysia.

Care for acute conditions is very subjective and dependent on the individual's perception of unwellness, severity of the condition and health-seeking behaviour which in turn is influenced by his/her socio-cultural environment. This study did not measure the differences in perceptions and health-seeking behaviour. However, assuming that seeking of care for acute conditions is associated with morbidity, then the study confirms the generally accepted philosophy that the poor and socially disadvantaged are more likely to suffer from ill health. The older (55 years and above) age-group, females, those from rural, lower educated, lower income households had higher morbidity rates for acute conditions. Chinese, tertiary educated and higher income household had lower morbidity rates.

Expenditure on acute conditions showed that it varied according to the source of care and the type of acute conditions involved. Private care was the main source of care even though it cost most for all conditions. Even among private care users, there were variations in cost. The Chinese, less educated, self-employed, retired and adults above 55 paid more per episode. Private care was more expensive per episode in urban and more developed states of Selangor, W.P.K.L. and P. Pinang. This may either be related to people seeking primary care at Specialist Clinics leading to higher cost or even to some form of sliding scale imposed by providers in that well-off communities are charged more for a service compared to poorer communities. Ironically, the better educated, higher income groups, government and private employees paid less for acute care in private services because they were subsidised.

Care was sought from public facilities in about 20% of acute conditions and it was the cheapest source of care involving consultations for all conditions. They were more commonly utilised among households of lower income, lower educated head of households. Even for public facilities; the cost was more in urban areas than rural areas. This is not surprising as a majority of rural areas are covered by rural health service which did not incur out-of-pocket expenditure whereas treatment in urban areas that are usually in hospitals or polyclinics involve minimal cost.

Self medication using treatment available at home or purchased from shops and pharmacies was utilised in about 34% of episodes. They were more commonly utilised among households headed by those with lower education.

61.2% of the out-of-pocket expenditure on acute care was paid by households alone. 27.4% did not involve any payment and employers paid for 10.3% of acute care. Health insurance paid for 0.01% of acute care. Thus for acute care, households were more likely to incur out-of-pocket expenditure and opt for private facilities, especially among the higher socio-economic group (higher income and better educated groups). This was probably related to the shorter waiting time, shorter travelling time (easier accessibility) and relatively small amounts of out-of-pocket expenditure involved.

6.1 Implication on Structure of Primary Care in Malaysia

The role of private facilities in improving accessibility of services and easing the burden on public facilities for acute care is to be acknowledged. The private sector can be encouraged to play a bigger role in providing services for acute conditions. Partnerships between the public and private sector should be encouraged to improve equity, accessibility and encourage maximum utilisation of resources in providing primary health care.

Integration of the private primary care facilities into the already established public primary care will allow the providers to garner their resources and avoid duplication of services. The question of differences in quality in both sectors will then be eliminated. Consumers will be given equal treatment and quality of services regardless of ability to pay. With the private sector integrated into the system, the Government can then afford to divert their resources to the relatively untouched areas such as "Care for the elderly" and "Care for adolescents".

6.2 Implication of Fee-Structure or Methods of Payment of Family Physicians

Once a financing scheme is in place, families can be registered for primary health care at one source of care (public or private) nearest to their homes and some form of capitation fee be paid to the provider to render the services. This will encourage continuity of care and allow the providers to be familiar with the families and their socio-cultural environment and thus improve the quality of care. The capitation fee rather than fee-for-service is preferred as it will encourage the providers to invest more in promotive and preventive strategies which will be more cost-effective.

A standardised capitation fee will also discourage the system of sliding scale imposed by the health providers. Through this system, it is envisioned that the public will be educated to obtain primary care from front-liners such as Family Physicians who function as primary care providers and not from Specialists. This phenomenon of super-speciality for primary care escalates costs unnecessarily. At the same time, the government must develop a comprehensive continuing education programme for all their primary care providers to ensure that they are equipped with new developments in medicine.

6.3 Implications on Self-Medication

A substantial proportion (34%) of households resorted to self medication. Although self-medication for minor ailments is to be encouraged, it is important for households to be aware of the danger inherent in such actions. A larger proportion of the households headed by those

with lower education used self-medication. Households need to be educated on the appropriateness of self-medication and consumer protection for purchase of over the counter drugs have to be strengthened.

In this era of information age, the benefits and potential side-effects of the medicines that are commonly used in self-medication must be made available to a wide audience so that informed choices can be made. Telehealth and Telemedicine are some of the tools that can be used to spread information to the public.

6.4 Implications on corporatisation

In the process of corporatisation of the public health system, the government must ensure that essential health services are rendered to the poor. The poor tend to suffer more ill health and this affects their productivity which leads to more poverty. There is strong justification for poverty assistance or equity grounds for government subsidies, aimed at improving access of the poor to important health services. However, since public resources are scarce, subsidies need to be carefully targeted.

The changes that Malaysia makes in its health sector reforms will rest not only on financial and economic analyses. They depend on more fundamental issues as to what kind of society it wants to be and the values it places on social cohesion, poverty alienation, equity, consumer choice and quality of care. In the right policy environment, achieving these broader social goals can be consistent with measures that improve efficiency in the health sector.

E. TWO-WEEK RECALL: ACUTE CONDITIONS

I would like to ask a few questions concerning the health of household members in the last two weeks, that is between 15
(including household member who is temporarily away / passed away in the last year)

FORM 3

Reasons for seeking treatment	E1 Code	E2 HHM No.	E3 Episode No.	E4 Source of care	E5 Location of source of care	E6 Number of visit	E7 Treatment cost	E8 HH health expenses	E9 Others who paid	E10 Traveling cost	E11 Other cost	E12 Time taken
<p>1. In the last 2 weeks (that is from to), did anyone from this household have health problems that he/she</p> <p>(a) had to seek treatment (b) had to buy or take medicine (c) suffered loss of wages</p> <p>2. If 'yes'</p> <p>(a) Who? [Note HHM No.] (b) What was the problem? [Note Code] (c) Probe E3 - E12</p> <p>3. If 'No' probe items 01 - 10</p>			<p>How many times did (name) have this problem in the last 2 weeks?</p> <p>Record each episode separately</p>	<p>1. Where did (name) go for treatment / buy the medicine?</p> <p>2. Did (name) seek treatment elsewhere?</p> <p>Self 01 Shop / Pharm 02 G. Hosp/clinic 03 Private clinic 04 Private hospital 05 Traditional Chinese 10 Malays 11 Indian 12 Others 20 Unknown 99</p>	<p>Where is the (clinic) located?</p> <p>If self-medication: where did (name) get the medicine?</p> <p>At home 1 Within district 2 Within state 3 Within country 4 Overseas 5 Unknown 9</p>	<p>How many times did (name) go to the (clinic) for treatment?</p> <p>Unknown = 99</p> <p>If self-medication: Code = 99</p>	<p>What was the total cost of this treatment?</p> <p>Unknown = 99999</p> <p>RM SEN</p>	<p>Did (name) or any HHM pay for this treatment?</p> <p>If 'yes' how much?</p> <p>If self-medication only include expenses incurred in the last 2 weeks</p> <p>Unknown = 96999</p> <p>RM SEN</p>	<p>Who else paid for this treatment?</p> <p>None 1 Employer 2 Insurance 3 SOCSSO 4 Donation 5 Friend / Relative 6 Others 7 NA 8 Unknown 9</p>	<p>Did (name) have to pay for transport to and from the (clinic)?</p> <p>If 'yes' how much?</p> <p>If own vehicle, Code = 7777</p> <p>Unknown = 99999</p> <p>RM SEN</p>	<p>Did (name) or other HHM suffer loss of wages due to this problem?</p> <p>If 'yes' how much loss?</p> <p>Unknown = 99999</p> <p>RM SEN</p>	<p>1. How long did (name) take to go to the (clinic) and return? TT [in minutes]</p> <p>2. How long did you wait before you were treated? WT</p> <p>If self-medication: Code = 999</p> <p>Unknown = 99999</p> <p>TT WT</p>
01 Had minor accidents such as fall, bites, burns, poisons, cuts, etc. ... (but not hospitalized) ?												
02 Had fever/cough/flu/runny nose sore throat/headache												
03 Diarrhoea, vomiting, worm infestation, abdominal pain ?												
04 Had asthma ?												
05 Had skin problems e.g. pimples, itch, rash, allergy, etc. ?												
06 Had acute ear problem (pain, bleeding, discharge, etc.) ?												
07 Had acute eye problem (infection, swelling, dryness, etc. ... exclude poor eyesight) ?												
08 Had mental stress or felt under pressure/worries ?												
09 Had any other painful conditions not associated with the conditions above e.g. backache, joint pains, menstrual pain ?												
10 Had any other health problems not mentioned? (diagnosed in the last 2 weeks)												

QUESTIONNAIRE FOR ACUTE AMBULATORY CARE

APPENDIX I

NHHES'96

P. Malaysia: Acute Ambulatory Care A 34

KOD HC - E

HC E HC E3

1. Applicable

2. Not A.

HC E7 HC E8

HC E10 HC E11

ANNEX B

NATIONAL HOUSEHOLD HEALTH EXPENDITURE SURVEY 1996 (NHES'96)

PENINSULAR MALAYSIA

Hospitalisation

Report of Findings

**NHES'96 TEAM
DEPARTMENT OF SOCIAL AND PREVENTIVE MEDICINE
FACULTY OF MEDICINE, UNIVERSITY OF MALAYA**

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INTRODUCTION

1

A common concern of most countries is health care resources. Such concern includes the financing of health services, the ability of the public sector to maintain past funding levels, resource allocation patterns in the public sector and the efficiency of health services delivery (WHO, 1990). These concerns are legitimate due to the magnitude of expenditure on health care each year, not only in terms of funds required or in terms of the proportion of gross national product (G.N.P.) consumed; but also because of pressures to increase health expenditures when public sector resources are limited, as is currently the case in many South East Asian countries.

Hospital services use a large proportion of the total cost of the health services since they account for a large portion of the health sector's financial, human and capital resources and thus they are an important element of the concern about health resources especially in resource limited countries. Hospitals utilise a large proportion of the most highly trained health personnel (Bloom et al, 1986); they utilise nearly half of the total national expenditure for the national health sector (Mills, 1990) and they commonly account for 50 - 60 percent of government recurrent health sector expenditure (Barnum and Kutzin, 1992). In Malaysia, in 1995, RM1.2 billion or 57.9% of the Ministry of Health operating budget allocation for the year 1995 was for hospital care (medical services); and out of capital or developmental expenditure, 46.8% was for hospitals (MOH, 1995).

In developed countries, the concern about the high cost of health care in light of scarce national and government resources has resulted in the scrutiny of the hospital sector of the health system. This is because that it is expected that the savings that is generated by controlling the hospital costs are much greater than those from adjustments made to the non-hospital components (Evans, 1990). There is also interest in dealing with the costs of operating hospitals amid indications of widespread wastage within the health sector. However, the hospital sector also needs additional resources; for public hospitals, the proportion of operating costs recovered from user charges has been very low, usually less than 10%. There have also been concerns about the equity of access and utilisation of hospital services when new schemes of financing are introduced. Hence, the need for mechanisms to generate additional resources requires financing policies which simultaneously achieve equity, efficiency and revenue objectives.

Public hospitals in general are confronted with complex problems. The symptoms of these underlying problems include: patient overcrowding in the wards; long waiting queues in outpatient clinics; questionable quality of care; shortages of basic pharmaceutical and medical supplies; lack of or inoperable diagnostic and treatment equipment; low staff morale and decaying facilities. These problems are caused by a combination of issues including lack of clearly defined role and relationship to other components of health care system; organisational weaknesses; lack of responsiveness to the service population and communities; and management deficiencies such as poor planning and monitoring.

All these problems relate directly or indirectly to the availability and to the appropriate use of resources by the hospitals. Resource issues common to hospitals in many countries fall within three major areas as adapted from Newbrander, 1992

- resource allocation to hospitals: The distribution of resources to hospitals within the health sector, as well as the allocation among hospitals by type of hospital (secondary or tertiary), geographic region, and population group served (eg. urban versus rural, poor versus rich, vulnerable versus non-vulnerable) must be examined in light of cost-effectiveness and equity concerns to ensure that the objectives of society and the health system are being served best.
- resource management by hospitals: The use of resources by hospitals must be analysed by comparing the outputs to the inputs to make assessments of relative efficiency. Such comparisons can be used to monitor performance for individual hospitals over time and across many hospitals, on a national or regional basis.
- resource generation for hospitals: Despite the relatively large amounts currently spent, there is little question that the hospital sector has need for additional resources. Health insurance, user charges and compulsory savings are some of the modes of financing of hospital services mentioned for generating additional funds. The design of such systems must balance the revenue raising objective against the distributional issues of access to and equity in the use of hospital services.

Addressing the issues facing the hospitals require an examination not only of actual hospital expenditures and the policies and management practices which underlie and affect these trends but also household expenditures on hospitalisation data to allow appropriate evidence based policy or decision making to be made.

In line with the national survey, the aim of this report is to provide baseline information on household expenditure for hospitalisation and on some aspects of the utilisation of hospital services in Malaysia. Demographic, social, economic and health factors that were hypothesised to be associated with these expenditures were investigated. Specifically, this report addresses the following questions:

1. Where did individuals seek hospital care?
2. What factors governed or were associated with the choice of source of care?
3. How much did households pay when a household member sought hospital care?
4. What factors were associated with household expenditure for hospitalisation?
5. What was the total household expenditure for hospitalisation in the country in 1996?

It is also hoped that this report will serve as a baseline data necessary to gauge the current state of utilisation of both the public and private facilities and their services in Peninsular Malaysia. Coupled with other studies and data, the report on household expenditures on hospitalisation may shed some light of the state of expenditures that is imposed on the population by the increasingly popular private sector. This might help policy makers and the monitoring agencies in auditing the prices that currently prevail in the health sector market.

As the data for Peninsular Malaysia is population based and cross-sectional; it is predicted, in the future, time-series expenditure patterns can be collected to allow for more complex modelling and evaluation of health sector reform in Malaysia. It is also envisaged that the data and the accompanying reports will continue to provide a pool of resource for policy makers in the construction of evidence-based policies and resource allocations in the future.

METHODS

2

2.1 Introduction

The National Household Health Expenditure Survey (NHHES'96) covered the whole of Malaysia. However, only the population residing in non-institutional living quarters (private living quarters) were canvassed. Details of the method utilised in the Survey are given in the General Report.

2.2 Survey instrument

In principle, the instrument designed to collect information on hospitalisation was similar to the other sectors of health. Form 4 of the survey instrument contained information on hospitalisation.

In this survey, the respondents were asked if anyone in the household had been hospitalised for treatment and discharged in the last one year, except for delivery or pregnancy-related complications. Current hospitalisation episodes which had not resulted in discharge within the one year recall period were not included in the analysis.

Every new admission which were discharged within the recall period is regarded as an episode of hospitalisation and details were recorded separately. Details regarding source of care, location of source of care and length of stay were also obtained. The reasons for hospitalisation were broadly categorised into four big groups: *accidents, surgical conditions, medical conditions and mental problems.*

The following components of expenditure on hospitalisation were recorded: treatment expenditures, travelling expenditures and other expenditures. *Treatment expenditure* included costs of registration, investigations and medicine. *Travelling expenditure* was also recorded but only public or private transport charges were included. No costs of time and distance were taken into account. Expenditures that were perceived by the household to be an indirect cost of hospitalisation such as loss of wages, costs of accompanying the sick household member to the hospital were all lumped together under *Other expenditures.*

Sources of care for hospitalisation were classified into the following categories:

Public source of care: which includes all episodes of hospitalisation that occurred in government owned, financed and managed hospitals including university hospitals, army hospitals etc.

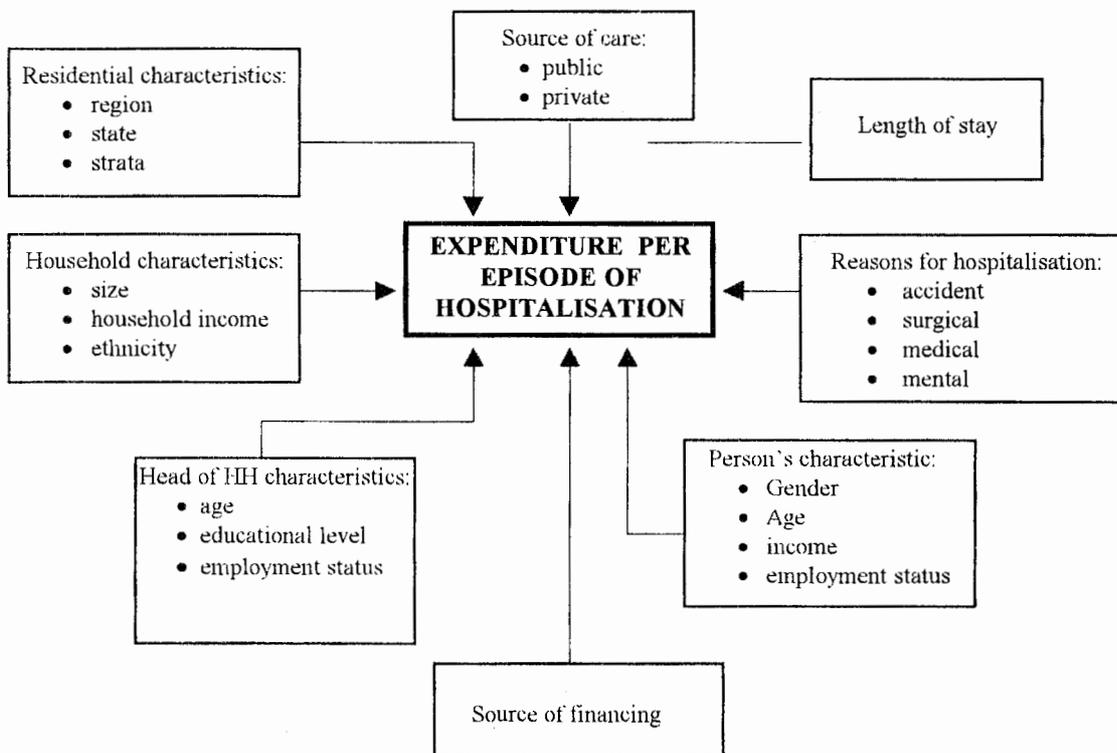
Private source of care: which includes all episodes of hospitalisation that occurred in facilities such as hospitals and clinics that are owned, financed and managed by the private sector.

2.3 The research database

The database was constructed and analysed to address questions relevant to policy issues in the context of household expenditure on hospital care. Fig. 2.1 represents a conceptual framework of the possible factors that may be associated with this expenditure.

The data are reported in terms of hospital episodes. An episode of hospitalisation is an occasion when an individual receives in-patient care for any disease or condition broadly classified into the four categories: accidents, surgical conditions, mental illness and medical conditions requiring hospital care. A person may have received care at either a public or a private facility per each episode of hospitalisation. Each admission is considered one episode and it may be either at private or public facility.

Fig. 2.1 A conceptual model to explain household expenditure for hospitalisation



This report describes the survey data on hospitalisation; utilisation and out-of-pocket expenditure and the characteristics of the population using different sources of care. A descriptive analysis of the characteristics that are associated with expenditure patterns is also included. Analysis using multi-level modelling techniques will cap off the report.

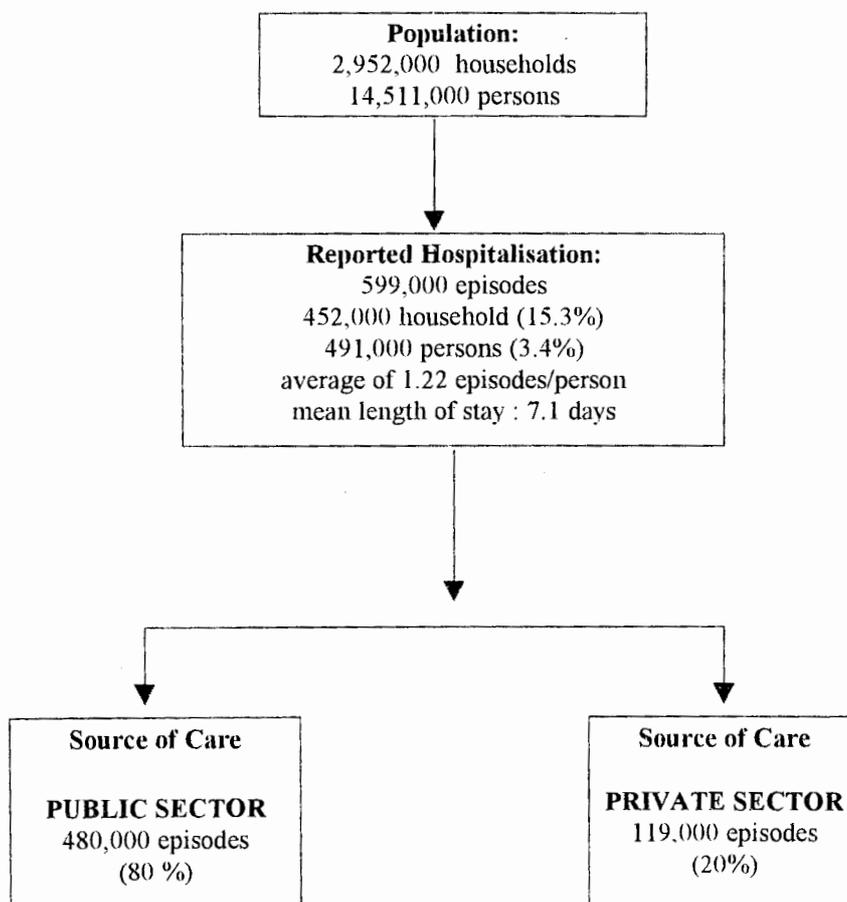
UTILISATION OF HOSPITAL SERVICES 3

3.1 General distribution

Out of the study population of 14,511,000 persons in 2.9 million households, an estimated 491,000 persons (3.4% of the population), and 452,000 households(15.3 % of households) in Peninsular Malaysia, reported hospitalisation in the one-year recall period.

There were 599,000 episodes reported by 491,000 persons in the year of survey giving an average of 1.22 episodes/person. 80% of these episodes were cared for in the public facilities and 20%, in the private sector. (See Fig: 3.1.1)

Fig. 3.1.1 Reporting of hospitalisation episodes.



Of those who were hospitalised, 85.4% had only one episode of hospitalisation. 11.0% reported to have two episodes of hospitalisation in the one year recall period. Only 3.6% reported to have been admitted three times or more in the year.

Table 3.1.1 Number of episodes of hospitalisation

No. of episodes	Persons	Episodes	%
1	419,373	419,373	85.4
2	54,274	54,274	11.0
3	11,007	11,007	2.2
4 & above	6,659	6,659	1.4
Total	491,313	559,429	100.0

58% of persons hospitalised were from the urban households compared to 42% from rural households.

Although Selangor, Perak and Johore recorded the highest number of hospitalisation episodes, these are also the most populous states. Perlis had the highest rate of hospitalisation episodes per population (61 episodes per 1000 population) as compared to the national average of 41 per 1000 population.

Characteristics of households studied included household size, household type, household ethnicity and household income group. When the percentage of utilisation of hospitalisation was examined, it was found that the proportions were closely related to the proportion of households in the particular category in the Survey. Nuclear families (59% of 599,000 episodes; they form 66% of the Survey population) and households with a household size of 5-7 (43% of 599,000 episodes; they form 41% of the Survey) constitutes the biggest proportion of users of hospitals in the year surveyed.

The Malays (62% of the 599,000 episodes; they form 61% of the Survey population) constitute the main users of hospital services; followed by the Chinese (22%), the Indians (14%) and others (2%). Households where the heads were employed in the private sector constitutes the main users of hospital services in the year surveyed where 34% of the 599,000 episodes were reported in such households. This was closely followed by households with heads self-employed (30%) and unemployed (22%). Households where heads were government employed only constitute 14% of the hospitalised episodes reported.

Rates of hospitalised episodes were highest in the extreme age-groups as seen in Table 3.1.2. The rate was exceptionally high (116 episodes per 1000 populations) in the above 55 years of age, as compared to only 19 episodes per 1000 population in the 5-14 years age-group.

Table 3.1.2 Hospitalisation by age-group

Age-group	Number of episodes	Total population	Rate per 1000
0-4	64,000	1,660,000	38.7
5-14	65,000	3,410,000	19.3
15-29	107,000	3,762,000	28.6
30-54	189,000	4,198,000	45.1
55 & above	172,000	1,480,000	116.6
Total	599,000	14,511,000	41.3

Out of the 599,000 episodes, 64 % were for medical conditions, 21 % for surgical conditions, 14% for accidents and 1% for stress or mental problems. Utilisation rates were higher in the public sector for all four types of reasons for hospitalisation.

The mean length of stay in hospitals was 7.1 days, with very small differences between the two strata (7.1 days for urban areas and 7.0 days for rural areas). States such as Negeri Sembilan (11.3 days) and WPKL (9.9 days) had longer mean length of stay compared to the national average.

The older age groups tends to spend more days in the hospital compared to the younger age-group. The reported mean length of stay per episode of hospitalisation for those aged 55 and above is 9.5 days (see Table 3.1.3)

Table 3.1.3 Length of stay by age-group

Age-group	Mean length of stay per episode (days)
0 - 14	5.5
15 - 29	6.0
30 - 54	6.9
55 and above	9.5
All ages	7.1

Nearly 80% of the episodes of hospitalisation in the year of survey were financed through out-of-pocket expenditures by the household. In the private sector, there is a slightly higher proportion of other sources of financing other than the household. There were 9,000 episodes (1.5%) that was financed through an insurance scheme (see Table 3.1.4).

Table 3.1.4 Distribution of hospitalised episodes by source of care (Numbers in thousands; denoted by “n”.)

Source of financing	Government		Private		All Sources	
	n	%	n	%	n	%
Household only	38	80.4	75	62.0	460	76.8
Employer	4	10.2	25	20.7	74	12.3
Insurance		1.1	4	3.3	9	1.5
SOCSO		1.2	1	0.8	1	0.2
Donation		0.6	1	0.8	3	0.5
Relatives	2	5.6	14	11.6	42	7.0
Others		1.9	1	0.9	10	1.7
Total	47	100	121	100	599	100

3.2 Utilisation of hospital services by source of care

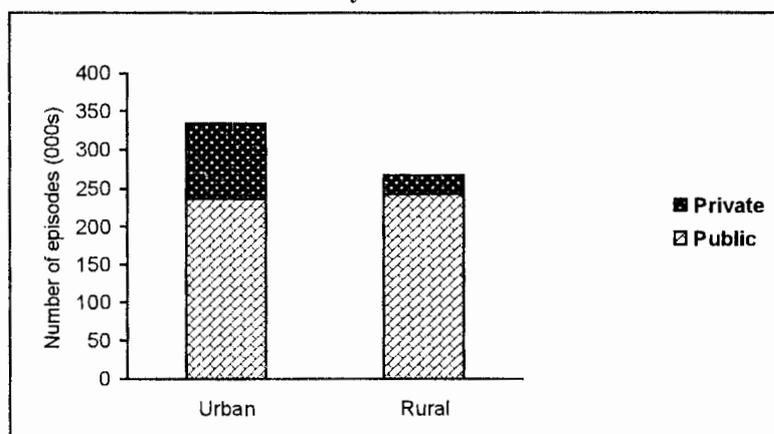
This section presents factors that are associated with the choice of public or private facilities for hospitalisation.

Utilisation was examined for five factors: geographic location, socio-economic attributes of households, heads of household and household member involved in the episode. Describing the profiles of the episodes of care at the two kind of facilities would give an impression of the characteristics of population subgroups who were more likely to choose and utilise one kind of facility over the other.

3.2.1 Utilisation of hospital services by geographical location

In urban areas, 30% of episodes were cared for in the private facilities, a higher percentage than in rural areas (10%).

Fig. 3.2.1a Utilisation of public and private facilities by strata.



Private facilities were used least in Kelantan, Perlis and Pahang. This could be because of limited availability of private facilities for hospitalisation in these states: See Appendix B. Pulau Pinang is the only state in P. Malaysia where more than 50% of episodes were cared for in private facilities.

**Table 3.2.1a Utilisation of public and private facilities by state
(Numbers in thousands; denoted by “n”.)**

State	Episodes of care at public facilities		Episodes of care at private facilities	
	n	%	n	%
Johore	58	83	12	17
Kedah	55	85	9	15
Kelantan	39	98	1	2
Melaka	17	76	6	24
N. Sembilan	28	91	3	9
Pahang	38	95	2	5
P. Pinang	25	48	27	52
Perak	74	84	14	16
Perlis	11	96	<1	4
Selangor	66	73	24	27
Terengganu	33	86	6	14
WPKL	32	65	17	35

3.2.2 Utilisation of hospital services by household attributes

Larger households used less private facilities compared to the smaller households excluding the single household. Single households were relatively lower utilisers of hospital care and as most were likely to be young adults with a single and thus lower household income, tend to utilise public hospital services.

A greater proportion of the Chinese households used private facilities compared to the other ethnic groups. Likely explanations for these differences, are that Chinese households generally reside in urban areas and have higher income, important prerequisites for using private health care.

Fig. 3.2.2a Utilisation of public and private facilities by household size

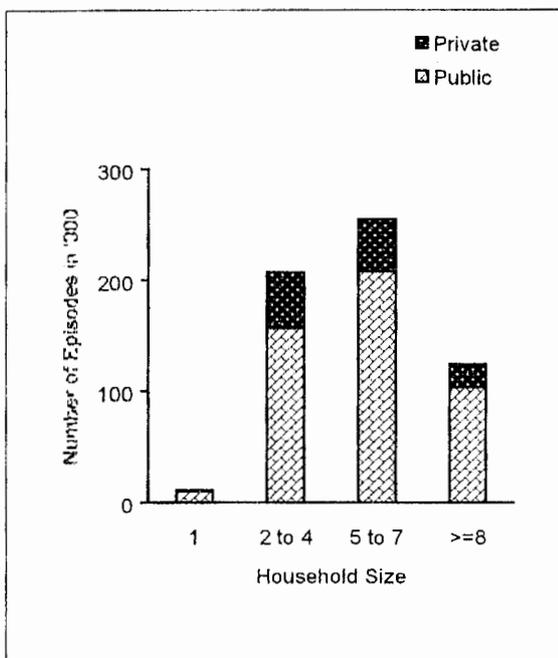
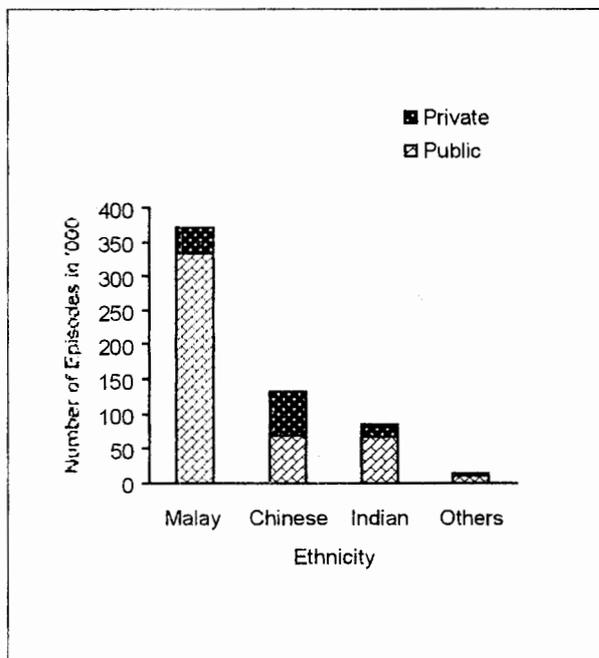
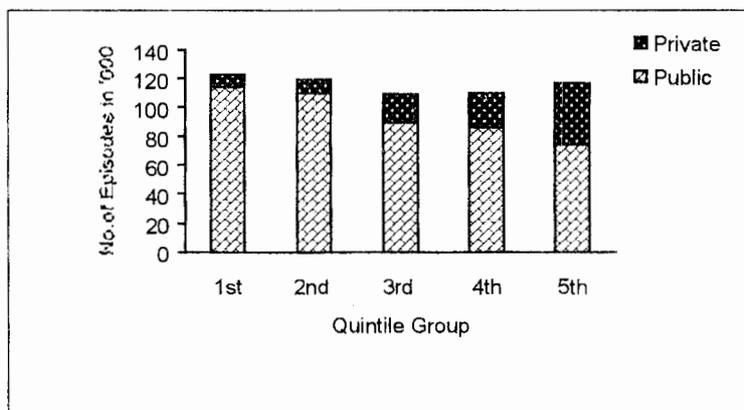


Fig. 3.2.2b Utilisation of public and private facilities by ethnicity of household



A higher proportion of households utilised public hospital care. However, the data suggests that higher household income is associated with greater utilisation of private hospital services (Fig. 3.2.2c). As household income increased, there was a corresponding increase in the proportions of household utilising private facilities.

Fig. 3.2.2c Utilisation of public and private facilities by household income quintile group.



3.2.3 Utilisation of hospital services by Head of household attributes

Approximately, the utilisation ratio for public: private services was 4:1; regardless of the age of the head of household. (Fig. 3.2.3a). Approximately, 20% of episodes were cared for in private facilities for each age-group of head of household.

The educational level of heads of households appeared to have an association with the utilisation of private services (Fig. 3.2.3b). For households headed by persons with tertiary education, the utilisation ratio for public:private services was 1:1; as compared to the other households headed by persons with lower education level where the ratio was 4:1.

Fig. 3.2.3a Utilisation of public and private services by age of head of household.

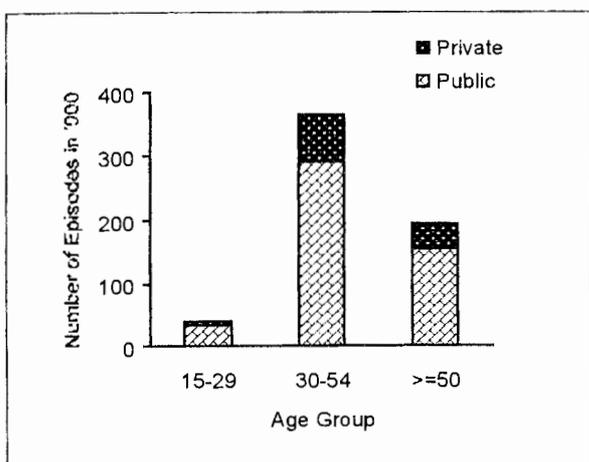
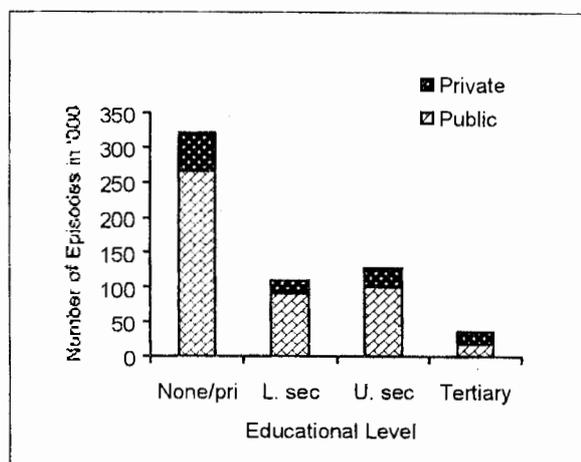
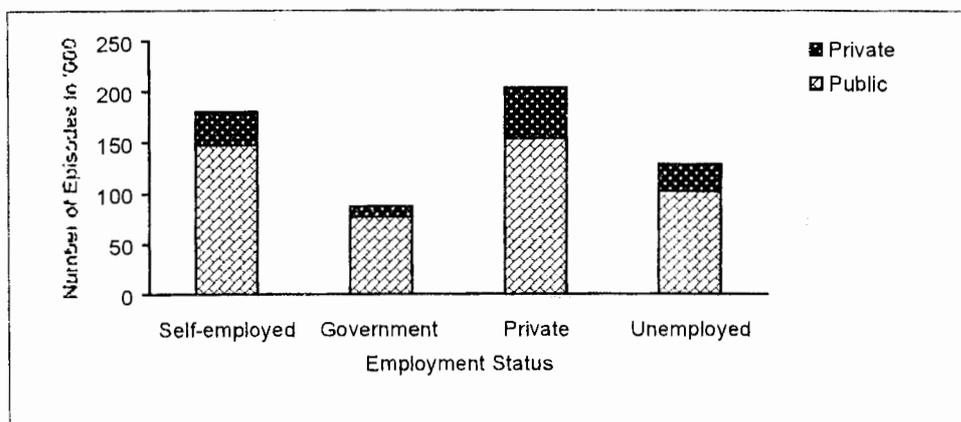


Fig. 3.2.3b Utilisation of public and private services by educational level of head of households.



Utilisation of private services were lowest in households headed by Government employees; the public: private utilisation ratio was 7:1; compared to households headed by private sector employees (3:1), self-employed (4:1) and unemployed (4:1). (Fig 3.2.3c)

Fig. 3.2.3c Utilisation of public and private services by employment status of head of households.



3.2.4 Utilisation of hospital services by Household member attributes

For both men and women, about 20% of hospitalisation were cared for in the private sector. There was a smaller proportion of episodes cared for in the private sector in the age-group 15-29; compared to those aged 30-54.(see Fig. 3.2.4a and Fig.3.2.4b)

Fig. 3.2.4a Utilisation of public and private services by gender of household member.

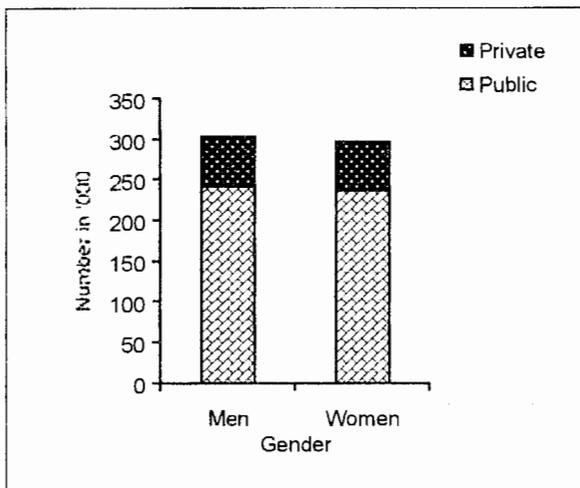
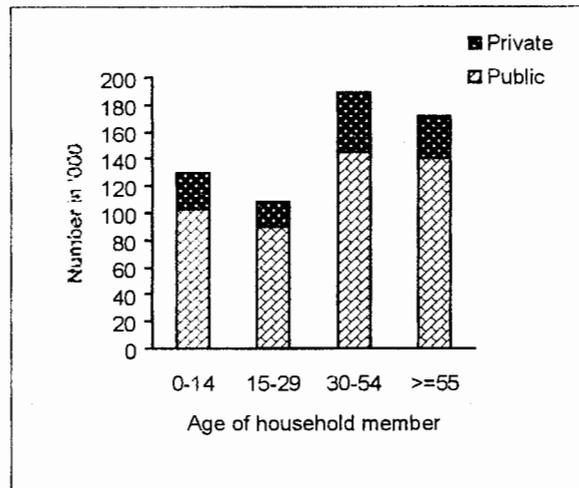


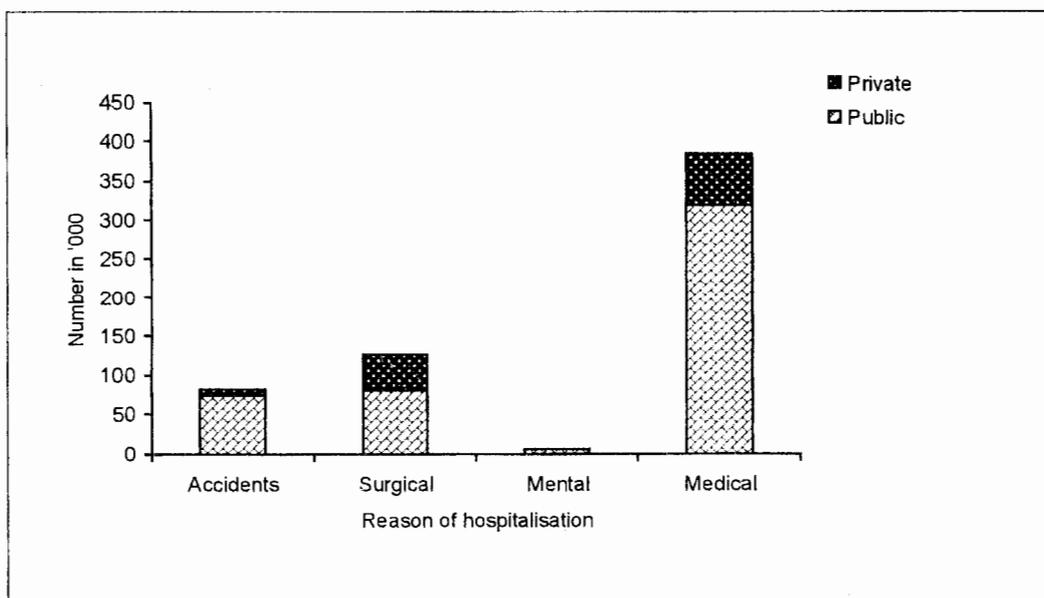
Fig. 3.2.4b Utilisation of public and private services by age of household member.



3.2.5 Utilisation of hospital services by reasons of hospitalisation

In looking at the utilisation ratio of public: private services; the demand for private services are highest in the category of problems requiring operation (surgical conditions) where the ratio is 2:1; as compared to accidents (9:1), stress/mental problems (5:1) and medical conditions (5:1).

Fig. 3.2.5a Utilisation of public and private services by reasons of hospitalisation.

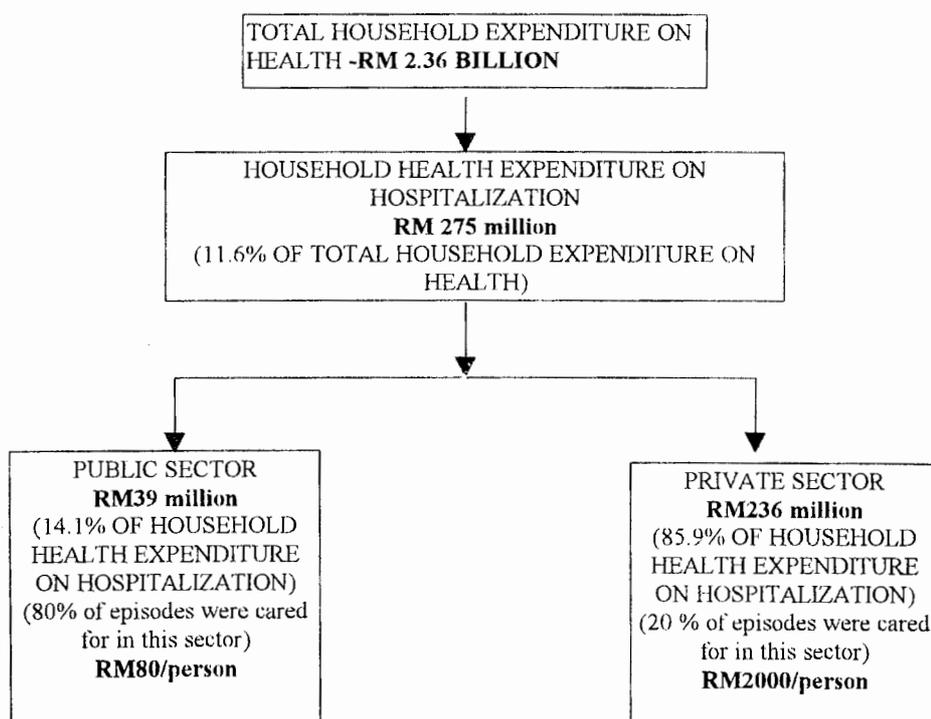


HOUSEHOLD EXPENDITURE FOR HOSPITALISATION 4

4.1 Expenditure on hospitalisation

The total household health expenditure for the weighted study population (14.5 million) in P. Malaysia was RM2.36 billion. Of this, 11.6% or RM 275 million was household expenditures on hospitalisation; see Fig.4.1a.

Fig. 4.1a Household Health Expenditure on Hospitalisation



As reported earlier, the utilisation rate was higher in the public sector; more than 80% of the episodes of hospitalisation were cared for in the public sector. However, as seen from Fig.4.1a; only 20% of the “out-of-pocket” expenditures were contributed to the public sector. This is in contrast with the private sector which catered for only 20% of the hospitalised episodes but received about 80% of the expenditures. Public hospitals in Malaysia generally are subsidised by the Government. Expenditures in the public hospitals vary according to the different classes of wards.

Mean hospitalisation expenditure per household per year was RM92 in Peninsular Malaysia (Table 4.1a). The average household health expenditure was higher only on health supplements and acute conditions.

Table 4.1a Mean of Total Health Expenditure (RM) Per Household Per Year by Type of Service/Care Sought , P. Malaysia.

Service/Care Sought	Mean
Acute condition	285.52
Hospitalisation	92.93
Pregnancy	55.91
Family planning/infertility	9.82
Medical check up	63.85
Non-hospitalisation	17.08
Health supplements. & appliance	186.94
Dental	32.64
Vision	55.44
All Types of Services/Care	800.14

The treatment expenditure which includes ward/bed charges, registration and costs of drugs and medication and nursing care, on average, constitutes more than 90 % of the household expenditure on hospitalisation. Less than 10% of the expenditure is on travelling and other indirect costs such as loss of wages.

As there were 599,000 episodes, the average expenditure was approximately RM458 per episode. The expenditure per episode was considerably higher in the private sector compared to the public sector (See Table 4.1b). Hospitalisation in the private sector is on average 24 times more expensive than in the public sector. A bigger percentage of episodes with zero expenditure were reported in the public sector. This is because public hospitals in Malaysia are subsidised largely by the Government. It is to be noted that in about 24% of the episodes which were cared for in private facilities also incurred no expenses altogether. They were subsidised by private companies or employers.

Table 4.1b: Expenditure per episode by source of care

Source of care	Number of episodes (n)	Mean expenditure per episode (RM)	Median expenditure per episode (RM)	Percentage of zero expenditure (%)
Public sector	480,000	81	15	34
Private sector	119,000	1955	900	24
Total	599,429	458	21	32

The mean expenditure per episode was considerably higher in the urban areas than in the rural. (see Table 4.1c). However, bigger percentage of episodes with zero expenditure was reported in the urban areas.

Table 4.1c: Expenditure per episode by strata

Strata	Number of episodes	Mean expenditure per episode (RM)	Median expenditure per episode (RM)	Percentage of zero expenditure
Urban	333,000	629	21	34
Rural	266,000	245	20	29
Total	599,429	458	21	32

On average, Chinese and Indians spent respectively about seven times and three times more, on one episode of hospitalisation than Malays (see Table 4.1d). A bigger percentage of the episodes with zero expenditure was reported in households of Malay ethnicity.

Table 4.1d: Expenditure per episode by major ethnic groups

	Number of episodes	Mean expenditure per episode (RM)	Median expenditure per episode (RM)	Percentage of zero expenditure
Malay	370,000	168	13	37
Chinese	132,000	1186	100	21
Indian	83,000	606	30	25

The mean hospitalisation expenditure per day in P. Malaysia was RM109 (median, RM5). The expenditure tends to be very high in the private sector; the mean hospitalisation expenditure per day in the private sector was RM480 which is thirty times greater than the mean hospitalisation expenditure in a public facility (RM16). (See Table 4.1e)

Table 4.1e: Expenditure per day by source of care

Source of Care	Number of episodes	Mean expenditure (RM)	Median expenditure (RM)
Public	476,000	16.40	4.00
Private	118,000	479.94	225.00
All Source of Care	595,000	108.77	5.35

74% of the expenditure on hospitalisation was incurred by the urban population. The mean hospitalisation expenditure per day for the urban population (RM150) was almost three times higher than the mean expenditure for the rural population (RM57) (see Table 4.1f).

Table 4.1f Expenditure per day by strata

Strata	Number of episodes	Expenditure (RM)	
		Mean	Median
Urban	320,000	150.35	6.00
Rural	264,000	56.85	5.00
All Strata	595,000	108.77	5.35

The following report looks in further detail at the expenditure on hospitalisation in the public and private sectors in the year of survey.

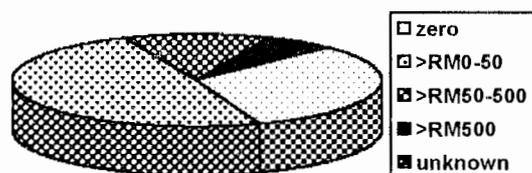
The section below describes household expenditure for hospitalisation per day at four levels: No payment (RM0), Nominal (>RM0-RM50), Commercial (>RM50-RM500), and Excessive (>RM500). (The definition of these levels is based on subjective judgement of the current rates for hospitalisation in Malaysia).

It is also hardly comparable when the causes for hospitalisation vary widely from a minor problem which requires only observation to major surgery. The reason for using per day expenditure is to allow the expenditure to be more comparable as the length of stay indirectly affects the payment charges that is billed to the patient as hospital charges at both public and private sectors are still based on daily ward charges.

4.2 Expenditure per day of hospitalisation by source of care

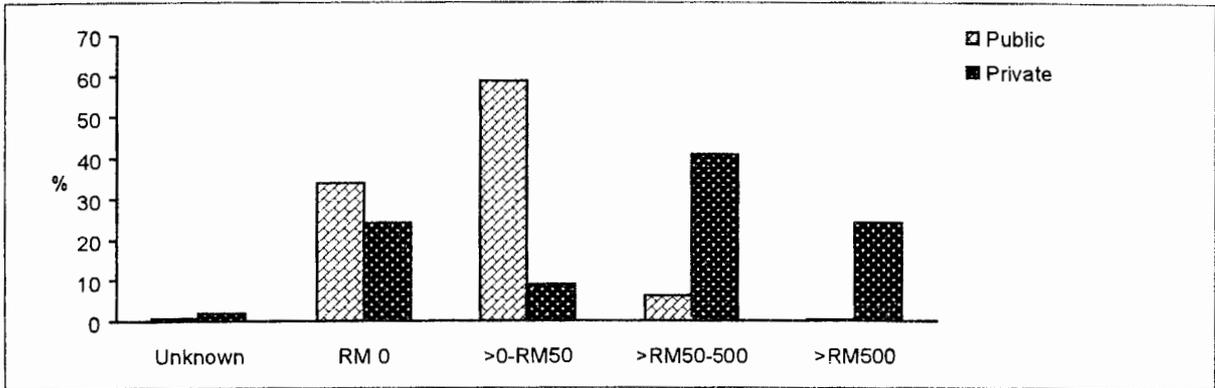
The analysis showed in 32% of the hospitalised episodes, the patient did not incur any expenses. This could be because the charges are paid by another party; that is subsidised either by the government, by the employer, or by an insurance company. A further 49% of the episodes incurred only nominal expenses, and about 14% incurred expenses at the commercial rate. Approximately 5% of the episodes incurred excessive expenses of more than RM500 a day. Reasons for this could be the application of high technological investigations and major surgery.

Fig. 4.2.1a Expenditure per day in both public and private sectors



Comparing the charges for the different sectors; public and private; for zero payment; public sector, 34% while private sector, 24%. For nominal payment; public, 60% ; private, only 9%. For payment of commercial value; public, only 6% and private, 41% and most surprisingly, for the payment which can be described as excessive; only 0.2 % of the episodes in public facilities were charged above RM500 a day, but in the private sector, more than 24% were charged at a rate of more than RM500 a day (see Fig.s 4.2b)

Fig. 4.2b Comparison of percentage of expenditures in the different sectors



4.2.1 Expenditure per day of hospitalisation by geographical location

A higher proportion of urban population compared to the rural were in the category of zero payment that is 34% for urban; and 29% for rural. However, more than 89% in the rural population paid less than RM50 compared to the urban population 74% . Around 18% of the urban population paid the commercial rates compared to only 7% in the rural population. More than 7% of the urban population paid the excessive rate of more than RM500 per day ; around 3% of the rural population also paid more than RM500 per day(see Fig. 4.2.1a and b)

This can be explained by the fact that as described in Fig. 3.2.1a (pg. 9); only 10 % of the rural population used private facilities as compared to 30% of the urban population. Out of those utilising the private sector, very few paid nominally compared to the public sector; where most of the expenditure are nominal.

Fig. 4.2.1a Percentage of expenditures in both sectors by strata

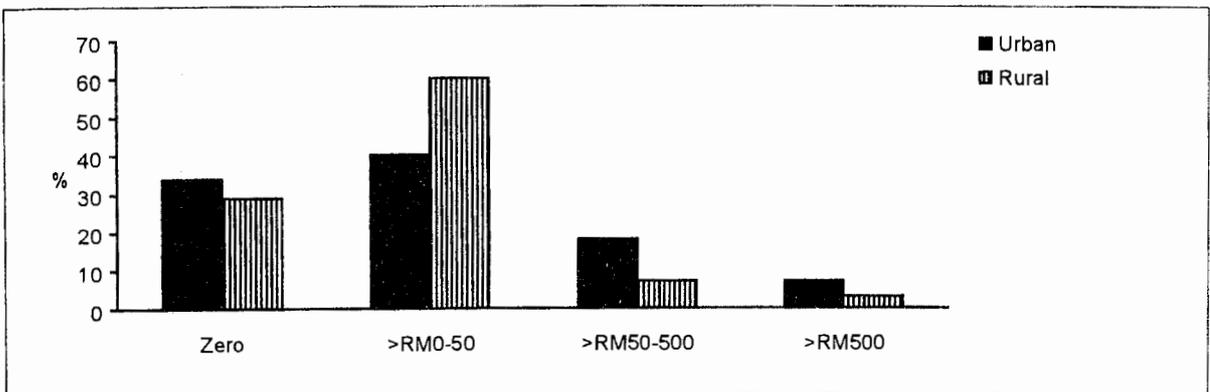
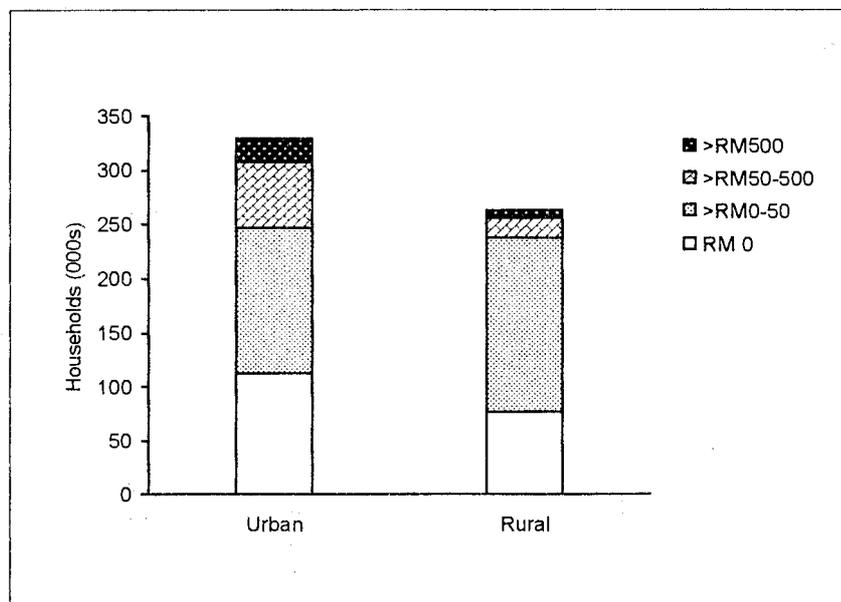


Fig. 4.2.1b Household expenditure for hospital care by strata



In P. Pinang, more than 43% hospital episodes incurred expenditure higher than RM50 per day, followed by WPKL (27%), Selangor and Johore (22% each) and Malacca (19%). These are the states where the utilisation rate of private facilities were also higher than the other states (see Table 3.2.1a (pg.10)). In Kelantan where only 2% of the population sought private hospital care; Pahang, where only 5% sought private hospital care and Perlis, where 4% sought private hospital care, more than 80% of the patients paid only nominal or zero payment for hospitalisation (see Table 4.2.1a).

Table 4.2.1a Household expenditure for hospitalisation by states in both sectors
(Number in thousands)

State	Episodes of care at various levels of expenditure							
	Zero payment		Nominal		Commercial		Excessive	
	n	%	n	%	n	%	n	%
Johore	20	28	34	49	11	15	5	7
Kedah	22	34	35	55	5	9	2	3
Kelantan	14	35	23	57	3	7	<1	1
Melaka	7	33	11	47	3	14	1	6
N.Sembilan	12	39	15	48	3	10	<1	2
Pahang	15	37	22	55	2	5	1	3
P. Pinang	9	18	18	34	20	38	5	9
Perak	28	32	49	56	6	7	5	5
Perlis	4	34	7	58	<1	6	<1	3
Selangor	35	38	38	40	16	17	4	5
Terengganu	8	20	26	66	2	5	<1	1
W.P.K.L.	17	34	20	39	8	16	5	11

Note: n denotes estimated number of episodes in thousands.

4.2.2 Expenditure per day of hospitalisation by household attributes

Only 9% of the single households with hospitalised episodes paid more than RM50 per day, compared to the bigger households (20% for HH size of 2-4; 17% for HH size of 5-7; and 20% for HH size of 8 and above). Looking at Fig. 4.2.2a; it could be said that there was no obvious effect of household size on the expenses that was incurred on hospitalisation.

Fig. 4.2.2a Household expenditure for hospitalisation by household size.

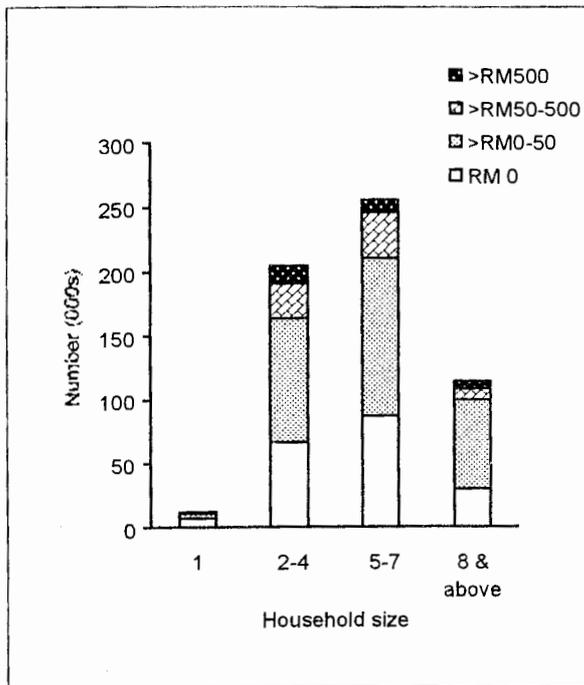
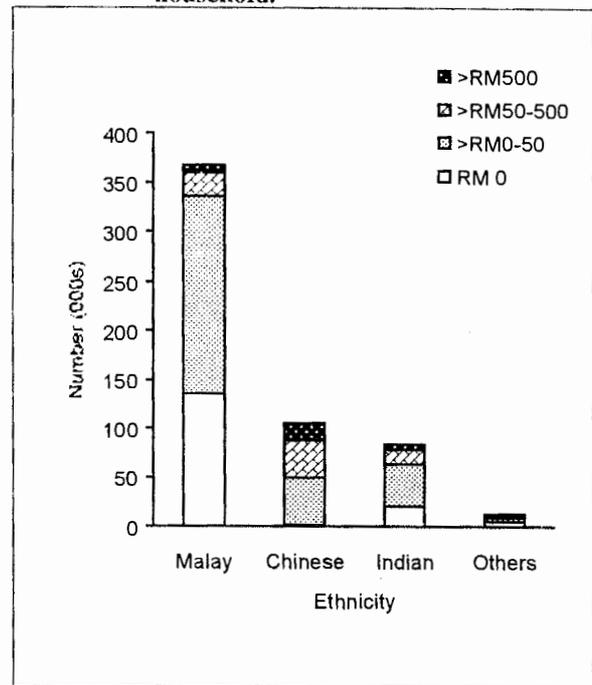


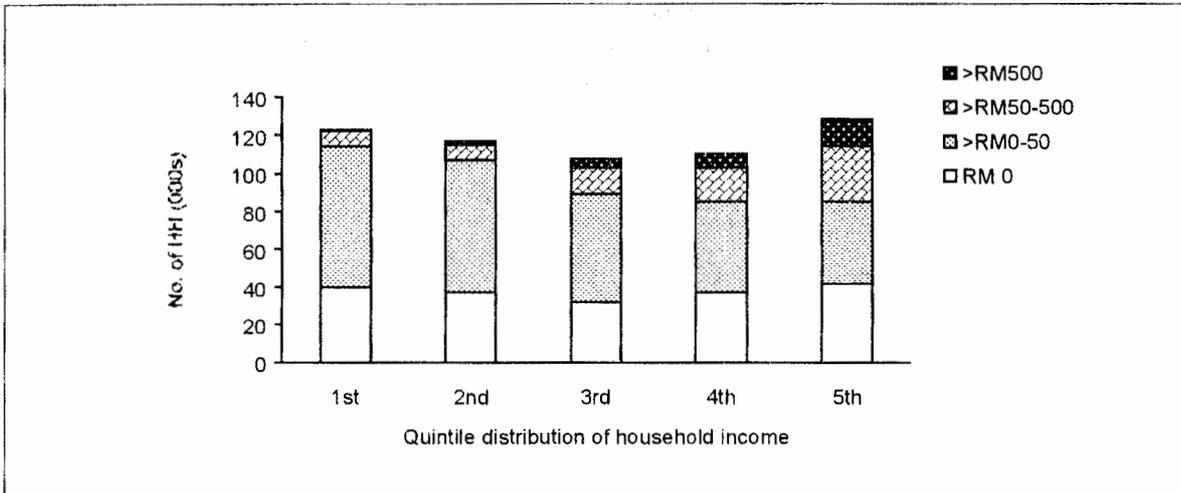
Fig. 4.2.2b Household expenditure for hospitalisation by ethnicity of household.



Of those who incurred no expenditure, 72% were Malay (Fig. 4.2.2b). Malays were also the main contributors to nominal payment charges. However, Chinese households predominate among patients with expenditure above RM50 per day .

Episodes that incurred no expenditure were evenly distributed across household income quintiles (18-22%) (see Fig. 4.2.2c). However, higher household income was associated with greater percentage of episodes with higher expenditure. It was shown that those that were charged more than RM 500 per day on hospitalisation; 47% of these episodes belonged to the highest income quintile group

Fig. 4.2.2c Household expenditure for hospitalisation by HH income quintile group.



4.2.3 Expenditure per day of hospitalisation by head of household attributes

Households headed by young persons aged less than 30 years old tended to pay less for hospitalisation than households headed by older persons. The proportion of episodes with zero or nominal expenses decreased with the age of the head of household.

Higher educational level of heads of household was associated with higher expenditure and with higher proportions of hospitalised episodes at the higher rates.

Fig. 4.2.3a Household expenditure for hospitalisation and age of the head of household

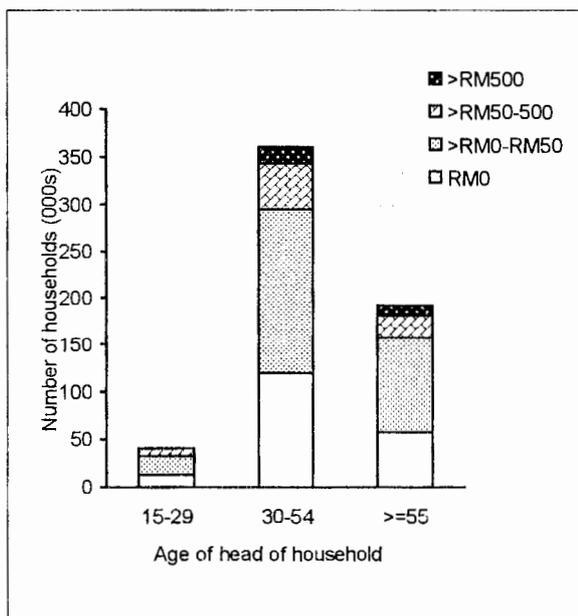
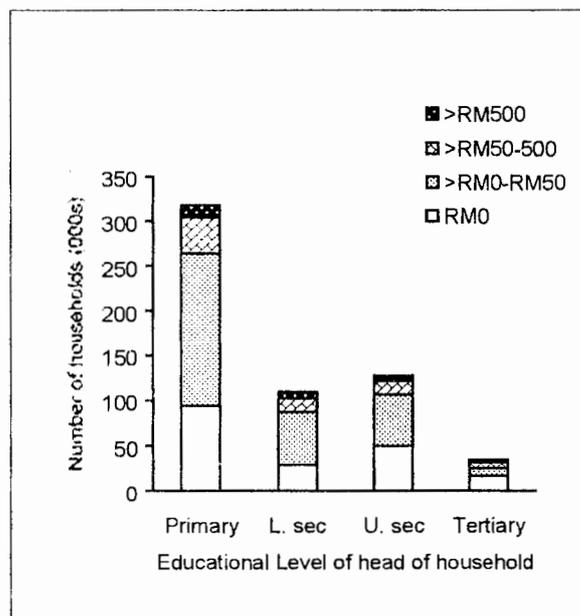


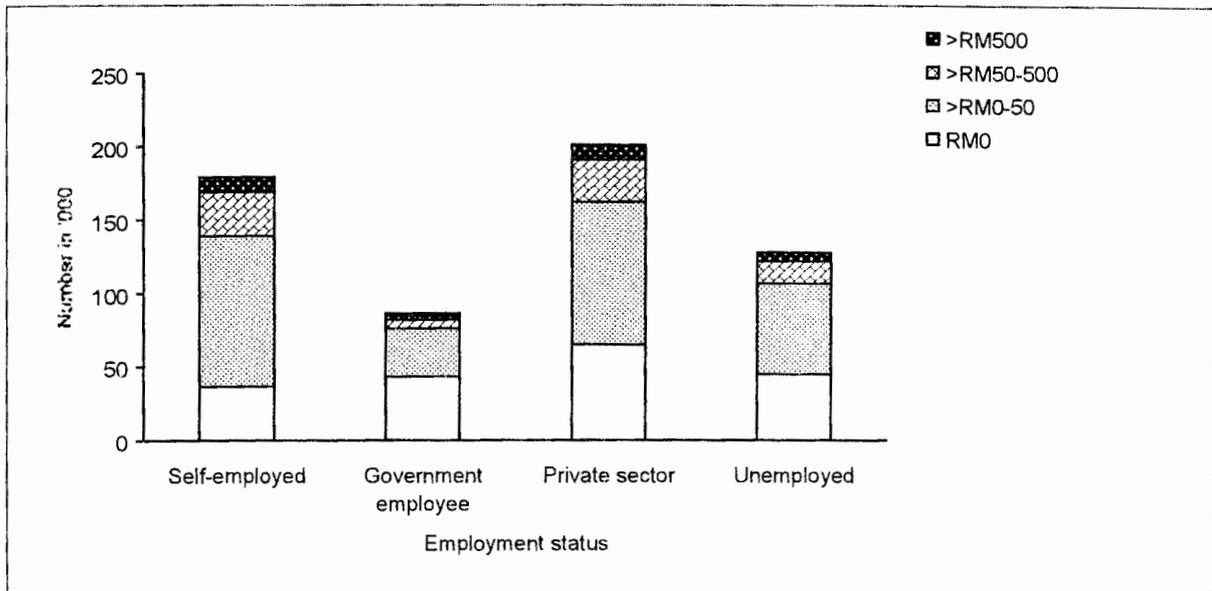
Fig. 4.2.3b Household expenditure for hospitalisation and educational level of the head of household



The majority of the households for each occupation or employment status of their heads paid only a nominal sum for hospital care. However, the biggest percentage was recorded in households where the heads were government employees; more than 87% of these household paid less than RM50 per day and nearly 50% of these household paid zero payment.

Contrary to reasonable expectations, there were relatively high proportions of episodes of hospitalisation in households with unemployed or self employed heads in the commercial and excessive categories (16% for unemployed and 22% for self-employed) of expenditure indicating higher expenditures compared to households with government-employed heads (only 12%). This could be explained by the fact that government employees and their dependants had greater access to public facilities. Households with heads employed in the private sector was reported to pay more than RM50 per day in 19% of the hospitalised episodes. This is still lower than the proportion that paid this amount among households whose heads were self-employed.

Fig. 4.2.3c Employment status of head of household.



4.2.4 Expenditure per day of hospitalisation by household member attributes

Among the household member (patient) attributes examined were income, level of education and employment status.

There seems to be an association of increasing expenses with increasing income; the highest income quintile recorded more than 13% of the episodes were in the category >RM500/day. There is also an association of increasing expenses with higher educational level of the patient. Persons with tertiary education recorded more than 19% of the episodes were in the category >RM500/day. Patients whom are engaged in the private sector also recorded around 6% of the episodes were in the category >RM500/day.

Fig. 4.2.4a Household expenditure for hospital care by income of household member.

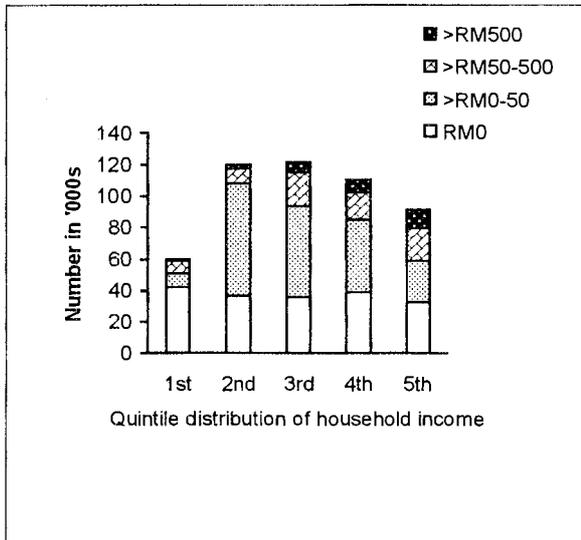


Fig. 4.2.4b Household expenditure for hospital care by employment status of household member.

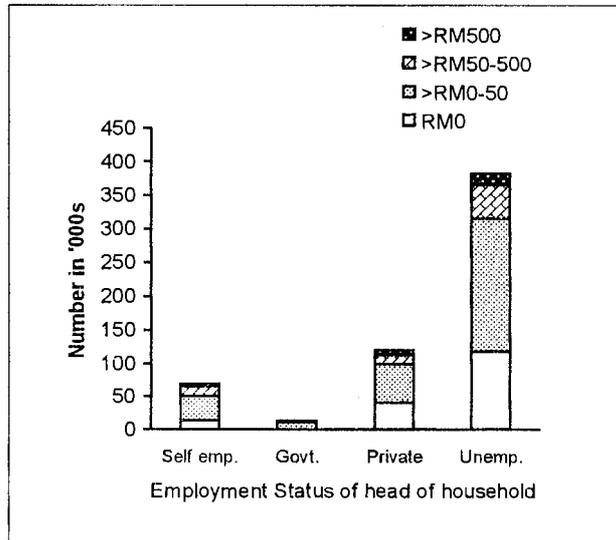
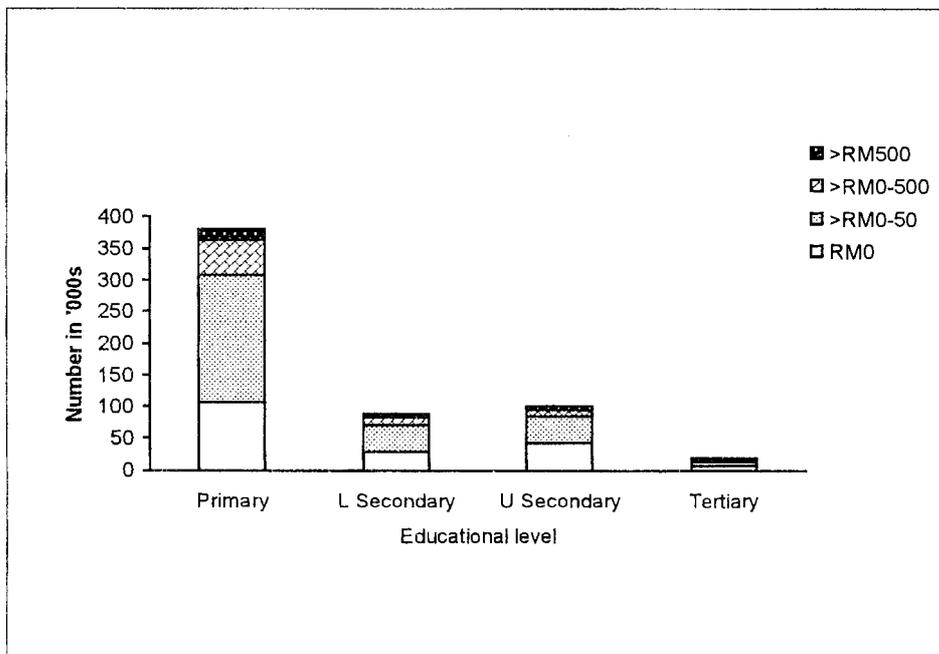


Fig. 4.2.4c Household expenditure for hospital care by education level Household member.



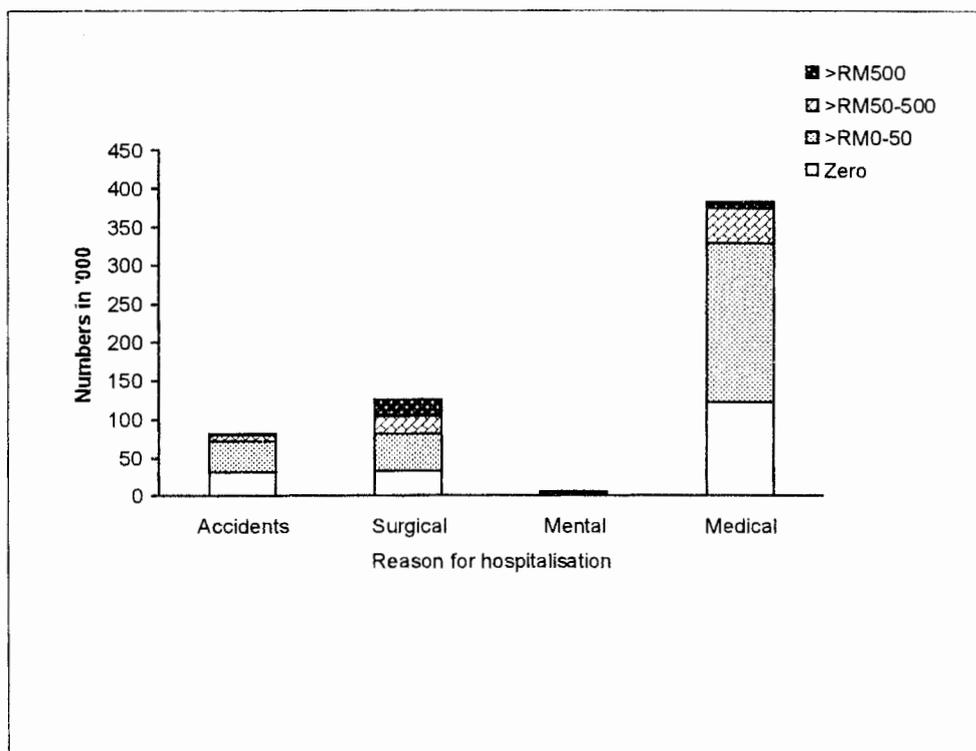
4.2.5 Expenditure per day of hospitalisation by reasons of hospitalisation

A greater proportion of episodes requiring operations (surgical conditions) involved expenditure of above RM500 a day (17%), compared to the other reasons for hospitalisation (see Fig. 4.3.1). Indeed, 36% of the episodes in this category requiring operations, incurred expenses above RM50 per day. This is most likely due to the high cost of investigations and surgical equipment.

The expenditure was much lower on episodes of stress and mental problems; 80% of the episodes due to this problem incurred payment of less than RM50 per day. More than 50% of these episodes involved no expenditure.

For episodes due to accidents, more than 85% were of no or only nominal expense. This is hardly surprising as most of the accident cases are seen at public facilities. For episodes due to problems requiring treatment only (medical conditions), more than 85% incurred no or only nominal expense. Only 1% of these episodes incurred expenses of more than RM500 per day.

Fig. 4.2.5a Household expenditure for hospitalisation by reasons of Hospitalisation.



4.3 Summary of findings

The pattern of utilisation reflects that there was a stronger preference for public facilities when hospitalisation is needed. The utilisation ratio for public: private facilities was 4:1.

By mere comparison without controlling for other variables, the utilisation of private facilities was higher in the urban areas, in more developed states (Pulau Pinang, WPKL and Selangor); in smaller households; in Chinese households; in households with higher household income; in household headed by persons with tertiary educational level and employed by the private sector; and when the reason for hospitalisation is for surgical conditions.

In contrast, the amount of out-of-pocket expenditure per episode in private facilities when hospitalisation is needed was on average 20 times more than the amount spent in public facilities. The mean out-of-pocket expenditure on hospitalisation per day in P. Malaysia was estimated to be RM109. On average, expenditure per day in private facilities was 30 times higher than hospitalisation in public facilities.

It is also notable to note that 32% of the episodes of hospitalisation incurred no expenditure at all. This could be because the charges are paid by another party; that is subsidised either by the government, by the employer, or by an insurance company. A further 49% of the episodes incurred only nominal expenses (less than RM50). This shows that more than 80% of the episodes are subsidised in some way or another.

The pattern of out-of-pocket expenditure was to a certain extent, similar to the pattern of utilisation. The expenditure was higher in urban areas, in developed states (P. Pinang, WPKL and Selangor); in smaller households; in Chinese households; in households with higher household income; in household headed by persons with tertiary educational level and employed by the private sector; and when the reason for hospitalisation is for surgical conditions.

MULTI LEVEL ANALYSIS

5

5.1 Introduction

The Survey collected data about 1878 episodes of hospitalization. Most episodes, 1541 (82%) were taken care of in public facilities. Of the remaining 337 episodes in private facilities or clinics, 126 were subsidized (by employer, an insurance scheme, or another party), so that there were only 221 unsubsidized cases (12%). However, the unsubsidized episodes account for 77% of the total *Treatment expenditure*.

The (geometric) mean of *Treatment expenditure* is RM1.46; most episodes are associated with only nominal expenses. In fact, in 815 cases (43%) *no Treatment expenditure* was incurred (in 604 cases, 32%, not even any *Total expenditure* was incurred) and in further 89 cases (5%) less than RM10 was expended. The mean for the subsidized cases is RM0.75 and for unsubsidized cases is RM682.30, almost 1000 times greater. The summaries for *Total expenditure* (including travel and other expenses) are similar; for most episodes, *Treatment expenditure* is the dominant component of *Total expenditure*. In fact, they coincide in 1341 cases (71%), and the (arithmetic) mean of the latter is only 12% greater than the mean of the former.

The (geometric) mean of *Total expenditure* is RM4.10. The subsidized and unsubsidized episodes have respective means RM2.26 and RM805.40. The discrepancy between the expenditure in subsidized and unsubsidized cases may be even more extreme because there are a few unsubsidized cases in which the declared expenditure is clearly only nominal. In fact, three records were excluded from the sub-sample of unsubsidized cases because they were associated with zero *Treatment expenditure*.

5.2 Multilevel analysis of expenditure

In the analysis of expenditure, the focus is on *Treatment expenditure*. Without accounting for the subsidy status or any other explanatory variable, *Treatment expenditure* is positively associated with *Household income*: The differences among the ethnic groups are modest relative to the other health-care sectors. After adjusting for *Household income*, Chinese are estimated to have mean *Treatment expenditure* 28 times greater and Indians 3.40 times greater expenditure than Malays. With the adjustment for *Ethnicity* the impact of *Household income* is greatly reduced; ten times greater *Household income* is now associated with only 2.17 times greater expenditure.

Two other explanatory variables of principal interest are *Subsidy status* and *Reason for treatment* (type of treatment). Of course, *Subsidy status* is highly significant (estimate 2.65, with standard error 0.14; the mean expenditure on unsubsidized cases is about 450 times greater than for subsidized cases). The differences among the four types of treatment are of little importance; the estimate for stress/mental problems (-0.632, standard error 0.444) stands out, but it is based on only 18 subjects.

Length of stay is a strong predictor of expenditure; ten times longer stay is associated with 3.55 times greater *Treatment expenditure*. The urban–rural differences in the mean expenditure are modest, amounting to estimated 1.63 times greater adjusted mean expenditure in urban areas. The expenditure (per episode) in single households tends to be lower than in families; an episode in a nuclear family involves on average 3.81 times greater expenditure and in an extended household 5.32 times greater expenditure than for a single person. Episodes in households whose head is a government employee involve 7.56 times lower expenditure than in households headed by self-employed; for households led by employees of the private sector the expenditure is 2.44 times greater than for self-employed. Expenditure on hospitalization is greater for adults than for children.

The mean *Treatment expenditure* for the unsubsidized episodes of Hospitalization is RM758.6. The most powerful predictors of the expenditure are *Length of stay*, *Household income*, and *age*. The model fit for these explanatory variables is displayed in Table 5.2.2. Ten-fold increase in *Household income* is associated with 3.05 times greater expenditure. In comparison, ten times longer stay in the hospital is associated with 5.02 times greater expenditure. The expenditure for mature adults and elderly (those aged 30 and over) is about three times greater than for children (aged 0–14), whereas the expenditure for young adults (aged 15–29) is on average about twice as large as for children.

The geometric mean of the *Treatment expenditure* for subsidized episodes of Hospitalization is RM0.75. A typical expenditure is 72.3 times greater or smaller than the mean. *Household income* is both not significant and unimportant as a predictor. For the various models fitted, ten-fold increase in *Household income* corresponds to no more than 40% greater expenditure. *Length of stay* is a much more important predictor of expenditure; ten times longer stay in (a private) hospital is associated with 4.25 times greater expenditure. Stress and mental problems are associated with much lower expenditure than other conditions (about 10 times), although the difference is estimated with little precision because there are only 14 cases in the analyzed data set.

Chinese tend to have greater expenditure than the other ethnic groups. The expenditure of members of households headed by government employees or unemployed is substantially lower on average (about 8 times) than for other households. For family members, the expenditure tends to be greater (about 5 times) than for single patients. Expenditure tends to be lower for children and young adults than for mature adults or elderly, to a slightly lesser extent than for subsidized episodes.

5.3 Multilevel analysis of utilization

Although it is reasonable to expect that *Household income* would be a principal determinant of the choice of private health care, in reality their association is very weak after adjusting for other relevant variables. Private care is chosen more frequently in urban than in rural areas. The choice of private care is greatly influenced by the *Type of treatment* required.

The Chinese stand out as having much greater preference for private care than the other ethnic groups. *Educational level* of the head of household is also strongly associated with the choice of private care. There is a weak indication that private care is preferred for children (0–14 year-olds) over adults. There is substantial variation among the states in the probability of choosing private care for hospitalization.

5.4 Conclusion

By definition, hospitalization involves only two sectors: private and public. There is a vast discrepancy in the expenditure incurred at public and private facilities. This is further accentuated when subsidized cases (all episodes in public facilities and those in private facilities that were not paid for entirely by the patient) were contrasted with unsubsidized cases (episodes in private facilities that were paid for solely by the patient). The analysis of expenditure for all the hospitalization episodes is greatly distorted by the large number of cases with zero recorded expenditure. Even after controlling for (matching on) background variables, unsubsidized hospitalization involves 450 times greater expenditure than subsidized hospitalization.

Apart from *Subsidy status*, *Length of stay*, *Ethnicity*, *Household type*, and *Employment status* of the head of household are the most important predictors of expenditure. The expenditure of Chinese is on average about five times, and of the Indians about twice as high as that of Malays. The expenditure of family members is 4–5 times greater than for single patients. Members of households headed by government employees or unemployed tend to have expenditures around 7 times greater than those in households headed by self-employed. Members of households headed by private employees are an intermediate case; their expenditure is on average 2.5 times greater than for self-employed.

Expenditure on hospitalization tends to increase with age, both for all episodes of hospitalization, and for unsubsidized episodes. The expenditure of mature adults (30–54 years of age) and elderly (55 years of age and over) is about three times higher than for children (aged 0–14). *Length of stay* is an important predictor for unsubsidized cases also; ten times longer stay in the hospital is associated with about five times higher expenditure.

The adjusted expenditure varies only moderately across the districts, but there is a great deal of unexplained episode-level variation; a typical unsubsidized episode is associated with expenditure about 20 times greater or smaller than the prediction. For subsidized cases, this variation is much greater, but of much lesser consequence since the expenditure for most episodes is only nominal.

The pattern of utilization reflects to some extent, but not perfectly, the pattern of expenditure. Thus, members of households headed by government employees have strong preference for public facilities, while Chinese have an even stronger preference for (higher probability of choosing) private facilities, even after adjusting for other important factors. Higher educational level (of the head of household) is associated with greater preference for private hospital care.

For operations, there is a strong preference for private care, and for accidents a strong preference for public hospital care. The longer the (anticipated) stay in hospital the stronger the preference for public hospital. In rural areas, the adjusted probability of choosing public hospital is greater than in urban areas. The difference of the probabilities is of the same magnitude as that associated with ten times longer stay in the hospital (around 0.10). Even after adjusting for all the factors listed, there is a substantial variation among the states.

CONCLUSIONS AND IMPLICATIONS 6

The development of health services without a comprehensive plan directed towards actual need may be very costly indeed, both in health and money. The goal of resource allocation decisions is to maximise output and promote equity. There has been a paucity of data on hospital expenditures in Malaysia. In addition, very little effort has been devoted to understanding the allocation of resources within the political and epidemiological environment. There will have to be the development of methods by which the resources can be allocated based on the existing situation and national priorities. This type of analysis will require examination of several categories of resources: financial, capital and human. Little study has been done on how the planning and allocation of hospital resources influences access to and equity of hospital services. For instance, the number, location and type of hospitals financed have an effect on the population's ability to use those services, and the degree of specialisation will define how large a population is served. These factors can and should be included in allocation decisions if they are specified as policy objectives for the health system.

To improve allocation of resources for hospitals in developing countries will require that there be analysis of economic data concerning hospitals and an understanding of the underlying economic concepts, processes and interactions. Also, decision-makers will have to be familiar with the national budget process and political context if the outcomes of planning are to be realistic and viable. It is also realistic to say that decision-makers must also be sensitive to the needs of the consumers, as consumers are potential voters to the government. This report thus provides the decision-makers with the profile of users of hospital services in P. Malaysia.

6.1 Implications on "Corporatisation of Public facilities"

More than 80% of all the hospitalisation episodes in the one-year study period occurred in the public hospitals. This finding shows that the public hospitals are easily accessible and very much accepted by the population at large in Peninsular Malaysia. Therefore it is suggested that any health sector reform in the future must ensure that good accessibility is still maintained and improved further. Also, any changes in the health care system that will affect acceptability of the system by the consumers must be instituted in such a fashion that will not reduce acceptability of the future health care system.

The data that has been generated through this nation-wide study has inevitably confirmed that the disadvantaged groups in the population are the ones currently utilising public facilities when hospitalisation is deemed needed. The rural population from less developed states, large families, Malay households, lower household income and lower educational levels are shown to have less preference for private facilities. The reasons for this are not clear from this survey but it can be said that there is a relationship between purchasing power (rural population, Malays, large families have relatively lower purchasing power) and utilisation ratio of public: private facilities.

Looking at the higher preference of private facilities in certain population groups such as households of Chinese ethnicity, higher educational level and urban population, it can be said that this could be related to higher expectations and higher amount of disposable income. The irony is when a situation of capitalism and market forces arise and thus opportunistic private-for-profit health care providers

will emerge to provide services to these groups of population; which if not balanced by any government intervention will leave the disadvantaged further inaccessible to similar facilities.

This is where the policy planners will have to create a balance in which both disadvantaged groups and the more advantaged groups are to be served if the "Health for All" slogan is to be carried on. The current concept of corporatising or privatising public health hospitals will have to take into account the needs that have been exposed through this study. The population likely to be most affected would be the disadvantaged groups, as they would not have the chance to make choices. They would inevitably either defer seeking treatment till it is too late or seek treatment elsewhere in other forms of alternative medicine that would jeopardise the otherwise impressive records of health status currently achieved in our country.

Corporatisation of public facilities can be carried out in certain districts where the population are less disadvantaged urban areas with majority Chinese of higher educational status as an example. These hospital charges can be at commercial rates if the services are of acceptable standards to the community. To be more equitable, these corporatised hospitals can have a "public wing" to provide services for the disadvantaged groups who are present in these areas.

6.2 Implications on "Health Care Financing Policy"

Public facilities in general, have relied almost exclusively on government financing of recurrent and capital costs for hospitals. As a result of economic realities and the limitations of government financing, the government recognised the need to find alternatives to public general revenues for the financing of health services. User fees, health insurance and compulsory savings are among the options discussed and mentioned for hospital services.

The study revealed that out-of-pocket expenditures were roughly thirty times higher in the private facilities for hospitalisation as compared to hospitalisation expenditures in public facilities. This definitely shows that in terms of monetary affordability, private facilities for hospitalisation purposes are only accessible to a small group of population. To enable the private sector to be more accessible to more groups of population, the government will have to regulate and monitor the prices and charges, which are currently unsubstantiated and left unchecked by a neutral third party. Another way of controlling prices in the private sector will be through having standard payment schemes based on procedures done and diagnosis made. Basic or essential packages can be instituted whereby the costs and charges on these packages will not be influenced by where the source of care is given and regardless of the differences in the degree of added luxury of the services, the prices of these basic packages remain equal.

Also revealed from this study, on average, the out-of-pocket expenditure for public facilities were approximately RM80 per person hospitalised; which is twenty five times less compared to the private sector where the out-of-pocket expenditure on average was calculated to be RM2000 per person hospitalised. The mean out-of-pocket expenditure on hospitalisation per day at a public hospital was revealed to be as low as RM16 with 50% of them actually paying less than RM4. If there were suggestions to increase the user charges to an amount nearer to the average out-of-pocket expenditure on hospitalisation at both public and private sources of care; which was calculated to be RM100 then this would mean a six-fold increase in out-of-pocket expenditure of the user. How would this influence demand and acceptability of the health care system is one of the many issues to be tackled prior to setting new charges.

It is also seen that out-of-pocket expenditures in the two sectors are overwhelmingly different; as such, it is possible to connote that there is over-subsidisation in the public sector. As the government is under a lot of economic constraints and resources for health services are limited, the government should continue to look at ways of reducing subsidisation of the public hospital services in the country without shifting the burden to the consumers wholly.

At the current rate of cost recovery of public facilities being as low as 5% (MOH, 1994); user charges might not seem to be the most efficient and equitable method of hospital financing in Malaysia. The primary justification provided for introducing or increasing user charges for hospital services is their ability to achieve efficiency, equity and revenue goals (Griffin, 1988). There are possible efficiency gains and equity may be enhanced by cross-subsidisation to improve utilisation by low-income groups and correct any regressive elements in current fee structures or facility locations. Likewise, fees may have adverse effects on equity by creating access barriers for the poor. Thus, a study on user charges and its effects on elasticity of demand are envisaged; so as to predict an outcome if user charges are imposed on the users of public facilities.

The study also revealed that when the expenses are paid by someone else, there is a higher preference for private facilities for hospitalisation. This shows that if the privatisation policy is to be a reality in the health sector and acceptable to the population at large, a health-financing scheme must first be in place prior to the implementation of the policy. It would be easier for the population to accept corporatization or privatisation of the public hospitals if the financing scheme ensures equal coverage in both sectors.

Insurance is a means for spreading the risk for the high cost of hospital services due to the unpredictability of the need for hospitalisation of any particular individual. Designing an insurance scheme that meets certain social objectives is extremely complicated because of the incentives created on both the demand and supply side of the market for hospital services. Private health insurance covers only a small segment of the population where only 3.4% of the population in P. Malaysia are covered in this scheme. This survey revealed that out of 599,000 episodes of hospitalisation in the year of survey, there were 9,000 episodes or only 1.5% of the episodes, which was financed through an insurance scheme. This is revealing information of the state of acceptance to insurance schemes in P. Malaysia currently.

Health insurance under social security can be developed at this stage but there were problems associated with equity (access) and efficiency (duplication of services, diseconomies of scale) as noted by McGreevey (1990). There is a need for the country to define our priorities and develop criteria for health insurance schemes before they are designed. This will preclude the need to adjust the schemes numerous times because of unintended or undesired results.

A health financing scheme that would probably be easier to be accepted by the population would be 'employment based' whereby more than a third of the population as shown by the study is currently covered by this scheme. A health savings scheme or a social/national health insurance will also be acceptable, as there will be contributions made by both the individual and the employer. A savings scheme would also encourage the individual to maintain his /her health to prevent these savings draining out due to treatment of ill health.

6.3 Directions for the future

A number of actions may be taken by governments and related agencies to ensure that the process of change in the management and financing of hospitals achieves its objectives. The implications regarding resource allocation can only be addressed; once issues such as the role of the hospitals, information about hospitals, hospital performance indicators and hospital management capacity are improved.

In Malaysia, there are large gaps in the available information on hospitals, their resources and their output. The pressing need is for reliable country based information as well as cross-national information gathering and information. Improved information about hospitals is needed for policy, planning and management decisions. The general categories of information needed are hospital resource allocation patterns, hospital income and expenditure patterns, and hospital recurrent and capital costs and hospital performance relative to ownership. Coupled with those information outlined above, this study will provide decision makers the tool to effectively improve the hospital's operation as well as in the general planning of the hospital sector in Malaysia.

The study also revealed that more than 60% of those who were hospitalised in public hospitals still paid out-of-pocket for these services. This, however nominal will pose a burden particularly to the indigent if a health financing scheme is not instituted before rising costs of health care occurs in this country; which if left unchecked will lead to the decadence of the health of our nation.

In conclusion, for the health care sector to progress in Malaysia; there must be integration of both the public and the private sectors to form a National health care system with the same objectives and mission stated in both sectors. This National health care system can be managed in the manner of a true not-for-profit Health Maintenance Organisation. This can be financed through compulsory savings or a national based social health insurance kind of financing schemes that will allow the healthy to be rewarded for maintaining their health and the sick to continue to seek treatment at hospitals, be it public or private, without being affected too greatly in the process.

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Appendix A

Table A: Mean Health Expenditure (RM) Per Person Per Year by Type of Service, P. Malaysia.

Type of Service	Mean Health Expenditure (RM)			
	Treatment	Transport	Others	Total
Acute	49.41	2.64	6.04	58.09
Hospitalisation	16.96	0.31	1.64	18.91
Pregnancy	9.93	0.20	1.25	11.38
Family Planning/Infertility	1.95	0.03	0.02	2.00
Medical Check-ups	11.05	0.84	1.10	12.99
Non-hospitalisation	3.13	0.22	0.13	3.48
Health supplements & appliances	37.92	0.10	0.02	38.02
Dental	6.33	0.10	0.21	6.64
Vision	11.15	0.08	0.04	11.27
All Types of Services	147.82	4.52	10.45	162.79

Appendix B

Table B: Number of beds in registered private hospitals by state (1985 and 1995)

State	Number of beds	
	1985	1995
Johore	232	600
Kedah	80	262
Kelantan	-	10
Melaka	69	603
N. Sembilan	70	78
Pahang	47	97
P. Pinang	635	1351
Perak	531	717
Perlis	10	-
Selangor	**	1044
Terengganu	19	21
WPKL	1866	1875
P. Malaysia	3559	6658

** included in WPKL's figures

Source: Amalan Perubatan, KKM, 1996 report

ANNEX C

NATIONAL HOUSEHOLD HEALTH EXPENDITURE SURVEY 1996 (NHHES'96)

PENINSULAR MALAYSIA

Maternity Care

Report of Findings

**NHHES'96 TEAM
DEPARTMENT OF SOCIAL AND PREVENTIVE MEDICINE
FACULTY OF MEDICINE, UNIVERSITY OF MALAYA**

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INTRODUCTION

1

Reproduction is one of the functions of all living beings and is crucial for the maintenance of the human species. Reproduction also implies extra health needs for women as they require, in addition to the general health needs, health care specific for reproduction. In Malaysia, "normal deliveries and complications of pregnancy" are the main causes of admission to public hospitals whilst antenatal and postnatal check-ups together form the bulk of outpatient care in public hospitals and clinics.

This report contains information on household expenditure for maternity care. The data forms part of a larger data set collected under the National Household Health Expenditure Survey 1996.

Purpose

In line with the national survey, the aim of this report is to provide baseline information on household expenditure for maternity care and on some aspects of the utilisation of maternity services in Malaysia. Demographic, social, economic and health factors that were hypothesised to be associated with these expenditures were investigated.

Specifically, this report addresses the following questions:

1. Where did individuals seek maternity care?
2. What factors were associated with the choice of source of care?
3. How much did households pay when a household member sought maternity care?
4. What factors were associated with household expenditure for maternity care?
5. What was the total household expenditure for maternity care in the country in 1996?

It is also hoped that this report will provide baseline data necessary to gauge the current state of utilisation of both the public and private facilities for maternity services in P. Malaysia. Coupled with other studies and data, the report on household expenditures on hospitalisation may shed some light of the state of expenditure that is imposed on the population by the increasingly popular private sector. This might help policy makers and the monitoring agencies in auditing the prices that currently prevail in the health sector market.

As the data for P. Malaysia is population based and cross-sectional, it is hoped that in the future, time-series expenditure patterns can be collected to allow for more complex modelling and evaluation. It is also envisaged that together with other studies, it will be a resource for policy makers in the construction of evidence-based policies in the future.

METHODS

2.1 Introduction

The National Household Health Expenditure Survey (NHHES'96) covered the whole of Malaysia. However, only the population residing in non-institutional living quarters (private living quarters) were canvassed. Details of the method utilised in the Survey are given in the General Report.

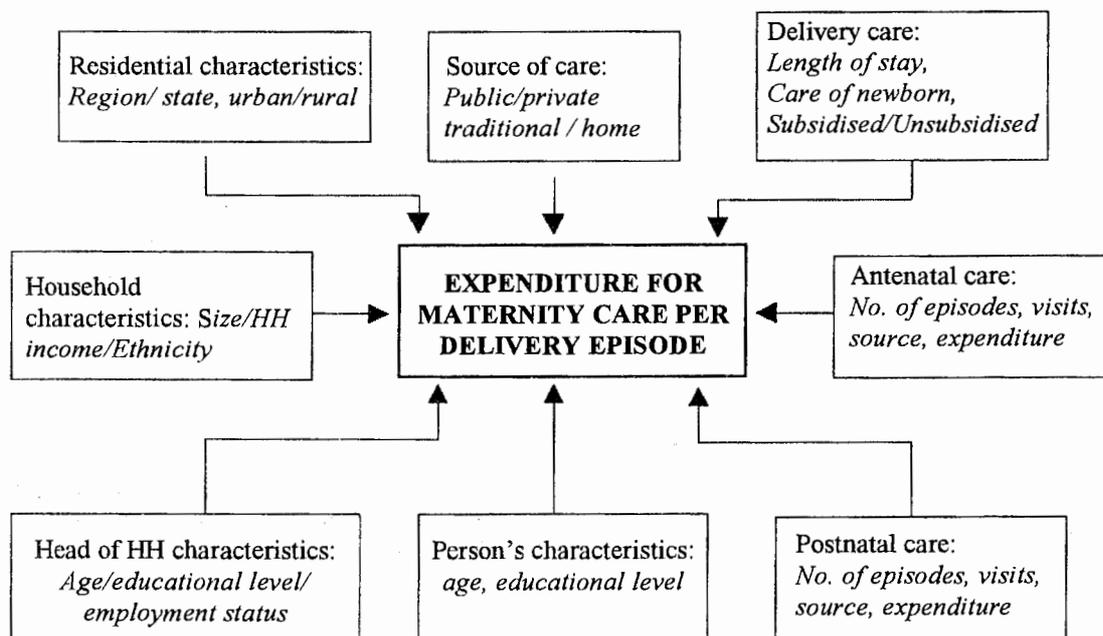
2.2 Survey instrument

In principle, the instrument designed to collect information on maternity was similar to the other sectors of health. Form 5 of the survey instrument was used to collect information on maternity care (Appendix 1).

2.3 The research database

The database was constructed and analysed to address questions relevant to policy issues in the context of household expenditure on maternity care. Figure 2.1 represents a conceptual framework of the possible factors that may be associated with this expenditure.

Figure 2.1 A conceptual model to explain household expenditure for maternity care



In this survey, the respondents were asked if anyone in the household had a pregnancy which resulted in a "delivery episode" in the last one year. A *delivery episode* was defined as an event leading to the termination of a pregnancy, whatever its outcome, be it live-birth, still-birth or abortion. Each delivery episode has one *source of care* (private, public or home/traditional source) defined by the facility which the delivery took place. The date of delivery was recorded to ensure that it was within the one year recall period. Pregnancies still in progress were not included.

Each *maternity care* involved care at several points in time. Care during a delivery was defined as *delivery care*. Care received before and after a delivery episode was defined as *antenatal care* and *postnatal care* respectively. Both *antenatal* and *postnatal* care can be obtained from various sources (private, public or home/traditional sources) and a woman may have one or several episodes but also none of either type of care. Some episodes of antenatal or postnatal care may also involve hospitalisation.

Details of *source of care* utilised as well as *expenditure incurred* for antenatal, delivery, postnatal and neonatal care involved in the pregnancy were recorded. For each *episode* of care the number of visits to a specific health care facility was recorded. For example, if a woman attended antenatal check-up at a public facilities five times, and subsequently a private clinic for three times, then she is considered to have had two episodes of antenatal care consisting of eight antenatal visits and a mean number of four visits per episode.

Delivery expenditure can be classified as *subsidised* or *unsubsidised*. An *unsubsidised* delivery is a private delivery which was solely paid for by the household. Any other delivery is regarded as *subsidised*. This includes deliveries at a public hospital and those paid by employer or other sources. Subsidised delivery expenditure is usually minimal and does not reflect the actual cost of care. Unsubsidised delivery expenditure gives a more accurate reflection of actual delivery cost.

As payment made for a delivery or postnatal episode may also involve expenditure for the newborn and cannot be easily separated out, the recorded delivery and postnatal expenditure may be inflated. The actual expenditure for the mother alone for delivery and postnatal care cannot be established. The mother was also asked whether the baby remained in the hospital after the delivery and, if so, details of its extra length of stay and cost were obtained.

This report summarises the survey findings about maternity care. It describes the findings for Peninsular Malaysia. Further analysis using multi-level modelling techniques was also done on the data for Peninsular Malaysia. Findings for Sabah and Sarawak are given in a separate report.

FINDINGS AND DISCUSSION

3

3.1 Introduction

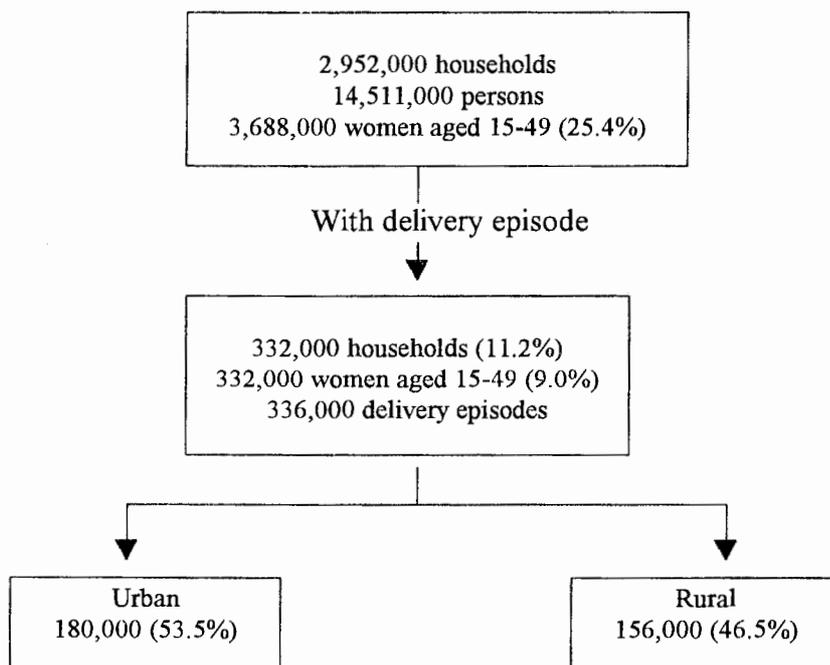
This chapter summarises the survey findings about maternity care in Peninsular Malaysia. It first describes the characteristics of the women with a delivery episode. The utilisation pattern and the expenditure incurred for the maternity episodes are the main focus of the report.

The sample survey involved a multi-stage random sample with unequal weights that ensure a good representation of households in Peninsular Malaysia by strata and states. To avoid a clutter of digits, and to better reflect the uncertainty about each summary (estimate), all estimates of numbers of episodes are rounded off to the nearest thousand and the mean expenditure will be given to the nearest Ringgit Malaysia (RM).

3.2 Women With Delivery Episodes

The study population consisted of 14,511,000 persons in 2,952,000 households. Out of this, 3,688,000 (25.4%) were women in reproductive age group (15-49 years). See Figure 3.1 below.

Figure 3.1: Women with delivery episodes in the survey



Out of the 3,688,000 women aged 15 – 49 years, 332,000 (9%) women had a delivery episode in the last year involving 332,000 (11.2%) households. Ninety-nine percent of women had only one delivery episode. There were 336,000 deliveries by 332,000 women from 332,000 households (Figure 3.1).

3.3 Maternity Care

In this section, we give estimates of the number of deliveries and of their distribution with respect to various demographic variables (Table 3.1 and 3.2). Antenatal and postnatal care received prior to and after the delivery is also summarised and discussed.

180,000 (53.5%) of the deliveries were from urban households and 156,000 (46.5%) were from rural households. The General Fertility Rate (GFR) which is the rate of deliveries per 1000 women aged 15-49 years was higher in rural areas (140.1/1000) than in urban areas (82.1/1000).

The highest rates of delivery were in the states of Kelantan (129.8/1000 women aged 15-49), Trengganu (124.4/1000) and Pahang (102.0/1000); and the lowest rates were in Pulau Pinang (63.0/1000) and W.P. Kuala Lumpur (70.3/1000).

Table 3.1 Number, Percentage and Rate of Deliveries by Strata and States, P. Malaysia.

Location	Deliveries		Women aged 15-49 Number	GFR
	Number	%		Deliveries per 1000 women aged 15-49
Strata				
Urban	180,000	53.5	2,190,000	82.1
Rural	156,000	46.5	1,498,000	140.1
States				
Johor	51,000	15.2	527,000	97.7
Kedah	33,000	9.8	345,000	94.9
Kelantan	34,000	10.1	263,000	129.8
Melaka	12,000	3.6	151,000	76.7
N. Sembilan	16,000	4.8	185,000	85.3
Panang	24,000	7.1	242,000	102.0
P. Pinang	18,000	5.4	290,000	63.0
Perak	34,000	9.8	430,000	78.4
Perlis	4,000	1.2	47,000	92.9
Selangor	63,000	18.8	694,000	90.6
Terengganu	23,000	6.6	184,000	124.4
W.P.K.L.	23,000	6.9	331,000	70.3
Total	336,000	100.0	3,688,000	91.5

Table 3.2 Number, Percentage and Rate of Deliveries by Characteristics of Women and Households , P. Malaysia.

	Deliveries		Women aged 15-49	GFR
	Number	%	Number	Deliveries per 1000 women aged 15-49
Age- Group of Mother				
< 20	6,000	1.9	711,000	8.8
20 - 29	171,000	50.9	1,144,000	149.2
30 - 39	136,000	40.6	1,026,000	133.0
40 - 49	22,000	6.6	807,000	27.5
Ethnicity				
Malay	248,000	73.8	2,193,000	113.1
Chinese	54,000	15.9	1,013,000	52.9
Indian	28,000	8.5	418,000	67.9
Others	6,000	1.8	65,000	90.3
Educational Level of Mother				
None/Primary	86,000	26.1	1,073,000	81.6
Lower Secondary	93,000	7.6	917,000	101.1
Upper Secondary	133,000	39.5	1,422,000	93.3
Tertiary	21,000	6.1	255,000	80.8
Unknown	2,000	0.7	22,000	101.5
Employment Status				
Not employed	213,000	63.6	2,138,000	99.8
Government	36,000	10.6	236,000	150.8
Private	87,000	25.8	1,315,000	66.0
Household Size				
2 - 4	98,000	29.0	1039,000	93.9
5 - 7	153,000	45.6	1801,000	85.1
8 & above	85,000	25.4	822,000	103.5
Household Type				
Nuclear	209,000	62.2	2416,000	86.4
Extended	127,000	37.8	1245,000	101.9
Annual Household Income Quintile Group				
1 st 20%	49,000	14.6	478,000	102.8
2 nd 20%	69,000	20.6	666,000	103.7
3 rd 20%	71,000	21.3	764,000	93.5
4 th 20%	71,000	21.1	818,000	86.7
5 th 20%	71,000	21.1	885,000	80.1
Unknown	4,000	1.3	78,000	55.0
Total	336,000	100.0	3,688,000	91.0

248,000 (73.8%) of the deliveries occurred in Malay households whilst Chinese and Indians had 54,000 (15.9%) and 28,000 (8.4%) deliveries respectively. The rate of deliveries per 1000 women were about two times greater among Malay women (113.1 per 1000) compared to Chinese (52.9 per 1000) and Indian (67.9 per 1000) women.

Based on the annual household income, the lowest income quintile group is slightly underrepresented, contributing only 14.6% of the deliveries whereas the other quintile groups were more evenly distributed (20.6 – 21.3%). The rate of deliveries per 1000 women were higher in the lower income group and lower in the higher income group.

The 336,000 deliveries involved an average of 1.02 episodes of antenatal care per delivery. An estimated 2.9 million antenatal visits were made, giving an average of 8.7 antenatal visits per delivery.

Antenatal complications that warranted hospitalisation were reported in 37,000 episodes (11% of deliveries) which involved 5.5 days of hospitalisation, on average.

For postnatal care, 79.7% of deliveries received non-hospitalised postnatal care. The average number of visits per episode of non-hospitalised post natal care was 4.3 visits. 176,000 (5.2%) deliveries involved a postnatal complication which required hospitalisation. The average length of hospitalisation due to a postnatal complication was 5.2 days.

Thus, for the 336,000 deliveries, there was a total of 4,055,000 visits (antenatal and postnatal) that involved no hospitalisation, giving an average of 12.1 visits per delivery. There was a total of 363,000 hospitalisation episodes involving 1.3 million days of hospitalisation. 309,000 (85.2%) were for delivery, 37,000 (10.1%) for antenatal and 17,000 (4.7%) for postnatal problems.

3.4 Source of Maternity Care

In this section we give details of the utilisation of health care facilities (public, private and other) for delivery, antenatal, and postnatal care. Reference will be made to secondary data to demonstrate the proximity of our estimates to national data. It must be borne in mind that some deviation are to be expected as our survey sample is only for Peninsular Malaysia and was not designed to be representative of Malaysian women in reproductive age groups.

309,000 (92.2%) of deliveries were deliveries in hospitals or clinics. 237,000 (70.5%) deliveries were in public facilities/clinics (subsequently referred to as public facilities) and 73,000 (21.7%) were in private facilities/clinics (subsequently referred to as private facilities). There were only 26,000 (7.8%) home and traditional deliveries. This is fairly close to the national data according to which there were 69.9% and 20.1% deliveries in public and private facilities respectively in 1995. (Ministry of Health, Annual Report 1995).

Deliveries took place in private facilities for 32.9% of urban women but only for 9.0% of rural women (Fig.3. 2a). Home/traditional deliveries were more common among rural women. On

average, the length of hospital stay for delivery was greater among urban (mean 2.7 days) than rural women (mean 2.3 days); the average length of hospital stay for delivery was 2.5 days.

Fig 3.2 Sources of Maternity Care by Characteristics of Women and Household

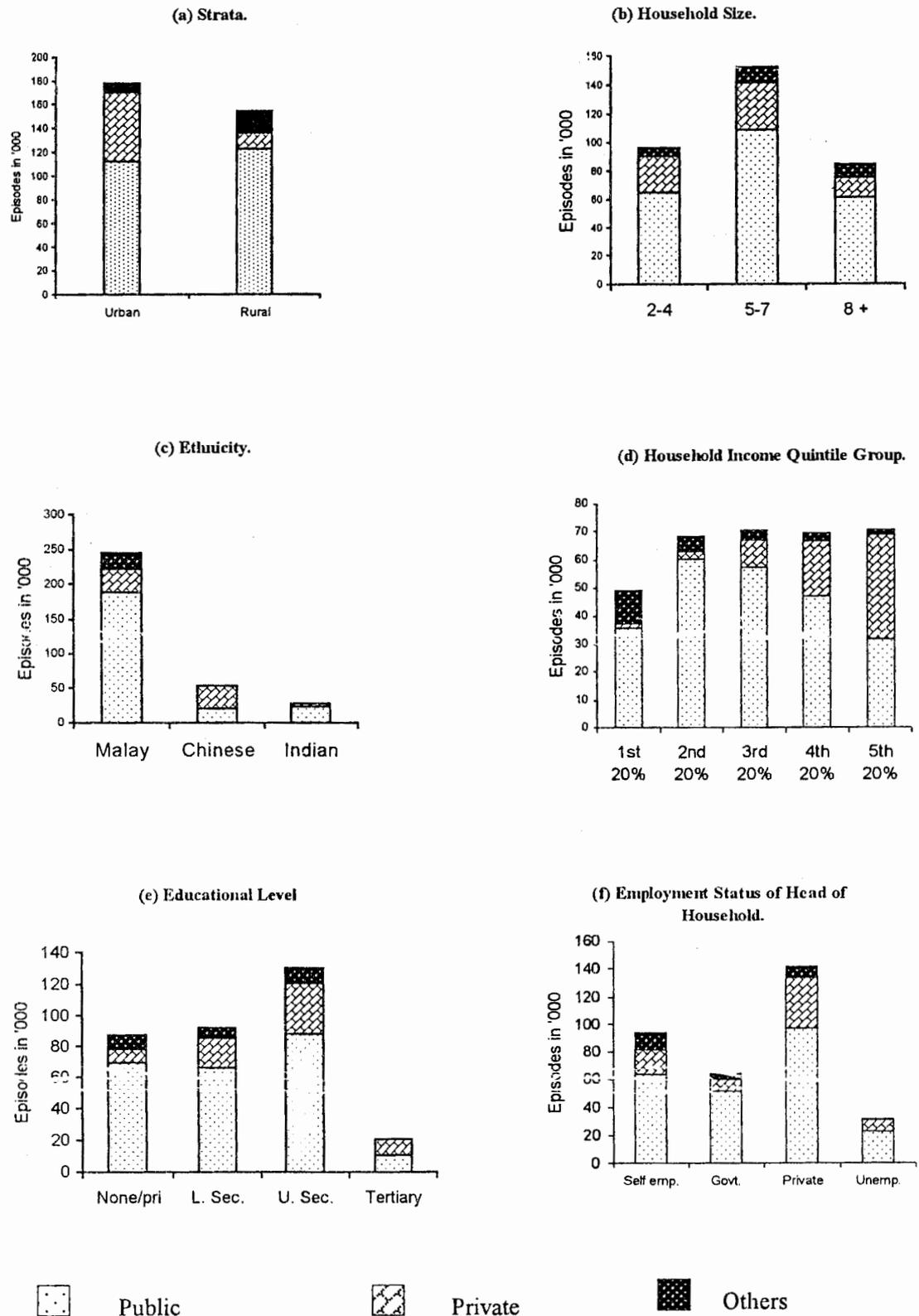
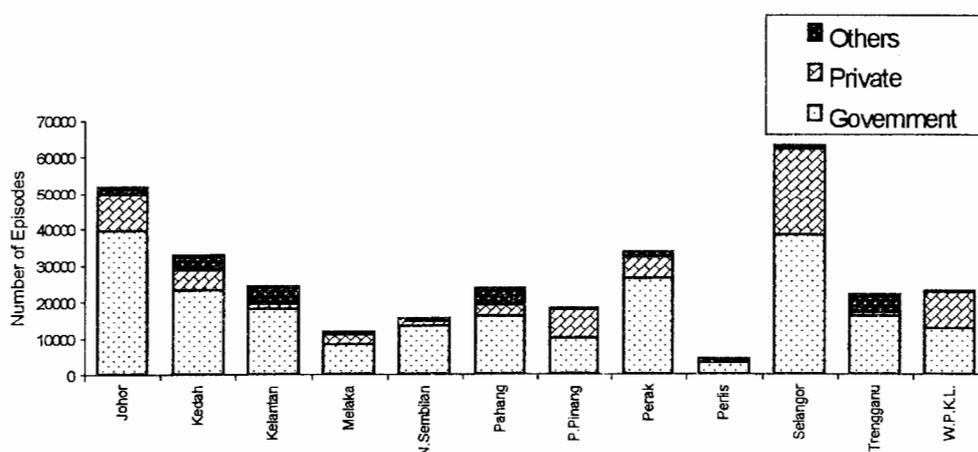


Figure 3.2g Sources of Delivery Care by States

Smaller households seem to have a higher proportion of private facility deliveries compared to larger households. 26.6% of the women from small households (household size 2-4) delivered in private facilities compared to 16.4% of those from large households (household size 8 (Fig. 3.2b). This may be related to socio-economic status as higher socio-economic groups tend to have smaller family size.

Among the Chinese, 61.9% of the deliveries were in private facilities and the remaining 38.1% were in public facilities. On the other hand, among the Indians and Malays, private hospital deliveries were only 15.0% and 13.9% respectively (Fig 3.2c). Length of hospital stay for delivery tended to be longer in private facilities (2.9 days on average) compared to public facilities (2.4 days).

The data suggests a strong relationship between household income and the choice of a private facility for delivery. The percentages of private facility deliveries increased from 2.5% in the lowest quintile group to 52.2% in the highest quintile group (Fig. 3.2d).

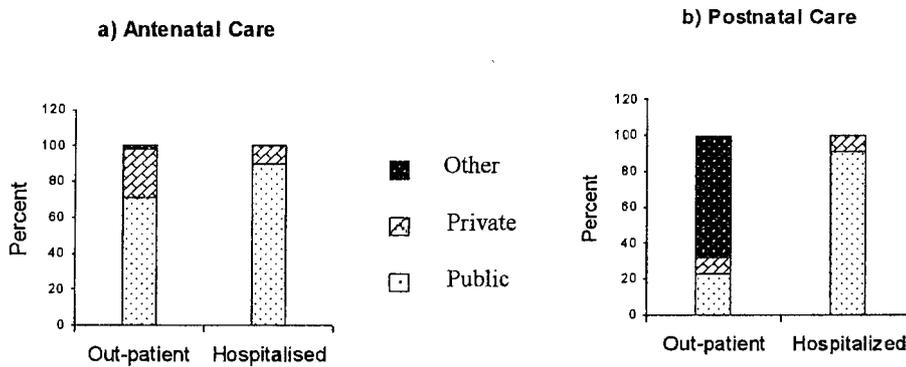
The educational level of women appeared to influence the choice of hospital delivery (Fig.3.2e). Women with tertiary and upper secondary education had a higher proportions of private facility deliveries (48.9% and 25.0%) compared to women with no education (10.2%).

Fig 3.2f shows that most mothers from households headed by government employees had deliveries in the public facilities (80.1%). The respective figures for self-employed heads of households and those in the private sector are 67.4% and 68.4%.

There was a variation in the utilisation of public and private facilities among the states in P. Malaysia. W.P. Kuala Lumpur and Pulau Pinang had higher proportion of private facility deliveries (43.5% and 41.7% respectively), whilst Perlis, Trengganu and Pahang had a relatively higher proportion of home deliveries (23.5%, 22.8% and 18.2% respectively). The highest percentage of public facility delivery was in the states of Negeri Sembilan and Kelantan (87% and 83% respectively) (Figure 3.2g).

Trengganu, W.P. Kuala Lumpur and Pahang recorded longer mean hospital stay for delivery than the national average, whilst Melaka, Negeri Sembilan and Johor had shorter mean hospital stay for delivery.

Figure 3.3 Sources of Antenatal and Postnatal Care



71.5% of the antenatal care took place in public facilities, 26.7% were in private facilities and 1.6% at home or a traditional facilities (Fig. 3.3a). Episodes of antenatal care in public facilities had an average of 8.1 visits whilst private facilities recorded a mean of 6.3 visits. In comparison, the average number of antenatal visits per delivery reported by the Ministry of Health in 1995 was 7.9 visits.

33,000 episodes (91%) of the antenatal hospitalisation were in public facilities. The average length of stay was 5.7 days compared to 3.5 days for private facilities due to antenatal complications. Longer stay in public facilities may be related to more serious complications among those who use public facilities.

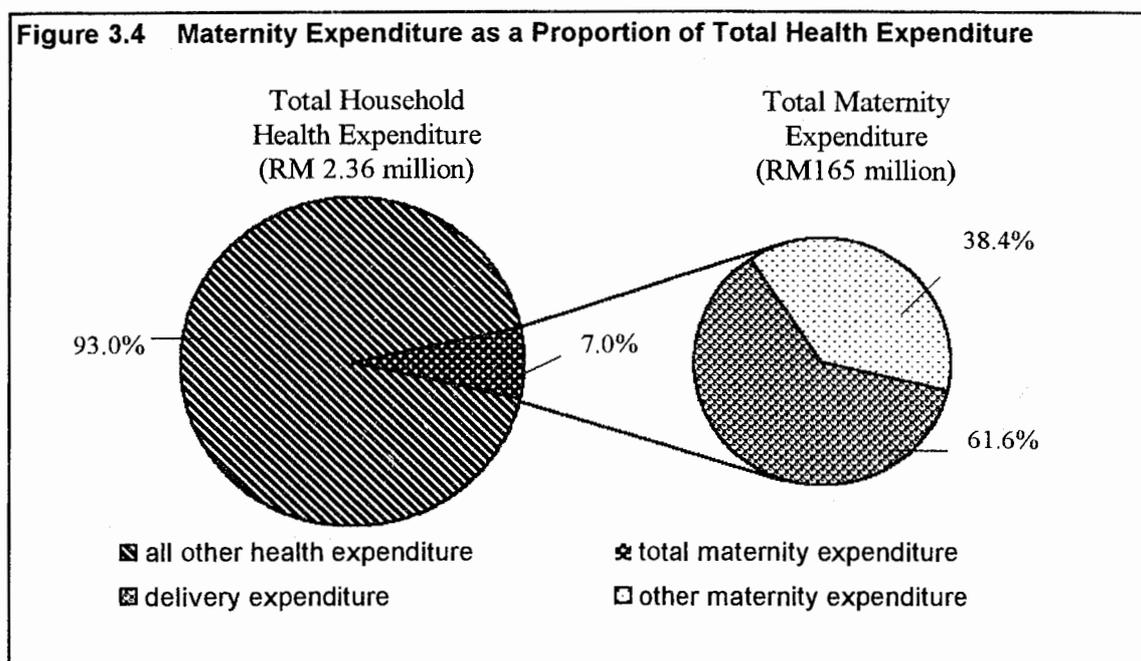
For non-hospitalised postnatal care, 66.5% of the episodes were taken care of at home or by traditional/pharmacy, 22.5% were at public facilities and 10.0% at private facilities (Fig. 3.3b). The number of visits per episode was highest for traditional facilities (5.4 visits on average), and lowest for public and private facilities (2.4 visits and 2.0 visits respectively).

For postnatal complications that required hospitalisation, 91.7% were cared for in public facilities and the average length of stay was 5.5 days (average private length of stay was 2.4 days).

Out of the total 336,000 deliveries, 30,000 babies (8.9%) were reported to have remained hospitalised after their mothers were discharged; 27,000 in public facilities and 3,000 (10%) in private facilities. Average length of stay in public facilities was about twice as long in public facilities (7.3 days) compared to private facilities (3.6 days). This longer stay in public Facilities may be due to the babies delivered in public facilities having more severe complications than babies delivered in private hospitals.

3.5 Expenditure For Maternity Care

This section summarises expenditure for maternity care, that is, the total of the expenses on antenatal, delivery and postnatal care for each maternity episode. First, expenditure on maternity is considered as a component of the total health-care expenditure. Then the association of maternity expenditure with various demographic variables is discussed.



Out of total household health expenditure of RM2.36 billion, 7.0% or RM165 million was the total maternity expenditure. 61.6% of the total maternity expenditure was for delivery care.

237,000 (70.5%) deliveries were in public facilities, 73,000 (21.7%) were in private facilities and 26,000 (7.8%) were home/traditional deliveries. As unsubsidised care was one where the expenditure was solely paid by the household and all others (including those utilising public facilities and those paid in part or in full by employers) were considered as subsidised care, a large proportion (81%) of deliveries were subsidised. This included 12.9% of private deliveries which paid by employers.

Since a large proportion of maternity care was subsidised, expenditure tended to be very low and skewed. An estimated 10.8% of maternity care involved no out of pocket expenditure, 58% involved expenditure between RM1-200; 24.4% paid between RM201-2000 and 6.8% paid more than RM2000 for a delivery. Because of this skew the mean expenditure is much bigger than the median expenditure.

Expenditure for a maternity episode was about 2.9 times more in urban than in rural areas, whereas expenditure for delivery care only was 3.5 times greater in urban than in rural areas.

Higher-income households tended to spend a greater proportion of their total health-care expenditure on maternity care. The lowest quintile (20th percentile) of households (ranked according to household income) spent only 3.3% of their total health expenditure on maternity care, whilst the top quintile of households spent 8.5%. These differences were more marked when only delivery expenditure was taken into account – the lowest quintile spent only 1.7%, whilst the highest quintile spent 5.4 % of their total health expenditure on delivery.

The differences in delivery expenditure were even greater than these figures suggest because the birth rate in better-off households was lower than for the poorest households. The rate of deliveries per 1000 women aged 15-49 was 80.1 in the highest quintile group compared to 102.8 in the lowest quintile group.

Households in urban areas spent more on maternity care compared to households in rural areas. About 11% of urban households spent more than RM2000 but only 2% of rural households spent that amount (Fig. 3.5a)

Smaller households spent more on maternity care compared to larger households. 9.3% of small households (household size 2-4) spent more than RM2000 on maternity care, compared to 5.3% of large households (household size of 8 or greater), see Fig. 3.5b.

Among the ethnic groups, Chinese stood out as having the highest maternity expenditure. 31.0% of Chinese households spent more than RM2000 for maternity care compared to 2.0% of Malay and 2.8% of Indian households (Fig. 3.5c). Maternity care was RM200 or less for 78% of Malay and 68.2 % of Indian households. Among Chinese households, only 20% had maternity expenditure smaller than RM200.

Households in the higher income groups spent more on maternity care. About 19% of households in the top quintile (according to household income) spent more than RM2000 compared to less than 1% of those in the lowest quintile (Fig. 3.5d).

Higher level of education was associated with higher expenditure on maternity care. 10.3% of women with tertiary education and 9.2% of women with upper secondary education spent more than RM2000 compared to the 5.8% and the 3.2% with primary or no education, respectively (Fig. 3.5e).

Figure 3.5 Categories of Household Expenditure for Maternity Care by Characteristics of Women and Household

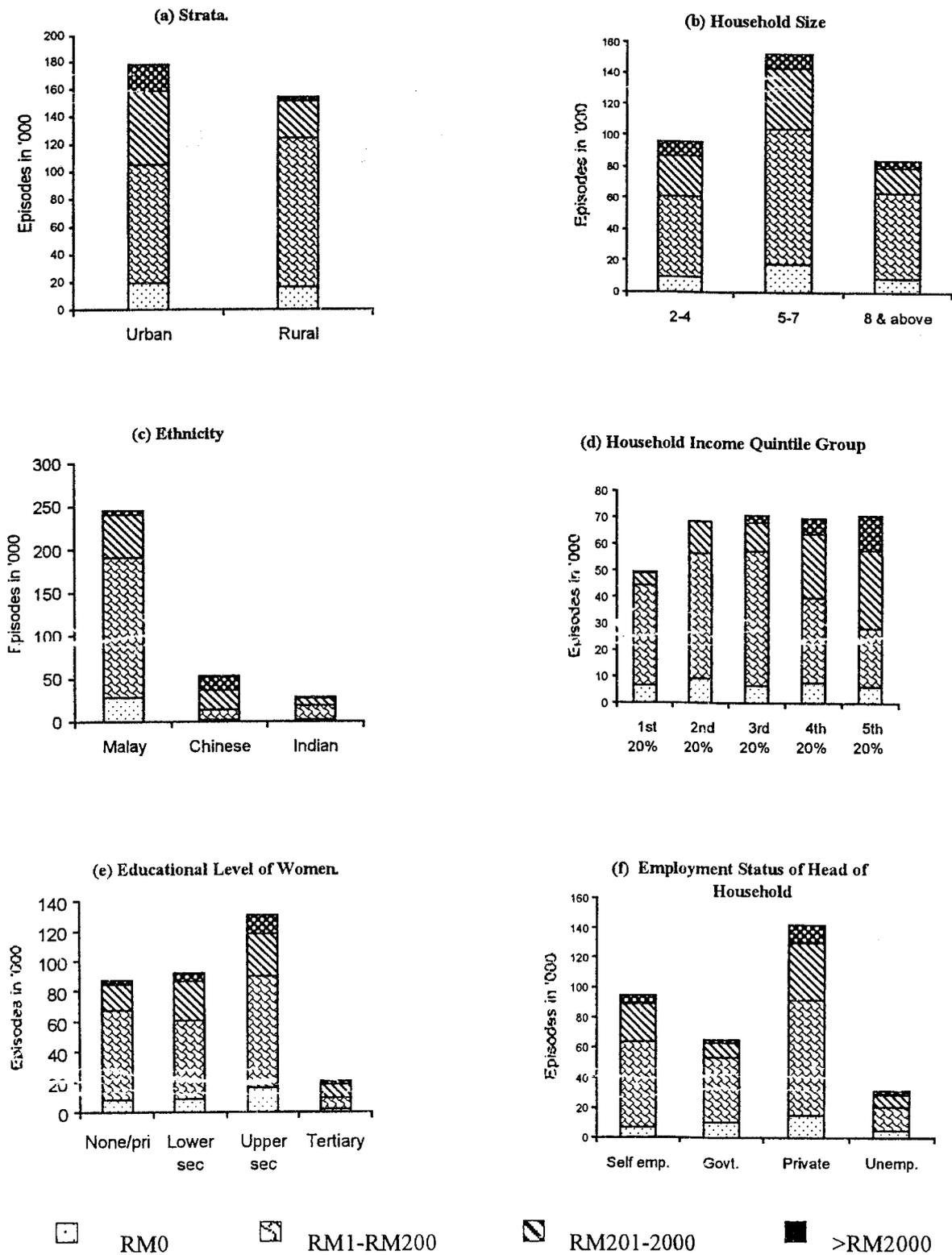


Figure 3.5g Categories of Household Expenditure for Maternity Care by States

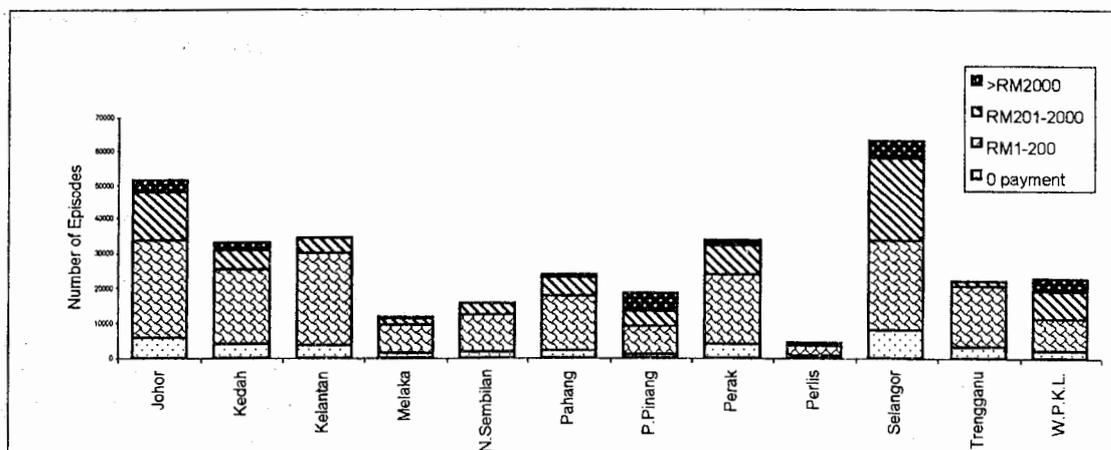


Fig. 3.5f illustrates that 8.5% of women whose heads of households were employed in the private sector spent more than RM2000 on maternity care. Only 2.6% of those in the government service spent more than RM2000.

At state level, mean expenditure for maternity care was dependent on the proportions utilising public and private facilities. States which were more developed had more private care and thus incur higher expenditure.(Fig 3.5g)

3.6 Delivery Expenditure

This section gives results for expenditure associated with delivery only. Delivery expenditure constitutes 61.6% of total maternity expenditure.

The mean and median expenditure for delivery was RM302 and RM21 respectively. The variation is dependent on the place of delivery and socio-economic variables.

Urban women spent on average 3.5 times more on delivery than their rural counterparts (mean RM451 for urban compared to RM130 for rural). These differences were less marked when median expenditure were compared (median RM28 for urban; RM19 for rural).

On average, Chinese and Indian women spent about 5.8 times and 1.7 times respectively more on delivery than Malay women.

Mean delivery expenditure was also highest in the States of Pulau Pinang, W.P. Kuala Lumpur and Selangor and lowest for Trengganu and Kelantan. This is related to the higher proportion of deliveries in private facilities.

Higher educational level of the head of household as well as higher household income, are associated with higher delivery expenditure.

The mean and median cost of per delivery episode were found to be RM58 and RM16 in the public facilities compared to RM1,202 and RM900 in the private facilities. The mean expenditure for delivery care in private facilities was about twenty times higher than for public facilities, whereas the corresponding median was fifty times higher. (The mean is more influenced by the few episodes of high expenditure in public facilities, whereas the median is more influenced by the high proportion of episodes with zero or very small expenditure.)

The mean and median *expenditure per day* of hospitalisation was RM572 and RM500 per day in private facilities and RM35 and RM13 per day in public facilities. This represented average costs of 16 times to 38 times higher in private than public facilities.

The higher proportion of private facility deliveries in urban areas, in States of Pulau Pinang, W.P. Kuala Lumpur and Selangor; among the Chinese; and those with higher educational level and household income correlates with higher delivery expenditure in these groups.

The choice for private or public facilities for delivery alone cannot explain all the differences in expenditure. Some women incur high costs even in public facilities. The Chinese who delivered in public facilities spent two to three times more for delivery than the Indians or Malays. This may be because the Chinese may have chosen to deliver in first or second class wards which cost more.

Another factor that may influence the delivery expenditure is the length of stay in the hospital during the delivery (recorded in days). Although the average length of stay for delivery was 2.5 days, deliveries in private facilities tended to involve longer stay (average 2.9 days) than public facilities (average 2.4 days). Urban women also had longer hospital stay (2.7 days) than rural women (2.3 days). This discrepancy is to be noted as although the higher socio-economic group tends to have less complications at delivery, they had longer hospitalisation for deliveries. This is because more of them delivered in private facilities which involved longer hospital stay.

3.7 Expenditure For Hospitalised Antenatal And Postnatal Care

Out of the 336,000 deliveries, there were 37,000 episodes (10.9%) of antenatal complications and 17,000 episodes (5.1%) of postnatal complications requiring hospitalisation.

33,000 episodes (91%) of hospitalised antenatal care were in public facilities and only 3,000 episodes were in private facilities. Among those who recalled the length of stay for each episode, the average length of stay for antenatal hospitalisation was longer in public facilities (5.7 days) than private facilities (3.5 days).

The mean expenditure per episode of antenatal hospitalisation was 6.3 times more in private facilities (RM248) than public facilities (RM40). However, the expenditure per day of hospitalisation was 13.8 times higher in private facilities (RM175) than in public facilities (RM13).

For postnatal episodes requiring hospitalisation, 91.7% were in public facilities whilst 8.3% were in private facilities. Among those who recalled the length of stay for each episode, the average length of stay for postnatal complications was 5.5 days in public facilities and 2.4 days in private facilities.

The mean expenditure per episode of postnatal hospitalisation was 40 times more in private facilities (RM1,735) than public facilities (RM42). However, if the expenditure per day of hospitalisation was considered, then the cost was 62 times more in private facilities (RM537) than public facilities (RM9).

For hospitalised neonatal care, the mean expenditure per day was about 11 times more in private facilities (RM78) than public facilities (RM7). As a large proportion of care at public facilities was free, the median expenditure per day at private facilities (RM70) was 35 times more than public facilities (RM2).

Expenditure for Outpatient Maternity Care

For the 336,000 delivery episodes, a total of 661,000 outpatient episodes of maternity care were recorded. 393,000 (59.4%) were for antenatal care whilst 268,000 (40.6%) were for postnatal care.

The mean expenditure for all outpatient maternity care was RM81. Outpatient maternity care per episode was highest in private facilities (mean RM189) and lowest in public facilities (mean RM14). The expenditure per episode of care at traditional facilities were also relatively high (mean RM133).

For antenatal check-ups, 281,000 (71.7%) episodes were in public facilities whilst 105,000 (26.7%) episodes were in private facilities. Home and traditional facilities made up only 1.6% of outpatient antenatal care. The average number of visits per episode of care was higher in public facilities (8.1 visits) than in private facilities (6.3 visits).

The mean expenditure for outpatient antenatal care was RM66 and the average number of visits per episode was 7.6 visits. The mean expenditure for outpatient antenatal care was about twenty times greater in private facilities (RM215) than in public facilities (RM11).

For outpatient postnatal care, out of the 268,000 episodes recorded, 60.1% (161,000) were cared for at traditional facilities. Public and private facilities were the source for 22.5% (60,000) and 11% (29,000) of outpatient postnatal care. Self treatment was reported in 6.4% of outpatient postnatal care.

The mean expenditure per episode of outpatient postnatal care was highest for traditional sources (RM135) followed by self treatment through direct purchases (RM 111); mean expenditure at private facilities was RM96 and at public facilities was only RM26. The average number of visits per episode was also highest for traditional sources (5.3 visits) but lowest for private facilities (2.0 visits).

3.9 Summary of Findings

There were 336,000 deliveries by 332,000 women from 332,000 households. These involved 4 million antenatal and postnatal visits and 1.3 million days of hospitalisation. 92.2% of deliveries were deliveries in hospitals or clinics of which 70.5% were in public facilities and 21.7% were in private facilities; 7.8% were home and traditional deliveries.

Private hospital/clinic deliveries were more common among the Chinese, urban, higher income groups, higher educated women and households of smaller family size and headed by better educated heads of household. Households headed by government employees tend to deliver in public facilities.

On average, the length of hospital stay for delivery was 2.5 days, being longer for deliveries in private facilities. Thus hospital stay was longer for deliveries in urban areas and states where private deliveries were commoner.

Antenatal care was almost universal for all women. There was an estimated 2.9 million antenatal visits with an average of 8.7 antenatal visits per delivery. Antenatal care was more commonly obtained from public facilities which recorded more visits per episode than private facilities.

11% of deliveries had antenatal complications that warranted hospitalisation. 91% of the antenatal hospitalisation were in public facilities. The average length of stay for antenatal hospitalisation was 5.5 days, being longer in public facilities than private facilities.

79.7% of deliveries received postnatal care. More than two third of postnatal care was obtained at home, from traditional sources or direct purchases from pharmacies/shops. 5.2% of deliveries had a postnatal complication which required hospitalisation and 91.5% of these were in public facilities. Length of stay for postnatal hospitalisation was longer in public facilities (5.5 days) than private facilities (2.4 days).

8.9% of babies delivered were hospitalised after their mothers were discharged. 90% of them were in public facilities and 10% in private facilities. Average length of stay in public facilities was about twice as long in public facilities compared to private facilities.

Regarding expenditure, household expenditure for maternity care was estimated to be RM165 million or 7.0% of total household health expenditure of RM2.36 billion. This relatively small amount was due to the high utilisation of public facilities and thus high subsidy. 61.6% of the total maternity expenditure was for delivery care.

Household expenditure on maternity care was dependent on the source of care utilised and whether there was any form of subsidy. As 81% of deliveries were subsidised; 10.8% of maternity care involved no payment, 58% involved expenditure between RM1-200; 24.4% paid between RM201-2000 and 6.8% paid RM2000 or more for a delivery.

Out of those who delivered in private facilities, 85.3% involved self-payment and thus fully unsubsidised. 12.9% of private deliveries were subsidised and paid for by their employers. Among those who delivered in public facilities, only 7.8% were paid for by their employers.

The higher proportion of private facility deliveries in urban areas, in States of Pulau Pinang, W.P. Kuala Lumpur and Selangor; among the Chinese; and those with higher educational level and household income correlates with higher delivery expenditure in these groups.

Differential utilisation (choice, or preference) of private and public facilities for delivery cannot explain all the differences in expenditure. Some women incur high costs even in public facilities. The Chinese who delivered in public facilities, spent two to three times more for delivery than the Indians or Malays.

Expenditure for a maternity episode was about 2.9 times more in urban than in rural areas, whereas expenditure for delivery care only was 3.5 times greater in urban than in rural areas. On average Chinese and Indian women spent 5.8 times and 1.7 times more on delivery than Malay women.

The mean and median cost per episode of delivery for households were estimated to be RM58 and RM16 in public facilities compared to RM1202 and RM900 in private facilities. The mean and median expenditure per day of hospitalisation was 16 and 38 times more in private than public facilities.

MULTILEVEL ANALYSIS

4

4.1 Introduction

This section reports on the findings of the multilevel analysis of expenditure and utilisation in the maternity sector of the NHES'96. This is extracted from a full report on multilevel analyses. The analysis searches for predictors of *Treatment expenditure*, and for predictors of utilisation (choice) of private and public facilities.

The analyses were performed using the software packages MLn and VARCL, both distributed by ProGamma iec, Groningen, the Netherlands.

The explanatory variables used for analysing data for the *Maternity* sector differ from those in other sectors in that:

- Expenditure for *Delivery* and *Maternity* are analysed separately. *Maternity* expenditure contains *Delivery* expenditure and expenditure for antenatal and postnatal check-ups and for any complications (prenatal or postnatal, requiring some or no hospitalisation).
- All subjects are women, aged 15–49. The age categories used are 15–19, 20–29, and 30+.
- Variable *Type of care* is not applicable.

4.2 Delivery expenditure

The model with no explanatory variables yields the estimate of the national mean for delivery expenditure, on the logarithm scale, of 2.626, with standard error 0.181. Converted to the original (linear) scale this represents an average expenditure of RM4.23, with a confidence interval (1.84, 9.73). Note that the estimate (RM4.23) is not in the centre of this interval.

The estimates of the variance components which describe the variation at the various levels of the nesting hierarchy, are

Level	Estimate	Standard error
Person (Household)	3.228	(0.148)
District	0.157	(0.159)
State	0.110	(0.111)

The estimates are variances and they refer to the logarithm scale. For interpretation, it may be more suitable to consider the standard deviations, that is, their square roots. Thus, the state-level standard deviation is $\sqrt{0.110} = 0.332$; its power, $10^{0.332} = 2.15$, represents the deviation of a typical state from the national average. This deviation is on a multiplicative scale, that is, the

mean expenditure in a typical state is 2.15 times greater or smaller than the national average. The means for the districts within a state also vary; this is captured by the district-level variance component. Its value converts to 2.49-multiple (greater or smaller) of the state-level mean. However, by far the greatest variation is within districts, that is, from one maternity episode to another: a typical subject pays 62.6 times more, or less, than the district-level average. The three components of variation, person, district, and state, can be combined as follows: the total variance is equal to 3.495, which corresponds to 74.85; a typical expenditure on delivery is 75 times greater or smaller than the national average. We refer to this figure as the *typical multiplicative factor*.

These summaries are greatly affected by the high proportion of episodes which involve no expenditure. The corresponding description for the subset of episodes with some expenditure (however small) is described in the following table.

Parameter	Estimate	Standard error	Conversion to RM
Mean	3.79	0.13	61.7
Variance components			
Household	3.24	0.15	$\times \pm 63.1$
District	0.14	0.08	$\times \pm 2.4$
State	1.44	0.62	$\times \pm 15.8$

The estimated mean is 3.79, which corresponds to $10^{3.79}/100 = \text{RM}61.70$. A typical within-state mean expenditure is 15.8 times greater or smaller than this national mean; the typical multiplicative factor at state-level is 15.8. At district level, the typical multiplicative factor is 2.4. But the typical multiplicative factor at household-level is 63.1. The expenditure on delivery varies a great deal from household to household, even among the households whose delivery care is not free.

4.3 Explanatory variables

The obvious causes of the vast differences in the expenditure are the economic circumstances of the households, desirability of high standard of care, and the prenatal and postnatal circumstances. These factors are observed indirectly through the standard socio-demographic variables and variables describing the maternity episode. For instance, *Household income* is an obvious explanatory variable. The multilevel analysis with a linear regression on the log-income yields the formula

$$0.078 + 0.627 \times \log\text{-income}$$

for all maternity cases, and

$$0.845 + 0.709 \times \log\text{-income}$$

for maternity episodes that were not free of charge. This can be interpreted as follows. The geometric mean expenditure on delivery for a household whose *Household income* is RM10,000 and who do not qualify for free delivery care, or choose options that result in delivery care not

free of charge, is $10^{0.845+4 \times 0.709}/100 = \text{RM}48.00$ on average. The estimate of the coefficient for log-income (the regression slope on log-income) can be interpreted as follows. A ten-fold (1.26-fold) increase of the household income (increase of log-income by 1.0 or 0.1 unit, respectively) is associated with an increase of the log-expenditure by 0.709 (0.071), that is, $10^{0.709} = 5.1$ times (1.18 times). This is, of course, contingent on the same choice being made by the household.

The average over all households with a maternity episode (including those with free delivery care) is $10^{0.078+0.627 \times 4}/100 = \text{RM}3.90$, 12.3 times less. Note however, that the expenditures vary around these figures by multiples of up to a few hundred. The comparison of the two estimated (geometric) means is not meaningful because even among households with the same *Household income* those who have no expenditure on delivery may tend to have different socio-demographic profiles.

The impact of the other factors can be assessed by including them in the regression model. The model fit with log-income and *Ethnicity* (for all maternity episodes) is given in the following table.

Parameter	Estimate	Standard error	Conversion to RM
Constant	2.15		1.40
	0.31	(0.13)	$\times 2.04$
Ethnicity			
Malay	0.00		$\times 1.00$
Chinese	0.99	(0.14)	$\times 9.66$
Indian	0.14	(0.17)	$\times 1.38$
Others	-0.51	(0.36)	$\times 0.31$
Variance components			
Person	1.93	(0.09)	$\times +24.5$
District	0.10	(0.05)	$\times +2.1$
State	0.02	(0.03)	$\times +1.4$

The right-most column converts the estimates to the linear scale; for the variance components, it gives the typical multiplicative factors. The fitted log-expenditure for a household with a maternity episode is computed by the formula

$$1.40 \times 2.04^{\log\text{-income}} \times Ethn$$

where *Ethn* stands for the coefficient corresponding to the *Ethnicity* (1.00 for Malay, 9.66 for Chinese, and so on). Thus, even when matched on *Household income*, Chinese pay on average almost ten times as much as Malays. This disparity may be partly due to other background variables. In particular, we should adjust for (condition on) whether the payment is subsidised or not. This is related to the choice among the alternative sources of care, because the choice is an important determinant of the expenditure. Together with other explanatory variables, a radically different picture emerges. The regression coefficient on the indicator of subsidy is equal to 1.56 (standard error 0.13), corresponding to 36.3 times higher expenditure for unsubsidised care. After adjusting for this factor, urban-rural differences, association with *Household income*, differences among the categories of *Educational level*, and between those patients who do or do

not receive any income, is unimportant, and the differences among the *Ethnic* groups are also greatly reduced.

Given a combination of the background variables, the mean *Delivery expenditure* for Chinese is only 1.8 times greater than for Malays, and the mean expenditures for Malays and Indians differ very little. The only outstanding differences among the background variables are due to age. *Delivery expenditure* of women in their 20's is 4.3 times greater, and of women aged 30 or older 5.0 times greater than for teenage mothers. Any variable that indicates whether the pregnancy involved any complications (counts of episodes or indicators of complications or of hospitalisation) is also unimportant. This may be an artefact due to differential proneness to complications by those who choose the alternative sources of care. (There are fewer complications and fewer lengthy hospitalisations among private patients.)

The uneven distribution of the choice between subsidised and unsubsidised care appears to be the main source of the between-state and between-district variation. After adjustment, the estimated state-level variance is 0.0 and the district-level variance is 0.034, corresponding to the typical multiplicative factor 1.53. The estimated household-level variance is 1.60 (typical multiplicative factor 18.4).

Maternity expenditure contains *Delivery expenditure* as its major component for most maternity episodes. The additional expenditure is for ante- and post-natal check-ups and for complications. The analysis of *Maternity expenditure* leads to conclusions very similar to those for *Delivery expenditure*.

4.4 Subsidised and unsubsidised cases

An alternative approach is to carry out separate analyses for the subsidised and unsubsidised cases. The rationale for this is that the two categories involve very different amounts of expenditure. The mean log-expenditure for subsidised cases is 2.33 (*Delivery*) and 3.37 (*Maternity*). This corresponds to RM2.10 and RM23.40, respectively. These estimates are incomplete without quoting the substantial variation: a typical household would incur 80 times greater or smaller (effectively zero) *Delivery expenditure* and 29 times greater or smaller *Maternity expenditure*. Since most subsidised cases involve only nominal expenditure there are unlikely to be any important determinants of expenditure. There is a weak indication that higher *Educational level* (of the mother) is associated with lower expenditure; higher secondary education is associated with about 1.60 times lower expenditure than for no or only primary education). When some hospitalisation was necessary either before or after delivery, expenditure is 2.05 times greater on average. Expenditure for Chinese is on average 1.85 times greater than for Malays. However, in view of the small mean expenditure and large variation, these systematic differences are of little consequence.

The mean expenditure for the unsubsidised maternity episodes is RM824.10 (*Delivery*) and RM1213.40 (*Maternity*), and the expenditures vary a great deal both among households within districts and among the states. There are only 172 unsubsidised episodes in the Survey, and so complex modelling of such data is not warranted. In particular, it is not possible to establish whether complications and lengthy stay in the hospital are associated with higher expenditure, as would be expected. However, if more such cases occur in hospitals which have generally lower charges for their services, such an association could not be detected even in larger studies.

4.5 Utilisation – the choice of service

Having conditioned on the form of payment (subsidised/unsubsidised) most of the observed differences among the background factors are greatly reduced. Thus, a reasonable hypothesis is that the observed differences in the expenditure are largely due to the choices made by the patients (households).

In our analysis we apply models for the probability (p) of using a private facility. To avoid any ambiguity, the source of care (public or private) is defined in our analysis by the hospital where the delivery took place (other episodes associated with the pregnancy may have used other sources of care). The analysis is based on the 924 maternity episodes that were cared for in public or private facilities. To enable the use of standard linear models, instead of the probability its *logit* transformation is modelled. Thus, all results refer to logits, defined as the natural logarithm of the odds ratio ($p/(1-p)$), that is, $\log(p)-\log(1-p)$. Zero logit corresponds to probability 0.5. Within the range of probabilities 0.2–0.8, a given increase on logit scale (say, 0.20) corresponds to slightly less than one quarter increase in the probability (say, almost 0.05).

If *Household income* and *Ethnicity* are the only explanatory variables, the obvious conclusion is arrived at: the higher the income the greater the preference for private care and, for a given income, Chinese use private care more than other ethnic groups. The fitted model is

$$\text{logit}(p) = -10.60 + 2.04 \times \log\text{-income} + 0.00/1.85/0.12/0.17$$

where the four right-most figures give the adjustment for the four ethnic groups. For instance, *Household income* of RM10,000 (that is, $\log\text{-income}$ 4.0) is associated with logit -2.44 for Malays, -0.59 for Chinese, -2.32 for Indians, and -2.27 for others. These figures convert to the respective estimated rates of using private care 8.0%, 35.6%, 8.9%, and 9.4%. The differences among Malays, Indians, and others are not significant, but Chinese stand out (the standard error for their estimate of 1.96 is 0.22). The association with *Household income* is also very strong. Among those with *Household income* of RM1000, only Chinese use private care to any appreciable extent; the fitted rates of using private care are 6.7% for Chinese, but less than 1.3% for the other ethnic groups.

Adjustment for other explanatory variables greatly reduces the impact of *Household income* as a predictor, but the differences among the ethnic groups prevail. Higher educational level is associated with greater preference for private care (the adjusted difference of logits for tertiary and no/primary education is 1.78). Rural areas are associated with lower adjusted rate of private care (by 0.80 logits). When another party contributes to the expenses, private care is used more frequently (by 0.84 logits, or by around 20%). *Household size* is negatively associated with the choice of private care (households with eight or more members have logit 0.69 lower than households with up to four members). The latter can be interpreted that households prefer, above and beyond the prediction based on other explanatory variables, higher quality care either for the earlier pregnancies or when they plan to have fewer children. However, the adjusted differences among the age categories are very small and not significant. Also, *Household type* (nuclear or extended) is not an important factor. Other factors, *Employment status* of the head of household in particular, are unimportant.

4.4.1 The model fit for the analysis of utilisation in maternity care.

Variable	Category	Estimate	Standard error
Constant		-8.30	
Educational level	No/Primary	0.00	
	Lower secondary	0.64	(0.32)
	Upper secondary	0.79	(0.33)
	Tertiary	1.68	(0.43)
Urban/rural	Urban	0.00	
	Rural	-0.80	(0.23)
Ethnicity	Malay	0.00	
	Chinese	2.29	(0.27)
	Indian	0.43	(0.40)
	Other	0.64	(0.95)
Household type	Nuclear	0.00	
	Extended	0.26	(0.25)
Household size	2-4	0.00	
	5-7	-0.48	(0.24)
	8+	-0.67	(0.33)
Income recipient (0/1)		0.27	(0.17)
Log-income		1.38	(0.30)
Others paid (0/1)		0.84	(0.29)
Employment status of head of household	Other	0.00	
	Government	-0.12	(0.42)
	Private	0.11	(0.35)
Age group	15-19	0.00	
	20-29	-0.20	(0.74)
	30+	-0.02	(0.74)

Note: For each categorical variable, category 1 is the reference category and is associated with value (adjustment) 0.00. Exceptions are *Household type* and *Household size*; for these variables categories 1 are not applicable, and therefore the respective categories 2 are used as reference. (0/1) indicates a variable with values 0 and 1.

Table 4 4..2: Estimates of state-level deviations from the prediction based on Table 4.4.1.

Johor -0.19	Kedah 0.11	Kelantan -0.54	Melaka 0.33
N. Sembilan -0.39	Pahang -0.26	P.Pinang 0.52	Perak -0.09
Perlis -0.09	Selangor 0.23	Terengganu -0.35	W.P.K.L. 0.17

Note: Figures in logits; their weighted mean is zero.

The adjusted rates of using private health care for delivery vary a great deal both without and with the adjustment for explanatory variables. Household-level variation is governed by the dichotomous nature of the outcomes. The equivalents of the variance components for districts and states are the *relative* variances. The estimated relative variances are 0.138 for districts and 0.194 for states. Among the states, Kelantan stands out as having the lowest adjusted rates (the national prediction has to be adjusted by around -0.6) and P. Pinang as having the highest adjusted rates (prediction has to be adjusted by around $+0.6$). The ordering of the states reflects the level of industrial development, but this may well be due to the differential availability of private health-care facilities in the states. Tables 4.1 and 4.2 give a complete listing of the results.

4.6 Conclusions

The analysis has shown that expenditure for maternity care varies a great deal both within and among the combinations of various background factors. The high variation prevails after controlling for the background factors, especially at household levels (within districts). Chinese and households with higher income tend to have higher expenditure both when not subsidised (in private facilities) and when subsidised. The analysis of subsidised episodes is distorted by the many episodes that incurred none or only nominal expenditure. Given *Source of care* (public or private facility), no factor contributes appreciably toward explaining the large variation in expenditure. For subsidised cases, such an explanation is of little substantive importance because small amounts of expenditure are involved (maternity episodes in private facilities constitute 19% of all maternity episodes, but involve 85% of the total *Delivery expenditure*).

The analysis of utilisation confirms the findings from the analysis of expenditure: private care is preferred by Chinese, higher-income groups, those with higher education, and those in urban areas. This may partly reflect the differential availability of private care and the uneven distribution of the socio-demographic factors across the country. Of importance is that the extent of these preferences is quantified.

CONCLUSIONS AND IMPLICATIONS 5

The survey was conducted to answer the questions identified in Page 1 of this report. Thus the conclusions will first address the main findings to these questions and then discuss the implications of these findings.

- Public facilities were the source for delivery and antenatal care for more than 70% of women; 21.7 % of deliveries were in private facilities and 7.8% were traditional or home deliveries. Traditional and home were more common sources for postnatal care.
- Private maternity care were associated with Chinese, higher-income groups, higher-educational levels and urban areas. A large majority of the other ethnic groups utilised private facilities.
- As a large proportion of maternity care was from public sources, 81% of maternity care were subsidised. 58.8% of maternity care had an expenditure of RM200 or less. Thus maternity care did not involve high household expenditure except in cases where maternity care was not subsidised. Maternity episodes in private facilities constitute 19% of all maternity episodes but involved 85% of the total delivery expenditure. The mean expenditure for unsubsidised maternity episodes was RM824.10 (delivery) and RM1213.40 (maternity), and the expenditures varied a great deal among households within districts and among states.
- Factors that were associated with household expenditure for maternity care were source of care and whether the care was subsidised. 85% of those who sought private care paid for the treatment themselves. 12.9% of private care were paid by their employers. For subsidised care at public facilities, only 7.8 % were paid by their employers.
- The total household expenditure spent on maternity care was RM165 million, 7 % of the total household health expenditure of RM2.36 billion. This small proportion was due to the fact that maternity care was highly subsidised and therefore involved less out of pocket expenditure.

Maternity care in Peninsular Malaysia is a highly subsidised commodity and thus contribute to only a small proportion of household expenditure. However the relatively large number of births imposes a great demand on health service resources. The 336,000 deliveries in this study involved approximately 1.3 million days of hospitalisation and 4 million antenatal and postnatal visits.

More than 90% of women in Peninsular Malaysia have access to safe delivery facilities. The 7.8% of women who had traditional or home deliveries were mainly Malays who probably opted for such, rather than because the services were not accessible. The accessibility of the services was much improved by the fact that maternity services is part of a public health programme in the Ministry of Health. Thus a comprehensive network of health delivery system and minimal payment for services that is currently available promotes equity.

The predominance of utilisation of public facilities for maternity services especially for antenatal and postnatal care shows that the private sector is not well utilised in this area. As more than half of the doctors in Peninsular Malaysia are in the private sector, private general practitioners should be encouraged to play a bigger role in the provision of routine antenatal and postnatal care, referring the complications to more specialised centres. As long as the continuity of care can be maintained, general practitioners can ease the burden of crowded public facilities and possibly improve the quality of care as a substantial proportion of care received presently in public facilities are done by nurses and mid-wives. Better partnership between the public and private sector can lead to improvements in accessibility and better utilisation of resources. Remuneration for the general practitioners can be based on the provision of a fixed number of antenatal check-ups and postnatal check-ups per pregnancy. Deliveries can be conducted in designated centres at private or public / corporatised hospitals.

Presently a majority of women utilise public facilities although the Chinese, higher-income groups, higher-educational level and urban women utilise more private facilities. This may be related to higher expectations and larger amount of disposable income. A situation of "supply-induced demand" is provoked and opportunistic health care providers will emerge to provide services to these group of women. At the same time very large differences in cost between the private and public sector probably encourages the middle-income group to opt for public facilities.

The higher socio-economic group who are less likely to suffer from complications of pregnancy and childbirth tend to deliver in private facilities which involved longer stay in hospitals. This discrepancy has to be noted and discouraged as although they can afford to pay for the services, longer hospital stay leads to escalation of costs, and unnecessary use of resources. Thus a policy has to be laid out as to the recommended length of hospital stay for normal deliveries; for deliveries which are funded through a National Health Financing Scheme; irrespective of place of delivery.

The present demographic profile of the country with its young population structure implies that maternity care will continue to exert a great demand on health services for the next few decades, in spite of declining fertility. At the same time the changing profile of diseases (with a growing predominance of chronic diseases), as well as the inevitable ageing of its population will lead to an increase in demand on health resources. Health resources are however limited and health costs need to be contained. Priorities have to be made and it is imperative that services for maternity as well as neonatal care be identified as a priority area. Poor accessibility to maternity care may lead to higher mortality and morbidity to both mothers and children and may affect the quality of the future generation.

As public resources are limited and in view of the anticipated growing demand on the health sector, subsidies need to be carefully targeted to the very poor. It is recognised that the poor are

more likely to suffer from ill health and their health problems can keep them in poverty. They are also more likely to have more births and suffer from more complications during the reproductive process. There is strong justification – on grounds of reducing poverty and improving equity - for government subsidies to maintain and improve the access of the poor to important health services like maternity services.

For those who are not subsidised, prices for services have to be high enough to protect and develop the services provided, yet low enough to ensure affordability for the users. In order to achieve the objectives of "Health for All", by ensuring accessibility and equity, some form of health financing mechanism involving risk-pooling will have to be developed. Once a health financing mechanism is in place provision of services can be shared between private and public sources leading to better utilisation of health resources.

Public health programmes like the maternal and child health programme address the health problems of large population groups. They provide services that yield important social benefits, but for which individuals are unwilling to pay the full cost, especially when disposable income is limited. Governments therefore have a large role to play in ensuring the provision of public health services and in encouraging promotive and preventive medicine especially during the production of its most valuable resource – its future generations.

ANNEX D

NATIONAL HOUSEHOLD HEALTH EXPENDITURE SURVEY 1996 (NHES'96)

PENINSULAR MALAYSIA

Health Supplements

Report of Findings

**NHES'96 TEAM
DEPARTMENT OF SOCIAL AND PREVENTIVE MEDICINE
FACULTY OF MEDICINE, UNIVERSITY OF MALAYA**

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INTRODUCTION

1

Background

Health supplement usage could be considered as a necessary strategy to maintain optimal health. There have been several studies to show the extent of its usage.^{1,2,3} Health professionals may not be aware of how popular health supplements are or of a particular supplement's potential side effects. It is not routine that doctors ask patients about their health supplement habit, unless they themselves prescribed it to their patients. Healthy individuals who consume diets selected from a wide variety of foods should obtain adequate amounts of necessary nutrients and have no need to resort to the use of health supplements. Hence, the effectiveness of self-medication is limited because no professional care is engaged to give proper advice. When the use is excessive it creates a dependency for commercially produced nutrients instead of drawing on a balanced diet. Besides, excessive intake of health supplements may be a threat than a panacea to health. Thus, regulating and monitoring supplement intake is an important consideration for the relevant authority

Locally, studies on the use of health supplements by the general public is lacking. However, in a non-random survey of 346 general public on the use of modern health supplements, it was reported that about 57% have taken at least one type of health supplement.⁴

In recent years there has been a rapid expansion of the health supplements market. Any effort to regulate this market requires an appreciation of the characteristics of the consumers of these products.

Purpose

The main trust of the NHHES'96 was to provide baseline information on out-of-pocket expenditure patterns of households on health. This section of the report contains information on household purchase and out-of-pocket expenditure related to health supplements in Peninsular Malaysia.

Specifically, it seeks to answer the following questions:

1. Who purchased health supplements?
2. What type of health supplements did they purchase?
3. Where did they purchase the health supplements?
4. How much did households pay per year for health supplements?
5. Which factors were associated with household expenditure for health supplements?

METHODS

2

Introduction

The NHHES'96 covered Peninsular Malaysia as well as the states of Sabah and Sarawak. Only households in private dwellings were interviewed. Details of the methods utilised in the survey as well as data management and analysis are fully described in the Preliminary Report, National Household Health Expenditure Survey 1996, Volume II.

Survey Instrument

A questionnaire was designed to collect all the information required during the interview. Form 8 of the questionnaire contained questions on health supplements (Appendix 1). Head of households were requested for detailed information (based on a one-year recall period) concerning purchase and expenditure for health supplements.

Health supplements in the survey referred to products registrable under Phase 2 and 3 of the National Pharmaceutical Control Bureau, Ministry of Health Malaysia⁵. Phase 2 comprised of pharmaceutical products which do not contain scheduled poisons, other than traditional medicines. In this survey, they were labelled as 'Modern health supplements'. Examples were vitamins, mineral salts, and aloe vera products. Phase 3 products were traditional health supplements. For the purpose of the survey, traditional health supplements were grouped into 'Chinese traditional health supplements' and 'Other traditional health supplements'. For both phases only products for oral consumption were considered in the survey.

The Research Database

The data was built and analysed to address policy issue questions in the context of household expenditure on health supplements. Figure 2.1 represents a conceptual framework of the possible factors that may be associated with this expenditure. Details of these factors are in Appendix II.

The basic unit of interest was a household purchase. A purchase was defined as total household buying of a type of health supplements throughout the recall period of one year. The household may have bought a particular type of health supplement on several occasions. All data concerning these occasions were aggregated to form a household purchase.

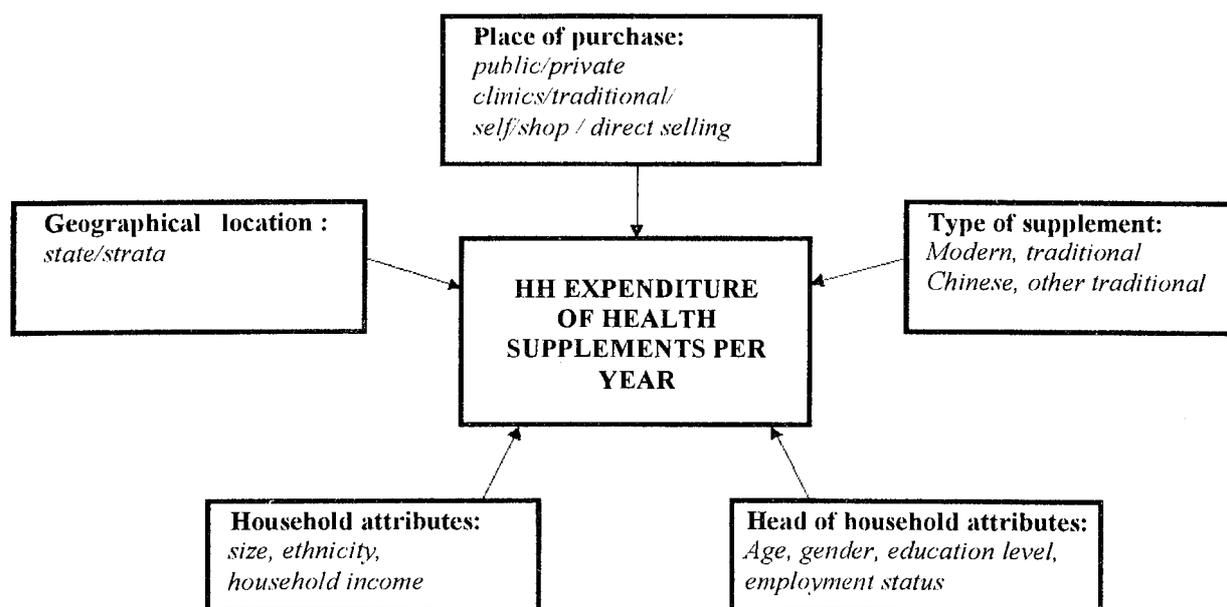


Figure 2.1 A conceptual model for data analysis (health supplements)

The expenditure data described in this report refers to the amount of money paid out-of-pocket by a household when making a purchase. The term expenditure per purchase was adopted. The expenditure component consisted of the cost of the health supplements purchased, cost of travelling to make the purchase and other cost involved such as loss of wages. Cost of travelling in private vehicles was not included as it was difficult for households to estimate the cost. Therefore, travelling cost was the fare paid out-of-pocket when using public transport.

In the survey in Peninsular Malaysia, 8905 households in 8727 private living quarters were successfully interviewed. About 6000 households in the sample reported having purchased at least one type of health supplement products. This sample was weighted in order to get the representation of state and strata. The weighted population consisted of approximately 2.95 million households. This report contains information related to the weighted population.

HOUSEHOLD PURCHASE

3

Household purchase of health supplements was examined against the following dimensions:

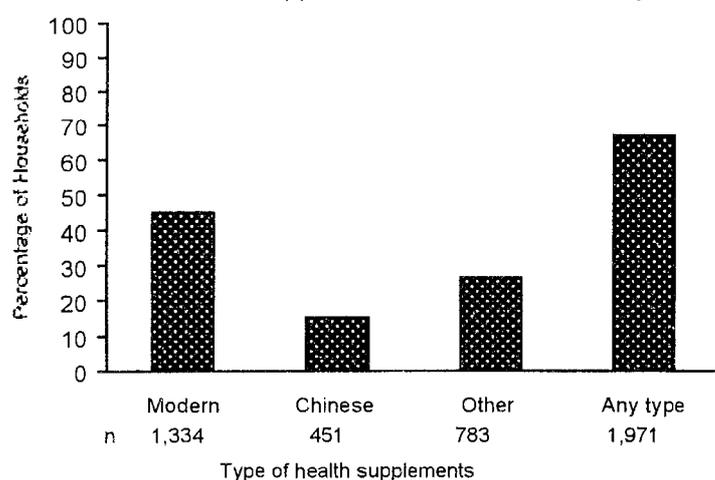
1. Geographic location of household: urban/ rural, states
2. Socio-economic attributes of households: household size, ethnicity and income
3. Socio-economic attributes of heads of households: age, gender, education level, employment status.

Extent of Usage and Type of Health Supplements

In this survey, it was found that 66.8% of the households in Peninsular Malaysia had purchased health supplements. (Figure 3.1) This implies that for every ten households, about seven would have purchased it. It gives a general impression that Malaysian householders have a high tendency for using health supplements.

The most common type of health supplements purchased was the 'Modern health supplements' (45.2%). However, the usage of traditional forms, particularly, other traditional which includes Malay herbs is commonplace too.

Figure 3.1. Percentage of households purchasing health supplements in Peninsular Malaysia, 1996.



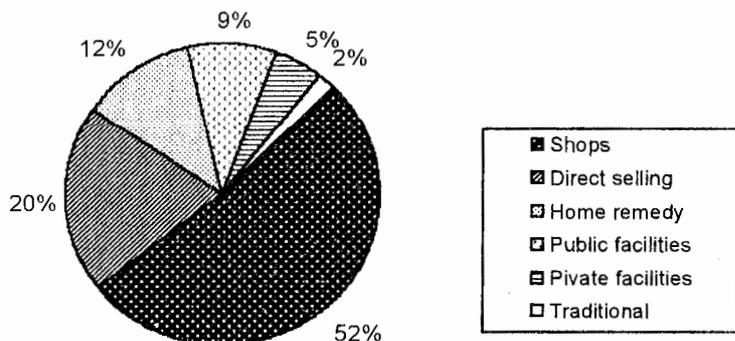
(n refers to the estimated number of households that purchased a type of health supplement)

It is important to identify whether this habit of purchasing health supplements prevails in the general population or is specific to certain section of the population. Measures such as health messages and sales can then be targeted appropriately to address the issues of monitoring and control over the excessive habit and redistribution of resources for health at the community level.

Source of Purchase

A very high proportion (86%) of households reported purchasing the supplements on their own accord and without professional advice (Figure 3.2). Shops (52%), direct-selling agents (20%), home remedies (12%) and traditional healers (2%) were sources of such purchases. Such purchases were grouped and termed 'self-purchase'. Such a purchase differs from health supplements obtained from health facilities because 1) there was no professional advice given 2) purchases made at public health facilities would involve minimal or no payment and 3) the cost of health supplements obtained from private health facilities may be masked by the cost of drugs and consultation.

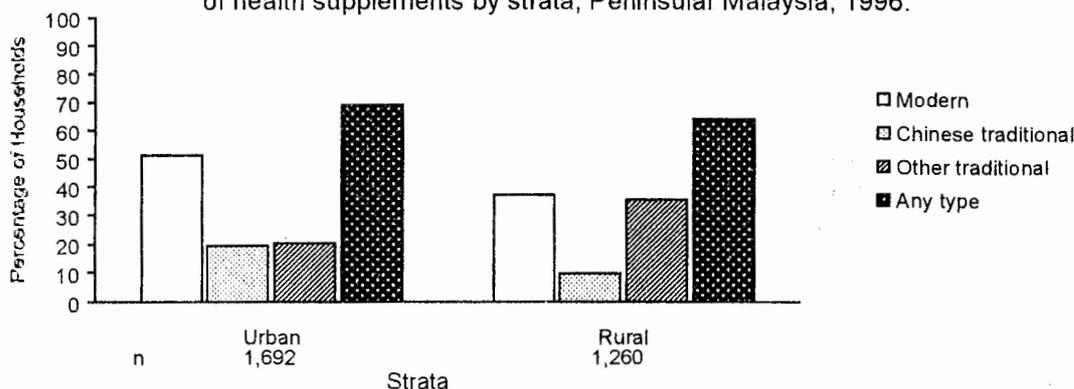
Figure 3.2. Percentage of households according to sources of purchase of health supplements, Peninsular Malaysia, 1996.



Geographical Location and Purchase of Health Supplements

Almost equal proportions of households in urban (68.7%) and rural (64.1%) areas reported purchasing health supplements. (Figure 3.3.) There were however, interesting variations in the preference for a particular type of health supplements. Higher proportion of urban households purchased 'modern supplements' compared to rural households. Urban households purchased more of 'modern supplements' compared to the other types of supplements. In rural areas, households showed an equal preference for 'modern supplements' and 'other traditional' type.

Figure 3.3. Percentage of households purchasing different types of health supplements by strata, Peninsular Malaysia, 1996.



n refers to the estimated number of households in each stratum

Chinese traditional supplements were equally preferred to the other traditional supplements in urban areas. Other traditional supplements were more popular compared to Chinese supplements in rural areas. The differences seen in the choice of health supplements between the urban and rural households may be partly explained by cultural beliefs, availability and affordability.

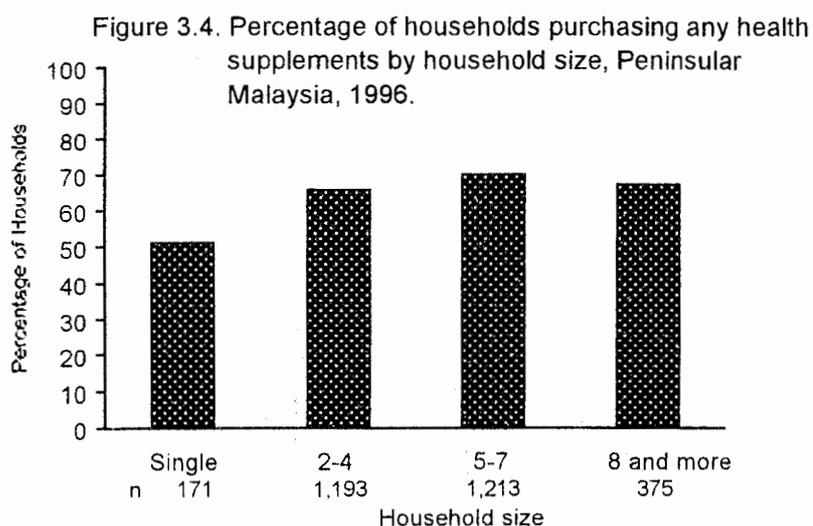
All states reported high proportions of household purchase of health supplements. (Table 3.1.) There is small variation in the proportion of purchasing between the states. This suggests that generally, households in Peninsular Malaysia are accustomed to the habit of taking health supplements.

Table 3.1. Numbers (in '000) and proportion of households purchasing any health supplements by state, Peninsular Malaysia, 1996.

State	Number	%
Johor	293	67.0
Kedah	215	74.0
Kelantan	169	73.8
Melaka	63	55.3
N. Sembilan	89	62.3
Pahang	130	67.9
P.Pinang	141	69.1
Perak	217	58.6
Perlis	29	72.7
Selangor	340	64.2
Terengganu	104	69.8
W.P.K.L.	181	71.3

Household Attributes and Purchase of Health Supplements

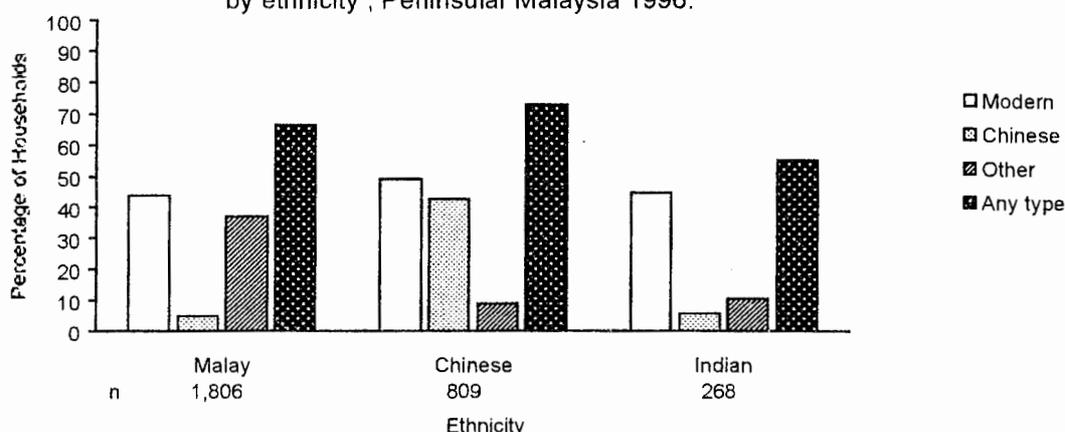
Larger households were more likely to purchase health supplements. (Figure 3.4.) It is likely that the more the members in a household the greater the perceived need for health supplements, especially young children and elderly persons.



n refers to the estimated number of households in each population group

Purchase of health supplements is common in all the three ethnic groups, especially among the Chinese households (72.8%). Overall, the preferred type within each ethnic group is the modern health supplements. However, with regards to traditional supplements, Malay households have a strong preference for other traditional supplements over Chinese supplements. The opposite is true among Chinese households who preferred Chinese health supplements. These findings are to be expected because of cultural tendency to use their own. On the other hand Indian households were much less likely to purchase traditional health supplements compared to Malays and Chinese.

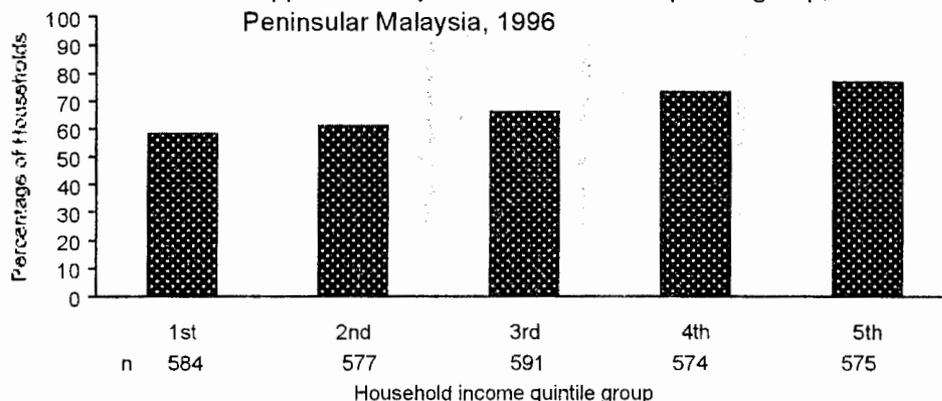
Figure 3.5. Percentage of households purchasing health supplements by ethnicity, Peninsular Malaysia 1996.



2.3 % of the households were not included as they belonged to other ethnic groups or were non-Malaysians
 n refers to the estimated number of households in each population group

Purchasing health supplements is commonplace in all household income groups as can be seen in Figure 3.6. It is not all too surprising to see an increase in tendency to purchase the higher the household income.

Figure 3.6. Percentage of households purchasing any health supplements by household income quintile group, Peninsular Malaysia, 1996



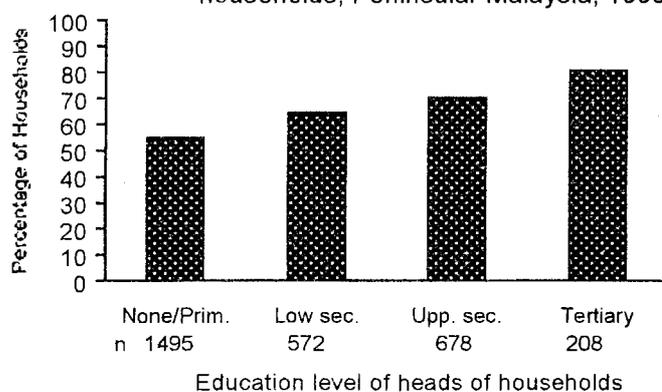
Household income was unknown in 1.7% of the households sampled

n refers to the estimated number of households in each population group

Head of Household Attributes and Purchase of Health Supplements

Gender and employment status of the head of household had little influence on the purchase of health supplements. However, educational level of head of household seems to influence purchasing of health supplements. (Figure 3.7) The proportion of households purchasing health supplements increased from 54.9% to 80.7% among households whose head did not have formal schooling and whose heads had tertiary level of education respectively. In this respect, the more educated the head, the greater the need for the household to purchase health supplements.

Figure 3.7. Percentage of households purchasing any health supplements by education level of heads of households, Peninsular Malaysia, 1996.



n refers to the estimated number of households in each population group

Summary

Households in Peninsular Malaysia have a great tendency to purchase health supplements, both in urban and rural areas. There is little variation in the purchase between the states. Modern health supplements was the most favoured, even though traditional forms are commonplace, especially with the Chinese and Malay households.

Households who were more likely to purchase health supplements were Chinese households, large households, households with high income and households whose heads have higher education level.

HOUSEHOLD EXPENDITURE

4

Introduction

The weighted population was estimated to have spent RM548 million on health supplement products in 1996. The per capita expenditure was RM37.76. Based on the estimated population of 16.7 million persons in Peninsular Malaysia in 1996, the household expenditure on health supplements was RM632 million. This represents about 23.4% of the estimated total household health expenditure of RM2.8 billion in the year 1996. This proportion of household health expenditure was the next highest after expenditure for acute conditions.

The total household expenditure for health supplements in Peninsular Malaysia was unevenly distributed. The expenditure was higher in the urban areas (accounting for 79.4% of the total expenditure) and the more developed states of Selangor (27.2%), Johor (16.6%) and W.P.K.L. (15%). Unlike household purchase which showed little geographical variation, the variation in the expenditure is likely to be governed by who uses it, the amount used and the costs of the different types of health supplements.

The purchase price of the health supplements was the major component of household expenditure for health supplements, as it constituted 99.7% of the total cost. The proportion could however be less since cost of travelling in private vehicles was not reported.

Chapter 3 described some socio-economic attributes of purchasers of health supplements. In this chapter the expenditure patterns of these purchasers are presented.

Household expenditure for health expenditure per year will be described at four levels:

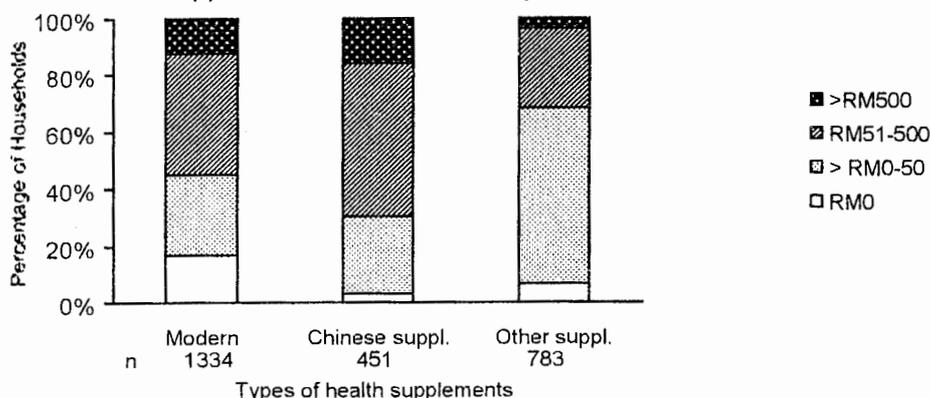
1. No payment (RM0)
2. Nominal (RM1-RM50)
3. Commercial (RM51-RM500)
4. Exorbitant (RM501 and above)

These levels were established arbitrarily as there is no readily available information on the market pricing of these products. Currently, pricing of health supplements is very much left to market forces. Only households that reported purchasing health supplements were analysed for their pattern of expenditure (referred to as 'n' in this chapter).

Type of Health Supplement and Expenditure

Among the three categories of health supplements, households who purchased Chinese traditional supplements paid more compared (69.6% paid at commercial and exorbitant prices) to households who bought 'Modern' and 'Other traditional supplements'. (Figure 4.1) This is most likely due to the fact that 'Chinese traditional supplements' is generally more expensive when compared to the other two, especially the 'Other traditional supplements', in which only 31.8% households paid at commercial and exorbitant price.

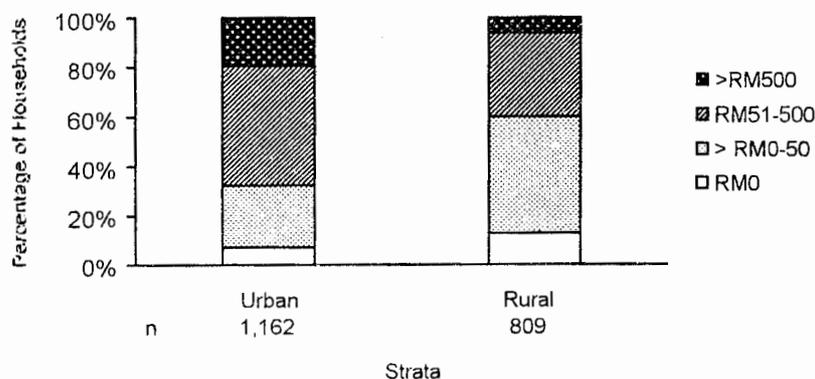
Figure 4.1. Household expenditure by type of health supplements, Peninsular Malaysia, 1996.



Geographical Location and Expenditure

Higher proportion of urban households (67.7%) purchased health supplements at the commercial-exorbitant rate compared to only 39.9% among rural households. (Figure 4.2) The large difference is due to the fact that more urban household consume 'Modern' and 'Chinese traditional supplements', and as already mentioned earlier these are generally more expensive than the 'Other traditional supplements'.

Figure 4.2. Household expenditure for health supplements by strata, Peninsular Malaysia, 1996.



As shown in Table 4.1, household expenditure for health supplements were generally higher for states such as W.P.K.L., Selangor, P. Pinang and Johor compared to states of Kelantan, Terengganu and Kedah. This difference is due to the fact that, W.P.K.L., Selangor, Pulau Pinang and Johor are more urbanised and a higher proportion of urban households in these states are Chinese. Also their household income are much higher compared to the rural areas. To cite an example - Kedah, which is a less urbanised state and predominantly consisting of Malay households has the highest proportion of households purchasing health supplements (74.0%; Table 3.1) yet 62.0% of these households spent nothing to only nominal. When compared to P.Pinang, 65.8% of the households paid at commercial to exorbitant price among the 69.1% households (Table 3.1) who purchased health supplements.

Table 4.1. Household expenditure for health supplements by state, Peninsular Malaysia, 1996.

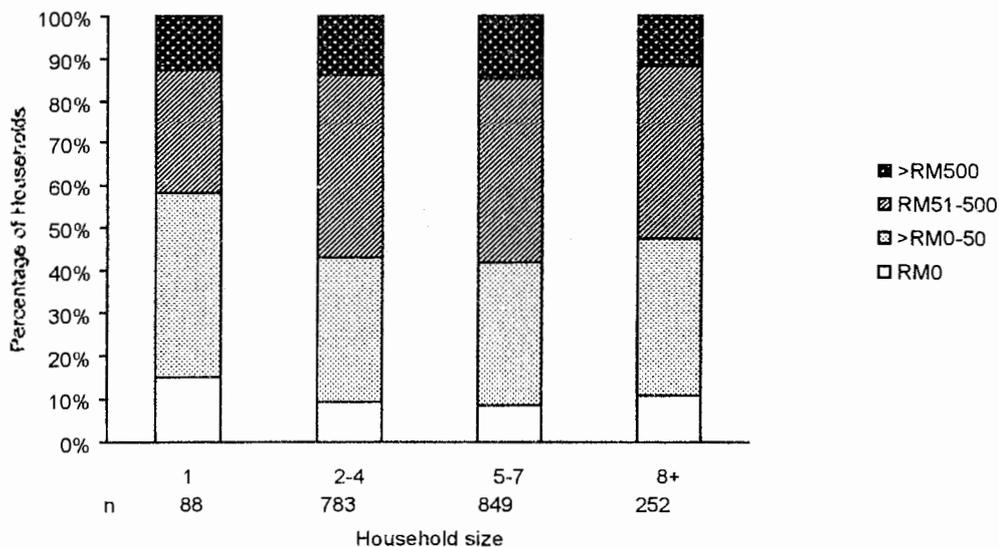
State	Number (in '000) and proportion of households at levels of expenditure			
	RM0	>RM0 – RM50	RM51 – RM500	> RM500
Johor	21 (7.1)	84 (28.7)	145 (49.4)	43 (14.8)
Kedah	14 (6.4)	119 (55.6)	67 (31.0)	15 (7.0)
Kelantan	21 (12.4)	107 (63.2)	39 (22.9)	3 (1.5)
Melaka	9 (13.8)	19 (29.8)	30 (46.8)	6 (9.5)
N. Sembilan	14 (15.2)	23 (25.8)	38 (42.8)	14 (16.2)
Pahang	18 (14.2)	39 (20.8)	54 (45.0)	14 (11.0)
P.Pinang	7 (4.8)	41 (29.4)	69 (48.7)	24 (17.1)
Perak	27 (12.4)	68 (31.4)	95 (43.7)	27 (12.4)
Perlis	3 (8.8)	16 (54.6)	9 (31.4)	2 (5.2)
Selangor	31 (9.2)	66 (19.5)	166 (48.7)	77 (22.5)
Terengganu	11 (10.4)	57 (54.7)	32 (30.7)	4 (4.2)
W.P.K.L.	11 (5.9)	37 (20.5)	90 (49.5)	44 (24.1)

Footnote: The percentages are based on those households who purchased health supplements.

Household Attributes and Expenditure

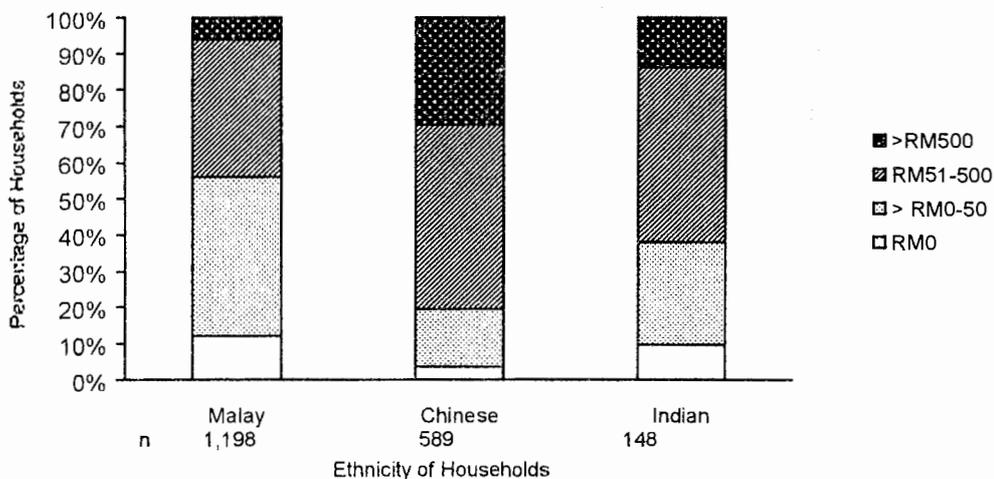
As shown in Figure 4.3 a majority (58.2%) of single household spent zero to nominal on health supplements. This is not so for larger households, where a large proportion spent much higher (i.e. at commercial to exorbitant rates) amounts. A possible explanation is that 1) the more the members in a household the higher the expenditure, 2) very young and elderly household members may be in more need for health supplements. Single households are more likely to consist of young adults.

Figure 4.3. Household expenditure for health supplements by household size, Peninsular Malaysia, 1996.



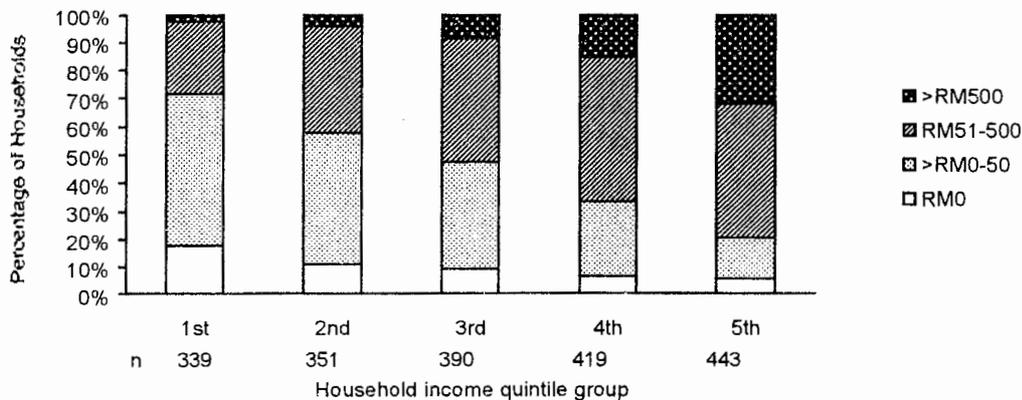
Higher proportion of Chinese households spent more money on health supplements compared to the Malay and Indian households. (Figure 4.4) This seems to suggest that Chinese households regards the use of health supplements as vital for the sustenance of good health, and the higher cost is partly due to the choice of 'Chinese traditional supplements' which is found to be more expensive than other types including the 'Modern' health supplements.

Figure 4.4. Household expenditure for health supplements by ethnicity of households, Peninsular Malaysia, 1996.



With an increase in household income, there is a corresponding increase in the proportion of households who purchased health supplements at least at a commercial sum. This is especially so among households whose income is in the fifth income quintile bracket, where nearly a third paid exorbitantly. In general terms, this would imply that demand for health supplements is motivated by the purchasing power of the households.

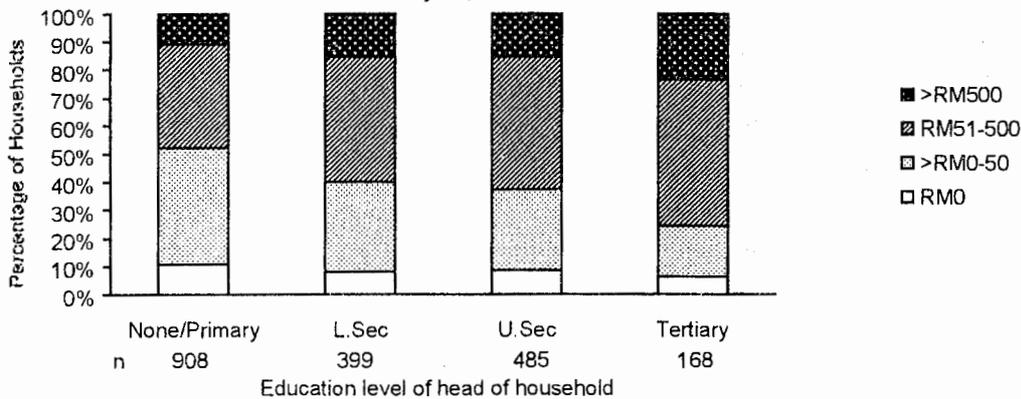
Figure 4.5. Household expenditure for health supplements by household income quintile group, Peninsular Malaysia, 1996.



Head of Household Attributes and Expenditure

As shown in Figure 4.6 the higher the education level of head of household, the higher the proportion of spending at commercial to exorbitant sum. This seems to suggest that the head

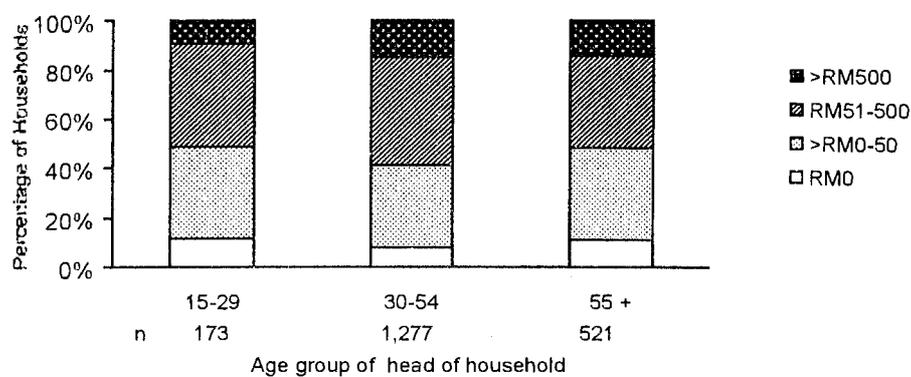
Figure 4.6. Household expenditure for health supplements by education level of head of household, Peninsular Malaysia, 1996.



has 1) an influence over the demand for health supplements for their household members and 2) the better educated they are the greater the expenditure of the households.

There is no indication that gender and employment status of heads of households have any impact on the pattern of household expenditure for health supplements. However, age group of head of household seems to influence expenditure patterns (Figure 4.7). There is a slight increase in the proportion of spending at commercial to exorbitant sum among households whose head is in the older age group.

Figure 4.7. Household expenditure for health supplements by age group of head of household, Peninsular Malaysia, 1996.



It is noted that for all the attributes discussed in relation to health expenditure patterns on health supplements, there are varying proportions of households who did not pay at all. This is likely to be due to the fact that these households may have received health supplements free of charge, especially vitamin tablets from sources such as 1) maternal and child health clinics and 2) outpatient clinics. In such cases one can say that such usage of health supplements are on the recommendation of the health professionals.

Summary

Of the estimated RM2.8 billion in total household health expenditure, slightly over a fifth was spent by households on health supplements for the year 1996. The health expenditure is higher in the urban areas and in the developed states. Chinese households spent much more compared to other ethnic groups. The higher the household income the more they spent on the health supplements. As expected the expenditure is much higher the larger the size of the households. With respect to the characteristics of the head of households, households whose heads have higher education level spent more compared to those with lower education levels.

The above descriptions may not totally explain the entire picture regarding the patterns of household health expenditure on health supplements. As an example, the high expenditure on health supplements by an urban household may in actual fact be explained (confounded) partly by the differential distributions of ethnicity, household income and type of supplement purchased. Besides this, one has to consider the possibility of 'clustering' among the households within the district and the districts within the state which may influence the expenditure patterns. Therefore,

in order to take these into consideration, a multilevel modelling which attempts to address these issues is presented in the next chapter.

MULTILEVEL ANALYSIS

5

The detailed description of multilevel analysis is described in the Technical Report, Multivariate Analysis of Expenditure and Utilisation. The analysis is concerned only with expenditure, in RM, defined as the total expenditure on all health supplements obtained in the recall period of one year prior to the interview. As outlined in Chapter 3, three categories of health supplements are distinguished:

1. Modern (e.g. vitamins, minerals, and aloe vera);
2. Traditional Chinese herbs; and
3. Other traditional preparations.

Apart from household-level attributes we consider also variables that indicate the type of supplements obtained. Since a household may obtain supplements of more than one kind, these indicator variables are not exclusive. Since the outcomes are aggregated within households, and no person-level attributes are used as explanatory variables.

The (geometric) mean Expenditure for households that purchased some health supplements is RM28.00 (the estimate on the logarithm scale is 1.447, with standard error 0.104). Most of the variation is among households, but there is moderate variation among both districts and states. The estimated variance components are 1.684 (households), 0.092 (districts), and 0.057 (states).

Households that purchased traditional Chinese supplements tended to have expenditure about three times higher than households that purchased only other kinds of health supplements. Household income is an important predictor of Expenditure. Ten-fold increase in Household income is associated with 6.37 times greater Expenditure (the regression slope estimate is 0.804, with standard error 0.070).

Of the other household attributes Ethnicity, and to a lesser extent, Urbanity, Educational level of head of household, and Age group of household, are important predictors of household expenditure, in addition to Household income. The influence of Household income on the prediction of Expenditure is moderated very little by the other explanatory variables. After controlling for them (including control of types of supplements purchased), ten-fold increase in Household income is associated with 4.32 times greater expenditure. Chinese spent on average about 3.7 times and Indians 2.35 times more than Malays. The adjusted differences among urban and rural areas are much smaller, households in urban areas expended 37% more than those in rural areas. Higher Educational level of head of household is associated with greater expenditure. The adjusted differences vis-a-vis the households whose heads have no more than primary education are about 40% (secondary) and 60% (tertiary education). In households with younger heads (15-29 years of age) the adjusted expenditure is somewhat lower, by about 40% than in households headed by older persons.

CONCLUSION AND IMPLICATIONS

6

Purchasing of health supplements is quite universal in Peninsular Malaysia and the (annual) household expenditure on these items exceeds the expenditure on typical episodes of extensive care in government facilities, such as in-patient care (Maternity or Hospitalisation).

Urban and rural households have the same tendency to purchase health supplements, even though the urban households spent much more. Even though the pattern is much the same in terms of purchase for all the states, what seems to differ is the amount of money spent which is much higher in the more economically developed states such as Selangor, P.Pinang, Johor and Kuala Lumpur.

Better-off households obtain more health supplements. Chinese and Indians households tend to spend more on health supplements than Malay households. However, bigger households are not associated with greater expenditure. Chinese traditional supplements tend to be more expensive than modern supplements. Chinese tend to prefer Chinese traditional supplements, Malays prefer other traditional preparations, and most of the expenditure of Indians is on modern supplements.

The findings from this Survey are not at all surprising in terms of the user (household) characteristics. But what is of concern and that need to be highlighted is the extent and the rationale of its use. Based on the sources of purchase it was found that most of these purchases were made in shops and pharmacies, and it is assumed that most of these purchases were made without prescription.

The main issue which is of concern to us, and in particular to the health professionals is whether the individuals who consume these health supplements really warrant its use. What is perceived to be useful can be harmful if it is improperly consumed. Evidence now exists that overuse of some health supplements such as vitamins A and D may lead to toxicity syndrome.^{6,7} Still, if it is not found to be harmful, is it not a waste of resources for a person known to be healthy and already taking a proper and adequate diet? In a report involving a United States cohort, it was shown that there was no evidence of a reduction of either cancer or all-cause mortality among vitamin and mineral supplement users.³ What we do not know for sure in this Survey is the extent household members consume health supplements for health reasons. Even, in a diseased state the use of multivitamins is being questioned, as depicted in a study on diabetes mellitus, where there is no evidence to suggest that routine prescribing of multivitamins is of any value.⁸

We emphasise that:

- 1) health supplement products are readily available to the general public,
- 2) many ingredients are not readily identifiable, and even for those that are identifiable, all potential effects and side-effects may not be known,
- 3) supplement users may combine two or more products and may set their own dosage regimens
- 4) some users may not disclose their use to their doctors for various reasons, e.g. they may not consider these items as drugs.

It is therefore necessary that consumers of health supplements need to be properly educated of the rationale, benefits and risks associated with its use. The informed consumer will be more discerning with the choice of health supplements, which will lead to an unnecessary waste of monetary resources as well as avoiding potential health hazard with its use. One area which needs to be stressed is the use of traditional health supplements (Chinese and other traditional) by the general public. As shown in this survey, its use is relatively widespread. There is much information that need to be known about its beneficial and harmful effects. Its contents and how it interacts with concurrent use with modern medicine is one such example.

It has been outlined under the Seventh Malaysia Plan that one of objectives of the Ministry of Health (MOH) is to encourage a healthy diet habit in the community.⁹ Needless to say, the use of health supplements may be warranted under certain circumstances. To ensure its proper use, regulatory and monitory measures regarding the sales, marketing and labelling of these products need to be strengthened. The roles of the MOH, pharmaceutical and related agencies are vital in ensuring that the consumers are being safe-guarded. Hence, reporting of adverse effects of health supplements to appropriate public health authorities, could be instrumental in preventing serious side-effects. Consumer associations have a pivotal role to inform the general public, besides being a watchdog to the government. The general public needs to be constantly reminded of indiscriminate commercial advertising of these products, as in these modern times, even dangerous products are actively being promoted via the Internet.¹⁰

This survey has provided some useful information and its implications justify for solicitous considerations. Furthermore, this survey has raised several questions which need to be addressed in the future. Firstly, the behavioural aspects of the Malaysian individuals who consume these supplements need to be studied, in order to give a proper perspective as to their usage. Secondly, the amount consumed by individuals need to be studied in order to establish the potential overuse and its side-effects.

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APPENDIX II

HEALTH SUPPLEMENTS : Variable list

The analysis for consumption and purchase of health supplements will not be related to persons but only to household and heads of households.

No	Conceptual definition	Operational definition	Scale of measure	Unit of measure
1.	Geographical location	Place of stay as identified on the ground & based on reported address and definition by Statistics Dept.	Nominal	State Strata
Household characteristics				
2.	Household size	No. of HHMs in the HH (See glossary)	Ordinal	HH size group
3.	Household income	Total contribution by HHM based on earned income	Ordinal	HH income quintile group
Head of HH attributes				
4.	Age	Age at last birthday	Ordinal	Age group: 15-29, 30-54, 55+
5.	Gender		Nominal	Male/ Female
6.	Ethnicity		Nominal	Malay, Chinese, Indian, etc.
7.	Education level	Accepted by Ministry of Education	Ordinal	None, Primary, Lower, Sec. etc.
8.	Employment status	Current job status	Nominal	Non-income recipient, self employed, govt, statutory, private

No	Conceptual definition	Operational definition	Scale of measure	Unit of measure
9.	Purchase	Aggregate of events in a year whereby household bought a type of health supplements.	Ordinal	1 or 2 or 3 purchases
Characteristics of purchase				
10.	Type of purchase	Related to types of health supplements	Nominal	Vitamins, aloe vera, Chinese medicine, Other traditional medicine
11.	Place of purchase	Type of place where supplement was purchased.	Nominal	self prep, public clinic, private clinic, traditional medicine hall, pharmacy / shop or direct selling
Expenditure variables				
12.	Purchase cost per year	Cost paid by HH for the supplement	Continuous	Ringgit Malaysia (RM)
13.	Travelling cost per year	cost incurred to travel to and fro to obtain the supplement (public transport only)	Continuous	Ringgit Malaysia (RM)
14.	Other cost per year	Cost other than treatment and transport e.g. loss of wages, cost of accompanying person	Continuous	Ringgit Malaysia (RM)
15.	HH expenditure per purchase	Total cost of Variables 14, 15, 16	Continuous Ordinal	Ringgit Malaysia (RM) No payment, Nominal, Commercial, Exorbitant
16.	HH expenditure for health supplements	Total cost paid by HH for all supplements in the year	Continuous Ordinal	Ringgit Malaysia (RM) No payment, Nominal, Commercial, Exorbitant

ANNEX E

NATIONAL HOUSEHOLD HEALTH EXPENDITURE SURVEY 1996 (NHHES'96)

PENINSULAR MALAYSIA

Dental Care

Report of Findings

**NHHES'96 TEAM
DEPARTMENT OF SOCIAL AND PREVENTIVE MEDICINE
FACULTY OF MEDICINE, UNIVERSITY OF MALAYA**

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- ❖ The Economic Planning Unit, Prime Minister's Department, Malaysia for giving us an opportunity to work for the nation and to gain experience in a nationwide survey.
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INTRODUCTION

1

This report contains information on household utilisation of dental facilities and expenditure for dental care. The data forms part of a larger data set collected under the National Household Health Expenditure Survey 1996.

Purpose

In line with the national survey, the aim of this report is to provide baseline information on household expenditure for dental care and some aspects of the utilisation of dental services in Malaysia. Demographic, social, economic and health factors that were suspected to be associated with these expenditures were investigated.

Specifically, this report seeks to answer the following questions:

1. Who were more likely to seek care?
2. Where did individuals seek dental care?
3. What factors were associated with the choice of source of care?
4. How much did households pay when a household member sought dental care?
5. What factors were associated with household expenditure for dental care?
6. What was the total household expenditure for dental care in the country in 1996?

METHODS

2

Introduction

The NHHES'96 covered the whole of Malaysia. However, only the population residing in non-institutional living quarters (private living quarters) were canvassed. Details of the method utilised in the survey is fully described in the Preliminary Report, National Household Health Expenditure Survey 1996 Volume II.

Survey instrument

In principle, the instrument designed to collect information on dental care was similar to the other sectors of health. Form 9 of the survey instrument contained information on dental care (Appendix 1). Only occasions when dental care was received were recorded. In situations where there were dental problems but the individuals chose to do nothing, information was not collected. Sources of care included the following:

1. Self/ home care
2. Public dental facilities
3. Private dental surgeries
4. Dental shops/clinics managed by Division II dental practitioners
5. School dental service
6. Traditional healers

The individual was also asked if the dental episode was associated with a painful or non-painful condition.

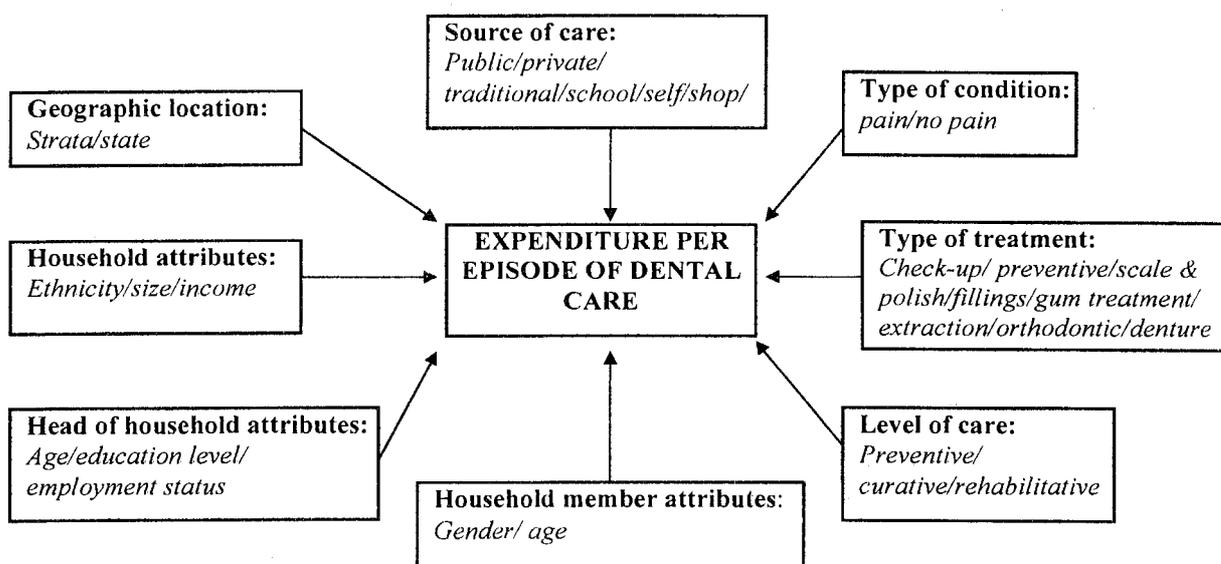
The research database

The database was built and analysed to address questions relevant to policy issues in the context of household expenditure on dental care. Figure 2.1 represents a conceptual framework of the possible factors that may be associated with this expenditure. Details of these factors are in Appendix 2.

The data are reported in terms of dental episodes. A dental episode is an event (dental visit) when an individual receives care for any disease or condition occurring or manifested in the mouth. The person may have received care at any of the alternative sources of dental services as stated above. Complex dental treatment such as obtaining dentures or orthodontic treatment, may have several episodes, each episode associated with one visit. This report covers household reporting of dental episodes within a recall period of one year. It is recognised that households most likely reported only the major type of treatment received during an episode. In addition, poor recall may have also lead to underreporting.

The basic unit of interest is an episode related to a dental problem during the year surveyed. One or more of these episodes may be reported by an individual. Individuals are members of households and therefore a household may have reported zero, one or more episodes.

Figure 2.1. A conceptual model to explain household expenditure for dental care



The expenditure data in this report is a measure of the amount of money paid out-of-pocket by a person when utilising a dental facility on each occasion. The term 'expenditure per dental episode' is used. The expenditure component consists of cost of treatment, cost of travelling and other costs such as loss of wages. Cost of travelling in private vehicles was not included as it was difficult for households to estimate the cost. Therefore, travelling cost was cost paid out-of-pocket when using public transport.

In the survey in Peninsular Malaysia, 8905 households in 8727 private living quarters were successfully interviewed. The sociodemographic details of the sample have been reported in the volume on 'Summary of Preliminary Results'. There were 12,000 episodes of dental care reported. The sample was weighted in order to get the representation of region, state and urban and rural strata. The weighted population consisted of 14,510,912 persons in approximately 2.95 million private households. This report contains information related to the weighted population.

UTILISATION OF DENTAL SERVICES 3

Introduction

This chapter focuses on possible factors that are associated with the choice of utilising dental care facilities when care was needed.

Utilisation was examined across 6 dimensions. The dimensions were:

1. Geographic location of household: urban/ rural strata, states
2. Socio-economic attributes of households: size, ethnicity, income
3. Socio-economic attributes of heads of households: age, education level, employment status
4. Socio-economic attributes of household member: gender, age
5. Outcome-related factors: type and level of treatment received, presence/absence of pain.
6. Source of care: public facilities/private facilities/school program/self-medication.

Describing the profiles of the episodes of care at the dental facilities would give an impression of population subgroups who were more likely to seek dental care and those more likely to use public or private facility. It is recognised, however, that the question of choice in this report is limited to the mere presentation of the individual at the facility either with some specific problem in mind or in response to a follow-up appointment. In most situations, the choice of specific treatment lies predominantly with the dentist rather than the patient. Further, there are those who refrain from seeking care even if they perceive a need and would only seek care when they suffer intolerable pain.

Reporting of dental episodes in Peninsular Malaysia

In the weighted population, about 2.6 million persons residing in about 1.6 million households in Peninsular Malaysia reported a total of about 3.9 million dental episodes. This involved about 17.6% of the population and about 54.2% of households in Peninsular Malaysia. In this respect, dental condition was the most commonly reported health condition by household members. Among those who reported receiving dental care, majority (71.4%) had experienced only one episode during the recall period of one year. The mean number of episode per person was 1.51 and it was 2.4 episodes per household (median was 2).

In the population the estimated rate of dental episodes was about 269 episodes per thousand persons (Table 3.1). The rate of utilisation of dental services was greater in urban areas at 280 episodes per thousand compared to only 256 per thousand in rural areas. This means that the urban population was more likely to use dental services. Among the various age groups of household members, those age 6-12 years (primary school) and 13-17 years (secondary school) had high rates of dental episodes; 547 and 244 episodes per thousand respectively. These high rates were mainly the effect of the school dental service.

Table 3.1. Rate of utilisation of dental facilities by age group of household members

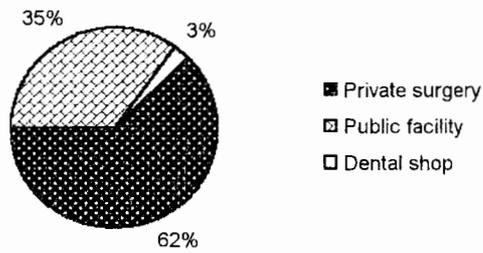
Age group (years)	Number of persons in weighted population sub-group	Number of episodes per thousand persons	
		Before adjusting for school dental service and self-medication	After adjusting for dental school service and self-medication
0-5	2,024,047	59	48
6-12	2,368,135	547	148
13-17	1,605,415	244	97
18-64	7,842,184	251	247
65 and >	671,131	191	190
All	14,510,912	269	184

A substantial proportion (30.6%) of the 3.9 million episodes was related to care given to schoolchildren under the school dental service in the Ministry of Health. Under this service, systematic and comprehensive treatment is available to all schoolchildren mainly in the school dental clinic. Schoolchildren are screened at least once a year and basic treatment is given free. Schoolchildren and their families need not make any extra effort to obtain care under this program since the service is available in the school. Due to these characteristics treatment received under the school dental service can be considered different from services rendered from other sources of care especially with respect to determining factors associated with utilisation and out-of-pocket expenditure. Such episodes were therefore not further considered in this report.

Self-medication at home constituted only 1.1% of all the episodes. There were no episodes where care was given by traditional healers. No further description of these population subgroups was carried out.

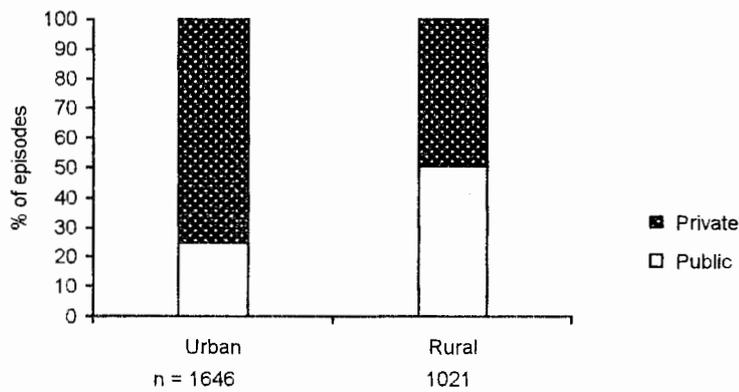
The sources of care considered in this report was therefore limited to episodes at public and private dental facilities (about 2.67 million episodes), of which 65% were private care (Fig 3.1). Private care comprised of care received at private dental surgeries (62%) and dental shops/ clinics (3.0%). High rates of utilisation of dental facilities were observed among Chinese (214 episodes per thousand), females (210 episodes per thousand), adults aged 18-64 years (247 episodes per thousand), persons with tertiary education (350 episodes per thousand) and the richest 20% of the population (257 episodes per thousand).

Figure 3.1. Proportion of episodes reported at various sources of care



Geographical location and utilisation of dental services

Figure 3.2. Utilisation of dental facilities by strata (Numbers in '000)



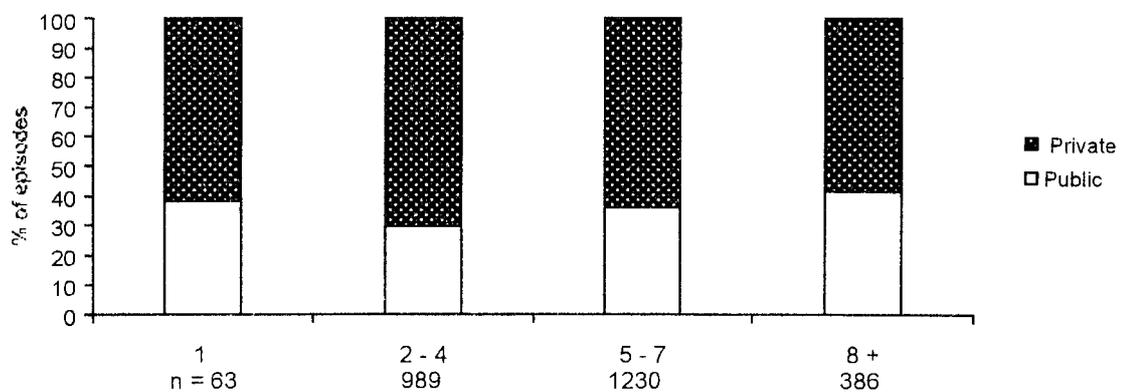
n refers to the estimated number of dental episodes in the population sub-group after weighting

Table 3.2. Utilisation of dental facilities by state
(Numbers in '000)

State	Episodes of care at public facilities		Episodes of care at private facilities	
	n	%	n	%
Johore	86	26.4	238	73.6
Kedah	166	54.4	139	45.6
Kelantan	94	55.1	76	44.9
Melaka	36	45.6	43	54.4
N. Sembilan	57	45.6	68	54.4
Pahang	79	52.3	72	47.7
P. Pinang	60	25.4	176	74.6
Perak	100	31.8	214	68.2
Perlis	22	66.7	11	33.3
Selangor	84	16.6	423	83.4
Terengganu	95	49.7	96	50.3
WPKL	46	19.7	187	80.3

Urban population (75.1%, Figure 3.2) and population of more developed states such as Selangor (83.4%), W.P.K.L. (80.3%), P.Pinang (74.6%) and Johore (73.4%) were more likely to choose private care (Table 3.2). The higher concentration of private practitioners in these areas and higher expectations of such population groups were quite likely reasons for these observations. In the less developed states, there was almost equal utilisation of public and private facilities. An exception was in the state of Perlis, where two thirds of the episodes were care received at public facilities.

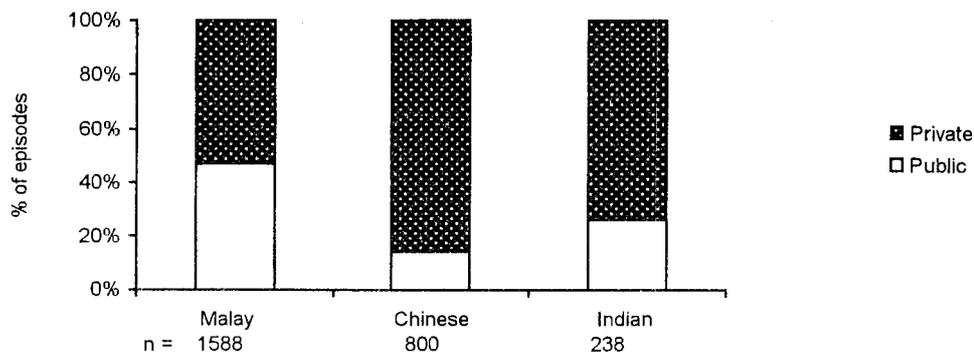
Figure. 3.3 Utilisation of dental facilities by household size
(Numbers in '000)



n refers to the estimated number of dental episodes in the population sub-group after weighting

Households of all sizes chose private over public dental facilities (Figure 3.3). The difference was in the degree of utilisation as assessed by the proportion of episodes at the facilities. Large households used less private dental facilities compared to small households. Large households are likely to be those in the lower household income group and the size of the households would further dilute the income available to household members. Large households would also experience more dental problems. These factors would restrain the choice of private care. Single households were likely to be recently employed young adults with a lower household income and would similarly face constraints in the choice of care.

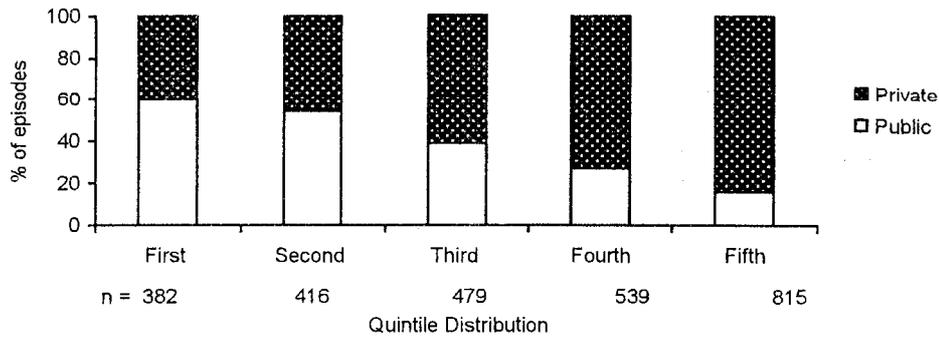
Figure 3.4. Utilisation of dental facilities by ethnicity of household (Numbers in '000)



n refers to the estimated number of dental episodes in the population sub-group after weighting. In 1.5% of the dental episodes, ethnicity of the households were not known

Chinese households highly sought care at private facilities (85.9%) compared to the other ethnic groups (Indian 73.1%, Malay 53.1%, Figure 3.4). Conversely, Malay households exhibited almost no preference for private or public dental services. Likely explanations for these ethnic choices include place of residence and household income. Chinese households generally reside in urban areas and have higher income and can be regarded to be more accessible to health facilities.

Figure 3.5. Utilisation of dental facilities by household income quintile group (Numbers in '000)

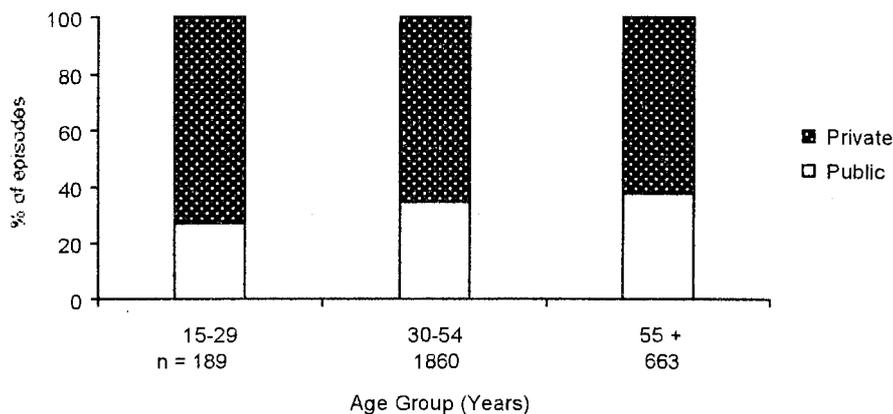


n refers to the estimated number of dental episodes in the population sub-group after weighting. In 1.6% of the dental episodes, the household income was not known

The data suggests a positive relationship between household income and utilisation of private dental services (Figure 3.5). Households with low income (1st and 2nd quintile) chose public over private services. From the 3rd household income quintile onwards the trend was reversed with a sudden increase in affinity for private care. A logical explanation for these differences is that household with higher income can afford to pay more for services.

Head of household attributes and utilisation of dental services

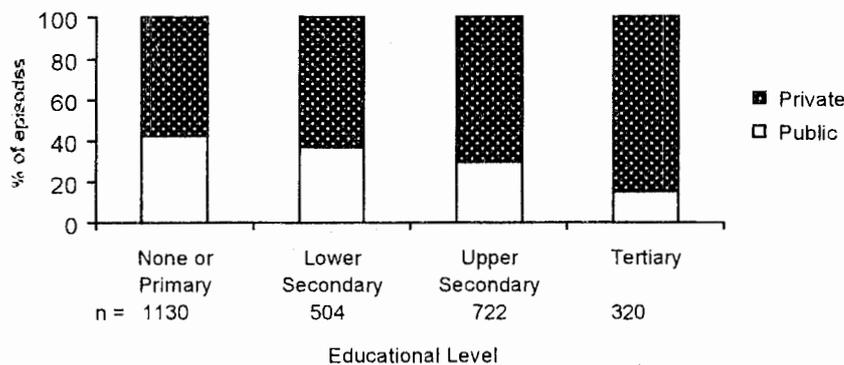
Figure 3.6. Utilisation of dental facilities by age-group of head of household (Numbers in '000)



n refers to the estimated number of dental episodes in the population sub-group after weighting

Overall, households of all age-groups of heads of households chose private facilities although households headed by younger persons had slightly greater tendency to obtain care at private facilities.

Figure 3.7 Utilisation of dental facilities by education level of head of household (Numbers in '000)

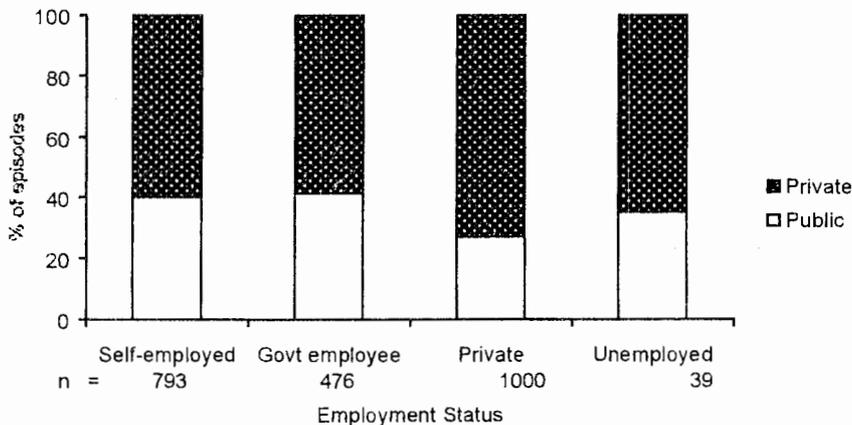


n refers to the estimated number of dental episodes in the population sub-group after weighting

The education level of heads of households appeared to have a positive impact on the utilisation of private services (Figure 3.7). For households headed by persons with tertiary education, 85.1% of the episodes had sought care at private facilities. The education level was probably related to employment status; whereby persons with higher level of education had better employment positions and commanded higher income.

In all categories of employment status of the heads of households, there was a tendency to favour private care more than public services (Figure 3.8). The emphasis for private care was greatest among households with privately employed heads (73.0%). Most unexpected, however, were

Figure 3.8 Utilisation of dental facilities by employment status of head of household (Numbers in '000)



n refer to the estimated number of dental episodes in the population sub-group after weighting

substantial proportions of households with heads who were self employed (59.9 %) or even unemployed (64.9%) had utilised private dental services.

Household member attributes and utilisation of dental services

Figure. 3.9 Utilisation of dental facilities by gender of household member (Numbers in '000)

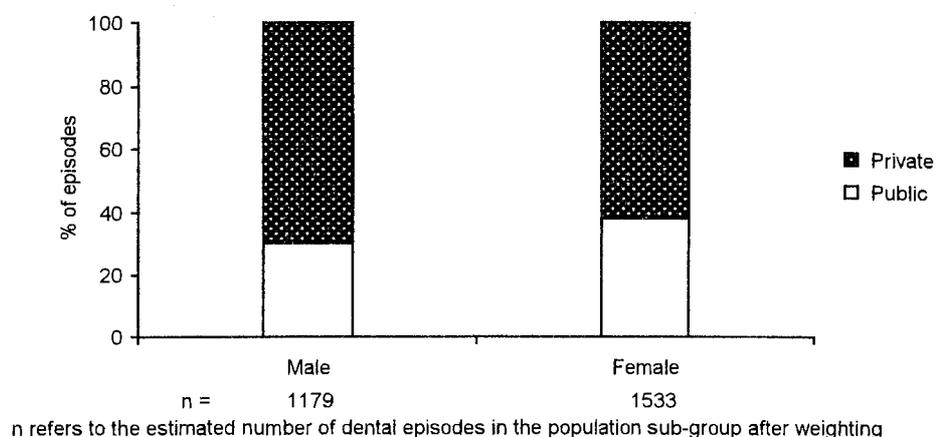
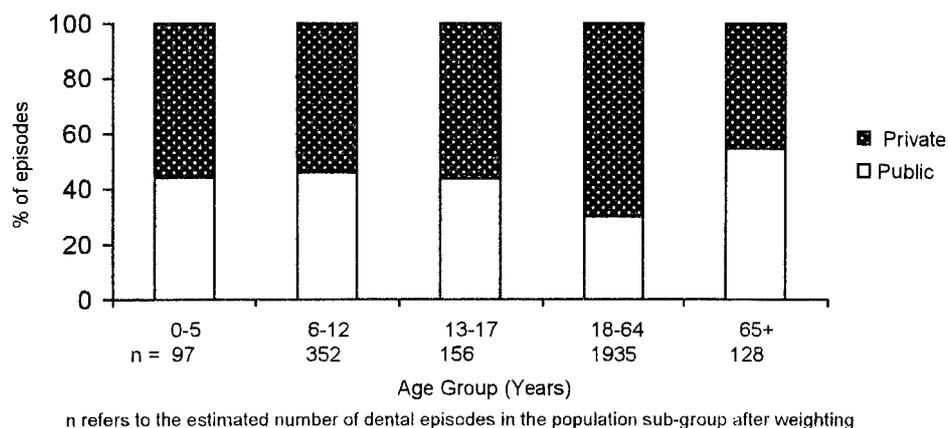


Figure. 3.10 Utilisation of dental facilities by age-group of household member (Numbers in '000)



Both gender preferred private care to public facilities (Figure 3.9). But higher proportion of men utilised private facilities than women. Most adults aged 18-64 years chose private care (Fig 3.10). The elderly population (65 years old and more) would be in greater need for complex and more costly treatment compared to the younger adults. Coupled with a less advantaged economic

position, they need to consider utilising the relatively cheaper public service as reflected in the findings. Children (17 years and below) seemed to use more private service in this survey. But this finding did not account for the school dental service where a high proportion of schoolchildren would have been cared for.

Type of care and utilisation of dental services

Table 3.3. Reporting of dental episodes by type of care (Numbers in '000)

Type of care	Number of episodes reported	%
Check-up	253	9.5
Preventive	21	0.8
Scale & polish	221	8.3
Fillings	563	21.1
Gum treatment	33	1.2
Extraction	1261	47.3
Orthodontic	33	1.2
Denture	201	7.5
Others	82	3.1
Total	2668	100.0

For each episode, the households reported only the major type of care received. The types of dental treatment most commonly sought for was tooth extraction (Table 3.3). Almost half of all the episodes reported were related to extraction. Fillings accounted for a fifth of the episodes. Preventive (check-up, clinical prevention and scale and polish) care was not common.

Table 3.4. Utilisation of dental services by type of care (Numbers in '000)

Type of care	Episodes of care at			
	Public facilities		Private facilities	
	n	%	n	%
Check-up	94	37.2	159	62.8
Preventive	4	19.0	17	81.0
Scale & Polish	43	19.5	178	80.5
Fillings	179	31.8	384	68.2
Gum treatment	10	31.2	22	68.8
Extraction	525	41.6	736	58.4
Orthodontic	14	42.4	19	57.6
Denture	38	18.9	163	81.1
Others	18	21.7	65	78.3

Higher proportions of all types and levels of care were carried out in private dental facilities (Table 3.4). This would be true only if the information was related to population groups other than schoolchildren. It must be emphasised here that the observation could be otherwise if care given by the school dental service was included.

For the population under consideration in this report, extremely high proportion of clinical preventive care (fissure sealant and topical fluoride, 81.0%), scale and polish (80.5%) and dentures (81.1%) were carried out in the private sector compared to the public sector. There were almost equal proportions of episodes for orthodontic and extraction in public and private facilities. These observations may well be a result of the public service emphasising the school dental service and hence have less resources available for other types of treatment and other population subgroups.

Public facilities were burdened with curative treatment although not as high as in the private facilities. Between 31% to 42% of curative treatment episodes (orthodontic, extraction, fillings and gum treatment) received care at public facilities. These figures reflect the treatment load imposed on the public service above that in the school dental service.

About 47.0% of all the episodes reported were related to pain. The data did not indicate pain as a factor in the choice of utilising public or private facilities as high proportions of painful (66.3%) and non-painful (64.4%) episodes received care at private facilities.

Summary

The school dental service plays a very important role in the delivery of oral health care for the younger generation. Almost a third of all the reported episodes received care through this service and 68.0% of episodes reported by schoolchildren aged 12-17 years were treated in school clinics.

Other than care given under the school dental service, dental facilities were generally highly utilised by the Chinese, females, adults aged 18-64 years, persons with tertiary education and the richest 20% of the population.

In general, the population in Peninsular Malaysia utilised more private (65.3%) than public (34.7%) dental facilities. Those who have a greater preference for using private facilities were mainly urban households in the more developed states, Chinese households, households with high income, households headed by better educated and privately employed persons; and adults aged 18-64 years. In contrast, those who referred public facilities were households in the states of Perlis, Kedah and Kelantan; and lower income households (1st and 2nd quintile).

Nevertheless, a substantial proportion of those who utilise public facilities were from households in the high income group (27.3% of episodes in 4th quintile and 16.2% in 5th quintile); households with heads in the economically productive age (34.4% of episodes in 30-54 years age group) and households whose heads were self-employed (40.1%). Also about 41.4% of the dental episodes reported by households whose heads were government employees received care in public facilities.

There were higher proportions of preventive and rehabilitative care in the private facilities. Above the treatment given in the school dental service, the public facilities were also burdened with curative care.

HOUSEHOLD EXPENDITURE

4

Introduction

Household expenditure is an important consideration in the choice of alternative sources of dental care. Often it is a reason why individuals forgo the need for seeking recommended care. It also assumes a central role in policy change because this burden of cost is amenable to shifts from individuals to the community.

Components of household expenditure on dental care

The per capita household expenditure for dental care in Peninsular Malaysia was estimated at RM6.64. Based on this estimate private households in Peninsular Malaysia spent approximately RM111 million out-of-pocket on dental care in 1996.

Household expenditure for dental care constituted three main components: treatment cost, transport cost and 'other cost'. In the weighted population, almost all of the estimated household expenditure was on treatment cost (95.3%). 'Other cost' which included loss of wages accounted for only 3.2%. Transport cost constituted a mere 1.6%. Transport cost in the survey included only out-of-pocket expenditure on public transport. Cost of travelling in private vehicles was not measured due to difficulties to input cost.

Total household expenditure for dental care accounted for 4.0% of the total household health expenditure in Peninsular Malaysia. The distribution of the estimated total household expenditure for dental care in Peninsular Malaysia was mainly at private facilities (96.0%), in urban areas (77.1%) and in the state of Selangor (33.9%). The distribution was also high among households with 2-7 members (88.5%), Chinese households (48.7%), households in the 5th income quintile group (51.3%), households with heads aged 30-54 years (68.5%) and persons aged 17-64 years (80.9%). Most of the household expenditure in Peninsular Malaysia was for non-painful conditions (70.6%) and for the provision of dentures (30.6%) and dental extraction (21.1%).

In the determination of variations in household expenditure, it is hypothesised that the observed differences in the out-of-pocket expenditure per episode of dental care are largely due to 1) the choice of services made and 2) who paid for the cost of care.

The approach adopted in describing the variations in household expenditure for dental care was to partition the episodes into subsidised and unsubsidised care. Subsidised episodes include care received at public facilities (excludes school health service), or at private facilities (private dental surgeries and clinics/shops) where part or all of the treatment cost was paid by the patient's employer or his/her head of household's employer, insurance scheme or any other party. Unsubsidised care is then care received at a private facility, for which the cost was borne by the patient in full. The reason behind this division is because expenditure for subsidised and unsubsidised care differ widely. For example, the mean expenditure per episode of subsidised care was RM4.30 (median RM1.00) and the mean for unsubsidised care was RM57.26 (median RM25.00). These estimates, however do not describe in greater detail the variations observed in the expenditure.

The following section will then describe household expenditure for dental care at four levels:

1. No payment (RM0)
2. Nominal (>RM0-RM20)
3. Commercial (>RM20-RM100)
4. Exorbitant (>RM100).

These levels were chosen based on the fact that dental extraction was the most common treatment reported (43.7%). It was estimated that the expenditure incurred for a simple extraction at private facilities was about RM20.00. The upper limit of the commercial rate of RM100 was arbitrarily selected to be five times more than the 'nominal' rate.

About 60% of the dental episodes considered were unsubsidised care (estimated at about 1.6 million episodes). Of the subsidised episodes, 87% received care at public facilities (estimated at about 925,000 episodes). Generally, the household out-of-pocket expenditure for most episodes of subsidised care was free or nominal (96.3%). About 88.4% of unsubsidised episodes cost between nominal to commercial rate.

Private employers played an insignificant role in subsidising dental care. Only 4.9% of the episodes were subsidised by them, almost all at private facilities. Private employers expenditure was equivalent to only 0.4% of household expenditure for dental care.

Geographical location and expenditure

Generally, households in Peninsular Malaysia who reported dental episodes paid RM36.08 per episode of dental care. However, 50% of these households paid RM15.00 or less per episode.

Among the subsidised episodes, the expenditure per dental episode in the rural areas (mean of RM4.79 and median RM1.00) was higher compared to urban areas (mean of RM3.81 and median RM0). About 60% of the urban episodes did not incur any household expenditure compared to only 35.9% in the rural areas (Fig.4.1). Expenditure was also higher in several less developed states (such as Kedah, Perlis and Kelantan) compared to more developed states (P. Pinang, Selangor and Johor, Table 4.1a). Interstate variation was small; 96.3% of all the subsidised episodes incurred RM20.00 or less per episode. Higher expenditure recorded in rural and less developed states is

likely due to higher utilisation of public transport in these areas. Poorer dental health status needing more complex treatment could also explain for the difference.

Among the 'not subsidised' group, the data suggests larger variation in the spread of household expenditure per episode of dental care. Episodes in the urban areas had a mean expenditure of RM64.66 (median of RM26.00) compared to RM40.18 (median RM20.00) in the rural areas. Almost half of the unsubsidised episodes in the urban areas incurred household expenditure between RM20-RM100; whereas 51.4% of these episodes in the rural areas incurred between RM1-RM20. Overall, the expenditures in the states of Selangor, N.Sembilan, Pahang and W.P.K.L. were high; expenditures in Johor, P. Pinang and Melaka were moderate and expenditures were low in the other states (Table 4.1b). The variation could be a result of differences in the dental health status, the type of treatment available and actual differences in the treatment charges for specific item of care.

Figure 4.1. Household expenditure for dental care by strata (Numbers in '000)

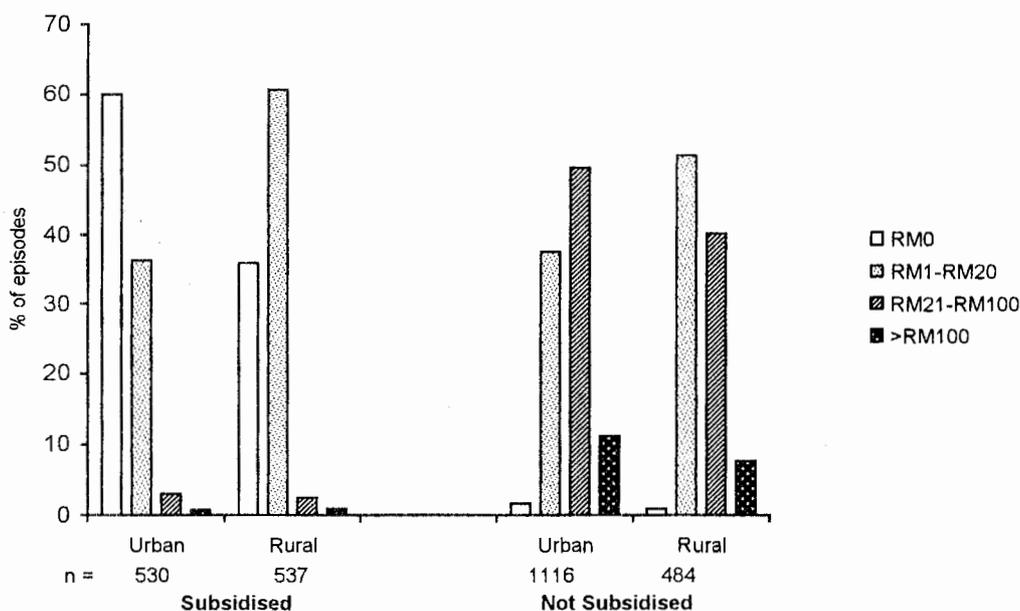


Table 4.1a. Household expenditure for dental care by state, subsidised care (Numbers in '000)

State	Subsidised (number and % of episodes)							
	RM0		RM1 – RM20		RM21 – RM100		>RM100	
	n	%	n	%	n	%	n	%
Johor	61	62.7	33	33.4	3	2.8	1	1.1
Kedah	44	24.9	124	70.9	5	2.9	2	1.3
Kelantan	32	33.7	61	64.2	2	1.6	0.5	0.5
Melaka	16	38.8	24	57.7	1	3.0	0.2	0.5
N.Sembilan	33	52.3	27	43.3	1	2.3	1	2.1
Pahang	38	46.7	38	46.2	5	6.5	0.5	0.6
P. Pinang	46	63.6	22	29.8	4	5.9	0.5	0.7
Perak	59	54.7	46	42.1	2	1.8	2	1.4
Perlis	7	30.5	14	66.0	0.6	2.8	0.1	0.7
Selangor	91	63.3	52	35.8	1	0.8	0	0
Terengganu	49	48.4	50	49.6	2	1.9	0.2	0.2
W.P.K.L.	33	52.1	28	43.1	2	3.7	0.7	1.1
Total	511	47.8	518	48.5	30	2.8	9	0.8

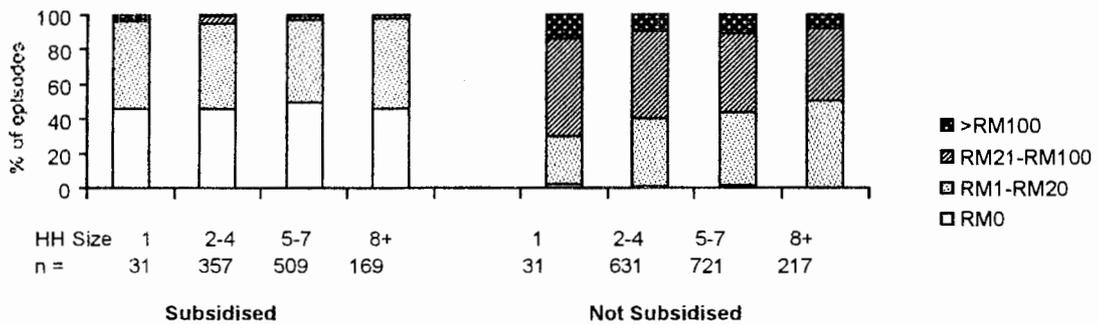
Table 4.1b. Household expenditure for dental care by state, not subsidised care (Numbers in '000)

State	Not subsidised (number and % of episodes)							
	RM0		RM1 – RM20		RM21 – RM100		>RM100	
	n	%	n	%	n	%	n	%
Johor	3	1.5	91	40.3	111	49.1	21	9.2
Kedah	2	1.3	69	53.3	46	35.7	13	9.7
Kelantan	2	2.2	51	68.0	17	23.0	5	6.8
Melaka	2	4.2	17	46.0	16	41.9	3	7.9
N.Sembilan	0.9	1.4	25	40.6	28	45.3	8	12.7
Pahang	1	1.4	27	39.5	33	47.0	8	12.1
P. Pinang	1	0.8	74	45.5	73	44.6	15	9.1
Perak	4	2.1	112	54.4	77	37.4	13	6.2
Perlis	0.2	1.9	6	54.9	4	38.8	0.5	4.4
Selangor	4	1.1	101	27.8	204	56.2	54	15.0
Terengganu	0.4	0.4	58	65.2	28	31.0	3	3.4
W.P.K.L.	3	1.5	36	21.1	112	66.2	19	11.2
Total	23	1.4	668	41.7	748	46.7	162	10.1

Household attributes and expenditure

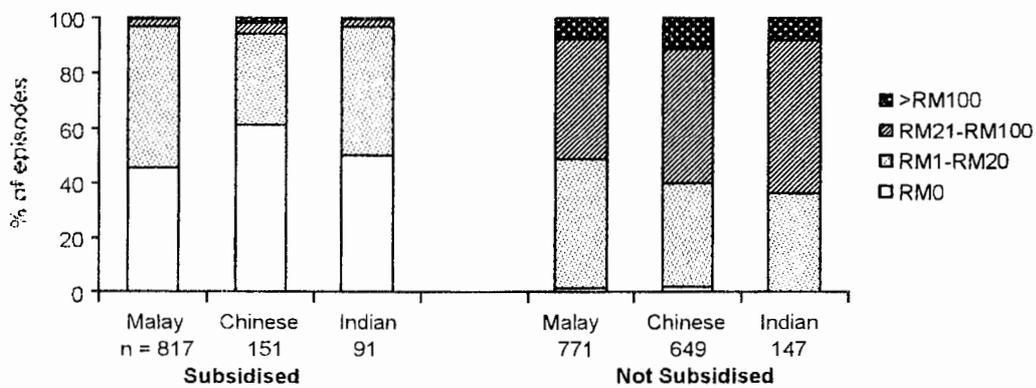
For subsidised care the effect of household size on expenditure is small (Figure 4.2). The effect is more obvious in the unsubsidised care. The expenditure for single households is larger than households of other sizes.

Figure 4.2 Household expenditure for dental care by household size (Numbers in '000)



For subsidised care, expenditure appears not to be associated with the ethnicity of the household (Figure 4.3). A slightly larger proportion of Chinese households did not pay for subsidised care (61.4%). For unsubsidised care, dental episodes in Indian and Chinese households had slightly higher expenditure than Malay households. About 55.7% of the unsubsidised episodes in Indian households and 48.7% in Chinese households incurred between RM20-RM100. In the Malay households, 47.0% of the episodes were between RM1-RM20.

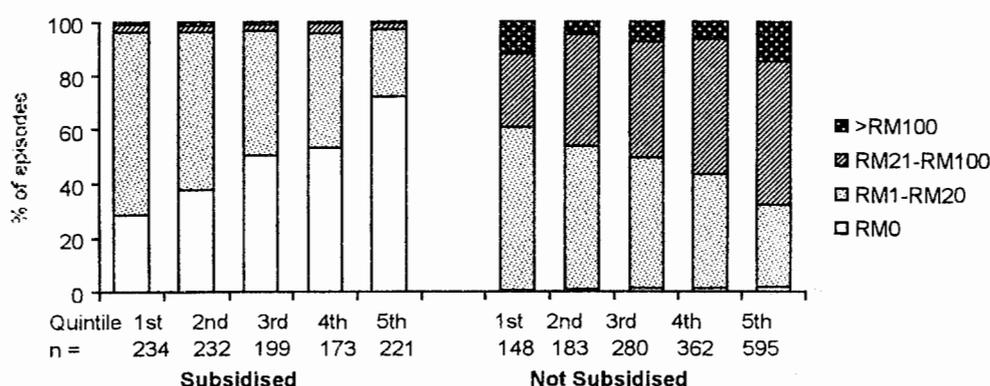
Figure 4.3 Household expenditure for dental care by ethnicity of household (Numbers in '000)



The richest 20% of the population contributed 51.4% of the out-of-pocket household expenditure for dental care. This is 6.5 times more than the poorest 20% of the population who contributed 7.9%.

In the subsidised group, household income is inversely associated with expenditure (Figure 4.4). In particular, a high proportion of subsidised episodes among households in the 5th household quintile did not have expenses (72.1%). In fact, the richest 20% of the population accounted for 31.3% of the episodes that had zero expenses. This implies that richer households benefit most from public expenditure. This observation is probably due to the medical benefits available to government employees and richer households have the means to negotiate the health care system since they are empowered with better skills and facilities. Low income households were more likely to use public transport and the cost contributed towards their higher expenditure.

Figure 4.4. Household expenditure for dental care by household income quintile group (Numbers in '000)



In the unsubsidised group, household income is positively associated with expenditure. This is probably an effect of high income households having greater demands and expectations and are in a better position to choose not only the dental facility but also the type of treatment available for a particular condition. An exception can be seen among households in the 1st quintile group where there is a relatively high proportion of episodes at the exorbitant level (12%). Low income or low socio-economic status is generally associated with poorer dental status. This leads to a need for more complex and costly care such as replacing several missing teeth. Although this group of the population could have received such care at the public facilities, but the longer waiting time and not-so-comfortable surroundings at public facilities may be a barrier to seeking care for some of them.

Head of household attributes and expenditure

The association between age of head of households and expenditure is not obvious (Figure 4.5). In the subsidised group, households with heads age 54 years and below had higher proportion of episodes in the RM0 level. In both subsidised and unsubsidised groups, households with heads

age 55 years and above had higher proportion of episodes in the commercial and exorbitant levels.

Figure 4.5. Household expenditure for dental care by age of head of households (Numbers in '000)

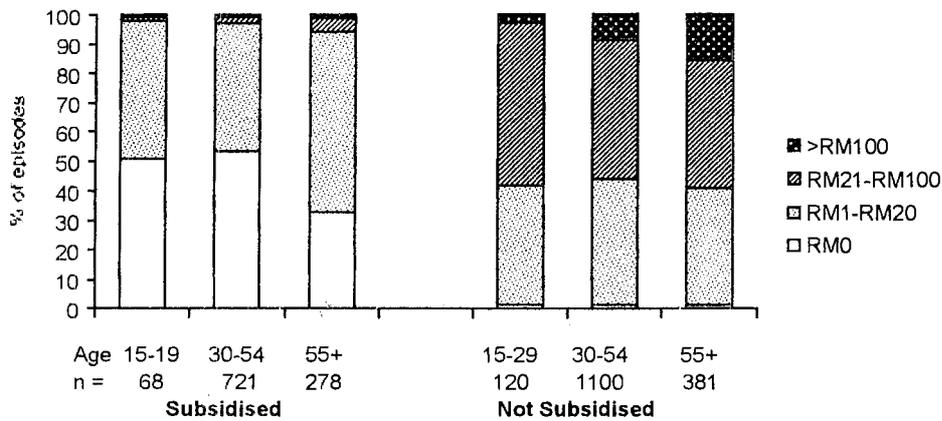
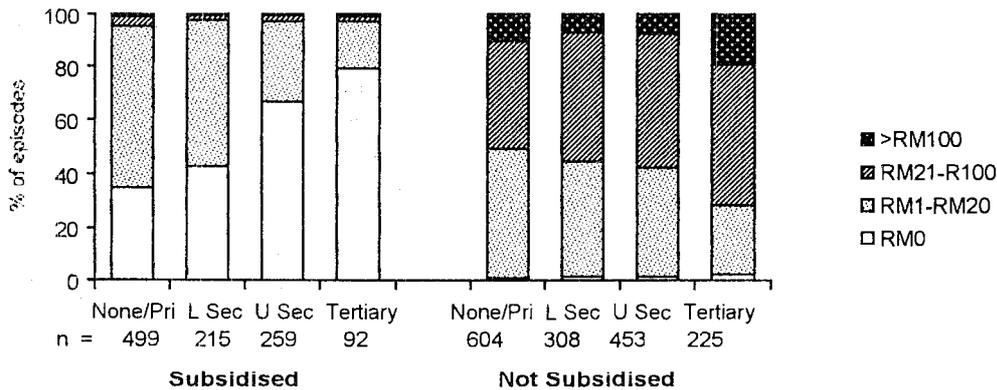


Figure 4.6 Household expenditure for dental care by education level of head of household (Numbers in '000)



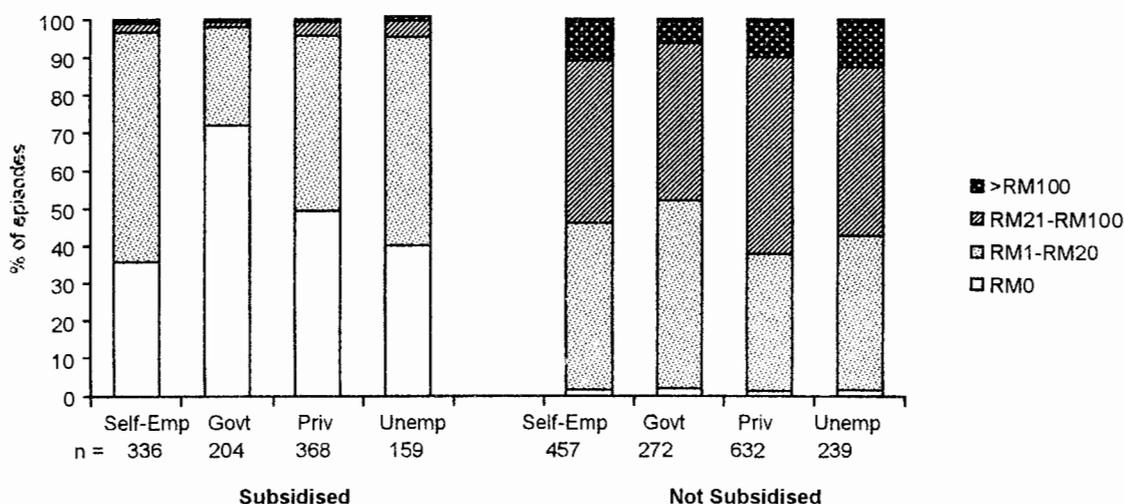
The association between education level of head of households and expenditure is similar to that of household income and expenditure (Figure 4.6). In the subsidised group, households with higher educated heads paid less than households headed by lower educated persons. In fact, 79.3% of episodes were free in the highest education group compared to only 34.6% in the lowest education group.

In the unsubsidised group, households with higher educated heads paid more per episode of care. For households with heads in the lowest education group, there appears to be a slight raise in the expenditure compared to the 'Secondary' groups.

Households with privately and self-employed heads accounted for the highest proportion of episodes in the subsidised group (34.5% and 32.0% consecutively) (Figure 4.7). Since 87.0% of subsidised care were in public facilities, this data shows that the government is still playing an important role in the provision of low-priced service to these households. In the other 13%, subsidised care was sought at private facilities and paid partly or fully by private employers. Most private employees (and their families) were unsubsidised and paid out-of-pocket at private facilities.

In the subsidised group, a high proportion of episodes in households with government employed heads was free. At the same time many of these households (who are entitled to free dental service at public facilities) had also opted for unsubsidised care at private clinics. Households with self-employed or unemployed head of households not only preferred private facilities but these households had to pay slightly more per episode of dental care.

Figure 4.7 Household expenditure for dental care by employment status of head of household (Numbers in '000)

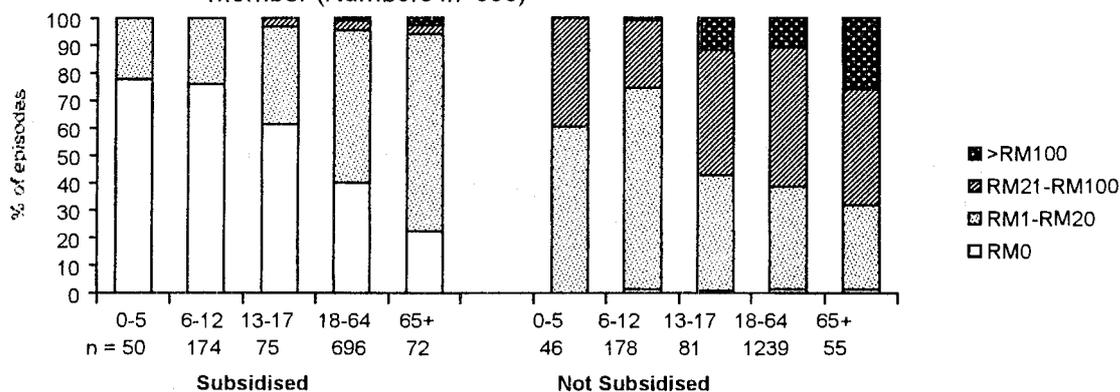


Household member attributes and expenditure

In both the subsidised and unsubsidised groups, older household members had higher expenditure per episode of dental care (Figure 4.8). Young children had the lowest expenditure. Those aged 64 years and above paid the most. In the unsubsidised group, about a quarter of the episodes of elderly persons cost more than RM100 with mean and median values of RMRM105.83 and RM30.00. In comparison, the mean and median values of unsubsidised episodes of adults aged 18-64 years were

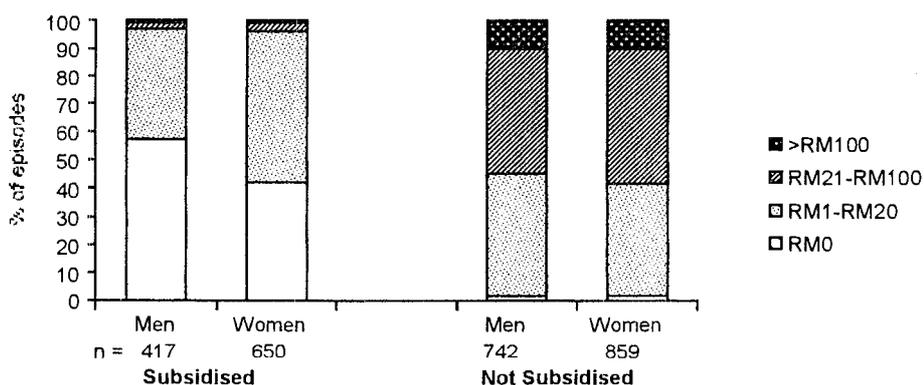
RM59.63 and RM26.00 and only 11% of their episodes involved exorbitant expenditure. Oral health status usually declines with age and the treatment required gets more complex, requires more than one visit and therefore cost very much more.

Figure 4.8 Household expenditure for dental care by age of household member (Numbers in '000)



In both subsidised and unsubsidised groups, gender was not an important determinant of household expenditure for dental care (Figure 4.9).

Figure 4.9 Household expenditure for dental care by gender of household member (Numbers in '000)

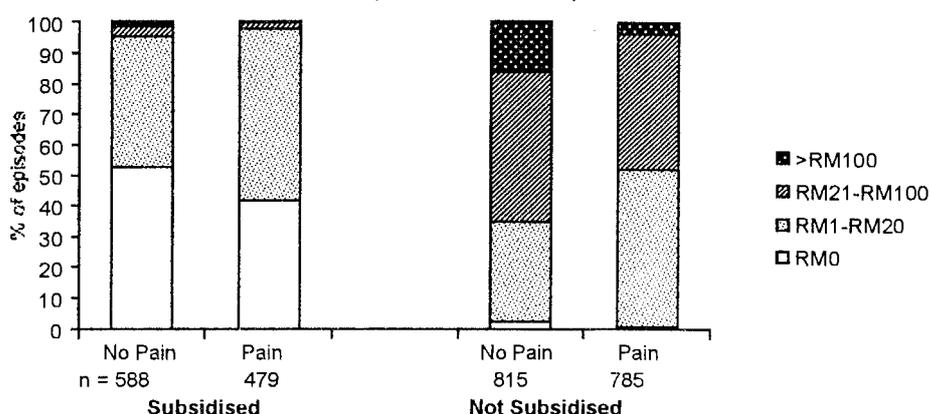


Type of condition, type and level of care and expenditure

Household expenditure per episode of painful condition was lower than non-painful condition in both subsidised and non-subsidised episodes (Figure 4.10). However, the difference in expenditure

was greater in the unsubsidised episodes. Painful episodes cost an average of about RM34.00 (median was RM20.00) compared to a mean of RM80.00 and median of RM30.00 for non-painful episodes.

Figure 4.10 Household expenditure for dental care by type of condition. (Numbers in '000)



The main causes of painful dental conditions are advanced tooth decay and dental abscess. Such conditions are more prevalent in the lower socio-economic group. Dental extraction would be the expected choice of treatment for this sector of the population as it would provide immediate relief of pain in a single visit. When compared to alternative treatment options, the cost of dental extraction is small.

Table 4.2a Household expenditure (Subsidised) for dental care by type and level of care. (Numbers in '000)

Type of treatment	Number and % of episodes of care at level of expenditure							
	RM0		RM1-RM20		RM21-RM100		>RM100	
	n	%	n	%	n	%	n	%
Preventive								
Checkup	98	75.7	30	23.4	1	0.9	0	0
Clinical preventive	3	54.7	2	45.3	0	0	0	0
Scale & Polish	48	72.3	16	24.6	2	3.1	0	0
Curative								
Fillings	123	58.7	85	40.3	2	1.0	0	0
Gum treatment	10	74.7	3	20.8	0.6	4.5	0	0
Extraction	198	35.3	353	63.1	8	1.4	1	0.2
Orthodontic	7	45.9	6	40.7	2	11.6	0.3	1.7
Rehabilitative								
Denture	9	20.5	15	34.3	13	29.9	7	15.3
Others	14	61.6	7	31.0	0.9	3.8	0.8	3.6

Table 4.2b. Household expenditure (Not subsidised) for dental care by type and level of care. (Numbers in '000)

Type of treatment	Number and % of episodes of care at level of expenditure							
	RM0		RM1-RM20		RM21-RM100		>RM100	
	n	%	n	%	n	%	n	%
Preventive								
Checkup	13	10.6	42	34.6	59	48.5	8	6.3
Clinical preventive	0	0	2	11.5	10	59.9	5	28.6
Scale and Polish	0.2	0.2	41	26.4	108	69.7	6	3.7
Curative								
Fillings	1	0.4	148	42.0	197	55.9	6	1.7
Gum treatment	0	0	8	41.4	10	50.8	1	7.8
Extraction	3	0.5	407	58.2	278	39.7	12	1.7
Orthodontic	0	0	0.4	2.0	7	39.9	10	58.1
Rehabilitative								
Denture	5	3.0	7	4.3	61	38.6	85	54.0
Others	23	1.4	668	41.7	748	46.7	162	10.1

In the subsidised group, household expenditures for all types of dental care (except rehabilitative and orthodontic) were minimal (Table 4.2a). In particular, high proportions of episodes for checkups (75.7%), gum treatment (74.7%) and scale and polish (72.3%) were free.

Unlike in the subsidised group, household expenditure per episode of preventive care in the unsubsidised group was slightly higher than curative care. Expensive episodes were those involving orthodontic (mean was RM470.46 and median RM160.60) and denture treatment (mean was RM174.21 and median RM110.00). Besides high expenditure per episode, such treatment would require more than one visit to the dentist. In both subsidised and unsubsidised groups, rehabilitative care cost the most and the difference in expenditure between rehabilitative care and preventive or curative care is much greater in the unsubsidised than the subsidised group. Even with this great difference in expenditure, the number of episodes reported for dentures at private facilities (157 thousand) is 3.5 times more than that of subsidised care (44 thousand) in the public facilities.

Summary

Total household expenditure for dental health in Peninsular Malaysia was estimated at RM111 million. This is about 4% of the total household expenditure on health. Treatment cost accounted for 95.3% of the total household expenditure for dental care. About 96% of the estimated household expenditure for dental care was for expenses incurred when seeking care at private facilities.

After removing care received through the school dental service, about 40% of the dental episodes were subsidised care which were mainly at public facilities. Household expenditure at public facilities was mainly between RM0-RM20. In 47.8% of the subsidised episodes there was no household expenditure involved. Those who had subsidised care and were more likely to incur zero

cost were urban households (60.0%) in the better developed states (P. Pinang 63.6%, Selangor 63.3% and Johor 62.7%); Chinese households (61.4%), households in the 5th income quintile group (72.1%), households headed by government employees (76.6%), heads with tertiary education (79.3%); and children aged 0-12 years (76.3%). Preventive care was more likely to be free (74.0%).

Unsubsidised care cost mainly between RM1-RM100. However, about 10.1% of the unsubsidised care cost more than RM100 per episodes and the episodes were related to orthodontic, denture treatment and 'other' types of treatment. Considering the fact that these treatment procedures require more than one visit, the household expenditure for such episodes are much higher.

Of concern are those who incurred high expenditures (>RM20 per episode) at private facilities but who could have received care at public facilities at a much lower cost. There were 47.8% of rural households, 43.1% of households with low income (1st and 2nd quintile), 57.4% of households whose heads are unemployed, 68.2% of the elderly aged 65 years and above who had to bear with high expenses at unsubsidised rates.

Most private employees do not have dental care benefits. Households also do not subscribe to health insurance for dental care.

MULTILEVEL ANALYSIS

5

Introduction

Chapters 3 and 4 describe utilisation of dental services and household expenditure for dental care by considering only one possible explanatory factor at any one time. In most real life situations, however, predicting the values of an outcome variable requires several explanatory variables taken together at the same time. Multivariate analysis allows us to do this.

Multilevel modelling is a multivariate technique. It accounts for the clustering effect at various nesting levels. For example, at the episode level it is believed that certain characteristics of a district influence the expenditure pattern of dental episodes (or persons) that occurred in the district. On a higher level, characteristics of a state may influence the expenditure pattern at the district level.

This chapter is a summary of the findings based on multilevel analysis to explain for utilisation and household expenditure for dental care. A detailed technical report is available in a separate volume.

In the multilevel analysis, all episodes of care under the school dental service were removed. Care received at the dental clinic/shop operated by the Division II dentists are considered under unsubsidised private care. The explanatory variables were: all the available household and household member attributes, whether the episode was associated with a painful or non-painful condition, the *Level of care* (preventive/promotive, curative or rehabilitative) and *Source of care* (public or private). *Type of treatment* is not considered because the nine categories is rather excessive. The following age categories are considered: 0-2, 3-5, 6-12, 13-17, 18-64, 65+years. Among the pairs of household member and household attributes, such as *Educational level* and *Employment* (of the patient and of the head of household), precedence is given to the attributes of the head of household; otherwise children would be in the same category as unemployed, irrespective of their family/household background.

Utilisation of dental services

The main determinants of utilisation are *Ethnicity*, *Educational level*, *Level of care* and *source of care*. Private care is preferred for rehabilitative care, by Chinese, and by members of households with educated heads (tertiary level). To a lesser extent, families (as opposed to single households) and income recipients prefer to use private care and private care is also preferred for treatment

associated with pain. The adjusted differences in utilisation between urban and rural areas, and between the age groups are unimportant. Although better-off households have greater preference for private care, the impact of *Household income* is negligible in comparison to the other factors.

Household Expenditure

The geometric mean expenditure (including transport and other expenses) for subsidised care is RM0.18, with a 95% confidence interval (0.12-0.27). There was little variation at state and district level, but the episode-level variance is by far the greatest. That is, the mean expenditure of a typical episode is 14.9 times greater or smaller than the district mean. The large variation at the episode level reflects the diversity of the treatments provided.

The geometric mean expenditure for unsubsidised care is RM23.10, more than 100 times greater than for subsidised care. The 95% confidence interval for the mean is (20.00, 26.70). The between-state and between-district sources of variation are very small. The episode-level variation dominates the other sources. The mean expenditure of a typical episode is 3.73 times greater or smaller than the district mean. In view of the great diversity in the levels and types of treatment this figure appears to be very low. However, the most expensive treatments are very rare and the routine dental procedures predominate. Also, expenditure for the most complex procedures is often spread over several visits, which are regarded in the survey as separate episodes.

The relatively small variation in expenditure for dental episodes (compared to other health conditions) has an explanation in the data collection procedures. A complex dental treatment, such as obtaining dentures which may incur substantial expenditure is recorded in the database as several episodes; one associated with each visit. In this way, the expenditure is spread over several visits/ episodes. It is not possible to group the episodes into sets of visits corresponding to a single cause because such a set may not be defined unambiguously and it may involve episodes of different types of treatment.

The expenditure for a typical episode is greater for the elderly. For subsidised episodes (most of them in public facilities), expenditure is inversely associated with *Household income*; for unsubsidised episodes (all are in private facilities), expenditure is positively associated, although the association is greatly weakened when *Age* and *Level* of care are accounted for.

CONCLUSIONS AND IMPLICATIONS

6

This database was intended to provide baseline information on the utilisation of dental care facilities and the household expenditure incurred during the year 1996. Household expenditure was reported as an outcome of utilisation of dental care facilities (measured as public or private services) and whether another party had paid partly or fully for the treatment. These information are useful to consider in formulating the National Health Financing Scheme as it provides evidence to support several important issues such as sectors of the population paying for dental care at various quantum at different facilities; those who could make further contribution when seeking care and those who need protection in health care.

There is an abundance of literature on the utilisation pattern of dental care services but literature to explain the community's choice of available dental services is limited. At the most these studies offer a socio-demographic profile of utilisers of public dental services^{1,2}. Comparison of findings of this survey with studies in other countries would be futile as the utilisation and expenditure pattern were set in entirely different backgrounds.

Under the Seventh Malaysia Plan, The Ministry of Health has outlined several objectives, strategies and priorities³. Of relevance to the findings of this survey are the following:

1. To continue adopting the Primary Health Care Approaches to improve health and to reduce the gap in health status (and health care) in achieving social justice among communities and areas that differ.
2. To increase the community's active participation in health activities and at the same time increase cost sharing
3. To mobilise the community's resources, NGOs and Voluntary Organisation to support health strategies for the senior citizens.
4. To identify appropriate strategies and approaches in ensuring that every individual has equitable access to health care at a cost that is affordable to the community and government.

Households in Peninsular Malaysia widely utilise dental facilities. Health facilities for dental care were the most utilised besides utilisation for acute illnesses. However, household expenditure for dental care constituted only about 4.0% of total household health expenditure; one of the lowest among all the health sectors considered. The high utilisation but low household expenditure can be

explained by the substantial proportion of the episodes receiving treatment under the school dental service (30.6%).

The school dental service is a priority program of the Dental Division, Ministry of Health, whereby comprehensive dental care is provided free to all schoolchildren in the schools. The program rests on the principle that the young generation be given the privilege and opportunity to realise their full health potential. The school dental service plays a vital role in the oral health care of schoolchildren. This outreach service must continue to cater to the needs of the young generation, however, such programs are very resource intensive. Hence, it is imperative that the strategies employed and the financing mechanism of the program are health promotive, cost-benefit, sustainable and simultaneously do not present a burden to the consumers and providers. Corporatisation of the service is a possible alternative to consider to increase efficiency whilst keeping within the health policies set by the Ministry of Health. In such an instance the Ministry of Education assumes the role of purchaser where it either wholly pay for the services or impose a nominal household contribution in a cost-sharing exercise. Cost-sharing would encourage community participation and sharing of responsibilities for health. It is envisaged that when households contribute towards a school health fund, parents would be more aware of the existence of such a service and institute proper utilisation.

The estimated household expenditure for dental care in Peninsular Malaysia in 1996 was about RM111 million. This quantum is equivalent to 83% of the operating expenditure of the Dental Division, Ministry of Health (RM133 million) in 1996². It must be noted here that the operating expenditure of RM133 million covered Sabah and Sarawak as well. Since private employers and other sources (relatives, NGOs, private insurance) contributed an equivalent of only 0.4% of household expenditure for dental care, it can be concluded that out-of-pocket expenditure remains the major element in private funding for dental care. In this context, private employers should be made to play a more significant role when considering resource mobilization in health funding for dental care.

Overall, public sector financing for dental health in the form of government budget predominates. As confirmed by the findings of the survey, there are currently, no extrabudgetary resources such as compulsory social insurance scheme. The Ministry of Health provides care to a large sector of the population including schoolchildren, yet at the same time household out-of-pocket expenditure at public facilities constituted only 4% of the total household expenditure for dental care. A substantial proportion of the economically privileged households in Peninsular Malaysia have access to subsidised care (mainly at public facilities) with zero or nominal direct-out-of-pocket expenditure involved. This is supported by the findings that the richest 20% of the households accounted for 31.3% of the dental visits with no household expenditure at public facilities. This implies that the richer households benefits most from public funding. This sector of the population can be viewed as 'dependants' of the Ministry of Health where their dental health costs are being absorbed by the Ministry. This observation is probably due to the medical benefits made available to government employees and their families. It is evident that the public sector is phenomenally stressed both financially and structurally and services rendered to these sectors of the population should be reviewed and their potential to participate in cost-sharing tapped. These are important factors to incorporate when reviewing the fee schedule at public facilities.

Findings from this survey and evidence from the Ministry of Health Annual Report 1996² show that the public facilities are burdened with curative care. Curative care is costly and since it usually requires the attendance of a dentist, it is resource consuming. On the other hand, preventive and oral health promotive strategies cost less and dental nurses could be trained to institute these measures. If dental care in the public service is more preventive/ promotive oriented (than curative), there would be substantial savings for the service. More resources could be redistributed to consolidate public health programs such as health education and water fluoridation which would go a long way for the health of the community. The bulk of curative care should then be the domain of the private sector. Nevertheless, the National Health Financing Scheme must address the issue of accessibility to dental health care for all sectors of the community in particular the less privileged.

Households in the less developed states and those from the lower household income were more likely to utilise the public service. If the public service is perceived as a less efficient service, then the issue of equity and social justice (those who are in need most should get the best care) is raised. Likewise, of concern are those who sought unsubsidised care and incurred high household expenditures who in actual fact require assistance. This refers in particular to the elderly population and the indigents. In the survey, it was found that 43% of the dental visits made by the elderly were at private facilities; with an average household expenditure of RM105.53 (median RM30.00) per visit. This supports the fact that relatively enormous amount of money is spent in the last few years of life⁴. Among the poorest 20% of the households, 39% of their dental visits were at private facilities with an average expenditure of RM43.08 (median RM18.00) per visit.

In this survey, ethnicity and educational level of head of household, level of care and the availability of another party to cover the expenditure were the main determinants of utilisation. Chinese households and households with higher educated heads chose private dental care. This is probably related to high income households. These households sought private care to fulfil their higher life expectations and demands. It could also be said that these educated households were empowered with the knowledge and economic potential to make choices when seeking care. Although these households had a greater utilisation of private dental care, the general population in Peninsular Malaysia preferred private to public facilities (when the school dental service was not considered).

The higher utilisation of private dental facilities for dental care in general, shows that people will pay for dental services even if they have to bear the entire expenditure. However, the findings of this survey cannot confirm the hardship faced by households in such circumstances.

Low utilisation of public service may be due to 1) a general lack of awareness among the population on the availability of specific types of dental treatment procedures provided; 2) population perception of a less efficient public service (eg. long waiting time and crowding). A likely explanation for these perceptions would be that the public service is burdened with the care of priority groups (schoolchildren and antenatal mothers), and thus resources to care for other groups of the population are limited, leading to an actual decline in the efficiency of the service for the general population. Any increase in utilisation will only further aggravate the problem. The public needs to be educated on the appropriate use of dental facilities may it be public or private. At the same time, organisational restructuring in the form of corporatization of the existing Dental Service or integration of public and private facilities in the delivery of services can lead to a

continuing provision of quality health care which is delivered efficiently aimed at meeting consumers expectation.

A prime concern in organisational restructuring is to reduce the public sector's role in the provision of services directly to the public and to allow the public sector to focus on regulatory, monitory, planning and policy-making roles. However, it must be emphasized that such a shift requires training and development of the oral health care workers (may they be in the public, corporatised or private sector) to fulfil their future role.

Any scheme to formally include the private sector as providers of dental care need to also consider the distribution of the private dental facilities in the country. In 1996, 59% of the Division I dental practitioners were in the private sector⁵ and most of the practices are concentrated in towns. The fee-for-service charges in the private sector must also be regulated in the interest of consumers, providers and purchasers. In 1992, the Malaysian Dental Association reviewed its recommended charges to private practitioners but the exercise was based more on market price. A more objective manner of deriving charges and cost of health activities for both the public and private sectors is being investigated at the moment under the case-mix study. The charges derived must avoid cross elasticity between the various types of treatment with demand. Otherwise, patients may choose cheaper but inappropriate treatment options. In the study, unsubsidised preventive care was more expensive than for curative care; dental extraction was less expensive than fillings. This would affect the patient's choice of the type of care, especially if cost is of prime concern. If on the other hand, the charges for preventive care are far lower than for curative care, it might deter private practitioners from recommending preventive options to the patients. Allowing dental nurses to carry out simple dental procedures under supervision in private clinics may help to reduce treatment cost at these facilities.

The above discussion implies several important issues:

1. Household expenditure for dental care does not reflect ability to pay in sectors of the population. Those who could pay for health care are not paying (households with high income, income recipients) and those who need assistance are paying for health care (elderly persons and the indigents).
2. There is insufficient protection for the dental care of the elderly and households with low income.
3. The public service in its effort to recover or reduce cost should look into households who utilise the public facilities to cost-share either by direct or indirect means (such as health insurance for government employees).
4. Households can contribute towards cost recovery of a corporatised school dental service through a school health fund.
5. Mobilisation of resources for health care (including dental care) must account for the participation of private employers and workers.

6. Review the pricing policy for public dental facilities to improve equity in the incidence of public spending. Differences in prices by the income class of users and charging lower prices for services more likely to be used by the poor as well as health promoting services such as checkups and clinical preventive therapy.
7. There should be a compulsory coverage of basic dental care under the National Health Financing Scheme as dental health should be viewed as part and parcel of total health care.
8. Redefining the role of the dental public facilities from direct provision of mainly curative care to more health promotion activities; regulatory, monitor, planning and policy-making roles.
9. Simultaneously, the private sector needs to be formally organized to play a complementary role in the public-private integration of delivery of dental services.

The accuracy of the data obtained from households suffers from recall bias. Households may only recall major dental episodes and children attended to at school dental clinics may not be known to other household members. Consequently, the proportion of persons with dental episodes may be underestimated. The Ministry of Health reported that 23.85% of the population utilises the public dental service in 1996² and therefore this confirms the underestimation.

The out-of-pocket expenditure data for transport in this survey did not include cost of using private vehicles as it was envisaged that households would face difficulties in costing it. Further, the cost of fuel and maintenance of the vehicle used would be dependent on the type and make. Nonetheless, omitting this cost has contributed towards the discrepancy in the expenditure between those who used public transport (rural areas, low income households) and those who used private vehicles (urban areas and higher income households).

In this survey factors that governed utilisation and expenditure were limited to socio-economic circumstances and type of treatment received. Factors such as oral health status and needs, the oral health system available and the community's socio-behavioural perspective with respect to utilisation were not within the scope of this survey although these factors were recognised to have a dynamic relationship with utilisation of oral health services and subsequently expenditure pattern^{6, 7, 8}. The fact that need for health care (perceived or normative) was not investigated simply means that utilisation of dental services as reported represents only the tip of the clinical iceberg with respect to the volume of illness in the community⁹. Findings from this survey were interpreted within this context and specific for the year of survey in 1996 within the prevailing political, economic and development status. Due to the innate qualities of a survey data (cross sectional) such as this, these findings can only be used to project future patterns of utilisation and household expenditure with the assumption that factors other than that studied remain unchanged.

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K. DENTAL

I am going to ask you a few questions about dental treatment of household members in the last one year, that is from to
(Including household member who is temporarily away / passed away in the last year)

Questionnaire for Dental Care

NHHES-96

P. Malaysia: Dental Care E34

APPENDIX 1

Reasons for seeking treatment	K 1 Code	K 2 HHM No.	K 3 Visit No.	K 4 Source of care	K 5 Location of source of care	K 7 Treatment cost	K 8 HH health expenses	K 9 Others who paid	K 10 Traveling cost	K 11 Other cost
1. In the last one year (that is from to) did any household member receive dental treatment like ...			In the last one year, how many times did (name) visit the dental clinic?	Where did (name) get the treatment/checkups? Self 01 Govt dental clinic 03 Private dental clinic 04 School health 15 Kedai gigi / tukang gigi 16 Others (sp) 27	Where is the place of treatment? At home 1 Within district 2 Within state 3 Within country 4 Overseas 5 Unknown 8	How much did the whole treatment / checkups cost?	How much did (name) / other HHM pay for this treatment / checkups?	Who else paid for the treatment / checkups? None 1 Employer 2 Insurance 3 SOCSSO 4 Donation 5 Friend / Relative 6 Others (sp) 7 NA 8	Did (name) have to pay for the transport to and from the (place of treatment)? If own vehicle: Code = 777.7 Unknown = 9999	Did (name) / other HHM suffer loss of wages because of this problem? If 'yes' How much loss? Unknown = 9999
2. If 'yes', Who was it? (Record HHM No.)			Record number of visits in column K3A							
3. Ask question in K3			Then insert the visit No. in Column K3B							
4. Probe for any dental visit, if (name) made more than one visit in the last year.										
5. What treatment did (name) receive on the (n)th visit? (Record code in K1 and insert the visit No. in Col. K3B)										
6. Did (name) seek the treatment/checkup because (name) had a pain in the mouth? If 'yes' insert '1' into Column K1 after the code. If 'No', insert '0'										
7. Probe Column K4 - K11			K 3A	K 3B		RM	RM		RM	RM
61 A tooth filled?										
62 A tooth extracted?										
63 Gum treatment?										
64 Polishing/cleaning of teeth and gum (scaling)?										
65 Fake teeth made?										
68 Teeth and gum examination?										
67 Orthodontic treatment to straighten crooked teeth and wear braces?										
68 Special treatment to prevent tooth decay (e.g. fissure sealant)										
69 Other treatment for teeth or mouth not mentioned above (specify)										

KOD HC - K

1. Applicable
2. Not A.

HC K

HC K3A

HC K7 HC K8

HC K10 HC K11

DENTAL HEALTH**APPENDIX II****Variable list**

No	Conceptual definition	Operational definition	Scale of measure	Unit of measure
1.	Geographical location	Place of stay as identified on the ground & based on reported address and definition by Stats Dept.	nominal	Region, state, strata
Household attributes				
2.	Ethnicity		nominal	Malay, Chinese, Indian etc
3.	Size	No. of HHMs in the HH	continuous ordinal	HHM HH size group
4.	Household income	Total contribution by HHM based on earned income	continuous ordinal	HH income per month/ annum HH income quintile group
Head of Household attributes				
5.	Age	Age at last b`day	continuous ordinal	age in years age group: Head of HH: 15-29, 30-54, 55+ Household member : 0-5, 6-12, 13-17, 18-64, 65+
6.	Gender		nominal	Male/ female
7.	Education level	Accepted by Ministry of Education	ordinal	None, primary, lower sec etc
8.	Employment status	current job status	nominal	Non-income recipient, self employed, govt/statutory, private etc
Household member attributes				
9.	Gender		nominal	Male/ female
10.	Age	As of last birthday	nominal	Age group 0-14 15-54 55 and >

No	Conceptual definition	Operational definition	Scale of measure	Unit of measure
Outcome-related				
11.	Type of care received	Main type of dental treatment HHM received during an episode	nominal	Checkup, fissure sealent. Scale & polish, fillings, Gum rxt. Extraction, ortho, Denture, other.
12.	Level of care	Relates to type of care received	nominal	Preventive/promotive, curative, rehab
13.	Type of condition	The nature of the condition	nominal	Painful, not painful
14.	Source of care	Type of place where care was obtained	nominal	Self prep. Public clinic, private clinic, school clinic, shop
Expenditure Var				
15.	Treatment cost	Cost paid by HH for the care/ medication	continuous	Ringgit Malaysia (RM)
16.	Travelling cost	Cost incurred to travel to and fro to obtain care	continuous	Ringgit Malaysia (RM)
17.	Other cost	Cost other than treatment and transport e.g. loss of wages, cost of accompanying person	continuous	Ringgit Malaysia (RM)
18.	HH expenditure per dental episode	Total cost of Var 16+17+18 for an episode	continuous ordinal	Ringgit Malaysia (RM) No payment/ nominal/ Commercial/ exorbitant

ANNEX F

NATIONAL HOUSEHOLD HEALTH EXPENDITURE SURVEY 1996 (NHHES'96)

PENINSULAR MALAYSIA

Other Health Needs

Report of Findings on

Eye Care
Care for Long Standing Illnesses
Medical Check-ups
Immunization
Miscellaneous Health Needs

NHHES'96 TEAM
DEPARTMENT OF SOCIAL AND PREVENTIVE MEDICINE
FACULTY OF MEDICINE, UNIVERSITY OF MALAYA

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NHHES'96 Research Team,

OTHER HEALTH NEEDS

1

1.1 Introduction

This report gives a brief summary on the utilisation of health services and household expenditure resulting from the following health needs:

- Eye care for visual acuity.
- Care for long standing illnesses.
- Medical check-ups.
- Immunisation.
- Miscellaneous health needs (Day care surgery, rehabilitation therapy, institutionalised care, etc).

Utilisation and expenditure on the eye care, care for long standing illness, medical check-up, immunisation and miscellaneous health needs collectively, represented a minor component and contribution to the total household health expenditure in the NHHES'96 Survey.

Health expenditure for each component and the percentage contribution to the total out-of-pocket expenditure in Peninsular Malaysia were as follows:

Type of Health Needs	Household Expenditure (RM)	Percentage of Total Household Health Expenditure
Eye care	163,688,192	6.9
Care for long standing illnesses	139,906,463	5.9
Medical check-ups	48,596,514	2.1
Immunization	16,766,136	0.7
Miscellaneous health needs	33,661,659	1.4

The expenditure figures mentioned in this report are out-of-pocket household expenditure resulting from seeking care from the various health services. The total household health expenditure represented household expenditure on all the health needs covered in the NHHES'96 Survey for Peninsular Malaysia.

The methodology of the NHHES'96 Survey has been detailed in Volume II of the project report. The descriptions in this section are based on the weighted Peninsular Malaysia population of 14,511,000. The limitations of the findings in this report follow the general limitations of the NHHES'96 survey, highlighted in Volume II of the project report.

For eye care and immunization services, the choice of providers available to the consumers are limited. For utilization of services on glasses and contact lenses, majority of the consumers used private facilities. Immunization is provided by the government as a public health preventive measure and it is more of a public goods than a private goods. The majority of the rural as well as urban residents used public facilities for immunisation.

There is a choice of providers for routine medical check-up and treatment for long standing chronic illnesses. For medical check-up, both the public and private providers are involved. In the case of treatment of chronic illnesses, the public, private and traditional services are utilised.

EYE CARE

2

2.1 Findings

Direct out-of-pocket expenditure for eye care represented 6.9% of the total out-of-pocket expenditure of RM 2.4 billion in the weighted population (14.5 million) of Peninsular Malaysia, 1996. As such, it is not a small amount of expenditure by itself. There were two main items under the eye care section, that is, check-up for visual acuity and purchase of new glasses or contact lenses. Acute eye conditions which require any medical attention was captured under "Care for Acute Condition"; eye surgery for any reason was captured under the "Hospitalization" or "Day Care Surgery" section of the survey.

1,113,000 persons (7.7% of the total household members) reported utilisation of services and expenditure on eye care. Eye care expenditure as a percentage of the total household health expenditure by strata and states are shown in Tables 2.4.1 and 2.4.2. Expenditure on eye care constituted about 7% of the total health expenditure, with those in the urban areas spending a higher percentage (7.6%) compared with rural areas (5.5%). The states of Johor, Kedah, Pahang, P. Pinang and Perak spent less than 7% of the total health expenditure on eye care compared with that of the other states. Table 2.4.3 shows the distribution of households with eye care episodes, with a higher percentage in the urban areas (33.9%.)

Distribution of household members or persons with eye care episodes by various household characteristics is shown in Table 2.4.4. The urban-rural distribution followed the same trend as that described above, with the urban area reporting a higher percentage of 9.4%. In terms of age, the percentage spent increased with age, from 3.9% to 18.8%. A similar trend is also seen in terms of educational level and household income. Among the three main ethnic groups, the Chinese spent a higher percentage of their health expenditure on eye care with 11.5%, compared with 6.1% and 8.6% among the Malays and Indians, respectively.

The distribution of 'eyesight check-up only' episodes by age groups is shown in Tables 2.4.5 with about 29 episodes per 1000 household members, being highest for those aged 55 years & above with 55.2 episodes per 1000. Table 2.4.6 shows the distribution of "making new glasses or contact lenses" by age group with about 61 episodes per 1000. Those below the age of 15 had only about 25 episodes per 1000, while there was no marked differences between the older age groups. Distribution of expenditure on "eye sight check-up only" by strata (Table 2.4.7) shows a mean of RM18.3 per episode with little difference between urban and rural areas. Mean expenditure for "making new glasses/contact lenses" is RM177.1 per episode, with a higher mean in the urban areas with RM191.3 compared with RM141.5 in the rural areas. Table 2.4.8 shows the distribution of mean expenditure according to age group. Those below the age of 15 years spent only RM9.20 for eye sight check-ups and RM118.80 for "making new glasses/contact lenses", while those in the older age groups tended to spend more.

Among the three main ethnic groups, the Chinese and Indians spent slightly more than the Malays on "making new glasses/contact lenses", with means above RM180 compared with RM168.59 for the latter (Table 2.4.9). The median expenditure, however, appears to be the same for all ethnic groups, indicating that the distributions were skewed to the right. The households with upper secondary and tertiary education spent more with means of RM193.52 and RM257.68, respectively. Mean expenditure also increased with income, ranging from RM128 to RM231.

Expenditure for "making new glasses/contact lenses" was highest for the private sector with a mean of RM186.53, compared with only RM64.31 per episode for government facilities (Table 2.4.10). A mean of RM145.96 was spent in shops, mainly on non-prescription glasses.

Females, persons in older age groups, those with higher education, higher income groups and Chinese, reported more episodes of eye care than others in the other respective categories. Among those who reported eye care episodes, 33.7% reported check-up for visual acuity and 75.7% reported buying of new glasses or contact lenses. Among those who purchased new glasses or contact lenses, 2.7% of them purchased more than one pair of glasses or contact lenses in the past one year.

On an average, household members purchased 61 pairs of glasses/contact lenses per 1000 population in 1996. Almost all of these purchases included check-up for eyesight. In addition to this, there were about 29 episodes of check-up for eyesight per 1000 population that did not involve the purchase of glasses or contact lenses. 43.9% of these 'check-ups only' episodes were done at public facilities. The mean expenditure for 'check-ups only' episodes was RM 18.34. In comparison, only 2.1% of the glasses or contact lenses were made at the public facilities; the mean and median expenditure was RM64.00 and RM20.00 respectively. **97.9% of the glasses or contact lenses were made at the private facilities; the mean and median expenditure were RM177.10 and RM150.00, respectively.**

The mean expenditure for the purchase of new glasses/contact lenses did not differ very much between the urban areas (RM191.30) and the rural areas (RM141.50). Kelantan and Terengganu are the two states with the lowest mean expenditure for the purchase of glasses or contact lenses (RM132.70 and RM135.20 respectively). The W.P.K.L. and Selangor have the highest mean expenditure among the states (RM232.30 and RM221.80 respectively).

The expenditure for the purchase of glasses or contact lenses did not differ very much among the various ethnic groups. People from higher income groups spent more than those from the lower income groups, for a new pair of glasses/contact lenses. Similarly, those who are better educated (with upper secondary or tertiary education) also spent more on glasses/contact lenses.

Ninety-two percent of the 'check-up only' episodes and 96.1% of the purchases of new glasses or contact lenses episodes were paid for by the household members themselves. Only 5.5% of the 'check-up only' episodes and 1.4% of the purchases of new glasses/contact lenses were paid by employers. Other modes of payment were very minimal.

2.2 Discussion

More than RM163 million was spent on eyesight check-up and the purchase of glasses and contact lenses, contributing to about 6.9% of the total direct out-of-pocket household health expenditure. In terms of the absolute amount of money spent by the households and the individuals on this aspect of health care, it seemed to show that the opticians and optical shops are important for consumers to improve their quality of life.

A complete lack of choice for the consumers in this sub sector, especially for purchase of new glasses or contact lenses, is also an important aspect to consider. About 98% of the new glasses or contact lenses were purchased from the private sector and for this reason the mean and median expenditures for these purchases did not differ very much among households in the various socio-economic strata.

The difference in mean expenditures for the purchases of new glasses or contact lenses across the urban-rural, developed and less developed states, ethnicity and socio-economic groups, did not vary very much because most people have to buy their glasses from private facilities. The differences in expenditures are reflections of personal taste, style and fashion. As a basic necessity, every body who needs to wear glasses would have to purchase them from the private optical shops and are required to pay the market price for it.

Another point to note is the predominance of self-payment for these services. Normally, the purchase of glasses or contact lenses are not covered by insurance and employment health care benefits.

2.3 Conclusion

As there is no choice for the consumers with regards to providers and expenditure for eye care and these are mainly paid for by direct out-of-pocket expenditure from the consumers. There is not much of a policy option for the government with regards to the public/private mix or in influencing the consumer's behaviour.

However, if one considers that proper eyesight and good vision are basic health rights reflecting an acceptable quality of life for Malaysians, there may be a case for inclusion of regular eye check-up and the necessary visual acuity correction in the basic medical or health benefit package. There is a stronger argument for school children, the elderly and the indigent to be subsidised for basic eye care in any future health financing and provision reforms.

There are possibilities of changing the current predominantly imported market structure for spectacle frames and lenses. If the intention is to reduce the financial burden on the individuals and the households and to encourage everyone who needs to wear glasses for visual acuity, to have regular check-ups and glasses when necessary, there should be more local production of frames, optical quality glass and other lenses. To encourage local production, the government should perhaps offer tax breaks and other incentives to attract local and foreign companies to invest in this area. This will lower the price for the average citizen.

In order to formulate a sound policy, there might be a need to do a market survey of the optical companies in the country, to gauge the extent of the import component of this commodity. It will also help to obtain exact sales figures from such companies.

2.4 Summary Tables

The following tables are displayed to give further information on eye care and the cost of these services. The tables are self-explanatory and thus no descriptions will be provided. The period under consideration is for one year, the period under study.

Table 2.4.1 Eye care expenditure as a percentage of total household health expenditure by strata, P. Malaysia.

Strata	Eye care expenditure		Other health expenditure		Total health expenditure	
	RM	%	RM	%	RM	%
Urban	125,327,197	7.6	1,534,254,400	92.4	1,659,581,597	100.0
Rural	38,360,995	5.5	664,295,409	94.5	702,656,404	100.0
Total	163,688,192	6.9	2,198,549,809	93.1	2,362,238,001	100.0

Table 2.4.2 Eye care expenditure as a percentage of total household health expenditure by states, P. Malaysia.

State	Eye care expenditure		Other health expenditure		Total health expenditure	
	RM	%	RM	%	RM	%
Johor	23,398,023	5.6	393,826,586	94.4	417,224,608	100.0
Kedah	11,094,510	6.7	154,958,409	93.3	166,052,918	100.0
Kelantan	3,627,975	5.1	68,121,571	94.9	71,749,545	100.0
Melaka	5,259,391	8.2	58,730,197	91.8	63,989,587	100.0
N.Sembilan	7,431,441	8.4	80,978,497	91.6	88,409,938	100.0
Pahang	7,163,558	5.9	114,545,237	94.1	121,708,796	100.0
P.Pinang	16,399,651	6.3	242,713,340	93.7	259,112,990	100.0
Perak	14,109,532	5.7	234,849,249	94.3	248,958,781	100.0
Perlis	1,381,486	8.9	14,206,704	91.1	15,588,190	100.0
Selangor	46,664,111	8.6	498,851,934	91.4	545,516,045	100.0
Terengganu	5,192,966	7.6	63,191,241	92.4	68,384,207	100.0
W.P.K.L.	21,965,548	7.4	273,576,846	92.6	295,542,394	100.0
Total	163,688,192	6.9	2,198,549,809	93.1	2,362,238,001	100.0

Table 2.4.3 Distribution of households with eye care episode/expenditure by strata
P. Malaysia.

Strata	HH with eye care episodes/expenditure		HH without eye care episodes/ expenditure		Total number of Household	
	Number	%	Number	%	Number	%
Urban	573,354	33.9	1,118,490	66.1	1,691,845	100.0
Rural	295,631	23.5	964,790	76.5	1,260,421	100.0
Total	868,985	29.4	1,083,280	70.6	2,952,266	100.0

Table 2.4.4 Distribution of persons with expenditure on eye care by characteristics of household member (HHM), P. Malaysia.

Strata	HHM with eye care		HHM without eye care		Total HHMs	
	No.	%	No.	%	No.	%
<i>Strata</i>						
Urban	756,974	9.4	7,314,368	90.6	8,071,342	100.0
Rural	356,128	5.5	6,083,442	94.5	6,439,570	100.0
<i>Age group</i>						
0-14	198,825	3.9	4,868,612	96.1	5,067,436	100.0
15-29	334,564	8.9	3,428,097	91.1	3,762,661	100.0
30-54	415,717	9.9	3,784,258	90.1	4,199,975	100.0
55 and above	163,997	11.1	1,316,844	88.9	1,480,840	100.0
<i>Education level</i>						
None	98,181	2.9	3,245,054	97.1	3,343,235	100.0
Primary	315,023	6.7	4,358,700	93.3	4,673,722	100.0
Lower secondary	244,843	8.7	2,575,234	91.3	2,820,078	100.0
Upper secondary	330,541	11.1	2,642,886	88.9	2,973,427	100.0
Tertiary	118,184	18.8	509,255	81.2	627,439	100.0
Unknown	6,330	8.7	66,681	91.3	73,011	100.0
<i>Ethnicity</i>						
Malay	554,025	6.1	8,537,470	93.9	9,091,495	100.0
Chinese	429,703	11.5	3,305,272	88.5	3,734,975	100.0
Indian	118,064	8.6	1,258,459	91.4	1,376,523	100.0
Other Malaysian	7,530	3.8	189,299	96.2	196,829	100.0
Non-Malaysian	3,780	3.4	107,310	96.6	111,090	100.0
<i>Household income quintile group</i>						
1st 20 %	111,788	4.8	2,208,184	95.2	2,319,972	100.0
2nd 20 %	151,937	5.4	2,659,942	94.6	2,811,879	100.0
3rd 20 %	190,707	6.4	2,776,730	93.6	2,967,437	100.0
4th 20 %	277,236	9.3	2,693,557	90.7	2,970,792	100.0
5th 20 %	364,745	11.5	2,814,405	88.5	3,179,150	100.0
unknown						
Total	1,113,102	7.7	13,397,810	92.3	14,510,912	100.0

Table 2.4.5 Distribution of household members by eye sight checkup episodes according to age group, P. Malaysia.

Age group of household member	Episodes of eye sight checkups	Total household members	Episodes Per 1000
	Number	Number	
0-14	103,634	5,067,436	20.45
15-29	112,098	3,762,661	29.79
30-54	123,863	4,199,975	29.49
55 and above	81,677	1,480,840	55.16
Total	421,271	14,510,912	29.03

Table 2.4.6 Distribution of making "new glasses or contact lenses episodes" by age group of household member, P. Malaysia.

Age group of household member	Episodes of 'making of new glasses or contact lenses'	Total household members	Episodes Per 1000
	Number	Number	
0-14	127,473	5,067,436	25.16
15-29	277,744	3,762,661	73.82
30-54	356,223	4,199,975	84.82
55 and above	119,100	1,480,840	80.43
Total	880,539	14,510,912	60.68

Table 2.4.7 Distribution of episodes and mean, minimum, median and maximum of eye care expenditure by Strata P. Malaysia.

Strata	Eye care need									
	Eye sight checkups only					Making new glasses/ contact lenses				
	Episodes	Mean	Min.	Med.	Max.	Episodes	Mean	Min.	Med.	Max.
Urban	256,962	18.70	-	-	400.00	630,140	191.30	-	150.00	1,300.00
Rural	164,309	17.80	-	-	273.80	250,400	141.50	-	120.00	810.00
Total	421,271	18.30	-	-	400.00	880,539	177.10	-	150.00	1,300.00

Table 2.4.8 Distribution of episodes and mean, minimum, median and maximum of eye care expenditure by age group of household member, P. Malaysia.

Age group of household member	Eye care need									
	Eye sight checkups					Making new glasses/ contact lenses				
	Episodes	Mean	Min.	Med.	Max.	Episodes	Mean	Min.	Med.	Max.
0-14	103,634	9.20	-	-	150.00	127,473	118.80	-	95.00	420.00
15-29	112,098	18.60	-	-	400.00	277,744	171.20	-	150.00	650.00
30-54	123,863	25.50	-	-	300.00	356,223	212.80	-	180.00	1,300.00
55 and above	81,677	18.80	-	-	230.00	119,100	146.80	-	120.00	1,250.00
Total	421,271	18.30	-	-	400.00	880,539	177.10	-	150.00	1,300.00

Table 2.4.9 Distribution of episodes and mean, minimum, median and maximum expenditure on making new glasses/contact lenses by household characteristics, P. Malaysia.

Household Characteristic	Episodes Number	Mean RM	Min. RM	Med. RM	Max. RM
<i>Ethnicity</i>					
Malay	410.340	168.59	-	150.00	1,300.00
Chinese	376.798	185.20	-	150.00	1,250.00
Indian	85.412	180.38	-	150.00	660.00
Other Malaysian	5.094	210.17	32.40	150.00	450.00
Non-Malaysian	2.895	180.21	-	150.00	500.00
<i>Education level of HHM</i>					
None	54.356	143.04	-	101.20	1,250.00
Primary	232.063	143.78	-	120.00	700.00
Lower secondary	200.742	155.00	-	130.00	600.00
Upper secondary	283.114	193.52	-	170.00	900.00
Tertiary	107.219	257.68	-	200.00	1,300.00
Unknown	3.046	423.37	100.00	400.00	700.00
<i>Income Quintile Group</i>					
1st 20 %	69.500	127.87	-	110.00	502.20
2nd 20 %	105.925	124.56	-	110.00	480.00
3rd 20 %	146.049	139.10	-	120.00	700.00
4th 20 %	227.288	164.59	-	150.00	750.00
5th 20 %	317.017	231.47	-	200.00	1,300.00
Unknown	14.760	188.05	-	150.00	600.00
Total	880.539	177.12	-	150.00	1,300.00

Table 2.4.10 Distribution of episodes and mean, minimum, median and maximum expenditure of making new glasses/contact lenses by source of care, P. Malaysia.

Source of care	Episodes Number	Mean RM	Min. RM	Med. RM	Max. RM
Shop*	149.147	145.96	-	120.00	624.00
Government	18.288	64.31	-	20.00	450.00
Private	713.104	186.53	-	150.00	1,300.00
Total	880.539	177.12	-	150.00	1,300.00

* Non-prescription glasses

CARE FOR LONG STANDING ILLNESSES

3

3.1 Findings

This section covers health service utilization and expenditure on care for long standing chronic illnesses such as diabetes mellitus, heart disease, hypertension, mental illness and cancer, etc. Regular and routine follow-up visits for all these chronic illnesses and expenditure for these visits are covered in this section. Other routine medical check-ups for preventive reasons or for specific reasons (job entry, education and religious pilgrimage) among the well population are not included in this section.

An estimated RM140 million was spent on care for long standing illnesses. This represents 5.9% of the total household health expenditure for the weighted survey population of Peninsular Malaysia in the one-year study period. Rural residents spent 8% of their total household health expenditure on care for long standing illnesses, more than the urban residents who spent only 5.1% of their total health expenditure for such conditions (Table 3.4.1). This is also reflected by the higher percentage contribution of this component of expenditure to total health expenditure in the less developed states such as Kedah, Pahang and Terengganu, (7.9%, 7.8% and 7.4%, respectively) (Table 3.4.2).

6.9% of all individuals in the weighted population had used health services and incurred expenditure for care of long standing illnesses.

There was a slight gender difference with more females (7.8%) reporting episodes of long standing illnesses than males (6.1%) (Table 3.4.5).

Another feature of interest was the disproportionately higher percentage expenditure on care for long standing illnesses among the households with people aged 65 years and above.

Type of Household	% of total health expenditure
Households with Children and Adults only (Aged 0-14 & 15-64).	4.1%
Households with Adults only (Aged 15-64).	6.4%
Households with Children, Adults and Old Aged (Aged 0-14, 15-64 & 65+).	7.8%
Households with Adults and Old Aged only (Aged 15-64 & 65+).	12.0%
Households with Children and Old Aged only, or Old Aged only (Aged 0-14 & 65+ and 65+).	17.3%

The study showed that utilisation of services for long standing illnesses increased with age.

Age Groups	% of population
0-14	0.9
15-29	2.2
30-39	6.4
40-49	14.1
50-59	23.4
60 & above	28.0
All	6.9

By the time people reached the age of 60 and above, 28% of them had one or other form of chronic illnesses that required them to undertake follow-up visits, check-ups and treatment for such conditions.

This was also reflected in the higher than average expenditure for the older people for care of long standing illnesses (Table 3.4.6). Although the mean expenditure per episode (for all affected persons) for long standing illnesses was RM127.00, for those who were above 60 years, their mean was higher at RM165.80. The burden on the elderly was also reflected by similar trends in the case of other socio-economic variables. Retired people spent on an average, RM164.10 and those individuals with no education spent a mean of about RM165.50 per episode of care (Table 3.4.7).

The mean expenditure per person of RM139.30, was a bit higher than the mean expenditure per episode of RM127.00 since most people would have more than one episode of care in one year. The mean annual expenditure for care of long standing illnesses among the elderly population aged 60 years and above was thus higher at RM184.40 per person. Similarly, retired persons spent an average of about RM178.50 per year.

A majority of the episodes of long standing illnesses (55.8%) were treated at public facilities, 43.2% at private facilities and only 1% of the episodes was treated at traditional medical facilities. Rural residents tended to use public facilities (62.6%) more than private facilities (36.1%).

Household members who used public facilities for care of long standing illnesses paid relatively small amounts of money compared to those who used private facilities or traditional practitioners.

Type of Facilities	Mean Expenditure	Median Expenditure
Public facilities	RM 26.60	RM1.40
Private facilities	RM 255.40	RM60.00
Traditional facilities	RM 177.20	RM50.00

Among those who used private facilities for care of long standing illnesses, there was no difference in the mean expenditures between urban and rural residents (RM252.70 vs. RM 260.30). However, among those who used traditional practitioners, the rural residents spent on an average more than double those in the urban areas (RM233.90 vs. RM103.20).

Residents in Kelantan, Pahang, Perlis and Terengganu used public facilities more than private facilities (63.1%, 65.2%, 74.1% and 63.1% respectively). However, a smaller proportion of the population in the more urbanized states used public facilities for the treatment of long standing illnesses; with 45.6% in Pulau Pinang, 49.4% in Selangor and 49.5% in W.P.K.L.

Among those who used private facilities, household members from Kelantan, Terengganu and Perlis paid relatively less per episode than that of other states, with RM89.60, RM120.20 and RM148.70, respectively. People from Perak and Selangor spent relatively more than the average expenditure at private facilities, with mean expenditures of RM349.80 and RM341.60 per episode. As expected, those from developed states like Pulau Pinang, Selangor and W.P.K.L. used private facilities more (54.4%, 50.6% and 50.1% respectively).

More people in Kelantan (2.2%), Terengganu (4.1%) and Perlis (4.9%) went to traditional practitioners for care of long standing illnesses than that from the other states.

Among the ethnic groups, 59.7% of the Malay used public facilities and 39% of them used private facilities. The trend was reversed among the Chinese with 43% using public facilities and 56.3% private facilities.

In terms of the amount of money spent per episode of care at private facilities, Chinese spent more than the other ethnic groups.

Ethnic Group	Mean Expenditure (RM)	Median Expenditure (RM)
Malay	194.80	36.00
Chinese	371.70	121.20
Indian	207.30	40.00

3.2 Discussion

5.9% of the total household health expenditure which was spent on check-up and treatment for chronic and long standing illnesses, constitutes a substantial amount of money. For policy makers the fact that the rural strata spent proportionately more (8%) of their household health expenditure on this sub sector is of importance. Another finding of importance is that households with elderly persons spent proportionately more on treatment of long standing illnesses (from 7.8% to 17.3% of total household health expenditure). As expected, utilization of services resulting from chronic illnesses increased with age. 23.4% of household members between the ages of 50 and 59 reported usage of health services for chronic illnesses in the last one year recall. This figure rose to 28% for those who were above 60 years of age.

The mean expenditure per episode and mean expenditure per person per year for the treatment of long standing illnesses were higher for those aged 60 years and above (RM165.80 & RM184.40) and for those who were retired (RM164.10 & RM178.50). The corresponding figures for the study population were RM127.00 and RM139.30, respectively. This finding highlights the growing importance of the elderly in terms of their usage of health care services in the Malaysian context.

There are three categories of providers available for the treatment of chronic and long standing illnesses, namely the public providers, the private providers and the traditional practitioners. In practice, the main choice the consumers have to make is between public and private providers as the usage of traditional practitioners is proportionately very low.

Rural residents used public facilities more (62.6%) and the same applies to residents in the relatively less developed states such as Kelantan (63.1%), Pahang (65.2%), Perlis (74.1%) and Terengganu (63.1%) and the Malays (59.7%).

Although the majority of those from developed states of Pulau Pinang, Selangor and W.P.K.L. and the majority of the Chinese chose to go to the private practitioners, it is of importance to note that a sizeable percentage of the population still utilised public facilities.

There was a big difference in the mean expenditure for those who used the private and traditional practitioners' services for treatment of chronic illnesses from those who received subsidized care from public providers.

Even among those who used the private practitioners' service, there was a considerable difference in the average amount of money spent for each episode. People from the relatively less developed states spent substantially less than those in other states. The Chinese spent more than the Malays and the Indians. Whether this pattern is a reflection of a sliding scale of fees practised by private practitioners or because of a difference of disease patterns and treatment procedures among the various states and ethnic groups, are not known.

Although the overall utilisation of traditional practitioners' services for the treatment of chronic illnesses was low, people from Kelantan, Terengganu and Perlis used more of such services compared to other states. It is a reflection of the strong cultural and traditional belief systems in these predominantly Malay states. Therefore, it remains as an important source of care for the consumers with strong traditional and cultural beliefs.

3.3 Conclusion

If the aims of treatment for chronic and long standing illnesses are disease control, the prevention of complications and improvement of quality of life of the sufferers, then it can be said that services for these illnesses have some of the characteristics of public goods. In this situation, it is important to have a health financing system which will not discourage the sufferers of long standing illnesses, especially those from the underprivileged and disadvantaged strata and groups, from using the services. The uneducated, old aged and pensioners who live in the rural areas of the less developed states have to bear the costs for the treatment of these chronic illnesses.

The main choice for the consumers in this case is between the public and private providers. With any change in the government's policy, especially with regards to public-private mix of health provision and financing, it is imperative to take care of those people who currently used public facilities for treatment of long standing illnesses. Fees or prices should not be a barrier to the use of health services for treatment of long standing illnesses. In fact, there is a strong case for subsidizing the old, the underprivileged and the disadvantaged in future health financing and provision reforms.

In Malaysia, it is important to establish the safety of the myriad of traditional medicinal preparations. It is of urgent importance to establish a registration and regulation practice for this branch of traditional medicine. National efforts and assistance from international agencies like WHO could be instrumental in ensuring safety in the use of traditional medicinal preparations for the population.

In recognition of this, the Ministry of Health has already formed a National Steering Committee on Traditional Medicine to forge a relationship with traditional practitioners. WHO already has a Traditional Medicine Programme (TRM) which provides training, development and consultancy services for the member countries, which include some of the most important and influential nations in the practice of traditional medicine like China, Japan and Korea. TRM programme works mainly for the secular traditional practitioners like the herbalists and the acupuncturists.

It is important also to look into the marketing aspect of traditional medicine. In Malaysia, the practice of traditional medicine cross cultural and ethnic lines, which makes it necessary to make traditional medicinal preparations understandable to the different ethnic groups. Product labelling and regulatory measures are important aspects to ensure proper usage and safety.

For the sacred traditional healers and those who practices a mix of both sacred and secular healing, the present Ministry of Health's approach of self regulation will be sufficient to nurture an orderly development of these practices. It will take time and patience to institute and perpetuate dialogues between the practitioners and the government.

3.4 Summary Tables

Table 3.4.1 Expenditure of Care for Long Standing Illnesses as a Percentage of Total Household Health Expenditure by strata, P. Malaysia.

Strata	Expenditure on care for long standing illnesses		Total health expenditure	
	RM	%	RM	%
Urban	83,928,303	5.1	1,659,581,597	100.0
Rural	55,978,160	8.0	702,656,404	100.0
Total	139,906,463	5.9	2,362,238,001	100.0

Table 3.4.2 Expenditure for long standing illnesses as a percentage of total household health expenditure by state, P. Malaysia.

State	Expenditure on care for long standing illnesses		Total health expenditure	
	RM	%	RM	%
Johor	21,904,269	5.2	417,224,608	100.0
Kedah	13,194,481	7.9	166,052,918	100.0
Kelantan	4,162,179	5.8	71,749,545	100.0
Melaka	3,156,056	4.9	63,989,587	100.0
N.Sembilan	5,106,569	5.8	88,409,938	100.0
Pahang	9,471,914	7.8	121,708,796	100.0
P.Pinang	11,992,323	4.6	259,112,990	100.0
Perak	24,612,139	9.9	248,958,781	100.0
Perlis	879,974	5.6	15,588,190	100.0
Selangor	30,262,561	5.5	545,516,045	100.0
Terengganu	5,051,132	7.4	68,384,207	100.0
W.P.K.L.	10,112,869	3.4	295,542,394	100.0
Total	139,906,463	5.9	2,362,238,001	100.0

Table 3.4.3 Distribution of households with episodes of care for long standing illnesses by state, P. Malaysia.

State	Households with care for long standing illnesses		Total number of households	
	Number	%	Number	%
Johor	115,197	26.4	437,024	100.0
Kedah	71,956	24.8	290,091	100.0
Kelantan	72,722	31.8	228,623	100.0
Melaka	35,237	30.8	114,500	100.0
N.Sembilan	41,421	29.0	142,610	100.0
Pahang	66,017	34.6	191,034	100.0
P.Pinang	68,566	33.6	204,258	100.0
Perak	125,280	33.8	371,092	100.0
Perlis	10,548	26.1	40,418	100.0
Selangor	133,387	25.2	530,070	100.0
Terengganu	49,899	33.6	148,599	100.0
W.P.K.L.	69,645	27.4	253,946	100.0
Total	859,875	29.1	2,952,266	100.0

Table 3.4.4 Distribution of persons with and without long standing illness (LSI) by age group ,P.Malaysia

	Age group of Household Member													
	0-14		15-29		30-39		40-49		50-59		>=60		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Without LSI	5,023,444	37.2	3,681,582	27.3	1,902,998	14.1	1,401,825	10.4	759,480	5.6	737,193	5.5	13,506,523	100.0
With LSI	43,993	4.4	81,078	8.1	130,901	13.0	229,590	22.9	231,891	23.1	286,937	28.6	1,004,390	100.0
Total	67,436	34.9	3,762,661	25.9	2,033,899	14.0	1,631,415	11.2	991,372	6.8	1,024,130	7.1	14,510,912	100.0

Table 3.4.5 Distribution of persons with and without long standing illness (SLI) by age group and gender, P.Malaysia

Gender	Age group of Household Member													
	0-14		15-29		30-39		40-49		50-59		60 & above		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Male														
Without LSI	2,584,157	99.1	1,872,769	98.2	951,173	94.4	722,832	87.7	393,036	78.6	358,661	74.8	6,882,628	93.9
With LSI	24,573	0.9	34,269	1.8	56,705	5.6	101,745	12.3	106,894	21.4	120,515	25.2	444,701	6.1
Total male	2,608,730	100.0	1,907,038	100.0	1,007,878	100.0	824,577	100.0	499,930	100.0	479,176	100.0	7,327,329	100.0
Female														
Without LSI	2,439,287	99.2	1,808,813	97.5	951,825	92.8	678,993	84.2	366,445	74.6	378,532	69.5	6,623,894	92.2
With LSI	19,420	0.8	46,810	2.5	74,195	7.2	127,845	15.8	124,997	25.4	166,422	30.5	559,689	7.8
Total females	2,458,706	100.0	1,855,623	100.0	1,026,020	100.0	806,838	100.0	491,442	100.0	544,953	100.0	7,183,583	100.0

Table 3.4.6 Distribution of care for long standing illness episodes and per episode expenditure (mean and median) by source of care and characteristics of household member, P. Malaysia

Strata	Sources of Care												Total			
	Government				Private				Traditional				No. of episodes	%	Mean	Median
	No. of episodes	%	Mean	Median	No. of episodes	%	Mean	Median	No. of episodes	%	Mean	Median				
Urban	316,000	50.6	21.2	2.0	303,735	48.6	252.7	60.0	4,889	0.8	103.2	40.0	624,624	100.0	134.4	12.0
Rural	298,303	62.6	32.4	1.2	172,196	36.1	260.3	50.0	6,373	1.3	233.9	50.0	476,872	100.0	117.4	12.0
<i>Age group</i>																
0-14	32,293	64.2	42.5	3.0	17,528	34.9	438.1	45.0	454	0.9	2,100.0	2,100.0	50,276	100.0	199.0	15.0
15-29	42,790	48.1	60.3	1.0	44,452	50.0	154.6	25.0	1,684	1.9	218.8	140.0	88,926	100.0	110.4	10.0
30-39	71,477	50.7	36.6	1.0	68,900	48.9	149.5	25.0	548	0.4	134.2	2.0	140,925	100.0	92.2	8.0
40-49	137,779	55.7	26.5	2.0	108,010	43.7	194.2	60.0	1,560	0.6	97.0	126.0	247,349	100.0	100.2	12.0
50-59	145,020	56.9	20.6	2.0	106,934	42.0	245.5	86.7	2,917	1.1	52.7	10.0	254,871	100.0	115.3	12.0
60 & above	184,944	57.9	17.0	1.4	130,106	40.8	380.3	100.0	4,099	1.3	71.8	60.0	319,149	100.0	165.8	12.0
<i>Ethnicity</i>																
Malay	399,002	59.7	24.3	-	260,569	39.0	194.8	36.0	9,314	1.4	194.7	40.0	668,885	100.0	93.1	5.6
Chinese	124,581	43.0	27.1	6.0	163,320	56.3	71.6	121.2	1,948	0.7	93.4	107.0	289,850	100.0	221.7	30.0
Indian	78,918	63.2	36.8	7.0	45,869	36.8	207.3	40.0	-	-	-	-	124,787	100.0	99.4	12.0
O. Malaysian	9,445	65.8	34.8	7.0	4,918	34.2	98.7	16.0	-	-	-	-	14,363	100.0	56.7	12.0
Non-Malaysian	2,357	65.3	18.6	12.0	1,254	34.7	91.3	40.0	-	-	-	-	3,611	100.0	43.9	30.0
Total	14,303	55.8	26.6	1.4	475,931	43.2	255.4	60.0	11,262	1.0	177.2	50.0	1,101,496	100.0	127.0	12.0

Table 3.4. 7 Distribution of persons with care long standing illness episodes and per person expenditure (mean and median) by characteristics of household members, P. Malaysia.

Characteristics of Household member	Persons with care for long standing illnesses		Per Person Expenditure (RM)	
	Number	%	Mean	Median
<i>Strata</i>				
Urban	583,163	58.1	143.9	13.2
Rural	421,226	41.9	132.9	12.0
<i>Age group</i>				
0-14	43,993	4.4	227.4	12.0
15-29	81,078	8.1	121.1	12.0
30-39	130,901	13.0	99.2	12.0
40-49	229,590	22.9	107.9	12.0
50-59	231,891	23.1	126.8	12.0
60 & above	286,937	28.6	184.4	12.5
<i>Ethnicity</i>				
Malay	602,576	60.0	103.3	6.2
Chinese	266,494	26.5	241.1	38.0
Indian	118,249	11.8	104.9	12.0
Other Malaysian	13,459	1.3	60.5	12.0
Non-Malaysian	3,611	0.4	43.9	30.0
<i>Education level</i>				
None	260,401	25.9	186.4	15.0
Primary	374,872	37.3	134.2	14.0
Lower secondary	160,415	16.0	124.7	12.0
Upper secondary	162,380	16.2	96.4	4.0
Tertiary	37,150	3.7	116.7	1.0
Unknown	9,171	0.9	116.8	5.0
<i>Emp.status/soc.economic status</i>				
Non-income recipient	420,055	41.8	170.4	17.0
Self-employed	175,538	17.5	124.1	21.0
Government	81,319	8.1	99.5	-
Private	185,554	18.5	93.7	8.8
Retired	77,438	7.7	178.5	3.0
Housewife	44,214	4.4	118.6	7.0
Unemployed	20,272	2.0	98.9	17.0
<i>HH income group</i>				
1st 20 %	200,916	20.0	82.7	12.0
2nd 20 %	190,050	18.9	103.6	13.2
3rd 20 %	177,832	17.7	125.9	12.0
4th 20 %	204,909	20.4	132.2	13.2
5th 20 %	213,224	21.2	242.6	18.0
Unknown	17,458	1.7	136.4	12.0
Total	1,004,390	100.0	139.3	12.0

MEDICAL CHECK-UPS

4

4.1 Findings

Direct out-of-pocket household expenditure on the utilization of medical check-up services, represented a mere 2.1% of the total household health expenditure. Medical check-ups covered under this section include annual check-up, routine check-up, medical check-up for further education, job entrance, insurance and religious purposes. Medical check-ups for long-standing and chronic illnesses were discussed in Chapter 3 of this report.

Only 6.4% of all the individuals in the weighted population had reported the utilization of medical check-up services in the last one year. The age groups breakdown showed that more than 90% of the population in almost all the age groups did not report any medical check-up in the last one year. This was true even for the people in the older age groups.

Age Group	% of total population with medical check-up
0-14	3.3
15-29	6.7
30-39	8.7
40-49	9.3
50-59	10.2
60 and above	7.8
All ages	6.4

There was no gender difference observed in the percentage of individuals who had medical check-ups. 6.5% males and 6.3% females reported at least one episode of medical check-up in the last one year.

About 53% of the medical check-ups were done at private facilities and the remainder at public facilities. More developed states like W.P.K.L. and Selangor had a higher utilization of private facilities for medical check-ups (71.8% and 69.7% respectively) while Kelantan, Pahang, Perlis and Terengganu had lower utilization of private facilities (27.5%, 32.1%, 33.4% and 35.9%, respectively).

There was also a striking difference in the utilization of public and private facilities among the people from urban and rural areas. 63.5% of the urbanites used private facilities for medical check-up, while the majority of 63% in the rural areas used public facilities for these check-ups.

The use of the public facilities for medical check-ups among the 0-14 age group is understandably high. Adults used more of private facilities but after the age of 50, the use of public facilities for medical check-up, increased again.

Age Group	Public Facilities	Public Facilities
0 -14	83.9%	16.1%
15-29	38.0%	62.0%
30-39	33.9%	66.1%
40-49	36.9%	63.1%
50-59	43.4%	56.6%
60 & above	47.1%	52.9%

The mean expenditure for medical check-up was RM51.20 for each episode. As expected, there was a big difference between the mean expenditures for the private and the public facilities with RM84.60 versus RM13.10.

The mean expenditures of the private medical check-ups within the developed states did not differ very much from the overall mean except for the W.P.K.L., with a mean expenditure of RM107.00. Those who used private facilities for medical check-ups in the states of Kelantan and Terengganu, paid substantially less than the overall average, i.e. RM33.20 and RM41.60, respectively.

Among the adults who used the private facilities for medical check-up, the average fees paid for each episode increased with increasing age.

Age group	Mean Expenditure	Median Expenditure
0 -14	RM 70.77	RM 25.00
15-29	RM 41.66	RM 25.00
30-39	RM 85.76	RM 25.00
40-49	RM 117.82	RM 30.00
50-59	RM 137.72	RM 47.00
60 & above	RM 97.21	RM 50.00

The majority of the Chinese used private facilities and on an average they also paid more. The reverse was true for the Malays.

Ethnic Group	Public Facilities	Private Facilities	Mean Expenditure at Private Facilities
Malay	61.3%	38.7%	RM 45.00
Chinese	21.0%	79.0%	RM 138.80
Indian	46.8%	53.2%	RM 50.90

The mean expenditure per person of RM52.40 was slightly more than the mean expenditure per episode of RM 51.20 because some of the individuals had reported more than one episode of routine medical check-ups. The overall mean expenditure are affected by the utilization of the private facilities, thus the mean expenditure per person was higher in the urban than the rural

areas, in the developed states than the less developed states, the Chinese, and in those with higher education, self employment, and higher income group.

Detailed summary statistics were presented in the section **4.4 Summary Tables**. The percentage contribution of expenditure on medical check-up to the total household health expenditures by strata was presented first (Tables 4.4.1). The distribution of households with reported medical check-ups episodes by states was reported (Table 4.4.2) followed by the distributions of persons with medical check-up episodes by age group and gender (Tables 4.4.3 and 4.4.4). Distribution of medical check-up episodes and expenditure per episode by source of care were presented by strata, age groups, and ethnicity (Table 4.4.5). Finally, expenditure per person was tabulated by strata and person or household characteristics (Tables 4.4.6).

4.2 Discussion

The medical check-ups under this section are mainly done for persons for entry into schools, jobs, insurance programs, etc. or for screening purposes. The utilization of services for annual and routine medical examination for screening purposes especially among people aged 50 years and above, is of public health importance.

The most salient point from the survey was the overwhelming lack of reporting for annual and routine medical check-ups among people aged 50 years and above, 89.8% of those who were between ages of 50 and 59 and 92.2% of those aged 60 years and above did not report any episode of medical check-up in the last one year. Even after taking into consideration the problem of recall, these percentages were way above any professionally recommended preventive practices for these age groups.

Overall utilization of services showed almost equal preference for public and private facilities. However, the urban population, those living in more developed states and the adult working age groups had higher preference for private providers

Because of the public-private dichotomy in usage, there was a big difference in the mean expenditure of medical check-ups in public facilities and private facilities. Even among those who used private facilities, the mean expenditures for private medical check-ups varied across states, ethnic and age groups. This points to the importance of the components or items of what will be considered a quality general medical check-up service according to the age groups of the consumers. There is a need to have a uniformity or consensus in this aspect of routine and preventive medical check-up service. There is also a possibility of a sliding scale of charges by the private practitioners when providing more or less the same quality and quantity of services to the consumers.

4.3 Conclusion

Lack of reporting for routine medical check-ups especially among the older population is of public health concern. There is a need to promote health consciousness and health awareness among the adult and the older population groups with regards to the value of annual general medical check-up. Health educators and promoters need to target these age groups for more annual medical check-ups. It is more difficult to get well people to the providers for the general medical check-ups than when they are sick.

All preventive health activities such as immunization, screening and medical check-ups, have the characteristics of a public goods. If the government or public health professionals want to increase the coverage of such activities there is a good argument for promoting and providing it as a subsidized or public delivery. This might be a good way to provide this service for the elderly and those from rural areas who are without any health financing coverage. There is no reason for people who can afford to pay or those who are covered by employment medical benefits to get subsidized medical check-up services. This situation requires the government to pursue a selective and targeted policy in health financing and provision so that societal goals can be achieved in bringing about the desirable outcome of improving the quality of life especially in the elderly population.

There is also a need for professional bodies to look at the quantitative and qualitative aspects of the general medical check-up service and the uniformity of the fees structure for these services. The accepted or standard examinations for a quality medical check-up might vary with the age and gender of the consumer. For the same quantity of service, the quality and fees have to be uniform when this service is provided by private practitioners, at least in Peninsular Malaysia.

4.4 Summary Tables

Table 4.4.1 Expenditure for Medical checkup as a percentage of total household health expenditure by strata, P. Malaysia.

Strata	Medical checkup expenditure		Total health expenditure	
	RM	%	RM	%
Urban	36,662,354	2.2	1,659,581,597	100.0
Rural	11,934,161	1.7	702,656,404	100.0
Total	48,596,514	2.1	2,362,238,001	100.0

Table 4.4.2 Distribution of households with medical checkup episodes by states, P. Malaysia.

State	Households with medical checkup		Total number of households	
	Number	%	Number	%
Johor	131,903	30.2	437,024	100.0
Kedah	75,537	26.0	290,091	100.0
Kelantan	24,628	10.8	228,623	100.0
Melaka	20,324	17.8	114,500	100.0
N.Sembilan	36,700	25.7	142,610	100.0
Pahang	40,686	21.3	191,034	100.0
P.Pinang	52,266	25.6	204,258	100.0
Perak	56,415	15.2	371,092	100.0
Perlis	9,503	23.5	40,418	100.0
Selangor	110,819	20.9	530,070	100.0
Terengganu	26,013	17.5	148,599	100.0
W.P.K.L.	68,530	27.0	253,946	100.0
Total	653,324	22.1	2,952,266	100.0

Table 4.4.3 Distribution of persons with and without medical checkups by age group, P. Malaysia.

	Age group of HHM												Total	%
	0-14	%	15-29	%	30-39	%	40-49	%	50-59	%	>=60	%		
Without medical checkup	4,899,711	36.1	3,511,664	25.9	1,857,630	13.7	1,479,769	10.9	890,271	6.6	944,085	7.0	13,583,129	100.0
With medical checkup	167,726	18.1	250,997	27.1	176,269	19.0	151,646	16.3	101,101	10.9	80,044	8.6	927,784	100.0
Total	5,067,436	34.9	3,762,661	25.9	2,033,899	14.0	1,631,415	11.2	991,372	6.8	1,024,130	7.1	14,510,912	100.0

Table 4.4.4 Distribution of persons with and without medical checkup by age group and gender, P. Malaysia.

Gender	Age group of HHM												Total	%
	0-14	%	15-29	%	30-39	%	40-49	%	50-59	%	>=60	%		
Male														
Without medical checkup	2,526,169	96.8	1,777,875	93.2	912,055	90.5	749,280	90.9	451,360	90.3	433,866	90.5	6,850,606	93.5
With medical checkup	82,561	3.2	129,163	6.8	95,823	9.5	75,297	9.1	48,570	9.7	45,310	9.5	476,723	6.5
Total male	2,608,730	100.0	1,907,038	100.0	1,007,878	100.0	824,577	100.0	499,930	100.0	479,176	100.0	7,327,329	100.0
Female														
Without medical checkup	2,373,541	96.5	1,733,789	93.4	945,574	92.2	730,488	90.5	438,911	89.3	510,220	93.6	6,732,523	93.7
With medical checkup	85,165	3.5	121,834	6.6	80,446	7.8	76,349	9.5	52,531	10.7	34,734	6.4	451,060	6.3
Total females	2,458,706	100.0	1,855,623	100.0	1,026,020	100.0	806,838	100.0	491,442	100.0	544,953	100.0	7,183,583	100.0

Table 4.5.5 Distribution of medical checkup episodes and per episode expenditure (mean and median) by source of care and characteristics of household members, P. Malaysia

Strata	No. of episodes	Source of care								Total		
		Public			Private			Total		Mean	Median	
		%	Mean	Median	No. of episodes	%	Mean	Median	No. of episodes	%	Mean	Median
Urban	213,301	36.5	12.5	-	370,913	63.5	91.6	30.0	584,214	100.0	62.8	1.2
Rural	229,811	63.0	13.6	-	134,915	37.0	65.4	15.4	364,726	100.0	32.7	-
<i>Age group of HHM</i>												
0-14	142,816	83.9	4.7	-	27,380	16.1	70.8	25.0	170,196	100.0	15.3	-
15-29	96,383	38.0	12.0	-	157,131	62.0	41.7	-	253,513	100.0	30.4	-
30-39	60,844	33.9	37.7	-	118,516	66.1	85.8	25.0	179,360	100.0	69.5	1.0
40-49	57,476	36.9	13.5	-	98,389	63.1	117.8	30.0	155,865	100.0	79.3	5.0
50-59	45,840	43.4	12.0	-	59,798	56.6	137.7	47.0	105,638	100.0	83.1	10.0
60 & above	39,755	47.1	8.6	-	44,614	52.9	97.2	50.0	84,368	100.0	55.4	10.0
<i>Ethnicity</i>												
Malay	309,858	61.3	12.8	-	195,597	38.7	45.0	2.0	505,455	100.0	25.3	-
Chinese	59,885	21.0	18.3	-	225,042	79.0	138.8	69.0	284,927	100.0	113.5	50.0
Indian	41,353	46.8	16.2	-	47,069	53.2	50.9	7.0	88,422	100.0	34.6	-
Other Malaysian	29,889	71.3	0.2	-	12,013	28.7	12.6	16.0	41,902	100.0	3.8	-
Non-Malaysian	2,127	7.5	23.4	5.0	26,107	92.5	8.7	-	28,233	100.0	9.9	-
Total	443,113	46.7	13.1	-	505,827	53.3	84.6	22.0	948,940	100.0	51.2	-

Table 4.4.6 Distribution of persons with medical checkup episodes and per person expenditure (mean and median) by characteristics of household members, P. Malaysia

	Persons with Medical	Per Person Expenditure	
	check-ups episodes	Mean	Median
	Number		
<i>Strata</i>			
Urban	574,000	63.9	1.0
Rural	353,784	33.7	-
<i>Age group</i>			
0-14	167,726	15.5	-
15-29	250,997	30.7	-
30-39	176,269	70.7	1.0
40-49	151,646	81.5	5.0
50-59	101,101	86.9	12.0
60 & above	80,044	58.4	10.0
<i>Ethnicity</i>			
Malay	493,372	25.9	-
Chinese	276,573	116.9	50.0
Indian	87,703	34.9	-
Other Malaysian	41,902	3.8	-
Non-Malaysian	28,233	9.9	-
<i>Education level</i>			
None	158,938	36.9	-
Primary	247,213	44.4	1.0
Lower secondary	158,764	47.7	-
Upper secondary	243,867	69.0	-
Tertiary	112,844	63.5	-
Unknown	6,157	26.7	-
<i>Emp. Status.soc. economic status</i>			
Non-income recipient	383,579	46.0	-
Self-employed	112,129	83.0	15.2
Government	87,185	18.7	-
Private	297,486	57.5	-
Retired	27,240	67.0	7.0
Housewife	13,736	46.3	17.8
Unemployed	6,430	69.6	15.0
<i>HH income group</i>			
1 st 20 %	119,318	28.4	-
2 nd 20 %	142,162	22.5	-
3 rd 20 %	163,028	37.7	-
4 th 20 %	174,984	55.5	-
5 th 20 %	303,063	79.4	2.0
Unknown	25,228	83.1	60.0
Total	927,784	52.4	-

IMMUNIZATION

5

5.1 Findings

Immunization usage was asked under two questions in the NHES'96 Survey. Utilisation of immunisation services provided by the public health services for children and their expenditures were inquired into under one question and utilisation of any other immunisation services and their expenditures were dealt with under another question.

Overall expenditure on immunization represented 0.7% of total household health expenditure for the weighted population in Peninsular Malaysia. There was a slight difference between the urban and rural strata (0.8% vs. 0.6%). Kelantan, Selangor and W.P.K.L. spent higher proportions of total household health expenditure (1.0%, 0.9% and 0.8% respectively) compared with Terengganu and Melaka (0.2% and 0.3%, respectively).

As shown in the distribution of immunization episodes according to age group, immunization usage is age specific. As expected, immunization service usage was higher in younger children (0-4 and 5-19) than in adults. The percentage of adults who had immunization in the last one year was relatively small.

Age Group	% of population with immunization episodes
0 - 4	34.2%
5 -19	12.9%
20-39	1.7%
40-59	1.4%
60 & above	1.0%

There is not much of a gender difference although within the 5-19 age group more females were reported to have immunization in the last one year (15% vs. 11%) which was a reflection of rubella immunization among female school children in this age group.

Overall, 81.9% of immunization episodes were carried out at public facilities. An overwhelming majority of rural residents who had immunization, were immunized (93%) at public facilities. A substantial proportion of urban users (27.9%) were immunized at the private facilities. This was reflected in the distribution of users in various states. More than 90% of all immunization episodes in Kelantan, Pahang, Perlis and Terengganu were done at public facilities. In contrast, a higher percentage of the users preferred private facilities in the highly urbanized states of Pulau Pinang (26.4%), Selangor (36.8%) and W.P.K.L. (38.1%) although the majority in these states still utilised public facilities for immunization services.

Among children aged 0-4 years who are the main users of the immunization services provided by the government under the Expanded Programme of Immunization, there was a substantial usage of services provided by the private sector (22.8%).

Utilization of immunization services by ethnic groups showed the usual picture of the Chinese using more private facilities than the other ethnic groups.

Ethnic Group	Public Facilities	Private Facilities
Malay	88.6%	11.4%
Chinese	61.5%	38.5%
Indian	83.3%	16.7%

Immunization services for the children are provided free by the government as one of the main public health preventive measures. For this reason, the mean expenditure for an immunization episode at the public facility was only RM1.70. The users had to pay an average of RM54.20 for an immunization at the private facilities. Even for children under five, an immunization shot cost an average of RM57.50.

The mean expenditure per immunization episode across the states and ethnic groups showed quite a different scale of charges at the private facilities. Private practitioners in Terengganu charged as low as RM16.20 on average for an immunization shot, increasing to a high of RM68.20 by the private practitioners in Pulau Pinang. The Malays paid on average of RM32.20 at the private facilities while Chinese paid more than double, about RM75.00 at the private facilities for an immunization episode.

An individual may have more than one immunization episodes in the last one year. Therefore mean expenditure per person on immunization (RM12.70) was slightly higher than mean expenditure per episode immunization (RM11.20).

Users from Johor, Pulau Pinang, Selangor and W.P.K.L. had higher expenditures per person (RM15.30, RM22.60, RM24.00 and RM25.30, respectively). Chinese spent on an average of RM34.63 for immunization service in a year. Users from the highest household income quintile spent about RM29.70 per person per year on the average, while the two lowest income quintile groups spent RM3.70 and RM3.00 per person per year respectively, on immunization.

5.2 Discussion

Immunization service is mainly provided free of charge by the public health service for children against a few communicable diseases. For this reason the financial burden on the households for immunization is very minimal (0.7% of the total household health expenditure).

The usage is also age-specific and mainly used by children under five, with 34.2% of this age group reporting at least one episode of immunization in the last one year.

Between the age group of 5-19 years, more females were reported to have immunization in the last one year because of the Rubella (German Measles) immunizations for female secondary school children.

81.9% of all the immunizations were given at the public facilities. Residents in the rural areas, from Kelantan, Pahang, Perlis and Terengganu, and Malays showed higher than the average usage of public facilities for immunization.

A segment of the population used private facilities for immunization, with a higher than average usage among the urban population, Chinese, residents from Pulau Pinang, Selangor and W.P.K.L. The general preference for private facilities by various socio-economic groups seem to be the same for a number of different health services. The urban residents, people from more developed states and the Chinese had higher preferences for private immunisation facilities.

The mean household expenditure on immunization at public facilities is RM1.70. The mean expenditure per episode at the private facilities (RM54.20) is much higher. Further more, there was a substantial usage of private facilities by the main user of immunisation services, children below the age of five, with 22.8% of these children receiving their immunisation at private facilities and paying an average of RM57.54 for each immunization episode.

There was also the usual finding of the different scales of payment within states and ethnic groups, among users of private immunization service. Whether this was due to the sliding scale fees structure or because of the different cost profiles of the different vaccines was not known.

Detailed statistics on immunization were presented as Summary Tables in section 5.4. The contribution of the expenditure on immunization to total household health expenditure across the strata was first presented (Table 5.4.1). Then distribution of households with immunization episodes were presented across the states (Table 5.4.2) followed by the distribution of persons with immunization episodes by age group and the gender (Tables 5.4.3 and 5.4.4). The distribution of immunization episodes and expenditures per episode by the type of facilities and by strata, age groups and ethnicity are shown in Table 5.4.5. Finally, distributions of persons with immunization episodes and mean expenditure per person, were presented across the strata and socio-economic characteristics (Table 5.4.6).

5.3 Conclusion

Immunization as a preventive service has all the characteristics of a public goods. As such it should be provided by the public providers so that the society's goal of complete freedom from the immunizable communicable diseases can be achieved. In this respect, childhood immunization services should continue to be provided by the public sector.

There is scope for the private facilities in providing immunization services especially for those who can afford to pay and for those type of vaccines which are not covered by the public childhood immunization programmes such as those included in the Expanded Programme of Immunization.

The main policy issue here is the quality of service. To provide quality immunization service, the private practitioners have to invest in the proper maintenance of a cold chain and the use of reliable and proven vaccines and manufacturers. Regulation on these aspects among the private practitioners needs to be strengthened.

The fees structure for all available immunization in the private sector has to be agreed upon in consultation with the private practitioners, the vaccine suppliers, the public health

immunization programme managers and the consumers' associations. The cost information or the prices consumers have to pay for these immunization should be provided to the consumers. Immunization is one of the few health care decisions which the consumers can make without relying on their doctors . In order to be able to make an informed decision, necessary information about the vaccines, the diseases prevented by immunization and the cost of such services must be made available to the consumers.

5.4 Summary Tables

Table 5.4.1 Immunization expenditure as a percentage of total household health expenditure by strata P. Malaysia.

Strata	Immunization expenditure		Total Health Expenditure
	RM	%	RM
Urban	12,887,377	0.8	1,659,581,597
Rural	3,878,759	0.6	702,656,404
Total	16,766,136	0.7	2,362,238,001

Table 5.4.2 Distribution of households with immunization episodes and total households by state P. Malaysia.

States	Households with immunization episodes		Total number of households
	Number	%	
Johor	153,354	35.1	437,024
Kedah	119,766	41.3	290,091
Kelantan	96,970	42.4	228,623
Melaka	32,184	28.1	114,500
N.Sembilan	40,480	28.4	142,610
Pahang	84,918	44.5	191,034
P.Pinang	69,716	34.1	204,258
Perak	114,142	30.8	371,092
Perlis	16,589	41.0	40,418
Selangor	171,023	32.3	530,070
Terengganu	58,926	39.7	148,599
W.P.K.L.	76,312	30.1	253,946
Total	1,034,379	35.0	2,952,266

Table 5.4.3 Distribution of persons with and without immunization episodes by age group, P.Malaysia

Age group of HHM	Age group of household member											
	0-14		15-29		30-39		40-49		60 & above		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Without immunization episodes	1,092,349	8.3	4,241,826	32.2	4,257,242	32.3	2,586,171	19.6	1,013,939	7.7	13,191,527	100.0
With immunization episodes	567,178	43.0	630,703	47.8	74,699	5.7	36,615	2.8	10,191	0.8	1,319,386	100.0
Total	1,659,527	11.4	4,872,528	33.6	4,331,941	29.9	2,622,787	18.1	1,024,130	7.1	14,510,912	100.0

Table 5.4.4 Distribution of persons with and without immunization episodes by age group and gender, P.Malaysia

Age group of HHM	Age group of household member											
	0-14		15-29		30-39		40-49		60 & above		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Male												
Without immunization episodes	569,902	65.3	2,215,417	89.0	2,135,128	98.8	1,307,243	98.7	472,925	98.7	6,700,614	91.4
With immunization episodes	302,449	34.7	274,445	11.0	26,306	1.2	17,264	1.3	6,251	1.3	626,715	8.6
Total male	872,351	100.0	2,489,862	100.0	2,161,433	100.0	1,324,507	100.0	479,176	100.0	7,327,329	100.0
Female												
Without immunization episodes	522,447	66.4	2,026,409	85.0	2,122,114	97.8	1,278,929	98.5	541,014	99.3	6,490,913	90.4
With immunization episodes	264,729	33.6	356,257	15.0	48,394	2.2	19,351	1.5	3,939	0.7	692,670	9.6
Total females	787,176	100.0	2,382,666	100.0	2,170,508	100.0	1,298,280	100.0	544,954	100.0	7,183,583	100.0

Table 5.4.5 Distribution of immunization episodes and per episode expenditure (mean and median) by source of care and characteristics of household members, P. Malaysia.

Strata	Source of Care for Immunization Episodes											
	Public				Private				Total			
	No. of episodes	%	Mean	Median	No. of episodes	%	Mean	Median	No. of episodes	%	Mean	Median
Urban	576,984	72.1	1.4	-	223,253	27.9	54.1	32.4	800,238	100.0	16.1	-
Rural	649,846	93.0	1.9	-	48,738	7.0	54.5	40.0	698,583	100.0	5.6	-
<i>Age group of HHM</i>												
0-4	562,145	77.2	2.6	-	166,096	22.8	57.5	30.0	728,241	100.0	15.1	-
5-19	595,899	92.6	0.3	-	47,956	7.4	39.1	30.0	643,855	100.0	3.2	-
20-39	39,593	51.3	5.7	-	37,654	48.7	61.2	45.0	77,247	100.0	32.7	2.0
40-59	21,574	57.2	5.0	-	16,175	42.8	39.5	28.0	37,749	100.0	19.8	5.0
60 & above	7,619	65.0	7.3	-	4,109	35.0	89.7	21.0	11,728	100.0	36.2	-
<i>Ethnicity</i>												
Malay	895,871	88.6	1.4	-	114,900	11.4	32.2	18.0	1,010,771	100.0	4.9	-
Chinese	208,611	61.5	2.9	-	130,793	38.5	75.0	50.0	339,404	100.0	30.6	-
Indian	101,098	83.3	1.0	-	20,313	16.7	38.9	30.0	121,411	100.0	7.4	-
Other Malaysian	16,517	83.9	4.0	-	3,174	16.1	41.5	23.0	19,691	100.0	10.1	-
Non-Malaysian	4,732	62.7	3.6	-	2,813	37.3	109.9	75.0	7,545	100.0	43.2	6.0
Total	1,226,830	81.9	1.7	-	271,991	18.1	54.2	35.0	1,498,821	100.0	11.2	-

Table 5.4.6 Distribution of persons with immunization episodes and per person expenditure (mean, median) by characteristics of household members, P. Malaysia .

Characteristics of household member	With immunization episodes		Per person expenditure	
	No. of persons	%	Mean	Median
<i>Strata</i>				
Urban	714,262.50	54.14	18.0	-
Rural	605,123.20	45.86	6.4	-
<i>Age group</i>				
0-4	567,178.00	42.99	19.4	-
5-19	630,702.60	47.80	3.3	-
20-39	74,699.20	5.66	33.8	2.8
40-59	36,615.30	2.78	20.4	5.0
60 & above	10,190.60	0.77	41.6	-
<i>Ethnicity</i>				
Malay	880,764.00	66.76	5.6	-
Chinese	300,375.10	22.77	34.6	-
Indian	113,732.80	8.62	7.9	-
Other Malaysian	18,153.70	1.38	10.9	-
Non-Malaysian	6,360.10	0.48	51.3	14.0
<i>Education level of HHM</i>				
None	597,339.00	45.27	19.0	-
Primary	482,722.10	36.59	4.8	-
Lower secondary	152,665.70	11.57	8.0	-
Upper secondary	73,173.80	5.55	20.9	-
Tertiary	12,618.10	0.96	26.8	10.0
Unknown	867.00	0.07	17.1	-
<i>Employment status/ socio-Economic status</i>				
Non-income recipient	1,236,327.50	93.70	11.5	-
Self-employed	30,108.80	2.28	32.8	5.0
Government/ Statutory	7,582.40	0.57	5.9	-
Non-government/ private	39,142.80	2.97	36.5	3.0
Retired	1,318.90	0.10	8.3	-
Housewife	3,594.10	0.27	25.1	-
Unemployed	1,311.20	0.10	12.5	12.0
<i>Household income quintile group</i>				
1st 20 %	226,144.10	17.14	3.7	-
2nd 20 %	266,927.40	20.23	3.0	-
3rd 20 %	280,448.70	21.26	7.8	-
4th 20 %	277,049.00	21.00	18.2	-
5th 20 %	252,188.70	19.11	29.7	-
Unknown	16,627.80	1.26	23.9	-
Total	1,319,385.70	100.00	12.7	-

MISCELLANEOUS HEALTH NEEDS

6

6.1 Findings

This section reports on the utilisation of services and out-of-pocket expenditure incurred by households for the following health needs which were not major contributors to the total household health expenditure:

- Non-hospitalized minor operation (day care surgery)
- Special treatment like rehabilitation therapy
- Care in special homes (e.g. old folks home, homes for the disabled, etc.)
- Special institutionalized care (e.g. drug rehabilitation centre, etc.)

The overall direct out-of-pocket expenditure for these items were as follow:

	Expenditure	% of Total Household Health Expenditure
Day care surgery	RM 21,471,095	0.9%
Special treatment	RM 7,922,684	0.3%
Care in special homes	RM 3,883,480	0.2%
Institutionalized care	RM 384,400	0.02%

6.1.1 Day care surgery

Day care surgery involves minor operations like cataract operation, circumcision, etc. Only a small percentage of the weighted population (0.8%) reported utilizing health services for day care surgery. Rural folks reported more usage (1%). Similarly, those from Kedah (1.2%), Pahang (1.2%) and Perlis (1.3%) and children below 15 years (1.6%) also have higher than average utilization.

Mean expenditure per person for these minor operations was RM186.80. There was a substantial difference between the mean expenditure of the urban and rural strata (RM272.70 vs. RM112.00). As usual, Pulau Pinang (RM439.50), Selangor (RM340.10) and W.P.K.L. (RM488.71) showed very much higher mean expenditure per person. Although children aged below 15 years reported higher than average usage, the amount of money spent per person is relatively low (RM44.60) in comparison to the adults aged 15-59 (RM451.40) and those aged 60 years and above (RM692.00).

6.1.2 Special Rehabilitation Treatment

Special rehabilitation treatment in this survey includes treatment to improve body movement, speech and breathing, etc. It represented only 0.3% of total household health expenditure. There was not much of a difference in utilization across strata and states but older people above the age of 60 years reported higher usage of 0.8% compared with 0.4% for the whole group.

Mean expenditure per person for special rehabilitation treatment was RM153.00 for each person who had received treatment in the last one year, with higher expenditure reported in urban areas, RM178.80 compared to RM117.30 in the rural areas. Adults between the ages of 15 and 59 also had higher expenditure (RM180.00).

6.1.3 Special home care

Household expenditure on the special home care such as the old folk home, home for the disabled, etc. was also found to be small, involving 0.2% of total household health. About 0.02% of the population reported staying in these special homes. The mean expenditure at these special home care facilities was RM 1691.40 per person per year.

6.1.4 Special institutionalized care

Similarly a very small proportion of the population (0.03%) had institutionalized special care such as drug rehabilitation treatment. The average household expenditure on these special care was RM 88.60 per person per year. It represented a tiny 0.02% of total household out-of-pocket health expenditure.

Summary statistics of these usage were presented in section 6.4. For each of these minor services, their percentage contribution to total household health expenditures was presented first. Then the distributions of the individuals with their respective choice of health facilities and the mean expenditure per person were presented across the strata and the age groups for each of these minor services(Tables 6.4.1 – 6.4.12).

6.2 Discussion

Day care surgery involved mainly minor operations such as cataract operations for adults especially the old aged and circumcision for children below 15 years old. For this reason, the mean expenditure for children below the age of 15 was RM44.60 while mean expenditures for adults aged 15 and 59 was RM451.40 and for elderly aged 60 and above was RM692.00.

Elderly persons aged 60 years and above reported higher usage of special rehabilitation treatment and also higher expenditure. The number of people who reported staying in an old folks home or home for the disabled was very small. The number reported to have been institutionalized for drug rehabilitation treatment was even smaller.

6.3 Conclusion

The reporting of episodes of day care surgery was very small for the population of Peninsular Malaysia. With careful planning and proper patient management, more minor operations can be done as day care surgery without the need for hospitalization. This will not only reduce the burden of cost on the patient but also save hospital beds for more serious cases. Such practice will enable health care providers to use scarce health resources for more productive uses.

6.4 Summary Tables

Table 6.4.1 Minor operation expenditure as a percentage of total household health expenditure by strata, P. Malaysia.

Strata	Minor operation expenditure		Total health expenditure	
	RM	%	RM	%
Urban	14,590,954	0.9	1,659,581,597	100.0
Rural	6,880,142	1.0	702,656,404	100.0
Total	21,471,095	0.9	2,362,238,001	100.0

Table 6.4.2 Distribution of persons with minor operation episodes and per person mean expenditure by strata, P. Malaysia.

Strata	Total household member		Persons with minor operations		Per person mean expenditure
	Number	%	Number	%	RM
Urban	8,071,342	100.0	53,514	0.7	272.70
Rural	6,439,570	100.0	61,460	1.0	112.00
Total	14,510,912	100.0	114,974	0.8	186.80

Table 6.4.3 Distribution of persons with minor operations and per person mean expenditure by age group of household member, P. Malaysia.

Age group of household member	Total household member		Persons with minor operations		Per person mean expenditure
	Number	%	Number	%	RM
0-14	5,067,436	100.0	79,778	1.6	44.60
15-59	8,419,346	100.0	26,761	0.3	451.40
60 & above	1,024,130	100.0	8,435	0.8	692.00
Total	14,510,912	100.0	114,974	0.8	186.80

Table 6.4.4 Special treatment expenditure as a percentage of total household health expenditure by strata, P. Malaysia.

Strata	Special treatment expenditure		Total health expenditure	
	RM	%	RM	%
Urban	5,376,695	0.3	1,659,581,597	100.0
Rural	2,545,989	0.4	702,656,404	100.0
Total	7,922,684	0.3	2,362,238,001	100.0

Table 6.4.5 Distribution of persons with special treatment episodes and per person mean expenditure by strata, P. Malaysia.

Strata	Total household member		Persons with special treatment		Per person mean expenditure RM
	Number	%	Number	%	
Urban	8,071,342	100.0	30,068	0.4	178.80
Rural	6,439,570	100.0	21,705	0.3	117.30
Total	14,510,912	100.0	51,773	0.4	153.00

Table 6.4.6 Distribution of persons with special treatment and per person mean expenditure by age group of household member, P. Malaysia.

Age group of HHM	Total household member		Persons with special treatment		Per person mean expenditure RM
	Number	%	Number	%	
0-14	5,067,436	100.0	10,473	0.2	122.10
15-59	8,419,346	100.0	33,369	0.4	180.00
60 & above	1,024,130	100.0	7,930	0.8	80.60
Total	14,510,912	100.0	51,773	0.4	153.00

Table 6.4.7 Special home care expenditure as a percentage of total household health expenditure by strata, P. Malaysia.

Strata	Special home care expenditure		Total health expenditure	
	RM	%	RM	%
Urban	3,390,540	0.2	1,659,581,597	100.0
Rural	492,940	0.1	702,656,404	100.0
Total	3,883,480	0.2	2,362,238,001	100.0

Table 6.4.8 Distribution of persons with special home care episodes and mean expenditure per person by strata, P. Malaysia.

Strata	Total household member		Persons with special home care		Per person mean expenditure
	Number	%	Number	%	RM
Urban	8,071,342	100.0	1,552	0.02	2,185.10
Rural	6,439,570	100.0	744	0.01	662.20
Total	14,510,912	100.0	2,296	0.02	1,691.30

Table 6.4.9 Distribution of persons with special home care episodes and mean expenditure per person by age group of household member, P. Malaysia.

Age group of HHM	Total household member		Persons with Special home care		Per person mean expenditure
	Number	%	Number	%	RM
0-14	5,067,436	100.0	182	0.00	-
15-59	8,419,346	100.0	1,103	0.01	446.80
60 & above	1,024,130	100.0	1,011	0.10	3,355.00
Total	14,510,912	100.0	2,296	0.02	1,691.30

Table 6.4.10 Expenditure for special care in institution as a percentage of total household health expenditure by strata, P. Malaysia.

Strata	Expenditure for special care in institution		Total health expenditure	
	RM	%	RM	%
Urban	315,627	0.02	1,659,581,597	100.0
Rural	68,773	0.01	702,656,404	100.0
Total	384,400	0.02	2,362,238,001	100.0

Table 6.4.11 Distribution of persons with special care in institution and mean expenditure per person by strata, P. Malaysia.

Strata	Total household member		Person with special care in institution		Per person mean expenditure
	Number	%	Number	%	RM
Urban	8,071,342	100.0	3,485	0.01	90.60
Rural	6,439,570	100.0	854	0.01	80.60
Total	14,510,912	100.0	4,339	0.03	88.60

Table 6.4..12 Distribution of persons with special care in institution and mean expenditure per person by age group of household member, P. Malaysia.

Age group of household member	Total household member		Persons with special care in institution		Per person mean expenditure RM
	Number	%	Number	%	
0-14	5,067,436	100.0	391	0.01	-
15-59	8,419,346	100.0	3,466	0.04	61.01
60 & above	1,024,130	100.0	482	0.05	358.80
Total	14,510,912	100.0	4,339	0.03	88.60

MULTIVARIATE ANALYSIS

7

7.1 Eye Care

The Survey recorded 3888 episodes of eye care. Two kinds of episodes are identified: check-up (1309 episodes, 33.7%) and purchase of eyeglasses or contact lenses (2579 episodes, 66.3%). Most episodes were taken care of in private clinics (2770 episodes, 71.2%). For purposes of statistical modelling, we consider three types of source of care: private, government (653 episodes, 16.8%, including 161 episodes of the School Health programme), and other (shops and pharmacies, 463 episodes, 11.9%). In addition to the covariates considered in the analyses for other health-care sectors, we consider the dichotomous variable indicating whether the episode took place in the district of the client's residence (3065 episodes) or outside (823 episodes, 21.2%). Episodes may be associated with several visits. Although 3497 episodes were dealt with by a single visit and 318 by two visits each, a small number of episodes required many visits; 42 episodes (1.1%) required 10 or more visits each. We consider the logarithm of *Number of episodes* as a covariate. For the subjects (clients), two categories of age are defined: 0–14 years of age (young) and 15 years of age and older (adult). For heads of households, we consider three categories: 15–29, 30–54, and 55+ years of age.

The majority of episodes are not subsidised (2608 episodes, 67.1%). Check-up tends to involve substantially smaller expenditure than purchase of glasses or contact lenses. The mean expenditures (using geometric averaging) for the two kinds of episodes, cross-classified by the *Subsidy status* are given in Table 7.1.1. Most episodes of check-up involve either no or only nominal expenditure, even in private facilities; 839 episodes (64.1%) are associated with no *Treatment expenditure*. Clearly, many private facilities operate a form of cross-subsidy, recovering their costs when a client purchases a pair of glasses or contact lenses. On the other hand, zero expenditure for glasses or contact lenses is very rare; there are only 84 such episodes (3.3%).

Treatment expenditure constitutes 98.9% of *Total expenditure*. Therefore our analysis deals only with *Treatment expenditure*. In the analysis of utilisation, we search for covariates that are associated with the choice of private facilities. Unlike in the dental-care sector, the School Health programme is not comprehensive (it affects only a small fraction of school children). Therefore we do not distinguish its episodes from other episodes of government care.

Glasses and contact lenses are purchased principally in private clinics and shops and pharmacies, so analysis of the utilisation for purchases is not relevant. Check-up of eyesight is provided only in government and private clinics. We carry an analysis to explore the important predictors of the choice between these two sources of care.

Table 7.1.1 Geometric means of expenditure (in RM) and numbers of episodes, cross-classified by *Subsidy status* and *Type of care*

<i>Subsidy status</i>	Subsidised		Unsubsidised	
	Mean expenditure	Number of episodes	Mean expenditure	Number of episodes
Check-up	0.02	672	0.73	637
Purchase of glasses and c. lenses	29.50	608	141.25	1971

Treatment expenditure

Purchase of glasses and contact lenses constitutes most of the expenditure on eye care. Therefore it is essential to allow for consistent differences among the two types of care. Additionally, we analyse expenditure on glasses and contact lenses separately for subsidised and unsubsidised episodes.

Analysis of all episodes

Subsidy status, *Type of care*, and *Household income* are obvious covariates for *Treatment expenditure*. The corresponding model fitted by multilevel analysis is

$$0.227 + 2.560 \times I_T + 0.960 \times I_S + 0.109 \times \log\text{-income}$$

(0.040) (0.048) (0.043)

where I_T and I_S are the respective indicators of purchase (of glasses or contact lenses) and of unsubsidised care ($I_T = 1$ for purchase and $I_T = 0$ for check-up; $I_S = 1$ for unsubsidised care and $I_T = 0$ for subsidised care). The standard errors are given in parentheses underneath the estimates. Thus, purchase of glasses or contact lenses is on average $10^{2.56} = 363$ times as expensive as a check-up (within the same *Subsidy status*), and the expenditure for an unsubsidised episode is on average 9.12 times as expensive as for a subsidised episode (for the same *Type of care*). Although also significant, the differences due to *Household income* are much smaller; ten-fold increase in *Household income* is associated with only 1.29 times greater expenditure.

For more detailed modeling, we consider first *Source of care*, *Number of visits*, *Ethnicity*, *Age group* of the client, *Area* (urban/rural), *Educational level* and *Employment status* of the head of household. Of these covariates, *Source of care*, *Number of visits*, *Ethnicity*, and *Age group* are significant (at 5% level of significance). They reduce the importance of *Household income* and strengthen the impact of *Subsidy status*. Roughly, care in a government facility is associated on average with about ten times greater expenditure than subsidised care in a private facility, but with about ten times lower expenditure than in shops and pharmacies, and with about one hundred times lower expenditure than in unsubsidised private care. Greater number of visits is

associated with greater expenditure; ten-fold (two-fold) increase in the number of visits is associated with 5.02 times (1.62 times) greater expenditure.

Unlike in other health-care sectors, for Eye care, Indians tend to have greater expenditure than the other ethnic groups; 1.67 times greater than Malays and 1.46 times greater than Chinese. The average difference between the age groups is of the same order; an adult's expenditure is on average 1.60 times greater than for a young client, after controlling for *Source of care*, *Type of care*, *Subsidy status*, *Number of visits*, *Household income*, and *Ethnicity*.

Of the remaining covariates only *Location of care* (within or outside the district of residence) and *Sex* of the head of household are significant, and only the former's impact is of any importance. On average, care outside the district of residence is associated with 1.72 times greater expenditure. The expenditure in households headed by women is on average 1.30 times lower (that is, by 23%) than in households headed by men.

The estimated between-district and between-state variances are small. The typical multiplicative factors for districts and states are 1.44 and 1.41, respectively. In comparison, the estimated between-subject (within-district) variance corresponds to the multiplicative factor 9.19. Details are given in Table 7.1.2.

Table 7.1.2 The model fit for *Treatment expenditure* in Eye care; all episodes

Parameter	Category	Estimate	Standard error
Constant		0.004	
Type of care	Check-up	0.000	
	Purchase	2.231	(0.042)
Log-income		0.063	(0.042)
Source of care	Government	0.000	
	Private	-0.839	(0.089)
	Shop/pharmacy	1.173	(0.073)
Subsidy status	Subsidised	0.000	
	Unsubsidised	2.190	(0.080)
Number of visits		0.703	(0.096)
Location of care	Within district	0.000	(0.000)
	Outside district	0.236	(0.041)
Age group	Young (0-14 yrs)	0.000	
	Adult (15+)	0.160	(0.043)
Sex of head of household	Male	0.000	
	Female	-0.115	(0.052)
Variance components			
Episode		0.928	
District		0.025	(0.009)
State		0.022	(0.021)

Unsubsidised purchase of glasses and contact lenses

About half the episodes of eye care involved purchasing glasses or contact lenses in private facilities. The expenditure for most of these episodes was not subsidised. *Treatment*

expenditure for unsubsidised episodes is very homogeneous (i. e., has small variance). The most important factors are *Household income* and age of the client. Glasses (and contact lenses) are cheaper for children than for adults, by about 40%. Possibly, contact lenses are more expensive than glasses, but they are purchased only (or mainly) by adults — this may contribute to the difference. Ten-fold increase in *Household income* is associated with 53% greater expenditure. An episode involving twice as many visits is associated with 26% higher expenditure. The only other statistically significant factor is *Income recipient status*. For given *Household income* and *Number of visits*, income recipients have average expenditure about 15% greater than those receiving no income.

Table 7.1.3 Model fit for unsubsidised episodes of purchase of glasses or contact lenses; unsubsidised episodes

Parameter	Category	Estimate	Standard error
Constant		3.164	
Log-income		0.186	(0.026)
Age group	0-14	0.000	
	15+	0.148	(0.031)
Number of visits (log)		0.101	(0.070)
Income recipient	Yes	0.000	
	No	0.060	(0.022)
Variance components			
Episode		0.175	
District		0.009	(0.003)
State		0.003	(0.002)

Differences among the states and districts are of little consequence; the corresponding typical multiplicative factors are 1.24 and 1.13. Even within a district, the expenditure varies only moderately; the typical multiplicative factor is 2.62. Details of the model fitted are given in Table 7.1.3.

Purchase of glasses and contact lenses; subsidised episodes

There are only 608 subsidised episodes of purchasing glasses and contact lenses, and so detailed modelling of such data is not feasible. In particular, there may be substantively important differences among the levels of some factors, but they cannot be detected by comparing the corresponding estimates with their standard errors.

Expenditure per episode in shops and pharmacies is on average 32.5 times greater than expenditure in government facilities, and 167.1 times greater than expenditure in private facilities (in subsidised cases). The estimated regression slope on the logarithm of *Number of visits* is close to unity (estimate 0.987, standard error 0.306); the average expenditure per visit is about the same for episodes that involve a single visit as those for several visits. (For unsubsidised episodes, the average expenditure per visit tends to be much lower than for single-visit episodes.) *Household income* is not a significant factor, but the estimate of the slope is of the same order of magnitude as in the analysis of all episodes (estimate 0.168, standard error 0.118).

Utilisation — check-up

In this section, we investigate factors related to choosing government and private clinics for check-up. Glasses and contact lenses are purchased principally in private clinics or shops and pharmacies, and so utilisation analysis for them is not relevant. Note that in most episodes check-up involves very small expenditure, so factors other than cost are likely to be the main factors in the selection of the source of care. In the database, there are 1309 records of episodes of check-up; 596 (45.5%) of them were taken care of in government clinics, and the remainder, 713 episodes, in private clinics.

Ethnicity and *Education* of the head of household are the covariates most strongly associated with the choice of private facilities. Chinese and members of households whose heads have tertiary education choose private care with probability about 0.20 greater than, respectively, Malays and members of households whose heads have no or only primary education. Note that the prediction is approximately additive; that is, the probability for a client who is Chinese *and* whose head of household has tertiary education is almost 40%. The preference for private care among Indians is only slightly greater than among Malays. The estimate for the 'Other' ethnic groups is extremely high (1.520);

Table 7.1.4a Multilevel logistic regression of the choice of private facilities for check-up of eyesight.

Parameter	Category	Estimate	Standard error
Constant		-0.553	
Ethnicity	Malay	0.000	
	Chinese	0.811	(0.160)
	Indian	0.147	(0.275)
	Other	1.520	(0.752)
Area	Urban	0.000	
	Rural	-0.248	(0.149)
Education of head of household	No/primary	0.000	
	Lower secondary	0.097	(0.165)
	Upper secondary	0.620	(0.178)
	Tertiary	1.002	(0.299)
Age group (client)	0-14	0.000	
	15+	0.701	(0.167)
Sex	Male	0.000	
	Female	0.161	(0.127)
Others paid	No	0.000	
	Yes	1.983	(0.486)

Table 7.1.4b Estimates of state-level deviations (on the logit scale) from the prediction based on Table 7.1.4a

Johor 0.16	Kedah 0.01	Kelantan 0.08	Melaka -0.02
N. Sembilan -0.01	Pahang -0.20	P. Pinang -0.01	Perak 0.06
Perlis -0.03	Selangor 0.08	Terengganu 0.03	W. P. K. L. -0.03

however, it is subject to substantial uncertainty (standard error 0.752). Infact, the data contain only 15 records of check-up for 'Other' ethnic groups (13 of them in private facilities). Note also that Chinese are greatly over-represented in the data; there are 466 records of check-ups for Chinese (34/1%) and 766 of check-ups for Malays (58.5%). In th general population, Malays are in much greter majority.

The level preference for private care in households whose heads have upper secondary education is approximately halfway between those with tertiary education on the one hand, and those with no, primary or lower secondary education on the other hand. The *Employment status* of the head of household is associated with the choice of private care much more weakly than *Educational level*. The order of the estimates for preference of private care is: Private, Government, Self-employed, and Unemployed. The adjusted difference between Private and Unemployed is about 0.10.

Adults select private care more often, with probability greater by about 0.15, than private care is selected for children. This is partly due to the School Health programme. Women have slightly greater estimated preference for private care, by about 0.04, but the estimate of the difference among men and women is not significant. Private care is selected more often in urban than rural areas, with probability greater by 0.05.

Household income and *Location of care* (within or outside the district of residence), *Income recipient status*, *Household type* and *Household size* are not important as predictors of choice between private and government facilities..

Even after adjusting for several covariates, there are substantial differences among the districts and, to a lesser extent, among the states. The respective relative variances are 0.222 and 0.031. Johor stands out as the state with the highest adjusted preference for private care (by 0.04 on the probability scale), and Pahang as the state with the lowest adjusted preference (by almost 0.05).

Conclusions

Check-up of eyesight is in most instances associated with very small expenditure, even in private facilities. On the other hand, the expenses for glasses and contact lenses are non-trivial in most cases, even in government facilities. The mean levels of expenditure for eye care in unsubsidised episodes, shops and pharmacies, government facilities, and in subsidised episodes of private care are roughly in relation 1000:100:10:1.

For unsubsidised episodes, *Household income* is a good predictor of *Treatment expenditure*, but for other episodes it is not. Episodes that involve more visits are associated with higher expenditure. Eye care tends to be more expensive for adults and men than for children and women. Expenditure for glasses or contact lenses in unsubsidised episodes varies little across the country.

Private facilities for the check-up of eyesight are selected more often by Chinese than by Indians or Malays, by adults (as opposed to being selected for children), and in households whose heads have tertiary education. Even after adjusting for these factors, as well as for *Sex*,

Area (urban or rural), and *Employment status* of the head of household, there are substantial differences in the utilisation of private care among the districts and states.

7.2 Long-standing illness

The Survey database contains 3385 records of episodes of long-standing illness. Most episodes were treated in government facilities (1937 episodes, 57.2%) and private facilities (1405 episodes, 41.5%); the remaining 43 episodes (1.3%) were treated in facilities providing traditional care. For statistical modelling, we use the same covariates as for Eye care, except for *Type of care* which is not defined for the episodes of long-standing illness.

On average, *Treatment expenditure* constitutes 81.1% of *Total expenditure*; *Treatment expenditure* coincides with *Total expenditure* for 2449 episodes (72.3%). As for all other health-care sectors, *Treatment expenditure* for subsidised care (2271 episodes, 67.1%) tends to be much lower than for unsubsidised care (1114 episodes). The respective (geometric) means of *Treatment expenditure* are RM0.10 and RM74.29. We analyse *Treatment expenditure* for all episodes (taking account of *Subsidy status*), and separately for subsidised episodes. In the analysis of utilisation we exclude the episodes of traditional care and investigate predictors for the choice between government and private facilities.

Treatment expenditure

The most important factors associated with *Treatment expenditure* are *Source of care*, *Subsidy status*, and *Household income*. For a given *Household income*, an episode of unsubsidised care is associated with expenditure about 3800 times as high as an episode of subsidised care in a private facility. (The latter is free for many patients.) Even care in government facilities is more expensive, on average about 5.8 times for a given *Household income*. Care in traditional facilities is associated with 95.7 times greater expenditure on average than in government facilities.

In addition to these factors, several other covariates are strongly associated with *Treatment expenditure*. The pattern of association has some commonalities with Eye care and other health-care sectors. For instance, conditional on other factors, Chinese tend to have greater expenditure than Indians who in turn have greater expenditure than Malays. The ratio of the respective (adjusted) mean expenditures is 3.73:2.41:1. Adjusting for more covariates results in a reduced impact of *Household expenditure*, but the impact remains substantial and statistically significant; the estimated slope on log-income is equal to 0.265 (standard error 0.063). This corresponds to 1.84-fold increase for ten-fold increase in *Household income*.

Episodes involving more visits are associated with greater expenditure; ten-fold (two-fold) increase in *Number of visits* corresponds to 3.55 (1.46) times greater expenditure. Treatment outside the district of residence is associated with expenditure 2.02 times as high as treatment within the district.

For the *Employment status* of the head of household, patients can be classified into two aggregate categories: self-employed and employees of private companies on the one hand, and government employees and unemployed on the other hand. The former are associated with about 1.75 times greater expenditure than the latter. The pattern of differences among the categories of *Educational level* of the head of household contradicts the findings for other

health-care sectors. The expenditure of clients whose heads of household have tertiary education is on average almost twice as low as that of clients whose heads have no greater than lower secondary education. The average expenditure in households whose heads have upper secondary education is about half-way — 1.46 times lower than for households whose heads have a lower level of education.

The differences among the states and districts are of little consequence; the typical multiplicative factors for the states and districts are 1.195 and 1.47, respectively. The estimated between-episode variance, 1.677, corresponds to the typical multiplicative factor of 19.72. Details of the multilevel regression model fit are given in Table 7.2.1.

Table 7.2.1 Multilevel regression model fit for *Treatment expenditure of episodes of Long-standing illness.*

Parameter	Category	Estimate	Standard error
Constant		-0.345	
Log-income		0.265	(0.063)
Source of care	Government	0.000	
	Private	-0.767	(0.089)
	Traditional	1.983	(0.204)
Subsidy status	Subsidy	0.000	
	No subsidy	3.460	(0.092)
Number of visits (log)		0.550	(0.053)
Location of care	Within district	0.000	
	Outside district	0.306	(0.062)
Sex	Male	0.000	
	Female	-0.121	(0.052)
Ethnicity	Malay	0.000	
	Chinese	0.528	(0.063)
	Indian	0.382	(0.082)
	Other	0.163	(0.183)
Education of head of household	No/Primary	0.000	
	Lower secondary	-0.007	(0.066)
	Upper secondary	-0.165	(0.068)
	Tertiary	-0.292	(0.116)
Employment of head of household	Self-employed	0.000	
	Government	-0.286	(0.080)
	Private	-0.042	(0.064)
	Unemployed	-0.247	(0.063)
Variance components			
Episode		1.677	
District		0.028	(0.013)
State		0.006	(0.008)

Unsubsidised episodes

Treatment expenditure for unsubsidised episodes displays a great deal of homogeneity. Even without adjusting for any covariates, the estimated between-episode variance is only 0.688 (typical multiplicative factor 6.75), and the between-district and between-state variances are

0.045 and 0.008, respectively, much smaller than their counterparts in the analysis of all episodes. For unsubsidised episodes, *Location of care*, *Ethnicity*, and *Employment status* of the head of household are also important covariates, although the estimated regression parameters are very different from those in the analysis of all episodes. Unlike in the analysis of all episodes, the adjusted difference between urban and rural areas is significant for unsubsidised care. Episodes in urban areas involve on average 1.42 times higher expenditure than in rural areas. Episodes requiring more visits to health-care facilities are associated with higher expenditure, but the differences are much smaller than in the analysis of all episodes; ten-fold (two-fold) increase in the number of visits is associated with 1.76 times (1.185 times) greater expenditure; the corresponding figures for all episodes are 3.55 (1.46).

The differences in mean (adjusted) expenditure among the ethnic groups are also much smaller than in the analysis of all episodes. On average, *Treatment expenditure* of Chinese is 1.66 times as high and that of Indians 1.17 times as high as that of Malays. The pattern of differences among the four levels of *Employment status* of head of household is different from that for all episodes. The differences among the four categories are much smaller; the lowest mean expenditure is for episodes in households whose heads are employed in private companies and highest in households whose heads are self-employed or unemployed. But the ratio of mean expenditures between these categories is only about 1.5.

Adjustment for these covariates reduces all three variance components; the estimated district- and state-level variances are 0.013 and 0.000, respectively. The estimated episode-level variance, 0.524, corresponds to the typical multiplicative factor 5.30, also much smaller than its counterpart in the analysis of all episodes. The multilevel regression model fit are summarised in Table 7.2.2.

Table 7.2.2 Multilevel regression fit for *Treatment expenditure* of unsubsidised episodes of Long-standing illness.

Parameter	Category	Estimate	Standard error
Constant		3.346	
Number of visits (log)		0.769	(0.044)
Location of care	Within district	0.000	
	Outside district	0.245	(0.059)
Area	Urban	0.000	
	Rural	-0.151	(0.052)
Ethnicity	Malay	0.000	
	Chinese	0.219	(0.052)
	Indian	0.067	(0.084)
	Other	0.043	(0.219)
Employment of head of household	Self-employed	0.000	
	Government	-0.081	(0.077)
	Private	-0.155	(0.057)
	Unemployed	0.018	(0.058)

Utilisation

Since there are only a few episodes of care in traditional facilities (43 episodes, 1.3%), and the patients involved can be regarded as a constituency different from those using government or private facilities, we exclude the episodes of care in traditional facilities from the analysis of utilisation. Thus, this analysis explores the factors associated with the choice of care in private facilities, given government and private care as the options considered.

The results of the multilevel logistic regression have several commonalities with the analyses of utilisation of private facilities in other health-care sectors. In particular, private care is preferred more by Chinese, and in households whose heads have tertiary education and are either self-employed or employed in private companies. Household income is positively associated with utilisation of private facilities, but the differences, after adjusting for other covariates, are much smaller than due to other factors. We included *Number of visits* among the covariates, assuming that its value can be anticipated when the choice of the health-care facility is made. *Number of visits* is negatively associated with selecting care in private facilities; an episode involving ten times (twice) as many visits is associated with about 0.11 (0.03) smaller probability of selecting private care. Three distinct interpretations of this result appear reasonable. First, in making their decisions, (prospective) patients may take the anticipated number of visits into consideration. Next, among those loyal to government health-care facilities, there may be more severe or more complicated cases. Finally, the estimated difference may be due to different practices in government and private facilities.

After adjusting for all relevant covariates, the probability that a Chinese client selects a private facility for care is greater than for a Malay client by about 0.17. The fitted probability for Indians is even lower, although the difference between Malays and Indians is not significant. In households whose heads have tertiary education, the probability of choosing care in private facilities is greater than for households whose heads have only secondary or lower education by 0.11–0.14. Households whose heads are employed by the Government are most averse to using private-care facilities; their probability of selecting a private facility is about 0.11 lower than for households headed by self-employed or those employed in private companies. Households headed by unemployed are about half-way between these two extremes (their probabilities are about 0.05 greater than for government employees' households and about 0.05 smaller than for households headed by self-employed). Without adjusting for the covariates listed above, *Household income* is an important predictor of using private care. However, after adjustment, although still significant, it is much less important. Ten-fold increase in *Household income* is associated

Table 7.2.3 Multilevel logistic regression analysis of utilisation (private vs. government facilities); long-standing illness.

Parameter	Category	Estimate	Standard error
Constant		-0.545	
Log-income		0.059	(0.025)
Number of visits (log)		-0.496	(0.082)
Area	Urban	0.000	
	Rural	-0.128	(0.090)
Ethnicity	Malay	0.000	
	Chinese	0.790	(0.097)
	Indian	-0.201	(0.136)
	Other	-0.486	(0.325)
Educational level of head of household	No/primary	0.000	
	Lower secondary	0.152	(0.107)
	Upper secondary	0.143	(0.108)
	Tertiary	0.657	(0.176)
Employment of head of household	Self-employed	0.000	
	Government	-0.516	(0.133)
	Private	-0.005	(0.102)
	Unemployed	-0.265	(0.109)

with only 0.01 greater probability of seeking care in a private facility. In contrast, when the expenditure is covered by another party, the probability of the episode being treated in a private facility is greater than in a government facility by about 0.40.

After adjusting for all the relevant covariates, the differences among the districts and states are very small. The relative variances are 0.036 (between-states) and 0.026 (between-districts). Among the states, P. Pinang and Perlis stand out as having the highest and lowest adjusted probabilities (0.05 greater and 0.05 lower, respectively, than the average state). Details of the model fit using multilevel logistic regression are given in Table 7.2.3.

Conclusions

Episodes of long-standing illness are dealt with primarily in government and private hospitals and clinics. Private facilities are preferred more by Chinese, households whose heads have tertiary education, residents of urban areas and those with higher *Household income*

Treatment expenditure for episodes on unsubsidised care is on average several thousand times greater than for subsidised care in government or private facilities. Within categories of *Subsidy status* and *Source of care*, the mean expenditure is highest for Chinese, followed by Indians and Malays. Episodes requiring more visits tend to involve higher expenditure. Higher *Household income* is associated with higher expenditure. Expenditure for episodes dealt with outside the district of residence is on average about twice as high as for episodes within the district. The expenditure tends to be lower in households whose heads are either unemployed or employed by the Government. For a given profile of factors, the differences among the districts and states are negligible.

Expenditure for episodes of unsubsidised care is more homogeneous (on the logarithm scale) than for most other health-care sectors. The factor most strongly associated with expenditure is *Number of visits*. The adjusted differences among the levels of the other factors are in general reduced in relation to subsidised episodes. One exception is *Area*; expenditure on episodes of unsubsidised care tends to be higher in urban areas.

ANNEX G

NATIONAL HOUSEHOLD HEALTH EXPENDITURE SURVEY 1996 (NHHES'96)

PENINSULAR MALAYSIA

TECHNICAL REPORT

**Multilevel Analysis
of
Expenditure and Utilisation**

**NHHES'96 TEAM
DEPARTMENT OF SOCIAL AND PREVENTIVE MEDICINE
FACULTY OF MEDICINE, UNIVERSITY OF MALAYA**

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Multilevel analysis of expenditure and utilisation in NHES'96

This is the Report of multilevel analyses of expenditure and utilisation in NHES'96. The analyses are carried out for the following health-care sectors: Maternity, Dental care, Hospitalisation, Acute conditions, and Health supplements. For each sector, the analysis searches for predictors of *Treatment expenditure*, and, with the exception of Health supplements, for predictors of utilisation (choice) of private and government facilities.

All inferences refer to Peninsular Malaysia. In the analyses, the sampling design is accounted for by using the sampling weights, by including as an explanatory variable the indicator of urbanity (*Urban/Rural*), used as a stratifying variable, and by modelling persons, households, enumeration blocks, districts, and states as levels of a nesting hierarchy.

Variables used in multilevel analysis

Table 1 lists the variables used in multilevel analyses of the separate health-care sectors. The variables are grouped in the following categories:

- person attributes
- household attributes
- treatment information
- outcomes.

For clarity, names of the variables are capitalised and printed in italics. The principal outcome variable is *expenditure*, defined for each health-care episode. The episodes are the elementary units in the analysis. The episodes of a person form a cluster of units. The clustering of persons within households within enumeration blocks (EB) within districts within states is defined by *Person identification*. These units are associated with levels of nesting: episodes are at the elementary level, persons at level 2, households at level 3, and so on.

Although there are some differences from one sector to another, the analyses for the different health-care sectors share a common core of background variables. For instance, *Length of stay* is applicable for the Maternity and Hospitalisation, but not for Dental care. The age groups are specific to each sector.

The next section describes the general approach to multilevel analysis.

Multilevel analysis

Multilevel analysis shares several features with the ordinary regression. We specify the response (outcome) variable, such as *Total expenditure*, defined for episodes, explanatory variables (person and household attributes, type and circumstances of the treatment, and the like), the nesting structure (episodes within subjects within ... within states), and the

sampling weights. The explanatory variables can be defined at any level of nesting; for instance, *Type of treatment* in Dental health is defined for episodes, and a household attribute is defined for households. Most explanatory variables are categorical; they can attain only a small number of distinct values (such as values 1–4 for *Type of treatment*). In the regression or multilevel analysis, the differences of the means of the outcome variable among the categories of such a variable are estimated. These differences are *after adjustment* for the other explanatory variables used in the model.

Length of stay (number of days) and *Household income* (for the past year, in RM) are continuous explanatory variables. In our analyses, we estimate the average difference in the outcome variable between two sets of observations that differ on the explanatory variable by one unit. This difference is adjusted for all the other explanatory variables included in the model.

In ordinary regression, the observations (episodes) are assumed to be statistically independent; multilevel analysis takes account of the dependence (similarity, or correlation) of the outcomes within the aggregate units. That is, episodes of a person, and of the members of a household, have some features in common and their outcomes (*Expenditure* or *Length of stay*) are more similar than for all the episodes. By the same token, episodes within a district or state also have a common component. The adjusted means for each state vary, and this variation is described by a variance, called the *state-level variance*. Each level of nesting (episode, person, household, EB, district, and state) is associated with a variance. As a simplification, necessary when the data are not sufficient, some levels of nesting have to be ignored (omitted from the model). For instance, if most persons had at most one episode (as is the case in most analyses), we cannot distinguish between episode- and person-level variances, and so we declare only one of these levels in the model.

Modelling for a typical data set proceeds as follows: first we declare the outcome variable and the levels of nesting; next we declare the explanatory variables. Then we fit the model with no explanatory variables. The fit (the result) for this model comprises the national (population) mean and the variances associated with the declared levels of nesting. Each estimated quantity (estimate) is associated with a standard error, describing the uncertainty about the estimated parameter. The standard errors are quoted only when they are of substantive interest. In some cases, the estimates for each state (district) may also be of interest. In the next step, we may add to the model one, a few, or even most of the candidate explanatory variables, and proceed by including or excluding variables depending on their contribution to the model fit. The contribution is judged by the absolute size of the estimate and by its size relative to the standard error. As a convention, we keep at least one variable from each of the categories A–D listed in Table 1.

Two response variables are considered: *expenditure* associated with an episode and the choice between government and private facilities for the treatment (*utilisation*). The expenditure has three components: treatment, travel, and other expenses. Our analyses focus on *Treatment expenditure* which is in most cases the dominant part of the *Total expenditure*. For expenditure we apply the logarithm transformation in order to promote the statistical modelling assumptions (related to the normal distribution and variance homogeneity), but also to enable easy references in terms of percentages or multiples to mean differences among the various factors. The logarithm of *Household income* is referred to as *log-income*. With *log-income*, a unit increment corresponds to ten-fold increase of *Household income*. Therefore, the estimates associated with *log-income* as an explanatory variable refer to the change corresponding to ten-fold greater.

Household income. Since expenditure is transformed, the estimates have to be transformed back to the original scale. For instance, in an analysis of expenditure, the estimate of the slope on log-income equal to 0.5 corresponds to $10^{0.5} = 3.16$ times greater expenditure associated with ten-fold increase in *Household income*. We give the intermediate steps in the derivations in the analysis of expenditure for the Maternity sector in the next section. Thereafter we omit them so as to focus on the substantive findings. As a consequence of using the logarithm transformation, all references to means on the scale of RM (or sens) are to *geometric* means.

Table 1. Variables used for analysis of health-care sectors in NHES'96.

A. PERSON	
1. Person identification	16 digits
2. Age	years
3. Age group	1-K
4. Ethnicity	1-4
5. Sex	1-2
6. Educational level (HHm)	1-5
7. Employment (HHm)	1-3
8. Relation to head of HH	1-4
B. HOUSEHOLD	
9. Household type	1-3
10. Household size	1-4
11. Employment status of hHH	1-4
12. Educational level of hHH	1-4
13. Household income (\log_{10})	$\log(1+RM/year)$
14. Area (urban/rural)	1-2
C. TREATMENT	
15. Episode No.	1-
16. Subsidised/unsubsidised	0/1
17. Institution type	1-3
18. Type of care	1-4
19. Length of stay	days
OUTCOME	
20. Treatment expenditure (\log_{10})	$\log(sen+1)$
21. Total expenditure (\log_{10})	$\log(sen+1)$
22. Others who paid	0/1

Notes: HH stands for 'household', HHm for 'member of household' (person), and hHH for head of household. Unity (1 sen or RM1) is added to the arguments in variables 13, 20, and 21, so as to avoid expressions of the form $\log(0)$. Otherwise, the impact of adding unity is negligible.

In the analysis of utilisation, which is based on dichotomous outcomes (0/1), we apply generalised linear models with *logit* link. In these analyses, the probability of selecting health care in a private facility, given need for treatment and commitment to either private or government health care, is estimated. This probability may depend on one or several factors (explanatory variables). The importance of using the logit link is that instead of the probability scale (0, 1) a scale which covers the entire real axis is used. Using linear models on this scale is much more natural. For instance, an increase in the logit by 0.2 corresponds to

an increase of about 0.05 in probability within the range 0.2–0.8, but to a smaller increase for probabilities closer to 0.0 or 1.0 (say, from 0.98 an increase of 0.05 is impossible).

The analyses were performed using the software packages MLn and VARCL, both distributed by ProGamma iec, Groningen, the Netherlands.

Subsidised and unsubsidised cases

Obviously, expenditure for an episode with a given set of circumstances (factors) is much lower in government health-care facilities than in private ones. In addition, private health care may be paid for (in full or in part) by the patient's or his/her head of household's employer, by an insurance scheme, or by other parties. For simplicity we therefore define *unsubsidised* care as one received in a private facility, for which the patient paid in its entirety. All other cases are regarded as *subsidised* (provided in government facilities, at home, or in private facilities, but with financial assistance of another party). Traditional care is also regarded as subsidised. In the data, there are 172 unsubsidised and 845 subsidised maternity episodes. The latter comprise 728 maternity episodes with care in government facilities, 24 subsidised maternity episodes in private facilities, and 93 (subsidised) maternity cases that relied on other sources of care.

An alternative is to focus on episodes that incurred *any* (non-zero) payment. There were 720 such episodes (91 percent) among the maternity episodes. However, the results of such an analysis would be governed by the differences between nominal and commercially realistic expenses.

Maternity Care

The explanatory variables used for analysing data for the *Maternity* sector differ from those listed in Table 1 as follows:

1. Expenditure for *Delivery* and *Maternity* are analysed separately. *Maternity* expenditure contains *Delivery* expenditure and expenditure for antenatal and postnatal check-ups and for any complications (prenatal or postnatal, requiring some or no hospitalisation).
2. All subjects are women, aged 15–49. The age categories used are 15–19, 20–29, and 30+.
3. Variable *Type of care* is not applicable.

Delivery expenditure

The model with no explanatory variables yields the estimate of the national mean for delivery expenditure, on the logarithm scale of 2.626, with standard error 0.181. Converted to the original (linear) scale this represents an average expenditure of RM4.23, with a confidence interval (1.84, 9.73). Note that the estimate (RM4.23) is not in the centre of this interval.

The estimates of the variance components which describe the variation at the various levels of the nesting hierarchy, are

Level	Estimate	Standard error
Person (Household)	3.228	(0.148)
District	0.157	(0.159)
State	0.110	(0.111)

The estimates are variances and they refer to the logarithm scale. For interpretation, it may be more suitable to consider the standard deviations, that is, their square roots. Thus, the state-level standard deviation is $\sqrt{0.110} = 0.332$; its power, $10^{0.332} = 2.15$, represents the deviation of a typical state from the national average. This deviation is on a multiplicative scale, that is, the mean expenditure in a typical state is 2.15 times greater or smaller than the national average. The means for the districts within a state also vary; this is captured by the district-level variance component. Its value converts to 2.49-multiple (greater or smaller) of the state-level mean. However, by far the greatest variation is within districts, that is, from one maternity episode to another: a typical subject pays 62.6 times more, or less, than the district-level average. The three components of variation, person, district, and state, can be combined as follows: the total variance is equal to 3.495, which corresponds to 74.85; a typical expenditure on delivery is 75 times greater or smaller than the national average. We refer to this figure as the *typical multiplicative factor*.

These summaries are greatly affected by the high proportion of episodes which involve no expenditure. The corresponding description for the subset of episodes with some expenditure (however small) is described in the following table.

Parameter	Estimate	Standard error	Conversion to RM
Mean	3.79	0.13	61.7
Variance components			
Household	3.24	0.15	×÷63.1
District	0.14	0.08	×÷2.4
State	1.44	0.62	×÷15.8

The estimated mean is 3.79, which corresponds to $10^{3.79}/100 = \text{RM}61.70$. A typical within-state mean expenditure is 15.8 times greater or smaller than this national mean; the typical multiplicative factor at state-level is 15.8. At district level, the typical multiplicative factor is 2.4. But the typical multiplicative factor at household-level is 63.1. The expenditure on delivery varies a great deal from household to household, even among the households whose delivery care is not free.

Explanatory variables

The obvious causes of the vast differences in the expenditure are the economic circumstances of the households, desirability of high standard of care, and the prenatal and postnatal circumstances. These factors are observed indirectly through the standard socio-demographic variables and variables describing the maternity episode. For instance, *Household income* is an obvious explanatory variable. The multilevel analysis with a linear regression on the log-income yields the formula

$$0.078 + 0.627 \times \log\text{-income}$$

for all maternity cases, and

$$0.845 + 0.709 \times \log\text{-income}$$

for maternity episodes that were not free of charge. This can be interpreted as follows. The geometric mean expenditure on delivery for a household whose *Household income* is RM10,000 and who do not qualify for free delivery care, or choose options that result in delivery care not free of charge, is $10^{0.845+4 \times 0.709}/100 = \text{RM}48.00$ on average. The estimate of the coefficient for log-income (the regression slope on log-income) can be interpreted as follows. A ten-fold (1.26-fold) increase of the household income (increase of log-income by 1.0 or 0.1 unit, respectively) is associated with an increase of the log-expenditure by 0.709 (0.071), that is, $10^{0.709} = 5.1$ times (1.18 times). This is, of course, contingent on the same choice being made by the household.

The average over all households with a maternity episode (including those with free delivery care) is $10^{0.078+0.627 \times 4}/100 = \text{RM}3.90$, 12.3 times less. Note however, that the expenditures vary around these figures by multiples of up to a few hundred. The comparison of the two estimated (geometric) means is not meaningful because even among households with the same *Household income* those who have no expenditure on delivery may tend to have different socio-demographic profiles.

The impact of the other factors can be assessed by including them in the regression model. The model fit with log-income and *Ethnicity* (for all maternity episodes) is given in the following table.

Parameter	Estimate	Standard error	Conversion to RM
Constant	2.15		1.40
Log-income	0.31	(0.13)	×2.04
Ethnicity			
Malay	0.00		×1.00
Chinese	0.99	(0.14)	×9.66
Indian	0.14	(0.17)	×1.38
Others	-0.51	(0.36)	×0.31
Variance components			
Person	1.93	(0.09)	×÷24.5
District	0.10	(0.05)	×÷2.1
State	0.02	(0.03)	×÷1.4

The right-most column converts the estimates to the linear scale; for the variance components, it gives the typical multiplicative factors. The fitted log-expenditure for a household with a maternity episode is computed by the formula

$$1.40 \times 2.04^{\text{log-income}} \times Ethn$$

where *Ethn* stands for the coefficient corresponding to the *Ethnicity* (1.00 for Malay, 9.66 for Chinese, and so on). Thus, even when matched on *Household income*, Chinese pay on average almost ten times as much as Malays. This disparity may be partly due to other background variables. In particular, we should adjust for (condition on) whether the payment is subsidised or not. This is related to the choice among the alternative sources of care, because the choice is an important determinant of the expenditure. Together with other explanatory variables, a radically different picture emerges. The regression coefficient on the indicator of subsidy is equal to 1.56 (standard error 0.13), corresponding to 36.3 times higher expenditure for unsubsidised care. After adjusting for this factor, urban-rural differences, association with *Household income*, differences among the categories of *Educational level*, and between those patients who do or do not receive any income, is unimportant, and the differences among the *Ethnic* groups are also greatly reduced.

Given a combination of the background variables, the mean *Delivery expenditure* for Chinese is only 1.8 times greater than for Malays, and the mean expenditures for Malays and Indians differ very little. The only outstanding differences among the background variables are due to age. *Delivery expenditure* of women in their 20's is 4.3 times greater, and of women aged 30 or older 5.0 times greater than for teenage mothers. Any variable that indicates whether the pregnancy involved any complications (counts of episodes or indicators of complications or of hospitalisation) is also unimportant. This may be an artefact due to differential proneness to complications by those who choose the alternative sources of care. (There are fewer complications and fewer lengthy hospitalisations among private patients.)

The uneven distribution of the choice between subsidised and unsubsidised care appears to be the main source of the between-state and between-district variation. After adjustment, the estimated state-level variance is 0.0 and the district-level variance is 0.034, corresponding to the typical multiplicative factor 1.53. The estimated household-level variance is 1.60 (typical multiplicative factor 18.4).

Maternity expenditure contains *Delivery expenditure* as its major component for most maternity episodes. The additional expenditure is for ante- and post-natal check-ups and for complications. The analysis of *Maternity expenditure* leads to conclusions very similar to those for *Delivery expenditure*.

Subsidised and unsubsidised cases

An alternative approach is to carry out separate analyses for the subsidised and unsubsidised cases. The rationale for this is that the two categories involve very different amounts of expenditure. The mean log-expenditure for subsidised cases is 2.33 (*Delivery*) and 3.37 (*Maternity*). This corresponds to RM2.10 and RM23.40, respectively. These estimates are incomplete without quoting the substantial variation: a typical household would incur 80 times greater or smaller (effectively zero) *Delivery expenditure* and 29 times greater or smaller *Maternity expenditure*. Since most subsidised cases involve only nominal expenditure there are unlikely to be any important determinants of expenditure. There is a weak indication that higher *Educational level* (of the mother) is associated with lower expenditure; higher secondary education is associated with about 1.60 times lower expenditure than for no or only primary education). When some hospitalisation was necessary either before or after delivery, expenditure is 2.05 times greater on average. Expenditure for Chinese is on average 1.85 times greater than for Malays. However, in view of the small mean expenditure and large variation, these systematic differences are of little consequence.

The mean expenditure for the unsubsidised maternity episodes is RM824.10 (*Delivery*) and RM1213.40 (*Maternity*), and the expenditures vary a great deal both among households within districts and among the states. There are only 172 unsubsidised episodes in the Survey, and so complex modelling of such data is not warranted. In particular, it is not possible to establish whether complications and lengthy stay in the hospital are associated with higher expenditure, as would be expected. However, if more such cases occur in hospitals which have generally lower charges for their services, such an association could not be detected even in larger studies.

Utilisation – the choice of service

Having conditioned on the form of payment (subsidised/unsubsidised) most of the observed differences among the background factors are greatly reduced. Thus, a reasonable hypothesis is that the observed differences in the expenditure are largely due to the choices made by the patients (households).

In our analysis we apply models for the probability (p) of using a private facility. To avoid any ambiguity, the source of care (government or private) is defined in our analysis by the hospital where the delivery took place (other episodes associated with the pregnancy may have used other sources of care). The analysis is based on the 924 maternity episodes that were cared for in government or private hospitals. To enable the use of standard linear models, instead of the probability its *logit* transformation is modelled. Thus, all results refer to logits, defined as the natural logarithm of the odds ratio ($p/(1-p)$), that is, $\log(p) - \log(1-p)$. Zero logit corresponds to probability 0.5. Within the range of probabilities 0.2–0.8, a given increase on logit scale (say, 0.20) corresponds to slightly less than one quarter increase in the probability (say, almost 0.05).

If *Household income* and *Ethnicity* are the only explanatory variables, the obvious conclusion is arrived at: the higher the income the greater the preference for private care and, for a given income, Chinese use private care more than other ethnic groups. The fitted model is

$$\text{logit}(p) = -10.60 + 2.04 \times \log\text{-income} + 0.00/1.85/0.12/0.17$$

where the four right-most figures give the adjustment for the four ethnic groups. For instance, *Household income* of RM10,000 (that is, log-income 4.0) is associated with logit -2.44 for Malays, -0.59 for Chinese, -2.32 for Indians, and -2.27 for others. These figures convert to the respective estimated rates of using private care 8.0%, 35.6%, 8.9%, and 9.4%. The differences among Malays, Indians, and others are not significant, but Chinese stand out (the standard error for their estimate of 1.96 is 0.22). The association with *Household income* is also very strong. Among those with *Household income* of RM1000, only Chinese use private care to any appreciable extent; the fitted rates of using private care are 6.7% for Chinese, but less than 1.3% for the other ethnic groups.

Adjustment for other explanatory variables greatly reduces the impact of *Household income* as a predictor, but the differences among the ethnic groups prevail. Higher educational level is associated with greater preference for private care (the adjusted difference of logits for tertiary and no/primary education is 1.78). Rural areas are associated with lower adjusted rate of private care (by 0.80 logits). When another party contributes to the expenses, private care is used more frequently (by 0.84 logits, or by around 20%). *Household size* is negatively associated with the choice of private care (households with eight or more members have logit 0.69 lower than households with up to four members). The latter can be interpreted that households prefer, above and beyond the prediction based on other explanatory variables, higher quality care either for the earlier pregnancies or when they plan to have fewer children. However, the adjusted differences among the age categories are very small and not significant. Also, *Household type* (nuclear or extended) is not an important factor. Other factors, *Employment status* of the head of household in particular, are unimportant.

The adjusted rates of using private health care for delivery vary a great deal both without and with the adjustment for explanatory variables. Household-level variation is governed by the dichotomous nature of the outcomes. The equivalents of the variance components for districts and states are the *relative* variances. The estimated relative variances are 0.138 for districts and 0.194 for states. Among the states, Kelantan stands out as having the lowest adjusted rates (the national prediction has to be adjusted by around -0.6) and P. Pinang as having the highest adjusted rates (prediction has to be adjusted by around $+0.6$). The ordering of the states reflects the level of industrial development, but this may well be due to the differential availability of private health-care facilities in the states. Tables 2a and 2b give a complete listing of the results.

Table 2a. The model fit for the analysis of utilisation in maternity care.

Variable	Category	Estimate	Standard error
Constant		-8.30	
Educational level	No/Primary	0.00	
	Lower secondary	0.64	(0.32)
	Upper secondary	0.79	(0.33)
	Tertiary	1.68	(0.43)
Urban/rural	Urban	0.00	
	Rural	-0.80	(0.23)
Ethnicity	Malay	0.00	
	Chinese	2.29	(0.27)
	Indian	0.43	(0.40)
	Other	0.64	(0.95)
Household type	Nuclear	0.00	
	Extended	0.26	(0.25)
Household size	2-4	0.00	
	5-7	-0.48	(0.24)
	8+	-0.67	(0.33)
Income recipient (0/1)		0.27	(0.17)
Log-income		1.38	(0.30)
Others paid (0/1)		0.84	(0.29)
Employment status of head of household	Other	0.00	
	Government	-0.12	(0.42)
	Private	0.11	(0.35)
Age group	15-19	0.00	
	20-29	-0.20	(0.74)
	30+	-0.02	(0.74)

Note: For each categorical variable, category 1 is the reference category and is associated with value (adjustment) 0.00. Exceptions are *Household type* and *Household size*: for these variables categories 1 are not applicable, and therefore the respective categories 2 are used as reference. (0/1) indicates a variable with values 0 and 1.

Table 2b. Estimates of state-level deviations from the prediction based on Table 2a.

Johor -0.19	Kedah 0.11	Kelantan -0.54	Melaka 0.33
N. Sembilan -0.39	Pahang -0.26	P.Pinang 0.52	Perak -0.09
Perlis -0.09	Selangor 0.23	Terengganu -0.35	W.P.K.L. 0.17

Note: Figures in logits; their weighted mean is zero.

Conclusions

The analysis has shown that expenditure for maternity care varies a great deal both within and among the combinations of various background factors. The high variation prevails after controlling for the background factors, especially at household levels (within districts). Chinese and households with higher income tend to have higher expenditure both when not subsidised (in private facilities) and when subsidised. The analysis of subsidised episodes is distorted by the many episodes that incurred none or only nominal expenditure. Given *Source of care* (government or private facility), no factor contributes appreciably toward explaining the large variation in expenditure. For subsidised cases, such an explanation is of little substantive importance because small amounts of expenditure are involved (maternity episodes in private facilities constitute 19% of all maternity episodes, but involve 85% of the total *Delivery expenditure*).

The analysis of utilisation confirms the findings from the analysis of expenditure: private care is preferred by Chinese, higher-income groups, those with higher education, and those in urban areas. This may partly reflect the differential availability of private care and the uneven distribution of the socio-demographic factors across the country. Of importance is that the extent of these preferences is quantified.

Dental Care

There were 12,000 episodes of dental health care in the Survey. About 3900 (33 percent) of the episodes were part of the School Health programme in which no treatment costs were incurred. We analyse separately the subsets of subsidised and unsubsidised episodes since they involve very different amounts of expenditure. Episodes of traditional care which were paid for solely by the patient are included among unsubsidised episodes because the expenses tend to be in similar ranges to those for unsubsidised private care. The School Health episodes are excluded from all analyses. In the 4547 episodes in private facilities (38% of the episodes, and 56% after excluding School Health episodes), RM2.38 million was spent on treatment, which constitutes 94% of the total *Treatment expenditure* for dental care.

As explanatory variables we consider all the available person and household attributes, and the following circumstances of the episode: whether the episode was associated with any pain, *Level of care* (preventive/promotive, curative, or rehabilitative), and *Source of care* (Government, private, School Health programme, and traditional care). *Type of treatment* is not considered because using the nine categories it involves is rather excessive. The following age categories, coded 1–6, are considered: 0–2, 3–5, 6–12, 13–17, 18–64, 65+ years. Among the pairs of person and household attributes, such as *Educational level* and *Employment status* (of the patient and of the head of household), we give precedence to the attributes of the head of household. Otherwise children would be in the same category as unemployed, irrespective of their family/ household background.

Subsidised treatment

The survey data contain 3559 records of episodes of dental care classified as subsidised. Government facilities are the source of care for 3031 episodes (85%), private facilities for 302 episodes (11%), and other facilities (including sources of traditional care) for 146 episodes (4%). (All School health programme episodes are excluded.) The estimated number of episodes of subsidised treatment in Peninsular Malaysia is 1.11 million. The geometric mean expenditure (including travel and other expenses) is RM0.18, with 95% confidence interval (0.12, 0.27). There is little variation at the state level (the estimated state-level variance is 0.022), corresponding to the typical multiplicative factor of 1.40. That is, the mean expenditure in a typical state is 1.40 times greater or smaller than the national mean. The districts vary more (the estimated variance, 0.18, corresponds to the typical multiplicative factor of 2.67), but the episode-level variance is by far the greatest; the estimated variance, 1.374, corresponds to the typical multiplicative factor of 14.9. The large variation at the episode level reflects the diversity of the treatments provided; however, this variation is much smaller than that for maternity care where the treatment is much more uniform.

Adjustment for *Household income* yields a counterfactual result. The fitted regression is

$$3.442 - 0.534 \times \log\text{-income} ,$$

implying that higher income is associated with lower expenditure: 10-fold increase in income corresponds to $10^{0.534} = 3.4$ -fold reduction of expenditure. One feasible explanation for such a finding is that the better-off clients tend to require less complex care, preventive care in particular, and that even within a given *Type of treatment* they tend to require less complex

treatment. Conditioning on *Ethnicity* does not alter the association of *Expenditure* and *Household income* appreciably. The adjusted mean for Chinese is 2.34 times and for Indians 1.23 times greater than for Malays.

The most important factor among the background variables is age. After adjusting for *Household income* and *Ethnicity* the mean expenditure for those aged 65 or older is 5.6 times greater than for 18–64 year-olds and 38.5 times greater than for 13–17 year-olds. After adjusting for age, *Household income* becomes an unimportant, though statistically still a significant factor (estimate 0.029, standard error 0.007).

The importance of age as an explanatory factor is bound to be mainly due to the different distribution of the treatments required by the age groups. This hypothesis can be confirmed by analyses in which age is ignored, but *Level of treatment* is accounted for. Rehabilitative care is associated with 52.8 times greater mean expenditure than preventive/promotive care; in contrast, the adjusted mean expenditure for curative treatment is only 2.30 times greater than for preventive/promotive care. *Household income* remains negatively associated with expenditure (the estimated regression slope is -0.466 , corresponding to the multiplicative factor 0.342 for 10-fold increase in *Household income*).

The adjusted urban-rural differences are significant but modest; the estimate on the log-scale is 0.136 (standard error 0.054) corresponding to 1.37 times greater (adjusted) expenditure in urban areas, with 95% confidence interval (1.07,1.75). Episodes in households with government employee heads incur 2.04 times lower adjusted expenditure on average, and those with private employee head 2.24 times greater adjusted expenditure than those in other households. Higher *Educational level* of the head of household is associated with lower adjusted expenditure: for level 2 (lower secondary) 1.41 times, for level 3 (upper secondary) 1.95 times, and for level 4 (tertiary) 3.18 times lower than for level 1 (primary or none). Other background variables are unimportant for explaining the variation of *Treatment expenditure*. Also, whether the episode was associated with any pain is unimportant.

The sources of variation unaccounted for by the background factors are: episode-level (estimated variance 1.275), district-level (0.126), and state-level (0.013). A typical expenditure is 16.3 times greater or smaller than the prediction based on the explanatory variables. However, when age is taken into account these sources of variation are greatly reduced. Simultaneous modelling of age and episode-related variables is not possible because of confounding – the distribution of types of care varies from age group to age group a great deal. The results of multilevel analysis are summarised in Tables 3a and 3b.

Unsubsidised care

The survey collected data about 4547 episodes of care classified as unsubsidised; this corresponds to the population estimate of 1.60 million episodes in Peninsular Malaysia. The source of 4352 episodes (95.7%) is private facilities, the remaining 195 episodes (4.3%) are from traditional care facilities. The geometric mean expenditure is RM23.10, more than 100 times greater than for subsidised care. The 95% confidence interval for the mean is (20.00, 26.70). The between-state and between-district sources of variation are very small; the estimated state-level variance is 0.0061 (typical multiplicative factor 1.20), and the district-level variance is 0.0097 (typical multiplicative factor 1.26). The episode-level variation dominates the other sources – the estimated variance of 0.327 corresponds to the typical

Table 3a. Multilevel analysis of expenditure for dental care. Subsidised episodes. Adjustment for household income, age, and ethnicity.

Parameter	Category	Estimate	Standard error
Constant		0.057	
Log-income		0.029	(0.007)
Ethnicity	Malay	0.000	
	Chinese	0.011	(0.008)
	Indian	0.006	(0.010)
	Other	-0.017	(0.030)
Age group	0-2	0.000	
	3-5	-0.122	(0.029)
	6-12	2.016	(0.028)
	13-17	2.839	(0.029)
	18-64	3.734	(0.033)
	65+	4.470	(0.058)

Table 3b. Multilevel analysis of expenditure for dental care. Subsidised episodes. Adjustment for all variables except for age.

Parameter	Category	Estimate	Standard error
Constant		2.351	
Log-income		-0.439	(0.058)
Ethnicity	Malay	0.000	
	Chinese	0.068	(0.071)
	Indian	0.372	(0.086)
	Other	0.099	(0.247)
Area	Urban	0.000	
	Rural	0.136	(0.054)
Educational level of head of household	None/primary	0.000	
	Lower secondary	-0.148	(0.054)
	Upper secondary	-0.290	(0.055)
	Tertiary	-0.504	(0.085)
Employment status of head of household	Other	0.000	
	Government	-0.229	(0.076)
	Private	0.318	(0.044)
Level of treatment	Prevent./promotive	0.000	
	Curative	0.356	(0.058)
	Rehabilitative	1.732	(0.117)

Note: Variables other than *Age group* that make small contribution to the model fit are omitted.

multiplicative factor of 3.73. In view of the great diversity in the levels and types of treatment this figure appears to be very low; however, the most expensive treatments are very rare and the routine dental procedures predominate. Also, expenditure for the most complex procedures is often spread over several visits which are regarded in the Survey as separate episodes.

The linear regression on log-income is

$$2.79 + 0.134 \times \log\text{-income} ;$$

the standard error for the slope on log-income is 0.026. Ten-fold increase of *Household income* is associated with only 36% greater *Treatment expenditure*. The differences among the ethnic groups are small. After adjusting for *Household income*, the estimated mean expenditure of Chinese is 1.01 times greater, that of Indians 1.22 times greater, and of the other ethnic groups 1.82 times greater than for Malays. The pattern of association with age is very similar to that for subsidised episodes. Dental care episodes are most expensive on average for the elderly and least expensive for children. The mean expenditure for patients aged 65 or over is 54.1 times greater than for the 13–17 year-olds. For the 18–64 year-olds the mean expenditure is 7.1 times greater than for the 13–17 year-olds. The mean expenditure for younger children is lower than for 13–17 year-olds (3.24 times for the 6–12 year-olds, 34.6 times for the 3–5 year-olds, and effectively free for 0–2 year-olds). The differences between urban and rural areas are unimportant (estimated as 2%).

The other background factors, including *Sex*, *Educational level*, *Household type* and *Household size* are unimportant. When all the important variables are accounted for, the association of *Treatment expenditure* with *Household income* is greatly reduced; the estimated slope on log-income is reduced to 0.074, which corresponds to only 19% increase in expenditure for 10-fold increase in *Household income*.

After adjusting for age, *Household income*, *Ethnicity*, and *Urbanity*, most of the variation is accounted for. The three variance component estimates are 0.053 (episodes), 0.0039 (districts) and 0.00046 (states), corresponding to the respective multiplicative factors ($\times\pm$) 1.69, 1.15, and 1.05. The typical expenditure for a given set of background variables is 1.72 times greater or smaller than the prediction based on the fitted model. The model fit with all important explanatory variables is displayed in Table 4.

Utilisation

In this Section we explore factors associated with the choice of private facilities. We exclude from the analysis all episodes of School health programme, which cannot be interpreted as a choice between alternative sources of care, and episodes dealt with 7765 episodes took place in government or private facilities; 72% of them were in private facilities.

Since private care is more expensive, we expect that *Household income* would be the principal determinant of choosing private dental care. However, that is far from being the case. Even without adjusting for any other explanatory variables, the choice of a private facility is only very weakly associated with *Household income*. The fitted regression for the logit of the probability of choosing private care is

$$0.057 + 0.038 \times \log\text{-income} .$$

Table 4. Multilevel analysis of expenditure for dental care. Unsubsidised episodes.

Parameter	Category	Estimate	Stand. error
Constant		-2.386	
Log-income		0.074	(0.010)
Ethnicity	Malay	0.000	
	Chinese	0.005	(0.009)
	Indian	0.016	(0.013)
	Other	0.076	(0.028)
Area	Urban	0.000	
	Rural	0.009	(0.010)
Level of treatment	Prevent./promotive	0.000	
	Curative	-0.005	(0.010)
	Rehabilitative	0.246	(0.015)
Age group	0-2	0.000	
	3-5	2.286	(0.056)
	6-12	3.315	(0.028)
	13-17	3.825	(0.029)
	18-64	4.677	(0.040)
	65+	5.558	(0.168)

Note: Variables that make small contributions to the model fit are omitted.

The estimated regression slope on log-income, 0.038, has standard error 0.015; it is significant at 5% level. However, even a 10-fold increase in *Household income* is associated with an increase in the probability of choosing private care smaller than 0.01. In contrast, when another party contributes to the bill, the logit of the probability is increased by 1.27 (standard error 0.126), corresponding to probability greater by about 0.25. The differences in probabilities of choosing private care are also substantial. For rehabilitative treatment, private care is generally preferred.

These findings are only moderately compounded by the other background variables. A logistic regression with random coefficients due to episode, district, and state was fitted for the entire set of explanatory variables. Variables which both contributed little to the model fit and were associated with small differences were excluded from the model. By this process, the model fit displayed in Table 5 was obtained. From this fit we conclude that the strongest preference for private care is among Chinese, households whose heads have tertiary education, those seeking rehabilitative treatment (dentures) and, naturally, when another party pays (or contributes to the payment) for the treatment. To a lesser extent, for episodes that involve some pain, private care is preferred. Income recipients prefer private care (probability greater by about 0.10). Single patients prefer government facilities.

Although *Age group* is the principal determinant of expenditure for both subsidised and unsubsidised episodes, the choice between private and government facilities is not associated with age. There is some indication that government facilities are preferred for teenagers (13-17 year-olds) and that 18-64 year-olds have a greater preference for private facilities than what would be predicted from the other explanatory variables. *Employment status* of the

head of household is also only weakly associated with the choice; according to the fitted model, in households with a government employee as head, government facilities are preferred, but the corresponding estimates are statistically not significant. Among the household sizes, the small nuclear family (with 2–4 members) has the greatest estimated preference for private care, by 4–7%, differences among the *Household size* categories are not significant.

Without adjusting for explanatory variables, both districts and states vary a great deal in the probabilities of their residents selecting private care. The variance of the logits at the district level is 0.293 and at the state level is 0.304. After adjusting for the important explanatory variables the district-level variation is unchanged (estimate 0.282), depending on the details of the model and values of the explanatory variables. However, the state-level variance is reduced substantially (estimate 0.097). The state-level variance can be interpreted as follows: for an episode of dental care with a particular background of the patient and given circumstances, the logit for private care in a typical state differs from the prediction given by the estimates in Table 5 by $\sqrt{0.097} = 0.31$. This converts to 0.06–0.08 greater probability of selecting private care.

Table 5. Results of the logit regression for the choice between private and government facilities for dental care.

Parameter	Category	Estimate	Standard error
Constant		-1.994	
Log-income		0.091	(0.021)
Ethnicity	Malay	0.000	
	Chinese	1.715	(0.075)
	Indian	0.650	(0.098)
	Other	1.055	(0.241)
	Urban	0.000	
	Rural	-0.256	(0.068)
Educational level of head of household	Primary or none	0.000	
	Lower secondary	0.164	(0.071)
	Upper secondary	0.471	(0.068)
	Tertiary	1.154	(0.099)
Household type	Single	0.000	
	Nuclear	0.805	(0.172)
	Extended	0.726	(0.176)
Income recipient		0.454	(0.049)
Level of treatment	Prevent./promotive	0.000	
	Curative	-0.110	(0.077)
	Rehabilitative	0.966	(0.126)
Painful (0/1)		0.649	(0.059)
Others paid (0/1)		1.407	(0.148)

Note: Variables that make small contributions to the model fit are omitted.

Conclusions

The relatively small variation of expenditure for dental-care episodes has an explanation in the data collection procedures. A complex dental treatment, such as obtaining dentures, which may incur substantial expenditure, is recorded in the database as several episodes, one associated with each visit. In this way, the expenditure is spread over several visits/episodes. It is not possible to group the episodes into sets of visits corresponding to a single cause because the definition of such a set is ambiguous and it may involve episodes of different types of treatment.

The expenditure for a typical episode is greater for elderly. For subsidised episodes (most of them are in government facilities), expenditure is inversely associated with *Household income*; for unsubsidised episodes (most of them are in private facilities), expenditure is positively associated, although the association is greatly weakened when age and *Level of treatment* are controlled for.

The main determinants of utilisation are *Ethnicity*, *Educational level*, *Level of care*, and source of care. Private care is preferred for rehabilitative care, by Chinese, and by members of families with educated heads of household. To a lesser extent, families (as opposed to single subjects) and income recipients prefer using private care and private care is also preferred for treatment associated with pain. The adjusted differences in utilisation between urban and rural areas, and between the age groups, are unimportant. Although better-off households have greater preference for private care, the impact of *Household income* is negligible in comparison to the other factors.

Hospitalisation

The Survey collected data about 1878 episodes of hospitalisation. Most episodes, 1541 (82%) were taken care of in government hospitals. Of the remaining 337 episodes in private hospitals or clinics, 126 were subsidised (by employer, an insurance scheme, or another party), so that there were only 221 unsubsidised cases (12%). However, the unsubsidised episodes account for 77% of the total *Treatment expenditure*.

The (geometric) mean of *Treatment expenditure* is RM1.46; most episodes are associated with only nominal expenses. In fact, in 815 cases (43%) *no Treatment expenditure* was incurred (in 604 cases, 32%, not even any *Total expenditure* was incurred) and in further 89 cases (5%) less than RM10 was expended. The mean for the subsidised cases is RM0.75 and for unsubsidised cases is RM682.30, almost 1000 times greater. The summaries for *Total expenditure* (including travel and other expenses) are similar; for most episodes, *Treatment expenditure* is the dominant component of *Total expenditure*. In fact, they coincide in 1341 cases (71%), and the (arithmetic) mean of the latter is only 12% greater than the mean of the former.

The (geometric) mean of *Total expenditure* is RM4.10. The subsidised and unsubsidised episodes have respective means RM2.26 and RM805.40. The discrepancy between the expenditure in subsidised and unsubsidised cases may be even more extreme because there are a few unsubsidised cases in which the declared expenditure is clearly only nominal. In fact, three records were excluded from the sub-sample of unsubsidised cases because they were associated with zero *Treatment expenditure*.

Apart from the standard explanatory variables we also consider *Length of stay* (number of days of hospitalisation) and *Reason for treatment*. To avoid undue influence of a few episodes with the lengthiest declared stays in hospital, we truncate all stays above 30 days and set them to 31 days. The recording for the lengthiest stays is unlikely to be accurate. The fact that most of the lengthy recorded stays appear to be rounded to whole months is a circumstantial evidence of this. Further, to conform to the logarithm transformation of *Expenditure*, we apply the logarithm transformation also to *Length of stay*. The advantage of this is that in our regression-based prediction a multiplicative increase of *Length of stay* (say, twofold) would correspond to a certain multiplicative increase (say 1.5-fold) of *Expenditure*.

We distinguish four kinds of reasons for hospitalisation (kinds of health need): accidents, operations, stress and mental problems, and problems requiring other treatment (treatment only). The corresponding counts of episodes are 257 (14%), 371 (20%), 18 (2%), and 1232 (66%). The following age groups are considered: 0–14 year-olds (children), 15–29 year-olds (young adults), 30–54 year-olds (mature adults), and those aged 55 and above (elderly). The same categories, except for the first one, are considered for heads of household. All episodes are associated with either government or private health care, and so for *Source of care* we consider only these two categories.

Multilevel analysis of expenditure

In the analysis of expenditure we focus on *Treatment expenditure*. Most inferences carry over from *Treatment expenditure* to *Total expenditure*. We point out instances where this is not the case.

All episodes

Without accounting for the subsidy status or any other explanatory variable, *Treatment expenditure* is positively associated with *Household income*: a ten-fold increase of *Household income* is associated with 3.47 times greater *Treatment expenditure*. The expenditure varies a great deal at all three levels of clustering: the three estimated variance components are 4.65 (episode-level), 0.114 (district-level), and 0.135 (state-level), corresponding to the typical multiplicative factors 143.3, 2.18, and 2.33. A typical *Treatment expenditure* is 163.5 times greater or smaller than the mean of RM1.46. The differences among the ethnic groups are modest relative to the other health-care sectors. After adjusting for *Household income*, Chinese are estimated to have mean *Treatment expenditure* 28 times greater and Indians 3.40 times greater expenditure than Malays. With the adjustment for *Ethnicity* the impact of *Household income* is greatly reduced; ten times greater *Household income* is now associated with only 2.17 times greater expenditure.

Two other explanatory variables of principal interest are *Subsidy status* and *Reason for treatment* (type of treatment). Of course, *Subsidy status* is highly significant (estimate 2.65, with standard error 0.14; the mean expenditure on unsubsidised cases is about 450 times greater than for subsidised cases). The differences among the four types of treatment are of little importance; the estimate for stress/mental problems (−0.632, standard error 0.444) stands out, but it is based on only 18 subjects. The estimate implies that stress/mental problems are associated with 4.29 times lower expenditure than accidents, but the uncertainty about the estimate is so great that even no difference is feasible. With the inclusion of these variables, the impact of *Household income* is further reduced; ten-fold increase in *Household income* is now associated with only 21% greater expenditure. Also, the difference in the adjusted mean expenditure between Chinese and Malay is greatly reduced (to typical multiplicative factor of 5.84). The estimated differences among the states are reduced to zero, the district-level variation is reduced to 0.077 (from 0.114), and the episode level variance is reduced to 3.01. After adjusting for all the explanatory variables considered above, a typical episode involves 57.1 times greater or smaller expenditure than the prediction.

Length of stay is a strong predictor of expenditure; ten times longer stay is associated with 3.55 times greater *Treatment expenditure*. The urban–rural differences in the mean expenditure are modest, amounting to estimated 1.63 times greater adjusted mean expenditure in urban areas. The expenditure (per episode) in single households tends to be lower than in families; an episode in a nuclear family involves on average 3.81 times greater expenditure and in an extended household 5.32 times greater expenditure than for a single person.

Episodes in households whose head is a government employee involve 7.56 times lower expenditure than in households headed by self-employed; for households led by employees of the private sector the expenditure is 2.44 times greater than for self-employed.

Expenditure on hospitalisation is greater for adults than for children. For those aged 30 and over (age groups 30–54 and 55+), the mean expenditure is about 2.5 times greater than for

children (age group 0–14). Young adults (15–29 years of age) are an intermediate group; their expenditure is on average 1.6 times greater than for children.

Table 5a gives the model fit for the important explanatory variables. For parsimony *Type of treatment* is collapsed to two categories: Other (original categories Accidents, Operations, and Treatment only) and Stress/mental problems.

Table 5a. The model fit with important explanatory variables for Treatment expenditure in Hospitalisation

Parameter	Category	Estimate	Standard error
Constant		-0.128	
Household income		0.184	(0.115)
Subsidy		2.655	(0.145)
Length of stay (log)		0.550	(0.112)
Type of treatment	Other	0.000	
	Stress/mental	-0.843	(0.433)
Ethnicity	Malay	0.000	
	Chinese	0.706	(0.124)
	Indian	0.324	(0.137)
	Other	-0.304	(0.307)
Age group	0–14	0.000	
	15–29	0.210	(0.135)
	30–54	0.380	(0.117)
	54+	0.411	(0.131)
Area	Urban	0.000	
	Rural	0.213	(0.100)
Household type	Single	0.000	
	Nuclear	0.581	(0.322)
	Extended	0.726	(0.327)
Employment status of the head of household	Self-employed	0.000	
	Government	-0.879	(0.137)
	Private	-0.388	(0.112)
	Unemployed	-0.817	(0.125)

Note: The four categories of *Type of treatment* are collapsed to two, as described in the text.

The adjustment for explanatory variables reduces the estimated state-level variance to zero. The district-level variation is affected by the adjustment only slightly; it is reduced from 0.114 to 0.078, which corresponds to the typical multiplicative factor 1.90. There remains a great deal of unexplained episode-level variation; it is reduced from 4.65 to 2.91 (the typical multiplicative factor is 50.9).

Unsubsidised episodes

The analysis of *Treatment expenditure* for the unsubsidised episodes in Hospitalisation is based on 208 records. (Three records associated with no *Treatment expenditure* were excluded from this subset of data.) Since most districts are represented in the data by only a

few episodes each, we consider only two sources of variation: episode and state. In fact, only 45 districts are represented in the data, 14 of them with only one episode each.

The mean *Treatment expenditure* for the unsubsidised episodes of Hospitalisation is RM758.6. The most powerful predictors of the expenditure are *Length of stay*, *Household income*, and age. The model fit for these explanatory variables is displayed in Table 6. All other explanatory variables make insignificant contributions to the model fit.

Ten-fold increase in *Household income* is associated with 3.05 times greater expenditure. In comparison, ten times longer stay in the hospital is associated with 5.02 times greater expenditure. The expenditure for mature adults and elderly (those aged 30 and over) is about three times greater than for children (aged 0–14), whereas the expenditure for young adults (aged 15–29) is on average about twice as large as for children. Note however, that all estimates are associated with considerable variation. For instance, the regression slope on *Length of stay* could be as large as 1.0, which corresponds to twice (ten times) higher expenditure for twice (ten times) longer hospitalisation.

The adjusted state-level mean expenditure varies moderately; the estimated state-level variance component, 0.113, corresponds to the typical multiplicative factor 2.17. Within states, episodes vary to a greater extent but, by the standards of other health-care sectors, also only moderately. The episode-level variance component, 1.66, corresponds to the typical multiplicative factor 19.4.

Table 6. Multilevel model fit for the Treatment expenditure for unsubsidised episodes in Hospitalisation

Parameter	Category	Estimate	Standard error
Constant		2.160	
Household income		0.485	(0.280)
Length of stay (log)		0.700	(0.262)
Age group	0–14	0.000	
	15–29	0.292	(0.319)
	30–54	0.455	(0.266)
	55+	0.498	(0.275)
Variance components			
Episode		1.657	
State		0.113	(0.091)

Note: The variable *Length of stay* is truncated and transformed to the logarithm scale. See text for details.

Subsidised episodes

The results of the analyses for subsidised episodes are bound to be similar to those for all episodes, because only a small fraction of the episodes are unsubsidised.

The geometric mean of the *Treatment expenditure* for subsidised episodes of Hospitalisation is RM0.75. A typical expenditure is 72.3 times greater or smaller than the mean. *Household income* is both not significant and unimportant as a predictor. For the various models fitted, ten-fold increase in *Household income* corresponds to no more than 40% greater expenditure.

Length of stay is a much more important predictor of expenditure; ten times longer stay in (a private) hospital is associated with 4.25 times greater expenditure. Stress and mental problems are associated with much lower expenditure than other conditions (about 10 times), although the difference is estimated with little precision because there are only 14 cases in the analyzed data set.

Chinese tend to have greater expenditure than the other ethnic groups. The expenditure of members of households headed by government employees or unemployed is substantially lower on average (about 8 times) than for other households. For family members, the expenditure tends to be greater (about 5 times) than for single patients. Expenditure tends to be lower for children and young adults than for mature adults or elderly, to a slightly lesser extent than for subsidised episodes.

All state-level variation is explained by the explanatory variables (although there is little variation even without any adjustment). The estimated district-level variance is 0.092, corresponding to the typical multiplicative factor 2.01. The episode-level variance is much greater; its estimate, 3.11, corresponds to the typical multiplicative factor 58.0. A typical expenditure for a subsidised episode of hospitalisation is about 60 times greater or smaller than the prediction.

Utilisation

Although it is reasonable to expect that *Household income* would be a principal determinant of the choice of private health care, in reality their association is very weak after adjusting for other relevant variables. Private care is chosen more frequently in urban than in rural areas (the logit of difference is -0.42 , corresponding to a difference of probability up to 0.10); the slope on log-income is only 0.016 (standard error 0.038). The choice of private care is greatly influenced by the *Type of treatment* required. The adjusted logit for Operations is greater than for Accidents by 1.79 (standard error 0.28). The adjusted logit for Stress/Mental problems is also very high, 1.13 greater than for Accidents, but its estimate is much less precise (standard error 0.75). The adjusted logit for Treatment is greater than for Accidents by 0.82. In comparison, when another party contributes to the expenses, the logit is increased by 1.09 (standard error 0.16).

Since in many cases the length of hospitalisation can be anticipated, it is appropriate to include *Length of stay* among the explanatory variables. The estimated logit is -0.46 ; ten times longer stay is associated with up to 0.10 increase in the probability of choosing private care.

The Chinese stand out as having much greater preference for private care than the other ethnic groups. Their adjusted logit is 2.02 greater than for Malays; the adjusted logit for Indians is 0.62 and for the Other ethnic groups is 0.49 greater than for Malays. For a wide range of values of the background variables Chinese are the majority of the clientele for private health care. *Educational level* of the head of household is also strongly associated with the choice of private care. The adjusted logit for the episodes in households whose head has upper secondary education is 0.65, and for those with tertiary education it is 1.41. Episodes in families have the adjusted logit about one point greater than episodes for single patients. Episodes in households headed by government employees have the adjusted logit almost one point lower than others (self-employed, unemployed, or those employed in the private sector);

government employees are most averse to using private care. There is a weak indication that private care is preferred for children (0–14 year-olds) over adults.

There is substantial variation among the states in the probability of choosing private care for hospitalisation. The relative variances for district and state are 0.121 and 0.410, respectively. P. Pinang stands out as the state with the highest preference for private care (even after adjusting for all relevant explanatory variables), the (logit) prediction for the state has to be adjusted by adding 1.12. Kelantan, N. Sembilan and Pahang have the lowest preference for private care; their predictions have to be adjusted by around -0.70 . The estimates and standard errors for the model with all relevant variables are listed in Table 7.

Table 7. Estimates and standard errors for the utilisation model for Hospitalisation

Parameter	Category	Estimate	Standard error
Constant		-4.142	
Ethnicity	Malay	0.000	
	Chinese	2.025	(0.182)
	Indian	0.619	(0.237)
	Other	0.488	(0.550)
Area	Urban	0.000	
	Rural	-0.423	(0.174)
Type of treatment	Accident	0.000	
	Operation	1.788	(0.282)
	Stress/mental probl.	1.134	(0.755)
	Treatment only	0.820	(0.268)
Length of stay (log)		-0.462	(0.159)
Others paid		1.094	(0.164)
Age group	0–14	0.000	
	15–29	-0.280	(0.242)
	30–54	-0.222	(0.206)
	55+	-0.361	(0.224)
Employment status of the head of household	Self-employed	0.000	
	Government	-0.953	(0.280)
	Private	-0.164	(0.190)
	Unemployed	-0.079	(0.214)
Educational level of the head of household	No/Primary	0.000	
	Lower secondary	-0.021	(0.215)
	Upper secondary	0.654	(0.199)
	Tertiary	1.406	(0.268)
Variance components			
Episode		1.000	
District		0.121	(0.108)
State		0.410	(0.214)

Conclusions

By definition, hospitalisation involves only two sectors: private and government. There is a vast discrepancy in the expenditure incurred at government and private hospitals. This is further accentuated when we contrast subsidised cases (all episodes in government hospitals and those in private hospitals that were not paid for entirely by the patient) and unsubsidised cases (episodes in private hospitals that were paid for solely by the patient). The analysis of expenditure for all the hospitalisation episodes is greatly distorted by the large number of cases with zero recorded expenditure. Even after controlling for (matching on) background variables, unsubsidised hospitalisation involves 450 times greater expenditure than subsidised hospitalisation. Apart from *Subsidy status*, *Length of stay*, *Ethnicity*, *Household type*, and *Employment status* of the head of household are the most important predictors of expenditure. The expenditure of Chinese is on average about five times, and of the Indians about twice as high as that of Malays. The expenditure of family members is 4–5 times greater than for single patients. Members of households headed by government employees or unemployed tend to have expenditures around 7 times greater than those in households headed by self-employed. Members of households headed by private employees are an intermediate case; their expenditure is on average 2.5 times greater than for self-employed.

Expenditure on hospitalisation tends to increase with age, both for all episodes of hospitalisation, and for unsubsidised episodes. The expenditure of mature adults (30–54 years of age) and elderly (55 years of age and over) is about three times higher than for children (aged 0–14). *Length of stay* is an important predictor for unsubsidised cases also; ten times longer stay in the hospital is associated with about five times higher expenditure.

The adjusted expenditure varies only moderately across the districts, but there is a great deal of unexplained episode-level variation; a typical unsubsidised episode is associated with expenditure about 20 times greater or smaller than the prediction. For subsidised cases, this variation is much greater, but of much lesser consequence since the expenditure for most episodes is only nominal.

The pattern of utilisation reflects to some extent, but not perfectly, the pattern of expenditure. Thus, members of households headed by government employees have strong preference for government hospitals, while Chinese have an even stronger preference for (higher probability of choosing) private hospitals, even after adjusting for other important factors. Higher educational level (of the head of household) is associated with greater preference for private hospital care. For operations, there is a strong preference for private care, and for accidents a strong preference for government hospital care. The longer the (anticipated) stay in hospital the stronger the preference for government hospital. In rural areas, the adjusted probability of choosing government hospital is greater than in urban areas. The difference of the probabilities is of the same magnitude as that associated with ten times longer stay in the hospital (around 0.10). Even after adjusting for all the factors listed, there is a substantial variation among the states.

Acute Ambulatory Care – Two Week Recall

The Survey inquired about ten different medical conditions that the subjects may have suffered from in the two weeks immediately prior to the interview. For the purposes of multivariate analysis, we have reclassified these conditions into five categories:

1. Fever, cough, flu, common cold, and similar conditions (original category 02)
– 5025 cases;
2. Skin problems and acute ear and eye problems (original categories 05, 06, and 07) – 1042 cases;
3. Minor accidents and other painful conditions (original categories 01 and 09)
– 1699 cases;
4. Diarrhoea, vomiting, and similar conditions (original category 03) – 650 cases;
5. Asthma, mental stress, and other problems (original categories 04, 08, and 10)
– 733 cases.

Five categories of *Source of care* are considered:

- A. Home/self
- B. Shop/pharmacy
- C. Government facility
- D. Private facility
- E. Traditional facility.

In general, treatment in private facilities is most expensive, although, where subsidised (by employer, an insurance scheme, or another party), the patient's expenses are often very small, of the same order of magnitude as in government facilities or as for treatment at home and by the patient (Home/self). The expenditure in shops and pharmacies and in traditional facilities tends to be much higher than in government facilities but lower than in private facilities when patients pay for the treatment in full (i.e., in unsubsidised cases).

Separate analyses were carried out for each of the conditions 1–5. For conditions 2, 3, and 5, which were formed by collating two or three original categories each, we allow for systematic differences among these categories by defining the appropriate indicator variables. The age groups (in years) 0–4, 5–14, 15–34, 35–54, and 55 and over are used throughout. The variables *Type of care* and *Length of stay* are not defined for acute conditions.

The analyses and their results have many features in common. To avoid repetitiveness, we concentrate on condition 1, which involves by far the greatest number of episodes, and then point out the differences in the results from the other conditions.

An unsubsidised episode is defined as an episode of health care in a private facility, which was paid for solely by the patient. Since episodes at shops and pharmacies are not associated with any subsidy as such, this definition is no longer well motivated. However, in our modelling we use *Subsidy status* (indicator of subsidy) in conjunction with *Source of care*, and so, in effect, *Subsidy status* represents the difference between expenditure for unsubsidised and subsidised cases in *private* facilities.

Since there are five different types of *Source of care*, in utilisation analysis we seek a description for the pattern of use of private facilities and a separate description for the pattern of use of government facilities. Throughout, we analyze only *Treatment expenditure*.

Information about acute conditions was collected with a recall period of two weeks. This was necessitated by practical considerations. However, collecting data in this way entails two profound problems. First, the period of two weeks prior to the interview may not be a good representation of the acute conditions over the entire year (because of seasonal effects for certain conditions). Second, subjects may report episodes which took place prior to the period of recall. Especially problematic are instances of illnesses which started prior to the beginning of the recall period, but persisted into the period. Related expenses may have been incurred either outside or within the period or recall, or even in both periods.

Expenditure for treating fever, cough, flu, and similar conditions

More than 5000 episodes of fever, cough, flu, common cold, and of similar conditions were recorded by the Survey. (Nearly one in ten subjects reported an episode.) Almost half of the episodes, 2357 (47%), were treated in private facilities and 1040 (21%) in government facilities.

The (geometric) mean *Expenditure* is RM0.44, reflecting the large proportion of episodes that incurred no expenditure (2789 episodes, that is, 55.5%). Most of the unexplained variation is at the episode level; the episode-level variance estimate, 1.98, corresponds to the typical multiplicative factor 25.5. The district- and state-level variances are 0.056 and 0.057 each, corresponding to typical multiplicative factors of around 1.7 each. *Household income* is strongly associated with *Expenditure*; tenfold increase of *Household income* is associated with 2.15 times greater *Expenditure*. However, *Subsidy status* provides an alternative explanation for these differences; subsidised episodes are associated with 150 times smaller expenditure than unsubsidised cases. Within the two categories of *Subsidy status*, *Household income* is not associated with *Expenditure*. The mean expenditures for the five categories of *Source of care* and for the subsidised and unsubsidised private care are given in Table 8.

Table 8. (Geometric) means of expenditure within the categories of Source of care and for subsidised private and unsubsidised episodes of Acute conditions

Source of care	Mean (in RM)
Home/self	0.03
Shop/pharmacy	1.35
Government	0.03
Private Subsidised	0.02
Unsubsidised	18.20
Traditional	2.30

Private unsubsidised care is associated with 673 times greater expenditure than private subsidised care. Within these six categories there is little variation among the districts or states, and even the episode-level variance is only 0.54, corresponding to the typical multiplicative factor 5.39.

Other background factors, although statistically significant, are of little substantive importance. The mean adjusted expenditure in urban areas is 21.5% higher than in rural areas (estimate -0.085 , standard error 0.027). Ten-fold increase in *Household income* is associated with only 12.7% greater expenditure. The adjusted difference between Chinese and Malays is 27%, and Indians' expenditure is on average only slightly lower than that of Chinese. Episodes in households headed by government or private employees involve expenses about 12% smaller than episodes in households headed by self-employed or unemployed. In view of the average amounts of expenditure, these differences are of little consequence. For completeness, Table 9 gives the details of the model fit.

Table 9. Model fit for expenditure for Acute conditions

Parameter	Category	Estimate	Standard error
Constant		0.270	
Source of care	Self/home	0.000	(0.038)
	Shop/pharmacy	1.700	(0.037)
	Government	0.024	(0.044)
	Private	-0.202	(0.098)
	Traditional	1.914	
Subsidy status (private)	Subsidised	0.000	
	Unsubsidised	2.814	(0.037)
Household income		0.052	(0.030)
Area	Urban	0.000	
	Rural	-0.085	(0.027)
Ethnicity	Malay	0.000	
	Chinese	0.103	(0.031)
	Indian	0.089	(0.040)
	Other	0.001	(0.077)
Employment status Of h-d of household	Self-employed	0.000	
	Government	-0.060	(0.033)
	Private	-0.053	(0.027)
	Unemployed	0.011	(0.036)
Variance components			
Episode		0.537	
District		0.013	(0.004)
State		0.008	(0.005)

Although the analysed category of conditions comprises a variety of everyday illnesses, there is a great deal of uniformity in the *Expenditure* for the resulting episodes and the variation at district- and state-levels is very small.

The analysis of unsubsidised episodes fails to identify any factors that are strongly associated with *Expenditure*. *Expenditure* tends to increase with age; the average *Expenditure* of elderly (aged 55 and over) is about 1.5 times greater than that of children (0-14 year-olds). The expenditures for unsubsidised cases are in a very narrow range; the typical multiplicative factor for episode-level variation is 2.8; the variation at district and state levels is negligible.

Utilisation for fever, cold, flu, and similar conditions

In the presence of five types of *Source of care*, we carry out separate analyses for exploring which background factors are associated with the selection of care in private facilities on the one hand, and in government facilities on the other. Private facilities were used in 47%, government facilities in 21%, shops or pharmacies in 18%, home/self in 14%, and traditional sources in 1% of episodes.

Care in private facilities is preferred (that is, is selected more often) by Chinese, those living in urban areas, households whose heads have tertiary education, and families (as opposed to single persons). The preference gradually decreases with age. *Household income* is positively associated with preference for private care, but its impact is negligible in comparison with the other factors.

The adjusted difference between Chinese and Malays corresponds to about 0.15 greater probability of using private care by the former (estimate 0.648, standard error 0.085). The adjusted difference of probabilities corresponding to ten times greater income is only about 0.02 (the estimate on the logit scale is 0.088, with standard error 0.027). The estimated logits for the age groups, contrasted against the reference group of 0–4 year olds, are –0.47 (5–14 year-olds), –0.77 (15–34 year-olds), –0.89 (35–54 year-olds), and –0.94 (55+ year-olds); the corresponding standard errors are in the range 0.09–0.12. The variation at the district and state levels is moderate (the relative variance estimates are 0.09 and 0.08, respectively). Kelantan and Pahang stand out as the states with the lowest adjusted probabilities of using private care (logit adjustment of –0.50, corresponding to probabilities reduced by about 0.10).

The analysis for government facilities does not yield exactly the opposite results to those for private facilities because the use of other sources of care is uneven across the population strata defined by the background variables. However, some of the expected patterns of utilisation are present. Chinese, households whose heads have tertiary education, and those living in urban areas are most averse to using government facilities. Households headed by a government employee use government facilities more often than others (probability higher by up to 0.09), working-age adults (15–54 years of age) use government facilities less than other age groups (probability lower by around 0.10).

There is a moderate extent of district- and state-level variation in the adjusted probabilities of using government care (on the logit scale, the corresponding relative variance estimates are equal to 0.08 each). Pahang stands out as the state with the highest adjusted probabilities of using government facilities (logit adjustment of 0.57, corresponding to up to 0.14 difference on the probability scale). Unlike in the analysis for private facilities, Kelantan does not have a very high adjusted rate of using government facilities (its estimated adjustment is 0.22, corresponding to around 0.05 higher probability than the general prediction).

Other acute conditions

In this section we summarise the results of the analyses for the other four types of acute condition. The sample sizes for these types are smaller than for Fever, cough, flu and similar conditions, and so there is less scope for detailed modelling of the expenditure. In any case, the expenditure is very small for most episodes, and so the results are of less importance.

Expenditure

The mean expenditures for acute conditions 2–5 are in the range RM0.35–0.55. For the types of condition that have been aggregated into a single category there are no important differences except for Mental stress (within type 5), which is associated with much lower expenditure, especially for unsubsidised episodes.

Subsidy status and *Source of care* are the principal predictors of *Expenditure*. Unsubsidised episodes are associated with *Expenditure* almost 1000 times greater than subsidised (private-care) episodes, which are in the same range as episodes of care at government facilities or at home and by the patient him/herself (Home/self). Shops, pharmacies, and traditional sources of care are associated with *Expenditure* around 100 times greater than government facilities (about 10 times smaller than for unsubsidised private care); the corresponding estimates are in the range 1.50–2.30 on the logarithm scale, that is, 32–200 on the multiplicative scale of RM.

Chinese tend to have higher expenditure, about 1.6 times, than Malays, and the expenditure of Indians is similar to that of Malays. Tertiary education of the head of household is associated with higher expenditure, about 1.5 times, for Skin/ear/eye problems and for Diarrhoea and similar conditions (conditions of type 2 and 4). In general, expenditure of elderly (aged 55 and over) is higher than that of the other patients, and that of children (up to 4 years of age) is the lowest. The expenditure of the elderly is about 1.8 times greater than for children, and the expenditure for working-age adults (15–54 years of age) is intermediate. There is a weak indication that households with government employees as heads tend to have lower expenditure than other households do.

The analysis of unsubsidised episodes largely confirms these findings. In particular, Chinese tend to have greater expenditure and the mean expenses for treating mental illnesses are much lower than for other conditions.

The expenditures are very homogeneous; a typical expenditure is 6.5–7.5 times greater or smaller than the average expenditure. After adjusting for the important explanatory variables, the variation at district and state levels is very small.

Utilisation

Private facilities are the most frequent source of care for all acute conditions except for type 3 (Minor accidents and other painful conditions), which are dealt with at home or by the injured (Home/self) in 34% of cases. Government facilities are the second most frequent source for types 2 (Skin/ear/eye problems) and 5 (Asthma, mental stress, and other problems). Traditional sources are used least frequently for all types of condition, in 1–6% of cases, except for type 3 (Minor accidents and other painful conditions), where they are used in 11% of cases.

Chinese select private facilities more frequently than Indians who in turn select them more frequently than Malays. The difference between Chinese and Malays is most pronounced for types 4 (Diarrhoea and similar conditions) and 5 (Asthma, mental stress, and other problems), corresponding to the difference in probabilities, after controlling for other factors, of up to 0.20. Indians select private facilities with (adjusted) probability of around 0.10 greater than Malays. Households in which the head has tertiary education select private care more frequently than others, especially for conditions of type 2 (Skin/ ear/eye problems) and 4

(Diarrhoea and similar conditions). Families select private care for these conditions more frequently than do single persons. Private care is selected with greater probability in urban than in rural areas, but the difference, after adjustment, is smaller than 0.10 in probability.

Household income is not strongly associated with the probability of selecting private care (at most 0.04 greater probability for tenfold increase in *Household income*). *Household size* and *Employment status* of head of household are not associated with selecting private care. Differences of the probabilities for men and women are small. For Minor accidents and other painful conditions, young adults (15–34 year-olds) select private care with probability 0.10 greater and older adults (aged 35 years or over) with probability almost 0.20 greater than private care is selected for small children (0–4 year-olds). For treatment of mental problems, private care is selected very infrequently.

The between-state variation is substantial for types 3 (Minor accidents and other painful conditions) and 4 (Diarrhoea and similar conditions). In general, even after adjusting for the relevant explanatory variables, the use of private facilities is least frequent in Pahang and most frequent in Selangor.

Utilisation of government facilities for treatment of acute conditions is much more uniform across the states and districts. A possible explanation is that where private facilities are not available the potential clientele seeks care at shops/pharmacies or at sources of traditional care. In most other aspects, the pattern of utilisation of government facilities is a mirror image of the pattern for private facilities.

Thus, Chinese are least likely to select a government facility (probability lower by up to 0.20, and even more for conditions of type 5 for certain combinations of background). Higher education of the head of household is associated with lower probability of using government facilities (by over 0.10 on the probability scale). After controlling for the relevant background variables, government facilities are selected in rural areas with a probability of around 0.10 greater than in urban areas. Government employees and members of their households select government facilities more frequently, by about 0.10 greater probability than self-employed or employees of private enterprises.

Household type, *Household size*, gender, and *Household income* are not associated with the probability of selecting a government facility for treating an acute condition. For acute ear and acute eye conditions government facilities are selected more frequently than for skin problems.

Conclusions

Acute conditions are in general associated with very small *Expenditure*, although episodes, especially of the most common conditions, are very frequent. Home/self, care in government facilities, and private subsidised care are often free of charge, care or purchases in shops/pharmacies or in traditional facilities tend to be of the order of RM1–2, and care in private facilities has mean expenditure around RM20. Private care is selected more often, even after controlling for the relevant background variables, by Chinese, heads of households with tertiary education, and by residents of urban areas. The same sub-populations have the lowest (adjusted) probabilities of using government facilities. Private care is used more often

for children: *Household income* is not an important predictor of utilisation after controlling for *Ethnicity*, *Educational level*, and *Urbanity*.

A prediction for the entire year, based on the 26-fold multiple of the results from this section of the Survey, is not appropriate because the episodes recorded are likely to cover, in effect, a period longer than two weeks. In any case, the two-week period may not be a good representation of the whole year.

Health Supplements

Using health supplements is an important component of self-administered health care. Health supplements are obtained or purchased not necessarily in response to a newly arisen or a continuing medical condition, but in anticipation of need in the future, often without any connection to an illness or infirmity. Since purchases are in general associated with households, the survey collected data about health supplements with no reference to household members who were the (principal) users of the health supplements, to medical conditions, health-care episodes, or sources of care.

Therefore the analysis is concerned only with *Expenditure*, in RM, defined as the total expenditure on all health supplements obtained in the recall period of one year prior to the interview by the households. Three categories of health supplements are distinguished:

1. vitamins, minerals, and aloe vera;
2. traditional Chinese herbs;
3. and other traditional preparations.

Apart from household-level attributes we consider also variables that indicate the type of supplements obtained. Since a household may obtain supplements of more than one kind, these indicator variables are not exclusive. Since the outcomes are aggregated within households, no person-level attributes or treatment-related variables are used as explanatory variables.

Almost 6000 households (52% of the sample) reported having obtained at least one kind of health supplements. About 4000 households reported using vitamins, minerals, or aloe vera, 2500 households reported using traditional Chinese herbs, and 2550 reported using other traditional preparations. However, only 4240 households used exclusively one these three kinds of supplements.

The (geometric) mean *Expenditure* for households that obtained *some* health supplements is RM0.28 (the estimate on the logarithm scale is 1.447, with standard error 0.104). Most of the variation is among households, but there is moderate variation among both districts and states. The estimated variance components are 1.684 (households), 0.092 (districts), and 0.057 (states), corresponding to the respective multiplicative factors 19.85, 2.01, and 1.73, respectively.

Households that purchased traditional Chinese herbs tended to have expenditure about three times higher than households that purchased only other kinds of health supplements. *Household income* is an important predictor of *Expenditure*. Ten-fold increase in *Household income* is associated with 6.37 times greater *Expenditure* (the regression slope estimate is 0.804, with standard error 0.070).

Of the other household attributes *Ethnicity*, and to a lesser extent, *Urbanity*, *Educational level* of head of household, and *Age group* of head of household, are important predictors of household expenditure, in addition to *Household income*. The influence of *Household income* on the prediction of *Expenditure* is moderated very little by the other explanatory variables.

After controlling for them (including control for the types of supplements purchased), ten-fold increase in *Household income* is associated with 4.32 times greater expenditure. Chinese spent on average about 3.7 times and Indians 2.35 times more than Malays. The adjusted differences among urban and rural areas are much smaller; households in urban areas expended 37% more than those in rural areas. Higher *Educational level* of head of household is associated with greater expenditure. The adjusted differences *vis-à-vis* the households whose heads have no more than primary education are about 40% (secondary education) and 60% (tertiary education). In households with younger heads (15–29 years of age) the adjusted expenditure is somewhat lower, by about 40%, than in households headed by older persons.

The model fit including the important explanatory variables is given in Table 10.

Table 10. Model fit for expenditure on Household supplements

Parameter	Category	Estimate	Standard error
Constant		-2.295	
Household income		0.636	(0.060)
Type purchased:			
Modern (0/1)		0.457	(0.053)
Chinese trad. (0/1)		0.757	(0.066)
Other trad. (0/1)		0.789	(0.054)
Ethnicity	Malay	0.000	
	Chinese	0.566	(0.063)
	Indian	0.370	(0.088)
	Other	-0.112	(0.160)
Area	Urban	0.000	
	Rural	-0.137	(0.051)
Educational level Of head of household	No/primary	0.000	
	Lower secondary	0.165	(0.060)
	Upper secondary	0.141	(0.060)
	Tertiary	0.214	(0.089)
Age group Of head of household	15–29	0.000	
	30–54	0.166	(0.078)
	55+	0.127	(0.127)
Variance components			
Household		1.693	
District		0.014	(0.009)
State		0.052	(0.025)

Conclusions

Purchasing of health supplements is quite universal in Peninsular Malaysia and the (annual) household expenditure on them exceeds the expenditure on typical episodes of extensive care in government facilities, such as in-patient care (Maternity or Hospitalisation).

Better-off households tend to obtain more health supplements. Chinese and Indians households tend to expend more on health supplements than Malay households. However, bigger households are not associated with greater expenditure. Traditional supplements (Chinese or other) tend to be more expensive than modern supplements. An important aspect not explored by the multilevel analysis is the pattern of use: Chinese tend to prefer Chinese traditional herbs, Malays prefer other traditional preparations, and most of the expenditure of Indians is on modern supplements.

Eye Care

The Survey recorded 3888 episodes of eye care. Two kinds of episodes are identified: check-up (1309 episodes, 33.7%) and purchase of eyeglasses or contact lenses (2579 episodes, 66.3%). Most episodes were taken care of in private clinics (2770 episodes, 71.2%). For purposes of statistical modelling, we consider three types of source of care: private, government (653 episodes, 16.8%, including 161 episodes of the School Health programme), and other (shops and pharmacies, 463 episodes, 11.9%). In addition to the covariates considered in the analyses for other health-care sectors, we consider the dichotomous variable indicating whether the episode took place in the district of the client's residence (3065 episodes) or outside (823 episodes, 21.2%). Episodes may be associated with several visits. Although 3497 episodes were dealt with by a single visit and 318 by two visits each, a small number of episodes required many visits; 42 episodes (1.1%) required 10 or more visits each. We consider the logarithm of *Number of episodes* as a covariate. For the subjects (clients), two categories of age are defined: 0–14 years of age (young) and 15 years of age and older (adult). For heads of households, we consider three categories: 15–29, 30–54, and 55+ years of age.

The majority of episodes are not subsidised (2608 episodes, 67.1%). Check-up tends to involve substantially smaller expenditure than purchase of glasses or contact lenses. The mean expenditures (using geometric averaging) for the two kinds of episodes, cross-classified by the *Subsidy status* are given in Table 11. Most episodes of check-up involve either no or only nominal expenditure, even in private facilities; 839 episodes (64.1%) are associated with no *Treatment expenditure*. Clearly, many private facilities operate a form of cross-subsidy, recovering their costs when a client purchases a pair of glasses or contact lenses. On the other hand, zero expenditure for glasses or contact lenses is very rare; there are only 84 such episodes (3.3%).

Table 11 Geometric means of expenditure (in RM) and numbers of episodes, cross-classified by *Subsidy status* and *Type of care*

<i>Subsidy status</i>	Subsidised		Unsubsidised	
	Mean expenditure	Number of episodes	Mean expenditure	Number of episodes
Check-up	0.02	672	0.73	637
Purchase of glasses and c. lenses	29.50	608	141.25	1971

Treatment expenditure constitutes 98.9% of *Total expenditure*. Therefore our analysis deals only with *Treatment expenditure*. In the analysis of utilisation, we search for covariates that are associated with the choice of private facilities. Unlike in the dental-care sector, the School Health programme is not comprehensive (it affects only a small fraction of school children). Therefore we do not distinguish its episodes from other episodes of government care.

Glasses and contact lenses are purchased principally in private clinics and shops and pharmacies, so analysis of the utilisation for purchases is not relevant. Check-up of eyesight

is provided only in government and private clinics. We carry an analysis to explore the important predictors of the choice between these two sources of care.

Treatment expenditure

Purchase of glasses and contact lenses constitutes most of the expenditure on eye care. Therefore it is essential to allow for consistent differences among the two types of care. Additionally, we analyse expenditure on glasses and contact lenses separately for subsidised and unsubsidised episodes.

Analysis of all episodes

Subsidy status, *Type of care*, and *Household income* are obvious covariates for *Treatment expenditure*. The corresponding model fitted by multilevel analysis is

$$0.227 + 2.560 \times I_T + 0.960 \times I_S + 0.109 \times \log\text{-income}$$

(0.040) (0.048) (0.043)

where I_T and I_S are the respective indicators of purchase (of glasses or contact lenses) and of unsubsidised care ($I_T = 1$ for purchase and $I_T = 0$ for check-up; $I_S = 1$ for unsubsidised care and $I_T = 0$ for subsidised care). The standard errors are given in parentheses under-neath the estimates. Thus, purchase of glasses or contact lenses is on average $10^{2.56} = 363$ times as expensive as a check-up (within the same *Subsidy status*), and the expenditure for an unsubsidised episode is on average 9.12 times as expensive as for a subsidised episode (for the same *Type of care*). Although also significant, the differences due to *Household income* are much smaller; ten-fold increase in *Household income* is associated with only 1.29 times greater expenditure.

For more detailed modelling, we consider first *Source of care*, *Number of visits*, *Ethnicity*, *Age group* of the client, *Area* (urban/rural), *Educational level* and *Employment status* of the head of household. Of these covariates, *Source of care*, *Number of visits*, *Ethnicity*, and *Age group* are significant (at 5% level of significance). They reduce the importance of *Household income* and strengthen the impact of *Subsidy status*. Roughly, care in a government facility is associated on average with about ten times greater expenditure than subsidised care in a private facility, but with about ten times lower expenditure than in shops and pharmacies, and with about one hundred times lower expenditure than in unsubsidised private care. Greater number of visits is associated with greater expenditure; ten-fold (two-fold) increase in the number of visits is associated with 5.02 times (1.62 times) greater expenditure.

Unlike in other health-care sectors, for Eye care, Indians tend to have greater expenditure than the other ethnic groups; 1.67 times greater than Malays and 1.46 times greater than Chinese. The average difference between the age groups is of the same order; an adult's expenditure is on average 1.60 times greater than for a young client, after controlling for *Source of care*, *Type of care*, *Subsidy status*, *Number of visits*, *Household income*, and *Ethnicity*.

Of the remaining covariates only *Location of care* (within or outside the district of residence) and *Sex* of the head of household are significant, and only the former's impact is of any importance. On average, care outside the district of residence is associated with 1.72 times greater expenditure. The expenditure in households headed by women is on average 1.30 times lower (that is, by 23%) than in households headed by men.

The estimated between-district and between-state variances are small. The typical multiplicative factors for districts and states are 1.44 and 1.41, respectively. In comparison, the estimated between-subject (within-district) variance corresponds to the multiplicative factor 9.19. Details are given in Table 12.

Table 12 The model fit for *Treatment expenditure* in Eye care; all episodes

Parameter	Category	Estimate	Standard error
Constant		0.004	
Type of care	Check-up	0.000	
	Purchase	2.231	(0.042)
Log-income		0.063	(0.042)
Source of care	Government	0.000	
	Private	-0.839	(0.089)
	Shop/pharmacy	1.173	(0.073)
Subsidy status	Subsidised	0.000	
	Unsubsidised	2.190	(0.080)
Number of visits		0.703	(0.096)
Location of care	Within district	0.000	(0.000)
	Outside district	0.236	(0.041)
Age group	Young (0-14 yrs)	0.000	
	Adult (15+)	0.160	(0.043)
Sex of head of household	Male	0.000	
	Female	-0.115	(0.052)
Variance components			
Episode		0.928	
District		0.025	(0.009)
State		0.022	(0.021)

Unsubsidised purchase of glasses and contact lenses

About half the episodes of eye care involved purchasing glasses or contact lenses in private facilities. The expenditure for most of these episodes was not subsidised. *Treatment expenditure* for unsubsidised episodes is very homogeneous (i. e., has small variance). The most important factors are *Household income* and age of the client. Glasses (and contact lenses) are cheaper for children than for adults, by about 40%. Possibly, contact lenses are more expensive than glasses, but they are purchased only (or mainly) by adults — this may contribute to the difference. Ten-fold increase in *Household income* is associated with 53% greater expenditure. An episode involving twice as many visits is associated with 26% higher expenditure. The only other statistically significant factor is *Income recipient status*. For given *Household income* and *Number of visits*, income recipients have average expenditure about 15% greater than those receiving no income.

Differences among the states and districts are of little consequence; the corresponding typical multiplicative factors are 1.24 and 1.13. Even within a district, the expenditure varies only moderately; the typical multiplicative factor is 2.62. Details of the model fitted are given in Table 13.

Table 13 Model fit for unsubsidised episodes of purchase of glasses or contact lenses; unsubsidised episodes

Parameter	Category	Estimate	Standard error
Constant		3.164	
Log-income		0.186	(0.026)
Age group	0-14	0.000	
	15+	0.148	(0.031)
Number of visits (log)		0.101	(0.070)
Income recipient	Yes	0.000	
	No	0.060	(0.022)
Variance components			
Episode		0.175	
District		0.009	(0.003)
State		0.003	(0.002)

Purchase of glasses and contact lenses; subsidised episodes

There are only 608 subsidised episodes of purchasing glasses and contact lenses, and so detailed modelling of such data is not feasible. In particular, there may be substantively important differences among the levels of some factors, but they cannot be detected by comparing the corresponding estimates with their standard errors.

Expenditure per episode in shops and pharmacies is on average 32.5 times greater than expenditure in government facilities, and 167.1 times greater than expenditure in private facilities (in subsidised cases). The estimated regression slope on the logarithm of *Number of visits* is close to unity (estimate 0.987, standard error 0.306); the average expenditure per visit is about the same for episodes that involve a single visit as those for several visits. (For unsubsidised episodes, the average expenditure per visit tends to be much lower than for single-visit episodes.) *Household income* is not a significant factor, but the estimate of the slope is of the same order of magnitude as in the analysis of all episodes (estimate 0.168, standard error 0.118).

Utilisation — check-up

In this section, we investigate factors related to choosing government and private clinics for check-up. Glasses and contact lenses are purchased principally in private clinics or shops and pharmacies, and so utilisation analysis for them is not relevant. Note that in most episodes check-up involves very small expenditure, so factors other than cost are likely to be the main factors in the selection of the source of care. In the database, there are 1309 records of episodes of check-up; 596 (45.5%) of them were taken care of in government clinics, and the remainder, 713 episodes, in private clinics.

Ethnicity and *Education* of the head of household are the covariates most strongly associated with the choice of private facilities. Chinese and members of households whose heads have tertiary education choose private care with probability about 0.20 greater than, respectively, Malays and members of households whose heads have no or only primary education. Note that the prediction is approximately additive; that is, the probability for a client who is

Chinese *and* whose head of household has tertiary education is almost 40%. The preference for private care among Indians is only slightly greater than among Malays. The estimate for

Table 14a Multilevel logistic regression of the choice of private facilities for check-up of eyesight.

Parameter	Category	Estimate	Standard error
Constant		-0.553	
Ethnicity	Malay	0.000	
	Chinese	0.811	(0.160)
	Indian	0.147	(0.275)
	Other	1.520	(0.752)
Area	Urban	0.000	
	Rural	-0.248	(0.149)
Education of head of household	No/primary	0.000	
	Lower secondary	0.097	(0.165)
	Upper secondary	0.620	(0.178)
	Tertiary	1.002	(0.299)
Age group (client)	0-14	0.000	
	15+	0.701	(0.167)
Sex	Male	0.000	
	Female	0.161	(0.127)
Others paid	No	0.000	
	Yes	1.983	(0.486)

Table 14b Estimates of state-level deviations (on the logit scale) from the prediction based on Table 14a.

Johor 0.16	Kedah 0.01	Kelantan 0.08	Melaka -0.02
N. Sembilan -0.01	Pahang -0.20	P. Pinang -0.01	Perak 0.06
Perlis -0.03	Selangor 0.08	Terengganu 0.03	W. P. K. L. -0.03

the 'Other' ethnic groups is extremely high (1.520); however, it is subject to substantial uncertainty (standard error 0.752). Infact, the data contain only 15 records of check-up for 'Other' ethnic groups (13 of them in private facilities). Note also that Chinese are greatly over-represented in the data; there are 466 records of check-ups for Chinese (34/1%) and 766 of check-ups for Malays (58.5%). In th general population, Malays are in much greter majority.

The level preference for private care in households whose heads have upper secondary education is approximately halfway between those with tertiary education on the one hand, and those with no, primary or lower secondary education on the other hand. The *Employment status* of the head of household is associated with the choice of private care much more weakly than *Educational level*. The order of the estimates for preference of private care is: Private, Government, Self-employed, and Unemployed. The adjusted difference between Private and Unemployed is about 0.10.

Adults select private care more often, with probability greater by about 0.15, than private care is selected for children. This is partly due to the School Health programme. Women have slightly greater estimated preference for private care, by about 0.04, but the estimate of the difference among men and women is not significant. Private care is selected more often in urban than rural areas, with probability greater by 0.05.

Household income and *Location of care* (within or outside the district of residence), *Income recipient status*, *Household type* and *Household size* are not important as predictors of choice between private and government facilities..

Even after adjusting for several covariates, there are substantial differences among the districts and, to a lesser extent, among the states. The respective relative variances are 0.222 and 0.031. Johor stands out as the state with the highest adjusted preference for private care (by 0.04 on the probability scale), and Pahang as the state with the lowest adjusted preference (by almost 0.05).

Conclusions

Check-up of eyesight is in most instances associated with very small expenditure, even in private facilities. On the other hand, the expenses for glasses and contact lenses are non-trivial in most cases, even in government facilities. The mean levels of expenditure for eye care in unsubsidised episodes, shops and pharmacies, government facilities, and in subsidised episodes of private care are roughly in relation 1000:100:10:1.

For unsubsidised episodes, *Household income* is a good predictor of *Treatment expenditure*, but for other episodes it is not. Episodes that involve more visits are associated with higher expenditure. Eye care tends to be more expensive for adults and men than for children and women. Expenditure for glasses or contact lenses in unsubsidised episodes varies little across the country.

Private facilities for the check-up of eyesight are selected more often by Chinese than by Indians or Malays, by adults (as opposed to being selected for children), and in households whose heads have tertiary education. Even after adjusting for these factors, as well as for *Sex*, *Area* (urban or rural), and *Employment status* of the head of household, there are substantial differences in the utilisation of private care among the districts and states.

Long-standing Illness

The Survey database contains 3385 records of episodes of long-standing illness. Most episodes were treated in government facilities (1937 episodes, 57.2%) and private facilities (1405 episodes, 41.5%); the remaining 43 episodes (1.3%) were treated in facilities providing traditional care. For statistical modelling, we use the same covariates as for Eye care, except for *Type of care* which is not defined for the episodes of long-standing illness.

On average, *Treatment expenditure* constitutes 81.1% of *Total expenditure*; *Treatment expenditure* coincides with *Total expenditure* for 2449 episodes (72.3%). As for all other health-care sectors, *Treatment expenditure* for subsidised care (2271 episodes, 67.1%) tends to be much lower than for unsubsidised care (1114 episodes). The respective (geometric) means of *Treatment expenditure* are RM0.10 and RM74.29. We analyse *Treatment expenditure* for all episodes (taking account of *Subsidy status*), and separately for subsidised episodes. In the analysis of utilisation we exclude the episodes of traditional care and investigate predictors for the choice between government and private facilities.

Treatment expenditure

The most important factors associated with *Treatment expenditure* are *Source of care*, *Subsidy status*, and *Household income*. For a given *Household income*, an episode of unsubsidised care is associated with expenditure about 3800 times as high as an episode of subsidised care in a private facility. (The latter is free for many patients.) Even care in government facilities is more expensive, on average about 5.8 times for a given *Household income*. Care in traditional facilities is associated with 95.7 times greater expenditure on average than in government facilities.

In addition to these factors, several other covariates are strongly associated with *Treatment expenditure*. The pattern of association has some commonalities with Eye care and other health-care sectors. For instance, conditional on other factors, Chinese tend to have greater expenditure than Indians who in turn have greater expenditure than Malays. The ratio of the respective (adjusted) mean expenditures is 3.73:2.41:1. Adjusting for more covariates results in a reduced impact of *Household expenditure*, but the impact remains substantial and statistically significant; the estimated slope on log-income is equal to 0.265 (standard error 0.063). This corresponds to 1.84-fold increase for ten-fold increase in *Household income*. Episodes involving more visits are associated with greater expenditure; ten-fold (two-fold) increase in *Number of visits* corresponds to 3.55 (1.46) times greater expenditure. Treatment outside the district of residence is associated with expenditure 2.02 times as high as treatment within the district.

For the *Employment status* of the head of household, patients can be classified into two aggregate categories: self-employed and employees of private companies on the one hand, and government employees and unemployed on the other hand. The former are associated with about 1.75 times greater expenditure than the latter. The pattern of differences among the categories of *Educational level* of the head of household contradicts the findings for other health-care sectors. The expenditure of clients whose heads of household have tertiary education is on average almost twice as low as that of clients whose heads have no greater

than lower secondary education. The average expenditure in households whose heads have upper secondary education is about half-way — 1.46 times lower than for households whose heads have a lower level of education.

The differences among the states and districts are of little consequence; the typical multiplicative factors for the states and districts are 1.195 and 1.47, respectively. The estimated between-episode variance, 1.677, corresponds to the typical multiplicative factor of 19.72. Details of the multilevel regression model fit are given in Table 15.

Table 15 Multilevel regression model fit for *Treatment expenditure* of episodes of Long-standing illness.

Parameter	Category	Estimate	Standard error
Constant		-0.345	
Log-income		0.265	(0.063)
Source of care	Government	0.000	
	Private	-0.767	(0.089)
	Traditional	1.983	(0.204)
Subsidy status	Subsidy	0.000	
	No subsidy	3.460	(0.092)
Number of visits (log)		0.550	(0.053)
Location of care	Within district	0.000	
	Outside district	0.306	(0.062)
Sex	Male	0.000	
	Female	-0.121	(0.052)
Ethnicity	Malay	0.000	
	Chinese	0.528	(0.063)
	Indian	0.382	(0.082)
	Other	0.163	(0.183)
Education of head of household	No/Primary	0.000	
	Lower secondary	-0.007	(0.066)
	Upper secondary	-0.165	(0.068)
	Tertiary	-0.292	(0.116)
Employment of head of household	Self-employed	0.000	
	Government	-0.286	(0.080)
	Private	-0.042	(0.064)
	Unemployed	-0.247	(0.063)
Variance components			
Episode		1.677	
District		0.028	(0.013)
State		0.006	(0.008)

Unsubsidised episodes

Treatment expenditure for unsubsidised episodes displays a great deal of homogeneity. Even without adjusting for any covariates, the estimated between-episode variance is only 0.688 (typical multiplicative factor 6.75), and the between-district and between-state variances are 0.045 and 0.008, respectively, much smaller than their counterparts in the analysis of all episodes. For unsubsidised episodes, *Location of care*, *Ethnicity*, and *Employment status* of the head of household are also important covariates, although the estimated regression

parameters are very different from those in the analysis of all episodes. Unlike in the analysis of all episodes, the adjusted difference between urban and rural areas is significant for unsubsidised care. Episodes in urban areas involve on average 1.42 times higher expenditure than in rural areas. Episodes requiring more visits to health-care facilities are associated with higher expenditure, but the differences are much smaller than in the analysis of all episodes; ten-fold (two-fold) increase in the number of visits is associated with 1.76 times (1.185 times) greater expenditure; the corresponding figures for all episodes are 3.55 (1.46).

The differences in mean (adjusted) expenditure among the ethnic groups are also much smaller than in the analysis of all episodes. On average, *Treatment expenditure* of Chinese is 1.66 times as high and that of Indians 1.17 times as high as that of Malays. The pattern of differences among the four levels of *Employment status* of head of household is different from that for all episodes. The differences among the four categories are much smaller; the lowest mean expenditure is for episodes in households whose heads are employed in private companies and highest in households whose heads are self-employed or unemployed. But the ratio of mean expenditures between these categories is only about 1.5.

Adjustment for these covariates reduces all three variance components; the estimated district- and state-level variances are 0.013 and 0.000, respectively. The estimated episode-level variance, 0.524, corresponds to the typical multiplicative factor 5.30, also much smaller than its counterpart in the analysis of all episodes. The multilevel regression model fit are summarised in Table 16.

Table 16 Multilevel regression fit for *Treatment expenditure* of unsubsidised episodes of Long-standing illness.

Parameter	Category	Estimate	Standard error
Constant		3.346	
Number of visits (log)		0.769	(0.044)
Location of care	Within district	0.000	
	Outside district	0.245	(0.059)
Area	Urban	0.000	
	Rural	-0.151	(0.052)
Ethnicity	Malay	0.000	
	Chinese	0.219	(0.052)
	Indian	0.067	(0.084)
	Other	0.043	(0.219)
Employment of head of household	Self-employed	0.000	
	Government	-0.081	(0.077)
	Private	-0.155	(0.057)
	Unemployed	0.018	(0.058)

Utilisation

Since there are only a few episodes of care in traditional facilities (43 episodes, 1.3%), and the patients involved can be regarded as a constituency different from those using government or private facilities, we exclude the episodes of care in traditional facilities from the analysis of utilisation. Thus, this analysis explores the factors associated with the choice of care in private facilities, given government and private care as the options considered.

The results of the multilevel logistic regression have several commonalities with the analyses of utilisation of private facilities in other health-care sectors. In particular, private care is preferred more by Chinese, and in households whose heads have tertiary education and are either self-employed or employed in private companies. Household income is positively associated with utilisation of private facilities, but the differences, after adjusting for other covariates, are much smaller than due to other factors. We included *Number of visits* among the covariates, assuming that its value can be anticipated when the choice of the health-care facility is made. *Number of visits* is negatively associated with selecting care in private facilities; an episode involving ten times (twice) as many visits is associated with about 0.11 (0.03) smaller probability of selecting private care. Three distinct interpretations of this result appear reasonable. First, in making their decisions, (prospective) patients may take the anticipated number of visits into consideration. Next, among those loyal to government health-care facilities, there may be more severe or more complicated cases. Finally, the estimated difference may be due to different practices in government and private facilities.

After adjusting for all relevant covariates, the probability that a Chinese client selects a private facility for care is greater than for a Malay client by about 0.17. The fitted probability for Indians is even lower, although the difference between Malays and Indians is not significant. In households whose heads have tertiary education, the probability of choosing care in private facilities is greater than for households whose heads have only secondary or lower education by 0.11–0.14. Households whose heads are employed by the Government are most averse to using private-care facilities; their probability of selecting a private facility is about 0.11 lower than for households headed by self-employed or those employed in private companies. Households headed by unemployed are about half-way between these two extremes (their probabilities are about 0.05 greater than for government employees' households and about 0.05 smaller than for households headed by self-employed). Without adjusting for the covariates listed above, *Household income* is an important predictor of using private care. However, after adjustment, although still significant, it is much less important. Ten-fold increase in *Household income* is associated with only 0.01 greater probability of seeking care in a private facility. In contrast, when the expenditure is covered by another party, the probability of the episode being treated in a private facility is greater than in a government facility by about 0.40.

After adjusting for all the relevant covariates, the differences among the districts and states are very small. The relative variances are 0.036 (between-states) and 0.026 (between-districts). Among the states, P. Pinang and Perlis stand out as having the highest and lowest adjusted probabilities (0.05 greater and 0.05 lower, respectively, than the average state). Details of the model fit using multilevel logistic regression are given in Table 17.

Table 17 Multilevel logistic regression analysis of utilisation (private vs. government facilities); long-standing illness.

Parameter	Category	Estimate	Standard error
Constant		-0.545	
Log-income		0.059	(0.025)
Number of visits (log)		-0.496	(0.082)
Area	Urban	0.000	
	Rural	-0.128	(0.090)
Ethnicity	Malay	0.000	
	Chinese	0.790	(0.097)
	Indian	-0.201	(0.136)
	Other	-0.486	(0.325)
Educational level of head of household	No/primary	0.000	
	Lower secondary	0.152	(0.107)
	Upper secondary	0.143	(0.108)
	Tertiary	0.657	(0.176)
Employment of head of household	Self-employed	0.000	
	Government	-0.516	(0.133)
	Private	-0.005	(0.102)
	Unemployed	-0.265	(0.109)

Conclusions

Episodes of long-standing illness are dealt with primarily in government and private hospitals and clinics. Private facilities are preferred more by Chinese, households whose heads have tertiary education, residents of urban areas and those with higher *Household income*

Treatment expenditure for episodes on unsubsidised care is on average several thousand times greater than for subsidised care in government or private facilities. Within categories of *Subsidy status* and *Source of care*, the mean expenditure is highest for Chinese, followed by Indians and Malays. Episodes requiring more visits tend to involve higher expenditure. Higher *Household income* is associated with higher expenditure. Expenditure for episodes dealt with outside the district of residence is on average about twice as high as for episodes within the district. The expenditure tends to be lower in households whose heads are either unemployed or employed by the Government. For a given profile of factors, the differences among the districts and states are negligible.

Expenditure for episodes of unsubsidised care is more homogeneous (on the logarithm scale) than for most other health-care sectors. The factor most strongly associated with expenditure is *Number of visits*. The adjusted differences among the levels of the other factors are in general reduced in relation to subsidised episodes. One exception is *Area*; expenditure on episodes of unsubsidised care tends to be higher in urban areas.

Conclusions

NHHES provides a wealth of information about the patterns of expenditure on health care by the population of Peninsular Malaysia in 1996. The most important findings are:

- a high proportion of episodes involved no expenditure, even for in-patient services, such as maternity care and hospitalisation;
- weak or no association of *Household income* with using government health-care facilities and weak association of *Household income* with *Treatment expenditure*, after controlling for other socio-demographic factors;
- substantial differences in the pattern of utilization and distribution of expenditure among the health-care sectors.

The Survey collected information on the health care received by individuals and on their expenditure. Thus, the Survey is a record of the choices made, in response to the arising medical conditions, by the (prospective) patients and their households. These choices are made within the constraints of the economic circumstances of the households and of health-care facilities available or accessible. In particular, no information was collected on how such behaviour would be altered in different circumstances: if the household's socio-economic circumstances changed, or if the country's health-care system were radically reformed. For gradual or small changes, the changes can be forecasted by extrapolation, in essence, assuming that the households' and (adult) individuals' general behaviour and attitudes to health would not be altered.

The substantial systematic differences in expenditure across the sub-populations defined by the background variables reflect a number of confounding factors:

- systematic differences in the (details of) health-care services required (e.g., maternity care for Chinese);
- differences in the complexity of the medical procedures (e.g., dental care for elderly);
- different patterns of preventive care (e.g., dental care);
- (almost) universal access to subsidised care (e.g., hospitalisation and maternity care).

An important feature of the health-care system is the large variation in the expenditure of patients. In principle, this may reflect various aspects of inequity of the system, but more likely it is a consequence of the natural variation in health-care needs (including the severity of the treated condition) in the population. Similarly, systematic differences may reflect differential affordability of high-quality health care, different distributions of health-care needs in the studied sub-populations, or systematic differences in the attitudes to health care.

Policy implications

Although there is a general agreement on desirable properties of a health-care system, such as equity, equal accessibility, comprehensive coverage, maintenance of high quality of care, and protection for those with extensive needs, the definitions of such attributes have a substantial social, cultural, and political content. In practice, a working compromise (e.g., between quality and resources available) has to be established. Different countries have different

ideals of a 'perfect' health-care system, and these ideals are continually being revised in the light of social, technological, economic, and political developments.

Any profound health-care reform is likely to alter the patterns of household expenditure on health care and of utilisation of the available sources of care. The results of NHHES'96 can effectively contribute to decision making in health-care policy making. The relevant body should formulate in detail the properties of an ideal health-care system for the country. This description would imply certain (or no) differences in the expenditure among the various socio-demographic strata. Any considered policy, or a set of policies, could be evaluated, among other standards, with respect to the criterion of how closer it would bring the distribution of household expenditure to the *a priori* formulated ideal.

In as much as higher contributions from the patients (households) towards the total cost of health care are being sought, the results can be applied to identify population strata that would not face undue hardship (and would not respond with any social or economic disruption) if their household expenditure on health care were increased. For several 'typical' households (with different household attributes), a range of acceptable levels of expenditure could be specified and compared with the current (average) levels. Any proposed change in the pricing mechanism could be evaluated, among other criteria, by how the average levels of expenditure would approach the acceptable levels for as many typical households as possible.

NHHES'96 is a cross-sectional survey, and as such it can inform only about static features of the health-care system – its state at a particular point in time. Dynamic features, such as secular changes over time, changes in response to macro-economic and other factors, can be observed (and made inference about) only from longitudinal surveys, or series of surveys administered at regular intervals. Having established a baseline by the NHHES'96, such surveys could in future be much smaller in scale. If desired, they could target population strata which are of specific interest, such as elderly, the most extensive users of health-care services, or areas in which government has a near-monopoly on health care.